



**Non-Time-Critical
Removal Action Report
Monte Cristo Mining Area
Mt. Baker-Snoqualmie National Forest
Snohomish County, Washington**

December 2016



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Monte Cristo Mining Area
Mt. Baker-Snoqualmie National Forest
Snohomish County, Washington**

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Report Date: December 8, 2016

Project Number: 2015230017

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Cover Photographs: Upper Left = Liner Installation at Repository; Upper Right = Helicopter at Pride of the Woods Mine; Lower Left = Reclaimed Upper Concentrator

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LIST OF ACRONYMS AND ABBREVIATIONS

amsl	Above Mean Sea Level
ARAR	Applicable or Relevant and Appropriate Requirement
AST	Aboveground Storage Tank
bcy	Bank Cubic Yard
bgs	Below Ground Surface
BO	Biological Opinion
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CES	Cascade Earth Sciences
County Road	Snohomish County Mine to Market Road
cy	Cubic yard
dB	decibel
dbh	Diameter at Breast Height
DEA	David Evans and Associates, Inc.
E	East
Ecology	State of Washington Department of Ecology
EE/CA	Engineering Evaluation/Cost Analysis
E&MCR	Everett & Monte Cristo Railway
EPA	U.S. Environmental Protection Agency
Forest Service	U.S. Department of Agriculture Forest Service
ft	Feet
gpm	Gallons per Minute
HDPE	High Density Polyethylene
HLZ	Helicopter Landing Zone
HMJ	Henry M. Jackson Wilderness
lb/ac	Pounds per Acre
LSR	Late Successional Reserve
MCMA	Monte Cristo Mining Area
mg/kg	Milligrams Per Kilogram
N	North
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
Near Features	Features with higher probable exposure near the Townsite
NOAA	National Oceanic Atmospheric Administration
NTU	Nephelometric Turbidity Unit
OSC	On-Scene Coordinator
PVC	Polyvinyl Chloride
R	Range
RA	Removal Action
Remote Features	Features with lower probable exposure away from the Townsite
RPA	Registered Professional Archaeologist
SDB	Self-Dumping Bin
Secs	Sections
SFSR	South Fork Sauk River
Site	MCMA Near and Remote Features
T	Township
Townsite	Monte Cristo Townsite
UN	United Nations
USFWS	U.S. Fish and Wildlife Service
W	West
WDFW	Washington Department of Fish and Wildlife
WM	Willamette Meridian
XRF	X-ray Fluorescence

1.0 INTRODUCTION

United States Department of Agriculture, Forest Service (Forest Service) retained Cascade Earth Sciences (CES) to complete a non-time-critical Removal Action (RA) for the Monte Cristo Mining Area (MCMA) located in the Mt. Baker-Snoqualmie National Forest of Washington. The RA was performed for the Forest Service under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) cleanup authorities [42 United States Code 9604(a) and 7 Code of Federal Regulations (CFR) 2.60(m)] and Federal Executive Order 12580. The RA was implemented in accordance with the provisions of National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR 300.415(b)(4)(i); and utilizing the U.S. Environmental Protection Agency (EPA) “*Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA*” (EPA, 1993).

The Forest Service requested all necessary labor, equipment, and materials be provided to conduct the RA under a turnkey, fixed fee contracting mechanism. The RA was completed under Contract No. AG-05K3-C-13-0002; Order No. AG-05K3-D-15-0012 (Repository Logging), AG-05K3-D-15-0015 (Remote Features and Repository), and AG-05K3-D-15-0023 (Near Features). The RA was conducted over the 2015 and 2016 field seasons.

Work conducted on private inholdings was completed under the Model Toxics Control Act (MTCA) Independent Cleanup Program (ICP). A Memorandum of Understanding (MOU) was completed between the Forest Service and State of Washington Department of Ecology (Ecology), along with cost sharing to address elevated concentrations of metals. Cleanup was conducted at private inholdings at the Rainy Mine, Ore Collector, and portions of the Concentrator under this MOU.

1.1 Site Description

The MCMA is located in the Mt. Baker-Snoqualmie National Forest, Darrington Ranger District, in Snohomish County, Washington (Appendix A; Sheet G1). The Monte Cristo Townsite (Townsite) is situated approximately 28 air-miles east-southeast of Granite Falls, Washington, which is about 9.5 miles east of Marysville, Washington. The 2015 project area included the Repository, Borrow Area, Helicopter Landing Zone, Log Deck, Glacier Creek crossing, and the MCMA Near and Remote Features (Site). Work completed in 2016 was limited to the repository and borrow area. Near Features are defined as those close to the Townsite and having fairly easy human access. Remote Features are typified by difficult terrain, lack of amenities, infrequent use, and difficult access. The potential for significant human activity is considered to be moderate to high at the Near Features and very low at the Remote Features.

The aforementioned project areas are located as follows:

- **Repository:** elevation of 2,600 feet (ft) above mean sea level (amsl); Sections (Secs) 16 and 21 of Township (T) 29 North (N), Range (R) 11 East (E) of the Willamette Meridian (WM), latitude 47° 59' 33.80" N, longitude 121° 24' 18.39" W.
- **Borrow Area:** elevation of 2,560 ft amsl; Sec 17 of T29N, R11E of the WM, latitude 47° 59' 41.62" N, longitude 121° 24' 33.97" W.
- **Helicopter Landing Zone:** elevation of 2,265 ft amsl; Sec 6 of T29N, R11E of the WM, latitude 48° 01' 52.58" N, longitude 121° 26' 10.97" W.
- **Log Deck:** elevation of 2,220 ft amsl; Sec 6 of T29N, R11E of the WM, latitude 48° 01' 50.54" N, longitude 121° 26' 16.51" W.
- **Glacier Creek Crossing near Concentrator:** elevation of 2,830 ft amsl; Sec 21 of T29N, R11E of the WM, latitude 47° 59' 08.75" N, longitude 121° 23' 23.06" W.

- **MCMA Near Features**

- **Rainy Mine:** elevation of 2,900 ft amsl; Sec 22 of T29N, R11E of the WM, latitude 47° 59' 02.95" N, longitude 121° 22' 59.84" W.
- **Ore Collector:** elevation of 2,970 ft amsl; Sec 22 of T29N, R11E of the WM, latitude 47° 59' 01.52" N, longitude 121° 23' 03.46" W.
- **United Companies Concentrator (Concentrator):** elevation of 2,890 ft amsl; Sec 21 of T29N, R11E of the WM, latitude 47° 59' 04.15" N, longitude 121° 23' 20.26" W.
- **Assay Shack:** elevation of 2,960 ft amsl; Sec 21 of T29N, R11E of the WM, latitude 47° 59' 02.66" N, longitude 121° 23' 23.77" W.
- **Comet Terminal and Tram/Haulage Ways:** elevation of 2,955 ft amsl; Sec 21 of T29N, R11E of the WM, latitude 47° 59' 01.06" N, longitude 121° 23' 13.75" W.

- **MCMA Remote Features**

- **Pride of the Woods Mine:** elevation of 4,400 ft amsl; Sec 23 of T29N, R11E of the WM, latitude 47° 59' 02.66" N, longitude 121° 23' 23.77" W.
- **Justice Mine:** elevation of 3,800 ft amsl; Sec 22 of T29N, R11E of the WM, latitude 47° 58' 53.30" N, longitude 121° 22' 34.38" W.
- **Mystery Mine:** elevation of 4,015 ft amsl (at Mystery #3 adit); Sec 22 of T29N, R11E of the WM, latitude 47° 58' 52.43" N, longitude 121° 22' 12.48" W.

1.2 Background

A total of 54 mines and prospects, as well as ore transport, storage, and processing facilities, were identified in the Monte Cristo Mining District (District) during a U.S. Bureau of Mines RARE II (U.S. Forest Service Second Roadless Area Review and Evaluation) study (Johnson, et al., 1983a, 1983b). Prospecting in the District began in the spring of 1889, and active claim staking and mine development ensued soon after. A railroad was completed to the Townsite in 1893, and construction began on a 300-tons-per-day concentrator. Mineral production flourished until massive floods destroyed rail access in 1897. Production was intermittent for a period of time; however, the mines were permanently closed again in the fall of 1907. Additional, unsuccessful attempts were made to revive the District through the winter of 1920 but due to a variety of reasons, not the least of which were severe weather and access problems, the District has been idle since.

Mineral production reported in the literature varies, primarily because District records are unreliable. However, ore production is estimated to be at least 310,000 tons (Johnson, et al., 1983b, 1985). Most of the production came from the Mystery, New Discovery, Pride of the Mountains, Pride of the Woods, Golden Cord, Comet, Justice, and Rainy Mines. The most significant mineral deposit in the District is in the northeast-trending, northwest-dipping shear zone developed by the Justice, Golden Cord, Mystery, Pride of the Woods, New Discovery, and Pride of the Mountains Mines. The zone is exposed underground and on the surface over a strike length of 5,800 ft. In addition to reports by Johnson, et al., (1983b, 1985), other relevant geologic and mining-related references include Hodges (1897), Spurr (1901, 1908), Westby (1939), Broughton (1942), Huntting (1956), Woodhouse (1979), Church, et al., (1983), Derkey, et al., (1990), USGS (1991), Northwest Underground Explorations (1997), and Orr and Orr (2002).

All mines in the MCMA used standard underground mining practices for the period. The smallest possible heading was maintained to minimize ore dilution and hand cobbing. In general, stopes were not backfilled except in a few scattered locations. Stopes were simple open stopes with stulls for support on a minimal basis. In a few areas, stopes broke through or are caved to the surface.

Run-of-mine ore from the Glacier Creek/Basin mines was sent to the Ore Collector for coarse crushing. Because of the differences in ore morphology between the Mystery Mine and other mines, separate ore bins were maintained at the Ore Collector to facilitate independent handling and modified processing. Ore was trammed by horse-driven rail from the Ore Collector to the Concentrator, where it was comminuted through a series of fine crushers and rollers before being passed through a system of jigs for concentrating. Tailings were discharged to land and Glacier Creek.

An Engineering Evaluation / Cost Analysis (EE/CA) prepared by CES (2010) concluded the waste rock and tailings presented an unacceptable risk to human health and the environment. Additional investigations and studies conducted by CES from 2010-2013 supplemented the evaluation of RA alternatives.

1.3 Objectives

As outlined in the EE/CA, Removal Action Memorandum (Forest Service, 2012), and the RA Work Plan (CES, 2015), the objective of the RA was, to the extent that is technically practical from an engineering perspective, meet the Applicable or Relevant and Appropriate Requirements (ARAR's) identified in the EE/CA.

The key objectives of the RA were to:

1. Reduce unacceptable risks to human and ecological receptors by controlling the exposures and migration of hazardous substances in soil, dust, tailings, waste rock, and water at the Site.
2. Minimize or eliminate potential for hazardous substance mobilization and transport from contaminated waste rock / soils.
3. Improve surface water quality by decreasing hazardous substance loading. The selected RA varies by mine facility based on the unique circumstances of each feature and the most appropriate combination of activities to achieve the RA Objectives.
4. Remove contaminated materials to improve water quality at features that directly contribute contaminants to Glacier Creek, Seventysix Creek, or South Fork Sauk River (SFSR), or are easily accessible by the public, especially children, and present a substantial human health risk.
5. Consolidate the majority of contaminated materials in an onsite repository. Approximately 12 bank cubic yards (bcy) of tailings from the slime recovery system at the Concentrator that exceeded Dangerous Waste criteria were transported offsite to a facility that accepts hazardous waste.
6. Provide institutional controls to warn the public of potential exposure hazards to mine wastes, soils, and drainage.
7. Retain significant historical evidence of mining activities utilizing onsite archaeologists during removal to catalogue, map, and preserve artifacts/features, to the extent practicable, while meeting health and safety concerns.

The risk-based cleanup concentration was calculated at 284 milligrams per kilogram (mg/kg) total arsenic for Near Features and 659 mg/kg for Remote Features. Cleanup of waste rock, tailings, and soil to these concentrations are expected to be protective of both human and ecological receptors.

1.4 Roles and Responsibilities

The following is a summary of the roles and responsibilities of the key parties for the RA.

Prime Contractor - Project Management, Engineering, and Oversight	Cascade Earth Sciences 3511 Pacific Boulevard SW Albany, Oregon 97321
Onsite Construction Subcontractor	Palm Construction, Inc. PO Box 322 53 Horizon Flat Road Winthrop, Washington 98862
Survey Subcontractor	David Evans and Associates, Inc. 908 N Howard, Suite 300 Spokane, Washington 99201
Geotechnical/Compaction Subcontractor	GeoEngineers, Inc. 523 E 2 nd Avenue Spokane, Washington 99202
Monitoring Well/Drilling Subcontractor	Cascade Drilling, L.P. 35100 Pacific Hwy South Federal Way, Washington 98003
Primary Helicopter Subcontractor/Heavy Lift	Columbia Helicopters, Inc. PO Box 3500 Portland, Oregon 97208
Secondary Helicopter Subcontractor	Hi Line Helicopters, Inc. 47225 Sauk Prairie Road Darrington, Washington 98241
Liner Leak Location Subcontractor	Leak Location Services, Inc. 16124 University Oak San Antonio, Texas 78249
Archeological Subcontractor	ASM Affiliates, Inc. 26231 72nd Avenue NW, Suite 104 Stanwood, Washington 98292
Analytical Laboratory	TestAmerica Laboratories 11922 East 1st Avenue Spokane, Washington 99206
Forest Service - On-Scene Coordinator (OSC)	Joseph Gibbens, PE 1835 Black Lake Blvd SW Olympia, Washington 98512
Forest Service - On-Scene Coordinator (OSC) - Repository	Karen Bower, PE 63095 Deschutes Market Road Bend, Oregon 97701

2.0 REMOVAL ACTION ACTIVITIES

The Work Plan (CES, 2015), as approved by the Forest Service, outlined the planned RA activities for the 2015 summer / fall field season. The following sections describe the various tasks associated with the implementation of the RA at the Site. As-Built plans are provided in Appendix A and photographs of the pre- and post-RA activities are provided in Appendix B.

2.1 Removal Action Timeline

The following is an outline of the general sequence of 2015-2016 RA activities. Sections 2.9 and 2.10 detail specific activities conducted at the Near and Remote Features. In addition to these activities, daily field notes were recorded and safety meetings were conducted as part of the RA. Moreover, representatives from the Forest Service, State of Washington Department of Ecology (Ecology), National Oceanic and Atmospheric Sciences (NOAA) Fisheries, and U.S. Fish and Wildlife Service (USFWS) visited/inspected the Site on a regular basis.

As outlined in the Work Plan, the Repository logging was scheduled to commence April 15, 2015. However, due to weather delays, the logging began on April 28, 2015. Demobilization from the Site was originally scheduled for October 7, 2015. However, due to the delays in scheduling, and weather-related constraints, demobilization occurred on October 24, 2015.

CES remobilized to the Site on June 19, 2016 to complete repairs to the access route and finalize the grading at the repository. The final survey and demobilization was completed on July 12, 2016.

2.2 Mobilization

The RA was completed under three separate task orders, which required mobilizations specific to each of the tasks. As discussed, the initial mobilization for Repository logging occurred on April 28, 2015. Mobilization for the work at the Repository / Remote Features began on June 14, 2015, while work at the Near Features started on July 21, 2015. Final work at the repository necessitated remobilization on June 19, 2016.

2.2.1 Repository Logging

Repository logging necessitated the establishment of a remote camp for Site workers at Perry Creek, approximately four miles west of Barlow Pass along the Mountain Loop Highway. The following equipment was used during logging operations:

- Caterpillar 325D Excavator
- Z Axis 350 LC Excavator
- Deere 450G Dozer
- Palm 12 cy Highway Dump Truck (USDOT #10237611)
- Whisperwatt Diesel Generator 45
- Caterpillar CP-433C Vibratory Roller
- Deere 648G-III Grapple Skidder
- W900 Kenworth Log Trucks (2)
- All-Terrain Vehicles
- Pickups
- Chainsaws

2.2.2 Near/Remote Features

Following logging operations, CES, subcontractors, and Forest Service personnel relocated to the Monte Cristo Campground to prepare the Repository for waste consolidation. The camp included a toilet / shower /

washroom facility, a septic tank with leach field, and various camping trailers and tents. The following equipment was used at the Near / Remote Features:

- Deere 450G Dozer
- Caterpillar D6K Dozer
- Whisperwatt Diesel Generator 45
- Caterpillar 312E Excavator
- Caterpillar 325D Excavator
- Caterpillar 329E Excavator
- Caterpillar 303.5E Mini Excavators (3)
- Taylor Hitachi 350 Excavator
- Deere 300D 20 cy Articulated Haul Trucks (2)
- Komatsu CD60R 5 cy Spin/Track Dump Trucks (2)
- Caterpillar 950K Wheeled Loader
- Caterpillar CP-433C Vibratory Roller
- Caterpillar CS56 Vibratory Sheepsfoot Roller
- Read Screen-All RD-90C Rock Sorter
- Boart Longyear Track-Mounted 6-Inch Mini Sonic Drill Rig
- Cascade Drilling Skid Steer
- Log Truck
- Columbia Vertol 107-II Heavy Lift Helicopter (N191CH)
- Columbia 7,500-Gallon Jet A Fuel Storage Truck
- Hi Line Hughes 500 Helicopter
- Attack 77 Fire Engine
- Crambo Dual Shaft Wood Shredder
- JD 720A Road Grader
- Pressure Washer
- Fuel Truck
- 4,000-Gallon Water truck
- Diesel Storage Tank
- Pickups
- All-Terrain Vehicles

All off-road equipment was thoroughly pressure washed and cleaned to remove dirt / weeds and inspected by CES prior to mobilization to the Site.

2.2.3 Fuel storage

Fuel storage at the Site was established for heavy equipment operating along the Access Route, Repository, and Near Features; helicopter staging at the Helicopter Landing Zone (HLZ); and in the Henry M. Jackson (HMJ) Wilderness, north of the Pride of the Woods Mine for mini-excavator operations.

A covered container with 2,000-gallon diesel fuel storage was established for heavy equipment at Station 13+00. A diesel powered generator was also located at the Monte Cristo Campground.

The 7,500-gallon helicopter fuel truck was positioned at the HLZ, inside a bermed containment area, overlain with a polyvinyl chloride (PVC) liner. The containment included a sump on the low end (west) to allow drainage of stormwater.

A skid mount was used to transport two United Nations (UN) Rated 1A1 steel 55-gallon drums for diesel fuel storage to the Pride of the Woods Mine. The mount was enclosed with a PVC liner to act as secondary containment. The Columbia Vertol 107-II helicopter lifted the skid mount to the flat area adjacent and to the north of the waste rock pile in the flat upland talus area, at the furthest reasonable distance from Glacier Creek. Talus was removed and stored for the fuel storage berming and secondary containment.

2.3 Clearing and Grubbing

Clearing and grubbing was performed at the direction of CES during the course of the RA, and was intended to only disturb areas within the limits of the Site and other minor areas for access. In general, the vegetation covering waste rock, tailings, and haulage ways required clearing prior to excavation. In addition, the access to the Rainy Mine and the temporary crossing on Glacier Creek necessitated clearing of shrubs and small trees. Grubbed material and slash were stockpiled onsite for shredding as mulch for revegetation or were placed on reclaimed areas for erosion control.

2.3.1 Tree Removal

Trees were felled at the Repository, Borrow Area, Access Route, HLZ, and near the Concentrator and haulage ways for the RA. Prior to Repository logging, a 21-inch western hemlock, 25-inch western hemlock, and 40-inch Pacific silver fir tree were removed at Station 13+00 along the Access Route to widen the corner for equipment. The hemlock trees were below the 30-inch diameter at breast height (dbh) threshold for potential marbled murrelet (murrelet) nesting platforms outlined in the Biological Opinion (BO) (USFWS, 2011). The silver fir did not contain branches large enough to support murrelet nesting. In addition, a 38-inch dbh western hemlock was removed adjacent to the south of Bridge #3, within murrelet habitat, to allow equipment access. Although the hemlock was above the 30-inch dbh threshold, the BO originally anticipated 43 trees greater than 30-inches dbh would be removed for the Access Route. The 38-inch dbh hemlock at Bridge #3 was the 9th tree of this size class to be felled, representing only 21% of the original USFWS estimate.

The Repository, situated outside mapped murrelet habitat, was logged from April 28-May 22, 2015. A total of 482 hundred cubic feet of timber was logged, comprising an approximate 2.47-acre patch cut. Directional felling was employed to target trees away from the historic Everett & Monte Cristo Railway (E&MCR) grade. The trees were limbed, bucked, and hauled from June 1-13, 2015 to the Log Deck at Station 27+00 along the Access Route in preparation for a timber sale by the Darrington Ranger District. Stumps, tops, and limbs were saved for reclamation, or were shredded with the Crambo and placed as part of the cover soil cap on the Repository.

On June 2, 2015, a 20-inch Pacific silver fir was removed at Bridge #3 along the Access Route to allow widening for equipment transport. A 6-inch western hemlock was also cut along the Python Road. Both trees were located in murrelet critical habitat, but neither were considered potential nest trees.

A total of eight trees were removed from the HLZ (inside critical murrelet habitat) on July 19, 2015 to provide safe clearance for the Vertol 107-II to land. The eight trees were determined by USFWS to occur in a small isolated patch and none of the trees were considered to have structural characteristics sufficient for murrelet nesting. In addition, USFWS considered none of these trees to have intermingled branches with other trees that have structural characteristics sufficient for murrelet nesting.

The remainder of trees removed during the RA were cleared outside mapped murrelet habitat. A Forest Service representative was onsite during the RA and was consulted on all tree removal activities. Felled trees were primarily used for reclamation at Near Features, including the Borrow Area, slope breaks and for cover on the Repository, and lower Concentrator. These trees were placed perpendicular on slopes and driven into the cover with an excavator. Downed trees were also used to block access to reclaimed areas of the Site.

2.4 Stormwater and Erosion Control

Prior to invasive activities, sediment control devices (i.e., straw bale barrier and silt fencing) were installed to control the migration of sediment into surface water bodies. Erosion control devices installed in 2012 and 2013 were also inspected and upgraded to ensure effectiveness during precipitation events. All silt fencing was placed with straw wattles anchored on the uphill side of the fences.

Silt fencing was installed along the southern boundary of the Snohomish County Mine to Market Road (County Road) at the Repository, the Rainy Mine (including the haul route), the Pride of the Woods Mine, temporary Glacier Creek crossing, and the Concentrator. The fencing provided a temporary physical barrier to sediment and reduced runoff velocities of overland flow. Following completion of RA activities, silt fencing was removed from the County Road, Pride of the Woods Mine, Rainy Mine, and Glacier Creek crossing. Erosion controls were left in place at the Concentrator to control runoff during the winter months. These erosion controls will be removed as part of the 2017 revegetation efforts.

A 6-foot wide riprapped intercepting ditch was constructed from the upper E&MCR grade to allow drainage from the depressional areas upslope from the Repository (Appendix A; Sheets C3a, C3b, and D1). The intercepting ditch flows into a run-on ditch, which was developed adjacent to the upslope side of the Repository. The slopes adjacent to the interceptor ditch were covered with a biodegradable coir mat, to stabilize the slopes immediately above the run-on ditch. The run-on ditch is directed around the northern and southern boundaries of the Repository, and discharges toward the County Road and lower bermed sections of the E&MCR grade.

During the 2016 field season, a 12-foot terrace drain was constructed across the face of the Repository. The drain discharges to a riprapped ditch adjacent to the lower Repository terrace.

2.5 Precipitation Events

A Campbell Scientific weather station equipped with a 41303-5A solar radiation shield; 03101-L11-PT anemometer; and TE525WS-L30-PT rain gauge mounted to a CM106B 10-foot tripod and grounding kit was established approximately 300 feet downstream of the temporary Glacier Creek crossing. The weather station provided real-time precipitation data to manage and prepare for potential rainfall at the Repository. The weather station measured rainfall to the nearest 0.01 inches and was monitored daily during the 2015 field season.

Waste rock and tailings were consolidated in the onsite Repository from July 26-September 23, 2015. During this period, 100-ft x 100-ft impermeable tarps were stored at the Repository to cover the waste material during precipitation events. At the onset of measurable / noticeable precipitation, tarps were deployed by onsite personnel to preclude drainage through the consolidated materials. Tarps were utilized during the following rainfall events:

- August 5-6, 2015: 0.28 inches of precipitation
- August 15, 2015: 0.97 inches of precipitation
- August 28-September 9, 2015: 7.90 inches of precipitation
- September 14-19, 2015: 0.77 inches of precipitation
- September 20-21, 2015: 1.56 inches of precipitation
- September 25-26, 2015: 0.46 inches of precipitation

Trash pumps were utilized to remove any ponded water collected on the tarp during and after rainfall. Ponded water was pumped to the adjacent forest duff for infiltration.

2.6 Biological Monitoring

Biological monitoring was conducted in accordance with the Work Plan (CES, 2015). Monitoring was completed to achieve compliance of the terms and conditions documented in the BO (USFWS, 2011). The Biological Monitoring Report was prepared and submitted to USFWS on January 31, 2016 (Appendix C).

2.6.1 Turbidity Monitoring

Turbidity monitoring was completed in 2015 in Glacier Creek at the temporary crossing at an 'interim' distance from the crossing that is less than the full extent of take. The interim distance is 300 feet below the temporary crossing over Glacier Creek. Turbidity monitoring was conducted in 2016 at three SFSR tributary crossings during sediment generating activities.

In-situ and discrete sampling identified turbidity measurements in excess of the 12.1 nephelometric turbidity unit (NTU) benchmark on September 14, 2015, when the temporary bridge was removed. However, the exceedances were noted for two minutes in discrete samples, after which, turbidity stabilized below the 12.1 NTU criterion. No mitigation measures were employed since it was a brief exceedance, followed by turbidity stabilization, and the sediment generating activities were complete.

Interim turbidity measured from June 23, 2016 to July 8, 2016 did not identify turbidity measurements above the 12.1 NTU benchmark. Therefore, no mitigation measures were required. Details of the turbidity monitoring are included in Appendix C.

2.6.2 Refuse Monitoring

Refuse monitoring was completed during seven events in the late-successional reserve (LSR) from April 30, 2015 to September 3, 2015. In 2016, refuse monitoring was completed during four events from May 16, 2016 to September 16. Refuse collected was recorded in the field notebook when removed (Appendix C).

2.6.3 Noise Monitoring

The Biological Opinion required noise levels be measured in suitable murrelet habitat at a distance of 45 yards while heavy machinery was operating until the end of the murrelet nesting season (September 15).

Results of the noise monitoring indicated the majority of equipment used in critical murrelet habitat was below the established 92 decibel (dB) threshold for the 2015 murrelet nesting season. The Columbia Vertol 107-II helicopter was the only equipment to exceed the 92 dB threshold when hovering, landing, and at takeoff. However, rotors in motion at the HLZ, while grounded, measured 85.1 dB. As such, exceedances of the noise threshold were likely short in duration. Moreover, the helicopter only operated in the LSR from September 5 to 15, 2015, a period when 95% of the murrelets in Western Washington have fledged. Furthermore, the glide path utilized by the Vertol 107-II was through an open avalanche chute, which is not considered viable murrelet habitat. Therefore, any temporary disturbance within occupied murrelet habitat from the Vertol 107-II helicopter is expected to have been minimal.

During the 142-day construction period that encompassed the 2015 murrelet nesting season, no work or heavy equipment movement occurred through murrelet habitat on 92 days (65% of the construction period). Of the 50 days when heavy equipment operated within murrelet habitat, 25 days included equipment moving from the gate to the borrow area, ATV use for refuse removal, or other temporary access with heavy equipment in the LSR. The remaining 25 days comprised stationary activities such as access route improvements, log hauling and decking, chainsaw use to remove trees/shrubs, or helicopter operations.

Limited equipment operation occurred beyond LOPs in 2015. Elimination of noise at the Site was considered impractical due to proximate recreational uses along the MLH (e.g., vehicles, all-terrain vehicles, chainsaws, and firearms). However, the LOPs were observed during all but 11 of the work days during the 2015 season. These exceptions are considered minor, and unlikely to have adversely impacted murrelet nesting behavior. CES employed additional noise limiting activities during the two-hour diurnal windows as follows:

- Prohibition of chainsaw use.
- Minimization of equipment idling, and equipment shut down when not in use.

In 2016, noise monitoring indicated equipment used in critical murrelet habitat was below the established 92 dB threshold for the murrelet nesting season. During the 22-day construction period that encompassed the murrelet nesting season, no work or heavy equipment movement occurred through murrelet habitat on 11 days (50% of the construction period). Primary construction equipment utilized during the 11 days in murrelet habitat included a CAT 312 excavator, dozer, chainsaw, ATV, and generator. Limited equipment operation did not occur beyond LOPs (Appendix C).

2.7 Cultural Resource Monitoring

The Forest Service and the Washington State Historic Preservation Office concurred that the MCMA RA will have an adverse effect on the Monte Cristo Mining Historic District, the Sauk Wagon Road, and potential effects on the E&MCR. Thus, cultural resources monitoring was performed under the oversight of Registered Professional Archaeologists (RPAs) during all ground disturbing activities throughout the RA. Monitoring was completed in accordance with the Work Plan (CES, 2015). Culturally sensitive areas were delineated as offsite, and were taped to minimize disturbance to these features. A separate Cultural Resources Monitoring report was submitted to Paul Alford at the Mt. Baker-Snoqualmie National Forest in September 2016 (ASM, 2016).

2.8 Haul Routes and Access

Temporary access to the Near Features south of Glacier Creek (Ore Collector, Concentrator, Assay Shack, Comet Terminal and Haulage ways) and Rainy Mine were completed prior to consolidation of waste rock and tailings in the Repository. The Rainy Mine was accessed by developing the former Mine to Market Road from the terminus of the County Road at the Monte Cristo Campground to the mine (Appendix A; Sheet G3).

The approximate 2,900-ft haul route was graded and surfaced with 2-inch minus gravel generated from the Borrow Area. The haul route was developed to be suitable for 20 cubic yard (cy) haul trucks to access the Repository.

Access to the Ore Collector, Concentrator, Assay Shack, Comet Terminal and Haulage Ways was accomplished by developing the Glacier Creek Trail (Trail #719) (Appendix A; Sheets C7a, C8a, C9a, C9b, and C10a) and lower sections of the former road to the Concentrator for 5 cy track / spin haul trucks. The haul route was not surfaced to reduce impacts to nearby cultural resources and to retain primitive features for reclamation.

2.9 Temporary Glacier Creek Crossing

A temporary bridge was installed over Glacier Creek on July 16, 2015 to access the Ore Collector, Concentrator, Assay Shack, Comet Terminal and Haulage Ways (Appendix A; Sheet G3). The crossing was placed across a southern meander of the creek, which allowed the abutments to be set without diversion of the channel. The temporary crossing was developed with two 24-inch deep, 8-ft wide, 40-ft long steel flat rail car decks, overlain by 12-inch x 12-inch western hemlock beams, 4-inch x 4-inch wood decking for the running surface, and 8-inch x 12-inch curb bumpers (Appendix A; Detail D2). The bridge was removed on September 14, 2015 to meet the in-water work window deadline stipulated in the BO. Following removal of the bridge, disturbed streambeds were restored to the overall original condition.

2.10 Material Excavation, Transportation, and Placement

The RA incorporated removal of contaminated waste rock and tailings from Near Features (Concentrator, Rainy Mine, Comet Terminal and Haulage Ways, Assay Shack, and Ore Collector) and Remote Features (Pride of the Woods Mine). Removal was guided using an Olympus Delta Series x-ray fluorescence (XRF) analyzer and was verified by laboratory analysis of conformation soil samples (Table 1). Waste materials were hauled from Near Features to the Repository utilizing access routes as previously described. Haul truck operating zones within the Repository were limited to access driveways and the clean subgrade to avoid tracking contaminated materials outside the exclusion zone. Loading areas and spur roads were inspected to ensure they were free of spilled material, to avoid tracking of waste rock and contaminated soil along the haul routes. Excavator tracks were cleaned with hand tools when exiting exclusion zones. No excavators were tracked outside the repository without inspection. Decontamination areas were also established at the edges of the exclusion zones for physical removal of contaminants. Please refer to the Health and Safety Plan (CES, 2015) for additional information regarding decontamination procedures.

2.10.1 Concentrator

The Concentrator and associated tailings are located at elevations ranging from 2,840-2,930 ft amsl on a mix of private and public lands. The upper Concentrator, mill foundation, Pelton race, blacksmith shop, upper rail trestle and terminus, and coal bunker are situated on Forest Service-administered land. A portion of the upper Concentrator tailings (north of the mill foundation) were positioned on private land (Stalter Claim). The majority of the lower Concentrator tailings and rail trestle (northwest of the mill foundation) were located on private land (Marsh / Williams Claim) (Appendix A; Sheet C7).

The Concentrator foundation is positioned about 100 ft above the south bank of Glacier Creek, and tailings were irregularly distributed along the stream bank west of the Concentrator and between Trail # 719 and the creek. Tailings were likely discharged directly into the stream, into a small bunker, and into a low drainage area near the south bank of the stream. The Concentrator generally included some of the highest concentrations of total arsenic at the Site. In addition, the lower Concentrator contained approximately 12 cy

of fines from the slime recovery system classified as a State-Listed Dangerous Waste under MTCA regulations.

Upper Concentrator

Tailings were excavated from five terraces at the upper Concentrator, which represented each level of the former 300-tons-per-day United Concentration gravity mill foundation. Tailings in the upper section of the Concentrator were also removed from the coal bunker, rail terminus, Pelton race, and brick piles. Some tailings were left in place in various sections of the upper Concentrator to retain the historic integrity of the remnant concrete, brick and rock wall features. Rock walls of the foundation were pressure washed to remove fines between the stonework.

Lower Concentrator

The 12 cy of Dangerous Waste were excavated and packaged in two roll-off dumpsters in accordance with applicable requirements outlined in 49 CFR 173.24, General Requirements for Packaging and Packages. The bulk waste was marked in accordance 49 CFR 172, Subpart D, and Washington Administrative Code 173-303-190. The containers were labeled in conformance with U.S. Department of Transportation regulations (49 CFR 172.430) for out-of-state transport. The labels included a Class 6.1 marking, indicating the material was toxic, the UN Identification Number (UN1558 for arsenic), manifest number, and generator's information. Dangerous Waste was transported from the Site under the supervision of Waste Management Solutions, by R Transport, Inc. (EPA ID - WAH000028338) and Union Pacific Railroad (EPA ID - NED001792910) in accordance with U.S. Department of Transportation Hazardous Materials Regulations (49 CFR Parts 173, 178, and 179). The Dangerous Waste was delivered to the Waste Management - Chemical Waste Management Inc., Resource Conservation and Recovery Act Subtitle C Landfill in Arlington, Oregon (EPA ID - ORD089452353) for disposal. A copy of the Uniform Hazardous Waste Manifest (EPA Form 8700-22, Rev 3-05 - Manifest #013472870) is included in the project file.

Subsequent to excavation of Dangerous Waste, the excavator bucket was decontaminated over an open transport container with brushes to remove any loose tailings, and allow it to fall into the container for transport. Following transport of the Dangerous Waste, tailings from the lower Concentrator were excavated and hauled to the Repository for consolidation. Tailings were removed from under the trestle to the drainage area at Glacier Creek. Clean cover soil was imported as the excavation progressed to ensure equipment did not track over contaminated media. Removal was guided using the XRF and verified by laboratory analysis of confirmation soil samples (Table 1). Pockets of tailings were left in place along the lower trestle, outside the floodplain, to protect historic resources. Sidewalls of the pockets were covered and graded with clean cover soil. The final cover thickness was approximately one-foot in the lower Concentrator. The clean, graded topsoil was covered with logs and slash generated from the logging conducted during the initial stages of removal activities (Appendix A; Sheet C7a).

Approximately 8,076 bcy of tailings were excavated from the Concentrator and transported to the Repository. This quantity was similar to the original design estimate of 8,100 bcy. The limits of excavation represented about 1.14 acres at the lower and upper Concentrator.

2.10.2 Ore Collector

The Ore Collector is located at an elevation of about 3,005 ft amsl on private land (Rainy Mine Claim) between Glacier Creek and Trail #719. The feature contains the remains of the collapsed tramway terminal ore storage facility, on which stockpiled ore remains and around which ore was spilled (Appendix A; Sheet C9).

Excavation at the Ore Collector was completed from July 25-29, 2015. Waste rock was excavated and transported via 5 cy haul trucks to the Concentrator. The lower sections of the pile were left in place due to stability concerns and to protect historic features. The upper portion of the pile was excavated to the base of Trail #719, until potential stability issues prevented further removal (Appendix A; Sheet C9a). The limits of excavation at the Ore Collector were about 0.17 acres. A total of 1,009 bcy of waste rock was excavated and removed from the Ore Collector. The quantity was less than the original design estimate of 2,500 bcy and is further discussed in Section 3.1.1.

2.10.3 Comet Terminal and Haulage Ways

The Comet Terminal, Tram, Golden Cord Terminal, Haulage Ways, and associated piles (collectively referred to as the Comet Terminal and Haulage Ways) are situated at elevations ranging from 2,930-2,990 ft amsl. The upper waste rock pile near the former Comet Terminal tramway was located on Forest Service-administered land. The lower terminal, Haulage Ways, and Golden Cord terminal are located on private land (Macks Claim). The area contained ore stockpiles and spillage piles, the remnants of ore storage facilities, and metallic and wood debris from the collapsed aerial tramway (Appendix A; Sheet C8).

The Comet Terminal and Haulage Ways were excavated and hauled to the Concentrator in 5 cy track trucks from July 30-August 6, 2015. The southernmost (upslope) piles were removed from the Comet Terminal tramway platform and spillage area upslope from Trail #719 using the Hitachi 350 Excavator. Excavation around the timber cribbing of the lower terminal necessitated the use of a CAT 303.5E Mini Excavator (Appendix A; Sheet C8a). Care was taken to preserve the historic integrity of the area, including wood components of former covered haulage alignment. Timber cribbing was picked, cleaned, and set aside while waste rock was removed. Following cover soil placement, the cribbing was replaced under the oversight of an archeologist to represent pre-removal features.

About 955 bcy of waste rock was excavated and removed from the Comet Terminal and Haulage Ways. The quantity is lower than the original design estimate of 1,200 bcy. The limits of excavation were about 0.05 acres in size.

2.10.4 Assay Shack

The Assay Shack is located at an elevation of approximately 2,910 ft amsl on Forest Service administered land. The waste rock pile consisted of a raised, rectangular, platform-like area approximately 2,500 square feet with depths ranging from 2 to 3 feet (Appendix A; Sheet C10). Waste rock associated with the Assay Shack was excavated and hauled to the Concentrator with 5 cy track trucks from August 6-7, 2015 (Appendix A; Sheet C10a).

Approximately 213 bcy of waste rock was excavated and removed from the Assay Shack. The quantity is slightly above the original design estimate of 200 bcy. The limits of excavation represented about 0.09 acres. A two-foot cover of clean soil was placed on the excavation following waste rock removal.

2.10.5 Rainy Mine

The Rainy Mine is situated at an elevation of 2,960 ft amsl on private land (Rainy Mine Claim). The mine included a partly-caved adit with a flooded open cut and a two-level waste rock dump. The property was developed by an 855-ft-long adit and a 210-ft-deep shaft, which accessed four levels. A steep waste rock pile was situated adjacent to Glacier Creek, which likely caved into the floodplain during high flow events (Appendix A; Sheet C11).

Waste rock from the Rainy Mine was excavated and hauled with 20 cy dump trucks to the Repository. Excavation occurred from July 31-August 3, 2015 and from September 20-24, 2015. Waste rock was initially removed from the upper sections of the waste rock pile until XRF readings indicated arsenic concentrations were below 284 mg/kg. The adit and shaft were opened in the lower section of the waste rock pile, and waste rock was removed to bedrock adjacent to Glacier Creek and around the seep. The adit was collapsed with native, clean cover soil above the pile. The shaft was filled with large boulders generated during removal to reduce physical hazards. Large boulders were also used to build a buttress wall at the base of the excavation adjacent to Glacier Creek to retain clean cover soil during high flow. Bedrock sections were then covered with available onsite cover soil and graded and contoured to match the natural landscape (Appendix A; Sheet C9a).

A total of 2,148 bcy of waste rock was excavated and removed from the Rainy Mine. The quantity was less than the original design estimate of 3,300 bcy and is further discussed in Section 3.1.4. The total limits of excavation were approximately 0.35 acres.

2.10.6 Pride of the Woods Mine

The Pride of the Woods Mine is located at an elevation of about 4,390 ft amsl on Forest Service administered land in the HMJ Wilderness. It is accessed via the Forest Service Glacier Basin Trail east 2.25 miles up Glacier Creek from the Townsite, and then 1,000 ft east up a talus slope to the mine. Surface workings included a collapsed adit, the remains of a tram station and bunkhouse just west of the main adit and an approximate 2,000 bcy waste rock pile adjacent to Glacier Creek (Appendix A; Sheet C11). Prior to removal, it was believed water drained from the collapsed adit through the waste rock pile and day-lighted at the base of the dump at Glacier Creek.

Waste rock removal at the Pride of the Woods Mine necessitated transport via heavy lift helicopter of equipment, fuel, materials, and supplies to the removal area. Personnel accessed the feature on foot and established a temporary camp south of the mine in a Forest Service-approved location from September 5-16, 2015.

Mobilization

A total of three Caterpillar 303.5E (8,139 pound operating weight) mini-excavators were mobilized by truck and trailer to Station 13+00 along the Access Route. On September 5, 2015, the excavators were lifted into the Pride of the Woods Mine site using the Columbia Vertol 107-II helicopter (10,000 pound payload capacity). A skid mount was also used to transport two UN-Rated 1A1 steel 55-gallon drums for diesel fuel storage, a spill kit, one porta-potty, silt fencing, and hand tools to the designated fueling areas. The mount was enclosed with a PVC liner to act as secondary containment.

Waste Rock Removal and Transport to the Drop Zone

Upon transport to the top of the Pride of the Woods waste rock pile, the three excavators commenced with excavation and filling 2.5 cy capacity self-dumping bins (SDB's [manufactured by Boscaro: Model A-200D]). Work advanced in the downslope direction toward Glacier Creek, with the excavators creating flat work benches as the removal progressed. The bins were pre-loaded with approximately 2.2 cy of waste rock using the mini-excavators, and transported to the Rainy Mine by heavy-lift helicopter, where they were dumped and returned to the Pride of the Woods Mine. Waste rock was then transported by 20 cy haul trucks from the Rainy Mine drop zone to the Repository for consolidation. Excavation progressed downslope to the Glacier Creek floodplain, where work was halted to protect the riparian features of the creek.

A total of 887 round trips were completed from the Pride of the Woods Mine to the drop zone at the Rainy Mine. This material was placed onto the existing Rainy Mine waste rock pile prior to excavation of that material, and was not placed on any clean soil outside the exclusion zone. The total weight of waste rock flown from the HMJ Wilderness was about 6,415,400 pounds. The limits of excavation were about 0.2 acres. It is estimated the helicopter spent about 20.5 hours (1,240 minutes) of flight time in the HMJ Wilderness.

Adit Opening

An excavator opened the collapsed adit portal on September 6, 2015 to assess whether water drained from the portal. As the portal was exposed, no evidence of flowing water or seepage was observed at the base of the adit. As such, no diversion was created at the apex of the pile for seepage.

Reclamation

Waste rock was removed to the cleanup goal of 659 mg/kg (total arsenic) was achieved, or unless waste rock removal was infeasible (e.g., material was situated in talus crevices below the excavation line or in ecologically sensitive areas). Waste material was left in place at the base of the excavation to avoid disruption of the Glacier Creek channel / riparian area and potential movement of waste rock into the stream (Appendix A; Sheet C11). Following removal, numerous ephemeral seeps, not associated with the adit were observed near the base of the former pile and surrounding talus slopes. The seeps were dry during post-RA sampling on October 6, 2015. Considering this, it is assumed that the former seep at the toe of the waste rock pile was related to the ephemeral drainages emanating from the northeast-facing talus slopes.

Based on an assumed average capacity of 2.2 cy per load, it is estimated 1,951 cy of waste rock was removed and transported to the Rainy Mine drop zone for consolidation in the Repository. This quantity is slightly below the design estimate of 2,000 bcy.

Demobilization

Upon completion of the RA at the Pride of the Woods Mine, one mini excavator was lifted to the Mystery Mine for use in the diversion drainage. The other two mini excavators, fuel skid, and supplies were lifted back from the Pride of the Woods Mine to Station 13+00. Silt fencing was removed from around the area near the creek and transported to Station 13+00 for disposal.

2.11 Mystery Mine #3 Diversion

The Mystery Mine is located at an elevation of 4,015 to 4,290 ft amsl on private land (Baltic Claim). The lowest adit (Adit #3) was the primary haulage adit at the mine and also served as the haulage adit for the Pride of the Woods Mine. Adit #3 is partially open at the portal and is 3,800 ft long. Mine drainage emanates from the Adit #3 portal at a rate of approximately 4.5 gallons per minute (gpm). The seep flowed on the surface of the waste rock pile in a north-northwest direction across the shelf, and dropped off the shelf onto the pile to the north, flowing the full length of the pile before infiltrating into the underlying talus. Water has also been observed draining from the toe of the waste rock pile at a rate of about 0.045 gpm. Secondary iron minerals precipitated for the full length of the flow path. The slope distance from the infiltration point at the toe of the Adit #3 waste rock pile to Glacier Creek was approximately 2,000 ft.

On September 16, 2015, a mini excavator was transported with the Vertol 107-II helicopter to the Mystery #3 waste rock pile. Under the direction of a CES engineer, the adit discharge was diverted along the exterior cliff face of the adit southwards for approximately 100 feet through talus to discharge off the shelf in a westerly direction (Appendix A; Detail D4). All work was completed at Mystery #3 in one day, and prevented mine drainage from flowing across and through the waste rock pile.

In addition to the diversion completed atop the pile, refuse was removed as part of the RA effort. A total of one supersack of refuse was collected and removed via helicopter, and transported offsite for disposal as solid waste.

2.12 Justice Mine Diversion

The Justice Mine is located at an elevation of 3,800 ft amsl on Forest Service administered land. It is accessed via the Forest Service Glacier Basin Trail southeast 0.9 mile up Glacier Creek from the Townsite then about 300 ft southeast to the toe of the waste rock pile.

The Justice Mine site consists of two adits – the main adit portal and a second, caved adit portal 150 ft to the west – the ruins of the old cookhouse, bunkhouse, headhouse, a tram station, and a large waste rock pile below the main adit portal. The adit portal is 6 ft wide and 7 ft high in solid rock. It is driven south 10° east into a vertical rock face on the south side of an 80-ft-long by 10- to 20-ft-wide ledge blasted out by the original operators. Mine water flowed out of the main adit portal at an approximate flow rate of 112 gpm, across the ledge and was confined to a channel approximately 490 ft down the face of the waste rock pile before infiltrating into the pile and underlying talus. Water seeped from waste rock and talus at Trail #719 at the toe of the pile, about 230 ft below, at an approximate flow rate of 1.35 gpm.

A pre-fabricated 8-ft long, 14-inch high, 8-inch thick concrete barrier fitted with a flange and approximately 280 feet of 8-inch high density polyethylene (HDPE) pipe was transported to the adit with the Vertol 107-II helicopter. Under direction of the CES engineer, the concrete barrier was placed into the adit and sealed into place (Appendix A; Detail D3). The 8-inch HDPE piping was attached to the flange and laid in place to direct the adit discharge off of the shelf to the northwest. The piping was installed manually to extend the discharge approximately 280 ft to the northwest and downslope towards large talus and vegetation for infiltration. The piping was attached to the adjacent rock ledge with anchor bolts to preserve the alignment during heavy snow loads. Approximately 3 hours following diversion, the seep at Trail #719 was observed to be dry. Follow-up examination of the pipeline in May and September 2016 indicated no seeps were present below the diversion.

2.13 Repository Construction

The Repository for waste rock, tailings, and impacted soils from the mines and features at the Site was constructed near the former E&MCR switchback (Appendix A; Sheet C3a and C3b). The remnant features of the E&MCR rail were avoided during Repository preparation, excavation, filling, cover, and reclamation activities under the oversight of an archaeologist. During subgrade preparation, soil was excavated and stored adjacent to the northwest of the Repository footprint for later use as cover soil.

Initial construction of the approximate 1.15-acre repository included development of the subgrade for consolidation of the waste rock and tailings. Following development, the Repository base and soil conditions at planned subgrade elevations were inspected and compaction testing was completed by a geotechnical engineer. After the base was complete, waste rock and tailings were placed in the Repository with dolomite applications over every two vertical feet of waste material at the standard application rate. Haul trucks operated on the access driveway and inside the subgrade to avoid tracking contaminated materials on the County Road. The geotechnical engineers observed and documented earthwork at other critical sequences during construction, to confirm soil compaction in accordance with project specifications (90% maximum density). Waste material was maintained below field capacity by covering the Repository during all precipitation events during consolidation. During the final two weeks of compaction and grading, material from the lower concentrator was too wet for effective compaction. Therefore, calcium oxide was added at a rate of 1-2% by weight, based on density of the materials, and mixed with the material by tilling and farming.

Upon visual determination that the material was dry enough to achieve compaction, the material was spread and compacted, prior to field verification by the geotechnical engineers. Please refer to Section 3.5.2 for additional details.

Wood waste generated from excavation of the Concentrator was transported to the Repository and segregated. The wood was shredded with the Crambo Dual Shaft Wood Shredder and was later spread across the consolidated waste rock and tailings.

After waste material was placed and compacted in the Repository, 6 inches of cover soil was placed as a cushion layer, followed by an 8-ounce non-woven geotextile layer. This was overlain with a 60-mil HDPE liner keyed into the compacted layer to prevent precipitation from entering the Repository following construction and to reduce percolation through the compacted soil base layer. On October 5, 2015, Leak Location Services, Inc. conducted a geomembrane leak location survey of the top liner of the Repository. No leaks or defects were detected during the survey. Following the leak test, drainage geotextile (GSE Environmental FabriNet: 300 mil Geocomposite [upper terrace] and 200 mil [lower terrace]) was placed over the liner (Appendix A; Detail D1) a total of eight vents were installed across the Repository to allow gas to escape from within the Repository (Appendix A; Detail D2).

The Repository drainage geotextile was covered with three 1-ft equipment compacted cover soil lifts. The final graded Repository had two tiers, with the top terrace sloping at a 10:1 grade to minimize erosion. The bottom tier slopes at a maximum 2.5:1, grading to 4H:1V (Appendix A; Sheet C3a and C3b). Final grading of the repository was accomplished during the 2016 field season by developing a southeast to northwest-trending terrace drain bisecting the two tiers (Sheet C3b).

2.13.1 Borrow Area

Supplemental cover soil needed for Site reclamation was generated from the former Forest Service rock quarry (borrow area) located about 0.25 miles northwest of the Repository. The Borrow Area was also used for screening to remove the large and small talus material. In general, the talus was screened to two-inches. Screened material larger than two-inches was used as riprap around the Site. Screened material below two-inches was used for haul route surfacing and as fill material.

Trees felled during Repository logging and Borrow Area development were used for reclamation following completion of RA activities. The trees were piled on the slopes and bottom of the Borrow Area to reduce erosion. The total disturbance represented about 0.5 acres.

2.14 Revegetation

All disturbed areas at the Ore Collector, Assay Shack, Comet Terminal / Haulage Ways, repository, HLZ, and timber deck were recontoured and seeded in accordance with Section 02801 of the Technical Specifications. In addition, the upper three terraces of the Concentrator were seeded, while the lower terraces were not seeded to preserve the visual aspects of the remnant features. The upper slopes of the Borrow Area were also seeded during the 2016 field season.

The following seed mix was obtained from Rainier Seeds, Inc. in Davenport, Washington, and was applied to the aforementioned reclaimed areas:

<u>Seed Mix C</u>	<u>Application Rate</u>
tufted hairgrass	4 lb/ac
winter triticale	60 lb/ac

annual ryegrass	10 lb/ac
alsike clover	2 lb/ac

Total = 170 seeds per square foot

A certified weed free mulch (Woodstraw™) was applied to control erosion during plant establishment. Slash and grubbed material was placed on the Repository, Rainy Mine, lower Concentrator, HLZ, timber deck, and Borrow Area at the direction of CES, with approval from the OSC. Material was generally placed parallel to slope to act as a “break” to any runoff. No fertilizer was used during the revegetation effort.

The Forest Service plans to perform additional revegetation work in future years with support from AmeriCorps. Tree or shrub planting will occur at the clearing adjacent to Bridge #1, the Repository, HLZ, Borrow Area and lower section of the Concentrator. Further seeding may also be performed, if needed, at erosional areas or sites where optimum germination did not occur.

2.14.1 Road Obliteration and Access Deterrents

Upon completion of the RA activities, the Rainy Mine haul route was decommissioned by recontouring with placement of woody debris and boulders to preclude access. The Glacier Creek channel was reclaimed to pre-RA contours, and clean fill material was removed from the Glacier Creek crossing.

Haul routes south of the Glacier Creek crossing were not surfaced, and were left to reclaim naturally. The access driveway to the Repository was left in place to allow ingress for long term monitoring through 2019.

3.0 DEVIATIONS FROM THE REMOVAL ACTION WORK PLAN

The following describes construction field changes and deviations from the RA Work Plan and Drawings (CES, 2015). Table 2 summarizes the estimated (design) and final quantities for the RA.

3.1 Waste Rock and Tailings Quantities

The pre-RA estimated volume of waste rock and tailings material for excavated and placement was 17,300 bcy for the Site. The volume was based on the pre-RA topographic survey and projected pre-mining topographic contours from the area around the features.

Based on the post-RA topographic survey (conducted by David Evans and Associates, Inc.[DEA]), the final volume was calculated at 14,352 bcy. The Repository is estimated to be about 1.15 acres in size, and the patch cut logged for repository preparation was about 2.47-acres.

3.1.1 Ore Collector

The Work Plan called for removal of approximately 2,500 bcy of waste rock from the Ore Collector. In addition, a haul route with 2-inch minus surfacing was to be pioneered from the Concentrator to the lower bunker at the base of the Ore Collector pile. Waste rock was planned to be transported using standard 20 cy haul trucks on the route. However, based on discussions between the OSC and onsite CES engineer, it was agreed the proposed surface haul route may impose deleterious, long-term impacts to riparian areas of Glacier Creek. Thus, the existing Glacier Creek Trail #719 was utilized as the haul route from the Ore Collector to the Concentrator. Komatsu CD60R 5 cy spin / track dump trucks were used to haul the material. The trail provided several advantages over the proposed haul route:

- Surfacing would not be required since track trucks could access the waste rock.

- The trail from the Concentrator to the Ore Collector is outside the riparian area and floodplain. As such, no sedimentation would occur in Glacier Creek, and no riparian vegetation would be removed.
- Minimal reclamation would be required since the trail could be left in place.

A total of 1,009 cy of waste rock was excavated and transported to the Repository from the Ore Collector. This represents a reduction of 1,491 cy anticipated in the Work Plan. Moreover, contaminated media was left in place, with approval from the OSC, to retain the structural integrity of Trail #719. A two-foot cover soil cap was used on the waste rock, which was covered with Woodstraw™ and seeded with the Forest-Service approved mix.

3.1.2 Comet Terminal and Haulage Ways

The original haul road described in the Work Plan to access the Comet Terminal included development of a surfaced access route from the Concentrator. Since the lower haul route to the Ore Collector was not developed, the smaller 5 cy track / spin haul trucks were used on Trail #719. As such, there was no need to cross the historic covered haulage way, and these historic features were not disturbed during removal at the Comet Terminal.

A total of 955 cy of waste rock was excavated and transported to the Repository from the Comet Terminal and Haulage Ways. This represents a reduction of 245 cy from the volume anticipated in the Work Plan.

3.1.3 Concentrator

The Work Plan anticipated 8,100 bcy of tailings would be removed from the Concentrator. Based on the results of the survey by DEA, a total of 8,076 bcy of tailings were excavated and hauled to the Repository for consolidation. In addition, contaminated media was left in place, with the approval of the OSC, to protect historic rock foundations / walls / features at the upper Concentrator and E&MCRR trestle. Contaminated media left in place at the upper Concentrator was capped with two feet of clean cover soil generated from the repository excavation, covered with Woodstraw™ and seeded with the Forest-Service approved mix. Tailings left in place under the E&MCRR trestle was covered with two feet of clean cover soil and logs / slash generated onsite.

3.1.4 Rainy Mine

The Work Plan anticipated 3,300 bcy of waste rock would be removed from the Rainy Mine. Based on the results of the survey by DEA, a total of 2,148 bcy of waste rock was excavated and hauled to the Repository for consolidation. This represents a reduction of 1,152 cy from the volume anticipated in the Work Plan.

3.2 Campsite Septic System

The Work Plan indicated onsite storage of blackwater would be plumbed to a double-walled, 1,000-gallon aboveground storage tank (AST) with secondary containment. The tank was to be pumped and transported offsite for disposal on a regular basis. Graywater was to be managed with an onsite 500-gallon AST plumbed to a subsurface drainfield sited approximately 500 ft upslope the SFSR.

During camp setup, the CES onsite Engineer made a field change to the plan to have both blackwater and greywater run through one underground septic system. The decision was based on the projected amount of use, and the flush volumes of the recreational vehicle and camp mobile toilets, which would necessitate pumping of the AST at least every other week. The ecological impact of about nine pumper trips was weighed against the potential ecological impact of adding the volume of blackwater liquid septic tank effluent to the drainfield. Based in the upslope positioning of the campsite, potential impact from the underground

system was estimated to be negligible. Furthermore, the underground option reduced the overall pump trips from nine to one, representing a marked reduction in risk associated with an overturned pumper truck.

3.3 Glacier Creek Crossing

The Work Plan provided specifications for a temporary log-stringer bridge over Glacier Creek following preparation of the Repository. The temporary bridge was to be constructed with available onsite timbers and would be removed by August 31, 2015 in accordance with the in-water work window for Glacier Creek. The Work Plan also indicated the Glacier Creek channel could require diversion to accommodate the bridge.

The log-stringer concept to cross Glacier Creek was substituted with two side-by-side rail flat-car bridges. The deviation was recommended for the following reasons:

- The rail car bridge takes less time to install and remove.
- The rail car bridge has less potential impact to the stream, since a longer section could be set further from the stream channel.
- Rail car bridges can carry heavier loads, increasing the factor of safety under loaded truck haul loading.
- The rail car bridge was 16-ft wide, approximately 4-ft wider than the log-stringer bridge concept, which increased the safety of truck travel across the structure.
- There was a lack of available 24-inch dbh (or greater) logs near the proposed crossing to construct log-stringer bridge.

Based on these considerations, the flat rail cars were utilized at the crossing. Due to the increased span, the channel in Glacier Creek did not require diversion or modification.

As the RA progressed, extenuating circumstances rendered the August 31, 2015 removal date infeasible. Thus, the Forest Service requested an extension of the temporary bridge removal date. Fish biologists with the WDFW were consulted, and bull trout were considered unlikely to begin spawning in the project area until after September 20, particularly in a warm low-water year like 2015. The USFWS subsequently provided a modification to the Incidental Take Statement for the Monte Cristo CERCLA Project, extending the bridge removal date to September 15, 2015.

3.4 Pride of the Woods Reclamation

The Work Plan for reclamation at the Pride of the Woods Mine indicated a biodegradable coconut fiber coir mat would be placed over the disturbed area to prevent erosion. The disturbed area would then be covered with native available onsite talus to blend into the surrounding terrain. Moreover, upon opening the adit, a water discharge diversion trench was to be developed with onsite talus to allow the seep to infiltrate approximately 20 ft south of the portal.

As discussed in Section 2.9.6, an excavator opened the collapsed adit portal to assess whether water drained from the portal. As the portal was exposed, no evidence of flowing water or seepage was observed at the base of the adit. Thus, no diversion was created at the apex of the pile for seepage.

Following waste rock removal at the Pride of the Woods Mine to the cleanup goal of 659 mg/kg (total arsenic) or to the stage in the removal where waste rock removal was infeasible; the coir mat was unrolled over the upper slopes of the reclaimed pile. However, deployment of the mat was ineffective due to the

undulating terrain and heterogeneous nature of the substrate. Due to the limited effectiveness observed, the coir mat was transported to the Repository to provide stabilization adjacent to the interceptor ditch.

3.5 Repository

The original Repository design encompassed approximately 1.79 acres, and accommodated up to 23,000 cy of tailings and waste rock. The design estimate was approximately 17,300 bcy of waste rock and tailings. As discussed, the total volume of waste rock and tailings consolidated in the repository was 14,352 cy. Therefore, the total volume represents 83% of the original anticipated volume, and encompassed about 1.15 acres.

3.5.1 Design Changes

Minor deviations from the design were proposed to provide additional anchorage for consolidated contaminated materials and geosynthetics. These included the following:

- A low compacted earthen berm was constructed at the base of the Repository to better contain the tailings and waste rock and provide additional security for the cover materials.
- Soils on the north edge of the Repository were compacted to the north edge of the Repository where the base meets uncompacted and unsloped substrate. The compaction was conducted to provide containment and a secure anchorage for the cover geosynthetic materials.

3.5.2 Lime Application Rates

The Work Plan described calcium carbonate equivalent applications over every two vertical feet of waste material during consolidation in the Repository. The application rate was intended to raise the pH of the material, minimize leaching of metals, provide stabilization/solidification, and act as a moisture conditioner for the tailings and waste rock. Rates were calculated as follows:

- An average rate of 1,890 pounds per acre (lb/ac) for Concentrator, Assay Shack, Rainy Mine, and Pride of the Woods Mine material.
- An average rate of 5,018 lb/ac for Ore Collector, Comet Terminal, and Haulage Ways material.

Based on the rates listed above, the total lime application anticipated for the Site would have been about 70 tons. However, calculations were based on the results of the 2010 Humidity Cell Testing (CES, 2011), which was predicated on conditions at that time (waste materials exposed to natural weathering and oxidation). In total, approximately 85 tons of lime was applied at varying rates described below.

Dolomite Application Rates

Dolomite was applied to neutralize any initial chemical imbalances that may occur from the presence of residual oxygen and water within the waste rock and tailings following placement. A total of six tons of dolomite was applied during waste rock and tailings consolidation.

Calcium Oxide Application Rates

As the field season progressed during the RA, increasingly frequent storms and shorter days inhibited the drying capacity at the Repository. By mid-September, it became necessary to condition the waste materials for compaction. As such, 79 tons of calcium oxide was shipped to the Site and applied to the Repository at a rate of 1-2%, based on dry density of materials. The additional calcium oxide applications were successful, and provided needed drying capacity to meet compaction requirements prior to lining the Repository.

3.5.3 Drainage Geotextile

The Work Plan specified a 6-inch layer of drainage gravel to be placed directly above the 60-mil HDPE liner at the Repository. However, screened rock generated at the Borrow Area was found to be sub-angular to angular, and not suitable for contact with the liner. Permission to access rounded river cobbles for drainage was not provided. As such, GSE FabriNet 200- and 300-mil geocomposite drainage material was proposed as an alternate to gravel directly above the liner. The geocomposite provided the following advantages:

- Enhanced slope stability
- Streamlined, expeditious installation without the need to haul rock
- Eliminated potential for silt coating on the drainage gravel
- Reduced overall height of the Repository, and potential added stability
- Minimized likelihood of damage to the HDPE liner
- Eliminated the need for the 8-oz non-woven layer, essentially replacing it

The drainage geocomposite was successfully installed from October 6-8, 2015 at the Repository.

3.6 Revegetation

The Work Plan estimated the RA activities would disturb four acres; however, the actual disturbance was about five acres. Disturbed areas at the Ore Collector, Comet Terminal, Assay Shack, repository, upper slopes of the Borrow Area, HLZ, timber deck, and upper Concentrator were revegetated with Forest Service-specified seed mix. The lower Concentrator and Rainy Mine were covered with available onsite slash, boulders, and downed trees. The Forest Service will perform additional revegetation work in future years with support from AmeriCorps. Planting will occur at the clearing adjacent to Bridge #1, the Repository, Borrow Area and lower section of the Concentrator. Further seeding may also be performed, if needed, at erosional areas or sites where optimum germination did not occur.

4.0 INSTITUTIONAL CONTROLS

Signage will be installed concurrently with long term monitoring activities. It will be used at the reclaimed Near Features and Repository as non-engineered instruments to minimize land and / or resource use. The signs will provide a visual warning as to the presence of potential hazards associated with non-approved uses and capped waste material at the Repository, Concentrator, Comet Terminal, Assay Shack, and Ore Collector. The signs will include the warning of potential hazards from remnant contamination as well as a description of the historical usage of each location. Signs will be durable, intended to tolerate moderate vandalism. A total of ten signs are planned: one each at the Repository, townsite footbridge, Ore Collector, Comet Terminal and Assay Shack; two at the Concentrator; one on the trail into Glacier Basin; one on the trail into 76 Gulch and one at Barlow Pass. A copy of the Institutional Control Plan is provided in Appendix D.

5.0 CONFIRMATION SAMPLING AND ANALYSIS

During the course of the RA, an XRF was used to guide the lateral and vertical extent of material to be excavated and transported to the Repository. The sampling program was designed to document impacted waste rock and tailings above the risk-based cleanup concentrations of 284 mg/kg for total arsenic (Near Features) and 659 mg/kg for total arsenic (Remote Features). Following excavation and XRF screening, a total of 40 confirmation samples were collected in the Ore Collector (5 samples), Comet Terminal / Haulage Ways (10 samples), Assay Shack (2 samples), Concentrator (11 samples), Rainy Mine (6 samples) and Pride

of the Woods Mine (6 samples). All confirmation samples were first screened with the XRF and then submitted to TestAmerica Laboratories in Spokane, Washington for analysis (Appendix E). The XRF screening locations coincided with confirmation samples submitted to the laboratory. As-built Sheets C7a, C-8a, C9a, C10a, and C11 identify the locations of confirmation samples.

5.1 Concentrator

As discussed, tailings were left in place in the terraces of the upper Concentrator to protect historic features. This action was conducted with consensus from the OSC. Remnant tailings were situated outside the Glacier Creek floodplain. A total of 11 confirmation samples were collected at the Concentrator (Appendix A; Sheet C7a). Laboratory analysis of four confirmation samples collected from the upper Concentrator indicated two of the samples contained total arsenic below, and two above the cleanup criterion of 284 mg/kg. The mean concentration of the tailings left in place in the upper Concentrator was 968 mg/kg. Tailings in the terraces of the mill were covered with two-feet of clean cover soil generated from excavation of the Repository and borrow area to limit exposure to onsite receptors.

Laboratory analysis of seven confirmation samples collected from the lower Concentrator indicated five of the samples contained total arsenic below the cleanup criterion of 284 mg/kg. The highest total arsenic concentration of material left in place under the trestle was 2,200 mg/kg. The mean concentration of total arsenic following excavation in the lower Concentrator was 496 mg/kg. Verification sampling of the cover soil was completed and is summarized in Table 3. The composite cover soil total arsenic concentration for the upper and lower Concentrator was 66 mg/kg.

The mean arsenic concentration at the Concentrator prior to the RA was 21,358 mg/kg (CES, 2010). Based on this, the cover soil cap concentration of 66 mg/kg represents a 99.69% reduction in exposure to onsite receptors.

5.2 Ore Collector

As discussed, waste rock was left in place at the Ore Collector with concurrence from the OSC to protect the integrity of Trail #719. The remnant waste rock in the upper section of the Ore Collector was screened with an XRF and five confirmation samples were collected (Table 1) (Appendix A; Sheet C9a). The mean total arsenic concentration of remnant waste rock was 1,852 mg/kg. The waste rock left in place was outside the Glacier Creek floodplain. Moreover, it was capped with two feet of clean cover soil and seeded. After the waste rock was covered, a composite verification sample was collected from the cover soil (Table 3). Results of the composite cover soil sampling indicated the total arsenic concentration was 130 mg/kg.

The pre-RA mean total arsenic concentration at the Ore Collector was 2,695 mg/kg (CES, 2010). As such, the final total arsenic concentration in the soil cap (130 mg/kg) represents a 95.18% reduction in exposure to the public along Trail #719.

5.3 Comet Terminal/Haulage Ways

A total of 10 verification samples were collected following excavation at the Comet Terminal/Haulage Ways (Appendix A; Sheet C8a). Laboratory analytical results of the samples indicated five of the samples contained total arsenic below the cleanup criterion of 284 mg/kg. However, the mean total arsenic concentration of the 10 verification samples was 273 mg/kg. A composite verification sample was also collected from the cover soil (Table 3). As shown, the total arsenic concentration in the cover soil was 25 mg/kg.

The pre-RA mean total arsenic concentration at the Comet Terminal / Haulage Ways was 28,863 mg/kg (CES, 2010). Thus, the final total arsenic concentration in the soil cap (25 mg/kg) represents a 99.91% reduction in exposure to the public along Trail #719.

5.4 Assay Shack

A total of two confirmation soil samples were collected at the Assay Shack (Appendix A; Sheet C10a). Results of the laboratory analysis of confirmation samples collected from the Assay Shack indicated total arsenic concentrations were below the cleanup criterion of 284 mg/kg. The mean arsenic concentration from the two verification samples was 170 mg/kg. A composite verification sample was also collected from the cover soil (Table 3). The total arsenic concentration in the composite cover soil sample was 110 mg/kg.

The pre-RA mean total arsenic concentration at the Assay Shack was 36,370 mg/kg (CES, 2010). Therefore, the final total arsenic concentration in the soil cap (110 mg/kg) represents a 99.70% reduction in exposure to onsite receptors.

5.5 Rainy Mine

A total of six confirmation samples were collected following excavation of the Rainy Mine (Table 1) (Appendix A; Sheet C9b). As shown, four of the verification samples contained total arsenic below the cleanup criterion of 284 mg/kg. The highest concentration of total arsenic in verification samples was 1,000 mg/kg. However, the mean concentration of total arsenic in the confirmation samples was 313 mg/kg (Table 1). A composite verification sample was also collected from the cover soil (Table 3). The total arsenic concentration in the composite cover soil sample was 330 mg/kg.

The confirmation sample with the highest concentration of total arsenic (1,000 mg/kg) may have been due to the bedrock exposure encountered during the excavation, and the difficulty associated with removal of small amounts of waste rock with standard excavators. The high concentration in this sample likely skewed the mean upward, resulting in a slight exceedance of the cleanup criterion. However, the total arsenic concentration in the composite cover soil sample (330 mg/kg) was also slightly above the cleanup level. The total arsenic concentration identified in the composite cover soil sample was also within the range of naturally occurring background concentrations (23.3 mg/kg-700 mg/kg) identified during the EE/CA (CES, 2010).

The mean total arsenic concentration at the Rainy Mine prior to the RA was 40,455 mg/kg. The total arsenic concentration in the composite cover soil sample (330 mg/kg) represents a 99.18% reduction from pre-RA conditions. Furthermore, the reclaimed area was covered with available onsite boulders and trees, which significantly limits public access. During the long-term monitoring, CES will inspect the Rainy Mine for vegetation coverage and signs of erosion.

5.6 Pride of the Woods Mine

Results of the confirmation sampling from the Pride of the Woods Mine are included in Table 1. A total of six samples were collected, five within the excavated area, and one outside the limits of excavation (Appendix A; Sheet C11). As shown, four of the five verification samples collected from the excavated area contained total arsenic below the cleanup criterion of 659 mg/kg. The mean total arsenic concentration of confirmation soil samples was 557 mg/kg in excavated waste rock footprint. The sample collected downslope and outside the limits of excavation identified a total arsenic concentration of 7,200 mg/kg in the Glacier Creek floodplain (along the old Glacier Basin Trail). This area was not disturbed during the RA to protect the riparian resources along the upper section of Glacier Creek.

The pre-RA mean total arsenic concentration at the Pride of the Woods Mine was 16,640 mg/kg (CES, 2010). The final total mean arsenic concentration from the excavated area (557 mg/kg) represents a 96.65% reduction in exposure to onsite receptors.

6.0 POST-REMOVAL ACTION MONITORING

Post-RA activities included monitoring of instream surface water and sediment quality. In addition, groundwater monitoring wells were established to assess any potential impacts from the contaminated media consolidation on the local shallow groundwater table.

6.1 Surface Water and Sediment Sampling

CES collected surface water and sediment sampling data in fall 2015 (low flow) after RA construction activities were completed (Appendix F). CES will continue to collect sampling data biannually through 2019 to assess post-RA stream conditions in Glacier Creek, Seventysix Creek, and the SFSR. Additional seep samples are planned to be collected from adits and seeps at the Site. CES will submit a letter report after each sampling event that summarizes the results of the sampling and monitoring and provides a comparison to the previous sampling results.

6.2 Groundwater Monitoring Wells

In 2014, CES oversaw the installation of three groundwater monitoring wells around the proposed Site Repository. Drilling was conducted by Cascade Drilling, L.P. out of Woodinville, Washington (Driller License #3182). Requisite Notice of Intent forms and Resource Protection Well reports were submitted to Ecology for each well. Monitoring well MW-1 was installed upgradient from the Repository, while MW-2 and MW-3 were placed in the presumed downgradient direction of the Repository. All wells were advanced to an approximate depth of 30-31 ft below ground surface (bgs).

6.2.1 Monitoring Well Replacements

Depths of wells MW-1 and MW-2 were determined to be insufficient for water column measurements and groundwater sampling at the Repository. As such, well MW-1 was decommissioned and replaced on June 18, 2015 with well MW-1R (upgradient of the Repository). The well was drilled to 79.43 ft bgs using track-mounted mini-sonic drilling methods. Monitoring well MW-3 was originally positioned in an area considered unfavorable for RA access. Therefore, this well was replaced with MW-3R (downgradient from the Repository), drilled to a depth of 29.05 ft bgs on June 18, 2015 (Appendix A; Sheet C3a). Requisite Notice of Intent forms were submitted to Ecology prior to all well decommissioning activities.

Following completion of the Repository consolidation, Cascade Drilling, L.P. mobilized a track-mounted mini-sonic drill to the Site. On October 21, 2015, monitoring well MW-2 was decommissioned and replaced with well MW-2R (downgradient from the Repository) and drilled to a depth of 55 ft bgs.

6.2.2 New Monitoring Wells

As part of the original mobilization in June 2015, monitoring well MW-4 was installed adjacent and to the east (crossgradient) of the Repository. The well was drilled to 58.18 ft bgs (Appendix A; Sheet C3a).

Monitoring well MW-5 was established on October 23, 2015, adjacent and to the west (crossgradient) of the Repository. The well was drilled to 60 ft bgs (Appendix A; Sheet C3a).

6.2.3 Methodology

A continuous core of the subsurface soil was obtained during placement of the wells as they were advanced. The borings were developed to appropriate depths to reach the shallow groundwater table. The boreholes were logged in the field by a CES Professional Engineer (#51660).

The inner casing of the wells were 2-inches in diameter, constructed with schedule 40 PVC. The outer steel casings were placed six inches above ground, surrounded on three sides with bollards. Following installation of the monitoring wells, the top of casing elevations were measured by a State of Washington Professional Land Surveyor, DEA. The top of casings were measured to a vertical accuracy of 0.01 ft. CES developed the wells by purging a minimum of five to ten well bore volumes, when the groundwater was chemically stable.

Groundwater samples were collected following well development. For details regarding groundwater sampling, please refer to the 2015 Year End Monitoring Report included in Appendix F.

7.0 SPILLS AND CLEANUP PROCEDURES

Unanticipated minor spills of hydraulic fluid and waste rock occurred during RA field activities. Details of the two incidents and subsequent response measures are provided in the following sections.

7.1 Hydraulic Spill

On June 25, 2015, the Taylor Hitachi 350 excavator struck a pile of logs and slash while rotating, damaging a hydraulic fitting, resulting in a spill of up approximately 5-10 gallons of hydraulic oil. The spill was on the ground, approximately 50 ft upslope of the SFSR. Work ceased and absorbent pads and buckets were immediately deployed. The spill was limited to within the upper 6-12 inches of soil, with no evidence of migration downslope toward the SFSR.

The area was segregated until the excavator could be repaired, and the spill was divided into three zones. Spill A was considered the main spill area, where fluid leaked onto the excavator tread after it was disabled. Spill B was situated to the north, and was likely associated with spray from the machine when it rotated. Spill C was positioned to the northeast and was based on visual discoloration, although no olfactory indications of petroleum were noted.

On July 1, 2015, the visual extent of the spill areas was excavated, stockpiled, and covered with visqueen pending analytical results. Confirmation soil samples were collected on July 2, 2015 from the bottom of the three excavations. Samples were collected in laboratory-supplied jars, placed in a cooler with ice, and submitted to TestAmerica Laboratories in Spokane, Washington for analysis via Method NWT PH-Dx. Laboratory analyses indicated the samples contained diesel fuel range hydrocarbons at concentrations ranging from 75 to 290 mg/kg. Heavy oil range hydrocarbon concentrations ranged from 240 to 1,400 mg/kg. As such, none of the concentrations exceeded the Model Toxics Control Act Method A Cleanup Level of 2,000 mg/kg for unrestricted land use (Ecology, 2007) (Table 4). Furthermore, groundwater sampling conducted as part of the post-RA monitoring effort indicated no petroleum hydrocarbons were present in any of the samples at concentrations above laboratory method reporting limits.

The spill was reported to Ecology in accordance with Washington Administrative Code 173.340-300. In addition, the Snohomish Health District was notified regarding the nature and extent of the release. On July 29, 2015, Mike Young, Environmental Health Specialist with the Snohomish Health District toured the spill area and cleanup efforts with the OSC.

On November 20, 2015, approximately 1.965 tons of petroleum-contaminated soil was transported from the Site for disposal as a special waste at the Central Landfill in Okanagan, Washington. A copy of the disposal ticket (#260946) is provided in the project file.

7.2 Waste Rock Spill

On August 9, 2015, a loaded Deere 300D 20 cy articulated haul truck caught the edge of the County Road, approximately 0.5 miles north of camp, and spilled waste rock onto the roadway. The cab remained in the upright position, but the bed tipped 90-degrees, spilling the waste rock. No injuries or damage to the vehicle were incurred as a result of the spill. The haul truck bed was placed in the upright position, and the spilled waste rock was removed using the front-end loader and mini-excavator. The front-end loader was also used to scrape the top six inches of roadway surfacing within the prism of the spill and place the material in the bed of the truck. The waste rock and scraped road surface were subsequently transported to the Repository for consolidation.

A confirmation soil sample was collected from the roadway following the incident. The sample, identified as MCPRAS-RS-01-05, was submitted to TestAmerica Laboratories in Spokane, Washington and analyzed for total metals per EPA Series 6020A/7471B. The sample exhibited concentrations of metals generally consistent, or below naturally occurring background concentrations identified by Ecology (2014). The total arsenic concentration was 330 mg/kg, which is slightly above the RA cleanup criterion of 284 mg/kg, but within the range of naturally-occurring background concentrations (23.3-700 mg/kg) (CES, 2010).

8.0 SUMMARY AND CONCLUSIONS

The RA was implemented in general accordance with the Work Plan (CES, 2015). Field modifications were initiated following concurrence from Forest Service OSCs to facilitate completion of the RA and / or protect historic / biological resources at the MCMA. Work Plan deviations included capping contaminated media in place, campsite upgrades, utilization of flat rail cars for bridges at the Glacier Creek crossing, minor alterations to the repository configuration, modified lime application rates, and use of geogrid geotextile drainage.

Contaminated media was left in place and capped with two feet of clean cover soil at the Ore Collector and Concentrator with approval from the OSC. A total of nine confirmation soil samples collected from these areas indicated remnant waste rock / tailings were present at concentrations exceeding the cleanup criterion of 284 mg/kg for total arsenic. In addition, one confirmation sample was collected at the Pride of the Woods Mine, outside of the limits of excavation, in the preserved riparian area Glacier Creek. This sample also exceeded the cleanup criterion of 659 mg/kg for Remote Features. Of the remaining 30 confirmation soil samples collected from reclaimed areas at the Site, 23 did not contain total arsenic above the cleanup level. Slight exceedances, ranging from 290 to 420 mg/kg total arsenic were exhibited from samples collected at the Comet Terminal and Rainy Mine. However, mean total arsenic concentrations from the Comet Terminal, Assay Shack, and Rainy Mine were consistent with naturally occurring background levels. Confirmation soil sampling from reclaimed areas of the Concentrator, outside capped tailings, were all below the arsenic cleanup criterion. Confirmation sampling also identified a mean total arsenic concentration at the Pride of the Woods Mine within the limits of excavation below the cleanup threshold of 659 mg/kg.

Sampling of clean cover soil placed on reclaimed areas of the Site identified marked reductions in potential exposure to onsite receptors. Based on a comparison of mean total arsenic concentrations prior to the RA, the following decreases were exhibited:

- Concentrator: Decrease from 21,358 to 66 mg/kg (99.69%)
- Ore Collector: Decrease from 2,695 to 130 mg/kg (95.18%)
- Comet Terminal/Haulage Ways: Decrease from 28,863 to 25 mg/kg (99.91%)
- Assay Shack: Decrease from 36,370 to 100 mg/kg (99.70%)
- Rainy Mine: Decrease from 40,455 to 330 mg/kg (99.18%)
- Pride of the Woods Mine: Decrease from 16,640 to 557 mg/kg (96.65%)

The Mystery Mine #3 adit discharge was successfully diverted along the exterior cliff face of the portal southwards for approximately 100 ft through talus to discharge off the shelf in a westerly direction. The Justice Mine adit discharge was diverted by installing a prefabricated concrete barrier and 8-inch HDPE piping to direct the seep off of the shelf. The piping was installed manually to extend the discharge approximately 280 ft to the northwest and downslope towards large talus and vegetation for infiltration. The piping was attached to the adjacent rock ledge with anchor bolts to preserve the alignment during heavy snow loads. Approximately three hours following diversion, the seep at Trail #719 was observed to be dry. Follow-up examination of the pipeline in May and September 2016 indicated no seeps were present below the diversion.

CES has established 21 aquatic stations in Glacier Creek, Seventysix Creek, and the SFSR to monitor surface water and sediment quality following the RA. In addition, 10 adit / seep stations are present for long-term monitoring. Moreover, five groundwater monitoring wells have been established at the repository to assess groundwater quality, flow regimes, and static water levels. The initial surface water / sediment and groundwater sampling event occurred in October 2015. Results of the surface water / sediment sampling indicated metals concentrations were similar to pre-RA conditions. Groundwater monitoring did not identify any deleterious impacts to shallow groundwater at the Repository.

9.0 RECOMMENDATIONS

The remaining field events are scheduled bi-annually from 2016-2019. Results will be summarized in annual Post-RA Reports discussing instream water and sediment quality. Benthic macroinvertebrate abundance and diversity will be assessed during the final Post-RA monitoring event in 2019.

CES recommends that the Forest Service perform the annual operations and maintenance at the Site after long-term monitoring is complete in 2019. Details are outlined in the final Operations and Maintenance Plan (CES, 2016). Activities include, but are not limited to, inspection of the Repository and reclaimed features, and vegetation management on the Repository to prevent establishment of conifers that could threaten the integrity of the liner below the 3-foot soil cap. CES will perform repository stability monitoring and surveying of monuments to evaluate downslope movement through 2019.

Confirmation soil sampling downslope from the Pride of the Woods excavation (along the old Glacier Basin Trail) identified a total arsenic concentration of 7,200 mg/kg. Sampling completed near the adit along the upper Trail #719 alignment indicated total arsenic was present at a concentration of 67 mg/kg. Based on this, CES recommends routing hikers in the Upper Glacier Basin to the south, upslope, and around the adit to avoid the riparian area below the Pride of the Woods excavation.

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TABLES

- Table 1. Confirmation Sample Analytical Results**
- Table 2. Pre- and Post- Removal Action Quantity Summary**
- Table 3. Cover Soil Analytical Results**
- Table 4. Hydraulic Spill Laboratory Analytical Results**

Table 1. Confirmation Sample Analytical Results
Monte Cristo Mining Area Removal Action - Mt. Baker-Snoqualmie National Forest, Washington

Sample ID	Sample Date	Depth	Arsenic (XRF)	Arsenic, Total (Laboratory)	RPD	Comments
		inches	mg/kg			
Ore Collector						
MCPRA-WR-OC-1-0.5	8/6/2015	0.5	250	520	70%	Waste rock left in place under the supervision of the OSC. Material was covered with two feet of clean cover soil. Outside Glacier Creek floodplain.
MCPRA-WR-OC-2-0.5	8/6/2015	0.5	1,145	940	20%	
MCPRA-WR-OC-3-0.5	8/6/2015	0.5	1,150	5,200	128%	
MCPRA-WR-OC-4-0.5	8/6/2015	0.5	1,155	2,100	58%	
MCPRA-WR-OC-5-0.5	8/6/2015	0.5	1,200	500	82%	
Mean			1,852			
Comet Terminal and Haulage Ways						
MCPRA-WR-CT-1-0.5	8/5/2015	0.5	92	420	128%	
MCPRA-WR-CT-2-0.5	8/5/2015	0.5	83	160	63%	
MCPRA-WR-CT-3-0.5	8/6/2015	0.5	139	100	33%	
MCPRA-WR-CT-4-0.5	8/6/2015	0.5	283	330	15%	
MCPRA-WR-CT-5-0.5	8/6/2015	0.5	92	320	111%	
MCPRA-WR-HW-1-0.5	8/5/2015	0.5	ND	190	NC	
MCPRA-WR-HW-2-0.5	8/5/2015	0.5	36	240	148%	
MCPRA-WR-HW-3-0.5	8/6/2015	0.5	165	380	79%	
MCPRA-WR-HW-4-0.5	8/6/2015	0.5	230	380	49%	
MCPRA-WR-HW-5-0.5	8/6/2015	0.5	219	210	4%	
Mean			273			
Assay Shack						
MCPRA-WR-AS-01	8/7/2015	0.5	54	130	83%	
MCPRA-WR-AS-02	8/7/2015	0.5	87	210	83%	
Mean			170			
Concentrator						
MCPRA-WR-CON-01-0.5	8/27/2015	0.5	3,022	3,100	3%	Upper terraces of Concentrator capped in place under supervision of OSC. Remnant tailings were covered with two feet of clean cover soil. Outside Glacier Creek floodplain.
MCPRA-WR-CON-02-0.5	8/27/2015	0.5	720	1,700	81%	
MCPRA-WR-CON-03-0.5	8/28/2015	0.5	39	79	68%	
MCPRA-WR-CON-04-0.5	8/28/2015	0.5	91	96	5%	
MCRA-WR-CON-05	9/3/2015	0.5	90	260	97%	
MCRA-WR-CON-06	9/3/2015	0.5	122	150	21%	
MCRA-WR-CON-07	9/3/2015	0.5	60	110	59%	
MCRA-WR-CON-08	9/3/2015	0.5	--	81	NC	
MCRA-WR-CON-09	9/11/2015	0.5	1,200	2,200	59%	Tailings under railroad trestle were left in place in this area to protect historic features. Capped with two feet of clean cover soil.
MCRA-WR-CON-10	9/10/2015	0.5	107	180	51%	
MCRA-WR-CON-11	9/10/2015	0.5	230	490	72%	Collected from edge of former railroad trestle. Tailings were left in place to protect historic features.
Mean			768			

Table 1. Confirmation Sample Analytical Results
Monte Cristo Mining Area Removal Action - Mt. Baker-Snoqualmie National Forest, Washington

Sample ID	Sample Date	Depth	Arsenic (XRF)	Arsenic, Total (Laboratory)	RPD	Comments
		inches	mg/kg			
Rainy Mine						
MCRA-WR-RY-01	9/24/2015	0.5	136	140	3%	
MCRA-WR-RY-02	9/24/2015	0.5	107	130	19%	
MCRA-WR-RY-03	9/24/2015	0.5	124	1,000	156%	
MCRA-WR-RY-04	9/24/2015	0.5	249	290	15%	
MCRA-WR-RY-05	9/24/2015	0.5	119	150	23%	
MCRA-WR-RY-06	9/24/2015	0.5	116	170	38%	
			Mean	313		
Pride of the Woods Mine						
MCRA-WR-POW-01	9/21/2015	0.5	54	67	21%	
MCRA-WR-POW-02	9/21/2015	0.5	109	270	85%	
MCRA-WR-POW-03	9/21/2015	0.5	442	120	115%	
MCRA-WR-POW-04	9/21/2015	0.5	45	130	97%	
MCRA-WR-POW-05	9/21/2015	0.5	939	2,200	80%	
MCRA-WR-POW-06	10/6/2015	0.5	--	7,200	NC	Sample collected outside the limits of excavation, below the former waste rock pile in the Glacier Creek floodplain (Old Glacier Basin Trail). The area was not excavated to prevent disturbance to the floodplain.
			Mean (Excavated Area)	557	NC	
Site-Specific Soil Cleanup Concentration (Near Features)¹				284	NC	
Site-Specific Soil Cleanup Concentration (Remote Features)²				659	NC	

NOTES:

Analysis performed by TestAmerica Laboratories, Spokane, Washington.

Abbreviations: -- = not analyzed, mg/kg = milligrams per kilogram, NC = not calculated, ND = not detected, RPD = relative percent difference, XRF = X-ray fluorescence.

Bold = Analyte was detected above the site specific soil cleanup concentration.

¹ Site-specific background calculated by the State of Washington Department of Ecology (Ecology, 2014. Draft Interim Action Plan, Monte Cristo Mining Area, Silverton, WA. State of Washington Department of Ecology, Toxics Cleanup Program, Central Regional Office. Yakima, Washington).

² Arsenic cleanup concentration based on the Reasonable Maximum Exposure conditions for the occasional visitor to the Remote locations (CES, 2010. Engineering Evaluation/Cost Analysis, Monte Cristo Mining Area, Mt. Baker-Snoqualmie National Forest, Snohomish County, Washington. Cascade Earth Sciences. Spokane, Washington).

Table 2. Pre- and Post-Removal Action Quantity Summary
Monte Cristo Mining Area Removal Action - Mt. Baker-Snoqualmie National Forest, Washington

Removal Action Area	Item	Unit	Pre-RA Quantities	Post-RA Quantities	% Change
Concentrator	Tailings	bcy	8,100	8,076	0%
Ore Collector	Waste Rock/Spilled Ore	bcy	2,500	1,009	-60%
Comet Terminal/Haulage Ways	Waste Rock/Spilled Ore	bcy	1,200	955	-20%
Assay Shack	Waste Rock	bcy	200	213	7%
Rainy Mine	Waste Rock	bcy	3,300	2,148	-35%
Pride of the Woods Mine	Waste Rock	bcy	2,000	1,951	-2%
Total - MCMA	Waste Rock/Tailings	bcy	17,300	14,352	-17%

NOTE:

Abbreviations: % = percent, bcy = bank cubic yards, MCMA = Monte Cristo Mining Area, RA = Removal Action.

Table 3. Cover Soil Analytical Results
Monte Cristo Mining Area Removal Action - Mt. Baker-Snoqualmie National Forest, Washington

Sample ID	Sample Date	Antimony	Arsenic	Cadmium	Copper	Lead	Mercury	Selenium	Thallium	Zinc
		milligrams per kilogram								
Ore Collector										
MCPRA-CS-COL-0.5	8/28/2015	6.7	130	0.3	59	25	0.069	1.1	< 0.25	83
Comet Terminal/Haulage Ways										
MCPRA-CS-CT-01	8/28/2015	1.3	25	0.12	36	15	0.15	0.75	< 0.25	46
Assay Shack										
MCPRA-CS-AS-01	8/28/2015	3.6	110	0.26	58	31	0.073	1	< 0.24	67
Concentrator										
MCPRA-CS-CON-01	8/28/2015	4.8	66	0.29	54	26	0.09	0.96	< 0.23	75
Rainy Mine										
MCRA-WR-RY-01	9/24/2015	4.6	330	0.28	52	37	0.062	1.5	< 0.28	85
MCMA Site-Specific background ¹		9.8	284	0.97	125	111	0.4	2.1	0.33	178

NOTES:

Analysis performed by TestAmerica Laboratories, Spokane, Washington.

Bold = Analyte was detected above the site specific soil cleanup concentration.

¹ Site-specific background calculated by the State of Washington Department of Ecology (Ecology, 2014. Draft Interim Action Plan, Monte Cristo Mining Area, Silverton, WA. State of Washington Department of Ecology, Toxics Cleanup Program, Central Regional Office, Yakima, Washington.).

**Table 4. Hydraulic Spill Laboratory Analytical Results
Monte Cristo Mining Area Removal Action - Mt. Baker-Snoqualmie National Forest, Washington**

Sample ID	Sample Date	Location	Petroleum Hydrocarbon Analyses ¹	
			Diesel Fuel Range Hydrocarbons	Heavy Oil Range Hydrocarbons
			milligrams per kilogram	
Spill A	7/2/2015	Base of Excavation - Spill A	290	1,400
Spill B	7/2/2015	Base of Excavation - Spill B	160	230
Spill C	7/2/2015	Base of Excavation - Spill C	75	240
MTCA Method A Soil Cleanup Levels for Unrestricted Land Use ²			2,000	2,000

NOTES:

Analyses were performed by TestAmerica Laboratories in Spokane, Washington.

Abbreviations: MTCA = Model Toxics Control Act

¹ Method NWTPH-Dx analyzes for diesel fuel range and heavy oil range hydrocarbons.

² MTCA Method A Soil Cleanup Levels - Tables 740-1 and 745-12 (Ecology, 2007. Model Toxics Control Act Statute and Regulation. Publication Number 94-06. State of Washington Department of Ecology Toxics Cleanup Program. Olympia, Washington.

APPENDICES

Appendix A.	As-Built Plans
Appendix B.	Pre- and Post-Removal Action Photographs
Appendix C.	2015 Biological Monitoring Report
Appendix D.	Institutional Control Plan
Appendix E.	Laboratory Analytical Results
Appendix F.	2015 Year End Monitoring Report

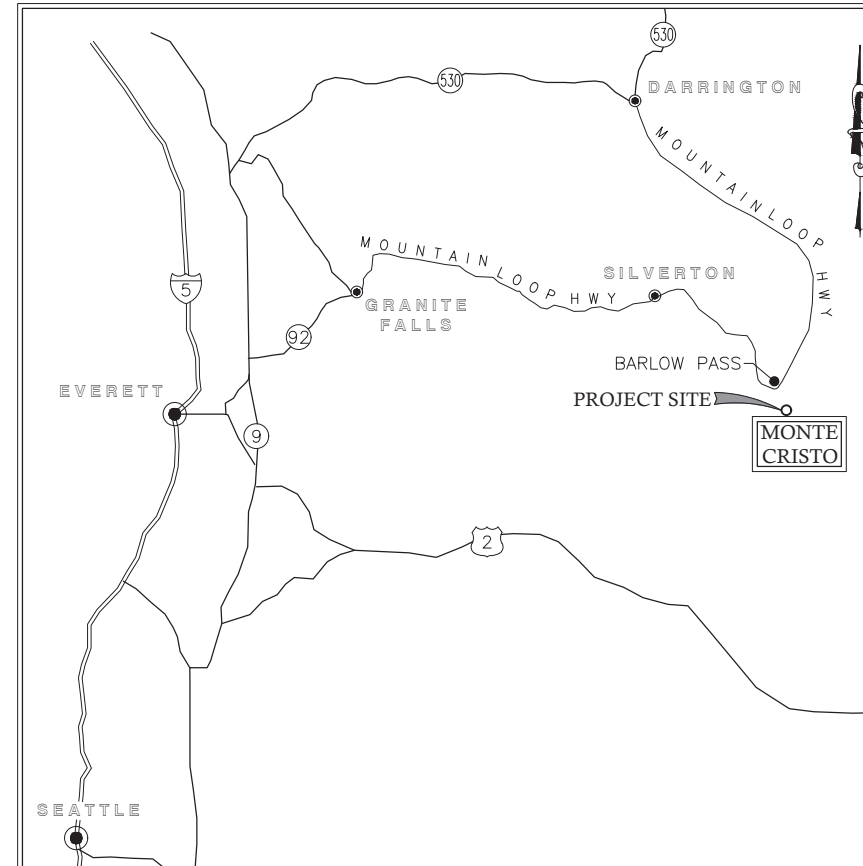
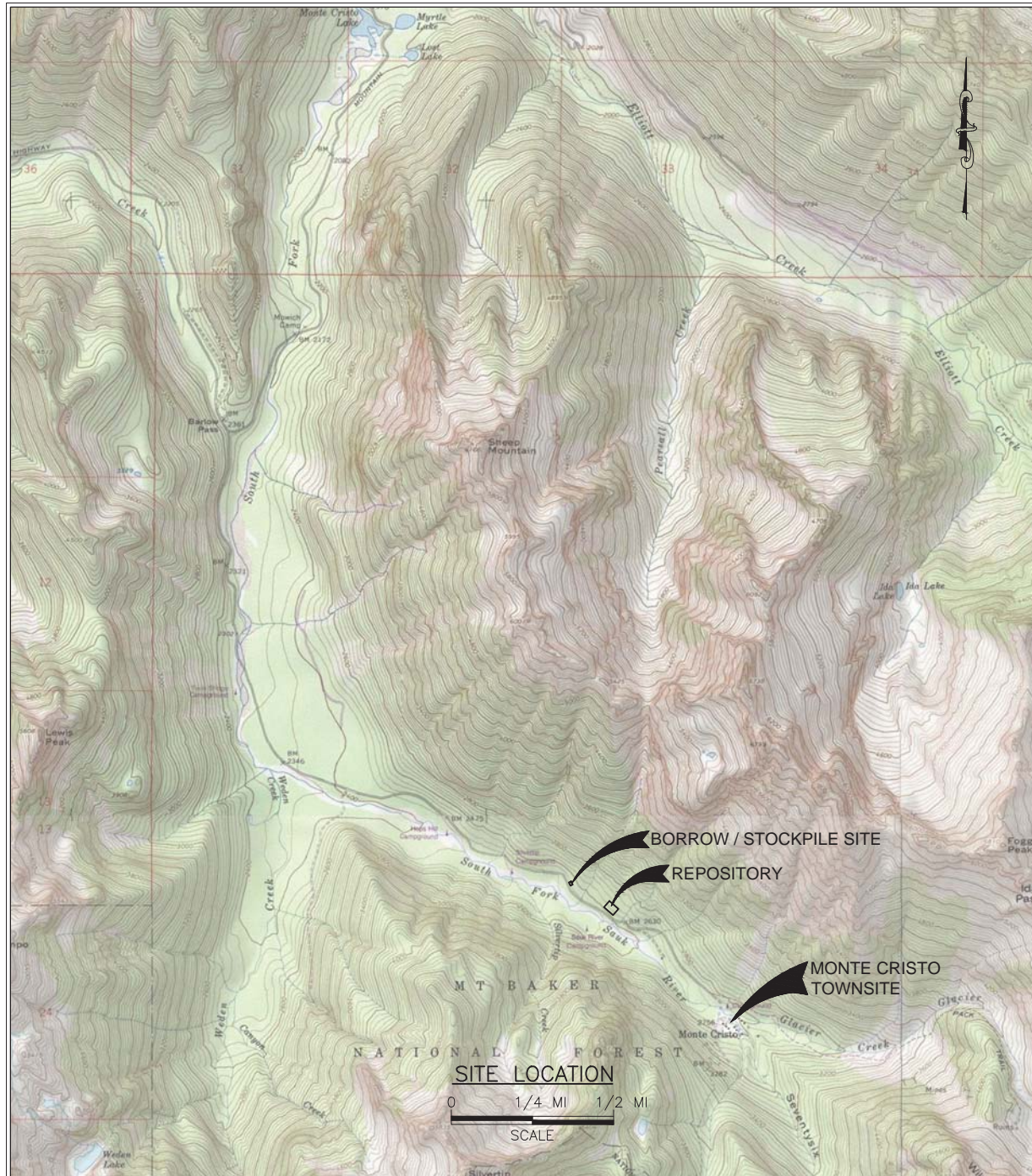
Appendix A.
As-Built Plans

MCMA REMOVAL ACTION

MT. BAKER-SNOQUALMIE NATIONAL FOREST

DARRINGTON RANGER DISTRICT

MONTE CRISTO, WASHINGTON



ROAD MAP
NOT TO SCALE

INDEX OF DRAWINGS:

- SHEET G1. TITLE SHEET
- SHEET G2. EXISTING SITE MAP AND SURVEY CONTROL
- SHEET G3. MONTE CRISTO TOWNSITE MAP
- SHEET G4. DESIGNATED WORK ZONES

- SHEET C1. REPOSITORY EXCAVATION SITE PLAN
- SHEET C2. REPOSITORY WASTE ROCK AND TAILINGS FINISHED GRADING
- SHEET C3. REPOSITORY FINISHED GRADING NOT USED NOT USED
- SHEET C3A. REPOSITORY AS-BUILT SURVEY
- SHEET C3B. REPOSITORY FINAL AS-BUILT SURVEY
- SHEET C4. REPOSITORY CROSS-SECTIONS NOT USED
- SHEET C4A. REPOSITORY AS-BUILT CROSS-SECTIONS
- SHEET C4B. REPOSITORY FINAL AS-BUILT CROSS-SECTIONS
- SHEET C5. REPOSITORY TEMPORARY ACCESS ROAD NOT USED
- SHEET C6. REPOSITORY DRAINAGE PLAN NOT USED
- SHEET C7. CONCENTRATOR SITE PLAN
- SHEET C7A. CONCENTRATOR SITE PLAN AS-BUILT SURVEY
- SHEET C8. COMET TERMINAL SITE PLAN
- SHEET C8A. COMET TERMINAL SITE AS-BUILT SURVEY
- SHEET C9. ORE COLLECTOR AND RAINY MINE SITE PLAN
- SHEET C9A. ORE COLLECTOR SITE AS-BUILT SURVEY
- SHEET C9B. RAINY MINE SITE AS-BUILT SURVEY
- SHEET C10. ASSAY BUILDING SITE PLAN
- SHEET C10A. ASSAY BUILDING SITE AS-BUILT SURVEY
- SHEET C11. PRIDE OF THE WOODS SITE PLAN

- SHEET D1. DETAILS
- SHEET D2. EROSION CONTROL DETAILS
- SHEET D3. JUSTICE MINE DRAINAGE PLAN AND DETAILS
- SHEET D4. MYSTERY #3 MINE DRAINAGE PLAN AND DETAILS

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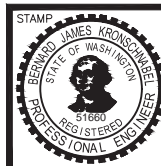
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2	RECORD DRAWINGS – FINAL REPOSITORY GRADING	RKB	9/20/16

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SHEET

G1



DATUM:
NAVD 88

BENCHMARK:
B.M. #1
S.C.D.-POINT ID: 1823
MONUMENT
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E: 1490631.717
ELEV= 2280.03

BENCHMARK:
B.M. #2
S.C.D.-POINT ID: 1745
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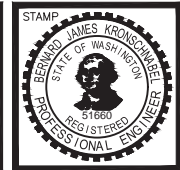
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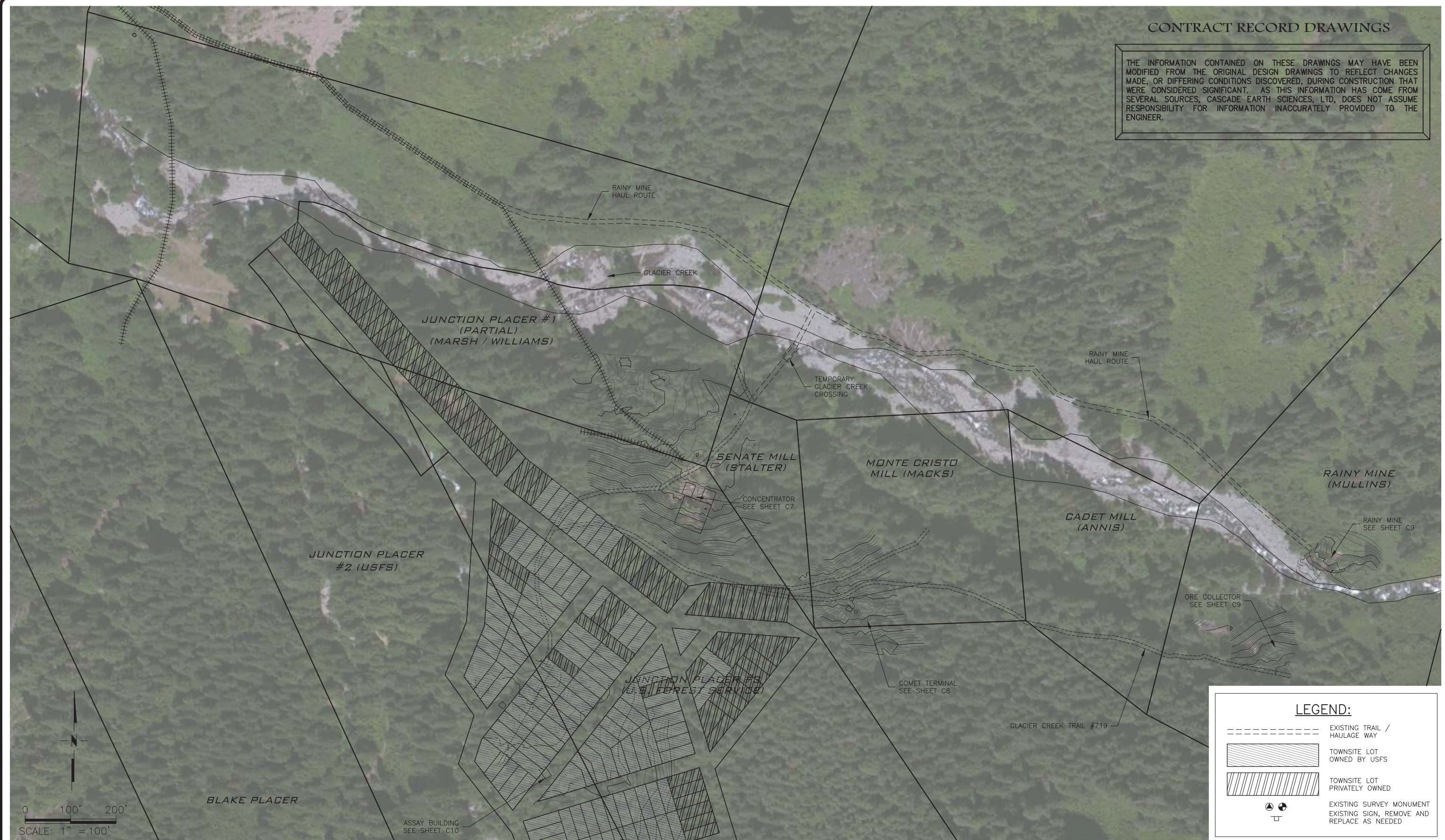
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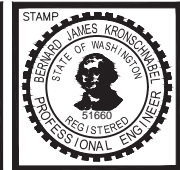
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- TOWNSITE LOT OWNED BY USFS
- TOWNSITE LOT PRIVATELY OWNED
- EXISTING SURVEY MONUMENT
- EXISTING SIGN, REMOVE AND REPLACE AS NEEDED

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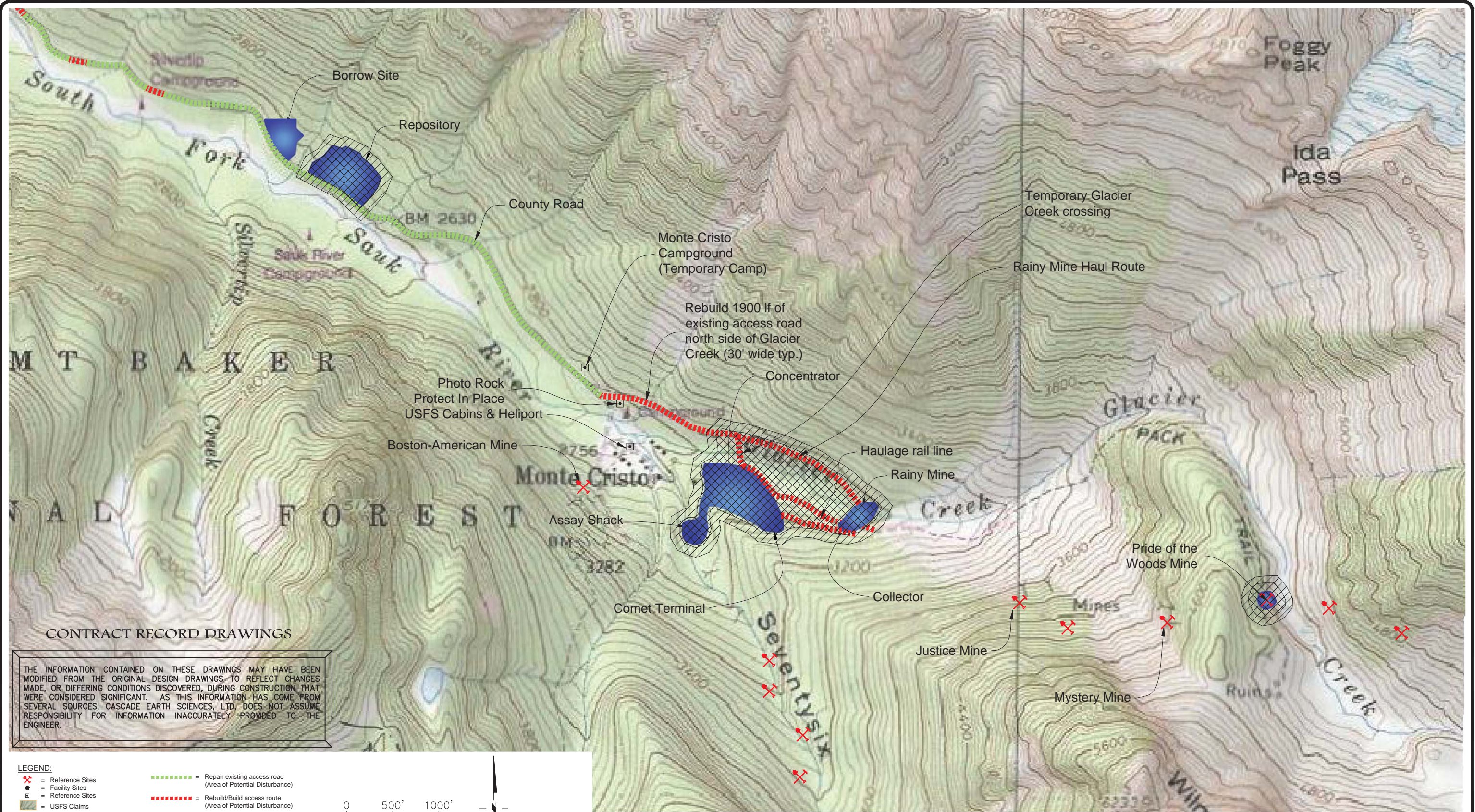
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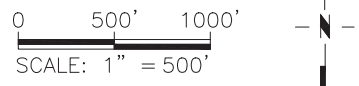
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 - = Reference Sites
 - = USFS Claims
 - = Private Claims
 - = Areas of Potential Disturbance
 - = Repair existing access road (Area of Potential Disturbance)
 - = Rebuild/Build access route (Area of Potential Disturbance)
 - = Exclusion Zone
 - = Contamination Reduction Zone

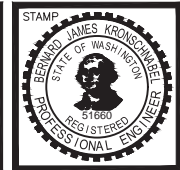


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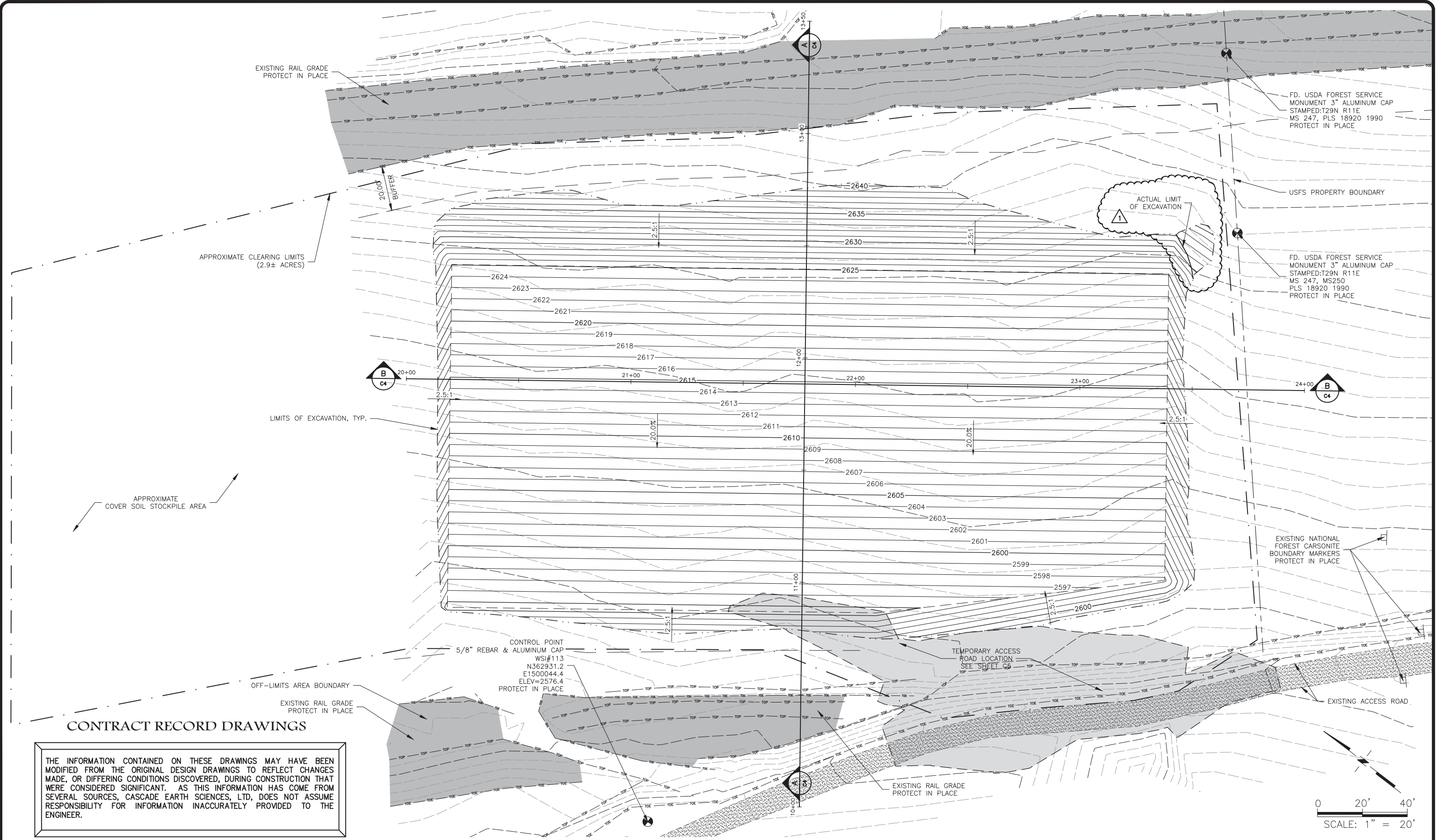
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REMOVAL ACTION

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G4



CONTRACT RECORD DRAWINGS

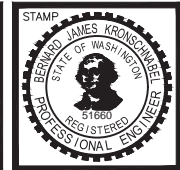
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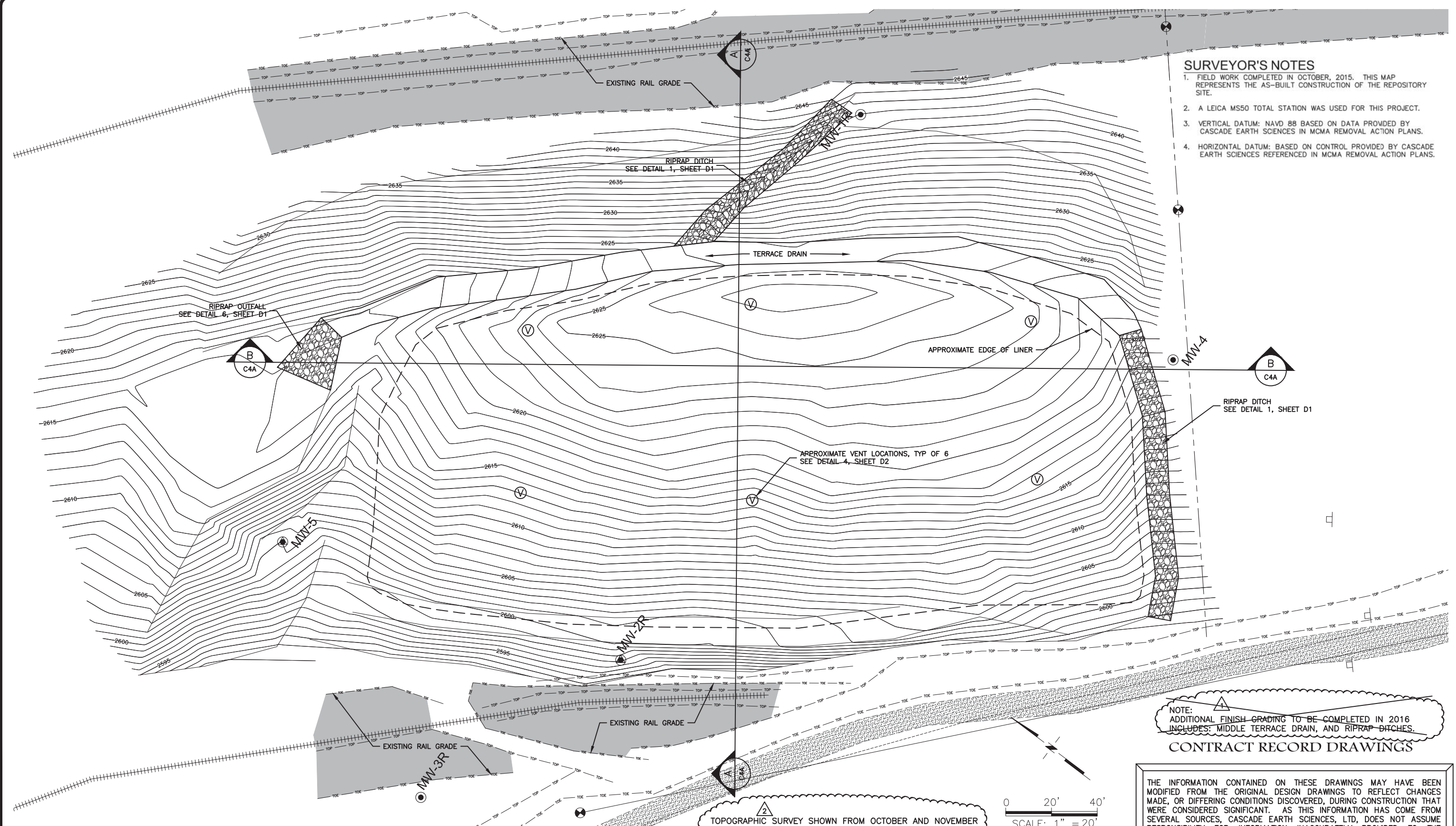
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C1



SURVEYOR'S NOTES

1. FIELD WORK COMPLETED IN OCTOBER, 2015. THIS MAP REPRESENTS THE AS-BUILT CONSTRUCTION OF THE REPOSITORY SITE.
2. A LEICA MS50 TOTAL STATION WAS USED FOR THIS PROJECT.
3. VERTICAL DATUM: NAVD 88 BASED ON DATA PROVIDED BY CASCADE EARTH SCIENCES IN MCMA REMOVAL ACTION PLANS.
4. HORIZONTAL DATUM: BASED ON CONTROL PROVIDED BY CASCADE EARTH SCIENCES REFERENCED IN MCMA REMOVAL ACTION PLANS.

NOTE:
 ADDITIONAL FINISH GRADING TO BE COMPLETED IN 2016
 INCLUDES: MIDDLE TERRACE DRAIN, AND RIPRAP DITCHES.

CONTRACT RECORD DRAWINGS

TOPOGRAPHIC SURVEY SHOWN FROM OCTOBER AND NOVEMBER OF 2015. SEE SHEET C3b FOR FINAL TOPOGRAPHIC SURVEY.



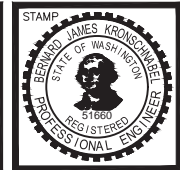
(SOURCE: AS-BUILT SURVEY COMPLETED BY DAVID EVANS AND ASSOC. SURVEY DATED 11-13-2015 STAMPED BY DUFFY HAGGARTY WA PLS# 52081)

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USDA Forest Service
 Mt. Baker – Snoqualmie
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 Darrington Ranger District

REV #	DESCRIPTION	BY	DATE
1	RECORD DRAWINGS	RKB	2/16/16
2	RECORD DRAWINGS – FINAL REPOSITORY GRADING	RKB	9/20/16

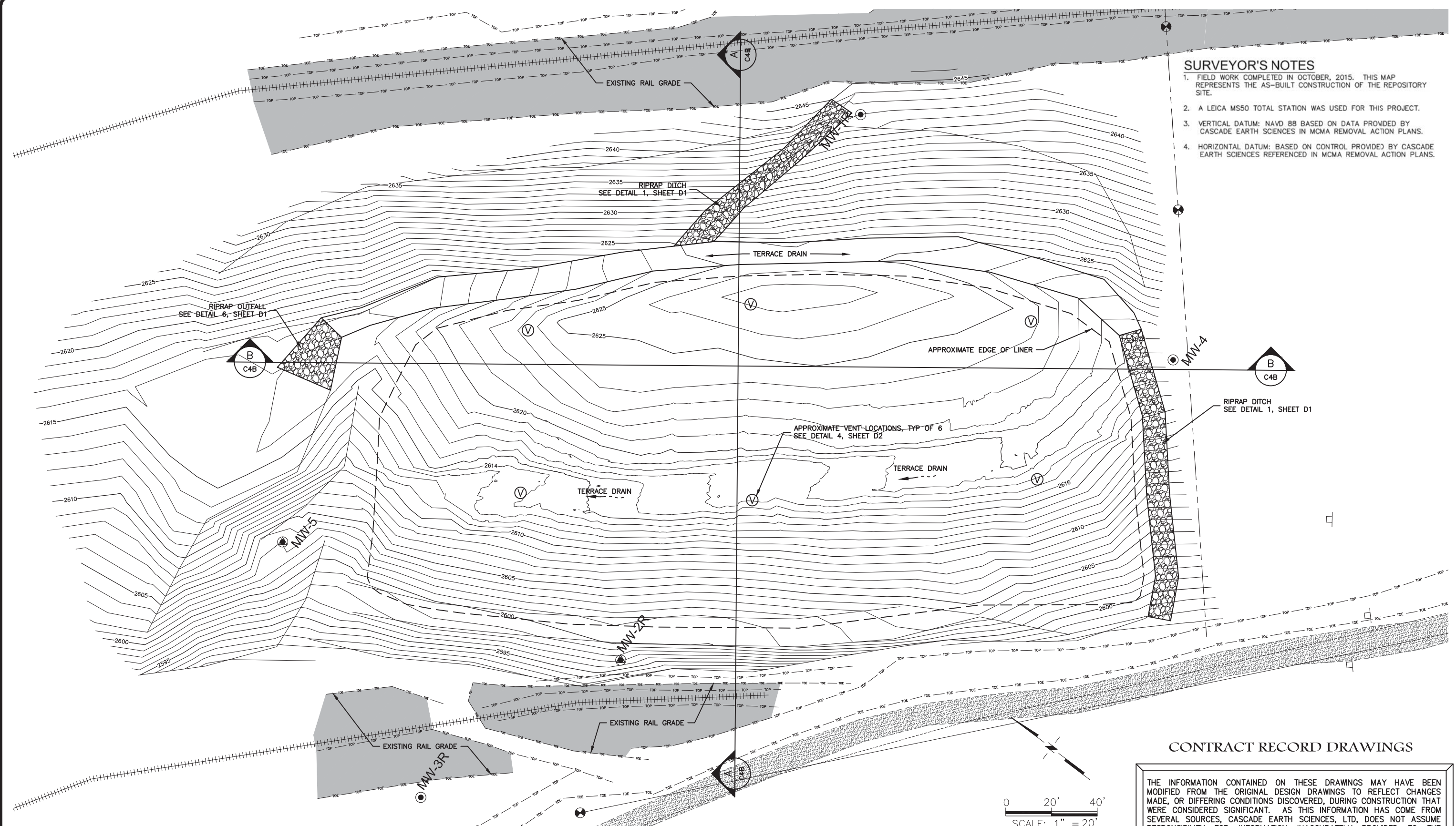
DES. BY TLO
 DRG. BY RKB
 CHK. BY JEW
 DATE 2/25/2015
 JOB No. 2013230022



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REPOSITORY AS-BUILT SURVEY
 MONTE CRISTO MINING AREA
 REMOVAL ACTION

SHEET
 C3a



- SURVEYOR'S NOTES**
1. FIELD WORK COMPLETED IN OCTOBER, 2015. THIS MAP REPRESENTS THE AS-BUILT CONSTRUCTION OF THE REPOSITORY SITE.
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CONTRACT RECORD DRAWINGS

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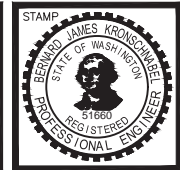
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Mt. Baker – Snoqualmie
National Forest
Darrington Ranger District

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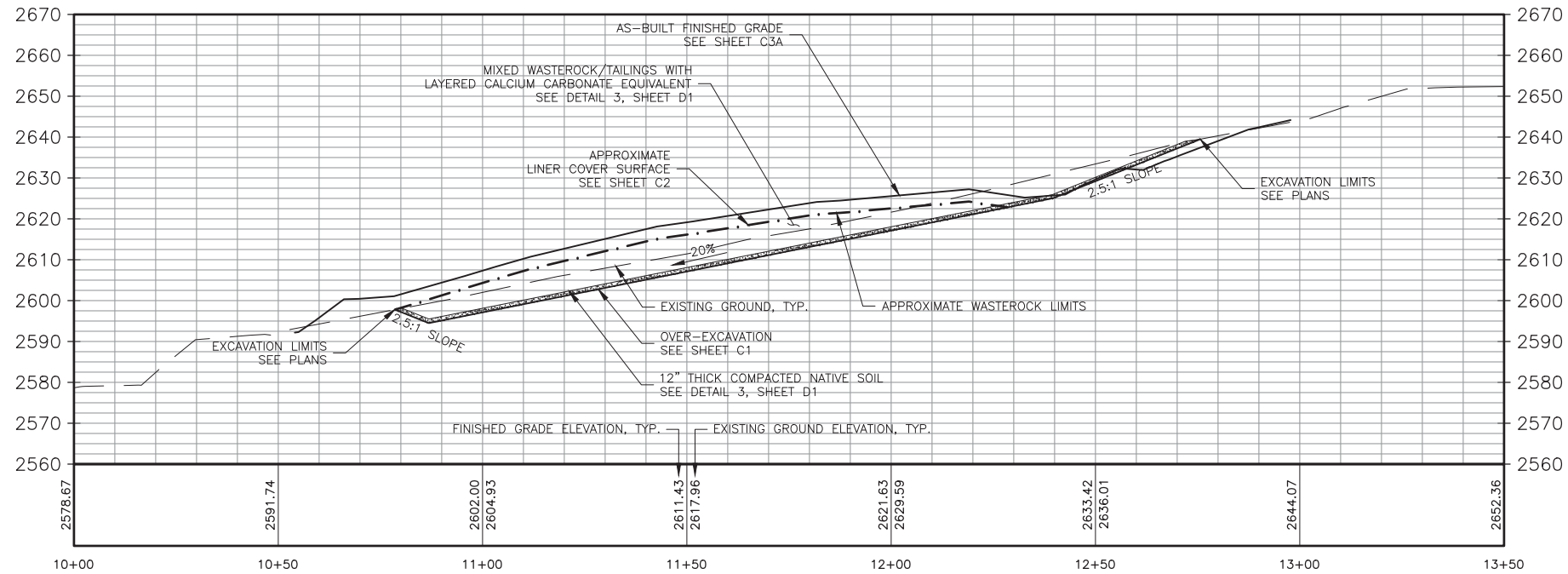
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DATE 2/25/2015
JOB No. 2013230022



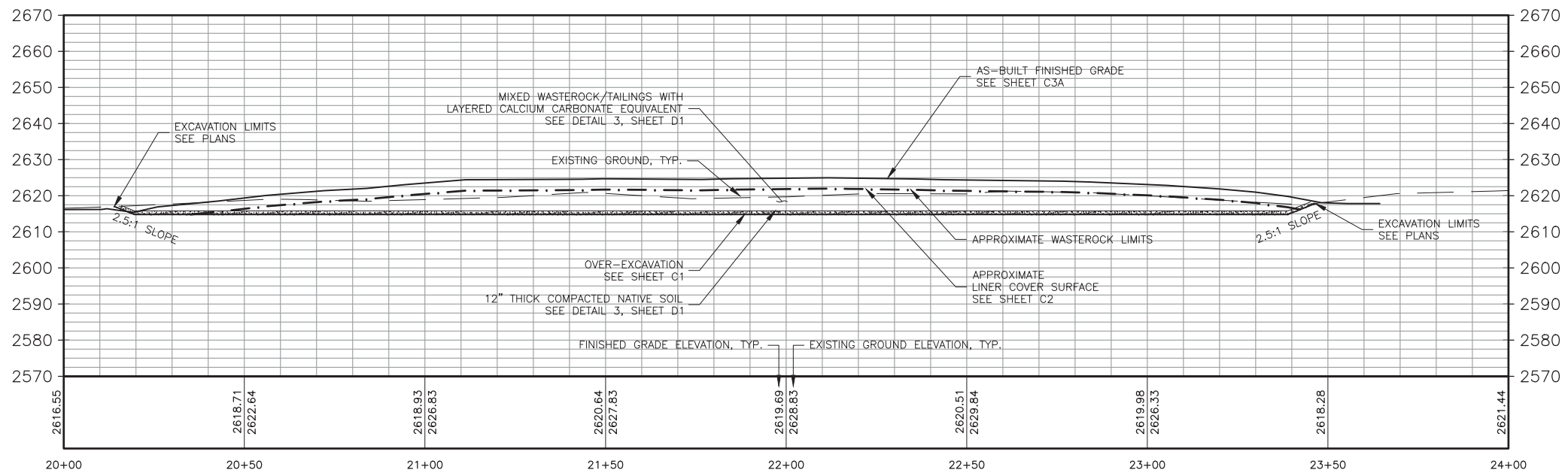
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REPOSITORY FINAL AS-BUILT SURVEY
MONTE CRISTO MINING AREA
REMOVAL ACTION

SHEET
C3b



A SECTION VIEW



B SECTION VIEW

~~NOTE: AS CONSTRUCTED
SEE SHEET C3A FOR
FINAL TOPOGRAPHIC
RECORD SURVEY~~

NOTE: AS CONSTRUCTED
SEE SHEET C3B FOR
FINAL TOPOGRAPHIC
RECORD SURVEY

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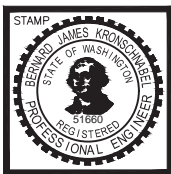


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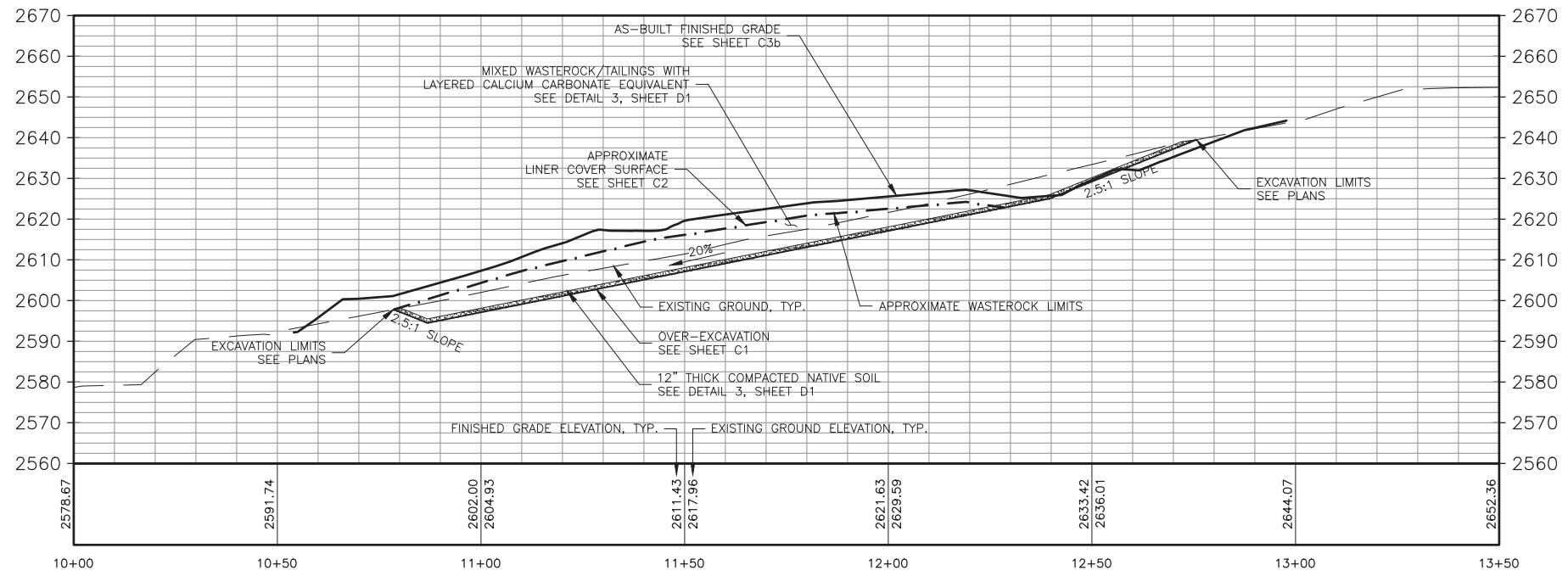
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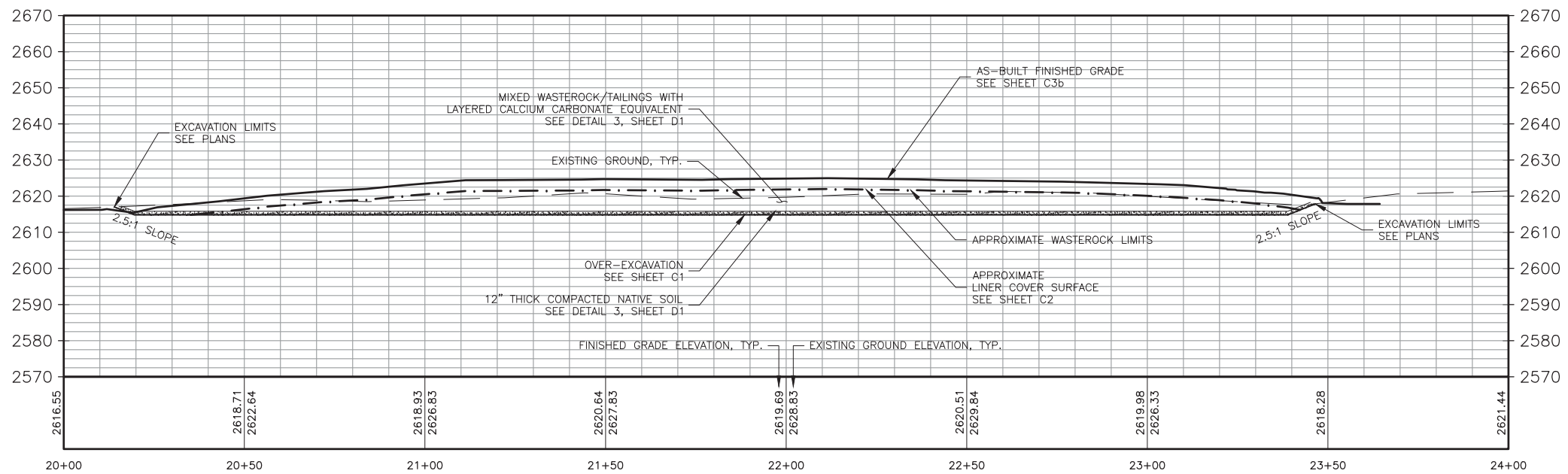
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REPOSITORY
CROSS SECTIONS
MONTE CRISTO MINING AREA
REMOVAL ACTION

SHEET
C4a



A SECTION VIEW



B SECTION VIEW

CONTRACT RECORD DRAWINGS

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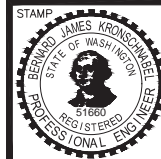


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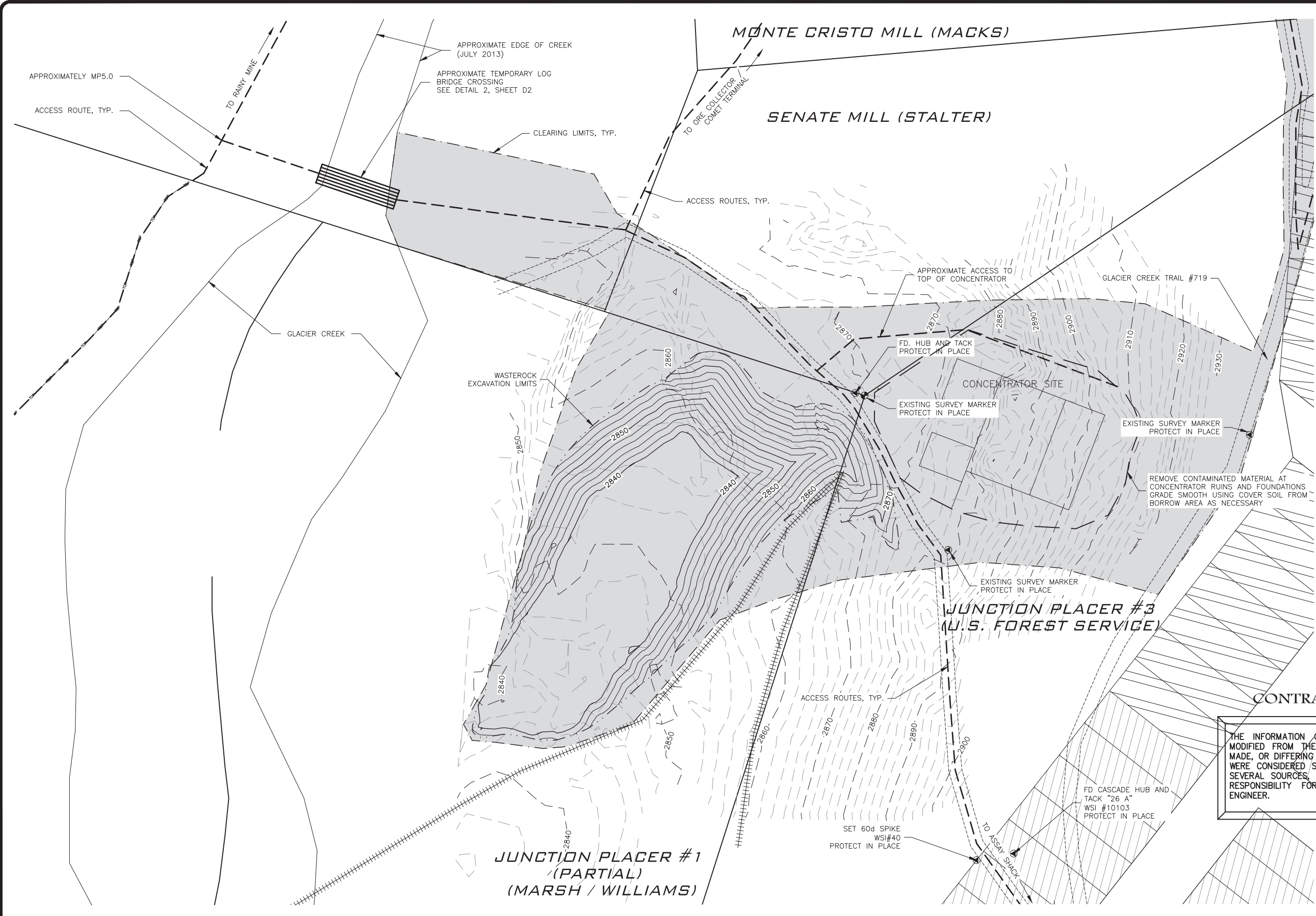


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REPOSITORY FINAL AS-BUILT
CROSS SECTIONS

MONTE CRISTO MINING AREA
REMOVAL ACTION

SHEET
C4b



LEGEND:

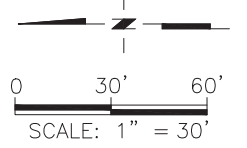
	ANTICIPATED CLEARING LIMITS
	EXCAVATION LIMITS
	ACCESS ROUTES
	EXISTING TRAIL
	TOWNSITE LOT OWNED BY USFS
	TOWNSITE LOT PRIVATELY OWNED
	EXISTING SURVEY MONUMENT
	EXISTING SIGN, REMOVE AND REPLACE AS NEEDED
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR

- NOTES:**
1. REMOVE APPROXIMATELY 8200 CY OF CONTAMINATED TAILINGS AS DIRECTED BY THE ENGINEER AND HAUL TO REPOSITORY.
 2. AFTER CLEANUP, BLEND WITH SURROUNDING TERRAIN OR SHAPE TO AND CONTOUR TO ILLUSTRATE HISTORIC FEATURES.
 3. ACTUAL FINISHED GRADE MAY NEED TO BE MODIFIED AS DETERMINED BY TESTING FOR CONTAMINANT CONCENTRATIONS.

△ NOTE: AS DESIGNED SEE SHEET C7A FOR FINAL TOPOGRAPHIC RECORD SURVEY

CONTRACT RECORD DRAWINGS

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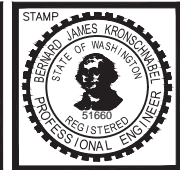


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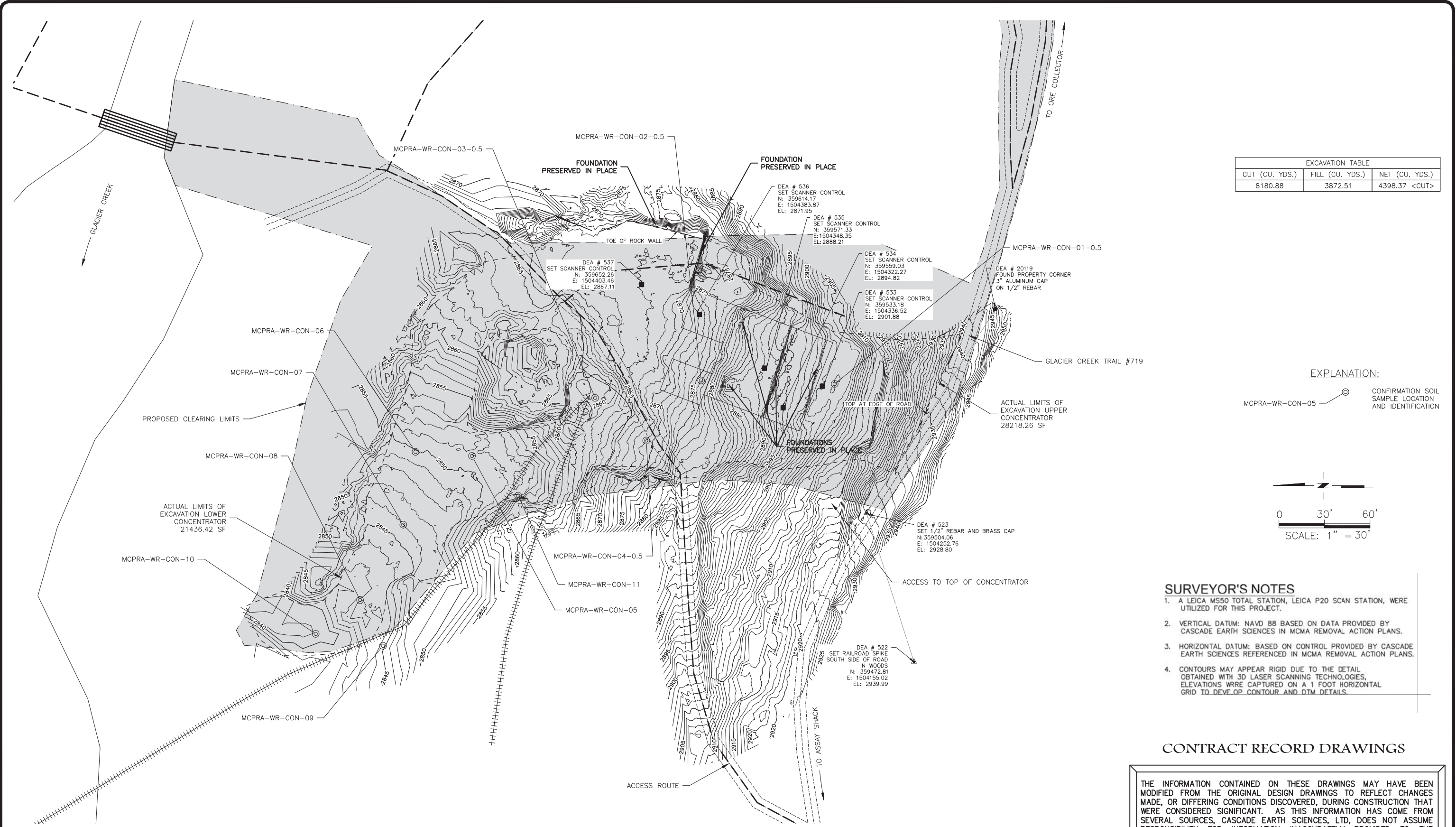
DES. BY TLO
DRG. BY RKB
CHK. BY JEW
DATE 2/25/2015
JOB No. 2013230022



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CONCENTRATOR SITE PLAN
MONTE CRISTO MINING AREA
REMOVAL ACTION

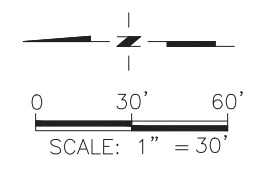
SHEET
C7



EXCAVATION TABLE		
CUT (CU. YDS.)	FILL (CU. YDS.)	NET (CU. YDS.)
8180.88	3872.51	4398.37 <CUT>

EXPLANATION:

MCPRA-WR-CON-05 CONFIRMATION SOIL SAMPLE LOCATION AND IDENTIFICATION



- SURVEYOR'S NOTES**
1. A LEICA M550 TOTAL STATION, LEICA P20 SCAN STATION, WERE UTILIZED FOR THIS PROJECT.
 2. VERTICAL DATUM: NAVD 88 BASED ON DATA PROVIDED BY CASCADE EARTH SCIENCES IN MCMA REMOVAL ACTION PLANS.
 3. HORIZONTAL DATUM: BASED ON CONTROL PROVIDED BY CASCADE EARTH SCIENCES REFERENCED IN MCMA REMOVAL ACTION PLANS.
 4. CONTOURS MAY APPEAR RIGID DUE TO THE DETAIL OBTAINED WITH 3D LASER SCANNING TECHNOLOGIES, ELEVATIONS WERE CAPTURED ON A 1 FOOT HORIZONTAL GRID TO DEVELOP CONTOUR AND DTM DETAILS.

CONTRACT RECORD DRAWINGS

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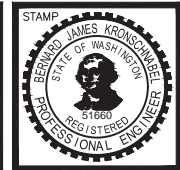
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2	RECORD DRAWINGS – FINAL REPOSITORY GRADING	RKB	9/20/16

DES. BY TLO
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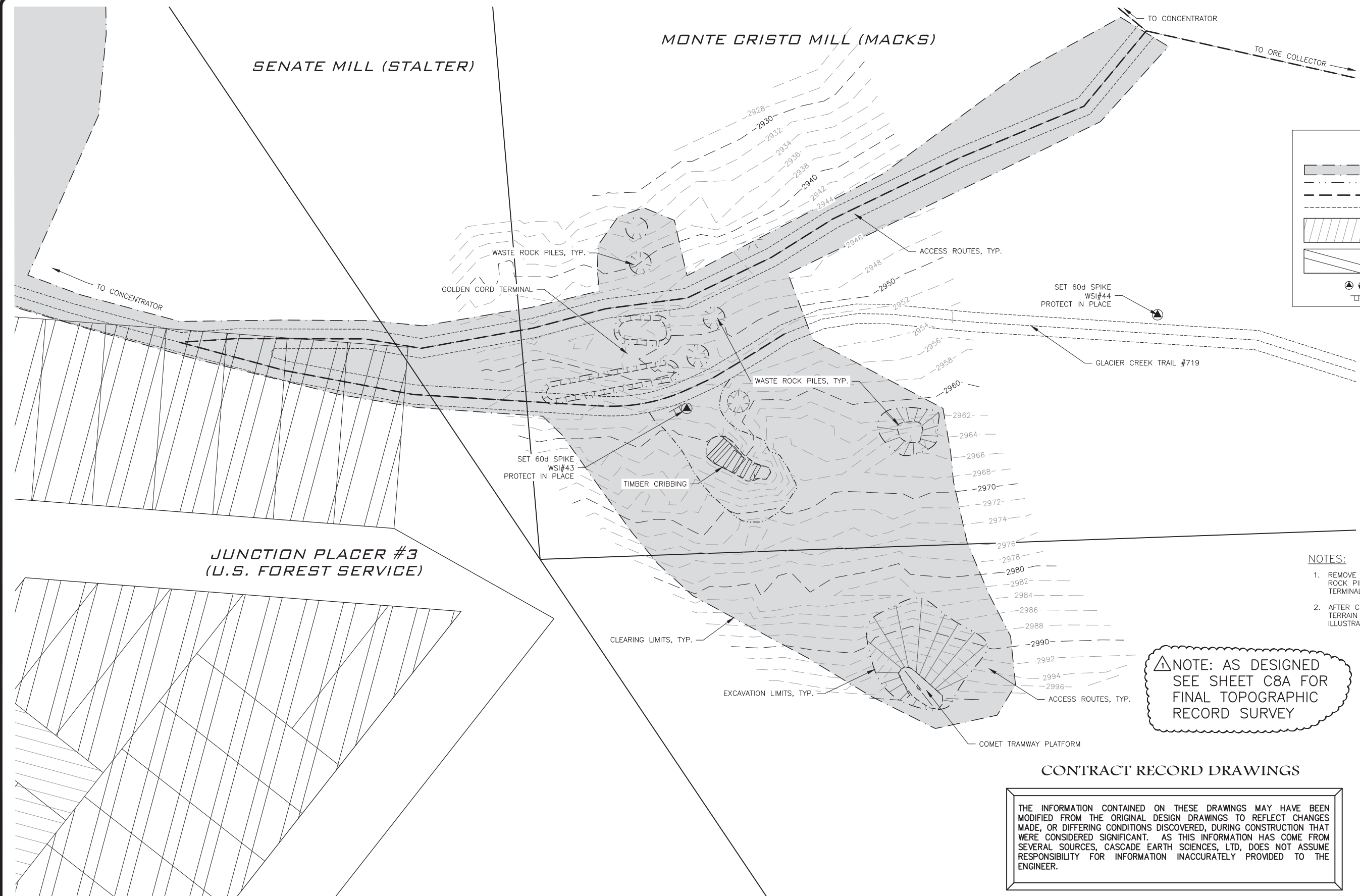
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CONCENTRATOR SITE AS-BUILT SURVEY
MONTE CRISTO MINING AREA
REMOVAL ACTION

SHEET
C7a

MONTE CRISTO MILL (MACKS)

SENATE MILL (STALTER)



LEGEND:

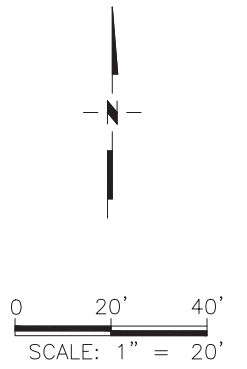
- ANTICIPATED CLEARING LIMITS
- EXCAVATION LIMITS
- ACCESS ROUTES
- EXISTING TRAIL
- TOWNSITE LOT OWNED BY USFS
- TOWNSITE LOT PRIVATELY OWNED
- EXISTING SURVEY MONUMENT
- EXISTING SIGN, REMOVE AND REPLACE AS NEEDED

- NOTES:**
1. REMOVE APPROXIMATELY 900 CY OF 10 WASTE ROCK PILES SHOWN, AND CONTAMINATED SOIL IN TERMINAL AREA AND IN HAULAGE WAYS.
 2. AFTER CLEANUP, BLEND WITH SURROUNDING TERRAIN OR SHAPE TO AND CONTOUR TO ILLUSTRATE HISTORIC FEATURES.

NOTE: AS DESIGNED SEE SHEET C8A FOR FINAL TOPOGRAPHIC RECORD SURVEY

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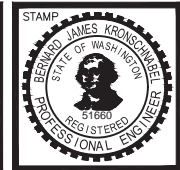


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COMET TERMINAL
SITE PLAN
MONTE CRISTO MINING AREA
REMOVAL ACTION

SHEET
C8

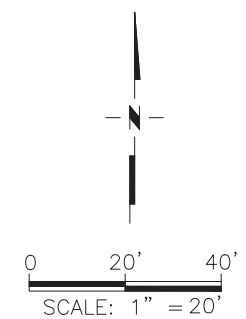
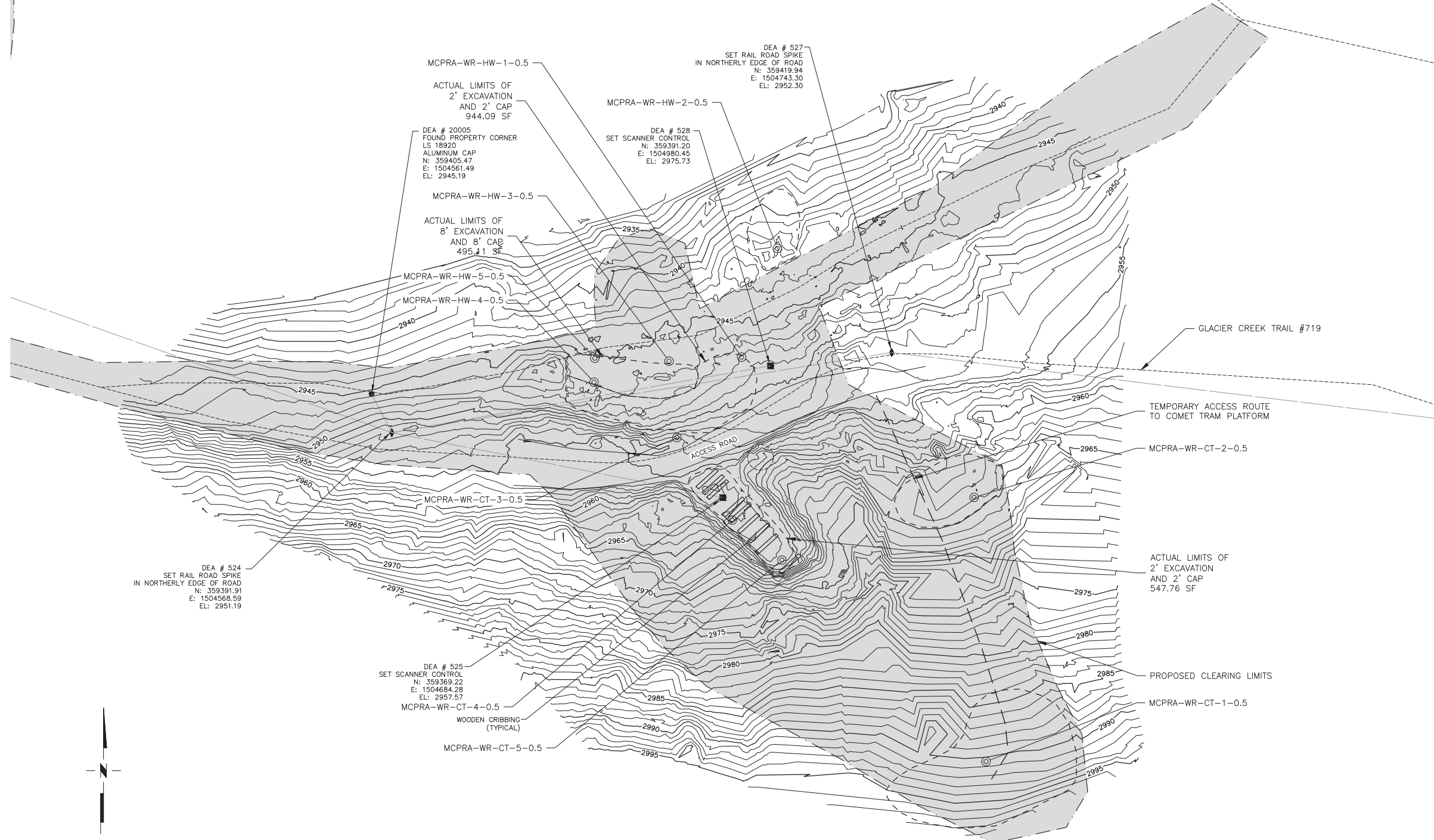
SURVEYOR'S NOTES

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EXCAVATION TABLE		
CUT (CU. YDS.)	FILL (CU. YDS.)	NET (CU. YDS.)
955.00	257.20	697.80 <CUT>

EXPLANATION:

MCPRA-WR-CT-2-0.5  CONFIRMATION SOIL SAMPLE LOCATION AND IDENTIFICATION



(SOURCE: AS-BUILT SURVEY COMPLETED BY DAVID EVANS AND ASSOC. SURVEY DATED 11-13-2015 STAMPED BY DUFFY HAGGARTY WA PLS# 52081)

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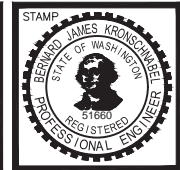
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Mt. Baker – Snoqualmie
National Forest
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2	RECORD DRAWINGS – FINAL REPOSITORY GRADING	RKB	9/20/16

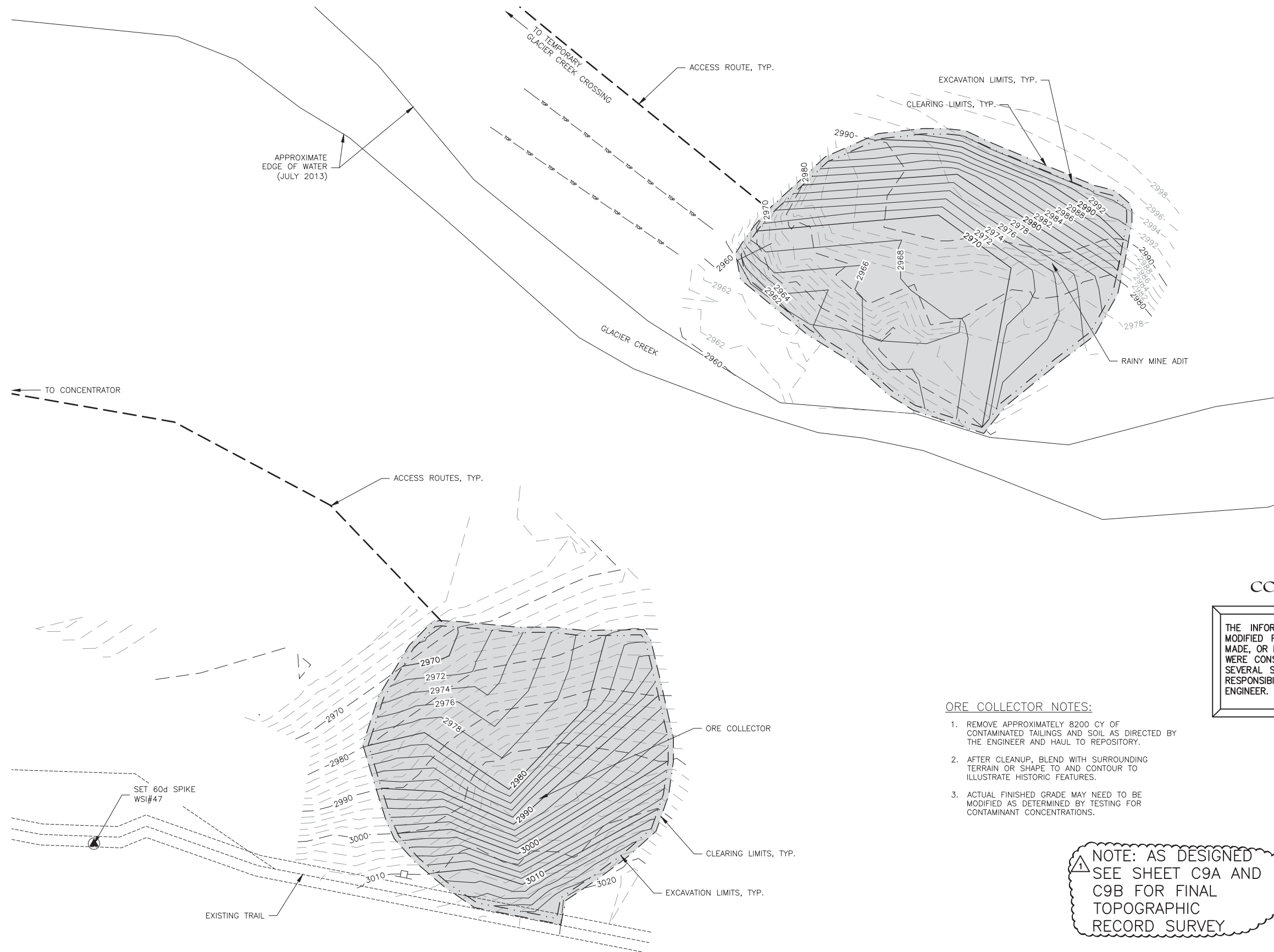
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COMET TERMINAL SITE AS-BUILT SURVEY
MONTE CRISTO MINING AREA
REMOVAL ACTION

SHEET
C8a



- RAINY MINE NOTES:**
1. REMOVE APPROXIMATELY 3300 CY OF CONTAMINATED TAILINGS AND SOIL AS DIRECTED BY THE ENGINEER AND HAUL TO REPOSITORY.
 2. AFTER CLEANUP, BLEND WITH SURROUNDING TERRAIN OR SHAPE TO AND CONTOUR TO ILLUSTRATE HISTORIC FEATURES.
 3. ACTUAL FINISHED GRADE MAY NEED TO BE MODIFIED AS DETERMINED BY TESTING FOR CONTAMINANT CONCENTRATIONS.

LEGEND:

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	EXCAVATION LIMITS
	ACCESS ROUTES
	EXISTING TRAIL
	TOWNSITE LOT OWNED BY USFS
	TOWNSITE LOT PRIVATELY OWNED
	EXISTING SURVEY MONUMENT
	EXISTING SIGN, REMOVE AND REPLACE AS NEEDED
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR

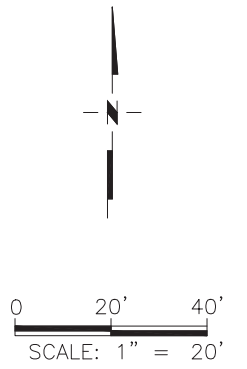
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ORE COLLECTOR NOTES:

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2. AFTER CLEANUP, BLEND WITH SURROUNDING TERRAIN OR SHAPE TO AND CONTOUR TO ILLUSTRATE HISTORIC FEATURES.
3. ACTUAL FINISHED GRADE MAY NEED TO BE MODIFIED AS DETERMINED BY TESTING FOR CONTAMINANT CONCENTRATIONS.

NOTE: AS DESIGNED SEE SHEET C9A AND C9B FOR FINAL TOPOGRAPHIC RECORD SURVEY

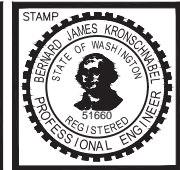


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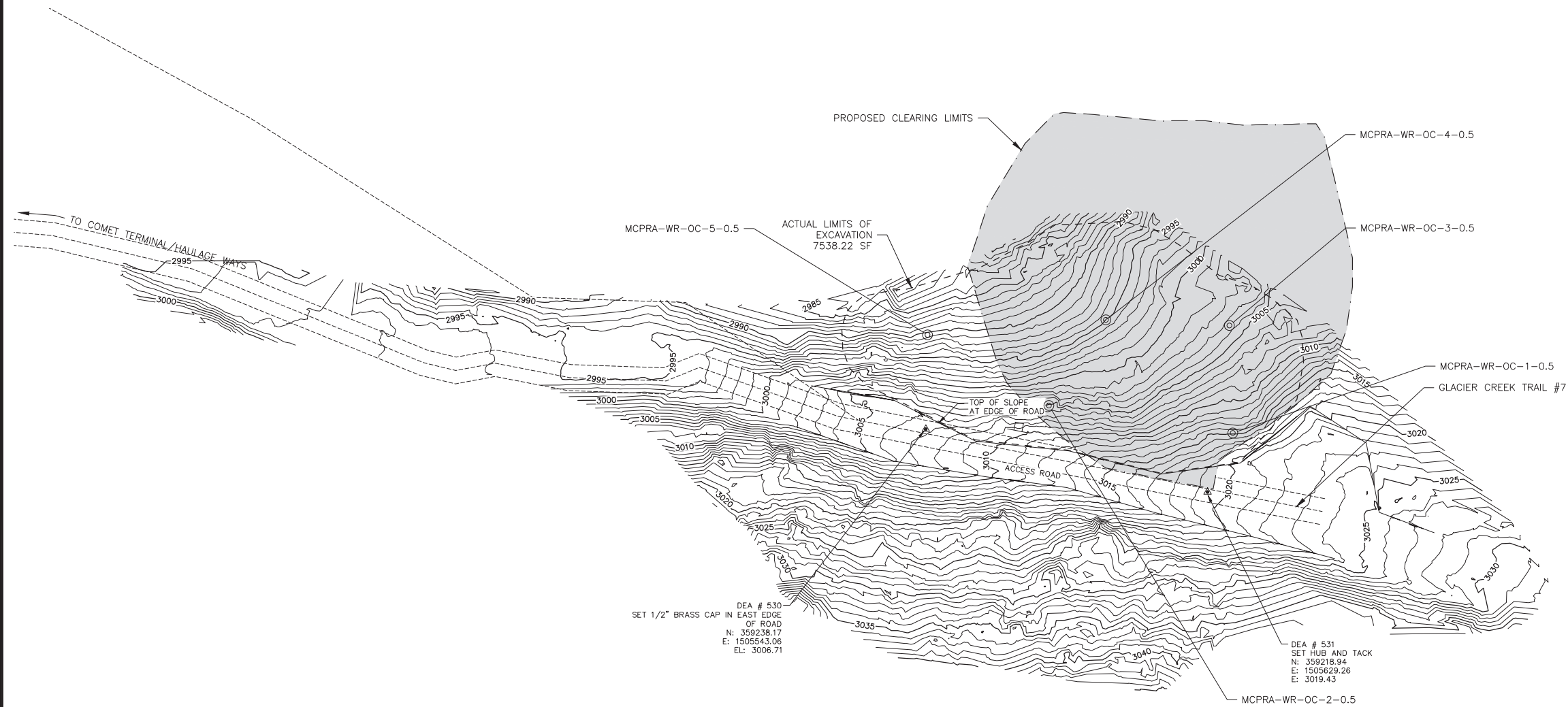
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ORE COLLECTOR AND RAINY MINE
SITE PLAN
MONTE CRISTO MINING AREA
REMOVAL ACTION

SHEET
C9

SURVEYOR'S NOTES

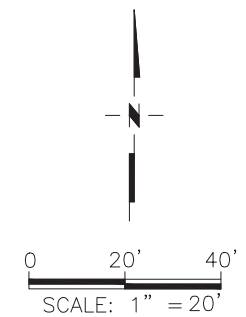
1. A LEICA MS50 TOTAL STATION, LEICA P20 SCAN STATION, WERE UTILIZED FOR THIS PROJECT.
2. VERTICAL DATUM: NAVD 88 BASED ON DATA PROVIDED BY CASCADE EARTH SCIENCES IN MCMA REMOVAL ACTION PLANS.
3. HORIZONTAL DATUM: BASED ON CONTROL PROVIDED BY CASCADE EARTH SCIENCES REFERENCED IN MCMA REMOVAL ACTION PLANS.
4. CONTOURS MAY APPEAR RIGID DUE TO THE DETAIL OBTAINED WITH 3D LASER SCANNING TECHNOLOGIES, ELEVATIONS WERE CAPTURED ON A 1 FOOT HORIZONTAL GRID TO DEVELOP CONTOUR AND DTM DETAILS.



EXCAVATION TABLE		
CUT (CU. YDS.)	FILL (CU. YDS.)	NET (CU. YDS.)
1081.15	630.43	450.72 <CUT>

EXPLANATION:

MCPRA-WR-OC-3-0.5 CONFIRMATION SOIL SAMPLE LOCATION AND IDENTIFICATION



CONTRACT RECORD DRAWINGS

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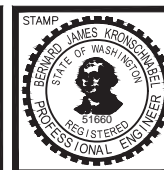
(SOURCE: AS-BUILT SURVEY COMPLETED BY DAVID EVANS AND ASSOC. SURVEY DATED 11-13-2015 STAMPED BY DUFFY HAGGARTY WA PLS# 52081)

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Mt. Baker – Snoqualmie
National Forest
Darrington Ranger District

REV #	DESCRIPTION	BY	DATE
1	RECORD DRAWINGS	RKB	2/16/16
2	RECORD DRAWINGS – FINAL REPOSITORY GRADING	RKB	9/20/16

DES. BY TLO
DRG. BY RKB
CHK. BY JEW
DATE 2/25/2015
JOB No. 2013230022



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ORE COLLECTOR SITE AS-BUILT SURVEY
MONTE CRISTO MINING AREA
REMOVAL ACTION

SHEET
C9a

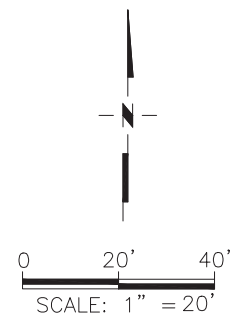
SURVEYOR'S NOTES

1. FIELD WORK COMPLETED ON OCTOBER 14, 2015. THIS MAP REPRESENTS THE AS-BUILT CONSTRUCTION OF THE RAINY MINE SITE.
2. A LEICA MS50 TOTAL STATION WAS USED FOR THIS PROJECT.
1. VERTICAL DATUM: NAVD 88 BASED ON DATA PROVIDED BY CASCADE EARTH SCIENCES IN MCMA REMOVAL ACTION PLANS.
2. HORIZONTAL DATUM: BASED ON CONTROL PROVIDED BY CASCADE EARTH SCIENCES REFERENCED IN MCMA REMOVAL ACTION PLANS.

EXCAVATION TABLE		
CUT (CU. YDS.)	FILL (CU. YDS.)	NET (CU. YDS.)
2147.86	1372.71	775.15 <CUT>

EXPLANATION:

MCRA-WR-RY-05  CONFIRMATION SOIL SAMPLE LOCATION AND IDENTIFICATION



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(SOURCE: AS-BUILT SURVEY COMPLETED BY DAVID EVANS AND ASSOC. SURVEY DATED 10-14-2015 STAMPED BY DUFFY HAGGARTY WA PLS# 52081)

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USDA Forest Service Mt. Baker – Snoqualmie National Forest Darrington Ranger District	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>REV #</th> <th>DESCRIPTION</th> <th>BY</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>RECORD DRAWINGS</td> <td>RKB</td> <td>2/16/16</td> </tr> <tr> <td>2</td> <td>RECORD DRAWINGS – FINAL REPOSITORY GRADING</td> <td>RKB</td> <td>9/20/16</td> </tr> </tbody> </table>	REV #	DESCRIPTION	BY	DATE	1	RECORD DRAWINGS	RKB	2/16/16	2	RECORD DRAWINGS – FINAL REPOSITORY GRADING	RKB	9/20/16	DES. BY TLO DRG. BY RKB CHK. BY JEW DATE 2/25/2015 JOB No. 2013230022		 CASCADE EARTH SCIENCES A Valmont Industries Company CALL 1-800-728-8322 FOR NATIONAL OFFICE LOCATIONS	RAINY MINE SITE AS-BUILT SURVEY <hr/> MONTE CRISTO MINING AREA REMOVAL ACTION	SHEET  C9b
REV #	DESCRIPTION	BY	DATE															
1	RECORD DRAWINGS	RKB	2/16/16															
2	RECORD DRAWINGS – FINAL REPOSITORY GRADING	RKB	9/20/16															

NOTE: AS DESIGNED
SEE SHEET C10A FOR
FINAL TOPOGRAPHIC
RECORD SURVEY

NOTES:

1. REMOVE APPROXIMATELY 200 CY OF CONTAMINATED TAILINGS AND SOIL AS DIRECTED BY THE ENGINEER AND HAUL TO REPOSITORY.
2. AFTER CLEANUP, BLEND WITH SURROUNDING TERRAIN OR SHAPE TO AND CONTOUR TO ILLUSTRATE HISTORIC FEATURES.
3. ACTUAL FINISHED GRADE MAY NEED TO BE MODIFIED AS DETERMINED BY TESTING FOR CONTAMINANT CONCENTRATIONS.

LEGEND:

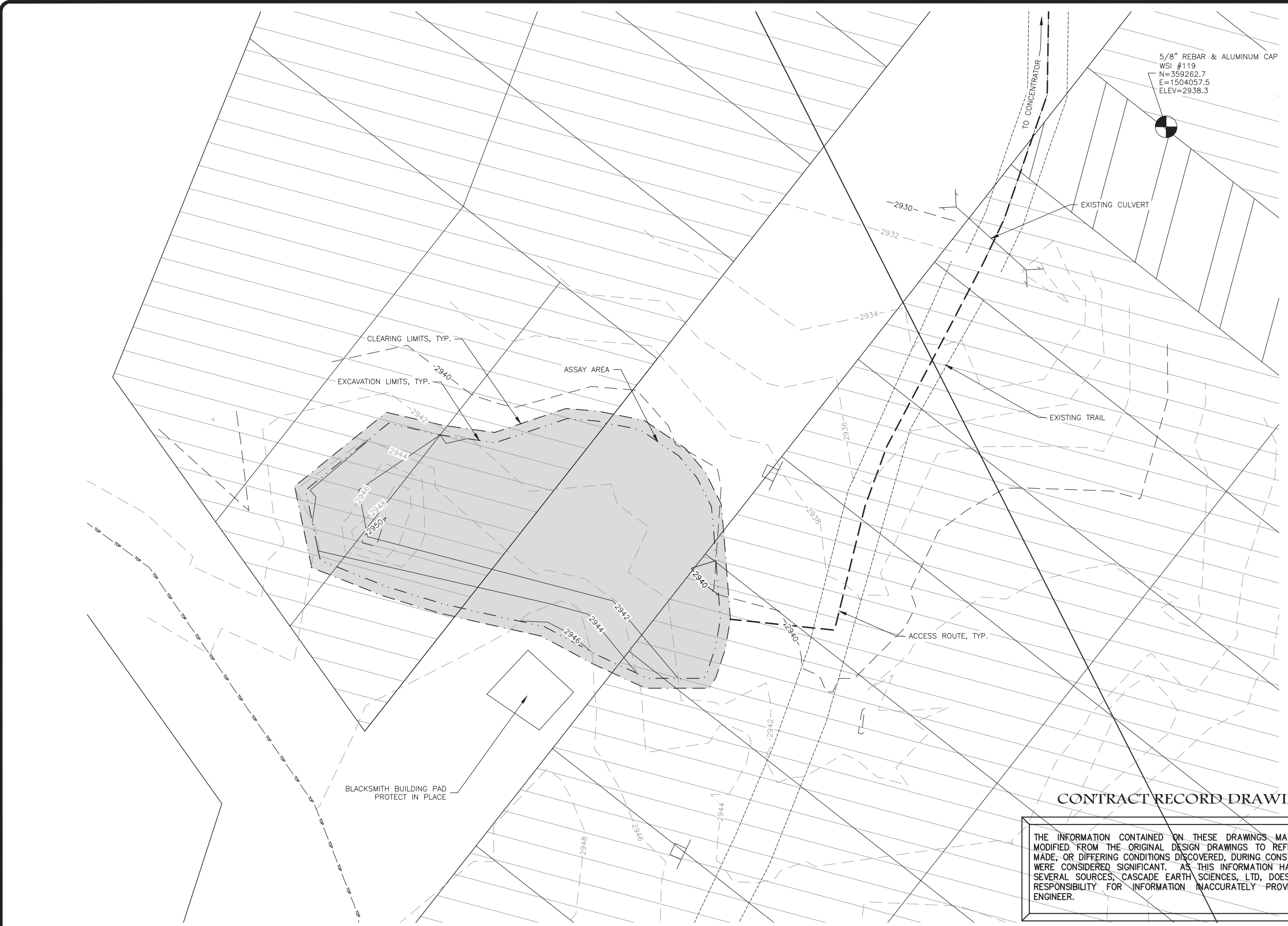
	ANTICIPATED CLEARING LIMITS
	EXCAVATION LIMITS
	ACCESS ROUTES
	EXISTING TRAIL
	TOWNSITE LOT OWNED BY USFS
	TOWNSITE LOT PRIVATELY OWNED
	EXISTING SURVEY MONUMENT
	EXISTING SIGN, REMOVE AND REPLACE AS NEEDED
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	PROPOSED MAJOR CONTOUR
	PROPOSED MINOR CONTOUR



0 10' 20'
SCALE: 1" = 10'

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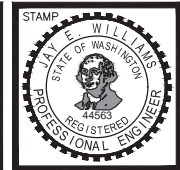
5/8" REBAR & ALUMINUM CAP
WSI #119
N=359262.7
E=1504057.5
ELEV=2938.3

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JOB No. 2013230022



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ASSAY BUILDING
SITE PLAN
MONTE CRISTO MINING AREA
REMOVAL ACTION

SHEET
C10

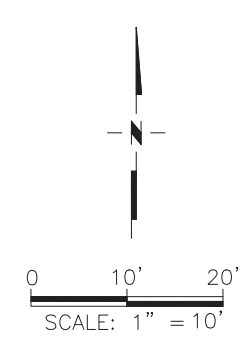
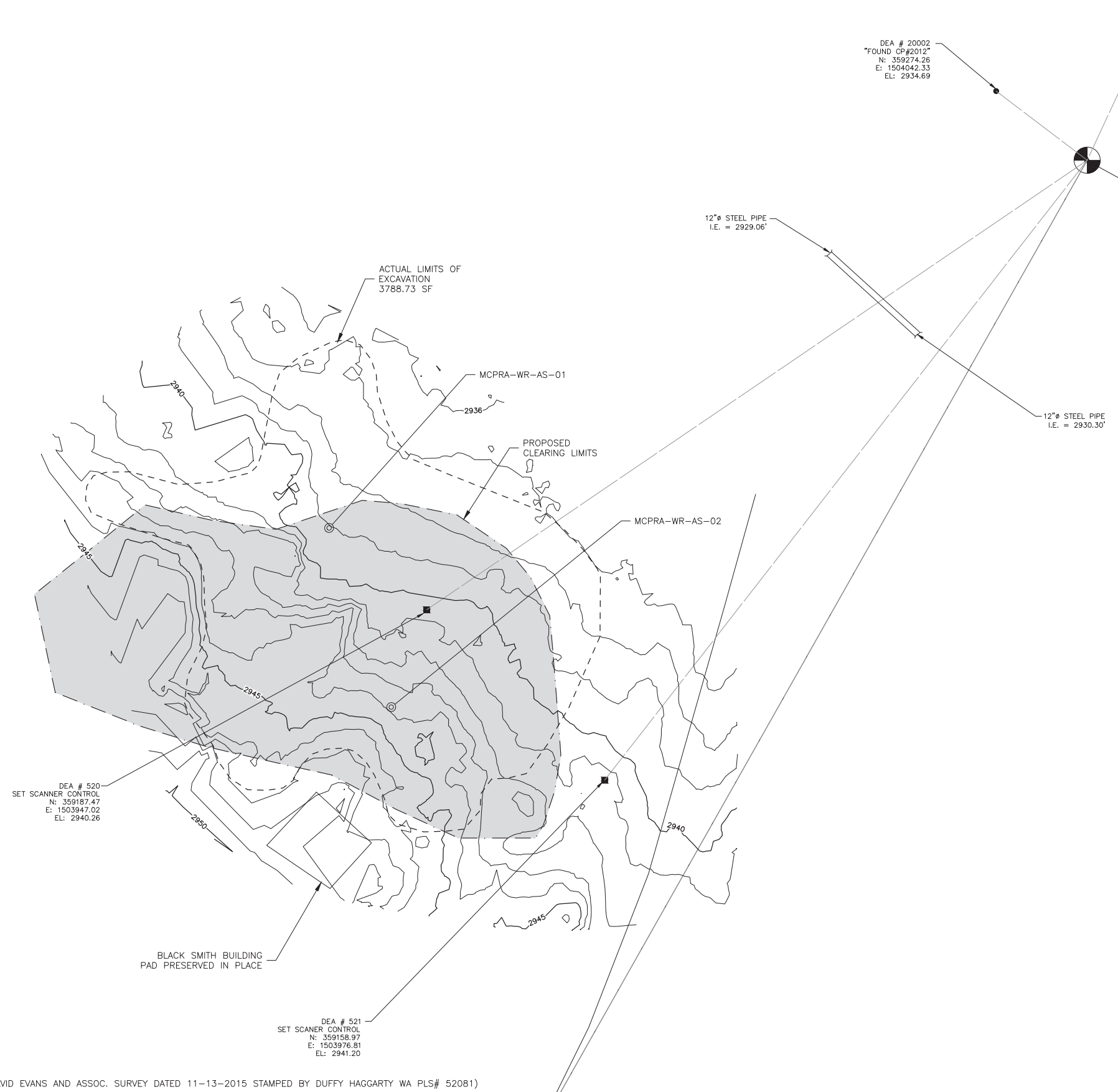
SURVEYOR'S NOTES

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EXCAVATION TABLE		
CUT (CU. YDS.)	FILL (CU. YDS.)	NET (CU. YDS.)
242.62	170.10	72.52 <CUT>

EXPLANATION:

MCPRA-WR-AS-02  CONFIRMATION SOIL SAMPLE LOCATION AND IDENTIFICATION



(SOURCE: AS-BUILT SURVEY COMPLETED BY DAVID EVANS AND ASSOC. SURVEY DATED 11-13-2015 STAMPED BY DUFFY HAGGARTY WA PLS# 52081)

CONTRACT RECORD DRAWINGS

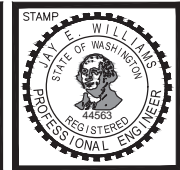
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National Forest
Darrington Ranger District

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DES. BY TLO
DRG. BY RKB
CHK. BY JEW
DATE 2/25/2015
JOB No. 2013230022



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ASSAY BUILDING SITE AS-BUILT SURVEY
MONTE CRISTO MINING AREA
REMOVAL ACTION

SHEET
C10a


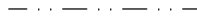











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WASTE ROCK VOLUME ~1951CU. YDS.

NOTE: POST EXCAVATION SURVEY NOT COMPLETED DUE TO REMOTE SITE LOCATION.

LEGEND:

-  CLEARING LIMITS
-  EXCAVATION LIMITS
-  ACCESS ROUTES
-  EXISTING TRAIL
-  TOWNSHIP LOT OWNED BY USFS
-  TOWNSHIP LOT PRIVATELY OWNED
-  EXISTING SURVEY MONUMENT
-  EXISTING SIGN, PROTECT IN PLACE
-  EXISTING MAJOR CONTOUR
-  EXISTING MINOR CONTOUR
-  PROPOSED MAJOR CONTOUR
-  PROPOSED MINOR CONTOUR
-  CONFIRMATION SOIL SAMPLE LOCATION AND IDENTIFICATION

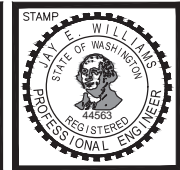


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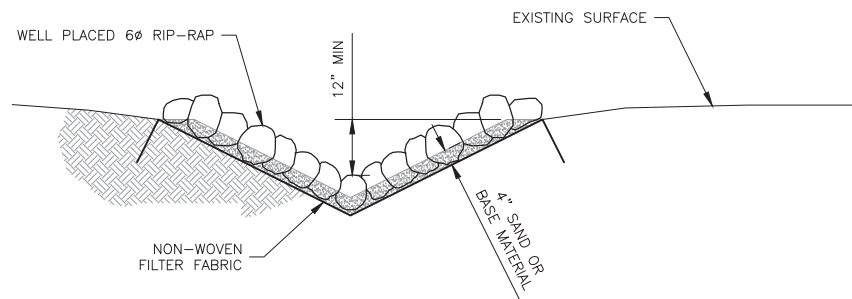
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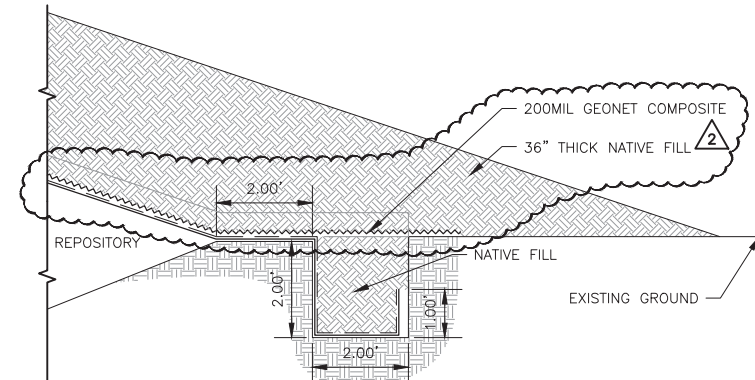
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PRIDE OF THE WOODS SITE PLAN
MONTE CRISTO MINING AREA
REMOVAL ACTION

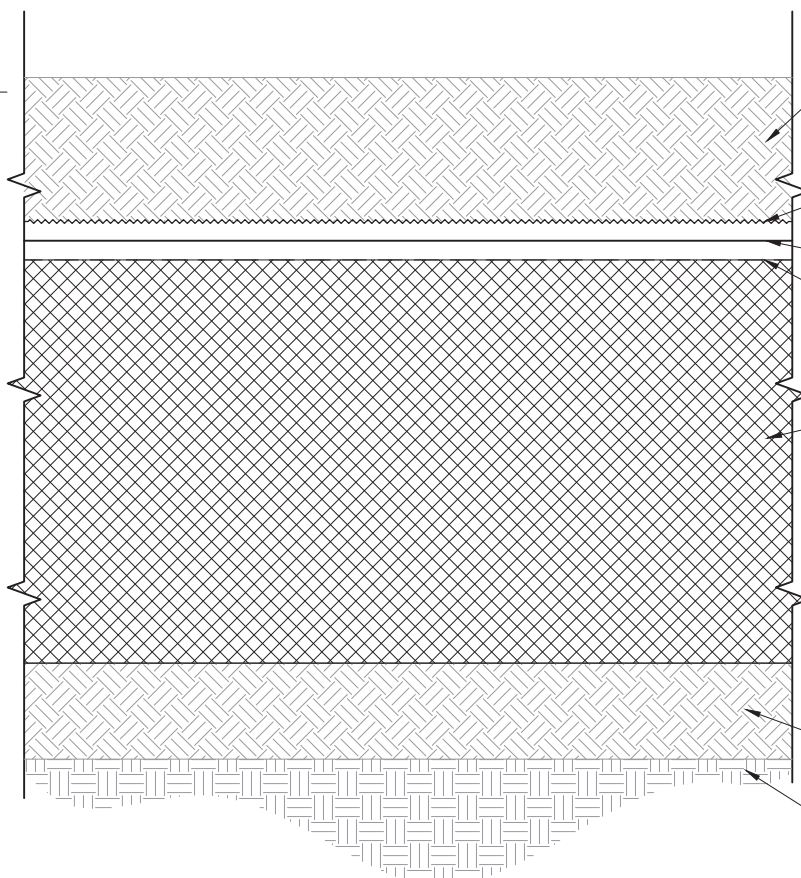
SHEET
C11



1 RIP-RAP DITCH DETAIL
NOT TO SCALE



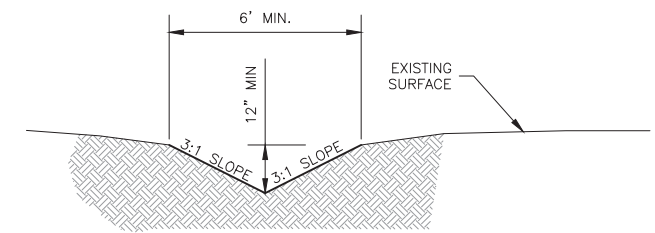
2 LINER ANCHOR TRENCH DETAIL
NOT TO SCALE



3 REPOSITORY SECTION
NOT TO SCALE

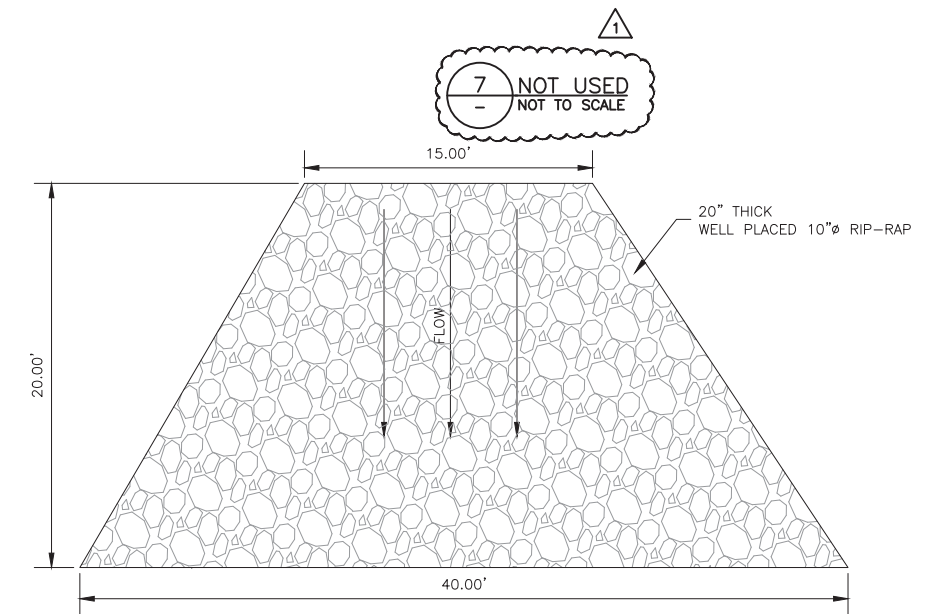
NOTE:
GEONET GEOCOMPOSITE SHALL CONSIST OF:
1. 300 MIL GEONET ON SLOPES < 3H:1V (FLATTER SLOPES)
2. 200 MIL GEONET ON SLOPES > 3H:1V (STEEPER SLOPES)
3. DOUBLE SIDED COMPOSITE SHALL HAVE 80Z NON-WOVEN GEO TEXTILE AS DESCRIBED IN SPECIFICATIONS - BOTH SIDES.
4. GEONET SHALL BE GSE FABRINET 200 OR 300 MIL FABRINET UF (SEE ITEMS 1 AND 2 ABOVE)

MIXED TAILINGS AND WASTE ROCK - THICKNESS VARIES (SEE SHEETS C1 AND C2). TAILINGS/WASTE ROCK PLACED IN 2-FOOT LIFTS, AMENDED WITH 90% CALCIUM CARBONATE EQUIVALENT DOLOMITE AT AN AGRONOMIC RATE, AND COMPACTED. 6 TONS OF DOLOMITE WERE ADDED TO THE TAILINGS/WASTE ROCK UNTIL DOLOMITE EXPENDED. THEN, 79 TONS OF CALCIUM OXIDE (LIME) WERE MECHANICALLY MIXED BY TILLING AND FARMING INTO THE TAILINGS/WASTE ROCK AT A RATE OF 1-2% BY WEIGHT. WASTE ROCK/TAILINGS/LIME THEN PLACED AND COMPACTED IN 2-FOOT LIFTS.



4 DITCH DETAIL
NOT TO SCALE

7 NOT USED
NOT TO SCALE



6 RIP-RAP OUTFALL DETAIL
NOT TO SCALE

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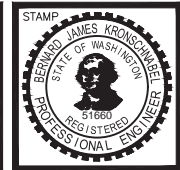
5 NOT USED
NOT TO SCALE

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National Forest
Darrington Ranger District

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DES. BY TLO
DRG. BY RKB
CHK. BY JEW
DATE 2/25/2015
JOB No. 2013230022



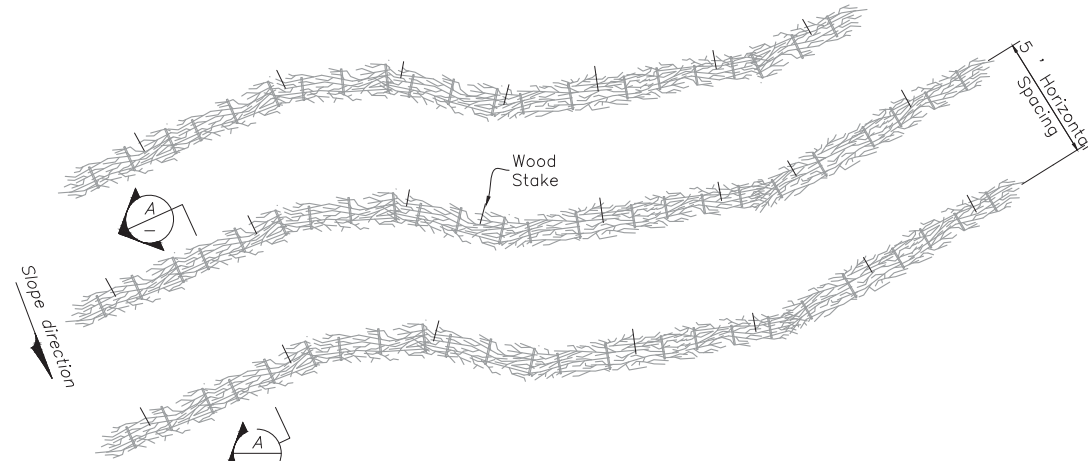
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DETAILS
MONTE CRISTO MINING AREA
REMOVAL ACTION

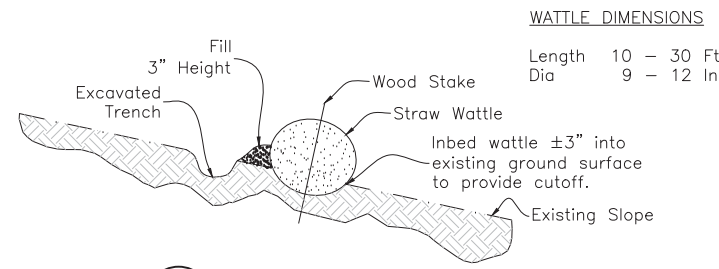
SHEET
D1

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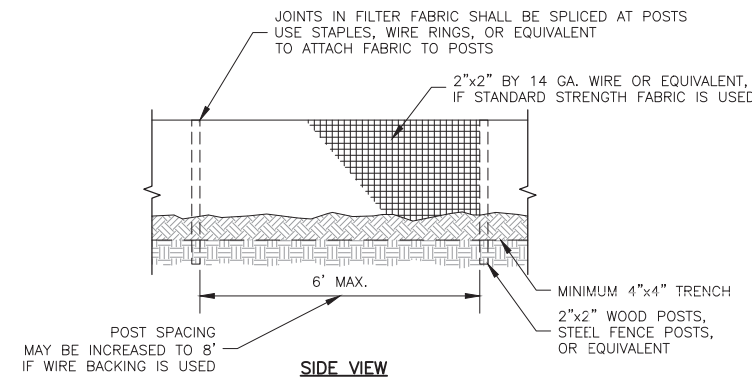
1 STRAW WATTLE PLACEMENT DETAIL
NOT TO SCALE



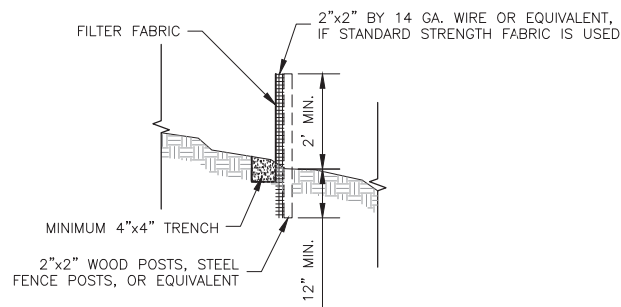
A STRAW WATTLE SECTION
NOT TO SCALE

WATTLE DIMENSIONS

Length 10 - 30 Ft
Dia 9 - 12 In

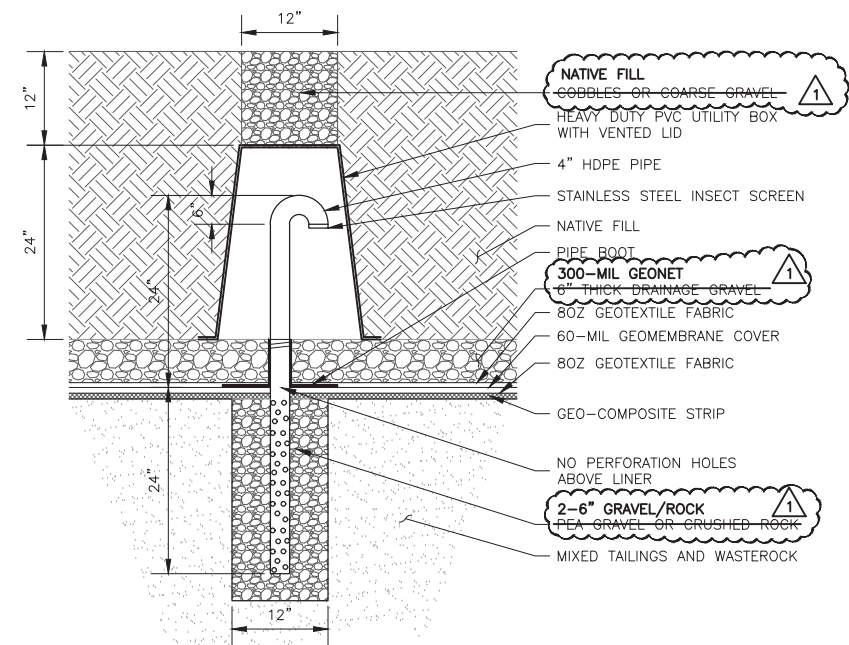


SIDE VIEW



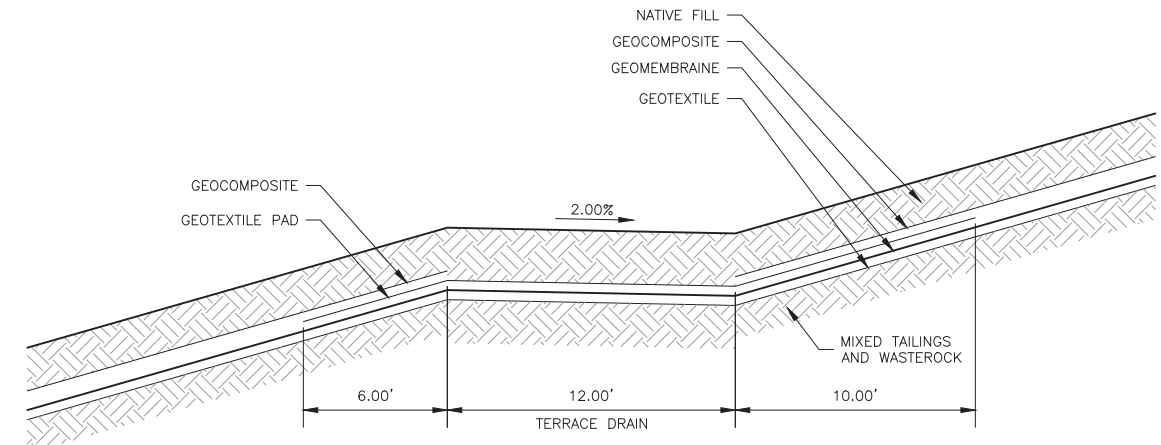
SECTION VIEW

3 SILT FENCE DETAIL
NOT TO SCALE



- NOTE:
- PIPE TO BE PERFORATED (MINIMUM TWO(2) 1/4" HOLES PER INCH) BELOW BOOT BANDING, SOLID ABOVE.
 - VENTS SPACED 50' ON CENTER
 - SEE DETAIL 3, SHEET D1 FOR REPOSITORY SECTION

4 LINER VENT DETAIL
C3 NOT TO SCALE



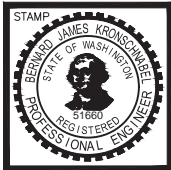
5 TERRACE DRAIN DETAIL
C3 NOT TO SCALE

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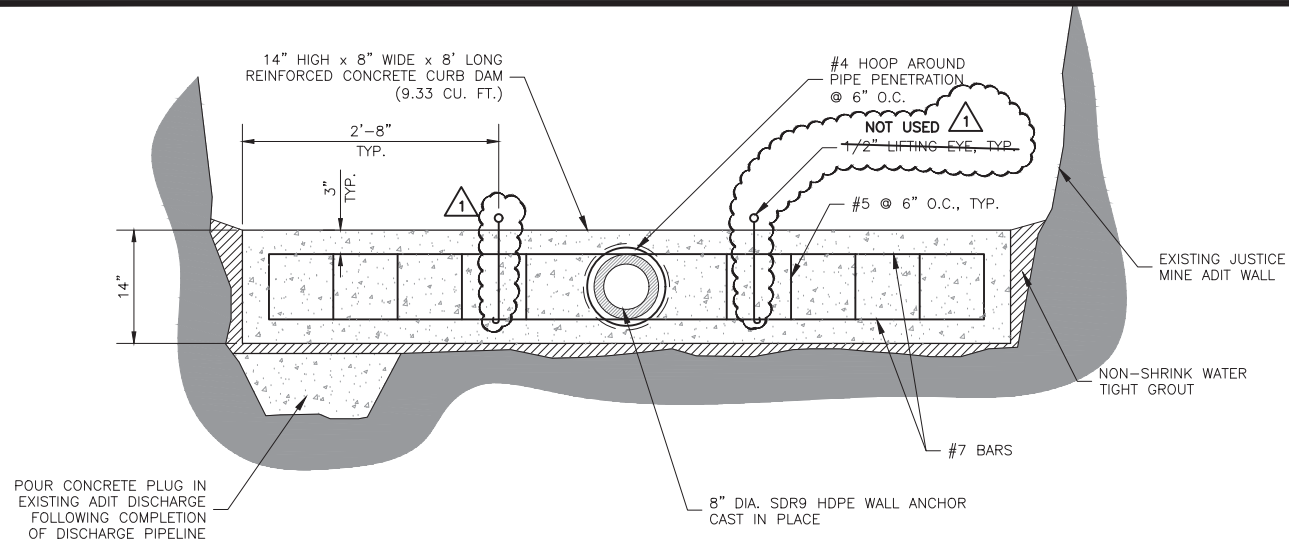
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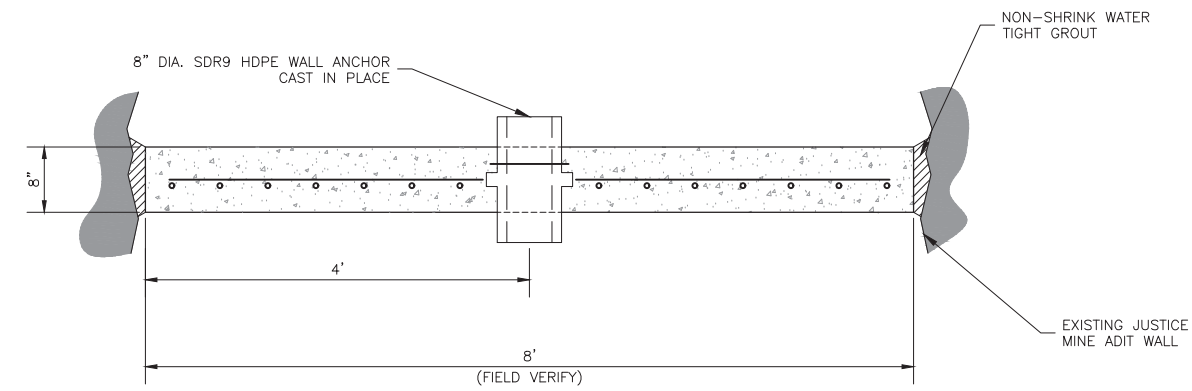
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DETAILS
MONTE CRISTO MINING AREA
REMOVAL ACTION

SHEET
D2

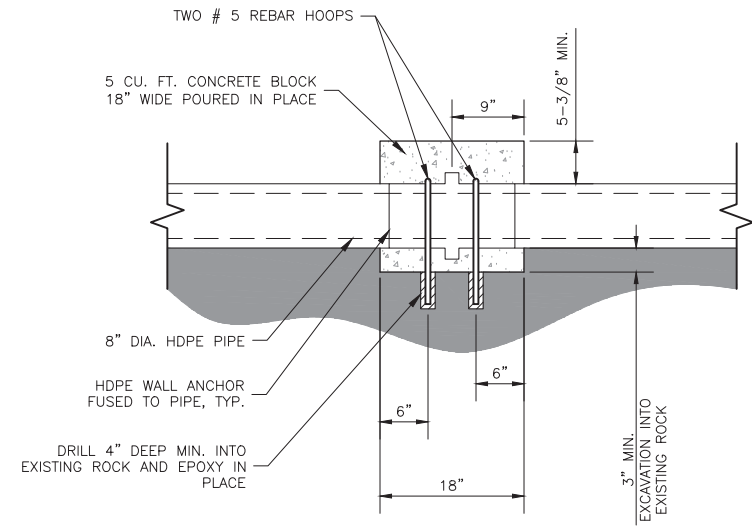


ELEVATION VIEW



PLAN VIEW

A REINFORCED CONCRETE CURB DAM DETAIL
SCALE: 1" = 1'



B PIPE ANCHOR SECTION VIEW
SCALE: 1" = 1'

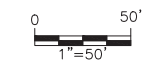
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1 PLAN VIEW

(SOURCE: Google Earth Pro Image July 2014, ©2015 Google)



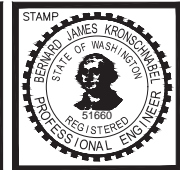
(SCALE AND LOCATIONS ARE APPROXIMATE)

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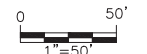
JUSTICE MINE DRAINAGE
PLAN AND DETAILS
MONTE CRISTO MINING AREA
REMOVAL ACTION

SHEET
D3



(SOURCE: Google Earth Pro Image July 2014, ©2015 Google)

1 PLAN VIEW



(SCALE AND LOCATIONS ARE APPROXIMATE)

CONTRACT RECORD DRAWINGS

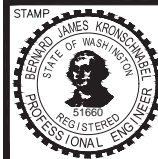
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1	RECORD DRAWINGS	RKB	2/16/16
2	RECORD DRAWINGS – FINAL REPOSITORY GRADING	RKB	9/20/16

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MYSTERY #3 MINE DRAINAGE
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MONTE CRISTO MINING AREA
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Appendix B.

Pre- and Post-Removal Action Photographs

Logging and Access Route Improvements



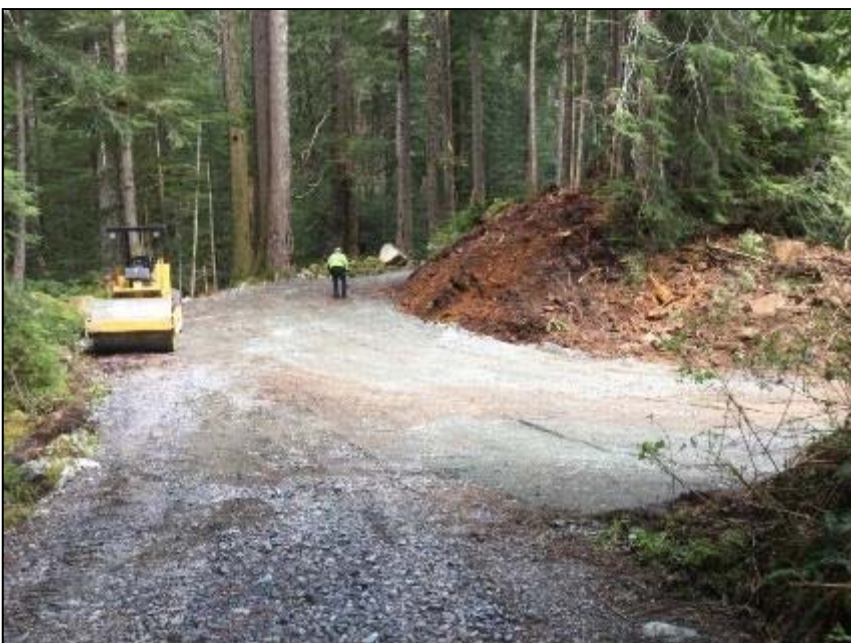
Photograph 1.

Widening Access Route at
Station 13+00
(CES 4/30/2015).



Photograph 2.

Tree removal at Station
13+00 (CES 4/30/2015).



Photograph 3.

Widening complete at
Station 13+00
(CES 4/30/2015).



Photograph 4.

Removal of the 38-inch western hemlock south of Bridge #3 (CES 4/30/2015).



Photograph 5.

Bridge #3 following removal of the 38-inch western hemlock (CES 4/30/2015).



Photograph 6.

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(CES 5/6/2015).



Photograph 8.
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Photograph 10.

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Photograph 11.

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Photograph 12.

South Fork Sauk River below the repository after logging (CES 5/27/2015).

Camp Setup and Mobilization



Photograph 13.

Monte Cristo Campground mobilization and setup (CES 6/20/2015).



Photograph 14.

Sewer line installation at camp (CES 6/15/2015).



Photograph 15.

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Photograph 17.

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Photograph 18.

Shower and toilet facilities at camp (CES 8/26/2015).



Photograph 19.
Final camp layout
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Photograph 20.
Cleaned, weed-free CAT
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Fuel truck container at
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Photograph 26.

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Photograph 27.

Interceptor ditch above the repository
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Photograph 28.

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CES weather station
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Photograph 32.

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Haul route from the Ore Collector without surfacing (CES 7/20/2015).



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Photograph 36.

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Photograph 37.

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Upper Concentrator Removal



Photograph 42.

Upper Concentrator tailings
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Photograph 43.

Upper Concentrator tailings prior to removal (CES 9/10/2005).



Photograph 44.

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Photograph 50.

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Photograph 51.

Back hauling cover soil to the upper Concentrator (CES 8/10/2015).



Photograph 52.

Excavated areas around the foundation walls (CES 8/26/2015).



Photograph 53.

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Photograph 54.

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Photograph 55.

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Photograph 57.

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Photograph 58.

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Photograph 59.

Preserved, pressure washed historic features around the Pelton race at the upper Concentrator following reclamation (CES 7/28/2015).



Photograph 60.

Final reclaimed upper
Concentrator
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Lower Concentrator Removal



Photograph 61.

Lower Concentrator prior to
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Photograph 62.

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Photograph 66.

Dangerous Waste bins filled with material from the lower Concentrator (CES 8/7/2015).



Photograph 67.

Tailings removed from the uppermost section of the lower Concentrator. Covered with clean topsoil from the borrow area (CES 9/5/2015).



Photograph 68.

Tailings under the trestle at the lower Concentrator (CES 9/7/2015).



Photograph 69.

Drainage from the lower Concentrator leading to Glacier Creek – before and after reclamation (CES 9/7/2015).



Photograph 70.

Excavation of the bottom section of the lower Concentrator. The excavator worked on clean cover soil while progressing downslope (CES 9/11/2015).



Photograph 71.

Reclaimed lower Concentrator covered with clean topsoil, trees, and slash (CES 10/8/2015).



Photograph 72.

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Photograph 73.

View west of the reclaimed lower Concentrator covered with clean topsoil, trees, and slash (CES 10/8/2015).



Photograph 74.

Reclaimed trestle section of the lower Concentrator covered with clean topsoil, trees, and slash (CES 10/8/2015).



Photograph 75.

View south toward reclaimed trestle and coal bunker area at the Concentrator (CES 10/4/2015).

Ore Collector Removal



Photograph 76.

Ore Collector waste rock pile, devoid of vegetation prior to removal (CES 9/10/2005).



Photograph 77.

Excavation and loading of waste rock for transport at the Ore Collector (CES 7/25/2015).



Photograph 78.

Ore Collector waste rock excavated to the base of the Glacier Creek Trail (CES 7/28/2015).



Photograph 79.

Ore Collector backfilled with clean cover soil to Trail #719 to reduce chemical hazards to onsite receptors (CES 8/12/2015).



Photograph 80.

Lower section of the Ore Collector covered with clean cover soil (CES 8/7/2015).



Photograph 81.

View downslope of the Ore Collector following placement of cover soil (CES 8/28/2015).



Photograph 82.

View downslope of Ore Collector with slash/Woodstraw™ placement, and early vegetation establishment (CES 10/22/2015).



Photograph 83.

Lower Comet Terminal and
cribbing prior to removal
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Photograph 84.

View downslope of the
Golden Cord Terminal and
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(CES 6/16/2015).



Photograph 85.

Removal of upper waste rock
pile near the Comet Terminal
tramway platform
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Photograph 86.

Mini-excavator removing waste rock from the lower terminal area (CES 8/4/2015).



Photograph 87.

Waste rock removal below the Haulage Way (CES 8/5/2015).



Photograph 88.

Mini-excavator removing waste rock from the Golden Cord Terminal area (CES 8/5/2015).



Photograph 89.

Comet Terminal waste rock removed and covered with two feet of clean cover soil (CES 8/6/2015).



Photograph 90.

Confirmation soil sampling in the Golden Cord Terminal area (CES 8/6/2015).



Photograph 91.

Timber cribbing placed on clean cover soil to retain historic features at the lower Comet Terminal (CES 8/26/2015).



Photograph 92.

Golden Cord Terminal following reclamation and seeding (CES 9/5/2015).



Photograph 93.

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Photograph 94.

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Photograph 95.

Assay Shack prior to removal (CES 7/19/2006).



Photograph 96.

Assay Shack waste rock profile prior to removal (CES 7/19/2006).



Photograph 97.

Waste rock excavation at the Assay Shack (CES 8/7/2015).



Photograph 98.

Waste rock excavation at the Assay Shack (CES 8/7/2015).



Photograph 99.

Assay Shack area reclaimed and covered with one foot of soil generated from the repository (CES 8/28/2015).



Photograph 100.

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Photograph 101.

Rainy Mine Waste rock pile adjacent to Glacier Creek prior to removal (CES 8/19/08).



Photograph 102.

Steep slopes of the Rainy Mine waste rock pile prior to removal (CES 8/21/08).



Photograph 103.

View across Glacier Creek of the Rainy Mine prior to removal (CES 7/20/2015).



Photograph 104.

Excavated upper section of the Rainy Mine with large boulders generated from the removal (CES 9/7/2015).



Photograph 105.

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Photograph 106.

Opened 200+ foot deep shaft filled with water at the Rainy Mine (CES 9/23/2015).



Photograph 107.

Partially opened adit at the Rain Mine (CES 9/23/2015).



Photograph 108.

Seep area excavated to bedrock. The shaft was filled with large boulders to reduce the physical hazard at the Rainy Mine (CES 9/23/2015).



Photograph 109.

Covering the Adit and seep area at the Rainy Mine with clean cover soil generated above the upper waste rock area (CES 9/24/2015).



Photograph 110.

Rainy Mine after
reclamation
(CES 10/4/2015).



Pride of the Woods Mine Removal

Photograph 111.

Pride of the Woods Mine
prior to removal
(CES 8/22/08).



Photograph 112.

View downslope of acidic waste rock and toe of the pile adjacent to Glacier Creek at the Pride of the Woods Mine prior to removal (CES 6/8/2015).



Photograph 113.

Pride of the Woods from the New Discovery Mine prior to removal (CES 6/16/2015).



Photograph 114.

Preparation for mini excavator lift to Pride of the Woods Mine (CES 9/5/2015).



Photograph 115.

Mini excavator lift with Columbia Vertol 107-II to the Pride of the Woods Mine (CES 9/5/2015).



Photograph 116.

Mini excavators filling a self-dumping bin atop the Pride of the Woods waste rock pile (CES 9/5/2015).



Photograph 117.

Columbia Vertol 107-II arrival with an empty self-dumping bin at the Pride of the Woods Mine (CES 9/5/2015).



Photograph 118.

Adit opening at the Pride of the Woods Mine (Palm Construction 9/6/2015).



Photograph 119.

Collapsed timbers inside the Pride of the Woods adit portal (CES 9/6/2015).



Photograph 120.

No discharge was observed at the Pride of the Woods adit. The portal was collapsed with onsite talus to reduce physical hazards (CES 9/8/2015).



Photograph 121.

Mini excavators benching downward toward Glacier Creek at the Pride of the Woods Mine (CES 9/8/2015).



Photograph 122.

Mini excavators benching downward toward Glacier Creek at the Pride of the Woods Mine (Palm Construction 9/9/2015).



Photograph 123.

Waste rock removal at the Pride of the Woods Mine (CES 9/13/2015).



Photograph 124.

Helicopter transporting waste rock from the HMJ Wilderness (CES 9/13/2015).



Photograph 125.

Waste rock removal at Pride of the Woods Mine (CES 9/15/2015).



Photograph 126.

Waste rock removal toward the base of the Pride of the Woods Mine pile (CES 9/15/2015).



Photograph 127.

Waste rock removal at the bottom of the Pride of the Woods Mine (CES 9/16/2015).



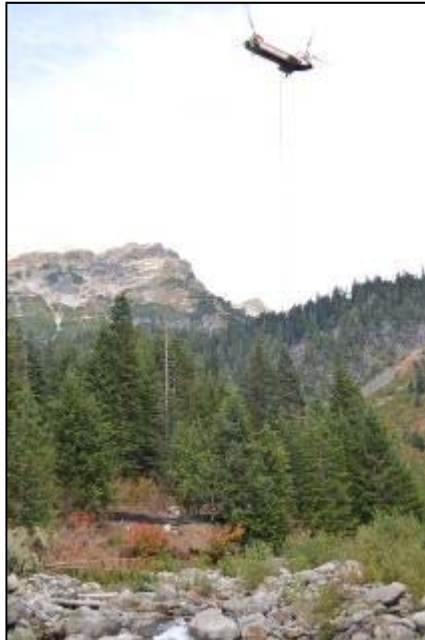
Photograph 128.

Self-dumping bin arriving at Pride of the Woods Mine (Forest Service 9/11/2015).



Photograph 129.

Rigging the self-dumping bin at the Pride of the Woods Mine (Forest Service 9/11/2015).



Photograph 130.

Drop zone at the Rainy Mine (CES 9/13/2015).



Photograph 131.

Upstream in-situ Reclaimed Pride of the Woods Mine (CES 10/6/2015).



Photograph 132.

View of the reclaimed Pride of the Woods Mine (CES 10/6/2015).



Photograph 133.

Dry seep area at the base of the Pride of the Woods Mine (CES 9/14/2016).



Photograph 134.

Moving a mini excavator from the Pride of the Woods Mine to the Mystery Mine (Forest Service 9/16/2015).

Mystery Mine #3 Diversion



Photograph 135.

Acid mine drainage flowing across the waste rock pile at Mystery #3 Mine prior to diversion (CES 6/30/10).



Photograph 136.

Lifting mini excavator to waste rock pile at Mystery #3 (CES 9/16/2015).



Photograph 137.

Mystery # 3 adit diversion (CES 9/16/2015).



Photograph 138.

Final Mystery # 3 adit diversion (CES 10/7/2015).



Photograph 139.

Justice Mine portal prior to diversion (CES 9/7/2015).



Photograph 140.

Justice Mine adit seep looking downstream from ledge, prior to diversion (CES 9/11/12).



Photograph 141.

Pipeline fabrication at the Glacier Creek Crossing prior to transport to the Justice Mine (CES 9/4/2015).



Photograph 142.

Pipe material transported to the Justice Mine via helicopter (CES 9/7/2015).



Photograph 143.

Preparation work to grout the prefabricated concrete barrier at the Justice Mine (CES 9/7/2015).



Photograph 144.

Installation of the concrete barrier at the Justice portal (CES 10/4/2015).



Photograph 145.

Anchoring the HDPE pipeline to the rock ledge. (CES 10/4/2015).



Photograph 146.

Concrete barrier placed in adit. Work area is dewatered by siphoning the seep over the barrier and down the ledge. (CES 10/7/2015).



Photograph 147.

HDPE pipe leading from the Justice Mine to coarse vegetated talus 200 feet northwest of the ledge (CES 10/7/2015).



Photograph 148.

Downslope view of Justice Mine bypass (CES 9/7/2015).



Photograph 149.

Pipeline alignment from the Justice Mine anchored to the rock walls (CES 10/8/2015).



Photograph 150.

Diversion of the Justice Mine adit seep into coarse vegetated talus. The seep at Trail #719 dried in about 6 hours following diversion. (CES 10/8/2015).



Photograph 151.

Repository subgrade prepared with stockpiled cover soil in the background (CES 7/20/2015).



Photograph 152.

Initial placement of tailings from the Concentrator in the lower section of the repository (CES 7/27/2015).



Photograph 153.

Repository waste rock and tailings covered during the August 7 rainstorm (CES 8/7/2015).



Photograph 154.

Tailings transported from the Concentrator and dumped in the repository (CES 8/26/2015).



Photograph 155.

Haul truck operating on clean subgrade in the repository. Contaminated tailings are in the foreground (CES 8/26/2015).



Photograph 156.

Waste rock placement in repository. The haul trucks operated on the clean subgrade to transport contaminated media to the repository (CES 8/28/2015).



Photograph 157.

View of the tarped repository from the EMC&R rail grade (CES 9/7/2015).



Photograph 158.

Compacted waste rock and tailings in the repository (CES 9/9/2015).



Photograph 159.

Additional waste rock placement from the Rainy Mine in the upper repository (CES 9/24/2015).



Photograph 160.

Calcium oxide application in the upper repository (Palm Construction 9/19/2015).



Photograph 161.

Compaction with Sheepsfoot roller in the upper repository (CES 9/19/2015).



Photograph 162.

Compaction in the upper repository prior to liner installation (CES 9/29/2015).



Photograph 163.

Initial placement of 8-ounce non-woven geotextile layer on the eastern section of the repository (CES 9/30/2015).



Photograph 164.

Nuclear density testing in the repository (CES 8/28/2015).



Photograph 165.

Anchor trench installation for the repository liner (CES 9/30/2015).



Photograph 166.

Liner installation on the eastern section of the repository (CES 9/30/2015).



Photograph 167.

Liner installation on the eastern section of the repository (Palm Construction 9/30/2015).



Photograph 168.

View south of liner installation (CES 10/1/2015).



Photograph 169.

View to the east of liner installation (Palm Construction 9/30/2015).



Photograph 170.

View to the west of liner installation (CES 9/30/2015).



Photograph 171.

Liner installation (CES 10/3/2015).



Photograph 172.

Vent installation and welding the liner (CES 10/1/2015).



Photograph 173.

Liner placement in anchor trench (CES 10/2/2015).



Photograph 174.

Liner installation
(CES 10/3/2015).



Photograph 175.

Aerial view of liner
installation (Palm
Construction 10/3/2015).



Photograph 176.

Liner installed at the
repository (CES 10/4/2015).



Photograph 177.

Independent leak test of the liner by Leak Location Services, Inc. (CES 10/5/2015).



Photograph 178.

Independent leak test of the liner by Leak Location Services, Inc. (CES 10/5/2015).



Photograph 179.

Drainage geotextile installation above the liner at the repository (CES 10/7/2015).



Photograph 180.

Drainage geotextile installed above the liner (CES 10/8/2015).



Photograph 181.

Soil cover soil on the western section of the repository (CES 10/9/2015).



Photograph 182.

Soil cover on the upper section of the repository
(CES 10/9/2015).



Photograph 183.

Soil cover on the upper half
of the repository
(CES 10/9/2015).



Photograph 184.

Soil Cover and slash for
erosion control at the
repository
(CES 10/22/2015).



Photograph 185.

View of the repository from the upper EMC&R rail grade (CES 10/22/2015).



Photograph 186.

Covered repository with upper run on control ditch (CES 10/22/2015).



Photograph 187.

View west of upper slopes of the repository and coir mat (CES 10/22/2015).



Photograph 188.

Drainage along the eastern boundary of the repository (CES 10/22/2015).



Photograph 189.

View upslope of the eastern drainage ditch along the repository (CES 11/4/2015).



Photograph 190.

Terrace drain development (CES 6/28/2016).



Photograph 191.

Terrace drain development
(CES 6/28/2016).



Photograph 192.

Final graded and seeded
terrace drain (CES
9/15/2016).



Photograph 193.

Final repository, looking east
(CES 7/12/2016).

Borrow Area

Photograph 194.

Borrow area development
(CES 6/16/2015).



Photograph 195.

Rock sorter at borrow area
(CES 6/16/2015).



Photograph 196.

Grizzly screen at the borrow
area (CES 6/17/2015).





Photograph 197.

Screened 2-inch minus material stockpiled at the borrow area (CES 7/22/2015).



Photograph 198.

Reclaimed borrow area (CES 11/4/2015).



Photograph 199.

Final seeded repository (CES 7/12/2016).

Monitoring Wells



Photograph 200.

Installation of monitoring well MW-1R upgradient of the repository (CES 6/18/2015).



Photograph 201.

Drilling MW-2R downgradient from the repository (CES 10/21/2015).



Photograph 202.

Drilling MW-3R
downgradient from the
repository (CES 6/18/2015).



Photograph 203.

Installation of monitoring
well MW-4 crossgradient
from the repository
(CES 6/18/2015).



Photograph 204.

Drilling MW-5 crossgradient from the repository (CES 10/23/2015).



Photograph 205.

Completed MW-1R with stick-up casing and painted bollards (CES 10/15/2015).



Photograph 206.

Completed MW-2R with stick-up casing and painted bollards (CES 10/22/2015).

Hydraulic Spill



Photograph 207.

Flagged and segregated spill areas at the repository (CES 6/25/2015).



Photograph 208.

Spilled hydraulic fluid on the ground at the repository (Spill A) (CES 6/25/2015).



Photograph 209.

Spill on the excavator track and ground surface (CES 6/25/2015).



Photograph 210.

Spill A flagged prior to soil removal (CES 6/25/2015).



Photograph 211.

Spill C following excavation and confirmation soil sampling (CES 7/2/2015).



Waste Rock Spill

Photograph 212.

Deere 20 cubic yard haul truck with tipped bed on the County Road (CES 8/9/2015).



Photograph 213.

Waste rock cleanup along the County Road (CES 8/9/2015).

Appendix C.

2015 Biological Monitoring Report

TECHNICAL MEMORANDUM

DATE: January 12, 2016

TO: Joseph Gibbens, PE – U.S. Forest Service Region 6 – Washington On-Scene Coordinator

FROM: Ryan Tobias, Cascade Earth Sciences

**SUBJECT: 2015 Biological Monitoring Report
Monte Cristo Mining Area Removal Action
Mt. Baker-Snoqualmie National Forest, Snohomish County, Washington**

Cascade Earth Sciences (CES) is pleased to provide this summary of the 2015 biological monitoring completed during the Removal Action conducted at the U.S. Forest Service (Forest Service) Monte Cristo Mining Area (MCMA; Site) located in the Mt. Baker-Snoqualmie National Forest, Snohomish County, Washington. Monitoring was performed in accordance with the Biological Monitoring Plan (Plan) submitted to the Forest Service as Appendix E of the *Removal Action Work Plan and Design Drawings* (CES, 2015).

BACKGROUND

Performance of the Non-Time-Critical Removal Action (RA) at the Site required development of a low-volume access route from the Mountain Loop Highway (MLH) to the MCMA Townsite. The access route was developed during the 2013 and 2014 field seasons, which necessitated Section 7 Consultation under the Endangered Species Act (ESA). Consequently, the U.S. Fish and Wildlife Service (USFWS) prepared a Biological Opinion (BO) to address potential effects of construction on the northern spotted owl (*Strix occidentalis caurina*); marbled murrelet (*Brachyramphus marmoratus*); bull trout (*Salvelinus confluentus*); and designated critical habitat.

Terms and conditions (T&Cs) of the BO included monitoring for noise, turbidity, and refuse during access route development. Noise monitoring was required due to potential increased levels of sound and human activity in the project area that may cause disturbance to marbled murrelets (murrelets). Turbidity monitoring was stipulated to assess impacts to three tributaries of the South Fork Sauk River (SFSR), which were crossed with log stringer bridges in 2014. Refuse monitoring was required due to the potential to attract corvids (i.e., crows and ravens) to the Site, which could increase the possibility of predation on nesting murrelets and/or juveniles. A Terrestrial Conservation Measure was also incorporated in the BO, which recommended activities using heavy equipment and other noise-generating equipment transpire outside a two-hour window after sunrise and before sunset between April 1 and September 15.

CES conducted biological monitoring in accordance with the T&Cs for the access route development in 2013 and 2014. The RA in 2015 was largely performed outside mapped critical habitat for the northern spotted owl and murrelet. However, large equipment operated and moved through late successional reserve (LSR) 115 to access the Site, log the repository, and provide access upgrades. In addition, a helicopter landing zone (HLZ) was established inside the LSR at Station 13+00 along the access route to accommodate remote operations in the Henry M. Jackson (HMJ) Wilderness. Moreover, a log deck was developed in the LSR at Station 27+00, about 0.25 miles south of the intersection of the access route with MLH. Furthermore, a temporary bridge was installed over Glacier Creek within bull trout habitat to access mine features for the RA (Figure 1).

Based on the requisites for the RA, the Forest Service requested re-initiation of formal Section 7 Consultation. On June 29, 2015, the USFWS provided an amended Incidental Take Statement for the RA, and an additional T&C for murrelet habitat monitoring, fulfilling the requirement for re-initiation of formal consultation. On September 1, 2015, the USFWS also provided a modification to the Incidental Take Statement for the Monte Cristo CERCLA Project. The modification stipulated removal of the Glacier Creek crossing no later than September 15, 2015 and restoration of the Glacier Creek channel to its pre-project contours, with removal of all foreign fill material (Appendix A).

REMOTE CAMPS

The initial phase of the RA included logging approximately 2.9 acres for preparation of the repository. Repository logging necessitated the establishment of a remote camp for Site workers at Perry Creek, approximately four miles west of Barlow Pass along the MLH. The camp was situated well outside the footprint of MCMA and access route alignment. Thus, the campsite was not subject to T&Cs outlined in the BO.

Following logging operations, CES, subcontractors, and Forest Service personnel relocated to the Monte Cristo Campground to prepare the repository for waste consolidation (Appendix B, Photograph 1). This camp was approximately 500 feet from the SFSR, which provides critical habitat for bull trout. However, there were no impacts to the river from the campsite. In addition, the camp was situated outside murrelet and spotted owl suitable habitat. Therefore, the campsite was not subject to T&Cs outlined in the BO.

An ancillary remote camp was established from September 4–16, 2015 to support removal of waste rock at the Pride of the Woods Mine in the HMJ Wilderness (Appendix B, Photograph 2). The camp was positioned outside mapped murrelet and spotted owl suitable habitat. In addition, the headwaters section of Glacier Creek nearest the camp does not support bull trout. As such, the ancillary campsite was not subject to T&Cs outlined in the BO.

NOISE MONITORING

A T&C of the BO requires noise levels be measured in suitable murrelet habitat at a distance of 45 yards while heavy machinery is operating until the end of the murrelet nesting season (September 15). Noise levels of 92 decibels (dB) or greater can result in negative effects to murrelets by causing an adult to flush from its nest during food delivery, resulting in a missed feeding opportunity for a fledgling (USFWS, 2011). CES staff monitored noise with a handheld digital sound level meter in the field during heavy equipment use to the September 15 cutoff date.

Noise Level Results

Results of the noise monitoring are presented in Table 1. The lowest noise level recorded by equipment was 58 dB (Whisperwatt 590746 generator) on July 20, 2015 from a distance of 45 yards. The highest noise level was recorded on September 6, 2015 (97.4 dB) from a Columbia Vertol 107-II helicopter, while hovering (Appendix B, Photograph 3). A noise level of 95.9 dB was also recorded from the helicopter on September 5, 2015 during a landing at the HLZ. All remaining noise level readings (e.g., chainsaws, heavy equipment, all-terrain vehicles, etc.) were between 65 and 89 dB.

Suitable Murrelet Habitat

Consultation re-initiation in 2015 resulted in an additional T&C, which required quantification of suitable murrelet habitat acres within 100 meters of noise and human activity (particularly operation of heavy machinery) and the quantity suitable murrelet habitat acres within 265 meters of helicopter operations at the HLZ.

The quantity of suitable murrelet habitat described from the USFWS re-initiation was 131 acres within 100 meters of noise and human activity and 25 acres within 265 meters of the HLZ. Based on a review of aerial photographs and mapped habitat in the LSR, 131 acres within 100 meters of noise and human activity is considered a reliable estimate. Suitable habitat within 265 meters of the HLZ was conservatively estimated at about 33 acres.

Noise Discussion

Based on the previously-described noise readings for the Columbia Vertol 107-II, it should be expected all takeoff, landing, and hovering operations between September 5-15, 2015 exceeded the 92 dB threshold at the HLZ. Helicopter rotors in motion at the HLZ, while grounded, measured 85.1 dB (Appendix B, Photograph 4). As such, exceedances of the noise threshold were likely short in duration. Moreover, the helicopter only operated in the LSR or near suitable habitat from September 5-15, a period when 95% of the murrelets in Western Washington were fledged (USFWS, 2012). Furthermore, the glide path utilized by the Vertol 107-II was through an open avalanche chute, which is not considered viable murrelet habitat (Figure 2) (Appendix B, Photograph 5). Therefore, any temporary disturbance within occupied murrelet habitat from the Vertol 107-II helicopter is expected to have been minimal.

With regard to human induced noise activity within 100 meters of the access route, the majority of heavy equipment use was associated with moving machinery from the MLH to the borrow area or repository. Periodic chainsaw use was required when removing trees and brush from the HLZ. However, none of the noise level readings from those activities exceeded 92 dB. Based on the limited duration of these noise generating activities and readings below 92 dB, impacts from noise to nesting murrelets along the access route are anticipated to have been negligible.

EQUIPMENT OPERATING TIMES

Heavy equipment was initially transported to the Site on April 28, 2015 for logging operations at the repository. As discussed, the majority of heavy equipment use occurred outside suitable nesting habitat, with periodic transport of machinery from the MLH, through suitable nesting habitat to the borrow area (Figure 3).

Limited Operating Periods

Murrelets are primarily crepuscular, with the majority of feeding activity occurring during low light hours near dawn and dusk (Hamer and Nelson, 1995). Peak landward movements are usually near first light and peak seaward movements are usually around sunrise (Cooper et al, 2003). Therefore, a Terrestrial Conservation Measure was incorporated in the BO, which recommended activities using heavy equipment and other noise-generating equipment transpire outside a two-hour window after sunrise and before sunset between April 1 and September 15 (USFWS, 2011). However, elimination of all noise is impractical, since the access route adjoins the MLH north of Mowich Camp, and ranges in distance from approximately 500 feet to approximately 1,200 feet west of the route at Barlow Pass. Proximate recreational uses include vehicles, all-terrain vehicles, chainsaws, and firearms, which are often utilized before, during, and after limited operating periods (LOPs).

In general, LOPs were maintained during the murrelet nesting season (Table 2). During the 142-day construction period that encompassed the murrelet nesting season, no work or heavy equipment movement occurred through murrelet habitat on 92 days. As such, no heavy equipment activity occurred in murrelet suitable nesting habitat for 65% of the construction period. Of the 50 days when heavy equipment operated within murrelet habitat, 25 days included equipment moving from the gate to the borrow area, all-terrain vehicle use for refuse removal, or other temporary access with heavy equipment in suitable nesting habitat. The remaining 25 days comprised stationary activities such as access route improvements, log hauling and decking, chainsaw use to remove trees/shrubs, or helicopter operations.

LOPs were not recognized on 11 occasions. Each is discussed below:

- April 29, 2105 – A CAT 325D excavator was dropped off inside the gate at 7:45, which was 11 minutes before the LOP. Since this limited, temporary activity occurred along a busy highway and only occurred 11 minutes outside the LOP, the deviation is considered negligible.
- June 15, 2015 – The rock sorter was delayed during transport from the gate to the borrow area. The sorter had difficulty managing the corner at Bridge #2. The crew mobilized to move the sorter off to the side of the road and finished at 20:05, which was 56 minutes outside the LOP. The divergence was unanticipated, and likely did not result in an exceedance of the 92 dB threshold. Based on this, the temporary exceedance is not considered a probable impact to nesting murrelets.
- July 19, 2015 – An excavator was walked toward the HLZ at 7:30, which is one minute before the sunrise LOP. The minor divergence from the LOP is not considered significant, since it represents a brief period of time (one minute) and the excavators exhibited noise level readings ranging from 65-89 dB, which is below the 92 dB threshold for the Site.
- July 22, 2015 – Surfacing material was placed on the Python Road section of the access route beginning at 7:15, which is 20 minutes prior to the sunrise LOP. The divergence from the LOP is not considered substantial, since the brief periods unloading rock measured about 72.5 dB, well below the 92 dB threshold for the Site.
- July 23, 2015 – A pickup and trailer with lime was unable to proceed up the hill south of the log deck. A haul truck was deployed at 21:30 to assist and transport personnel to camp. The divergence was 155 minutes beyond the LOP, but was brief, since it only involved moving through the LSR to assist and transport personnel back to camp. Since equipment was not stationary, any exposure to nesting murrelets would be temporary. Based on this, it does not likely represent a potential adverse threat to murrelet nesting behavior at the Site.
- August 17, 2015 – A Waste Management truck arrived at the gate at 6:50, 78 minutes prior to the sunrise LOP. The truck drove to the Concentrator to remove 12 cubic yards of hazardous waste for offsite disposal. Although the truck arrived early, equipment was not stationary, and any exposure to nesting murrelets would be temporary. Thus, the temporary disturbance was not likely substantial, since it advanced through the LSR without stopping and the noise was probably below the 92 dB threshold.
- August 24, 2015 – The D6 dozer moved to the gate to assist with track dump truck transport offsite. Operations at the gate were near highway traffic along the MLH. In addition, dozer operations measured about 70.5 dB at the Site. Therefore, the divergence from the sunrise LOP is not considered significant.
- September 7, 2015 – The helicopter landed one minute outside the sunset LOP at 17:39. The amended Incidental Take Statement for the Monte Cristo CERCLA Project (Appendix A) discusses contingencies that may occur during operations, resulting in the helicopter landing a little late in the day (after 2 hours before sunset). This was an anticipated exception versus operating procedure. Moreover, as discussed above, 95% of the murrelets in Western Washington have fledged by this date. Therefore, this deviation is considered negligible.
- September 14, 2015 - The helicopter landed one minute outside the sunset LOP at 17:25. The contingency that resulted in the helicopter landing shortly after the LOP was an anticipated exception versus operating procedure. Moreover, as discussed above, 95% of the murrelets in Western Washington have fledged by this date. Therefore, this deviation is considered negligible.
- September 15, 2015 - The helicopter exited the HLZ 29 minutes outside the sunrise LOP at 8:18 and landed 39 minutes before the sunset LOP at 18:01. Considering this is the final day of the nesting

season and 95% of the murrelets in Western Washington have fledged by this date, these divergences do not likely represent a substantial threat to murrelet nesting behavior.

CES employed additional noise limitation activities during the two-hour diurnal windows, which included:

- Cessation of chainsaw use.
- Minimization of equipment idling, and shutting off equipment when not in use.

Approximate start and stop times relative to official sunrise and sunset for equipment use is presented in Table 2. As shown, the average start time was 44.89 minutes after the official LOPs. The average stop time was 81.09 minutes prior to the end of the LOPs.

TURBIDITY

The USFWS concluded the level of anticipated take had a low probability of jeopardizing bull trout or resulting in the destruction or adverse modification of critical habitat for bull trout (USFWS, 2011). However, in order to be exempt from prohibitions of Section 9 of the ESA, the Forest Service was required comply with a T&C for turbidity monitoring in Glacier Creek at the temporary crossing at an ‘interim’ distance from the crossing that is less than the full extent of take. The interim distance is 300 feet below the temporary crossing over Glacier Creek.

CES monitored turbidity in Glacier Creek from July 2 – September 29, 2015. Two turbidity measurement methodologies were used:

1. A total of two Campbell Scientific OBS-3+ submersible turbidity probes and CR200x dataloggers were deployed to monitor continuous in-situ turbidity. The downstream turbidimeter was placed approximately 300 feet downstream of the crossing at the interim distance. The upstream turbidimeter was deployed upstream of the Rainy Mine to obtain true background measurements at 15-minute intervals (Appendix B, Photographs 6 and 7). The log of in-situ recording is provided in Appendix C.
2. Discrete samples were collected from July 16 – September 14, 2015 with the Oakton T-100 handheld turbidimeter. Sampling was conducted approximately 100 feet downstream and 50 feet upstream of the temporary crossing on a daily basis, or when a noticeable change in turbidity was observed (Figure 4). The meter was calibrated prior to daily observations using standards of 0.02, 20, 100 and 800 nephelometric turbidity units (NTU). Sample containers were wiped with a lint-free cloth and placed in the turbidimeter chamber for analysis. Grab samples were generally collected at the sample locations on a daily basis and/or during precipitation/sediment-generating events (Table 3).

Bridge Installation

Installation of the temporary bridge was completed on July 16, 2015 during low-flow conditions (Appendix B, Photographs 8-10). The crossing was placed across a southern meander of Glacier Creek, which allowed the abutments to be set without diversion of the channel (Figure 4). In-situ turbidity measurements for this day ranged from 0.516 to 1.05 NTU downstream from the bridge crossing. Discrete turbidity measurements conducted during installation indicated turbidity did not exceed 2.4 NTU downstream from the crossing (Appendix B). As such, the 12.1 NTU threshold was not exceeded, and additional monitoring was not needed over the full extent of take downstream of the sediment generating activities. Appendix B, Photograph 11 shows Glacier Creek downstream from the bridge after installation.

August 29 – September 4 Storm Event

The CES weather station recorded 7.41 inches of precipitation between August 29 and September 4, 2015 (Appendix B). In-situ turbidity measurements collected during the storm indicated the upstream and downstream probes moved as the streamflow increased, and likely became lodged under cobbles. As a result, artificially high readings (up to 1,260.058 NTU) were recorded in the upstream probe. The highest turbidity measurement of 1,298.382 was recorded in the downstream probe (Appendix C). The probes were discovered lodged under cobbles on September 2, 2015. They were subsequently removed and redeployed, after which, the upstream turbidity measured 1.61 to 2.09 NTU, and the downstream probe recorded turbidity at concentrations ranging from 3.22 to 9.31 NTU.

Discrete sampling conducted during the rain event indicated turbidity peaked on August 30, 2015 at 8:30, measuring 7.22 NTU. Therefore, the 12.1 NTU benchmark was not exceeded, and additional monitoring was not needed over the full extent of take downstream of the temporary crossing. Appendix B, Photograph 12 depicts the high flow conditions at the Glacier Creek crossing.

September 6 Storm Event

Moderate rainfall was noted at the Site on September 4, 2015, when the CES weather station recorded 0.46 inches of precipitation. Upstream turbidity measurements ranged from 0.72 to 1.61 NTU. The downstream in-situ turbidimeter recorded measurements ranging from 0.887 to 2.77 NTU. Grab sampling downstream of the bridge identified a turbidity measurement of 0.06 NTUs. Thus, the 12.1 NTU threshold was not exceeded and additional monitoring was not performed over the full extent of take.

Bridge Removal

The modification to the Incidental Take Statement for the Monte Cristo CERCLA Project stipulated removal of the temporary crossing over Glacier Creek by September 15, 2015 (Appendix A). Removal of the temporary bridge was completed on September 14, 2015 (Appendix B, Photograph 13). In-situ turbidity measurements for this day ranged from 1.14 to 2.85 NTU upstream and 3.86 to 14.5 NTU downstream from the bridge crossing. The 14.5 NTU measurement at 17:30 was the only exceedance of the 12.1 NTU threshold. Measurements dropped to 3.9 NTUs at 17:35 and remained below 5 NTUs the remainder of the day.

Discrete turbidity measurements downstream from the crossing during bridge removal indicated turbidity reached 23.1 NTUs at 13:49, dropping to 13.2 NTUs at 13:50, and 6.5 NTUs at 13:51. As such, the 12.1 NTU threshold was exceeded for two minutes. However, in-situ measurements at the full extent of take indicate turbidity did not exceed 4.08 NTUs during this timeframe. Therefore, compliance was achieved following the two-minute exceedance of the 12.1 NTU criterion.

REFUSE MONITORING

The BO requires monitoring and removal of refuse as a T&C. Monitoring/removal must occur during the seasonal fieldwork period and for 2 years after, at least once every 45 days during the snow-free period of the murrelet nesting season. Based on the suitable nesting habitat mapping data provided in the Biological Assessment (Forest Service, 2010), the extent of refuse removal and monitoring spans from the MLH to about Silvertip Campground (Figure 3).

CES and our subcontractors employed regular solid waste removal practices throughout the RA. Refuse was managed and removed from the entire project Site, including areas outside murrelet suitable nesting habitat. On-site personnel included a discussion of refuse removal and management with the contractor during all health and safety meetings. In addition, CES supervised the contractors to ensure effective sanitation practices for proper

disposal of food and refuse that could attract corvids (i.e., crows and ravens) and increase the possibility of predation on nesting murrelets and/or juveniles.

CES personnel performed seven refuse removal events from April 30 – September 3, 2015 (Table 4). Refuse collected was recorded in the field notebook when removed. CES also removed refuse from dispersed campsites not associated with the access route to further ensure corvids were not attracted to the work zone (Appendix B, Photographs 14 and 15).

CONCLUSIONS

Biological monitoring was completed in general accordance with the T&Cs and Terrestrial Conservation Measures outlined in the BO.

- Noise monitoring was conducted to fulfill the requirements outlined in the T&Cs of the BO. Results of the noise monitoring indicated the helicopter was the only equipment used in critical murrelet habitat that exceeded the established 92 dB threshold for the murrelet nesting season.
 - The Columbia Vertol 107-II helicopter was the only equipment to exceed the 92 dB threshold when hovering, landing, and at takeoff. However, rotors in motion at the HLZ, while grounded, measured 85.1 dB. As such, exceedances of the noise threshold were likely short in duration. Moreover, the helicopter only operated in or near suitable nesting habitat from September 5-15, a period when 95% of the murrelets in Western Washington have fledged. Furthermore, the glide path utilized by the Vertol 107-II was through an open avalanche chute, which is not considered viable murrelet habitat. Therefore, any temporary disturbance within occupied murrelet habitat from the Vertol 107-II helicopter is expected to have been minimal. A review of aerial photographs and mapped habitat in the LSR indicated suitable murrelet habitat within 265 meters of the HLZ is about 33 acres.
 - During the 142-day construction period that encompassed the murrelet nesting season, no work or heavy equipment movement occurred through murrelet habitat on 92 days (65% of the construction period). Of the 50 days when heavy equipment operated within murrelet habitat, 25 days included equipment moving from the gate to the borrow area, all-terrain vehicle use for refuse removal, or other temporary access with heavy equipment in the LSR. The remaining 25 days comprised stationary activities such as access route improvements, log hauling and decking, chainsaw use to remove trees/shrubs, or helicopter operations.
 - Limited equipment operation occurred beyond LOPs outlined in the BO. Elimination of noise at the Site is considered impractical due to proximate recreational uses along the MLH (e.g., vehicles, all-terrain vehicles, chainsaws, and firearms). However, the LOPs were observed during all but 11 of the work days during the 2015 season. These exceptions are considered minor, and unlikely to have adversely impacted murrelet nesting behavior.
 - CES employed additional noise limiting activities during the two-hour diurnal windows as follows:
 - Prohibition of chainsaw use.
 - Minimization of equipment idling, and equipment shut down when not in use.
- Turbidity measurements were collected in accordance with the T&Cs of the BO. In-situ and discrete sampling identified turbidity measurements in excess of the 12.1 NTU benchmark on September 14, 2015, when the temporary bridge was removed.
 - The exceedances were noted for two minutes in discrete samples, after which, turbidity stabilized below the 12.1 NTU criterion.

- No mitigation measures were employed since it was a brief exceedance, followed by turbidity stabilization, and the sediment generating activities were complete.
- Refuse monitoring was completed during seven events in the LSR from April 30, 2015 to September 3, 2015. Garbage removal was documented in the field notebook and is summarized in Table 4.

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Att: Table 1. Noise Monitoring
Table 2. Approximate Start and Stop Time Summary
Table 3. Discrete Turbidity Monitoring Summary
Table 4. Refuse Monitoring Summary
Figure 1. Site Layout Map of Monte Cristo Mining Area
Figure 2. Helicopter Landing Zone and 265 Meter Radius
Figure 3. Critical Murrelet Habitat
Figure 4. Temporary Glacier Creek Crossing and Turbidity Monitoring Stations
App A. U.S. Fish and Wildlife Service Documentation
App B. Photographs
App C. Continuous In-Situ Turbidity Documentation
Doc: 2015230017 MCMA Biological Monitoring Rpt.docx

TABLES

Table 1. Noise Monitoring

Table 2. Approximate Start and Stop Time Summary

Table 3. Discrete Turbidity Monitoring Summary

Table 4. Refuse Monitoring Summary

Table 1. Noise Monitoring

Date	Construction Location	Time	Noise Level	Equipment
			dB	
6/24/2015	Repository (outside murrelet habitat)	16:00	89	350 LC excavator, piling slash with backup alarm
6/24/2015	Repository (outside murrelet habitat)	16:00	73	350 LC excavator, while grabbing slash material
6/25/2015	Not recorded	8:15	77.5	Cat 329 excavator
6/25/2015	Not recorded	8:15	76	Chainsaw
6/25/2015	Not recorded	8:15	77.5	Chainsaw, haul truck, large excavators working simultaneously
6/26/2015	Not recorded	14:10	77.5	Excavator
6/27/2015	Not recorded	8:00	80	CAT excavator
6/27/2015	Not recorded	8:00	72.5	Deere dump truck
6/27/2015	Borrow area (outside murrelet habitat)	12:00	77.5	Excavator unloading running log truck
6/29/2015	Repository (outside murrelet habitat)	9:15	70.5	D6k dozer and CAT 329E excavator running simultaneously
6/29/2015	Repository (outside murrelet habitat)	9:15	76	329E excavator hitting a log to move it
6/29/2015	Repository (outside murrelet habitat)	14:00	67.5	CAT 329E excavator loading Deere 300D haul truck
6/29/2015	Road at repository entrance – approximately 200-250 feet away from equipment activity (outside murrelet habitat)	14:05	65	No equipment – mainly background of SFSR
7/2/2015	Monte Cristo Campground (outside murrelet habitat)	10:00	65	Whisperwatt 590746 generator
7/2/2015	MW-3R (outside murrelet habitat)	15:19	73.1	Portable generator for Rediflow pump
7/2/2015	Not recorded	15:19	65	CAT 329 excavator + dump truck
7/15/2015	Not recorded	16:30	78	Moving rail car bridge spans through murrelet habitat
7/19/2015	Culvert between Bridge #2 and #3	8:40	81	Repair and cover damaged culvert with CAT 325 excavator
7/19/2015	Helicopter landing zone	10:45	68	Chainsaw
7/19/2015	Helicopter landing zone	10:45	80	Chainsaw + 325 excavator
7/20/2015	Monte Cristo Campground (outside murrelet habitat)	18:08	58	Whisperwatt 590746 generator
9/3/2015	Bridge #2	10:15	60.1	ATV
9/5/2015	Helicopter landing zone	9:30	71.8	Chainsaw
9/5/2015	Helicopter landing zone	10:50	95.9	Columbia Vertol 107-II during landing
9/5/2015	Helicopter landing zone	10:50	85.1	Columbia Vertol 107-II, landed with rotors in motion
9/6/2015	Rainy Mine (outside murrelet habitat)	9:37	97.4	Columbia Vertol 107-II, during waste rock drop with self-dumping bin
Noise Level Threshold at 45 Yards			92	
Maximum Noise Level Recorded at 45 Yards			97.4	
Minimum Noise Level Recorded at 45 Yards			58	
Average Noise Level at 45 Yards			75.30	

NOTES:

All measurements taken at 45 yards or less from the source.

Abbreviations: dB = decibels, MLH = Mountain Loop Highway, SFSR = South Fork Sauk River.

Bold indicates the noise threshold outlined in the Biological Monitoring Plan was exceeded; Highlighted cells indicate which standard was exceeded.

Table 2. Approximate Start and Stop Time Summary

Date	Sunrise ¹	2 Hours After Sunrise	Approximate Start Time (Saws, Heavy Equipment)	Deviation from 2-Hour Diurnal Window	Work Started 2 Hours After Sunrise	Sunset ¹	2 Hours Before Sunset	Approximate Stop Time (Saws, Heavy Equipment)	Deviation from 2-Hour Diurnal Window	Work Ended 2 Hours Before Sunrise	Comments
	time		minutes	minutes	time		minutes	minutes			
4/28/2015	5:59	7:59	8:20	+ 21	Yes	20:16	18:16	13:20	- 294	Yes	Unloaded ATV at helicopter landing zone
4/29/2015	5:56	7:56	7:45	- 11	No	20:19	18:19	16:56	- 83	Yes	Dropped off CAT 325D excavator inside gate and departed
4/30/2015	5:54	7:54	8:30	+ 36	Yes	20:20	18:20	17:00	- 80	Yes	Chainsaw work at 9:00 to widen corner at Helicopter landing zone
5/1/2015	5:52	7:52	8:15	+ 22	Yes	20:21	18:21	14:51	- 210	Yes	Dump rock at Bridge #3 at 8:15
5/2/2015	5:51	7:51	11:55	+ 244	Yes	20:23	18:23	12:30	- 353	Yes	
5/3/2015	5:49	7:49	--	--	Yes	20:24	18:24	--	--	Yes	No equipment working at site
5/4/2015	5:48	7:48	8:30	+ 43	Yes	20:26	18:26	17:51	- 35	Yes	Mobilize from gate on ATV at 8:30
5/5/2015	5:46	7:46	8:06	+ 20	Yes	20:27	18:27	18:23	- 4	Yes	Equipment trailer mobilized to borrow area at 8:06
5/6/2015	5:45	7:45	--	--	Yes	20:28	18:28	--	--	Yes	No work in murrelet habitat
5/7/2015	5:43	7:43	--	--	Yes	20:30	18:30	--	--	Yes	No work in murrelet habitat
5/8/2015	5:42	7:43	--	--	Yes	20:31	18:31	--	--	Yes	Crew offsite
5/9/2015	5:40	7:40	--	--	Yes	20:32	18:32	--	--	Yes	Crew offsite
5/10/2015	5:39	7:49	--	--	Yes	20:34	18:34	--	--	Yes	Crew offsite
5/11/2015	5:37	7:37	--	--	Yes	20:35	18:35	--	--	Yes	Crew offsite
5/12/2015	5:36	7:36	--	--	Yes	20:36	18:36	--	--	Yes	Crew offsite
5/13/2015	5:35	7:35	--	--	Yes	20:38	18:38	--	--	Yes	Logging at repository, no equipment use in murrelet habitat
5/14/2015	5:33	7:33	--	--	Yes	20:39	18:39	--	--	Yes	Logging at repository, no equipment use in murrelet habitat
5/15/2015	5:32	7:32	--	--	Yes	20:40	18:40	--	--	Yes	Logging at repository, no equipment use in murrelet habitat
5/16/2015	5:31	7:31	--	--	Yes	20:41	18:41	--	--	Yes	Logging at repository, no equipment use in murrelet habitat
5/17/2015	5:30	7:30	--	--	Yes	20:43	18:43	--	--	Yes	Crew offsite
5/18/2015	5:29	7:29	--	--	Yes	20:44	18:44	--	--	Yes	325 Excavator down; no equipment working at site
5/19/2015	5:27	7:27	--	--	Yes	20:45	18:45	--	--	Yes	325 excavator repairs; no equipment working at site
5/20/2015	5:26	7:26	--	--	Yes	20:46	18:46	--	--	Yes	Hauled logs to borrow area; no work in murrelet habitat
5/21/2015	5:25	7:25	--	--	Yes	20:48	18:48	--	--	Yes	Hauled logs to borrow area; no work in murrelet habitat
5/22/2015	5:24	7:24	--	--	Yes	20:49	18:49	--	--	Yes	Hauled logs to borrow area; no work in murrelet habitat
5/23/2015	5:23	7:23	--	--	Yes	20:50	18:50	--	--	Yes	Crew offsite
5/24/2015	5:22	7:22	--	--	Yes	20:51	18:51	--	--	Yes	Crew offsite
5/25/2015	5:21	7:21	--	--	Yes	20:52	18:52	--	--	Yes	Crew offsite
5/26/2015	5:20	7:20	--	--	Yes	20:54	18:54	--	--	Yes	Crew offsite
5/27/2015	5:20	7:20	--	--	Yes	20:54	18:54	--	--	Yes	No work in murrelet habitat
5/28/2015	5:19	7:19	--	--	Yes	20:55	18:55	--	--	Yes	No equipment working at site
5/29/2015	5:18	7:18	--	--	Yes	20:56	18:56	--	--	Yes	No equipment working at site
5/30/2015	5:17	7:17	--	--	Yes	20:57	18:57	--	--	Yes	No equipment working at site
5/31/2015	5:16	7:16	--	--	Yes	20:58	18:58	--	--	Yes	No equipment working at site
6/1/2015	5:16	7:16	8:00	+ 44	Yes	20:59	18:59	--	--	Yes	Began hauling logs to decking area; only 4 loads moved due to mud
6/2/2015	5:15	7:15	8:15	+ 60	Yes	21:00	19:00	18:33	- 27	Yes	Widening south of Bridge #2 at 8:15
6/3/2015	5:15	7:15	7:15	0	Yes	21:01	19:01	18:00	- 61	Yes	Upgrades to access route
6/4/2015	5:14	7:14	7:15	+ 1	Yes	21:02	19:02	18:00	- 62	Yes	Upgrades to access route; hauled 3 loads of logs to decking area
6/5/2015	5:14	7:14	--	--	Yes	21:03	19:03	--	--	Yes	No equipment work in murrelet habitat. Conditions to muddy for hauling logs
6/6/2015	5:13	7:13	--	--	Yes	21:03	19:03	--	--	Yes	Crew offsite
6/7/2015	5:13	7:13	--	--	Yes	21:04	19:04	--	--	Yes	Crew offsite
6/8/2015	5:12	7:12	--	--	Yes	21:05	19:05	--	--	Yes	Crew offsite

Table 2. Approximate Start and Stop Time Summary

Date	Sunrise ¹	2 Hours After Sunrise	Approximate Start Time (Saws, Heavy Equipment)	Deviation from 2-Hour Diurnal Window	Work Started 2 Hours After Sunrise	Sunset ¹	2 Hours Before Sunset	Approximate Stop Time (Saws, Heavy Equipment)	Deviation from 2-Hour Diurnal Window	Work Ended 2 Hours Before Sunrise	Comments
	time			minutes		time			minutes		
6/9/2015	5:12	7:12	--	--	Yes	21:06	19:06	--	--	Yes	<i>Crew offsite</i>
6/10/2015	5:12	7:12	7:15	+ 3	Yes	21:06	19:06	18:00	- 66	Yes	Hauled logs to decking area
6/11/2015	5:12	7:12	7:15	+ 3	Yes	21:07	19:07	18:00	- 67	Yes	Hauled logs to decking area
6/12/2015	5:11	7:11	7:15	+ 4	Yes	21:07	19:07	18:00	- 67	Yes	Hauled logs to decking area
6/13/2015	5:11	7:11	7:15	+ 4	Yes	21:08	19:08	18:00	- 68	Yes	Hauled logs to decking area
6/14/2015	5:11	7:11	--	--	Yes	21:08	19:08	19:00	- 8	Yes	ATV moved from gate to MC Campground
6/15/2015	5:11	7:11	--	--	Yes	21:09	19:09	20:05	+ 56	No	Rock sorter pulled to turnout on Python Road. Difficulty with equipment making the corner at Bridge #2 resulted in a delay. Needed to move equipment off the road to provide access for RV behind the sorter.
6/16/2015	5:11	7:11	7:15	+ 4	Yes	21:09	19:09	18:20	- 49	Yes	Moved rock sorter to borrow area at 7:15. Cascade Drilling departed site at 18:20
6/17/2015	5:11	7:11	7:44	+ 33	Yes	21:10	19:10	18:15	- 55	Yes	CAT 329E excavator moved from gate to repository at 7:44. Cascade Drilling offsite at 18:15.
6/18/2015	5:11	7:11	--	--	Yes	21:10	19:10	17:30	- 100	Yes	Cascade Drilling skid steer mobilized through murrelet habitat at 17:30
6/19/2015	5:11	7:11	--	--	Yes	21:10	19:10	17:00	- 130	Yes	D6 dozer tracked through murrelet habitat to repository at 17:00
6/20/2015	5:11	7:11	8:15	+ 64	Yes	21:11	19:11	--	--	Yes	ATV accessed Python Logging Road/County Road intersection to turn back hikers at 8:15
6/21/2015	5:12	7:12	8:00	+ 48	Yes	21:11	19:11	17:00	- 131	Yes	Morning mobilization included obtaining wood platforms from log deck area. RV trailer pulled into MC campground at 17:00
6/22/2015	5:12	7:12	9:20	+ 128	Yes	21:11	19:11	17:30	- 151	Yes	Moved 329E excavator from log deck to borrow area at 9:20. Small trees removed enroute. Compactor at gate at 17:30
6/23/2015	5:12	7:12	--	--	Yes	21:11	19:11	--	--	Yes	<i>No work in murrelet habitat</i>
6/24/2015	5:12	7:12	--	--	Yes	21:11	19:11	16:00	- 191	Yes	Drive ATV to Python/County Road intersection at 16:00
6/25/2015	5:13	7:13	--	--	Yes	21:11	19:11	--	--	Yes	<i>No work in murrelet habitat</i>
6/26/2015	5:13	7:13	--	--	Yes	21:11	19:11	--	--	Yes	<i>No work in murrelet habitat</i>
6/27/2015	5:14	7:14	--	--	Yes	21:11	19:11	18:10	-51	Yes	ATV used for refuse removal in murrelet habitat until 18:10
6/28/2015	5:14	7:14	--	--	Yes	21:11	19:11	--	--	Yes	<i>No work in murrelet habitat</i>
6/29/2015	5:14	7:14	--	--	Yes	21:11	19:11	16:30	- 161	Yes	ATV used for refuse removal in murrelet habitat until 16:30
6/30/2015	5:15	7:15	--	--	Yes	21:11	19:11	--	--	Yes	<i>No work in murrelet habitat</i>
7/1/2015	5:16	7:16	--	--	Yes	21:11	19:11	--	--	Yes	<i>No work in murrelet habitat</i>
7/2/2015	5:15	7:16	--	--	Yes	21:10	19:10	--	--	Yes	<i>No work in murrelet habitat</i>
7/3/2015	5:17	7:17	--	--	Yes	21:10	19:10	--	--	Yes	<i>No work in murrelet habitat</i>
7/4/2015	5:18	7:18	--	--	Yes	21:10	19:10	--	--	Yes	<i>No work in murrelet habitat</i>
7/5/2015	5:18	7:18	--	--	Yes	21:09	19:09	--	--	Yes	<i>No work in murrelet habitat</i>
7/6/2015	5:19	7:19	--	--	Yes	21:09	19:09	--	--	Yes	<i>No work in murrelet habitat</i>
7/7/2015	5:20	7:20	--	--	Yes	21:08	19:08	--	--	Yes	<i>No work in murrelet habitat</i>
7/8/2015	5:21	7:21	--	--	Yes	21:08	19:08	--	--	Yes	<i>No work in murrelet habitat</i>
7/9/2015	5:21	7:21	--	--	Yes	21:07	19:07	--	--	Yes	<i>No work in murrelet habitat</i>
7/10/2015	5:22	7:22	--	--	Yes	21:07	19:07	--	--	Yes	<i>No work in murrelet habitat</i>
7/11/2015	5:23	7:23	--	--	Yes	21:06	19:06	--	--	Yes	<i>No work in murrelet habitat</i>
7/12/2015	5:24	7:24	--	--	Yes	21:05	19:05	--	--	Yes	<i>No work in murrelet habitat</i>
7/13/2015	5:25	7:25	--	--	Yes	21:05	19:05	--	--	Yes	<i>No work in murrelet habitat</i>
7/14/2015	5:26	7:26	--	--	Yes	21:04	19:04	--	--	Yes	<i>No work in murrelet habitat</i>
7/15/2015	5:27	7:27	--	--	Yes	21:03	19:03	16:30	- 153	Yes	Moved temporary bridge through murrelet habitat at 16:30
7/16/2015	5:28	7:28	--	--	Yes	21:02	19:02	--	--	Yes	<i>No work in murrelet habitat</i>
7/17/2015	5:29	7:29	--	--	Yes	21:01	19:01	19:00	- 1	Yes	Grader arrived at gate at 19:00

Table 2. Approximate Start and Stop Time Summary

Date	Sunrise ¹	2 Hours After Sunrise	Approximate Start Time (Saws, Heavy Equipment)	Deviation from 2-Hour Diurnal Window	Work Started 2 Hours After Sunrise	Sunset ¹	2 Hours Before Sunset	Approximate Stop Time (Saws, Heavy Equipment)	Deviation from 2-Hour Diurnal Window	Work Ended 2 Hours Before Sunrise	Comments
	time			minutes		time			minutes		
7/18/2015	5:30	7:30	--	--	Yes	21:01	19:01	--	--	Yes	No work in murrelet habitat
7/19/2015	5:31	7:31	7:30	- 1	No	21:00	19:00	17:00	-120	Yes	Excavator walked toward helicopter landing zone beginning at 7:30
7/20/2015	5:32	7:32	--	--	Yes	20:59	18:59	16:38	- 141	Yes	Used ATV to access County Road/Python Road intersection to post a sign at 16:38
7/21/2015	5:33	7:33	--	--	Yes	20:58	18:58	--	--	Yes	No work in murrelet habitat
7/22/2015	5:35	7:35	7:15	- 20	No	20:56	18:56	18:00	- 56	Yes	Place 3"-minus rock on Python Road beginning at 7:15; finish smoothing and water road at 18:00
7/23/2015	5:36	7:36	--	--	Yes	20:55	18:55	21:30	+ 155	No	Pickup and trailer with lime unable to move beyond log deck. Haul truck deployed at 21:30 to assist.
7/24/2015	5:37	7:37	--	--	Yes	20:54	18:54	17:10	- 154	Yes	Komatsu spin dump trucks arrived at repository at 17:10
7/25/2015	5:38	7:38	--	--	Yes	20:53	18:53	--	--	Yes	No work in murrelet habitat
7/26/2015	5:39	7:39	--	--	Yes	20:52	18:52	--	--	Yes	No work in murrelet habitat
7/27/2015	5:40	7:40	--	--	Yes	20:51	18:51	--	--	Yes	No work in murrelet habitat
7/28/2015	5:42	7:42	--	--	Yes	20:49	18:49	--	--	Yes	No work in murrelet habitat
7/29/2015	5:43	7:43	--	--	Yes	20:48	18:48	--	--	Yes	No work in murrelet habitat
7/30/2015	5:44	7:44	--	--	Yes	20:47	18:47	--	--	Yes	No work in murrelet habitat
7/31/2015	5:45	7:45	--	--	Yes	20:45	18:45	--	--	Yes	No work in murrelet habitat
8/1/2015	5:47	7:47	--	--	Yes	20:44	18:44	--	--	Yes	No work in murrelet habitat
8/2/2015	5:48	7:48	--	--	Yes	20:43	18:43	--	--	Yes	No work in murrelet habitat
8/3/2015	5:49	7:49	--	--	Yes	20:41	18:41	--	--	Yes	No work in murrelet habitat
8/4/2015	5:50	7:50	--	--	Yes	20:40	18:40	--	--	Yes	No work in murrelet habitat
8/5/2015	5:52	7:52	--	--	Yes	20:38	18:38	--	--	Yes	No work in murrelet habitat
8/6/2015	5:53	7:53	--	--	Yes	20:37	18:37	--	--	Yes	No work in murrelet habitat
8/7/2015	5:54	7:54	--	--	Yes	20:35	18:35	--	--	Yes	No work in murrelet habitat
8/8/2015	5:56	7:56	--	--	Yes	20:33	18:33	--	--	Yes	No work in murrelet habitat
8/9/2015	5:57	7:57	--	--	Yes	20:32	18:32	--	--	Yes	No work in murrelet habitat
8/10/2015	5:58	7:58	--	--	Yes	20:30	18:30	--	--	Yes	No work in murrelet habitat
8/11/2015	6:00	8:00	--	--	Yes	20:29	18:29	--	--	Yes	No work in murrelet habitat
8/12/2015	6:01	8:01	--	--	Yes	20:27	18:27	14:23	- 244	Yes	CAT 312 Excavator moved from gate to repository
8/13/2015	6:02	8:02	--	--	Yes	20:25	18:25	--	--	Yes	No work in murrelet habitat
8/14/2015	6:04	8:04	--	--	Yes	20:24	18:24	--	--	Yes	No work in murrelet habitat
8/15/2015	6:05	8:05	--	--	Yes	20:22	18:22	--	--	Yes	Rain - No equipment working at site
8/16/2015	6:06	8:06	--	--	Yes	20:20	18:20	--	--	Yes	Rain - No equipment working at site
8/17/2015	6:08	8:08	6:50	- 78	No	20:18	18:18	--	--	Yes	Waste Management truck onsite at 6:50 to remove hazardous waste containers
8/18/2015	6:09	8:09	--	--	Yes	20:17	18:17	--	--	Yes	No work in murrelet habitat
8/19/2015	6:10	8:10	--	--	Yes	20:15	18:15	--	--	Yes	No work in murrelet habitat
8/20/2015	6:12	8:12	--	--	Yes	20:13	18:13	--	--	Yes	No work in murrelet habitat
8/21/2015	6:13	8:13	--	--	Yes	20:11	18:11	--	--	Yes	No work in murrelet habitat
8/22/2015	6:14	8:14	--	--	Yes	20:09	18:09	--	--	Yes	No work in murrelet habitat
8/23/2015	6:16	8:16	--	--	Yes	20:07	18:07	--	--	Yes	No work in murrelet habitat
8/24/2015	6:17	8:17	7:00	-77	No	20:06	18:06	--	--	Yes	D6 dozer operated near gate starting at 7:00; track trucks moved offsite.
8/25/2015	6:18	8:18	12:00	+ 222	Yes	20:04	18:04	--	--	Yes	Krambo wood shredder walked to repository from gate at 12:00
8/26/2015	6:20	8:20	--	--	Yes	20:02	18:02	--	--	Yes	No work in murrelet habitat
8/27/2015	6:21	8:21	--	--	Yes	20:00	18:00	--	--	Yes	No work in murrelet habitat

Table 2. Approximate Start and Stop Time Summary

Date	Sunrise ¹	2 Hours After Sunrise	Approximate Start Time (Saws, Heavy Equipment)	Deviation from 2-Hour Diurnal Window	Work Started 2 Hours After Sunrise	Sunset ¹	2 Hours Before Sunset	Approximate Stop Time (Saws, Heavy Equipment)	Deviation from 2-Hour Diurnal Window	Work Ended 2 Hours Before Sunrise	Comments
	time			minutes		time			minutes		
8/28/2015	6:22	8:22	--	--	Yes	19:58	17:58	--	--	Yes	<i>No work in murrelet habitat</i>
8/29/2015	6:24	8:24	--	--	Yes	19:56	17:56	--	--	Yes	<i>Heavy rain - No equipment working at site</i>
8/30/2015	6:25	8:25	--	--	Yes	19:54	17:54	--	--	Yes	<i>Heavy rain - No equipment working at site</i>
8/31/2015	6:26	8:26	--	--	Yes	19:52	17:52	--	--	Yes	<i>No work in murrelet habitat</i>
9/1/2015	6:28	8:28	--	--	Yes	19:50	17:50	--	--	Yes	<i>Rain - No equipment working at site</i>
9/2/2015	6:29	8:29	--	--	Yes	19:48	17:48	--	--	Yes	<i>No work in murrelet habitat</i>
9/3/2015	6:30	8:30	8:50	+ 20	Yes	19:46	17:46	--	--	Yes	ATV access to murrelet habitat for refuse removal/monitoring
9/4/2015	6:32	8:32	--	--	Yes	19:44	17:44	--	--	Yes	<i>Rain - No equipment working at site</i>
9/5/2015 ²	6:33	8:33	9:30	+57	Yes	19:42	17:42	17:30	-12	Yes	ATV Accessed helicopter landing zone at 9:30; Helicopter arrived at 10:50, returned to landing zone at 17:30
9/6/2015	6:34	8:34	8:59	+ 25	Yes	19:40	17:40	9:40	- 420	Yes	Helicopter take off at 8:59; Returned to landing zone at 9:40 due to rain
9/7/2015	6:36	8:36	15:23	+ 327	Yes	19:38	17:38	17:39	+ 1	No	Helicopter take off at 13:23 due to repairs to speed trim; Returned to landing zone at 17:30
9/8/2015	6:37	8:37	8:48	+ 10	Yes	19:36	17:36	17:33	-3	Yes	Helicopter take off at 8:48; Returned to landing zone at 17:33
9/9/2015	6:38	8:38	9:13	+ 35	Yes	19:34	17:34	17:31	-3	Yes	Helicopter take off at 9:13; Returned to landing zone at 17:31
9/10/2015	6:40	8:40	8:40	0	Yes	19:32	17:32	17:27	- 5	Yes	Helicopter take off at 8:40; Returned to landing zone at 17:27
9/11/2015	6:41	8:41	10:44	+ 123	Yes	19:30	17:30	17:30	0	Yes	Helicopter take off at 10:44 due to repairs/replacement of drive shaft; Returned to landing zone at 17:30
9/12/2015	6:42	8:42	8:52	+ 10	Yes	19:28	17:28	17:26	- 2	Yes	Helicopter takeoff at 8:52; Returned to landing zone at 17:26
9/13/2015	6:44	8:44	10:24	+ 100	Yes	19:26	17:26	17:24	- 2	Yes	Helicopter take off at 10:24 due to fog; Returned to landing zone at 17:24
9/14/2015	6:45	8:45	11:31	+ 166	Yes	19:24	17:24	17:25	+ 1	No	Helicopter take off at 11:31 due to fog; Returned to landing zone at 17:25
9/15/2015	6:47	8:47	8:18	- 29	No	19:22	17:22	18:01	+ 39	No	Helicopter takeoff at 8:18; Returned to landing zone at 18:01
Average Time	5:42	7:42	8:41			20:38	18:38	17:13			
Average Deviation³				+44.89					-81.09		

NOTES:

¹ Sunrise and sunset data were derived from the Seattle, Washington sun and moon calendar from timeanddate.com.

² Work after September 4 should be considered within the context that 95% of the murrelets in Western Washington have fledged by that date (USFWS, 2012).

-- Deviation does not include dates where heavy equipment was not used within murrelet habitat; shown in *italics*.

Bold indicates work was completed within the 2 hour time restriction

Table 3. Discrete Turbidity Monitoring Summary

Date	Time	Temporary Bridge Turbidity at Glacier Creek Crossing		Comments
		Upstream	Downstream	
		NTU		
7/16/2015	13:20	0.70	--	Turbidity measured during installation of Glacier Creek crossing
	13:40	--	0.65	
	14:08	--	2.40	
	14:33	--	0.90	First abutment set
	15:03	--	0.80	Second abutment set
7/25/2015	18:00	--	0.00	
7/26/2015	14:05	--	0.00	
7/28/2015	16:45	0.00	--	Oakton T-100 calibration check: 0.02 = 0.03, 20 = 19.97, 100 = 99.7, 800 = 796
	16:50	--	0.00	
7/30/2015	13:10	0.00	--	Oakton T-100 calibration check: 0.02 = 0.00, 20 = 19.92, 100 = 99.8, 800 = 789
	13:15	--	0.26	
7/31/2015	16:50	0.36	--	Oakton T-100 calibration check: 0.02 = 0.03, 20 = 19.95, 100 = 99.8, 800 = 801
	16:55	--	0.00	
8/1/2015	17:40	0.00	--	Oakton T-100 calibration check: 0.02 = 0.02, 20 = 19.97, 100 = 99.8, 800 = 797
	17:45	--	0.00	
8/2/2015	12:40	0.18	--	Oakton T-100 calibration check: 0.02 = 0.01, 20 = 19.98, 100 = 99.99, 800 = 795
	12:45	--	0.38	
8/3/2015	15:10	0.00	--	Oakton T-100 calibration check: 0.02 = 0.02, 20 = 20.3, 100 = 101, 800 = 819
	15:15	--	0.00	Water truck pump inlet in stream
8/4/2015	18:00	--	0.00	Oakton T-100 calibration check: 0.02 = 0.00, 20 = 20.2, 100 = 101, 800 = 810
	18:05	0.00	--	
8/5/2015	16:13	--	0.00	Oakton T-100 calibration check: 0.02 = 0.00, 20 = 20.9, 100 = 104, 800 = 852
	16:16	0.00	--	0.28 inches of precipitation
8/6/2015	16:16	--	0.00	Oakton T-100 calibration check: 0.02 = 0.00, 20 = 20.5, 100 = 102
	16:18	0.00	--	
8/7/2015	7:00	0.00	0.00	
8/8/2015	10:00	--	0.00	Hauling stockpiled waste rock to repository
8/9/2015	12:05	--	0.00	Hauling concentrator tailings to repository, and cover soil to ore collector
8/10/2015	17:50	--	0.00	Hauling cover soil from repository to ore collector
8/11/2015	14:00	--	0.05	
8/12/2015	14:40	--	0.07	
8/13/2015	13:00	--	0.00	Hauling tailings from concentrator to repository
8/14/2015	13:25	--	0.00	Hauling tailings from concentrator to repository
8/15/2015	14:41	--	0.06	0.97 inches of precipitation
8/16/2015	13:38	--	0.07	No hauling over Glacier Creek crossing
8/17/2015	14:37	--	0.00	No hauling over Glacier Creek crossing
8/18/2015	13:30	--	0.08	Hauling waste rock from comet terminal stockpile to repository
8/19/2015	11:45	--	0.04	Hauling tailings from upper concentrator to repository
8/20/2015	13:57	--	0.00	Hauling cover soil to concentrator
8/21/2015	11:00	--	0.00	Hauling tailings from concentrator to repository
8/22/2015	11:28	--	0.00	Hauling tailings from concentrator to repository
8/23/2015	10:19	--	0.00	Hauling cover soil to concentrator
8/24/2015	17:39	--	0.30	Hauling cover soil to concentrator
8/25/2015	10:00	--	0.07	Hauling tailings from concentrator to repository
8/26/2015	10:03	--	0.00	Hauling cover soil to concentrator
8/27/2015	10:30	0.12	0.03	Oakton T-100 calibration check: 20 = 19.96, 100 = 100
8/27/2015	15:00	--	0.17	
	15:05	0.23	--	Hauling tailings from concentrator to repository
8/28/2015	10:30	--	0.02	
	10:35	0.13	--	0.01 inches of precipitation

Table 3. Discrete Turbidity Monitoring Summary

Date	Time	Temporary Bridge Turbidity at Glacier Creek Crossing		Comments
		Upstream	Downstream	
		NTU		
8/29/2015	9:05	--	0.25	1.56 inches of precipitation
8/30/2015	8:30	--	7.22	2.02 inches of precipitation
8/31/2015	13:50	--	4.08	1.8 inches of precipitation
9/1/2015	13:45	1.94	--	
	13:55	--	1.62	1.04 inches of precipitation
9/2/2015	8:30	--	1.55	
	8:35	1.94	--	
	11:55	--	1.72	
	12:00	3.48	--	
	17:00	--	0.86	
	17:05	1.29	--	0.73 inches of precipitation
9/3/2015	7:40	--	0.63	
	7:45	0.57	--	
	10:40	0.28	0.33	
	13:45	0.01	0.33	
	16:40	0.02	0.14	0.11 inches of precipitation
9/4/2015	7:30	--	0.05	Oakton T-100 calibration check: 20 = 20.1, 800 = 799
	7:35	0.23	--	
	12:30	0.05	0.22	
	14:30	0.10	0.05	
	18:00	0.41	0.19	0.14 inches of precipitation
9/5/2015	7:45	0.15	0.05	
	18:05	0.00	0.00	0.01 inches of precipitation
9/6/2015	8:10	0.00	0.06	Oakton T-100 calibration check: 20 = 19.94, 800 = 804 0.46 inches of precipitation
9/7/2015	8:40	--	0.00	Oakton T-100 calibration check: 0.02 = 0.00, 20 = 19.7, 100 = 102, 800 = 809
9/7/2015	8:45	0.00		0.01 inches of precipitation
9/8/2015	13:40	0.00	0.00	Oakton T-100 calibration check: 0.02 = 0.00, 20 = 19.36, 100 = 100, 800 = 800
9/9/2015	13:05	0.00	0.00	Oakton T-100 calibration check: 0.02 = 0.00, 20 = 19.41, 100 = 101, 800 = 799 0.01 inches of precipitation
9/10/2015	15:15	0.00	0.00	Oakton T-100 calibration check: 0.02 = 0.00, 20 = 19.94, 100 = 98.7, 800 = 778
9/11/2015	18:13	0.00	0.00	Oakton T-100 calibration check: 0.02 = 0.00, 20 = 19.94, 100 = 98.7, 800 = 778
9/12/2015	10:05	--	0.00	
9/14/2015	11:38	--	0.00	Removal of Glacier Creek crossing
	12:57	--	0.00	Oakton T-100 calibration check: 20 = 20.1
	13:47	--	11.59	0.22 inches of precipitation
	13:49	--	23.10	Exceeded 12.1 NTU threshold. No work stoppage (only exceeded for 2 minutes)
	13:50	--	13.20	Exceeded 12.1 NTU threshold. No work stoppage (only exceeded for 2 minutes)
	13:51	--	6.50	<i>Below 12.1 NTU threshold</i>

NOTES:

Turbidity was measured with an Oakton T-100 handheld turbidimeter.

Abbreviations: -- = no reading, NTU = nephelometric turbidity units.

Bold indicates one or more of the turbidity thresholds outlined in the Biological Monitoring Plan were exceeded.

Italics describes compliance measures.

Table 4. Refuse Monitoring Summary

Date	Location(s)	Time	Notes
4/30/2015	Gate area (connection with MLH)	8:56	Garbage picked up near gate area.
5/7/2015	Borrow area (outside murrelet habitat)	8:01	Picked up garbage near borrow area.
6/15/2015	MLH to Borrow area	16:15	Picked up broken mirror near Haps Hill.
6/27/2015	MLH to borrow area	16:55	Filled two Ziploc bags with flagging, broken survey sticks, small pieces of road fabric, plastic band, and plastic piece of barricade.
6/29/2015	MLH to borrow area	16:30	Filled Ziploc bag with survey flagging and a lug nut. Survey stake removed from center of road.
7/20/2015	County Road/Python Road intersection and dispersed campground adjacent to SFSR	10:00	Removed beer cans/bottles, garbage, deflated sleeping pad at dispersed camp adjacent to SFSR. Filled large Hefty bag with garbage from campers.
9/3/2015	MLH to borrow area	8:50	Removed Cheetos bag, beer cans, water bottles, styrofoam, and deflated balloon. Majority of refuse removed at MLH intersection.

NOTE:

Abbreviations: MLH = Mountain Loop Highway, SFSR = South Fork Sauk River.

FIGURES

- Figure 1. Site Layout Map of Monte Cristo Mining Area**
- Figure 2. Helicopter Landing Zone and 265 Meter Radius**
- Figure 3. Critical Murrelet Habitat**
- Figure 4. Temporary Glacier Creek Crossing and Turbidity Monitoring Stations**

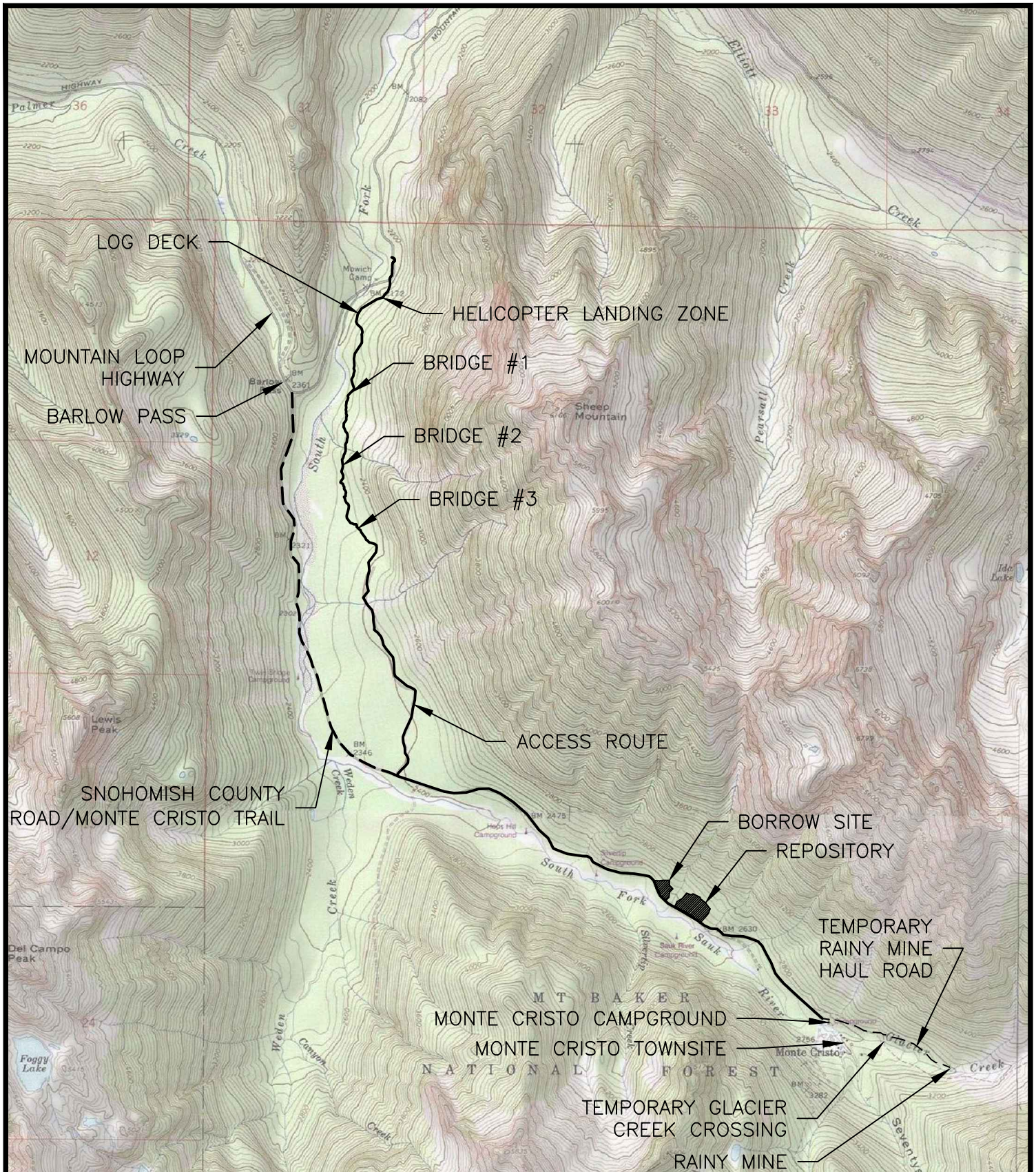



Figure 1. Site Layout Map of Monte Cristo Mining Area



(Source: USGS 7.5 min Topographic Map ©2015 National Geographic Society, i-cubed)

PROJECT NUMBER: 2015230017	Monte Cristo Mining Area Removal Action – Biological Monitoring Report
DATE: 12/18/2015	USDA Forest Service Mt. Baker–Snoqualmie National Forest Snohomish County, Washington
DWG NO: 2015230017 F1 BM.dwg	 CASCADE EARTH SCIENCES A Valmont Industries Company
DWG BY: PROJECT MANAGER: 6RKB	
REVISOR: 1RMT	
REVISED:	

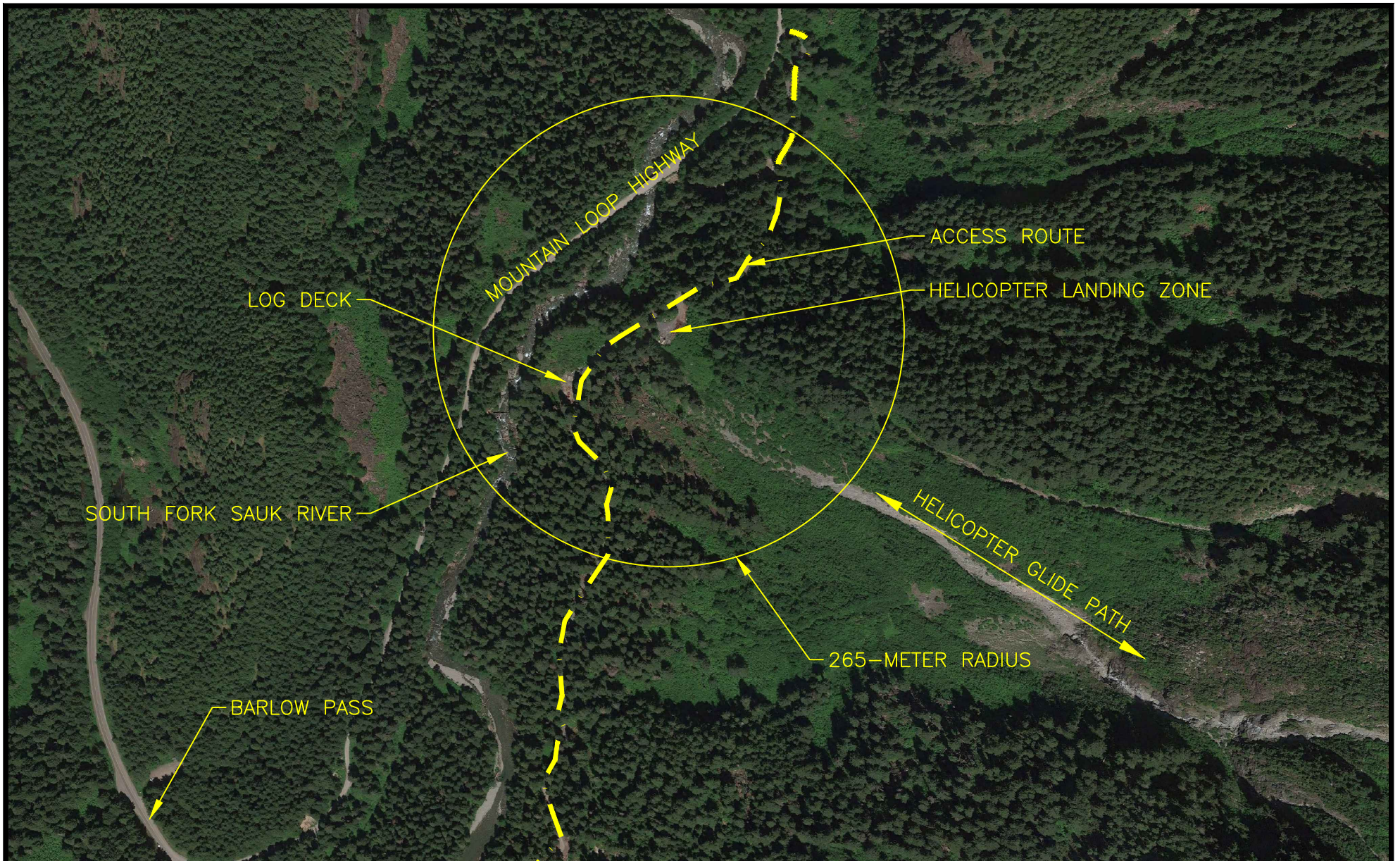
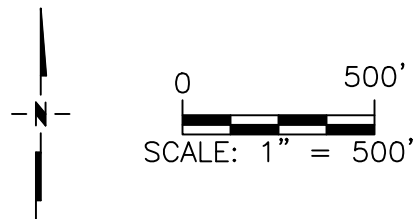
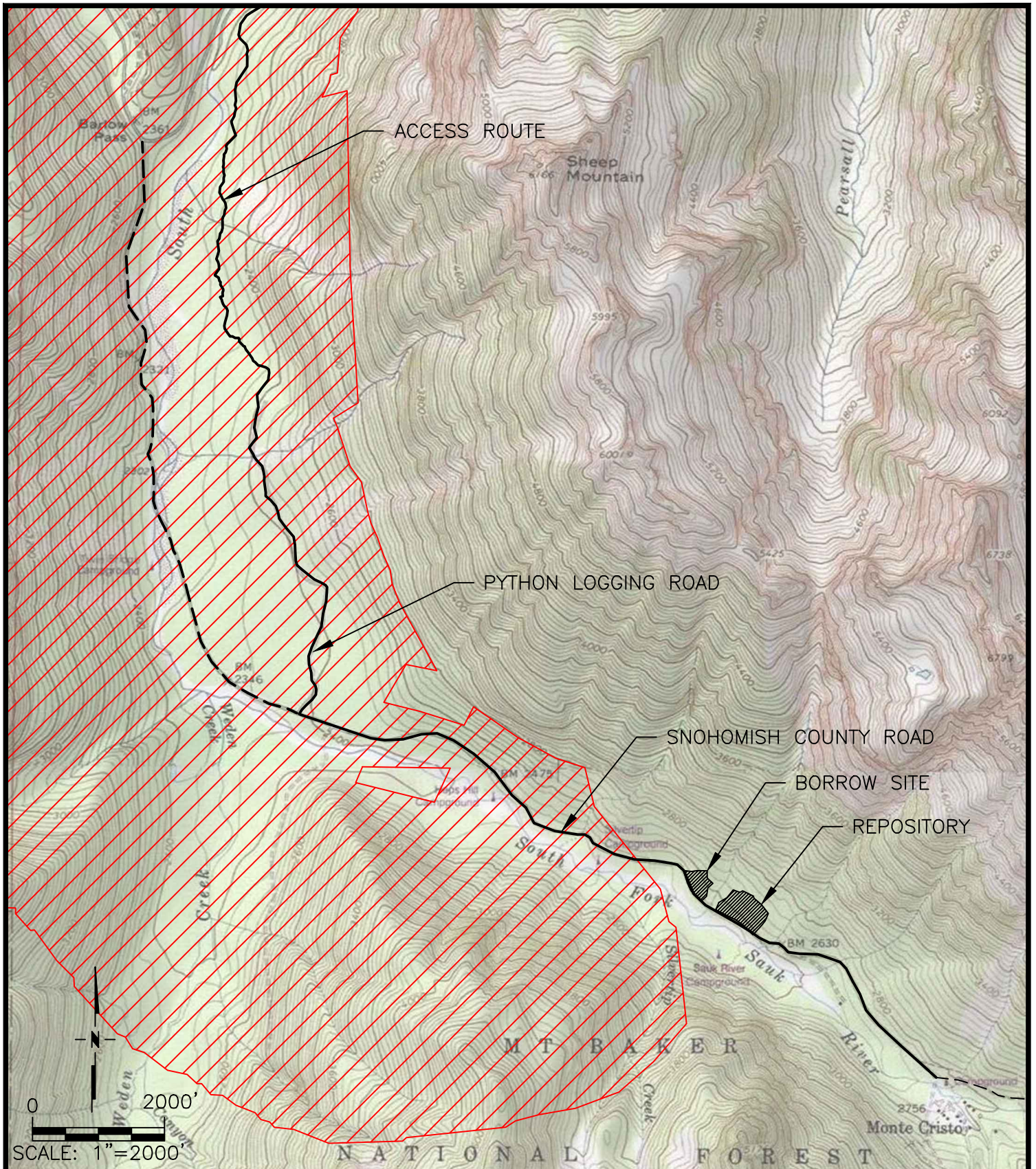


Figure 2. Helicopter Landing Zone and 265 Meter Radius



(SOURCE: Google Earth Pro Image June 2015, ©2015 Google)

PROJECT NUMBER: 2015230017	Monte Cristo Mining Area
DATE: 12/18/2015	Removal Action – Biological Monitoring Report
DWG NO: 2015230017 F2 BM.dwg	USDA Forest Service
DWG BY: 6JTP	Mt. Baker–Snoqualmie National Forest
PROJECT MANAGER: 1RMT	Snohomish County, Washington
REVISED:	CES CASCADE EARTH SCIENCES A Valmont Industries Company



EXPLANATION:

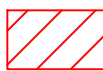

 MARBLED MURRELET CRITICAL HABITAT (LSR-116)

Figure 3. Critical Murrelet Habitat

PROJECT NUMBER: 2015230017	Monte Cristo Mining Area Removal Action – Biological Monitoring Report
DATE: 12/18/2015	USDA Forest Service
DWG NO: 2015230017 F3 BM.dwg	Mt. Baker–Snoqualmie National Forest Snohomish County, Washington
DWG BY: PROJECT MANAGER: 6RKB 1RMT	 CASCAD EARTH SCIENCES A Valmont Industries Company
REVISED:	

(Source: USGS 7.5 min Topographic Map ©2015 National Geographic Society, i-cubed and U.S. Fish and Wildlife Service Marbled Murrelet habitat October 4, 2011)

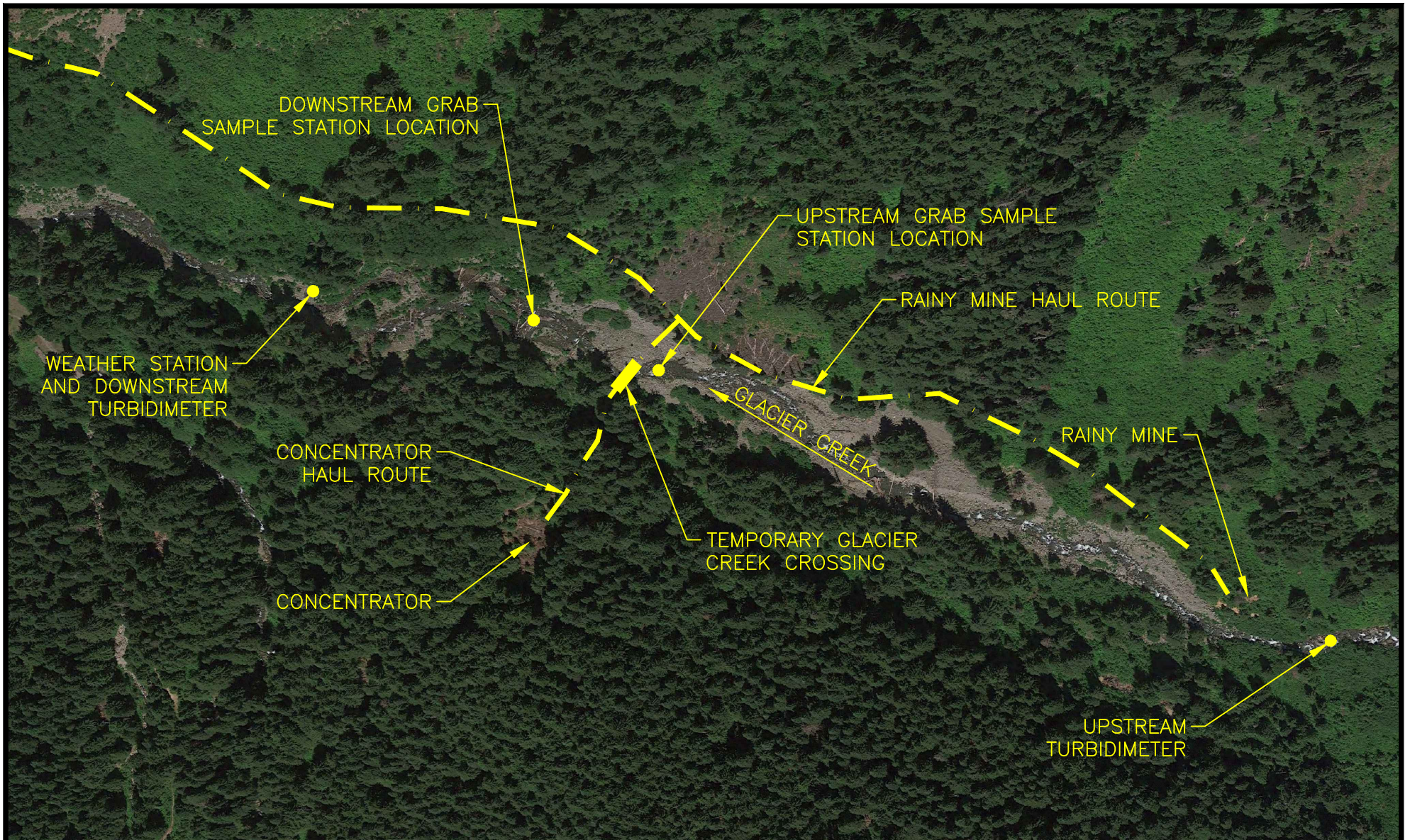
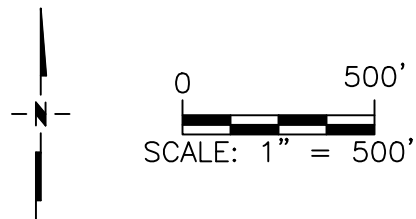


Figure 4. Temporary Glacier Creek Crossing and Turbidity Monitoring Stations



(SOURCE: Google Earth Pro Image June 2015, ©2015 Google)

PROJECT NUMBER: 2015230017	Monte Cristo Mining Area
DATE: 12/18/2015	Removal Action – Biological Monitoring Report
DWG NO: 2015230017 F4 BM.dwg	USDA Forest Service
DWG BY: 6JTP	Mt. Baker–Snoqualmie National Forest
PROJECT MANAGER: 1RMT	Snohomish County, Washington
REVISED:	CES CASCADE EARTH SCIENCES A Valmont Industries Company

APPENDICES

Appendix A.	U.S. Fish and Wildlife Service Documentation
Appendix B.	Photographs
Appendix C.	Continuous In-Situ Turbidity Documentation (Electronic)

Appendix A.

U.S. Fish and Wildlife Service Documentation



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Washington Fish and Wildlife Office
510 Desmond Dr. SE, Suite 102
Lacey, Washington 98503

JUN 29 2015

In Reply Refer To:

01EWF00-2011-F-0067-R002

X ref: 13410-2011-F-0067-R001

13410-2011-F-0067

Jennifer Eberlien
Mt. Baker-Snoqualmie National Forest
2930 Wetmore Avenue, Suite 3A
Everett, Washington 98021

Dear Ms. Eberlien:

Subject: Monte Cristo CERCLA Project

This letter transmits the amended Incidental Take Statement for the Monte Cristo CERCLA Project and fulfills the requirement for reinitiation of formal consultation under section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (ESA).

The Mt. Baker-Snoqualmie National Forest (Forest) submitted changes to the project description and indicated that the determination of “likely to adversely affect” for northern spotted owl (*Strix occidentalis caurina*) (spotted owl), marbled murrelet (*Brachyramphus marmoratus*) (murrelet), bull trout (*Salvelinus confluentus*), and designated critical habitat for these three species remains unchanged, and the determination of “not likely to adversely affect” for gray wolf (*Canis lupus*) and grizzly bear (*Ursus arctos horribilis*) also remains unchanged. Your May 28, 2015 request for reinitiation was received in our office on June 1, 2015.

Consultation History

The U.S. Fish and Wildlife Service (Service) completed formal consultation on the Monte Cristo CERCLA Project on September 16, 2011. Information concerning the status of the spotted owl, murrelet and bull trout, the environmental baseline, the effects of proposed action, and the cumulative effects were analyzed in the 2011 Biological Opinion (USFWS 2011, Service reference number 13410-2011-F-0067). The statuses of these species, the environmental baseline, and the cumulative effects have not substantially changed since 2011 and are still adequately described in that biological opinion. That consultation also included our concurrence that the proposed project is not likely to adversely affect gray wolves and grizzly bears.

The Monte Cristo CERCLA Project was reinitiated due to a Final Rule (77 FR 71876) for new locations of spotted owl critical habitat on January 9, 2013. Formal consultation was concluded on January 18, 2013 (USFWS 2013a, Service reference number 13410-2011-F-0067-R001), with the conclusion that the proposed project was not likely to destroy or adversely modify critical habitat for the spotted owl.

The Forest requested reinitiation of formal consultation for the Monte Cristo CERCLA project by letter dated May 28, 2015, and received in our office on June 1, 2015. Formal consultation was therefore initiated on June 1, 2015. The Service received additional information from the Forest by email on June 4, 2015.

Summary of the Proposed Action

The majority of the project description remains unchanged, and is included in the 2011 biological opinion. The following is a summary of the changes that occurred during project implementation since 2011, and then a summary of the changes that the Forest proposed in their May 28 letter.

The Forest made several adjustments to the proposed action as the access route was designed and constructed. Presumably since the adjustments were similar to the plan that was originally consulted on but of lesser magnitude, the Forest did not reinitiate consultation. Changes implemented since 2011 included but were not limited to: 1) a shift in road design from a Maintenance Level 2 Forest Service specified road to a route that is narrower and incorporates steeper grades (resulting in fewer large diameter trees removed than anticipated), and 2) road alignment shifts with more of the constructed route following an existing road segment at Haps Hill.

The Forest is proposing changes to previously consulted-on operations to complete the Monte Cristo CERCLA Project. Proposed changes include the following:

- Helicopter landing – The location of the helicopter landing and refueling site would shift from the Monte Cristo town site to the first opening along the access route (Station 13+00).
- Slash disposal – The primary disposal of slash at the repository site would be by mechanical chipping; however any tree waste material not conducive to chipping would be disposed of by piling and burning.
- New log decking location – The logs resulting from the repository clearing would be decked primarily at the second opening (open rock area) along the access route approximately 0.25 mile from the Mt. Loop Scenic By-way (USFS 2015, p. 5).
- Time extension – There would be an extension of the time frame for project operations from two years to three years.

Helicopter Landing

The Forest evaluated various helicopters for lift capabilities to ensure efficient operations in the clean-up operations at the Monte Cristo town site and in the wilderness. They determined that a 10,000 lb lift machine was the best choice for efficient removal of waste rock from Pride of the Woods to the Repository. Therefore, the use of a Columbia Vertol 107-II (10,000 lb payload capacity), or equivalent load-capacity helicopter, would need a tanker sized refueling truck. However, during first year operations, there was the decision for a design change in the new road construction (section from the Mt. Loop Scenic By-way to the Monte Cristo work site) which shifted the access road from a Level 2 road to a narrower route. This new route does not accommodate the size of a fuel truck needed for the large helicopter operations projected to be in the Monte Cristo town site. Therefore, the first opening along the new access route (Station 13+00, where the campsite was located during the 2013/2014 season) was selected for the helicopter re-fueling location. A Columbia Vertol 107-II would likely be used to complete the work. The Forest may still need to switch to a larger helicopter (Chinook 47d), and would like the Service to consult on the effects of the larger helicopter on listed species.

Modifications to the first opening for safe helicopter operations would include the removal of eight live trees in an isolated island with diameters ranging from 9.5 inches to 36.7 inches diameter at breast height. These trees were field reviewed on March 26, 2015, and no limbs of sufficient size or character for nesting murrelets and no cavities for nesting spotted owls were identified. The trees were isolated from the surrounding forest, with trees having an open canopy.

The 40-foot by 40-foot landing pad area will not require any additional excavation and fill. An area approximately 10-foot by 15-foot on the northwest corner of the clearing will be graded to provide safer vehicle access around what is currently a very tight corner. Vegetation in this area is limited to low brush and vine maple.

Helicopter flight operations would be restricted to occur from 2 hours after sunrise and 2 hours before sunset. Helicopter work is scheduled for approximately a month with 12 hour work days. Contingencies may occur during operations at the Monte Cristo work site, resulting in the helicopter landing a little late in the day (after 2 hours before sunset), but this would be the exception versus operating procedure. Work around the landed helicopter (pre-flight check, fueling, etc.) may occur before 2 hours after sunrise and after 2 hours after sunset. The flight path for the helicopter when taking off and landing would utilize the open avalanche chute area adjacent to the landing zone. Helicopter flights (outside of take-off and landing) would be at least 500 feet above the canopy.

Slash Disposal

The biological assessment (USFS 2011) identified the need to clear trees from up to 3 acres of land at the repository site. The clearing of the repository site would entail cutting trees, moving trees to deck sites, and clean-up of the branches or resulting slash material from felling. The primary method for slash disposal would be through mechanical chipping of the tree waste material; however, material not conducive to chipping would be piled for burning in the

repository location. Any pile burning would occur after September 23, outside of the murrelet and spotted owl breeding season. The chipping, slash piles, and burning would be located outside of critical habitat for the spotted owl and murrelet.

New Log Decking Location

The roadway plans used in the preparation of the biological assessment (USFS 2011) displayed open areas along the access route that would be “staging areas,” used for equipment, support operations, and log decks. However, due to the implemented change in the access route to utilize more of the previous ground-disturbed route, the access road now crosses a natural rock opening (referred to as the second opening where the saw mill operated during the 2014 season). This area, along with the first opening, were used as “staging areas” and are now proposed for the helicopter re-fueling site and log deck area. Other openings along the road (shown as staging areas in the roadway plans) (USFS 2015, p. 5) would also be considered for decking logs if so needed. The use of the second opening as the primary log deck area would not result in the need for additional clearing of trees.

Time Extension

The Monte Cristo CERCLA Project was originally proposed to be completed in two years. Unforeseen delays prevented the Forest from completing the project within two years, and therefore the Forest is now proposing to operate in a third year to complete the proposed action. Many of the aspects of the proposed action will still only occur a single time (e.g., tree felling, bridge construction, mine reclamation, etc.) but certain activities to complete those aspects (e.g., trucks driving in the action area, presence of workers, operation of heavy equipment, etc.) would occur for an additional year (specifically, one summer/fall work season longer than originally anticipated).

Effects to Spotted Owls

The following is an analysis of the anticipated effects resulting from changes to the proposed action.

Effects from Helicopter Landing

In the 2011 biological opinion, the Service concluded that 80 acres of suitable habitat for spotted owls would be exposed to disturbance from vehicles and heavy equipment (USFWS 2011, p. 20). The proposed new helicopter landing may affect spotted owls by creating loud noise and rotor wash at the landing site and along the flight path between the landing site and the mine reclamation areas. The Forest estimated that the helicopter work would expose 25 acres of suitable habitat to noise greater than 92 decibels (A-weighted) (dBA) and 2.75 acres of suitable habitat to rotor wash (USFS 2015, p. 3; Reed, *in litt.* 2015). In previous consultations, we have analyzed the effects of disturbance on spotted owls, and concluded that adverse effects may occur when noise and human activity causes a spotted owl to flush from a nest during the early nesting season (USFWS 2013b, p. 86) or when large helicopters (e.g., Chinook 47d) fly within 265 yards of known occupied spotted owl nest tree or suitable nest trees in unsurveyed nesting

habitat (USFWS 2013b, p. 82). We have also analyzed the effects of rotor wash on spotted owls, and concluded that adverse effects may occur when a hovering Chinook 47d helicopter is within 100 yards of known occupied spotted owl nest trees or suitable nest trees in unsurveyed nesting habitat (USFWS 2013b, p. 82). However, the 2011 biological opinion also considered that the nearest spotted owl activity center is 0.5 mile away from the road that would be used for the project and that there are no known potential spotted owl nest trees near that road. The actual road alignment as it was built is still 0.5 mile away from the nearest spotted owl activity center and there are no known potential spotted owl nest trees near the road. With those considerations, the determination in the 2011 biological opinion was that human activity and project activities that create noise greater than 92 dBA were extremely unlikely to flush a spotted owl from a nest because a spotted owl nest was extremely unlikely to be present (USFWS 2011, p. 20). We anticipate that, even with the additional area that would be disturbed by the new helicopter landing, nesting spotted owls are still unlikely to be present and exposed to project activities during the early nesting season. Similarly, we anticipate that rotor wash at the proposed helicopter landing is extremely unlikely to affect a spotted owl nest.

The Forest is proposing to remove eight trees to create a safe helicopter landing. Since these trees occur in a small isolated patch and none of the trees have structural characteristics sufficient for spotted owl nesting, we anticipated that effects to spotted owls from clearing them for the helicopter landing would be insignificant.

Effects from Slash Disposal

Slash disposal by chipping, piling, and burning may affect spotted owls by exposing them to smoke. However, the Forest's proposed action includes a conservation measure that would delay any slash pile burning until after September 1. At that time of year, adult spotted owls and recently fledged spotted owls would easily move away from the effects of smoke. Therefore, disruptions to normal spotted owl behaviors would be insignificant.

Effects from New Log Decking Location

Log removal from the repository and log decking at the first or second opening would not cause effects to spotted owls that were not considered in the 2011 biological opinion.

Effects from Time Extension

Construction/reclamation activities would occur for a duration one year longer than originally analyzed in the 2011 biological opinion. The increased duration of the action would not increase the habitat modification component of the proposed project, but it would increase the potential for disturbance from noise and human presence. In the 2011 biological opinion, we concluded that human activity and project activities were extremely unlikely to flush a spotted owl from a nest because a spotted owl nest is extremely unlikely to be present (USFWS 2011, p. 20). We anticipate that a third year of project duration would not significantly increase the probability of exposure, and therefore that the noise and human activities associated with the proposed activities would still be extremely unlikely to affect spotted owls.

Effects to Marbled Murrelets

The following is an analysis of the anticipated effects resulting from changes to the proposed action.

Effects from Helicopter Landing

As described above, the Forest is proposing to use the first opening along the new access route to operate as a helicopter landing for a ship as large as a Chinook 47d helicopter. The 2011 biological opinion did not address the effects of helicopter landing because at that time helicopter use and landing was only proposed for areas outside of suitable habitat for murrelets (high elevation areas). The proposed new helicopter landing may affect murrelets by creating loud noise and rotor wash at the landing site and by creating loud noise along the flight path between landing site and mine reclamation areas. Flights would occur at least twice daily for multiple weeks during the 2015 summer work season. The new helicopter landing may also affect murrelets as a result of tree removal.

Disturbance

In previous consultations, we have analyzed the effects of disturbance on murrelets, and concluded that adverse effects may occur when project noise or activity causes a murrelet to become so agitated that it flushes away from a nest or perch within the vicinity of a nest site (including delay or avoidance in nest establishment), or aborts or delays a feeding attempt during incubation or brooding of nestlings (USFWS 2013b, p. 101). These responses are considered significant disruptions of normal behaviors that result in a likelihood of injury to murrelets. A flush from a nest site includes movement out of an actual nest, off of the nest branch, and away from a branch of a tree within suitable habitat during the nesting season. Such events are considered significant because they have the potential to result in reduced hatching success, fitness, or survival of juveniles and adults.

Specifically, we previously concluded that the extent of significant disturbance caused by a Chinook 47d helicopter when landing, hovering, and taking off is likely to have radius of 265 yards (based on the 92 dBA contour) (Newman et al. 1984, *in* USFWS 2013b, p. 103). Additionally, we anticipated that murrelets may be adversely affected by rotor-wash within a 100-yard radius of a Chinook 47d helicopter when landing, hovering, or taking off (USFWS 2013b, p. 103). However, when Chinook 47d helicopters were flying overhead, Newman and others (1984, Appendix A) measured lower maximum noise levels than when the same helicopter was landing, hovering, and taking off. Using the same methodology we used to calculate the extent of disturbance for landing, hovering, and taking off (USFWS 2009, pp. 46-48; USFS 2009), we calculated the 92 dBA contour for Chinook 47d overflights and concluded that the extent of significant disturbance was likely to have a radius of 324 feet (Appendix A).

The proposed helicopter work may disturb murrelets within 265 yards of the new landing site. Since the proposed helicopter flights (outside of take-off and landing) would occur at least 500 feet above the canopy (Reed, *in litt.* 2015), we conclude that noise from the helicopter would not significantly affect nesting murrelets. The flight path for the helicopter when taking off and

landing would utilize the open avalanche chute area adjacent to the landing zone, so not all habitats within the helicopter glide path or operating radius are suitable nesting habitat for murrelets. Based on aerial photograph and review of habitat within 265 yards of the helicopter fueling site, the Forest estimated that there would be a potential for noise disturbance within 25 acres of mature to old forest adjacent to the helicopter landing (USFS 2015, p. 3). We agree that any murrelets within these 25 acres of mature to old forest are reasonably certain to be disturbed by helicopter operations.

The Forest has a proposed conservation measure limiting most helicopter flights to the period of time between 2 hours after sunrise and 2 hours before sunset. Unavoidable contingencies (technical difficulties, unanticipated weather, etc.) may result in some helicopter flights during restricted hours. Given the complicated nature of CERCLA cleanups in wilderness areas, we anticipate that at least one unavoidable contingency is reasonably certain to occur. We are therefore considering the adverse effects of some helicopter flights during restricted hours in this analysis. However, even when the proposed helicopter work adheres to the period of time between 2 hours after sunrise and 2 hours before sunset, this conservation measure would reduce but not eliminate the probability of interrupting feeding of nestlings (USFWS 2013b, Appendix A).

The Forest has proposed on-the-ground work around the landed helicopter (pre-flight check, fueling, etc.) that may occur earlier or later than the period of time between 2 hours after sunrise and 2 hours before sunset. However, we do not anticipate that work at this one location would significantly increase the risk of exposure described above because the proposed helicopter landing is located outside of immediate suitable murrelet habitat (over 35 yards to suitable nesting trees), much of the vicinity (within 100 meters) is an avalanche chute, and much of the vicinity is already within 100 meters of the Mountain Loop Highway (a high-use open road).

Rotor Wash

As described above, murrelets may be adversely affected (injury or mortality) by rotor-wash within a 100-yard radius of a Chinook 47d helicopter when landing, hovering, or taking off (USFWS 2013b, p. 103). Rotor wash is a column of high velocity air forced downward by a helicopter's blade rotation (Slijepcevic and Fogarty 1998, p. 1). Helicopter rotor wash can cause saplings, decaying trees, and loose debris from tree tops to fall, and can create hazardous conditions from dust and flying debris underneath the ship (WCB 2005, p. 19). The Forest estimated that 2.75 acres of suitable habitat for murrelets would be exposed to significant rotor wash during the nesting season in 2015 (Reed, *in litt.* 2015). Because murrelets occupy Washington State forests at a very low density, we cannot be reasonably certain that murrelets would be exposed to these adverse effects in only 2.75 acres of suitable habitat.

Tree Removal

The Forest is proposing to remove eight trees to create a safe helicopter landing. Since these trees occur in a small isolated patch, none of the trees have structural characteristics sufficient for murrelet nesting, none of these trees have intermingled branches with other trees that have structural characteristics sufficient for murrelet nesting, and edge effects to other forest stands would not occur, we anticipate that effects to murrelets from clearing these trees would be insignificant.

Effects from Slash Disposal

Slash disposal by chipping, piling, then burning may affect murrelets by exposing them to smoke. However, the Forest proposed to limit slash pile burning until after September 1. We anticipate that murrelets in the action area are extremely unlikely to be exposed to smoke from burning slash piles after September 1 because: 1) Slash piles would be burned only during approved atmospheric conditions that lead to vertical smoke movement and quick smoke dissipation (pursuant to Washington State Department of Natural Resources smoke permit approval), and 2) we assume that approximately 95 percent of the expected murrelet nestlings would have previously fledged (USFWS 2013b, Appendix A). Therefore, we anticipate that murrelets are extremely unlikely to be exposed to smoke from burning slash piles and the effects of slash treatment on murrelets would be discountable.

Effects from New Log Decking Location

Log removal from the repository and log decking at the first or second opening are not anticipated to cause effects on murrelets that were not considered in the 2011 biological opinion.

Effects from Time Extension

Construction/reclamation activities would occur for one year longer than originally analyzed in the 2011 biological opinion. The increased duration of the action would not increase the habitat modification component of the proposed project, but it would increase the potential for disturbance from noise and human presence. In the 2011 biological opinion, the Service concluded that 43 acres of suitable habitat for murrelets would be exposed to disturbance from vehicles and heavy equipment for two years (USFWS 2011, p. 40).

Since the 2011 biological opinion was signed for the Monte Cristo CERCLA project, the Service has revised the analyses that were used to describe the potential adverse effects to murrelets from noise and human presence, specifically the operation of heavy equipment. Reconsideration of the best available science led the Service to conclude that significant behavioral responses of murrelets to noise and human activity could occur at distances up to 100 meters during the nesting season (USFWS 2013b, Appendix H). Accordingly, we are revising the analysis for disturbance to evaluate a greater area of exposure and a longer duration of exposure. The Forest estimated that there are 106 acres of suitable murrelet habitat within 100 meters of the new road alignment (Reed, *in litt.* 2015). Those acres have been affected by the project for the past two years and are proposed to be affected for a third year.

In the 2011 biological opinion, the Service concluded that the combination of increased numbers of corvids along the road corridor and disturbance from project activities could result in the loss of a single murrelet nesting attempt due to predation of the egg or young (USFWS 2011, p. 40). This affect was anticipated to occur within a 43-acre area (USFWS 2011, p. 40). Even though the area in which disturbance may occur is now believed to be 106 acres, and the duration of noise and human presence is now 3 years, we still anticipate that the proposed action would lead to the loss of a single murrelet nesting attempt because murrelets occupy Washington State forest at a very low densities.

Summary of New Effects to Marbled Murrelets

The effects of changes associated with slash disposal, the new decking location, tree removal at the helicopter landing, and helicopter overflights on murrelets are anticipated to be insignificant or not reasonably certain to result in significant disruptions of normal behavior or death/injury of murrelets. The proposed relocation of the helicopter landing and the extended duration of the proposed activities would be reasonably certain to significantly disrupt the normal behavior of murrelets associated with 131 acres of suitable habitat (106 acres along the road, and 25 acres at the helicopter landing, with some overlap). The anticipated rotor wash may injure or kill nesting murrelets within 2.75 acres of suitable habitat, but we do not consider injure or death of murrelets to be reasonably certain to occur in this case. These effects would occur during the additional 2015 work season.

Effects to Bull Trout and Bull Trout Critical Habitat

The new helicopter landing site, the new method of slash disposal, and the new log decking location would not affect bull trout or bull trout critical habitat. Since the proposed time extension would not increase the number of stream crossings built or removed or the number of fish salvage operations, we anticipate that the effects of the proposed would not be altered, other than occurring in 2015 instead of 2014. Therefore, the analysis in the biological opinion for effects to bull trout and bull trout critical habitat remains accurate and the take statement need not be amended.

Effects to Spotted Owl Critical Habitat

The Service published a final revised critical habitat designation for the spotted owl on December 4, 2012 (77 FR 71875); the rule became effective on January 3, 2013. The primary constituent elements (PCEs) are the specific characteristics that make habitat areas suitable for nesting, roosting, foraging, or dispersal (77 FR 71876:71884). The PCEs identified in the revised spotted owl critical habitat rule include 1) forest types in early-, mid-, or late-seral stages that support the spotted owl across its geographic range; 2) nesting and roosting habitat; 3) foraging habitat; and 4) dispersal habitat (77 FR71876:72051-72052). The Project is located within Unit 04: West Cascades North: WCN1 of designated critical habitat for the spotted owl. The subunit contains 438,255 acres of critical habitat in Whatcom, Skagit, and Snohomish Counties, Washington, and comprises lands managed by the USFS and the State of Washington.

The only new effect to spotted owl critical habitat from the proposed Monte Cristo CERCLA project that was not previously considered is the removal of eight trees for the safe helicopter landing at the first opening along the new access route. Removal of those eight trees would occur in critical habitat for spotted owls. The portion of the project area where the additional tree removal would occur is within a larger matrix of forest patches that meet the definition of PCE 1, and some forest patches in vicinity are considered suitable habitat (PCEs 2 or 3). However the individual trees to be removed occur in a small isolated patch of non-suitable habitat and none of the trees have structural characteristics sufficient for spotted owl nesting. We therefore anticipate that effects to spotted owl critical habitat from clearing these eight trees for the helicopter landing would be insignificant to PCE 1 and would have no effect on PCEs 2, 3, or 4.

All other effects of the proposed action on spotted owl critical habitat, including adverse effects, were described and analyzed in the first reinitiation of the 2011 biological opinion (Service reference number 13410-2011-F-0067-R001).

Effects to Marbled Murrelet Critical Habitat

In the 2011 revised Final Rule designating critical habitat for the murrelet (76 FR 61599:61607 [October 5, 2011]), the Service identified PCEs essential to provide and support suitable nesting habitat for successful reproduction of the murrelet, and thus its conservation. These are 1) individual trees with potential nesting platforms (PCE 1), and 2) forested areas within 0.5 mile of individual trees with potential nesting platforms, and with a canopy height of at least one half the site-potential tree height (PCE 2).¹ Areas with just PCE 1, or both PCE 1 and 2, are considered to be critical habitat by definition. Also, activities that occur within or adjacent to lands designated as critical habitat may still have an effect on PCEs, depending on the particular aspects of the Federal action involved.

The only new effect to murrelet critical habitat from the proposed Monte Cristo CERCLA project that was not previously considered is the removal of eight trees for safety at the helicopter landing at the first opening along the new access route. Removal of those eight trees would occur in critical habitat for murrelets. The trees proposed to be removed do not have structural characteristics sufficient for murrelet nesting, and are therefore not PCE 1s. These trees are, however, likely to be within 0.5 mile of a PCE 1 and some of these eight trees are at least one half the canopy height of a site-potential tree, and therefore meet the definition of PCE 2. We anticipate that the effects of removing up to eight PCE 2s in an isolated patch of murrelet critical habitat would be insignificant, given the very small number of trees to be removed and the minimal support function that these trees provide when not connected to a contiguous closed-canopy forest. Removal of these trees would expand the size of a natural opening and not significantly degrade the function of murrelet critical habitat at the site scale or any larger scale.

¹ *The Washington Fish and Wildlife Office has enumerated these as discrete PCEs for convenience; the Federal Registers (1996 and 2011) do not identify these PCEs with discrete numbers.*

All other effects of the proposed action on murrelet critical habitat, including adverse effects, were previously addressed in the 2011 biological opinion.

Conclusion

After reviewing the current status of bull trout, spotted owl, and murrelet, the environmental baseline for the action area, the effects of the proposed Monte Cristo CERCLA Project and the cumulative effects on bull trout, spotted owl, and murrelet and their critical habitat, it is the Service's Opinion that the action, as proposed, is not likely to jeopardize the continued existence of these species and is not likely to destroy or adversely modify designated critical habitats.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. *Harm* is defined by the Service as an act which actually kills or injures wildlife. Such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering (50 CFR 17.3). *Harass* is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3). Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the (agency) so that they become binding conditions of any grant or permit issued to the (applicant), as appropriate, for the exemption in section 7(o)(2) to apply. The (agency) has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the Forest 1) fails to assume and implement the terms and conditions or 2) fails to require the (applicant) to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Forest must report the progress of the action and its impact on the species to the Service as specified in this Incidental Take Statement [50 CFR 402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

The anticipated incidental take for bull trout has not changed from the 2011 biological opinion, other than the year in which it occurs. Incidental take of spotted owls was not anticipated in the 2011 biological opinion and is still not anticipated as a result of the proposed changes to the action. Therefore, this revised take statement only applies to murrelets. Two years of project activities have already occurred; therefore this incidental take statement is for the third year of activities that the Forest has proposed to conduct.

Incidental take of murrelets is difficult to detect because the species is cryptic and murrelet nests are located rarely. However, based on the documented history of murrelet occupancy behaviors in the South Fork Sauk River watershed, and adjacent watersheds, suitable murrelet nesting habitat in the project area is reasonably certain to be occupied. Therefore the amount of nesting habitat that would be exposed to actions that would result in take provides a reasonable surrogate measure for this species.

In this revised take statement, we determined that noise and activity associated with use of motorized equipment and helicopters in the action area during this third year of construction and clean-up period (2015), coupled with increases in densities of corvids, will result in the incidental take of murrelets nesting within the 131 acres of suitable habitat in proximity to the new road and helicopter landing site. This take is in the form of harassment through significant disruption of normal nesting behaviors that creates a likelihood of injury due to decreased fitness of chicks from missed feedings for a third year and the increased possibility of predation by corvids in perpetuity (which was described in the 2011 biological opinion).

EFFECT OF THE TAKE

In the 2011 biological opinion and this revised take statement, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES

The conservation measures negotiated in cooperation with the Service and included as part of the proposed action constitute all of the reasonable measures necessary to minimize the impacts of incidental take. On that basis, no Reasonable and Prudent Measures (RPMs) except for monitoring and reporting requirements are included in this Incidental Take Statement. This RPM is a revision of RPM 2 for murrelets in the 2011 biological opinion. RPM 1 for murrelets remains unchanged.

RPM 2: Monitor the nature and extent of activities that are likely to result in incidental take of murrelets. Report the results of such monitoring.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the ESA, the Forest must comply with the following terms and conditions, which implement the reasonable and prudent measure described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

The following term and condition is required for implementation of RPM 2.

1. In order to monitor the impacts of the proposed action and the implementation of the RPMs, the Forest shall prepare a report describing the progress of the proposed action, including implementation of the associated terms and conditions, and impacts to the murrelet. The report shall be submitted to the consulting biologist or branch manager of the Washington State Office on or before January 31, annually until project completion. Electronic correspondence is acceptable for the reporting. The monitoring report shall include the following:
 - a) The quantity of suitable murrelet habitat acres that are within 100 meters of noise and human activity (particularly operation of heavy machinery) and the quantity suitable murrelet habitat acres that are within 265 meters of helicopter operations at the landing site shall be reported.

The Service believes that murrelets associated with no more than 131 acres of suitable habitat will be incidentally taken as a result of the proposed action. The reasonable and prudent measure, with its implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

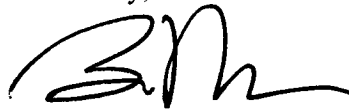
The Service is to be notified within three working days upon locating a dead, injured or sick endangered or threatened species specimen. Initial notification must be made to the nearest U.S. Fish and Wildlife Service Law Enforcement Office. Notification must include the date, time, precise location of the injured animal or carcass, and any other pertinent information. Care should be taken in handling sick or injured specimens to preserve biological materials in the best possible state for later analysis of cause of death, if that occurs. In conjunction with the care of sick or injured endangered or threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence associated with the specimen is not unnecessarily disturbed. Contact the U.S. Fish and Wildlife Service Law Enforcement Office at (425) 883-8122, or the Service's Washington Fish and Wildlife Office at (360) 753-9440.

REINITIATION NOTICE

This concludes formal consultation on the actions outlined in the reinitiation request. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding the Opinion, the amended take statement, or our shared responsibilities under the ESA, please contact Zach Radmer at 360-753-4325 or Carolyn Scaffidi at 360-753-4068.

Sincerely,



pm Eric V. Rickerson, State Supervisor
Washington Fish and Wildlife Office

cc:

Mt. Baker National Forest, Everett, WA (J. Plumage)

Mt. Baker National Forest, Everett, WA (L. Everest)

Mt. Baker National Forest, Everett, WA (P. Reed)

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- _____. 2013a. Reinitiation of the biological opinion for the Monte Cristo CERCLA Project, due to the 2012 designation of revised critical habitat for the northern spotted owl. January 18, 2013. Service Reference Number 13410-2011-F-0067-R001. Washington Fish and Wildlife Office, Lacey, WA.
- _____. 2013b. Biological Opinion for Effects to Northern Spotted Owls, Critical Habitat for Northern Spotted Owls, Marbled Murrelets, Critical Habitat for Marbled Murrelets, Bull Trout, and Critical Habitat for Bull Trout from Selected Programmatic Forest Management Activities March 25, 2013 to December 31, 2023 on the Olympic National Forest, Washington. U.S. Fish and Wildlife Service Reference: 13410-2009-F-0388. Washington Fish and Wildlife Office, Lacey, WA.
- WCB 2005. Safe work practices for helicopters in the forest industry. Workers Compensation Board of British Columbia. www.worksafefbc.com. 34 pp.

***In Litteris* REFERENCES**

Reed, P. 2015. Wildlife Biologist/Environmental Coordinator, Mt. Baker-Snoqualmie National Forest, Darrington. Email to Zachary Radmer, Fish and Wildlife Biologist, U.S. Fish and Wildlife Service, Washington Fish and Wildlife Office, Lacey. Topic: June 4, 2015, email transmitting clarifications to the changed proposed action for the Monte Cristo CERCLA Project.

APPENDIX A

In a previous biological opinion (USFWS 2009) we analyzed available data to determine the 92 dBA contour of a Chinook 47d helicopter. However, the previously analyzed sound recordings were taken during landing and take-off, and may not be comparable to the noise generated by a helicopter flying overhead. We used a more appropriate sound measurement from the same data set (Newman et al. 1984) to analyze the effects of helicopter overflights in the proposed action. Below, we describe how we followed the same methodology used in our previous biological opinion (USFWS 2009) but started with a different sound measurement.

The San Dimas Technology and Development Center, in San Dimas, California (San Dimas) was contracted by the Olympic National Forest to analyze sound levels of two helicopters often used for logging in Washington and Oregon. San Dimas measured sound levels of two different helicopters during a helicopter logging operation in Oregon. The study (USFS 2009) reported sound measurements of the Kaman KMAX, a helicopter with a 5,000 lb “on hook” lifting capacity, and the Boeing Vertol 107 (Chinook 46 military equivalent) helicopter with a lifting capacity (assuming an external hook and not internal load) of 10,000 lbs. The average maximum sound level readings of noise at different distances were determined. The data showed that the KMAX was below the target level of 92 dBA level at almost all distances. However, the Vertol 107 exceeded 92 dBA levels at some distances. San Dimas generated a power regression curve (where $R^2=0.8467$ and $Y=134.88X$) to predict the 92 dBA level threshold. The regression curves were consistent with the theoretical relationship of the decrease in sound pressure level as distance increases, specifically 6 dBAs with every doubling of distance over “soft” surfaces (i.e., grass fields or brush) (Piercy and Daigle 1991, p. 3.7). The USFS San Dimas Technical Development Centers study (Simonson 2009, Results Chapter, p. 7) reported an attenuation rate that more closely fell within 4 dBA to 6 dBAs with every doubling of distance between sound meter and helicopter. Since the study area was located in the forest setting during an active logging operation, this attenuation range should be appropriate for application to the proposed action.

San Dimas’ final figure for the Vertol 107 was 92 dBA at about 225 ft. Although this figure uses the 6 dBA attenuation model, sound measurements were close enough to the helicopter (less than 150 ft) that the difference between that and the 8 dBA attenuation model would be insignificant. San Dimas added two standard deviations to that figure to achieve a 97.5 percent confidence interval that resulted in a 92 dBA level at a distance of 450 feet.

This analysis focuses on a study conducted by the Federal Aviation Administration (Newman et al. 1984) that measured sound levels of a Chinook 47d helicopter. Measurements were taken during take-off and approach at different speeds, fly-overs, hovering, and idling on the ground. Noise was measured from various angles and distances from the helicopter. Both sound exposure levels (SEL) and dBA levels were recorded. However, the study occurred at an airport and the Chinook 47d was not hauling a load as was the case in the San Dimas study.

Sound Exposure Level is the total noise energy produced from a single noise event. The SEL is a metric used to describe the total sound energy measured in a specific time period and can be computed from measured dBA sound levels. It is an integration of all the acoustic energy

contained within an event. However, few studies concerning wildlife disturbance report findings in SEL, particularly those in the air environment. Our injury analyses were based on determining a level of sound and the threshold of its detection by murrelets, and not necessarily the accumulation of sound energy over time. Further, SEL maximums can exceed the highest dBA level recorded over an event. For this project, we are more interested in novel noise events in an otherwise natural setting and decided that maximum dBA sound levels are more appropriate as a metric for analysis.

We used the highest recorded noise level from an overflight in the study as a reasonable worst case scenario for our injury threshold distance calculations. The highest recorded noise for the helicopter overflight was at a speed of 135 knots and with a “military trim,” or a helicopter pitch of about 6 degrees from the horizon, apparently a more aggressive (and louder) angle of flight and therefore presumably less comfortable to passengers than a typical helicopter pitch of 3 degrees from the horizon. A microphone was positioned 492 feet from the helicopter and directly in line with the flight path. Other microphones were positioned to the right and left of the flyover also in line with the flight path.

The average dBA max measurement for these overflights was 86 dBA ($n = 4$, std. dev. = 1.2). To create a 97.7 percent confidence interval, we added 2 standard deviations to the average maximum dBA (following San Dimas 2008) for a value of 88.4 dBA. We next choose the attenuation rate of 6 dB per doubling of distance because we considered the action area a “soft” site. Our calculations resulted in the 92 dB injury threshold level reached at 324 feet (approximately 108 yards). Our calculations do not account for the noise level of a helicopter lifting a load. Little data exists for this difference in noise levels. We assumed that the 97.7 percent confidence interval would account for any increase in noise generated from a helicopter with a load.

LITERATURE CITED

Piercy, J.E. and G.A. Daigle. 1991. Sound propagation in the open air. Page 3.2-3.26. *In*: Harris, C.M. (ed). Handbook of acoustical measurements and noise control, 3 ed. McGraw Hill.

Simonson, B. 2009. Sound measurements of helicopters during logging operations. USDA Forest Service. <http://fsweb/programs/im/sound_measure/helo_index.shtml>. Accessed Apr-3-2009.

U.S. Forest Service (USFS). 2008. Sound measurements of helicopters during logging operations. R.T. Harrison, R. Farve, and A. Horcher. USDA Forest Service San Dimas Technology & Development Center, San Dimas, CA. Online report at http://www.fs.fed.us/eng/techdev/IM/sound_measure/helo_index.shtml

U.S. Fish and Wildlife Service (USFWS). 2009. Biological opinion and letter of concurrence for the Greenwater River restoration project. October 26, 2009. Service Reference Number 2009-F-0382. U.S. Fish and Wildlife Service, Lacey, Washington. 84 pp.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Washington Fish and Wildlife Office
510 Desmond Dr. SE, Suite 102
Lacey, Washington 98503



SEP - 1 2015

In Reply Refer To:

01EWF00-2011-F-0067-R002

X ref: 13410-2011-F-0067-R001
13410-2011-F-0067

Steve Kuennen
Mt. Baker-Snoqualmie National Forest
2930 Wetmore Avenue, Suite 3A
Everett, Washington 98021

Dear Mr. Kuennen:

Subject: Monte Cristo CERCLA Project

This letter transmits a modification to the Incidental Take Statement for the Monte Cristo CERCLA Project issued under section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (ESA).

The Mt. Baker-Snoqualmie National Forest (Forest) notified the U.S. Fish and Wildlife Service (Service) on August 28, 2015, that the Forest would not be able to comply with Term and Condition # 8 that was issued with the Incidental Take Statement for the Monte Cristo CERCLA Project Biological Opinion signed on September 16, 2011.

Term and Condition # 8 originally read as follows:

T&C 8. The Forest shall fully remove the Glacier Creek crossing no later than August 31. The Forest shall restore the Glacier Creek channel to its pre-project contours, and shall remove all foreign fill material from the Glacier Creek crossing.

The Forest explained in the August 28, 2015, email (Everest *in litt.* 2015a) that the Forest and associated contractors were faithfully following the intent of the term and condition, but that extenuating circumstances out of their control slowed project implementation. Specifically, a significant portion of the work crew was dismissed for a week to protect their homes and combat wildfires in the Okanogan area. The Forest now estimates that work can be completed on the far side of Glacier Creek and the temporary crossing removed by September 15, 2015. Fish biologists with the Washington Department of Fish and Wildlife were consulted, and bull trout are not likely to begin spawning in the project area until after September 20, particularly in a warm low-water year like 2015 (Everest *in litt.* 2015b).

The Service is therefore modifying the Incidental Take Statement for the Monte Cristo CERCLA Project, and Term and Condition # 8 will now read as follows:

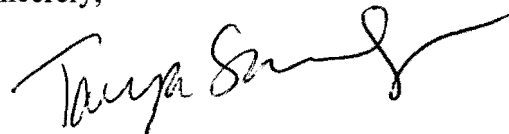
T&C 8. The Forest shall fully remove the Glacier Creek crossing no later than *September 15, 2015*. The Forest shall restore the Glacier Creek channel to its pre-project contours, and shall remove all foreign fill material from the Glacier Creek crossing.

The Forest's determination of "likely to adversely affect" for northern spotted owl (*Strix occidentalis caurina*) (spotted owl), marbled murrelet (*Brachyramphus marmoratus*) (murrelet), bull trout (*Salvelinus confluentus*), and designated critical habitat for these three species remains unchanged, and the determination of "not likely to adversely affect" for gray wolf (*Canis lupus*) and grizzly bear (*Ursus arctos horribilis*) also remains unchanged.

As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions regarding the Opinion, the modified take statement, or our shared responsibilities under the ESA, please contact Zach Radmer at 360-753-4325 or Carolyn Scafidi at 360-753-4068.

Sincerely,



Eric V. Rickerson, State Supervisor
Washington Fish and Wildlife Office



cc:

- Mt. Baker National Forest, Everett, WA (J. Plumage)
- Mt. Baker National Forest, Everett, WA (L. Everest)
- Mt. Baker National Forest, Everett, WA (P. Reed)

LITERATURE CITED***In Litteris* REFERENCES**

Everest, L. 2015a. Fisheries Program Manager, Mt. Baker-Snoqualmie National Forest, U.S. Forest Service, Everett, Washington. Email to: Zachary Radmer, Fish and Wildlife Biologist, Washington Fish and Wildlife Office, U.S. Fish and Wildlife Service, Lacey, Washington. Topic: August 28, 2015, email discussing the circumstances that led to the Forest's inability to meet term and condition #8.

Everest, L. 2015b. Fisheries Program Manager, Mt. Baker-Snoqualmie National Forest, U.S. Forest Service, Everett, Washington. Email to: Zachary Radmer, Fish and Wildlife Biologist, Washington Fish and Wildlife Office, U.S. Fish and Wildlife Service, Lacey, Washington. Topic: August 28, 2015, email discussing the timing of bull trout spawning in the Upper South Fork Sauk River.

Appendix B.
Photographs



Photograph 1.

Remote camp at the Monte Cristo Campground.



Photograph 2.

Ancillary remote camp in the Henry M. Jackson Wilderness.



Photograph 3.

Columbia Vertol 107-II measured 97.4 decibels while hovering during a waste rock dump at the Rainy Mine.



Photograph 4.

Helicopter with rotors in motion on the ground at the landing zone measured 85.1 decibels.



Photograph 5.

Helicopter at takeoff with avalanche chute glide path in the background.



Photograph 6.

Upstream in-situ turbidity probe in Glacier Creek.



Photograph 7.

Downloading data from the upstream in-situ turbidity monitor.



Photograph 8.

Abutments set for the Glacier Creek crossing.



Photograph 9.

Sliding the rail car deck over the north abutment.



Photograph 10.

Bridge deck set on the abutments over Glacier Creek on July 16, 2015.



Photograph 11.

Looking downstream toward Glacier Creek from the temporary crossing.



Photograph 12.

Glacier Creek on September 4, 2015 just downstream from the Glacier Creek crossing.



Photograph 13

Removal of the Glacier Creek crossing on September 14, 2015.



Photograph 14

Garbage at dispersed campsite adjacent to the South Fork Sauk River.



Photograph 15

Bag of garbage removed from dispersed campsite in the late successional reserve on July 20, 2015.

Appendix C.

**Continuous In-Situ Turbidity Documentation
(Electronic)**

Appendix D.

Institutional Control Plan

TECHNICAL MEMORANDUM

DATE: October 31, 2016

TO: Joseph Gibbens, PE – USDA Forest Service

FROM: Ryan Tobias – Cascade Earth Sciences

SUBJECT: MCMA Institutional Control Plan

BACKGROUND

The Forest Service Removal Action Memorandum (RAM) for the Monte Cristo Mining Area (MCMA) included a series of National Historic Preservation Act (NHPA) Mitigation, Minimization and Avoidance Measures. An appropriate preservation measure outlined in the RAM for the Monte Cristo Mining Historic District (MCMHD) included on-site historical interpretation as part of the signage required for institutional controls. Interpretive signs may incorporate text, historic photographs, and / or quick response codes for downloading applications to mobile phones and other devices (Forest Service, 2012).

In addition to signage, institutional controls are needed to maintain and monitor engineered controls and prevent potential exposure to soils underlying engineered caps by controlling disturbances of surficial material. Moreover, future land use restrictions for the repository will necessitate an alteration to the Bureau of Land Management (BLM) - Washington State Office master title plat of the Site.

SIGNAGE

Interpretive signs posted at the MCMA will conform to the Forest Service policy regarding signs and posters contained in Forest Service Manual (FSM) 7100, chapter 7160—*Signs and Posters*. A total of six interpretive signs will be installed at the following locations:

- Repository
- Footbridge
- Comet Terminal
- Ore Collector
- Assay Shack
- Concentrator

Signs will provide a general description of the natural, cultural, historic or physical aspects of the area. In addition, they will provide historic discussions of gold mining process and procedures and specific roles of each of the features during mining activity in the late 19th and early 20th centuries. Signs will also discuss the need to limit or avoid any disturbance of surficial soils, which could compromise the effectiveness of the Removal Action, while protecting archaeological resources and the historical integrity of the Site.

Up to four additional signs will be installed at the town site to provide general information regarding CERCLA activities and historic mining information. Placement of the additional signs will be determined at a later date. All signs will take the form of educational displays, prominently visible to the general public. The Forest Service will maintain these signs to ensure that they remain in place and readable.

MAP UPDATE

The BLM – Washington State Office master title plate will be updated to incorporate land use restrictions associated with the repository. The updated map will identify the boundaries of the repository and note limitations to any development within the repository footprint.

RMT/mjb
PN: 2015230017
Doc: App I Inst Control Plan.docx

REFERENCES

Forest Service, 2012. Removal Action Memorandum, Non-Time-Critical Removal Action, Monte Cristo Mining Area (MCMA) Site. Mt. Baker-Snoqualmie National Forest, Snohomish County, Washington.

Appendix E.

Laboratory Analytical Results

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

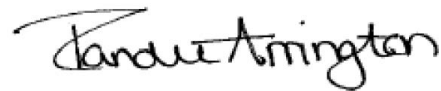
ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Spokane
11922 East 1st Ave
Spokane, WA 99206
Tel: (509)924-9200

TestAmerica Job ID: 590-1687-1
Client Project/Site: Monte Cristo Removal Action

For:
Cascade Earth Sciences Inc.
12720 E Nora Ave
Spokane, Washington 99216

Attn: Bernard Kronschnabel



Authorized for release by:
8/25/2015 3:39:16 PM

Randee Arrington, Project Manager II
(509)924-9200
randee.arrington@testamericainc.com

LINKS

Review your project
results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Job ID: 590-1687-1

Laboratory: TestAmerica Spokane

Narrative

Receipt

The samples were received on 8/10/2015 2:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 6.2° C.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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Sample Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-1687-1	MCPRA-WR-CT-1-0.5'	Solid	08/05/15 18:15	08/10/15 14:00
590-1687-2	MCPRA-WR-CT-2-0.5'	Solid	08/05/15 19:00	08/10/15 14:00
590-1687-3	MCPRA-WR-CT-3-0.5'	Solid	08/06/15 14:05	08/10/15 14:00
590-1687-4	MCPRA-WR-CT-4-0.5'	Solid	08/06/15 14:15	08/10/15 14:00
590-1687-5	MCPRA-WR-CT-5-0.5'	Solid	08/06/15 14:25	08/10/15 14:00
590-1687-6	MCPRA-WR-OC-1-0.5'	Solid	08/06/15 11:30	08/10/15 14:00
590-1687-7	MCPRA-WR-OC-2-0.5'	Solid	08/06/15 11:45	08/10/15 14:00
590-1687-8	MCPRA-WR-OC-3-0.5'	Solid	08/06/15 11:50	08/10/15 14:00
590-1687-9	MCPRA-WR-OC-4-0.5'	Solid	08/06/15 11:55	08/10/15 14:00
590-1687-10	MCPRA-WR-OC-5-0.5'	Solid	08/06/15 12:00	08/10/15 14:00
590-1687-11	MCPRA-WR-HW-1-0.5'	Solid	08/05/15 19:05	08/10/15 14:00
590-1687-12	MCPRA-WR-HW-2-0.5'	Solid	08/05/15 19:10	08/10/15 14:00
590-1687-13	MCPRA-WR-HW-3-0.5'	Solid	08/06/15 13:30	08/10/15 14:00
590-1687-14	MCPRA-WR-HW-4-0.5'	Solid	08/06/15 13:45	08/10/15 14:00
590-1687-15	MCPRA-WR-HW-5-0.5'	Solid	08/06/15 13:55	08/10/15 14:00
590-1687-16	MCPRA-WR-AS-01	Solid	08/07/15 11:55	08/10/15 14:00
590-1687-17	MCPRA-WR-AS-02	Solid	08/07/15 12:20	08/10/15 14:00
590-1687-18	8/4/15- ARCH-104 min	Air	08/04/15 00:00	08/10/15 14:00
590-1687-19	8/4/15-CAB-105 min	Air	08/04/15 00:00	08/10/15 14:00
590-1687-20	8/5/15-ARCH-605 min	Air	08/05/15 00:00	08/10/15 14:00
590-1687-21	8/5/15-CAB-605 min	Air	08/05/15 00:00	08/10/15 14:00

Definitions/Glossary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Client Sample ID: MCPRA-WR-CT-1-0.5'

Lab Sample ID: 590-1687-1

Date Collected: 08/05/15 18:15

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 62.2

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	170		0.14		mg/Kg	☼	08/20/15 15:22	08/21/15 12:41	5
Arsenic	420		0.35		mg/Kg	☼	08/20/15 15:22	08/21/15 12:41	5
Cadmium	1.2		0.14		mg/Kg	☼	08/20/15 15:22	08/21/15 12:41	5
Copper	30		0.28		mg/Kg	☼	08/20/15 15:22	08/21/15 12:41	5
Lead	210		0.35		mg/Kg	☼	08/20/15 15:22	08/21/15 12:41	5
Selenium	1.0		0.70		mg/Kg	☼	08/20/15 15:22	08/21/15 12:41	5
Thallium	ND		0.28		mg/Kg	☼	08/20/15 15:22	08/21/15 12:41	5
Zinc	160		3.5		mg/Kg	☼	08/20/15 15:22	08/21/15 12:41	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.19		0.074		mg/Kg	☼	08/14/15 09:39	08/17/15 11:59	1

Client Sample ID: MCPRA-WR-CT-2-0.5'

Lab Sample ID: 590-1687-2

Date Collected: 08/05/15 19:00

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 62.9

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	14		0.12		mg/Kg	☼	08/20/15 15:22	08/21/15 11:48	5
Arsenic	160		0.30		mg/Kg	☼	08/20/15 15:22	08/21/15 11:48	5
Cadmium	0.54		0.12		mg/Kg	☼	08/20/15 15:22	08/21/15 11:48	5
Copper	55		0.24		mg/Kg	☼	08/20/15 15:22	08/21/15 11:48	5
Lead	100		0.30		mg/Kg	☼	08/20/15 15:22	08/21/15 11:48	5
Selenium	1.2		0.60		mg/Kg	☼	08/20/15 15:22	08/21/15 11:48	5
Thallium	ND		0.24		mg/Kg	☼	08/20/15 15:22	08/21/15 11:48	5
Zinc	82		3.0		mg/Kg	☼	08/20/15 15:22	08/21/15 11:48	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.17		0.058		mg/Kg	☼	08/14/15 09:39	08/17/15 12:01	1

Client Sample ID: MCPRA-WR-CT-3-0.5'

Lab Sample ID: 590-1687-3

Date Collected: 08/06/15 14:05

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 64.4

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	9.3		0.12		mg/Kg	☼	08/20/15 15:22	08/21/15 11:52	5
Arsenic	100		0.31		mg/Kg	☼	08/20/15 15:22	08/21/15 11:52	5
Cadmium	0.65		0.12		mg/Kg	☼	08/20/15 15:22	08/21/15 11:52	5
Copper	22		0.25		mg/Kg	☼	08/20/15 15:22	08/21/15 11:52	5
Lead	42		0.31		mg/Kg	☼	08/20/15 15:22	08/21/15 11:52	5
Selenium	1.2		0.62		mg/Kg	☼	08/20/15 15:22	08/21/15 11:52	5
Thallium	ND		0.25		mg/Kg	☼	08/20/15 15:22	08/21/15 11:52	5
Zinc	60		3.1		mg/Kg	☼	08/20/15 15:22	08/21/15 11:52	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.17		0.065		mg/Kg	☼	08/14/15 09:39	08/17/15 12:08	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Client Sample ID: MCPRA-WR-CT-4-0.5'

Lab Sample ID: 590-1687-4

Date Collected: 08/06/15 14:15

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 81.3

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	25		0.11		mg/Kg	☼	08/20/15 15:22	08/21/15 11:57	5
Arsenic	330		0.27		mg/Kg	☼	08/20/15 15:22	08/21/15 11:57	5
Cadmium	1.6		0.11		mg/Kg	☼	08/20/15 15:22	08/21/15 11:57	5
Copper	79		0.22		mg/Kg	☼	08/20/15 15:22	08/21/15 11:57	5
Lead	69		0.27		mg/Kg	☼	08/20/15 15:22	08/21/15 11:57	5
Selenium	0.88		0.54		mg/Kg	☼	08/20/15 15:22	08/21/15 11:57	5
Thallium	ND		0.22		mg/Kg	☼	08/20/15 15:22	08/21/15 11:57	5
Zinc	310		2.7		mg/Kg	☼	08/20/15 15:22	08/21/15 11:57	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.21		0.060		mg/Kg	☼	08/14/15 09:39	08/17/15 12:10	1

Client Sample ID: MCPRA-WR-CT-5-0.5'

Lab Sample ID: 590-1687-5

Date Collected: 08/06/15 14:25

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 85.0

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	13		0.075		mg/Kg	☼	08/20/15 15:22	08/21/15 12:01	5
Arsenic	320		0.19		mg/Kg	☼	08/20/15 15:22	08/21/15 12:01	5
Cadmium	0.46		0.075		mg/Kg	☼	08/20/15 15:22	08/21/15 12:01	5
Copper	49		0.15		mg/Kg	☼	08/20/15 15:22	08/21/15 12:01	5
Lead	130		0.19		mg/Kg	☼	08/20/15 15:22	08/21/15 12:01	5
Selenium	0.55		0.38		mg/Kg	☼	08/20/15 15:22	08/21/15 12:01	5
Thallium	ND		0.15		mg/Kg	☼	08/20/15 15:22	08/21/15 12:01	5
Zinc	110		1.9		mg/Kg	☼	08/20/15 15:22	08/21/15 12:01	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.058		0.033		mg/Kg	☼	08/14/15 09:39	08/17/15 12:12	1

Client Sample ID: MCPRA-WR-OC-1-0.5'

Lab Sample ID: 590-1687-6

Date Collected: 08/06/15 11:30

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 85.2

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	17		0.074		mg/Kg	☼	08/20/15 15:22	08/21/15 12:06	5
Arsenic	520		0.19		mg/Kg	☼	08/20/15 15:22	08/21/15 12:06	5
Cadmium	0.55		0.074		mg/Kg	☼	08/20/15 15:22	08/21/15 12:06	5
Copper	120		0.15		mg/Kg	☼	08/20/15 15:22	08/21/15 12:06	5
Lead	56		0.19		mg/Kg	☼	08/20/15 15:22	08/21/15 12:06	5
Selenium	0.66		0.37		mg/Kg	☼	08/20/15 15:22	08/21/15 12:06	5
Thallium	ND		0.15		mg/Kg	☼	08/20/15 15:22	08/21/15 12:06	5
Zinc	130		1.9		mg/Kg	☼	08/20/15 15:22	08/21/15 12:06	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.10		0.054		mg/Kg	☼	08/14/15 09:39	08/17/15 12:15	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Client Sample ID: MCPRA-WR-OC-2-0.5'

Lab Sample ID: 590-1687-7

Date Collected: 08/06/15 11:45

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 62.6

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	38		0.13		mg/Kg	☼	08/20/15 15:22	08/21/15 12:28	5
Arsenic	940		0.33		mg/Kg	☼	08/20/15 15:22	08/21/15 12:28	5
Cadmium	0.65		0.13		mg/Kg	☼	08/20/15 15:22	08/21/15 12:28	5
Copper	98		0.27		mg/Kg	☼	08/20/15 15:22	08/21/15 12:28	5
Lead	280		0.33		mg/Kg	☼	08/20/15 15:22	08/21/15 12:28	5
Selenium	1.1		0.67		mg/Kg	☼	08/20/15 15:22	08/21/15 12:28	5
Thallium	ND		0.27		mg/Kg	☼	08/20/15 15:22	08/21/15 12:28	5
Zinc	140		3.3		mg/Kg	☼	08/20/15 15:22	08/21/15 12:28	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.19		0.064		mg/Kg	☼	08/14/15 09:39	08/17/15 12:17	1

Client Sample ID: MCPRA-WR-OC-3-0.5'

Lab Sample ID: 590-1687-8

Date Collected: 08/06/15 11:50

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 85.0

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	150		0.070		mg/Kg	☼	08/20/15 15:22	08/21/15 12:32	5
Arsenic	5200		0.18		mg/Kg	☼	08/20/15 15:22	08/21/15 12:32	5
Cadmium	0.99		0.070		mg/Kg	☼	08/20/15 15:22	08/21/15 12:32	5
Copper	100		0.14		mg/Kg	☼	08/20/15 15:22	08/21/15 12:32	5
Lead	320		0.18		mg/Kg	☼	08/20/15 15:22	08/21/15 12:32	5
Selenium	0.74		0.35		mg/Kg	☼	08/20/15 15:22	08/21/15 12:32	5
Thallium	0.20		0.14		mg/Kg	☼	08/20/15 15:22	08/21/15 12:32	5
Zinc	110		1.8		mg/Kg	☼	08/20/15 15:22	08/21/15 12:32	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.21		0.038		mg/Kg	☼	08/14/15 09:39	08/17/15 12:19	1

Client Sample ID: MCPRA-WR-OC-4-0.5'

Lab Sample ID: 590-1687-9

Date Collected: 08/06/15 11:55

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 83.5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	55		0.084		mg/Kg	☼	08/21/15 14:36	08/24/15 20:03	5
Arsenic	2100		0.21		mg/Kg	☼	08/21/15 14:36	08/24/15 20:03	5
Cadmium	1.1		0.084		mg/Kg	☼	08/21/15 14:36	08/24/15 20:03	5
Copper	99		0.17		mg/Kg	☼	08/21/15 14:36	08/24/15 20:03	5
Lead	550		0.21		mg/Kg	☼	08/21/15 14:36	08/24/15 20:03	5
Selenium	0.70		0.42		mg/Kg	☼	08/21/15 14:36	08/24/15 20:03	5
Thallium	0.19		0.17		mg/Kg	☼	08/21/15 14:36	08/24/15 20:03	5
Zinc	240		2.1		mg/Kg	☼	08/21/15 14:36	08/24/15 20:03	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.16		0.040		mg/Kg	☼	08/14/15 09:39	08/17/15 12:22	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Client Sample ID: MCPRA-WR-OC-5-0.5'

Lab Sample ID: 590-1687-10

Date Collected: 08/06/15 12:00

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 90.0

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	17		0.093		mg/Kg	☼	08/21/15 14:36	08/24/15 20:08	5
Arsenic	500		0.23		mg/Kg	☼	08/21/15 14:36	08/24/15 20:08	5
Cadmium	0.68		0.093		mg/Kg	☼	08/21/15 14:36	08/24/15 20:08	5
Copper	73		0.19		mg/Kg	☼	08/21/15 14:36	08/24/15 20:08	5
Lead	95		0.23		mg/Kg	☼	08/21/15 14:36	08/24/15 20:08	5
Selenium	0.67		0.47		mg/Kg	☼	08/21/15 14:36	08/24/15 20:08	5
Thallium	0.19		0.19		mg/Kg	☼	08/21/15 14:36	08/24/15 20:08	5
Zinc	190		2.3		mg/Kg	☼	08/21/15 14:36	08/24/15 20:08	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.073		0.041		mg/Kg	☼	08/14/15 09:39	08/17/15 12:24	1

Client Sample ID: MCPRA-WR-HW-1-0.5'

Lab Sample ID: 590-1687-11

Date Collected: 08/05/15 19:05

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 69.0

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	5.5		0.14		mg/Kg	☼	08/21/15 14:36	08/24/15 20:12	5
Arsenic	190		0.34		mg/Kg	☼	08/21/15 14:36	08/24/15 20:12	5
Cadmium	0.64		0.14		mg/Kg	☼	08/21/15 14:36	08/24/15 20:12	5
Copper	34		0.28		mg/Kg	☼	08/21/15 14:36	08/24/15 20:12	5
Lead	35		0.34		mg/Kg	☼	08/21/15 14:36	08/24/15 20:12	5
Selenium	1.2		0.69		mg/Kg	☼	08/21/15 14:36	08/24/15 20:12	5
Thallium	ND		0.28		mg/Kg	☼	08/21/15 14:36	08/24/15 20:12	5
Zinc	100		3.4		mg/Kg	☼	08/21/15 14:36	08/24/15 20:12	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.15		0.060		mg/Kg	☼	08/14/15 09:39	08/17/15 12:26	1

Client Sample ID: MCPRA-WR-HW-2-0.5'

Lab Sample ID: 590-1687-12

Date Collected: 08/05/15 19:10

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 84.3

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	3.7		0.11		mg/Kg	☼	08/21/15 14:36	08/24/15 20:17	5
Arsenic	240		0.26		mg/Kg	☼	08/21/15 14:36	08/24/15 20:17	5
Cadmium	0.68		0.11		mg/Kg	☼	08/21/15 14:36	08/24/15 20:17	5
Copper	55		0.21		mg/Kg	☼	08/21/15 14:36	08/24/15 20:17	5
Lead	25		0.26		mg/Kg	☼	08/21/15 14:36	08/24/15 20:17	5
Selenium	0.88		0.53		mg/Kg	☼	08/21/15 14:36	08/24/15 20:17	5
Thallium	ND		0.21		mg/Kg	☼	08/21/15 14:36	08/24/15 20:17	5
Zinc	120		2.6		mg/Kg	☼	08/21/15 14:36	08/24/15 20:17	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.094		0.059		mg/Kg	☼	08/14/15 09:39	08/17/15 12:29	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Client Sample ID: MCPRA-WR-HW-3-0.5'

Lab Sample ID: 590-1687-13

Date Collected: 08/06/15 13:30

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 60.7

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	15		0.14		mg/Kg	☼	08/21/15 14:36	08/24/15 20:21	5
Arsenic	380		0.36		mg/Kg	☼	08/21/15 14:36	08/24/15 20:21	5
Cadmium	1.7		0.14		mg/Kg	☼	08/21/15 14:36	08/24/15 20:21	5
Copper	82		0.29		mg/Kg	☼	08/21/15 14:36	08/24/15 20:21	5
Lead	100		0.36		mg/Kg	☼	08/21/15 14:36	08/24/15 20:21	5
Selenium	0.97		0.72		mg/Kg	☼	08/21/15 14:36	08/24/15 20:21	5
Thallium	ND		0.29		mg/Kg	☼	08/21/15 14:36	08/24/15 20:21	5
Zinc	140		3.6		mg/Kg	☼	08/21/15 14:36	08/24/15 20:21	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.19		0.048		mg/Kg	☼	08/14/15 09:39	08/17/15 14:01	1

Client Sample ID: MCPRA-WR-HW-4-0.5'

Lab Sample ID: 590-1687-14

Date Collected: 08/06/15 13:45

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 74.0

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	8.5		0.13		mg/Kg	☼	08/21/15 14:36	08/24/15 20:25	5
Arsenic	380		0.32		mg/Kg	☼	08/21/15 14:36	08/24/15 20:25	5
Cadmium	0.59		0.13		mg/Kg	☼	08/21/15 14:36	08/24/15 20:25	5
Copper	72		0.25		mg/Kg	☼	08/21/15 14:36	08/24/15 20:25	5
Lead	70		0.32		mg/Kg	☼	08/21/15 14:36	08/24/15 20:25	5
Selenium	0.89		0.63		mg/Kg	☼	08/21/15 14:36	08/24/15 20:25	5
Thallium	ND		0.25		mg/Kg	☼	08/21/15 14:36	08/24/15 20:25	5
Zinc	110		3.2		mg/Kg	☼	08/21/15 14:36	08/24/15 20:25	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.11		0.039		mg/Kg	☼	08/14/15 09:39	08/17/15 14:03	1

Client Sample ID: MCPRA-WR-HW-5-0.5'

Lab Sample ID: 590-1687-15

Date Collected: 08/06/15 13:55

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 85.5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	6.8		0.083		mg/Kg	☼	08/21/15 14:36	08/24/15 20:30	5
Arsenic	210		0.21		mg/Kg	☼	08/21/15 14:36	08/24/15 20:30	5
Cadmium	0.60		0.083		mg/Kg	☼	08/21/15 14:36	08/24/15 20:30	5
Copper	120		0.17		mg/Kg	☼	08/21/15 14:36	08/24/15 20:30	5
Lead	41		0.21		mg/Kg	☼	08/21/15 14:36	08/24/15 20:30	5
Selenium	0.66		0.42		mg/Kg	☼	08/21/15 14:36	08/24/15 20:30	5
Thallium	ND		0.17		mg/Kg	☼	08/21/15 14:36	08/24/15 20:30	5
Zinc	110		2.1		mg/Kg	☼	08/21/15 14:36	08/24/15 20:30	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.076		0.043		mg/Kg	☼	08/14/15 09:39	08/17/15 14:06	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Client Sample ID: MCPRA-WR-AS-01

Lab Sample ID: 590-1687-16

Date Collected: 08/07/15 11:55

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 62.7

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	17		0.15		mg/Kg	☼	08/21/15 14:36	08/24/15 20:34	5
Arsenic	130		0.38		mg/Kg	☼	08/21/15 14:36	08/24/15 20:34	5
Cadmium	0.52		0.15		mg/Kg	☼	08/21/15 14:36	08/24/15 20:34	5
Copper	150		0.30		mg/Kg	☼	08/21/15 14:36	08/24/15 20:34	5
Lead	220		0.38		mg/Kg	☼	08/21/15 14:36	08/24/15 20:34	5
Selenium	1.6		0.75		mg/Kg	☼	08/21/15 14:36	08/24/15 20:34	5
Thallium	ND		0.30		mg/Kg	☼	08/21/15 14:36	08/24/15 20:34	5
Zinc	80		3.8		mg/Kg	☼	08/21/15 14:36	08/24/15 20:34	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.20		0.058		mg/Kg	☼	08/14/15 09:39	08/17/15 14:08	1

Client Sample ID: MCPRA-WR-AS-02

Lab Sample ID: 590-1687-17

Date Collected: 08/07/15 12:20

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 78.6

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	13		0.12		mg/Kg	☼	08/21/15 14:36	08/24/15 20:39	5
Arsenic	210		0.30		mg/Kg	☼	08/21/15 14:36	08/24/15 20:39	5
Cadmium	0.90		0.12		mg/Kg	☼	08/21/15 14:36	08/24/15 20:39	5
Copper	23		0.24		mg/Kg	☼	08/21/15 14:36	08/24/15 20:39	5
Lead	130		0.30		mg/Kg	☼	08/21/15 14:36	08/24/15 20:39	5
Selenium	ND		0.59		mg/Kg	☼	08/21/15 14:36	08/24/15 20:39	5
Thallium	ND		0.24		mg/Kg	☼	08/21/15 14:36	08/24/15 20:39	5
Zinc	61		3.0		mg/Kg	☼	08/21/15 14:36	08/24/15 20:39	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.28		0.037		mg/Kg	☼	08/14/15 09:39	08/17/15 14:10	1

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Phoenix
4625 East Cotton Ctr Blvd
Suite 189
Phoenix, AZ 85040
Tel: (602)437-3340

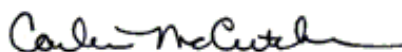
TestAmerica Job ID: 550-49311-1

Client Project/Site: Monte Cristo Monitoring Wells

For:

TestAmerica Laboratories, Inc
11922 East 1st Ave
Spokane, Washington 99206

Attn: Randee Arrington



Authorized for release by:
8/17/2015 3:18:58 PM

Carlene McCutcheon, Project Manager II
(602)659-7612
carlene.mccutcheon@testamericainc.com

LINKS

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results through
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www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.





Analyses included in this report were performed by TestAmerica Phoenix, 4625 E. Cotton Center Boulevard, Building 3, Suite 189, Phoenix, AZ 85040.

TestAmerica Phoenix (Lab ID 154268) is accredited by the American Industrial Hygiene Association (AIHA) in the industrial hygiene program for the analytical techniques noted on the scope of accreditation for the following methods:

NIOSH 0500, NIOSH 0600, NIOSH 1003, NIOSH 1005, NIOSH 1007, NIOSH 1010, NIOSH 1015, NIOSH 1022, NIOSH 1300, NIOSH 1400, NIOSH 1401, NIOSH 1403, NIOSH 1405, NIOSH 1450, NIOSH 1457, NIOSH 1500, NIOSH 1501, NIOSH 1550, NIOSH 1602, NIOSH 1604, NIOSH 1606, NIOSH 1609, NIOSH 1610, NIOSH 1611, NIOSH 1613, NIOSH 1615, NIOSH 2000, NIOSH 2016, NIOSH 2532, NIOSH 2546, NIOSH 2551, NIOSH 5000, NIOSH 5039, NIOSH 5503, NIOSH 5506, NIOSH 5523, NIOSH 5600, NIOSH 6006, NIOSH 6009, NIOSH 6010, NIOSH 6013, NIOSH 7300, NIOSH 7303, NIOSH 7600, NIOSH 7903, NIOSH 9100, NIOSH 9102, EPA IP-6A, EPA IP-6C, OSHA 7, OSHA 42, OSHA 47, OSHA 48, OSHA 64, OSHA 69, OSHA 111, OSHA ID-121, OSHA ID-125G, OSHA ID-140, OSHA ID-188, OSHA ID-215, OSHA 1001, OSHA 1002, OSHA 1003, OSHA 1004, OSHA 1005, OSHA 1007, OSHA 1009, OSHA 1014 and OSHA Chemical and Sampling Information for Silane. Volatile organic compounds on 3M Organic Vapor Monitors, Assay Technology Passive Monitors and SKC Passive Monitors. Formaldehyde and other aldehydes and ketones on Assay Technology passive monitor and SKC Umex 100 passive sampler by EPA TO-11A and OSHA 1007. Radiello diffusive sampler for hydrogen sulfide.

TestAmerica Phoenix also holds NELAC accreditation through the State of Oregon (AZ100001) for the analytical techniques noted on the scope of accreditation and the State of New York (11898) for NIOSH 6009, NIOSH 7300, EPA TO-10A, EPA TO-11A and EPA TO-17.

Analytical Comments:

Unless otherwise noted, all method blanks and laboratory control spikes met method and/or laboratory quality control objectives for the analyses included in this report.

Unless otherwise noted, sample results have been corrected for method blank values.

NIOSH Method 7300 analyses are performed using a modified digestion procedure to eliminate the use of perchloric acid.

A handwritten signature in black ink, reading "Carlene McCutcheon". The signature is written in a cursive style and is positioned above a horizontal blue line.

Carlene McCutcheon
Project Manager II
8/17/2015 3:18:58 PM

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Definitions/Glossary

Client: TestAmerica Laboratories, Inc
Project/Site: Monte Cristo Monitoring Wells

TestAmerica Job ID: 550-49311-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: TestAmerica Laboratories, Inc
Project/Site: Monte Cristo Monitoring Wells

TestAmerica Job ID: 550-49311-1

Job ID: 550-49311-1

Laboratory: TestAmerica Phoenix

Narrative

Job Narrative
550-49311-1

Comments

No additional comments.

Receipt

The samples were received on 8/12/2015 9:30 AM; the samples arrived in good condition. The temperature of the cooler at receipt was 20.0° C.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Industrial Hygiene

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.



Sample Summary

Client: TestAmerica Laboratories, Inc
Project/Site: Monte Cristo Monitoring Wells

TestAmerica Job ID: 550-49311-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-49311-1	8/4/15-ARCH-104 Min (590-1687-18)	Air	08/04/15 00:00	08/12/15 09:30
550-49311-2	8/4/15-CAB-105 min (590-1687-19)	Air	08/04/15 00:00	08/12/15 09:30
550-49311-3	8/5/15-ARCH-605 min (590-1687-20)	Air	08/05/15 00:00	08/12/15 09:30
550-49311-4	8/5/15-CAB-605 min (590-1687-21)	Air	08/05/15 00:00	08/12/15 09:30



Detection Summary

Client: TestAmerica Laboratories, Inc
Project/Site: Monte Cristo Monitoring Wells

TestAmerica Job ID: 550-49311-1

Client Sample ID: 8/4/15-ARCH-104 Min (590-1687-18)

Lab Sample ID: 550-49311-1

No Detections.

Client Sample ID: 8/4/15-CAB-105 min (590-1687-19)

Lab Sample ID: 550-49311-2

No Detections.

Client Sample ID: 8/5/15-ARCH-605 min (590-1687-20)

Lab Sample ID: 550-49311-3

No Detections.

Client Sample ID: 8/5/15-CAB-605 min (590-1687-21)

Lab Sample ID: 550-49311-4

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Phoenix



Client Sample Results

Client: TestAmerica Laboratories, Inc
 Project/Site: Monte Cristo Monitoring Wells

TestAmerica Job ID: 550-49311-1

Client Sample ID: 8/4/15-ARCH-104 Min (590-1687-18)

Lab Sample ID: 550-49311-1

Date Collected: 08/04/15 00:00

Matrix: Air

Date Received: 08/12/15 09:30

Sample Air Volume: 208 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: 7300 - NIOSH Method 7300 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Prepared	Analyzed	Dil Fac
Arsenic	<2.50	<0.0120		2.50	08/14/15 05:44	08/14/15 20:11	1

Client Sample ID: 8/4/15-CAB-105 min (590-1687-19)

Lab Sample ID: 550-49311-2

Date Collected: 08/04/15 00:00

Matrix: Air

Date Received: 08/12/15 09:30

Sample Air Volume: 210 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: 7300 - NIOSH Method 7300 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Prepared	Analyzed	Dil Fac
Arsenic	<2.50	<0.0119		2.50	08/14/15 05:44	08/14/15 20:14	1

Client Sample ID: 8/5/15-ARCH-605 min (590-1687-20)

Lab Sample ID: 550-49311-3

Date Collected: 08/05/15 00:00

Matrix: Air

Date Received: 08/12/15 09:30

Sample Air Volume: 1210 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: 7300 - NIOSH Method 7300 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Prepared	Analyzed	Dil Fac
Arsenic	<2.50	<0.00207		2.50	08/14/15 05:44	08/14/15 20:18	1

Client Sample ID: 8/5/15-CAB-605 min (590-1687-21)

Lab Sample ID: 550-49311-4

Date Collected: 08/05/15 00:00

Matrix: Air

Date Received: 08/12/15 09:30

Sample Air Volume: 1210 L

Sample Container: IH - MCE, 0.8 micron, 37-mm Filter

Method: 7300 - NIOSH Method 7300 (Modified)

Analyte	Result ug/Sample	Result mg/m3	Result Qualifier	RL ug/Sample	Prepared	Analyzed	Dil Fac
Arsenic	<2.50	<0.00207		2.50	08/14/15 05:44	08/14/15 20:21	1

QC Sample Results

Client: TestAmerica Laboratories, Inc
 Project/Site: Monte Cristo Monitoring Wells

TestAmerica Job ID: 550-49311-1

Method: 7300 - NIOSH Method 7300 (Modified)

Lab Sample ID: MB 550-70460/1-A
Matrix: Air
Analysis Batch: 70611

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 70460

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<2.50		2.50	ug/Sample		08/14/15 05:44	08/14/15 19:30	1

Lab Sample ID: LCS 550-70460/2-A
Matrix: Air
Analysis Batch: 70611

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 70460

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	25.0	25.16		ug/Sample		101	80 - 120

Lab Sample ID: LCSD 550-70460/3-A
Matrix: Air
Analysis Batch: 70611

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 70460

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	25.0	24.05		ug/Sample		96	80 - 120	5	20

QC Association Summary

Client: TestAmerica Laboratories, Inc
 Project/Site: Monte Cristo Monitoring Wells

TestAmerica Job ID: 550-49311-1

IH - Metals

Prep Batch: 70460

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-49311-1	8/4/15-ARCH-104 Min (590-1687-18)	Total/NA	Air	Filter Prep	
550-49311-2	8/4/15-CAB-105 min (590-1687-19)	Total/NA	Air	Filter Prep	
550-49311-3	8/5/15-ARCH-605 min (590-1687-20)	Total/NA	Air	Filter Prep	
550-49311-4	8/5/15-CAB-605 min (590-1687-21)	Total/NA	Air	Filter Prep	
LCS 550-70460/2-A	Lab Control Sample	Total/NA	Air	Filter Prep	
LCSD 550-70460/3-A	Lab Control Sample Dup	Total/NA	Air	Filter Prep	
MB 550-70460/1-A	Method Blank	Total/NA	Air	Filter Prep	

Analysis Batch: 70611

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-49311-1	8/4/15-ARCH-104 Min (590-1687-18)	Total/NA	Air	7300	70460
550-49311-2	8/4/15-CAB-105 min (590-1687-19)	Total/NA	Air	7300	70460
550-49311-3	8/5/15-ARCH-605 min (590-1687-20)	Total/NA	Air	7300	70460
550-49311-4	8/5/15-CAB-605 min (590-1687-21)	Total/NA	Air	7300	70460
LCS 550-70460/2-A	Lab Control Sample	Total/NA	Air	7300	70460
LCSD 550-70460/3-A	Lab Control Sample Dup	Total/NA	Air	7300	70460
MB 550-70460/1-A	Method Blank	Total/NA	Air	7300	70460



Lab Chronicle

Client: TestAmerica Laboratories, Inc
 Project/Site: Monte Cristo Monitoring Wells

TestAmerica Job ID: 550-49311-1

Client Sample ID: 8/4/15-ARCH-104 Min (590-1687-18)

Lab Sample ID: 550-49311-1

Date Collected: 08/04/15 00:00

Matrix: Air

Date Received: 08/12/15 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Filter Prep			70460	08/14/15 05:44	SGO	TAL PHX
Total/NA	Analysis	7300		1	70611	08/14/15 20:11	BCB	TAL PHX

Client Sample ID: 8/4/15-CAB-105 min (590-1687-19)

Lab Sample ID: 550-49311-2

Date Collected: 08/04/15 00:00

Matrix: Air

Date Received: 08/12/15 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Filter Prep			70460	08/14/15 05:44	SGO	TAL PHX
Total/NA	Analysis	7300		1	70611	08/14/15 20:14	BCB	TAL PHX

Client Sample ID: 8/5/15-ARCH-605 min (590-1687-20)

Lab Sample ID: 550-49311-3

Date Collected: 08/05/15 00:00

Matrix: Air

Date Received: 08/12/15 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Filter Prep			70460	08/14/15 05:44	SGO	TAL PHX
Total/NA	Analysis	7300		1	70611	08/14/15 20:18	BCB	TAL PHX

Client Sample ID: 8/5/15-CAB-605 min (590-1687-21)

Lab Sample ID: 550-49311-4

Date Collected: 08/05/15 00:00

Matrix: Air

Date Received: 08/12/15 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Filter Prep			70460	08/14/15 05:44	SGO	TAL PHX
Total/NA	Analysis	7300		1	70611	08/14/15 20:21	BCB	TAL PHX

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

Certification Summary

Client: TestAmerica Laboratories, Inc
Project/Site: Monte Cristo Monitoring Wells

TestAmerica Job ID: 550-49311-1

Laboratory: TestAmerica Phoenix

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
AIHA-LAP, LLC	IHLAP		154268	07-01-17



Method Summary

Client: TestAmerica Laboratories, Inc
Project/Site: Monte Cristo Monitoring Wells

TestAmerica Job ID: 550-49311-1

Method	Method Description	Protocol	Laboratory
7300	NIOSH Method 7300 (Modified)	NIOSH	TAL PHX

Protocol References:

NIOSH = NIOSH Manual Of Analytical Methods, National Institute For Occupational Safety And Health, 4th Edition, August 1994.

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340



TestAmerica Spokane

11922 East 1st Ave
 Spokane, WA 99206
 Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record

SN 49 311



THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)

Client Contact: _____
 Shipping/Receiving: _____
 Company: TestAmerica Laboratories, Inc
 Address: 4625 East Cotton Cir Blvd, Suite 189,
 Phoenix
 State, Zip: AZ, 85040
 Phone: 602-437-3340(Tel) 602-454-9303(Fax)
 Email: _____
 Project Name: Monte Cristo Monitoring Wells
 Site: _____

Sampler: _____
 Phone: _____

Lab PM: Arrington, Rande E
 E-Mail: randee.arrington@testamericainc.com

Carrier Tracking No(s): _____

COC No: 590-628-1
 Page: Page 1 of 1

Due Date Requested: 8/20/2015

Analysis Requested

Job #: 590-1687-1

TAT Requested (days): _____
 PO #: _____
 WOC #: _____
 Project #: 590000368
 SSOV#: _____

Field Filtered Sample (Yes or No) _____
 Perform MS/MSD (Yes or No) _____
 SUB (NIOSH 7300 Arsenic)/ NIOSH 7300 Arsenic

Preservation Codes:
 A - HCL
 B - NaOH
 C - Zn Acetate
 D - Nitric Acid
 E - NaHSO4
 F - MeOH
 G - Anchor
 H - Ascorbic Acid
 I - Ice
 J - DI Water
 K - EDTA
 L - EDA
 M - Hexane
 N - None
 O - AsNaO2
 P - Na2O4S
 Q - Na2SO3
 R - Na2S2O3
 S - H2SO4
 T - TSP Dodecahydrate
 U - Acetone
 V - WCAA
 W - pH 4.5
 Z - other (specify) _____
 Other: _____

Sample Identification - Client ID (Lab ID)

Sample ID	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Water, Soil, Gas, etc.)	Preservation Code	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (NIOSH 7300 Arsenic)/ NIOSH 7300 Arsenic	Total Number of containers	Special Instructions/Note
8/4/15-ARCH-104 min (590-1687-18)	8/4/15		Pacific	Air					1	-1
8/4/15-CAB-105 min (590-1687-19)	8/4/15		Pacific	Air					1	-2
8/5/15-ARCH-605 min (590-1687-20)	8/5/15		Pacific	Air					1	-3
8/5/15-CAB-605 min (590-1687-21)	8/5/15		Pacific	Air					1	-4



Possible Hazard Identification

Unconfirmed
 Deliverable Requested: I, II, III, IV, Other (Specify)

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client
 Disposal By Lab
 Archive For _____ Months

Empty Kit Relinquished by: _____

Date: _____

Method of Shipment: _____

Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
<i>Shane Steyer</i>	<i>8/15/15 15:10</i>	<i>Hydrex</i>	<i>[Signature]</i>	<i>8/15/15 05:00</i>	<i>Hydrex</i>

Custody Seals Intact: Yes No

Custody Seal No.: _____

Cooler Temperature(s) °C and Other Remarks: _____

Login Sample Receipt Checklist

Client: TestAmerica Laboratories, Inc

Job Number: 550-49311-1

Login Number: 49311

List Source: TestAmerica Phoenix

List Number: 1

Creator: Shoemaker, Cory M

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	Thermal preservation not required.
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	Check done at department level as required.



QC Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 580-198532/18-A
Matrix: Solid
Analysis Batch: 198635

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 198532

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.10		mg/Kg		08/20/15 15:22	08/21/15 10:31	5
Arsenic	ND		0.25		mg/Kg		08/20/15 15:22	08/21/15 10:31	5
Cadmium	ND		0.10		mg/Kg		08/20/15 15:22	08/21/15 10:31	5
Copper	ND		0.20		mg/Kg		08/20/15 15:22	08/21/15 10:31	5
Lead	ND		0.25		mg/Kg		08/20/15 15:22	08/21/15 10:31	5
Selenium	ND		0.50		mg/Kg		08/20/15 15:22	08/21/15 10:31	5
Thallium	ND		0.20		mg/Kg		08/20/15 15:22	08/21/15 10:31	5
Zinc	ND		2.5		mg/Kg		08/20/15 15:22	08/21/15 10:31	5

Lab Sample ID: LCS 580-198532/19-A
Matrix: Solid
Analysis Batch: 198635

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 198532

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Antimony	150	145		mg/Kg		96	80 - 120
Arsenic	200	194		mg/Kg		97	80 - 120
Cadmium	5.00	5.05		mg/Kg		101	80 - 120
Copper	25.0	24.0		mg/Kg		96	80 - 120
Lead	50.0	46.6		mg/Kg		93	80 - 120
Selenium	200	194		mg/Kg		97	80 - 120
Thallium	200	190		mg/Kg		95	80 - 120
Zinc	200	193		mg/Kg		97	80 - 120

Lab Sample ID: LCSD 580-198532/20-A
Matrix: Solid
Analysis Batch: 198635

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 198532

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Antimony	150	149		mg/Kg		99	80 - 120	3	20
Arsenic	200	199		mg/Kg		99	80 - 120	2	20
Cadmium	5.00	5.17		mg/Kg		103	80 - 120	2	20
Copper	25.0	24.8		mg/Kg		99	80 - 120	3	20
Lead	50.0	47.8		mg/Kg		96	80 - 120	3	20
Selenium	200	199		mg/Kg		99	80 - 120	3	20
Thallium	200	193		mg/Kg		96	80 - 120	1	20
Zinc	200	199		mg/Kg		99	80 - 120	3	20

Lab Sample ID: LCSSRM 580-198532/21-A
Matrix: Solid
Analysis Batch: 198635

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 198532

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	Limits
Antimony	88.8	155		mg/Kg		174.9	22.0 - 259.0
Arsenic	139	137		mg/Kg		98.9	70.4 - 140.3
Cadmium	96.0	93.6		mg/Kg		97.5	73.2 - 127.1
Copper	168	161		mg/Kg		95.6	75.6 - 125.0

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSSRM 580-198532/21-A
Matrix: Solid
Analysis Batch: 198635

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 198532

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Lead	133	127		mg/Kg		95.1	72.9 - 127.8
Selenium	177	173		mg/Kg		97.5	67.8 - 131.6
Thallium	138	129		mg/Kg		93.5	68.1 - 131.9
Zinc	189	185		mg/Kg		97.8	69.8 - 130.7

Lab Sample ID: MB 580-198644/21-A
Matrix: Solid
Analysis Batch: 198833

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 198644

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.10		mg/Kg		08/21/15 14:36	08/24/15 16:18	5
Arsenic	ND		0.25		mg/Kg		08/21/15 14:36	08/24/15 16:18	5
Cadmium	ND		0.10		mg/Kg		08/21/15 14:36	08/24/15 16:18	5
Copper	ND		0.20		mg/Kg		08/21/15 14:36	08/24/15 16:18	5
Lead	ND		0.25		mg/Kg		08/21/15 14:36	08/24/15 16:18	5
Selenium	ND		0.50		mg/Kg		08/21/15 14:36	08/24/15 16:18	5
Thallium	ND		0.20		mg/Kg		08/21/15 14:36	08/24/15 16:18	5
Zinc	ND		2.5		mg/Kg		08/21/15 14:36	08/24/15 16:18	5

Lab Sample ID: LCS 580-198644/22-A
Matrix: Solid
Analysis Batch: 198833

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 198644

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	150	160		mg/Kg		107	80 - 120
Arsenic	200	209		mg/Kg		105	80 - 120
Cadmium	5.00	5.65		mg/Kg		113	80 - 120
Copper	25.0	25.7		mg/Kg		103	80 - 120
Lead	50.0	49.5		mg/Kg		99	80 - 120
Selenium	200	214		mg/Kg		107	80 - 120
Thallium	200	207		mg/Kg		104	80 - 120
Zinc	200	207		mg/Kg		103	80 - 120

Lab Sample ID: LCSD 580-198644/23-A
Matrix: Solid
Analysis Batch: 198833

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 198644

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Antimony	150	160		mg/Kg		107	80 - 120	0	20
Arsenic	200	208		mg/Kg		104	80 - 120	1	20
Cadmium	5.00	5.56		mg/Kg		111	80 - 120	2	20
Copper	25.0	25.3		mg/Kg		101	80 - 120	2	20
Lead	50.0	49.6		mg/Kg		99	80 - 120	0	20
Selenium	200	213		mg/Kg		106	80 - 120	0	20
Thallium	200	208		mg/Kg		104	80 - 120	1	20
Zinc	200	204		mg/Kg		102	80 - 120	2	20

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Lab Sample ID: LCSSRM 580-198644/24-A
Matrix: Solid
Analysis Batch: 198833

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 198644

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	88.8	160		mg/Kg		180.1	22.0 - 259.0
Arsenic	139	141		mg/Kg		101.6	70.4 - 140.3
Cadmium	96.0	96.2		mg/Kg		100.2	73.2 - 127.1
Copper	168	162		mg/Kg		96.7	75.6 - 125.0
Lead	133	128		mg/Kg		96.0	72.9 - 127.8
Selenium	177	184		mg/Kg		103.9	67.8 - 131.6
Thallium	138	129		mg/Kg		93.6	68.1 - 131.9
Zinc	189	191		mg/Kg		101.1	69.8 - 130.7

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 590-2986/9-A
Matrix: Solid
Analysis Batch: 3019

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 2986

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.050		mg/Kg		08/14/15 09:39	08/17/15 11:34	1

Lab Sample ID: LCS 590-2986/8-A
Matrix: Solid
Analysis Batch: 3019

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 2986

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg	0.200	0.200		mg/Kg		100	80 - 120

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Client Sample ID: MCPRA-WR-CT-1-0.5'

Date Collected: 08/05/15 18:15

Date Received: 08/10/15 14:00

Lab Sample ID: 590-1687-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			197812	08/13/15 10:50	DGY	TAL SEA

Client Sample ID: MCPRA-WR-CT-1-0.5'

Date Collected: 08/05/15 18:15

Date Received: 08/10/15 14:00

Lab Sample ID: 590-1687-1

Matrix: Solid

Percent Solids: 62.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1479 g	50 mL	198532	08/20/15 15:22	PAB	TAL SEA
Total/NA	Analysis	6020A		5	1.1479 g	50 mL	198635	08/21/15 12:41	FCW	TAL SEA
Total/NA	Prep	7471B			0.54 g	50 mL	2986	08/14/15 09:39	JIS	TAL SPK
Total/NA	Analysis	7471B		1	0.54 g	50 mL	3019	08/17/15 11:59	JSP	TAL SPK

Client Sample ID: MCPRA-WR-CT-2-0.5'

Date Collected: 08/05/15 19:00

Date Received: 08/10/15 14:00

Lab Sample ID: 590-1687-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			197812	08/13/15 10:50	DGY	TAL SEA

Client Sample ID: MCPRA-WR-CT-2-0.5'

Date Collected: 08/05/15 19:00

Date Received: 08/10/15 14:00

Lab Sample ID: 590-1687-2

Matrix: Solid

Percent Solids: 62.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.3286 g	50 mL	198532	08/20/15 15:22	PAB	TAL SEA
Total/NA	Analysis	6020A		5	1.3286 g	50 mL	198635	08/21/15 11:48	FCW	TAL SEA
Total/NA	Prep	7471B			0.69 g	50 mL	2986	08/14/15 09:39	JIS	TAL SPK
Total/NA	Analysis	7471B		1	0.69 g	50 mL	3019	08/17/15 12:01	JSP	TAL SPK

Client Sample ID: MCPRA-WR-CT-3-0.5'

Date Collected: 08/06/15 14:05

Date Received: 08/10/15 14:00

Lab Sample ID: 590-1687-3

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			197812	08/13/15 10:50	DGY	TAL SEA

Client Sample ID: MCPRA-WR-CT-3-0.5'

Date Collected: 08/06/15 14:05

Date Received: 08/10/15 14:00

Lab Sample ID: 590-1687-3

Matrix: Solid

Percent Solids: 64.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.2613 g	50 mL	198532	08/20/15 15:22	PAB	TAL SEA

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Client Sample ID: MCPRA-WR-CT-3-0.5'

Date Collected: 08/06/15 14:05

Date Received: 08/10/15 14:00

Lab Sample ID: 590-1687-3

Matrix: Solid

Percent Solids: 64.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	6020A		5	1.2613 g	50 mL	198635	08/21/15 11:52	FCW	TAL SEA
Total/NA	Prep	7471B			0.60 g	50 mL	2986	08/14/15 09:39	JIS	TAL SPK
Total/NA	Analysis	7471B		1	0.60 g	50 mL	3019	08/17/15 12:08	JSP	TAL SPK

Client Sample ID: MCPRA-WR-CT-4-0.5'

Date Collected: 08/06/15 14:15

Date Received: 08/10/15 14:00

Lab Sample ID: 590-1687-4

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			197812	08/13/15 10:50	DGY	TAL SEA

Client Sample ID: MCPRA-WR-CT-4-0.5'

Date Collected: 08/06/15 14:15

Date Received: 08/10/15 14:00

Lab Sample ID: 590-1687-4

Matrix: Solid

Percent Solids: 81.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1344 g	50 mL	198532	08/20/15 15:22	PAB	TAL SEA
Total/NA	Analysis	6020A		5	1.1344 g	50 mL	198635	08/21/15 11:57	FCW	TAL SEA
Total/NA	Prep	7471B			0.51 g	50 mL	2986	08/14/15 09:39	JIS	TAL SPK
Total/NA	Analysis	7471B		1	0.51 g	50 mL	3019	08/17/15 12:10	JSP	TAL SPK

Client Sample ID: MCPRA-WR-CT-5-0.5'

Date Collected: 08/06/15 14:25

Date Received: 08/10/15 14:00

Lab Sample ID: 590-1687-5

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			197812	08/13/15 10:50	DGY	TAL SEA

Client Sample ID: MCPRA-WR-CT-5-0.5'

Date Collected: 08/06/15 14:25

Date Received: 08/10/15 14:00

Lab Sample ID: 590-1687-5

Matrix: Solid

Percent Solids: 85.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.5593 g	50 mL	198532	08/20/15 15:22	PAB	TAL SEA
Total/NA	Analysis	6020A		5	1.5593 g	50 mL	198635	08/21/15 12:01	FCW	TAL SEA
Total/NA	Prep	7471B			0.88 g	50 mL	2986	08/14/15 09:39	JIS	TAL SPK
Total/NA	Analysis	7471B		1	0.88 g	50 mL	3019	08/17/15 12:12	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Client Sample ID: MCPRA-WR-OC-1-0.5'

Lab Sample ID: 590-1687-6

Date Collected: 08/06/15 11:30

Matrix: Solid

Date Received: 08/10/15 14:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			197812	08/13/15 10:50	DGY	TAL SEA

Client Sample ID: MCPRA-WR-OC-1-0.5'

Lab Sample ID: 590-1687-6

Date Collected: 08/06/15 11:30

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 85.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.5781 g	50 mL	198532	08/20/15 15:22	PAB	TAL SEA
Total/NA	Analysis	6020A		5	1.5781 g	50 mL	198635	08/21/15 12:06	FCW	TAL SEA
Total/NA	Prep	7471B			0.54 g	50 mL	2986	08/14/15 09:39	JIS	TAL SPK
Total/NA	Analysis	7471B		1	0.54 g	50 mL	3019	08/17/15 12:15	JSP	TAL SPK

Client Sample ID: MCPRA-WR-OC-2-0.5'

Lab Sample ID: 590-1687-7

Date Collected: 08/06/15 11:45

Matrix: Solid

Date Received: 08/10/15 14:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			197812	08/13/15 10:50	DGY	TAL SEA

Client Sample ID: MCPRA-WR-OC-2-0.5'

Lab Sample ID: 590-1687-7

Date Collected: 08/06/15 11:45

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 62.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1993 g	50 mL	198532	08/20/15 15:22	PAB	TAL SEA
Total/NA	Analysis	6020A		5	1.1993 g	50 mL	198635	08/21/15 12:28	FCW	TAL SEA
Total/NA	Prep	7471B			0.62 g	50 mL	2986	08/14/15 09:39	JIS	TAL SPK
Total/NA	Analysis	7471B		1	0.62 g	50 mL	3019	08/17/15 12:17	JSP	TAL SPK

Client Sample ID: MCPRA-WR-OC-3-0.5'

Lab Sample ID: 590-1687-8

Date Collected: 08/06/15 11:50

Matrix: Solid

Date Received: 08/10/15 14:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			197812	08/13/15 10:50	DGY	TAL SEA

Client Sample ID: MCPRA-WR-OC-3-0.5'

Lab Sample ID: 590-1687-8

Date Collected: 08/06/15 11:50

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 85.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.6781 g	50 mL	198532	08/20/15 15:22	PAB	TAL SEA

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Client Sample ID: MCPRA-WR-OC-3-0.5'

Date Collected: 08/06/15 11:50

Date Received: 08/10/15 14:00

Lab Sample ID: 590-1687-8

Matrix: Solid

Percent Solids: 85.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	6020A		5	1.6781 g	50 mL	198635	08/21/15 12:32	FCW	TAL SEA
Total/NA	Prep	7471B			0.78 g	50 mL	2986	08/14/15 09:39	JIS	TAL SPK
Total/NA	Analysis	7471B		1	0.78 g	50 mL	3019	08/17/15 12:19	JSP	TAL SPK

Client Sample ID: MCPRA-WR-OC-4-0.5'

Date Collected: 08/06/15 11:55

Date Received: 08/10/15 14:00

Lab Sample ID: 590-1687-9

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			197812	08/13/15 10:50	DGY	TAL SEA

Client Sample ID: MCPRA-WR-OC-4-0.5'

Date Collected: 08/06/15 11:55

Date Received: 08/10/15 14:00

Lab Sample ID: 590-1687-9

Matrix: Solid

Percent Solids: 83.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.4196 g	50 mL	198644	08/21/15 14:36	PAB	TAL SEA
Total/NA	Analysis	6020A		5	1.4196 g	50 mL	198922	08/24/15 20:03	FCW	TAL SEA
Total/NA	Prep	7471B			0.74 g	50 mL	2986	08/14/15 09:39	JIS	TAL SPK
Total/NA	Analysis	7471B		1	0.74 g	50 mL	3019	08/17/15 12:22	JSP	TAL SPK

Client Sample ID: MCPRA-WR-OC-5-0.5'

Date Collected: 08/06/15 12:00

Date Received: 08/10/15 14:00

Lab Sample ID: 590-1687-10

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			197812	08/13/15 10:50	DGY	TAL SEA

Client Sample ID: MCPRA-WR-OC-5-0.5'

Date Collected: 08/06/15 12:00

Date Received: 08/10/15 14:00

Lab Sample ID: 590-1687-10

Matrix: Solid

Percent Solids: 90.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1944 g	50 mL	198644	08/21/15 14:36	PAB	TAL SEA
Total/NA	Analysis	6020A		5	1.1944 g	50 mL	198922	08/24/15 20:08	FCW	TAL SEA
Total/NA	Prep	7471B			0.68 g	50 mL	2986	08/14/15 09:39	JIS	TAL SPK
Total/NA	Analysis	7471B		1	0.68 g	50 mL	3019	08/17/15 12:24	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Client Sample ID: MCPRA-WR-HW-1-0.5'

Lab Sample ID: 590-1687-11

Date Collected: 08/05/15 19:05

Matrix: Solid

Date Received: 08/10/15 14:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			197812	08/13/15 10:50	DGY	TAL SEA

Client Sample ID: MCPRA-WR-HW-1-0.5'

Lab Sample ID: 590-1687-11

Date Collected: 08/05/15 19:05

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 69.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0511 g	50 mL	198644	08/21/15 14:36	PAB	TAL SEA
Total/NA	Analysis	6020A		5	1.0511 g	50 mL	198922	08/24/15 20:12	FCW	TAL SEA
Total/NA	Prep	7471B			0.60 g	50 mL	2986	08/14/15 09:39	JIS	TAL SPK
Total/NA	Analysis	7471B		1	0.60 g	50 mL	3019	08/17/15 12:26	JSP	TAL SPK

Client Sample ID: MCPRA-WR-HW-2-0.5'

Lab Sample ID: 590-1687-12

Date Collected: 08/05/15 19:10

Matrix: Solid

Date Received: 08/10/15 14:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			197812	08/13/15 10:50	DGY	TAL SEA

Client Sample ID: MCPRA-WR-HW-2-0.5'

Lab Sample ID: 590-1687-12

Date Collected: 08/05/15 19:10

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 84.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1193 g	50 mL	198644	08/21/15 14:36	PAB	TAL SEA
Total/NA	Analysis	6020A		5	1.1193 g	50 mL	198922	08/24/15 20:17	FCW	TAL SEA
Total/NA	Prep	7471B			0.50 g	50 mL	2986	08/14/15 09:39	JIS	TAL SPK
Total/NA	Analysis	7471B		1	0.50 g	50 mL	3019	08/17/15 12:29	JSP	TAL SPK

Client Sample ID: MCPRA-WR-HW-3-0.5'

Lab Sample ID: 590-1687-13

Date Collected: 08/06/15 13:30

Matrix: Solid

Date Received: 08/10/15 14:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			197812	08/13/15 10:50	DGY	TAL SEA

Client Sample ID: MCPRA-WR-HW-3-0.5'

Lab Sample ID: 590-1687-13

Date Collected: 08/06/15 13:30

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 60.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1398 g	50 mL	198644	08/21/15 14:36	PAB	TAL SEA

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Client Sample ID: MCPRA-WR-HW-3-0.5'

Lab Sample ID: 590-1687-13

Date Collected: 08/06/15 13:30

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 60.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	6020A		5	1.1398 g	50 mL	198922	08/24/15 20:21	FCW	TAL SEA
Total/NA	Prep	7471B			0.85 g	50 mL	2986	08/14/15 09:39	JIS	TAL SPK
Total/NA	Analysis	7471B		1	0.85 g	50 mL	3020	08/17/15 14:01	JSP	TAL SPK

Client Sample ID: MCPRA-WR-HW-4-0.5'

Lab Sample ID: 590-1687-14

Date Collected: 08/06/15 13:45

Matrix: Solid

Date Received: 08/10/15 14:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			197812	08/13/15 10:50	DGY	TAL SEA

Client Sample ID: MCPRA-WR-HW-4-0.5'

Lab Sample ID: 590-1687-14

Date Collected: 08/06/15 13:45

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 74.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0688 g	50 mL	198644	08/21/15 14:36	PAB	TAL SEA
Total/NA	Analysis	6020A		5	1.0688 g	50 mL	198922	08/24/15 20:25	FCW	TAL SEA
Total/NA	Prep	7471B			0.86 g	50 mL	2986	08/14/15 09:39	JIS	TAL SPK
Total/NA	Analysis	7471B		1	0.86 g	50 mL	3020	08/17/15 14:03	JSP	TAL SPK

Client Sample ID: MCPRA-WR-HW-5-0.5'

Lab Sample ID: 590-1687-15

Date Collected: 08/06/15 13:55

Matrix: Solid

Date Received: 08/10/15 14:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			197812	08/13/15 10:50	DGY	TAL SEA

Client Sample ID: MCPRA-WR-HW-5-0.5'

Lab Sample ID: 590-1687-15

Date Collected: 08/06/15 13:55

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 85.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.4063 g	50 mL	198644	08/21/15 14:36	PAB	TAL SEA
Total/NA	Analysis	6020A		5	1.4063 g	50 mL	198922	08/24/15 20:30	FCW	TAL SEA
Total/NA	Prep	7471B			0.68 g	50 mL	2986	08/14/15 09:39	JIS	TAL SPK
Total/NA	Analysis	7471B		1	0.68 g	50 mL	3020	08/17/15 14:06	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Client Sample ID: MCPRA-WR-AS-01

Lab Sample ID: 590-1687-16

Date Collected: 08/07/15 11:55

Matrix: Solid

Date Received: 08/10/15 14:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			197812	08/13/15 10:50	DGY	TAL SEA

Client Sample ID: MCPRA-WR-AS-01

Lab Sample ID: 590-1687-16

Date Collected: 08/07/15 11:55

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 62.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0576 g	50 mL	198644	08/21/15 14:36	PAB	TAL SEA
Total/NA	Analysis	6020A		5	1.0576 g	50 mL	198922	08/24/15 20:34	FCW	TAL SEA
Total/NA	Prep	7471B			0.69 g	50 mL	2986	08/14/15 09:39	JIS	TAL SPK
Total/NA	Analysis	7471B		1	0.69 g	50 mL	3020	08/17/15 14:08	JSP	TAL SPK

Client Sample ID: MCPRA-WR-AS-02

Lab Sample ID: 590-1687-17

Date Collected: 08/07/15 12:20

Matrix: Solid

Date Received: 08/10/15 14:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			197812	08/13/15 10:50	DGY	TAL SEA

Client Sample ID: MCPRA-WR-AS-02

Lab Sample ID: 590-1687-17

Date Collected: 08/07/15 12:20

Matrix: Solid

Date Received: 08/10/15 14:00

Percent Solids: 78.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0778 g	50 mL	198644	08/21/15 14:36	PAB	TAL SEA
Total/NA	Analysis	6020A		5	1.0778 g	50 mL	198922	08/24/15 20:39	FCW	TAL SEA
Total/NA	Prep	7471B			0.85 g	50 mL	2986	08/14/15 09:39	JIS	TAL SPK
Total/NA	Analysis	7471B		1	0.85 g	50 mL	3020	08/17/15 14:10	JSP	TAL SPK

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Certification Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Laboratory: TestAmerica Spokane

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C569	01-06-16

Laboratory: TestAmerica Seattle

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska (UST)	State Program	10	UST-022	03-02-16
California	State Program	9	2901	01-31-17
L-A-B	DoD ELAP		L2236	01-19-16
L-A-B	ISO/IEC 17025		L2236	01-19-16
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-06-15
US Fish & Wildlife	Federal		LE058448-0	02-28-16
USDA	Federal		P330-14-00126	04-08-17
Washington	State Program	10	C553	02-17-16

Method Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Removal Action

TestAmerica Job ID: 590-1687-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL SEA
7471B	Mercury (CVAA)	SW846	TAL SPK
D 2216	Percent Moisture	ASTM	TAL SEA

Protocol References:

ASTM = ASTM International

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200



Spokane, WA 99206
phone 509.924.9200 fax

Regulatory Program: DW NPDES RCRA Other:

TestAmerica Laboratories, Inc.

Client Contact

Project Manager: Ryan Tobias

Site Contact: BJ Kronschnabel

Date: 8/10/15

COC No. page 10 of 22

Cascade Earth Sciences

Tel/Fax: (509) 931-3157

Lab Contact: Rande Arrington

Carrier:

Sampler: For Lab Use Only: Walk-In Client Lab Sampling: Job / SDG No.:

12720 E Nora Ave Site A

Analysis Turnaround Time

Carrier:

Carrier:

Sampler: For Lab Use Only: Walk-In Client Lab Sampling: Job / SDG No.:

Spokane, WA 99216

CALENDAR DAYS WORKING DAYS

Carrier:

Carrier:

Sampler: For Lab Use Only: Walk-In Client Lab Sampling: Job / SDG No.:

(509) 921-0290

AT if different from Below

Carrier:

Carrier:

Sampler: For Lab Use Only: Walk-In Client Lab Sampling: Job / SDG No.:

(509) 921-1788

2 weeks 1 week 2 days 1 day

Carrier:

Carrier:

Sampler: For Lab Use Only: Walk-In Client Lab Sampling: Job / SDG No.:

Project Name: Monte Cristo Removal Action

1 day

Carrier:

Carrier:

Sampler: For Lab Use Only: Walk-In Client Lab Sampling: Job / SDG No.:

Site: Monte Cristo Mining Area

1 day

Carrier:

Carrier:

Sampler: For Lab Use Only: Walk-In Client Lab Sampling: Job / SDG No.:

P O # 2015230017

1 day

Carrier:

Carrier:

Sampler: For Lab Use Only: Walk-In Client Lab Sampling: Job / SDG No.:

Sample Identification

Sample Date

Sample Time

Sample Type (C-Comp, G-Gran)

Matrix

of Cont.

Sample Specific Notes:

Sample Identification	Sample Date	Sample Time	Sample Type (C-Comp, G-Gran)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Hg CVAA - 7471B	Sb, As, Cd, Cu, Pb, Se, Ti, Zn - 8020A	As by NIOSH Method 7300
MCRA-WR-CT-1-0.5'	8/5/15	1815	C	S	1	X	X	X	X	X
-CT-2-0.5'	8/6/15	1900	G	S	1	X	X	X	X	X
-CT-3-0.5'	8/6/15	1405				X	X	X	X	X
-CT-4-0.5'	8/6/15	1415				X	X	X	X	X
-CT-5-0.5'	8/6/15	1425				X	X	X	X	X
-OC-1-0.5'	8/6/15	1130				X	X	X	X	X
-OC-2-0.5'	8/6/15	1145				X	X	X	X	X
-OC-3-0.5'	8/6/15	1150				X	X	X	X	X
-OC-4-0.5'	8/6/15	1155				X	X	X	X	X
-OC-5-0.5'	8/6/15	1200				X	X	X	X	X
-HV-1-0.5'	8/5/15	1905				X	X	X	X	X
-HW-2-0.5'	8/5/15	1910				X	X	X	X	X



Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Return to Client: Disposal by Lab: Archive for: _____ Months

Special Instructions/QC Requirements & Comments:

Received in Laboratory by: _____ Company: _____

Custody Seals Intact: Yes No

Custody Seal No.:

Cooler Temp. (°C): Obsd: _____

Corrd: _____

Therm ID No.: 11001

Relinquished by: _____

Company: _____

Date/Time: 8/10/15

Received by: _____

Company: _____

Date/Time: 8/10/15 1400

Relinquished by: _____

Company: _____

Date/Time: _____

Received by: _____

Company: _____

Date/Time: _____

Relinquished by: _____

Company: _____

Date/Time: _____

Received in Laboratory by: _____

Company: _____

Date/Time: _____

Chain of Custody Record

THE LEADER IN ENVIRONMENTAL TESTING

Spokane, WA 99206
 phone 509.924.9200 fax

Regulatory Program: DW NPDES RCRA Other:

TestAmerica Laboratories, Inc

Cascade Earth Sciences
 12720 E Nora Ave Ste A
 Spokane, WA 99216
 (509) 921-0290
 (509) 921-1788

Client Contact
 Project Manager: Ryan Tobias
 Tel/Fax: (509) 931-3157

Site Contact: BJ Kronschabel
 Lab Contact: Rande Arrington

Date: 8/15/15

COC No: page 2 of 2
 of COCs

Project Name: Monte Cristo Removal Action
 Site: Monte Cristo Mining Area
 P O # 2015230017

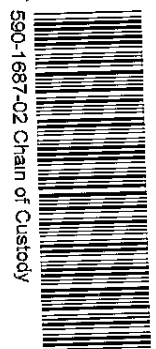
Analysis Turnaround Time
 CALENDAR DAYS WORKING DAYS
 TAT If different from Below
 2 weeks
 1 week
 2 days
 1 day

Filtered Sample (Y / N)
 Perform MS / MSD (Y / N)
 Hg CVAA - 7471B
 Sb, As, Cd, Cu, Pb, Se, Ti, Zn - 6020A
 As by NIOSH Method 7300

Carrier:
 Sampler:
 For Lab Use Only:
 Walk-in Client:
 Lab Sampling:
 Job / SDG No.:

Sample Specific Notes:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Cont, G=Grav)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	Hg CVAA - 7471B	Sb, As, Cd, Cu, Pb, Se, Ti, Zn - 6020A	As by NIOSH Method 7300
MCPRA-WR-HW-3-0.5'	8/6/15	1330	G	S	1			X		
-HW-4-0.5'		1345						X		
-HW-5-0.5'		1355						X		
-AS-01	8/15/15	1355						X		
-AS-02		1320						X		
8/4/15 - ARCH - 104 min	8/4/15	-	C	MCE	1			X		
8/4/15 - CAB - 105 min	8/4/15	-	C	MCE	1			X		
8/5/15 - ARCH - 005 min	8/5/15	-	C	MCE	1			X		
8/5/15 - CAB - 1005 min	8/5/15	-	C	MCE	1			X		



590-1687-02 Chain of Custody

Preservation Used: 1=Ice, 2=HCl; 3=H2SO4; 4=HNO3; 5=NaOH; 6=Other
 Possible Hazard Identification:
 Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Special Instructions/QC Requirements & Comments:
 Non-Hazard Flammable Skin Irritant Poison B Unknown
 Return to Client Disposal by Lab Archive for _____ Months

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Custody Seals Intact: Yes No

Custody Seal No.:

Cooler Temp. (°C): Obs'd: 7.2 Cord: 6.2 Therm ID No.: 10001

Relinquished by: *BJ Kronschabel* Company: *TestAmerica* Date/Time: *8/15/15 1400*

Relinquished by: *BJ Kronschabel* Company: *TestAmerica* Date/Time: *8/15/15 1400*

Relinquished by: _____ Company: _____ Date/Time: _____

Login Sample Receipt Checklist

Client: Cascade Earth Sciences Inc.

Job Number: 590-1687-1

Login Number: 1687

List Source: TestAmerica Spokane

List Number: 1

Creator: Kratz, Sheila J

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Login Sample Receipt Checklist

Client: Cascade Earth Sciences Inc.

Job Number: 590-1687-1

Login Number: 1687

List Number: 2

Creator: Blankinship, Tom X

List Source: TestAmerica Seattle

List Creation: 08/12/15 09:57 AM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.3°C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Spokane
11922 East 1st Ave
Spokane, WA 99206
Tel: (509)924-9200

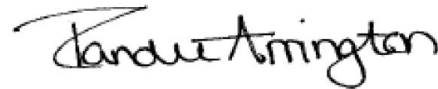
TestAmerica Job ID: 590-1867-1

Client Project/Site: Monte Cristo Mining Area - Removal Actio

For:

Cascade Earth Sciences Inc.
12720 E Nora Ave
Spokane, Washington 99216

Attn: Bernard Kronschnabel



Authorized for release by:
9/16/2015 3:50:31 PM

Randee Arrington, Project Manager II
(509)924-9200
randee.arrington@testamericainc.com

LINKS

Review your project
results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Mining Area - Removal Actio

TestAmerica Job ID: 590-1867-1

Job ID: 590-1867-1

Laboratory: TestAmerica Spokane

Narrative

Receipt

The samples were received on 9/3/2015 10:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 6.2° C.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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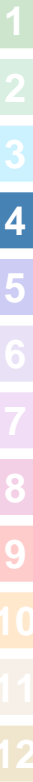
12

Sample Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Mining Area - Removal Actio

TestAmerica Job ID: 590-1867-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-1867-1	MCPRA-WR-CON-01-05	Solid	08/27/15 11:00	09/03/15 10:30
590-1867-2	MCPRA-WR-CON-02-05	Solid	08/27/15 11:30	09/03/15 10:30
590-1867-3	MCPRA-WR-CON-03-05	Solid	08/28/15 09:45	09/03/15 10:30
590-1867-4	MCPRA-WR-CON-04-05	Solid	08/28/15 09:55	09/03/15 10:30
590-1867-5	MCPRAS-RS-01-05	Solid	08/28/15 11:15	09/03/15 10:30
590-1867-6	MCPRA-CS-COL-05	Solid	08/28/15 09:05	09/03/15 10:30
590-1867-7	MCPRA-CS-CT-01	Solid	08/28/15 09:25	09/03/15 10:30
590-1867-8	MCPRA-CS-AS-01	Solid	08/28/15 09:35	09/03/15 10:30
590-1867-9	MCPRA-CS-CON-01	Solid	08/28/15 10:05	09/03/15 10:30



Definitions/Glossary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Mining Area - Removal Actio

TestAmerica Job ID: 590-1867-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Mining Area - Removal Actio

TestAmerica Job ID: 590-1867-1

Client Sample ID: MCPRA-WR-CON-01-05

Lab Sample ID: 590-1867-1

Date Collected: 08/27/15 11:00

Matrix: Solid

Date Received: 09/03/15 10:30

Percent Solids: 85.8

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	220		0.10		mg/Kg	☼	09/11/15 09:13	09/11/15 18:33	5
Arsenic	3100		26		mg/Kg	☼	09/11/15 09:13	09/14/15 12:07	500
Cadmium	1.1		0.10		mg/Kg	☼	09/11/15 09:13	09/11/15 18:33	5
Copper	190		0.21		mg/Kg	☼	09/11/15 09:13	09/11/15 18:33	5
Lead	1100		0.26		mg/Kg	☼	09/11/15 09:13	09/11/15 18:33	5
Selenium	0.83		0.52		mg/Kg	☼	09/11/15 09:13	09/11/15 18:33	5
Thallium	0.39		0.21		mg/Kg	☼	09/11/15 09:13	09/11/15 18:33	5
Zinc	190		2.6		mg/Kg	☼	09/11/15 09:13	09/11/15 18:33	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.16		0.027		mg/Kg	☼	09/16/15 09:49	09/16/15 14:21	1

Client Sample ID: MCPRA-WR-CON-02-05

Lab Sample ID: 590-1867-2

Date Collected: 08/27/15 11:30

Matrix: Solid

Date Received: 09/03/15 10:30

Percent Solids: 68.3

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	110		0.13		mg/Kg	☼	09/11/15 09:13	09/11/15 18:37	5
Arsenic	1700		0.33		mg/Kg	☼	09/11/15 09:13	09/11/15 18:37	5
Cadmium	6.2		0.13		mg/Kg	☼	09/11/15 09:13	09/11/15 18:37	5
Copper	330		0.26		mg/Kg	☼	09/11/15 09:13	09/11/15 18:37	5
Lead	620		0.33		mg/Kg	☼	09/11/15 09:13	09/11/15 18:37	5
Selenium	1.1		0.65		mg/Kg	☼	09/11/15 09:13	09/11/15 18:37	5
Thallium	ND		0.26		mg/Kg	☼	09/11/15 09:13	09/11/15 18:37	5
Zinc	540		3.3		mg/Kg	☼	09/11/15 09:13	09/11/15 18:37	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.17		0.033		mg/Kg	☼	09/16/15 09:49	09/16/15 14:30	1

Client Sample ID: MCPRA-WR-CON-03-05

Lab Sample ID: 590-1867-3

Date Collected: 08/28/15 09:45

Matrix: Solid

Date Received: 09/03/15 10:30

Percent Solids: 76.4

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	30		0.11		mg/Kg	☼	09/11/15 09:13	09/11/15 18:01	5
Arsenic	79		0.28		mg/Kg	☼	09/11/15 09:13	09/11/15 18:01	5
Cadmium	3.0		0.11		mg/Kg	☼	09/11/15 09:13	09/11/15 18:01	5
Copper	98		0.23		mg/Kg	☼	09/11/15 09:13	09/11/15 18:01	5
Lead	28		0.28		mg/Kg	☼	09/11/15 09:13	09/11/15 18:01	5
Selenium	0.76		0.57		mg/Kg	☼	09/11/15 09:13	09/11/15 18:01	5
Thallium	ND		0.23		mg/Kg	☼	09/11/15 09:13	09/11/15 18:01	5
Zinc	1100		2.8		mg/Kg	☼	09/11/15 09:13	09/11/15 18:01	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.099		0.022		mg/Kg	☼	09/16/15 09:49	09/16/15 14:32	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Mining Area - Removal Actio

TestAmerica Job ID: 590-1867-1

Client Sample ID: MCPRA-WR-CON-04-05

Lab Sample ID: 590-1867-4

Date Collected: 08/28/15 09:55

Matrix: Solid

Date Received: 09/03/15 10:30

Percent Solids: 72.8

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	11		0.12		mg/Kg	☼	09/11/15 09:13	09/11/15 18:06	5
Arsenic	96		0.31		mg/Kg	☼	09/11/15 09:13	09/11/15 18:06	5
Cadmium	0.66		0.12		mg/Kg	☼	09/11/15 09:13	09/11/15 18:06	5
Copper	170		0.25		mg/Kg	☼	09/11/15 09:13	09/11/15 18:06	5
Lead	43		0.31		mg/Kg	☼	09/11/15 09:13	09/11/15 18:06	5
Selenium	1.1		0.62		mg/Kg	☼	09/11/15 09:13	09/11/15 18:06	5
Thallium	ND		0.25		mg/Kg	☼	09/11/15 09:13	09/11/15 18:06	5
Zinc	90		3.1		mg/Kg	☼	09/11/15 09:13	09/11/15 18:06	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.14		0.027		mg/Kg	☼	09/16/15 09:49	09/16/15 14:34	1

Client Sample ID: MCPRAS-RS-01-05

Lab Sample ID: 590-1867-5

Date Collected: 08/28/15 11:15

Matrix: Solid

Date Received: 09/03/15 10:30

Percent Solids: 64.2

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	17		0.14		mg/Kg	☼	09/11/15 09:13	09/11/15 18:10	5
Arsenic	330		0.36		mg/Kg	☼	09/11/15 09:13	09/11/15 18:10	5
Cadmium	1.3		0.14		mg/Kg	☼	09/11/15 09:13	09/11/15 18:10	5
Copper	64		0.29		mg/Kg	☼	09/11/15 09:13	09/11/15 18:10	5
Lead	120		0.36		mg/Kg	☼	09/11/15 09:13	09/11/15 18:10	5
Selenium	0.82		0.71		mg/Kg	☼	09/11/15 09:13	09/11/15 18:10	5
Thallium	ND		0.29		mg/Kg	☼	09/11/15 09:13	09/11/15 18:10	5
Zinc	180		3.6		mg/Kg	☼	09/11/15 09:13	09/11/15 18:10	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.079		0.042		mg/Kg	☼	09/16/15 09:49	09/16/15 14:37	1

Client Sample ID: MCPRA-CS-COL-05

Lab Sample ID: 590-1867-6

Date Collected: 08/28/15 09:05

Matrix: Solid

Date Received: 09/03/15 10:30

Percent Solids: 71.4

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	6.7		0.12		mg/Kg	☼	09/11/15 09:13	09/11/15 18:14	5
Arsenic	130		0.31		mg/Kg	☼	09/11/15 09:13	09/11/15 18:14	5
Cadmium	0.30		0.12		mg/Kg	☼	09/11/15 09:13	09/11/15 18:14	5
Copper	59		0.25		mg/Kg	☼	09/11/15 09:13	09/11/15 18:14	5
Lead	25		0.31		mg/Kg	☼	09/11/15 09:13	09/11/15 18:14	5
Selenium	1.1		0.62		mg/Kg	☼	09/11/15 09:13	09/11/15 18:14	5
Thallium	ND		0.25		mg/Kg	☼	09/11/15 09:13	09/11/15 18:14	5
Zinc	83		3.1		mg/Kg	☼	09/11/15 09:13	09/11/15 18:14	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.069		0.030		mg/Kg	☼	09/16/15 09:49	09/16/15 14:44	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Mining Area - Removal Actio

TestAmerica Job ID: 590-1867-1

Client Sample ID: MCPRA-CS-CT-01

Lab Sample ID: 590-1867-7

Date Collected: 08/28/15 09:25

Matrix: Solid

Date Received: 09/03/15 10:30

Percent Solids: 71.6

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	1.3		0.12		mg/Kg	☼	09/11/15 09:13	09/11/15 18:19	5
Arsenic	25		0.31		mg/Kg	☼	09/11/15 09:13	09/11/15 18:19	5
Cadmium	0.12		0.12		mg/Kg	☼	09/11/15 09:13	09/11/15 18:19	5
Copper	36		0.25		mg/Kg	☼	09/11/15 09:13	09/11/15 18:19	5
Lead	15		0.31		mg/Kg	☼	09/11/15 09:13	09/11/15 18:19	5
Selenium	0.75		0.62		mg/Kg	☼	09/11/15 09:13	09/11/15 18:19	5
Thallium	ND		0.25		mg/Kg	☼	09/11/15 09:13	09/11/15 18:19	5
Zinc	46		3.1		mg/Kg	☼	09/11/15 09:13	09/11/15 18:19	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.15		0.033		mg/Kg	☼	09/16/15 09:49	09/16/15 14:46	1

Client Sample ID: MCPRA-CS-AS-01

Lab Sample ID: 590-1867-8

Date Collected: 08/28/15 09:35

Matrix: Solid

Date Received: 09/03/15 10:30

Percent Solids: 74.9

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	3.6		0.12		mg/Kg	☼	09/11/15 09:13	09/11/15 18:23	5
Arsenic	110		0.30		mg/Kg	☼	09/11/15 09:13	09/11/15 18:23	5
Cadmium	0.26		0.12		mg/Kg	☼	09/11/15 09:13	09/11/15 18:23	5
Copper	58		0.24		mg/Kg	☼	09/11/15 09:13	09/11/15 18:23	5
Lead	31		0.30		mg/Kg	☼	09/11/15 09:13	09/11/15 18:23	5
Selenium	1.0		0.60		mg/Kg	☼	09/11/15 09:13	09/11/15 18:23	5
Thallium	ND		0.24		mg/Kg	☼	09/11/15 09:13	09/11/15 18:23	5
Zinc	67		3.0		mg/Kg	☼	09/11/15 09:13	09/11/15 18:23	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.073		0.028		mg/Kg	☼	09/16/15 09:49	09/16/15 14:48	1

Client Sample ID: MCPRA-CS-CON-01

Lab Sample ID: 590-1867-9

Date Collected: 08/28/15 10:05

Matrix: Solid

Date Received: 09/03/15 10:30

Percent Solids: 74.5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	4.8		0.11		mg/Kg	☼	09/11/15 09:13	09/11/15 18:28	5
Arsenic	66		0.29		mg/Kg	☼	09/11/15 09:13	09/11/15 18:28	5
Cadmium	0.29		0.11		mg/Kg	☼	09/11/15 09:13	09/11/15 18:28	5
Copper	54		0.23		mg/Kg	☼	09/11/15 09:13	09/11/15 18:28	5
Lead	26		0.29		mg/Kg	☼	09/11/15 09:13	09/11/15 18:28	5
Selenium	0.96		0.57		mg/Kg	☼	09/11/15 09:13	09/11/15 18:28	5
Thallium	ND		0.23		mg/Kg	☼	09/11/15 09:13	09/11/15 18:28	5
Zinc	75		2.9		mg/Kg	☼	09/11/15 09:13	09/11/15 18:28	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.090		0.023		mg/Kg	☼	09/16/15 09:49	09/16/15 14:50	1

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Mining Area - Removal Actio

TestAmerica Job ID: 590-1867-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 580-200485/18-A
Matrix: Solid
Analysis Batch: 200609

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 200485

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.10		mg/Kg		09/11/15 09:13	09/11/15 16:30	5
Arsenic	ND		0.25		mg/Kg		09/11/15 09:13	09/11/15 16:30	5
Cadmium	ND		0.10		mg/Kg		09/11/15 09:13	09/11/15 16:30	5
Copper	ND		0.20		mg/Kg		09/11/15 09:13	09/11/15 16:30	5
Lead	ND		0.25		mg/Kg		09/11/15 09:13	09/11/15 16:30	5
Selenium	ND		0.50		mg/Kg		09/11/15 09:13	09/11/15 16:30	5
Thallium	ND		0.20		mg/Kg		09/11/15 09:13	09/11/15 16:30	5
Zinc	ND		2.5		mg/Kg		09/11/15 09:13	09/11/15 16:30	5

Lab Sample ID: LCS 580-200485/19-A
Matrix: Solid
Analysis Batch: 200609

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 200485

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Antimony	150	150		mg/Kg		100	80 - 120
Arsenic	200	196		mg/Kg		98	80 - 120
Cadmium	5.00	5.11		mg/Kg		102	80 - 120
Copper	25.0	24.8		mg/Kg		99	80 - 120
Lead	50.0	46.7		mg/Kg		93	80 - 120
Selenium	200	203		mg/Kg		102	80 - 120
Thallium	200	214		mg/Kg		107	80 - 120
Zinc	200	195		mg/Kg		97	80 - 120

Lab Sample ID: LCSD 580-200485/20-A
Matrix: Solid
Analysis Batch: 200609

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 200485

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Antimony	150	145		mg/Kg		97	80 - 120	3	20
Arsenic	200	192		mg/Kg		96	80 - 120	2	20
Cadmium	5.00	4.80		mg/Kg		96	80 - 120	6	20
Copper	25.0	24.4		mg/Kg		98	80 - 120	2	20
Lead	50.0	45.5		mg/Kg		91	80 - 120	2	20
Selenium	200	200		mg/Kg		100	80 - 120	2	20
Thallium	200	204		mg/Kg		102	80 - 120	5	20
Zinc	200	189		mg/Kg		94	80 - 120	3	20

Lab Sample ID: LCSSRM 580-200485/21-A
Matrix: Solid
Analysis Batch: 200609

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 200485

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	Limits
Antimony	88.8	153		mg/Kg		172.5	22.0 - 259.0
Arsenic	139	132		mg/Kg		95.2	70.4 - 140.3
Cadmium	96.0	89.4		mg/Kg		93.1	73.2 - 127.1
Copper	168	159		mg/Kg		94.4	75.6 - 125.0

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Mining Area - Removal Actio

TestAmerica Job ID: 590-1867-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSSRM 580-200485/21-A
Matrix: Solid
Analysis Batch: 200609

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 200485

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Lead	133	121		mg/Kg		91.3	72.9 - 127.8
Selenium	177	177		mg/Kg		100.2	67.8 - 131.6
Thallium	138	132		mg/Kg		95.5	68.1 - 131.9
Zinc	189	178		mg/Kg		94.4	69.8 - 130.7

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 590-3447/9-A
Matrix: Solid
Analysis Batch: 3455

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 3447

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.050		mg/Kg		09/16/15 09:49	09/16/15 14:18	1

Lab Sample ID: LCS 590-3447/8-A
Matrix: Solid
Analysis Batch: 3455

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 3447

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg	0.200	0.196		mg/Kg		98	80 - 120

Lab Sample ID: 590-1867-1 MS
Matrix: Solid
Analysis Batch: 3455

Client Sample ID: MCPRA-WR-CON-01-05
Prep Type: Total/NA
Prep Batch: 3447

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg	0.16		0.224	0.350		mg/Kg	☼	85	80 - 120

Lab Sample ID: 590-1867-1 MSD
Matrix: Solid
Analysis Batch: 3455

Client Sample ID: MCPRA-WR-CON-01-05
Prep Type: Total/NA
Prep Batch: 3447

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg	0.16		0.212	0.337		mg/Kg	☼	84	80 - 120	4	20

Lab Sample ID: 590-1867-1 DU
Matrix: Solid
Analysis Batch: 3455

Client Sample ID: MCPRA-WR-CON-01-05
Prep Type: Total/NA
Prep Batch: 3447

Analyte	Sample Result	Sample Qualifier	Spike Added	DU Result	DU Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg	0.16		0.212	0.175		mg/Kg	☼			9	20

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Mining Area - Removal Actio

TestAmerica Job ID: 590-1867-1

Client Sample ID: MCPRA-WR-CON-01-05
Date Collected: 08/27/15 11:00
Date Received: 09/03/15 10:30

Lab Sample ID: 590-1867-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3425	09/15/15 08:54	IAB	TAL SPK

Client Sample ID: MCPRA-WR-CON-01-05
Date Collected: 08/27/15 11:00
Date Received: 09/03/15 10:30

Lab Sample ID: 590-1867-1
Matrix: Solid
Percent Solids: 85.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1155 g	50 mL	200485	09/11/15 09:13	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1155 g	50 mL	200609	09/11/15 18:33	FCW	TAL SEA
Total/NA	Prep	3050B			1.1155 g	50 mL	200485	09/11/15 09:13	MKN	TAL SEA
Total/NA	Analysis	6020A		500	1.1155 g	50 mL	200738	09/14/15 12:07	FCW	TAL SEA
Total/NA	Prep	7471B			1.09 g	50 mL	3447	09/16/15 09:49	JSP	TAL SPK
Total/NA	Analysis	7471B		1	1.09 g	50 mL	3455	09/16/15 14:21	JSP	TAL SPK

Client Sample ID: MCPRA-WR-CON-02-05
Date Collected: 08/27/15 11:30
Date Received: 09/03/15 10:30

Lab Sample ID: 590-1867-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3425	09/15/15 08:54	IAB	TAL SPK

Client Sample ID: MCPRA-WR-CON-02-05
Date Collected: 08/27/15 11:30
Date Received: 09/03/15 10:30

Lab Sample ID: 590-1867-2
Matrix: Solid
Percent Solids: 68.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1233 g	50 mL	200485	09/11/15 09:13	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1233 g	50 mL	200609	09/11/15 18:37	FCW	TAL SEA
Total/NA	Prep	7471B			1.12 g	50 mL	3447	09/16/15 09:49	JSP	TAL SPK
Total/NA	Analysis	7471B		1	1.12 g	50 mL	3455	09/16/15 14:30	JSP	TAL SPK

Client Sample ID: MCPRA-WR-CON-03-05
Date Collected: 08/28/15 09:45
Date Received: 09/03/15 10:30

Lab Sample ID: 590-1867-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3425	09/15/15 08:54	IAB	TAL SPK

Lab Chronicle

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Mining Area - Removal Actio

TestAmerica Job ID: 590-1867-1

Client Sample ID: MCPRA-WR-CON-03-05

Lab Sample ID: 590-1867-3

Date Collected: 08/28/15 09:45

Matrix: Solid

Date Received: 09/03/15 10:30

Percent Solids: 76.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1572 g	50 mL	200485	09/11/15 09:13	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1572 g	50 mL	200609	09/11/15 18:01	FCW	TAL SEA
Total/NA	Prep	7471B			1.51 g	50 mL	3447	09/16/15 09:49	JSP	TAL SPK
Total/NA	Analysis	7471B		1	1.51 g	50 mL	3455	09/16/15 14:32	JSP	TAL SPK

Client Sample ID: MCPRA-WR-CON-04-05

Lab Sample ID: 590-1867-4

Date Collected: 08/28/15 09:55

Matrix: Solid

Date Received: 09/03/15 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3425	09/15/15 08:54	IAB	TAL SPK

Client Sample ID: MCPRA-WR-CON-04-05

Lab Sample ID: 590-1867-4

Date Collected: 08/28/15 09:55

Matrix: Solid

Date Received: 09/03/15 10:30

Percent Solids: 72.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1103 g	50 mL	200485	09/11/15 09:13	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1103 g	50 mL	200609	09/11/15 18:06	FCW	TAL SEA
Total/NA	Prep	7471B			1.25 g	50 mL	3447	09/16/15 09:49	JSP	TAL SPK
Total/NA	Analysis	7471B		1	1.25 g	50 mL	3455	09/16/15 14:34	JSP	TAL SPK

Client Sample ID: MCPRAS-RS-01-05

Lab Sample ID: 590-1867-5

Date Collected: 08/28/15 11:15

Matrix: Solid

Date Received: 09/03/15 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3425	09/15/15 08:54	IAB	TAL SPK

Client Sample ID: MCPRAS-RS-01-05

Lab Sample ID: 590-1867-5

Date Collected: 08/28/15 11:15

Matrix: Solid

Date Received: 09/03/15 10:30

Percent Solids: 64.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0892 g	50 mL	200485	09/11/15 09:13	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.0892 g	50 mL	200609	09/11/15 18:10	FCW	TAL SEA
Total/NA	Prep	7471B			0.92 g	50 mL	3447	09/16/15 09:49	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.92 g	50 mL	3455	09/16/15 14:37	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Mining Area - Removal Actio

TestAmerica Job ID: 590-1867-1

Client Sample ID: MCPRA-CS-COL-05

Lab Sample ID: 590-1867-6

Date Collected: 08/28/15 09:05

Matrix: Solid

Date Received: 09/03/15 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3425	09/15/15 08:54	IAB	TAL SPK

Client Sample ID: MCPRA-CS-COL-05

Lab Sample ID: 590-1867-6

Date Collected: 08/28/15 09:05

Matrix: Solid

Date Received: 09/03/15 10:30

Percent Solids: 71.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1202 g	50 mL	200485	09/11/15 09:13	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1202 g	50 mL	200609	09/11/15 18:14	FCW	TAL SEA
Total/NA	Prep	7471B			1.18 g	50 mL	3447	09/16/15 09:49	JSP	TAL SPK
Total/NA	Analysis	7471B		1	1.18 g	50 mL	3455	09/16/15 14:44	JSP	TAL SPK

Client Sample ID: MCPRA-CS-CT-01

Lab Sample ID: 590-1867-7

Date Collected: 08/28/15 09:25

Matrix: Solid

Date Received: 09/03/15 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3425	09/15/15 08:54	IAB	TAL SPK

Client Sample ID: MCPRA-CS-CT-01

Lab Sample ID: 590-1867-7

Date Collected: 08/28/15 09:25

Matrix: Solid

Date Received: 09/03/15 10:30

Percent Solids: 71.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1306 g	50 mL	200485	09/11/15 09:13	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1306 g	50 mL	200609	09/11/15 18:19	FCW	TAL SEA
Total/NA	Prep	7471B			1.07 g	50 mL	3447	09/16/15 09:49	JSP	TAL SPK
Total/NA	Analysis	7471B		1	1.07 g	50 mL	3455	09/16/15 14:46	JSP	TAL SPK

Client Sample ID: MCPRA-CS-AS-01

Lab Sample ID: 590-1867-8

Date Collected: 08/28/15 09:35

Matrix: Solid

Date Received: 09/03/15 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3425	09/15/15 08:54	IAB	TAL SPK

Client Sample ID: MCPRA-CS-AS-01

Lab Sample ID: 590-1867-8

Date Collected: 08/28/15 09:35

Matrix: Solid

Date Received: 09/03/15 10:30

Percent Solids: 74.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1161 g	50 mL	200485	09/11/15 09:13	MKN	TAL SEA

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Mining Area - Removal Actio

TestAmerica Job ID: 590-1867-1

Client Sample ID: MCPRA-CS-AS-01

Lab Sample ID: 590-1867-8

Date Collected: 08/28/15 09:35

Matrix: Solid

Date Received: 09/03/15 10:30

Percent Solids: 74.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	6020A		5	1.1161 g	50 mL	200609	09/11/15 18:23	FCW	TAL SEA
Total/NA	Prep	7471B			1.20 g	50 mL	3447	09/16/15 09:49	JSP	TAL SPK
Total/NA	Analysis	7471B		1	1.20 g	50 mL	3455	09/16/15 14:48	JSP	TAL SPK

Client Sample ID: MCPRA-CS-CON-01

Lab Sample ID: 590-1867-9

Date Collected: 08/28/15 10:05

Matrix: Solid

Date Received: 09/03/15 10:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3425	09/15/15 08:54	IAB	TAL SPK

Client Sample ID: MCPRA-CS-CON-01

Lab Sample ID: 590-1867-9

Date Collected: 08/28/15 10:05

Matrix: Solid

Date Received: 09/03/15 10:30

Percent Solids: 74.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1682 g	50 mL	200485	09/11/15 09:13	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1682 g	50 mL	200609	09/11/15 18:28	FCW	TAL SEA
Total/NA	Prep	7471B			1.47 g	50 mL	3447	09/16/15 09:49	JSP	TAL SPK
Total/NA	Analysis	7471B		1	1.47 g	50 mL	3455	09/16/15 14:50	JSP	TAL SPK

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Certification Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Mining Area - Removal Actio

TestAmerica Job ID: 590-1867-1

Laboratory: TestAmerica Spokane

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C569	01-06-16

Laboratory: TestAmerica Seattle

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska (UST)	State Program	10	UST-022	03-02-16
California	State Program	9	2901	01-31-17
L-A-B	DoD ELAP		L2236	01-19-16
L-A-B	ISO/IEC 17025		L2236	01-19-16
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-06-15
US Fish & Wildlife	Federal		LE058448-0	02-28-16
USDA	Federal		P330-14-00126	04-08-17
Washington	State Program	10	C553	02-17-16

Method Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Mining Area - Removal Actio

TestAmerica Job ID: 590-1867-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL SEA
7471B	Mercury (CVAA)	SW846	TAL SPK
Moisture	Percent Moisture	EPA	TAL SPK

Protocol References:

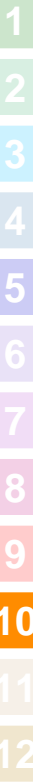
EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200



Spokane
11922 E. 1st Ave.
Spokane, WA 99206
phone 509.924.9200 fax

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Spokane, WA 99206
phone 509.924.9200 fax

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Ryan Tobias	Site Contact: BJ Kronschnabel	Date:
Cascade Earth Sciences 12720 E Nora Ave, Ste A Spokane, WA 99216	Tel/Fax: (509) 931-3157	Lab Contact:	Carrier:
(509) 921-0290	Analysis Turnaround Time	COC No.: _____ of _____ COCs	
(509) 921-1788	Calendar (C) or Work Days (W) Standard	Job No.: _____	
Project Name: Monte Cristo Mining Area - Removal Action	TRT if different from Below	SDG No.: _____	
Site: Monte Cristo Mining Area, WA	<input type="checkbox"/> 2 weeks		
P O #: 2015230017-203	<input type="checkbox"/> 1 week		
	<input type="checkbox"/> 2 days		
	<input type="checkbox"/> 1 day		

Sample Identification	Sample Date	Sample Time	Sample Type	Matrix	# of Cont.	Filtered Sample	Total Sb, As, Cd, Cu, Hg, Pb, Se, Th, Zn	Sample Specific Notes:
MCPRA-WR-CON-01-05	9/21/15	1100	Grab	Soil	1			
MCPRA-WR-CON-02-05	9/21/15	1130	Grab	Soil	1			
MCPRA-WR-CON-03-05	9/21/15	945	Grab	Soil	1			
MCPRA-WR-CON-04-05	9/21/15	955	Grab	Soil	1			
MCPRA-RS-01-05	9/21/15	1115	Grab	Soil	1			
MCPRA-CS-COL-05	9/21/15	905	Grab	Soil	1			
MCPRA-CS-CT-01	9/21/15	925	Grab	Soil	1			
MCPRA-CS-AS-01	9/21/15	935	Grab	Soil	1			
MCPRA-CS-CO1-01	9/21/15	1005	Grab	Soil	1			



Preservation Used: 1= Ice, 2= HCl, 3= H2SO4, 4= HNO3, 5= NaOH, 6= Other _____

Possible Hazard Identification

Non-Hazard Flammable Skin Irritant Poison B Unknown

Special Instructions/QC Requirements & Comments:

Relinquished by: _____ Company: _____ Date/Time: _____

Relinquished by: _____ Company: _____ Date/Time: _____

Relinquished by: _____ Company: _____ Date/Time: _____

Received by: _____ Company: _____ Date/Time: _____

Received by: _____ Company: _____ Date/Time: _____

Received by: _____ Company: _____ Date/Time: _____

Login Sample Receipt Checklist

Client: Cascade Earth Sciences Inc.

Job Number: 590-1867-1

Login Number: 1867

List Number: 1

Creator: Kratz, Sheila J

List Source: TestAmerica Spokane

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	False	Sample splitting required for subcontract purposes.
Residual Chlorine Checked.	N/A	



Login Sample Receipt Checklist

Client: Cascade Earth Sciences Inc.

Job Number: 590-1867-1

Login Number: 1867

List Number: 2

Creator: Vance, Diane R

List Source: TestAmerica Seattle

List Creation: 09/10/15 12:49 PM

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Spokane
11922 East 1st Ave
Spokane, WA 99206
Tel: (509)924-9200

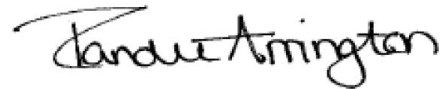
TestAmerica Job ID: 590-2083-1

Client Project/Site: Monte Cristo Post-Removal Action Monitor

For:

Cascade Earth Sciences Inc.
12720 E Nora Ave
Spokane, Washington 99216

Attn: Bernard Kronschnabel



Authorized for release by:
10/13/2015 4:10:17 PM

Randee Arrington, Project Manager II
(509)924-9200
randee.arrington@testamericainc.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Job ID: 590-2083-1

Laboratory: TestAmerica Spokane

Narrative

Receipt

The samples were received on 10/1/2015 10:15 AM; the samples arrived in good condition. The temperature of the cooler at receipt was 16.4° C.

Metals

Method 7471B: The following samples were received outside of holding time: MCRA-WR-CON-05 (590-2083-1), MCRA-WR-CON-06 (590-2083-2), MCRA-WR-CON-07 (590-2083-3) and MCRA-WR-CON-08 (590-2083-4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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Sample Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-2083-1	MCRA-WR-CON-05	Solid	09/03/15 12:55	10/01/15 10:15
590-2083-2	MCRA-WR-CON-06	Solid	09/03/15 13:05	10/01/15 10:15
590-2083-3	MCRA-WR-CON-07	Solid	09/03/15 13:15	10/01/15 10:15
590-2083-4	MCRA-WR-CON-08	Solid	09/03/15 13:25	10/01/15 10:15
590-2083-5	MCRA-WR-CON-09	Solid	09/11/15 17:55	10/01/15 10:15
590-2083-6	MCRA-WR-CON-10	Solid	09/10/15 17:55	10/01/15 10:15
590-2083-7	MCRA-WR-CON-11	Solid	09/10/15 18:05	10/01/15 10:15
590-2083-8	MCRA-WR-POW-01	Solid	09/21/15 14:00	10/01/15 10:15
590-2083-9	MCRA-WR-POW-02	Solid	09/21/15 14:20	10/01/15 10:15
590-2083-10	MCRA-WR-POW-03	Solid	09/21/15 14:35	10/01/15 10:15
590-2083-11	MCRA-WR-POW-04	Solid	09/21/15 14:45	10/01/15 10:15
590-2083-12	MCRA-WR-POW-05	Solid	09/21/15 15:00	10/01/15 10:15
590-2083-13	MCRA-WR-RY-01	Solid	09/24/15 07:35	10/01/15 10:15
590-2083-14	MCRA-WR-RY-02	Solid	09/24/15 07:45	10/01/15 10:15
590-2083-15	MCRA-WR-RY-03	Solid	09/24/15 08:05	10/01/15 10:15
590-2083-16	MCRA-WR-RY-04	Solid	09/24/15 08:20	10/01/15 10:15
590-2083-17	MCRA-WR-RY-05	Solid	09/24/15 08:35	10/01/15 10:15
590-2083-18	MCRA-WR-RY-06	Solid	09/24/15 08:40	10/01/15 10:15
590-2083-19	MCRA-CS-RY-01	Solid	09/24/15 10:30	10/01/15 10:15

Definitions/Glossary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Qualifiers

Metals

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
H	Sample was prepped or analyzed beyond the specified holding time
F3	Duplicate RPD exceeds the control limit
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Client Sample ID: MCRA-WR-CON-05

Date Collected: 09/03/15 12:55

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-1

Matrix: Solid

Percent Solids: 73.4

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	260	F1	0.33		mg/Kg	☼	10/12/15 09:04	10/13/15 05:44	5
Antimony	19		0.13		mg/Kg	☼	10/12/15 09:04	10/13/15 05:44	5
Cadmium	1.1		0.13		mg/Kg	☼	10/12/15 09:04	10/13/15 05:44	5
Copper	130		0.26		mg/Kg	☼	10/12/15 09:04	10/13/15 05:44	5
Lead	40		0.33		mg/Kg	☼	10/12/15 09:04	10/13/15 05:44	5
Selenium	0.83		0.66		mg/Kg	☼	10/12/15 09:04	10/13/15 05:44	5
Thallium	ND		0.26		mg/Kg	☼	10/12/15 09:04	10/13/15 05:44	5
Zinc	230		3.3		mg/Kg	☼	10/12/15 09:04	10/13/15 05:44	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.10	H	0.047		mg/Kg	☼	10/06/15 09:26	10/06/15 15:15	1

Client Sample ID: MCRA-WR-CON-06

Date Collected: 09/03/15 13:05

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-2

Matrix: Solid

Percent Solids: 74.2

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	150		0.32		mg/Kg	☼	10/12/15 09:04	10/13/15 06:21	5
Antimony	9.6		0.13		mg/Kg	☼	10/12/15 09:04	10/13/15 06:21	5
Cadmium	0.25		0.13		mg/Kg	☼	10/12/15 09:04	10/13/15 06:21	5
Copper	62		0.26		mg/Kg	☼	10/12/15 09:04	10/13/15 06:21	5
Lead	30		0.32		mg/Kg	☼	10/12/15 09:04	10/13/15 06:21	5
Selenium	0.78		0.64		mg/Kg	☼	10/12/15 09:04	10/13/15 06:21	5
Thallium	ND		0.26		mg/Kg	☼	10/12/15 09:04	10/13/15 06:21	5
Zinc	110		3.2		mg/Kg	☼	10/12/15 09:04	10/13/15 06:21	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.11	H	0.043		mg/Kg	☼	10/06/15 09:26	10/06/15 15:17	1

Client Sample ID: MCRA-WR-CON-07

Date Collected: 09/03/15 13:15

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-3

Matrix: Solid

Percent Solids: 67.7

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	110		0.36		mg/Kg	☼	10/12/15 09:04	10/13/15 06:25	5
Antimony	12		0.14		mg/Kg	☼	10/12/15 09:04	10/13/15 06:25	5
Cadmium	1.0		0.14		mg/Kg	☼	10/12/15 09:04	10/13/15 06:25	5
Copper	150		0.29		mg/Kg	☼	10/12/15 09:04	10/13/15 06:25	5
Lead	80		0.36		mg/Kg	☼	10/12/15 09:04	10/13/15 06:25	5
Selenium	0.81		0.72		mg/Kg	☼	10/12/15 09:04	10/13/15 06:25	5
Thallium	ND		0.29		mg/Kg	☼	10/12/15 09:04	10/13/15 06:25	5
Zinc	140		3.6		mg/Kg	☼	10/12/15 09:04	10/13/15 06:25	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.20	H	0.051		mg/Kg	☼	10/06/15 09:26	10/06/15 15:20	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Client Sample ID: MCRA-WR-CON-08

Lab Sample ID: 590-2083-4

Date Collected: 09/03/15 13:25

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 71.2

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	81		0.32		mg/Kg	☼	10/12/15 09:04	10/13/15 06:30	5
Antimony	17		0.13		mg/Kg	☼	10/12/15 09:04	10/13/15 06:30	5
Cadmium	0.73		0.13		mg/Kg	☼	10/12/15 09:04	10/13/15 06:30	5
Copper	100		0.26		mg/Kg	☼	10/12/15 09:04	10/13/15 06:30	5
Lead	38		0.32		mg/Kg	☼	10/12/15 09:04	10/13/15 06:30	5
Selenium	0.78		0.65		mg/Kg	☼	10/12/15 09:04	10/13/15 06:30	5
Thallium	ND		0.26		mg/Kg	☼	10/12/15 09:04	10/13/15 06:30	5
Zinc	130		3.2		mg/Kg	☼	10/12/15 09:04	10/13/15 06:30	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.13	H	0.052		mg/Kg	☼	10/06/15 09:26	10/06/15 15:26	1

Client Sample ID: MCRA-WR-CON-09

Lab Sample ID: 590-2083-5

Date Collected: 09/11/15 17:55

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 58.4

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2200		0.39		mg/Kg	☼	10/12/15 09:04	10/13/15 06:34	5
Antimony	860		0.16		mg/Kg	☼	10/12/15 09:04	10/13/15 06:34	5
Cadmium	1.3		0.16		mg/Kg	☼	10/12/15 09:04	10/13/15 06:34	5
Copper	210		0.31		mg/Kg	☼	10/12/15 09:04	10/13/15 06:34	5
Lead	1200		0.39		mg/Kg	☼	10/12/15 09:04	10/13/15 06:34	5
Selenium	1.0		0.78		mg/Kg	☼	10/12/15 09:04	10/13/15 06:34	5
Thallium	0.40		0.31		mg/Kg	☼	10/12/15 09:04	10/13/15 06:34	5
Zinc	220		3.9		mg/Kg	☼	10/12/15 09:04	10/13/15 06:34	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.50		0.071		mg/Kg	☼	10/06/15 09:26	10/06/15 15:29	1

Client Sample ID: MCRA-WR-CON-10

Lab Sample ID: 590-2083-6

Date Collected: 09/10/15 17:55

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 67.3

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	180		0.35		mg/Kg	☼	10/12/15 09:04	10/13/15 06:39	5
Antimony	27		0.14		mg/Kg	☼	10/12/15 09:04	10/13/15 06:39	5
Cadmium	0.33		0.14		mg/Kg	☼	10/12/15 09:04	10/13/15 06:39	5
Copper	45		0.28		mg/Kg	☼	10/12/15 09:04	10/13/15 06:39	5
Lead	56		0.35		mg/Kg	☼	10/12/15 09:04	10/13/15 06:39	5
Selenium	0.93		0.70		mg/Kg	☼	10/12/15 09:04	10/13/15 06:39	5
Thallium	ND		0.28		mg/Kg	☼	10/12/15 09:04	10/13/15 06:39	5
Zinc	73		3.5		mg/Kg	☼	10/12/15 09:04	10/13/15 06:39	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.10		0.045		mg/Kg	☼	10/06/15 09:26	10/06/15 15:31	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Client Sample ID: MCRA-WR-CON-11

Date Collected: 09/10/15 18:05

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-7

Matrix: Solid

Percent Solids: 57.5

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	490		0.43		mg/Kg	☼	10/12/15 09:04	10/13/15 05:03	5
Antimony	75		0.17		mg/Kg	☼	10/12/15 09:04	10/13/15 05:03	5
Cadmium	0.74		0.17		mg/Kg	☼	10/12/15 09:04	10/13/15 05:03	5
Copper	97		0.34		mg/Kg	☼	10/12/15 09:04	10/13/15 05:03	5
Lead	150		0.43		mg/Kg	☼	10/12/15 09:04	10/13/15 05:03	5
Selenium	1.1		0.86		mg/Kg	☼	10/12/15 09:04	10/13/15 05:03	5
Thallium	ND		0.34		mg/Kg	☼	10/12/15 09:04	10/13/15 05:03	5
Zinc	81		4.3		mg/Kg	☼	10/12/15 09:04	10/13/15 05:03	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.16		0.066		mg/Kg	☼	10/06/15 09:26	10/06/15 15:33	1

Client Sample ID: MCRA-WR-POW-01

Date Collected: 09/21/15 14:00

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-8

Matrix: Solid

Percent Solids: 61.2

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	67		0.40		mg/Kg	☼	10/12/15 09:04	10/13/15 06:48	5
Antimony	4.8		0.16		mg/Kg	☼	10/12/15 09:04	10/13/15 06:48	5
Cadmium	0.20		0.16		mg/Kg	☼	10/12/15 09:04	10/13/15 06:48	5
Copper	11		0.32		mg/Kg	☼	10/12/15 09:04	10/13/15 06:48	5
Lead	72		0.40		mg/Kg	☼	10/12/15 09:04	10/13/15 06:48	5
Selenium	ND		0.81		mg/Kg	☼	10/12/15 09:04	10/13/15 06:48	5
Thallium	ND		0.32		mg/Kg	☼	10/12/15 09:04	10/13/15 06:48	5
Zinc	27		4.0		mg/Kg	☼	10/12/15 09:04	10/13/15 06:48	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.093		0.058		mg/Kg	☼	10/06/15 09:26	10/06/15 15:36	1

Client Sample ID: MCRA-WR-POW-02

Date Collected: 09/21/15 14:20

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-9

Matrix: Solid

Percent Solids: 54.0

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	270		0.46		mg/Kg	☼	10/12/15 09:04	10/13/15 06:52	5
Antimony	29		0.18		mg/Kg	☼	10/12/15 09:04	10/13/15 06:52	5
Cadmium	ND		0.18		mg/Kg	☼	10/12/15 09:04	10/13/15 06:52	5
Copper	96		0.37		mg/Kg	☼	10/12/15 09:04	10/13/15 06:52	5
Lead	31		0.46		mg/Kg	☼	10/12/15 09:04	10/13/15 06:52	5
Selenium	ND		0.92		mg/Kg	☼	10/12/15 09:04	10/13/15 06:52	5
Thallium	ND		0.37		mg/Kg	☼	10/12/15 09:04	10/13/15 06:52	5
Zinc	18		4.6		mg/Kg	☼	10/12/15 09:04	10/13/15 06:52	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.077		mg/Kg	☼	10/06/15 09:26	10/06/15 15:38	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Client Sample ID: MCRA-WR-POW-03

Lab Sample ID: 590-2083-10

Date Collected: 09/21/15 14:35

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 87.2

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	120		0.28		mg/Kg	☼	10/12/15 09:04	10/13/15 04:54	5
Antimony	4.4		0.11		mg/Kg	☼	10/12/15 09:04	10/13/15 04:54	5
Cadmium	0.59		0.11		mg/Kg	☼	10/12/15 09:04	10/13/15 04:54	5
Copper	140		0.22		mg/Kg	☼	10/12/15 09:04	10/13/15 04:54	5
Lead	15		0.28		mg/Kg	☼	10/12/15 09:04	10/13/15 04:54	5
Selenium	0.81		0.56		mg/Kg	☼	10/12/15 09:04	10/13/15 04:54	5
Thallium	ND		0.22		mg/Kg	☼	10/12/15 09:04	10/13/15 04:54	5
Zinc	120		2.8		mg/Kg	☼	10/12/15 09:04	10/13/15 04:54	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.068		0.030		mg/Kg	☼	10/06/15 09:26	10/06/15 15:40	1

Client Sample ID: MCRA-WR-POW-04

Lab Sample ID: 590-2083-11

Date Collected: 09/21/15 14:45

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 38.7

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	130		0.61		mg/Kg	☼	10/12/15 09:04	10/13/15 06:57	5
Antimony	19		0.24		mg/Kg	☼	10/12/15 09:04	10/13/15 06:57	5
Cadmium	1.0		0.24		mg/Kg	☼	10/12/15 09:04	10/13/15 06:57	5
Copper	560		0.49		mg/Kg	☼	10/12/15 09:04	10/13/15 06:57	5
Lead	260		0.61		mg/Kg	☼	10/12/15 09:04	10/13/15 06:57	5
Selenium	2.0		1.2		mg/Kg	☼	10/12/15 09:04	10/13/15 06:57	5
Thallium	ND		0.49		mg/Kg	☼	10/12/15 09:04	10/13/15 06:57	5
Zinc	91		6.1		mg/Kg	☼	10/12/15 09:04	10/13/15 06:57	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.20		0.074		mg/Kg	☼	10/06/15 09:32	10/06/15 15:52	1

Client Sample ID: MCRA-WR-POW-05

Lab Sample ID: 590-2083-12

Date Collected: 09/21/15 15:00

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 90.7

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2200		0.27		mg/Kg	☼	10/12/15 09:04	10/13/15 04:59	5
Antimony	100		0.11		mg/Kg	☼	10/12/15 09:04	10/13/15 04:59	5
Cadmium	0.32		0.11		mg/Kg	☼	10/12/15 09:04	10/13/15 04:59	5
Copper	86		0.22		mg/Kg	☼	10/12/15 09:04	10/13/15 04:59	5
Lead	160		0.27		mg/Kg	☼	10/12/15 09:04	10/13/15 04:59	5
Selenium	0.62		0.54		mg/Kg	☼	10/12/15 09:04	10/13/15 04:59	5
Thallium	2.2		0.22		mg/Kg	☼	10/12/15 09:04	10/13/15 04:59	5
Zinc	150		2.7		mg/Kg	☼	10/12/15 09:04	10/13/15 04:59	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.69		0.037		mg/Kg	☼	10/06/15 09:32	10/06/15 16:01	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Client Sample ID: MCRA-WR-RY-01

Lab Sample ID: 590-2083-13

Date Collected: 09/24/15 07:35

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 77.2

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	140		0.30		mg/Kg	☼	10/12/15 08:59	10/13/15 03:41	5
Antimony	2.6		0.12		mg/Kg	☼	10/12/15 08:59	10/13/15 03:41	5
Cadmium	0.19		0.12		mg/Kg	☼	10/12/15 08:59	10/13/15 03:41	5
Copper	38		0.24		mg/Kg	☼	10/12/15 08:59	10/13/15 03:41	5
Lead	14		0.30		mg/Kg	☼	10/12/15 08:59	10/13/15 03:41	5
Selenium	0.88		0.59		mg/Kg	☼	10/12/15 08:59	10/13/15 03:41	5
Thallium	ND		0.24		mg/Kg	☼	10/12/15 08:59	10/13/15 03:41	5
Zinc	69		3.0		mg/Kg	☼	10/12/15 08:59	10/13/15 03:41	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.065		0.039		mg/Kg	☼	10/06/15 09:32	10/06/15 16:03	1

Client Sample ID: MCRA-WR-RY-02

Lab Sample ID: 590-2083-14

Date Collected: 09/24/15 07:45

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 95.0

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	130		0.25		mg/Kg	☼	10/12/15 08:59	10/13/15 03:46	5
Antimony	2.7		0.10		mg/Kg	☼	10/12/15 08:59	10/13/15 03:46	5
Cadmium	0.32		0.10		mg/Kg	☼	10/12/15 08:59	10/13/15 03:46	5
Copper	47		0.20		mg/Kg	☼	10/12/15 08:59	10/13/15 03:46	5
Lead	31		0.25		mg/Kg	☼	10/12/15 08:59	10/13/15 03:46	5
Selenium	ND		0.50		mg/Kg	☼	10/12/15 08:59	10/13/15 03:46	5
Thallium	ND		0.20		mg/Kg	☼	10/12/15 08:59	10/13/15 03:46	5
Zinc	82		2.5		mg/Kg	☼	10/12/15 08:59	10/13/15 03:46	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.075		0.045		mg/Kg	☼	10/06/15 09:32	10/06/15 16:06	1

Client Sample ID: MCRA-WR-RY-03

Lab Sample ID: 590-2083-15

Date Collected: 09/24/15 08:05

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 89.6

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1000		0.27		mg/Kg	☼	10/12/15 08:59	10/13/15 03:50	5
Antimony	7.0		0.11		mg/Kg	☼	10/12/15 08:59	10/13/15 03:50	5
Cadmium	0.40		0.11		mg/Kg	☼	10/12/15 08:59	10/13/15 03:50	5
Copper	75		0.21		mg/Kg	☼	10/12/15 08:59	10/13/15 03:50	5
Lead	32		0.27		mg/Kg	☼	10/12/15 08:59	10/13/15 03:50	5
Selenium	0.55		0.53		mg/Kg	☼	10/12/15 08:59	10/13/15 03:50	5
Thallium	ND		0.21		mg/Kg	☼	10/12/15 08:59	10/13/15 03:50	5
Zinc	110		2.7		mg/Kg	☼	10/12/15 08:59	10/13/15 03:50	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.051		0.037		mg/Kg	☼	10/06/15 09:32	10/06/15 16:08	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Client Sample ID: MCRA-WR-RY-04

Lab Sample ID: 590-2083-16

Date Collected: 09/24/15 08:20

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 81.7

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	290		0.28		mg/Kg	☼	10/12/15 08:59	10/13/15 03:55	5
Antimony	4.0		0.11		mg/Kg	☼	10/12/15 08:59	10/13/15 03:55	5
Cadmium	0.21		0.11		mg/Kg	☼	10/12/15 08:59	10/13/15 03:55	5
Copper	89		0.23		mg/Kg	☼	10/12/15 08:59	10/13/15 03:55	5
Lead	17		0.28		mg/Kg	☼	10/12/15 08:59	10/13/15 03:55	5
Selenium	0.97		0.57		mg/Kg	☼	10/12/15 08:59	10/13/15 03:55	5
Thallium	ND		0.23		mg/Kg	☼	10/12/15 08:59	10/13/15 03:55	5
Zinc	85		2.8		mg/Kg	☼	10/12/15 08:59	10/13/15 03:55	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.11		0.047		mg/Kg	☼	10/06/15 09:32	10/06/15 16:15	1

Client Sample ID: MCRA-WR-RY-05

Lab Sample ID: 590-2083-17

Date Collected: 09/24/15 08:35

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 88.6

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	150		0.27		mg/Kg	☼	10/12/15 08:59	10/13/15 03:59	5
Antimony	17		0.11		mg/Kg	☼	10/12/15 08:59	10/13/15 03:59	5
Cadmium	0.47		0.11		mg/Kg	☼	10/12/15 08:59	10/13/15 03:59	5
Copper	47		0.22		mg/Kg	☼	10/12/15 08:59	10/13/15 03:59	5
Lead	28		0.27		mg/Kg	☼	10/12/15 08:59	10/13/15 03:59	5
Selenium	ND		0.54		mg/Kg	☼	10/12/15 08:59	10/13/15 03:59	5
Thallium	ND		0.22		mg/Kg	☼	10/12/15 08:59	10/13/15 03:59	5
Zinc	95		2.7		mg/Kg	☼	10/12/15 08:59	10/13/15 03:59	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.084		0.039		mg/Kg	☼	10/06/15 09:32	10/06/15 16:22	1

Client Sample ID: MCRA-WR-RY-06

Lab Sample ID: 590-2083-18

Date Collected: 09/24/15 08:40

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 53.8

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	170		0.45		mg/Kg	☼	10/12/15 08:59	10/13/15 04:04	5
Antimony	5.3		0.18		mg/Kg	☼	10/12/15 08:59	10/13/15 04:04	5
Cadmium	0.27		0.18		mg/Kg	☼	10/12/15 08:59	10/13/15 04:04	5
Copper	69		0.36		mg/Kg	☼	10/12/15 08:59	10/13/15 04:04	5
Lead	31		0.45		mg/Kg	☼	10/12/15 08:59	10/13/15 04:04	5
Selenium	1.4		0.89		mg/Kg	☼	10/12/15 08:59	10/13/15 04:04	5
Thallium	ND		0.36		mg/Kg	☼	10/12/15 08:59	10/13/15 04:04	5
Zinc	120		4.5		mg/Kg	☼	10/12/15 08:59	10/13/15 04:04	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.096		0.073		mg/Kg	☼	10/06/15 09:32	10/06/15 16:25	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Client Sample ID: MCRA-CS-RY-01

Lab Sample ID: 590-2083-19

Date Collected: 09/24/15 10:30

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 69.0

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	340		0.35		mg/Kg	☼	10/12/15 08:59	10/13/15 04:08	5
Antimony	4.6		0.14		mg/Kg	☼	10/12/15 08:59	10/13/15 04:08	5
Cadmium	0.28		0.14		mg/Kg	☼	10/12/15 08:59	10/13/15 04:08	5
Copper	52		0.28		mg/Kg	☼	10/12/15 08:59	10/13/15 04:08	5
Lead	37		0.35		mg/Kg	☼	10/12/15 08:59	10/13/15 04:08	5
Selenium	1.5		0.71		mg/Kg	☼	10/12/15 08:59	10/13/15 04:08	5
Thallium	ND		0.28		mg/Kg	☼	10/12/15 08:59	10/13/15 04:08	5
Zinc	85		3.5		mg/Kg	☼	10/12/15 08:59	10/13/15 04:08	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.062		0.046		mg/Kg	☼	10/06/15 09:32	10/06/15 16:27	1



QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 580-203044/19-A
Matrix: Solid
Analysis Batch: 203150

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 203044

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.25		mg/Kg		10/12/15 08:59	10/13/15 02:38	5
Antimony	ND		0.10		mg/Kg		10/12/15 08:59	10/13/15 02:38	5
Cadmium	ND		0.10		mg/Kg		10/12/15 08:59	10/13/15 02:38	5
Copper	ND		0.20		mg/Kg		10/12/15 08:59	10/13/15 02:38	5
Lead	ND		0.25		mg/Kg		10/12/15 08:59	10/13/15 02:38	5
Selenium	ND		0.50		mg/Kg		10/12/15 08:59	10/13/15 02:38	5
Thallium	ND		0.20		mg/Kg		10/12/15 08:59	10/13/15 02:38	5
Zinc	ND		2.5		mg/Kg		10/12/15 08:59	10/13/15 02:38	5

Lab Sample ID: LCS 580-203044/20-A
Matrix: Solid
Analysis Batch: 203150

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 203044

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	200	196		mg/Kg		98	80 - 120
Antimony	150	146		mg/Kg		97	80 - 120
Cadmium	5.00	5.07		mg/Kg		101	80 - 120
Copper	25.0	23.7		mg/Kg		95	80 - 120
Lead	50.0	46.7		mg/Kg		93	80 - 120
Selenium	200	199		mg/Kg		100	80 - 120
Thallium	200	205		mg/Kg		103	80 - 120
Zinc	200	188		mg/Kg		94	80 - 120

Lab Sample ID: LCSD 580-203044/21-A
Matrix: Solid
Analysis Batch: 203150

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 203044

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Arsenic	200	196		mg/Kg		98	80 - 120	0	20
Antimony	150	146		mg/Kg		97	80 - 120	0	20
Cadmium	5.00	5.01		mg/Kg		100	80 - 120	1	20
Copper	25.0	23.7		mg/Kg		95	80 - 120	0	20
Lead	50.0	46.7		mg/Kg		93	80 - 120	0	20
Selenium	200	200		mg/Kg		100	80 - 120	1	20
Thallium	200	205		mg/Kg		102	80 - 120	0	20
Zinc	200	187		mg/Kg		94	80 - 120	0	20

Lab Sample ID: MB 580-203045/17-A
Matrix: Solid
Analysis Batch: 203150

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 203045

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.25		mg/Kg		10/12/15 09:04	10/13/15 05:26	5
Antimony	ND		0.10		mg/Kg		10/12/15 09:04	10/13/15 05:26	5
Cadmium	ND		0.10		mg/Kg		10/12/15 09:04	10/13/15 05:26	5
Copper	ND		0.20		mg/Kg		10/12/15 09:04	10/13/15 05:26	5
Lead	ND		0.25		mg/Kg		10/12/15 09:04	10/13/15 05:26	5
Selenium	ND		0.50		mg/Kg		10/12/15 09:04	10/13/15 05:26	5
Thallium	ND		0.20		mg/Kg		10/12/15 09:04	10/13/15 05:26	5

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Method: 6020 - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 580-203045/17-A
Matrix: Solid
Analysis Batch: 203150

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 203045

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	ND		2.5		mg/Kg		10/12/15 09:04	10/13/15 05:26	5

Lab Sample ID: LCS 580-203045/18-A
Matrix: Solid
Analysis Batch: 203150

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 203045

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	200	198		mg/Kg		99	80 - 120
Antimony	150	146		mg/Kg		97	80 - 120
Cadmium	5.00	4.97		mg/Kg		99	80 - 120
Copper	25.0	23.8		mg/Kg		95	80 - 120
Lead	50.0	47.1		mg/Kg		94	80 - 120
Selenium	200	197		mg/Kg		99	80 - 120
Thallium	200	209		mg/Kg		105	80 - 120
Zinc	200	188		mg/Kg		94	80 - 120

Lab Sample ID: LCSD 580-203045/19-A
Matrix: Solid
Analysis Batch: 203150

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 203045

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Arsenic	200	197		mg/Kg		98	80 - 120	1	20
Antimony	150	145		mg/Kg		97	80 - 120	1	20
Cadmium	5.00	4.94		mg/Kg		99	80 - 120	1	20
Copper	25.0	23.4		mg/Kg		94	80 - 120	2	20
Lead	50.0	46.8		mg/Kg		94	80 - 120	1	20
Selenium	200	196		mg/Kg		98	80 - 120	0	20
Thallium	200	207		mg/Kg		104	80 - 120	1	20
Zinc	200	186		mg/Kg		93	80 - 120	1	20

Lab Sample ID: 590-2083-1 MS
Matrix: Solid
Analysis Batch: 203150

Client Sample ID: MCRA-WR-CON-05
Prep Type: Total/NA
Prep Batch: 203045

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Arsenic	260	F1	228	398	F1	mg/Kg	☼	61	80 - 120
Antimony	19		171	179		mg/Kg	☼	94	80 - 120
Cadmium	1.1		5.71	7.74		mg/Kg	☼	117	80 - 120
Copper	130		28.5	173	4	mg/Kg	☼	156	80 - 120
Lead	40		57.1	86.2		mg/Kg	☼	81	80 - 120
Selenium	0.83		228	240		mg/Kg	☼	105	80 - 120
Thallium	ND		228	252		mg/Kg	☼	110	80 - 120
Zinc	230		228	463		mg/Kg	☼	102	80 - 120

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Method: 6020 - Metals (ICP/MS) (Continued)

Lab Sample ID: 590-2083-1 MSD
Matrix: Solid
Analysis Batch: 203150

Client Sample ID: MCRA-WR-CON-05
Prep Type: Total/NA
Prep Batch: 203045

Analyte	Sample	Sample	Spike	MSD		Unit	D	%Rec	Limits	RPD	Limit
	Result	Qualifier		Result	Qualifier						
Arsenic	260	F1	245	423	F1	mg/Kg	☼	66	80 - 120	6	20
Antimony	19		184	193		mg/Kg	☼	95	80 - 120	8	20
Cadmium	1.1		6.13	7.34		mg/Kg	☼	103	80 - 120	5	20
Copper	130		30.6	165	4	mg/Kg	☼	119	80 - 120	5	20
Lead	40		61.3	89.2		mg/Kg	☼	80	80 - 120	3	20
Selenium	0.83		245	262		mg/Kg	☼	107	80 - 120	9	20
Thallium	ND		245	277		mg/Kg	☼	113	80 - 120	9	20
Zinc	230		245	439		mg/Kg	☼	85	80 - 120	5	20

Lab Sample ID: 590-2083-1 DU
Matrix: Solid
Analysis Batch: 203150

Client Sample ID: MCRA-WR-CON-05
Prep Type: Total/NA
Prep Batch: 203045

Analyte	Sample	Sample	DU		Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Arsenic	260	F1	142	F3	mg/Kg	☼	59	20
Antimony	19		10.6	F3	mg/Kg	☼	57	20
Cadmium	1.1		1.10		mg/Kg	☼	5	20
Copper	130		121		mg/Kg	☼	6	20
Lead	40		26.4	F3	mg/Kg	☼	41	20
Selenium	0.83		0.688		mg/Kg	☼	18	20
Thallium	ND		ND		mg/Kg	☼	NC	20
Zinc	230		234		mg/Kg	☼	2	20

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 590-3806/9-A
Matrix: Solid
Analysis Batch: 3836

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 3806

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Hg	ND		0.050		mg/Kg		10/06/15 09:25	10/06/15 15:01	1

Lab Sample ID: LCS 590-3806/8-A
Matrix: Solid
Analysis Batch: 3836

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 3806

Analyte	Spike	LCS		Unit	D	%Rec	Limits
		Added	Result				
Hg	0.200	0.196		mg/Kg		98	80 - 120

Lab Sample ID: MB 590-3808/2-A
Matrix: Solid
Analysis Batch: 3836

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 3808

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Hg	ND		0.050		mg/Kg		10/06/15 09:32	10/06/15 15:49	1

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Method: 7471B - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 590-3808/1-A
Matrix: Solid
Analysis Batch: 3836

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 3808

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg	0.200	0.196		mg/Kg		98	80 - 120

Lab Sample ID: 590-2083-11 MS
Matrix: Solid
Analysis Batch: 3836

Client Sample ID: MCRA-WR-POW-04
Prep Type: Total/NA
Prep Batch: 3808

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg	0.20		0.470	0.607		mg/Kg	☼	86	80 - 120

Lab Sample ID: 590-2083-11 MSD
Matrix: Solid
Analysis Batch: 3836

Client Sample ID: MCRA-WR-POW-04
Prep Type: Total/NA
Prep Batch: 3808

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Hg	0.20		0.354	0.532		mg/Kg	☼	93	80 - 120	13	20

Lab Sample ID: 590-2083-11 DU
Matrix: Solid
Analysis Batch: 3836

Client Sample ID: MCRA-WR-POW-04
Prep Type: Total/NA
Prep Batch: 3808

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Hg	0.20		0.231		mg/Kg	☼	13	20

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Client Sample ID: MCRA-WR-CON-05

Date Collected: 09/03/15 12:55

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-CON-05

Date Collected: 09/03/15 12:55

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-1

Matrix: Solid

Percent Solids: 73.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0315 g	50 mL	203045	10/12/15 09:04	PAB	TAL SEA
Total/NA	Analysis	6020		5	1.0315 g	50 mL	203150	10/13/15 05:44	FCW	TAL SEA
Total/NA	Prep	7471B			0.73 g	50 mL	3806	10/06/15 09:26	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.73 g	50 mL	3836	10/06/15 15:15	JSP	TAL SPK

Client Sample ID: MCRA-WR-CON-06

Date Collected: 09/03/15 13:05

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-2

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-CON-06

Date Collected: 09/03/15 13:05

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-2

Matrix: Solid

Percent Solids: 74.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0497 g	50 mL	203045	10/12/15 09:04	PAB	TAL SEA
Total/NA	Analysis	6020		5	1.0497 g	50 mL	203150	10/13/15 06:21	FCW	TAL SEA
Total/NA	Prep	7471B			0.78 g	50 mL	3806	10/06/15 09:26	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.78 g	50 mL	3836	10/06/15 15:17	JSP	TAL SPK

Client Sample ID: MCRA-WR-CON-07

Date Collected: 09/03/15 13:15

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-3

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-CON-07

Date Collected: 09/03/15 13:15

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-3

Matrix: Solid

Percent Solids: 67.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0288 g	50 mL	203045	10/12/15 09:04	PAB	TAL SEA

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Client Sample ID: MCRA-WR-CON-07

Date Collected: 09/03/15 13:15
Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-3

Matrix: Solid
Percent Solids: 67.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	6020		5	1.0288 g	50 mL	203150	10/13/15 06:25	FCW	TAL SEA
Total/NA	Prep	7471B			0.73 g	50 mL	3806	10/06/15 09:26	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.73 g	50 mL	3836	10/06/15 15:20	JSP	TAL SPK

Client Sample ID: MCRA-WR-CON-08

Date Collected: 09/03/15 13:25
Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-4

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-CON-08

Date Collected: 09/03/15 13:25
Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-4

Matrix: Solid
Percent Solids: 71.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0859 g	50 mL	203045	10/12/15 09:04	PAB	TAL SEA
Total/NA	Analysis	6020		5	1.0859 g	50 mL	203150	10/13/15 06:30	FCW	TAL SEA
Total/NA	Prep	7471B			0.67 g	50 mL	3806	10/06/15 09:26	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.67 g	50 mL	3836	10/06/15 15:26	JSP	TAL SPK

Client Sample ID: MCRA-WR-CON-09

Date Collected: 09/11/15 17:55
Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-5

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-CON-09

Date Collected: 09/11/15 17:55
Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-5

Matrix: Solid
Percent Solids: 58.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0943 g	50 mL	203045	10/12/15 09:04	PAB	TAL SEA
Total/NA	Analysis	6020		5	1.0943 g	50 mL	203150	10/13/15 06:34	FCW	TAL SEA
Total/NA	Prep	7471B			0.60 g	50 mL	3806	10/06/15 09:26	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.60 g	50 mL	3836	10/06/15 15:29	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Client Sample ID: MCRA-WR-CON-10

Date Collected: 09/10/15 17:55

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-6

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-CON-10

Date Collected: 09/10/15 17:55

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-6

Matrix: Solid

Percent Solids: 67.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0606 g	50 mL	203045	10/12/15 09:04	PAB	TAL SEA
Total/NA	Analysis	6020		5	1.0606 g	50 mL	203150	10/13/15 06:39	FCW	TAL SEA
Total/NA	Prep	7471B			0.83 g	50 mL	3806	10/06/15 09:26	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.83 g	50 mL	3836	10/06/15 15:31	JSP	TAL SPK

Client Sample ID: MCRA-WR-CON-11

Date Collected: 09/10/15 18:05

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-7

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-CON-11

Date Collected: 09/10/15 18:05

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-7

Matrix: Solid

Percent Solids: 57.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0123 g	50 mL	203045	10/12/15 09:04	PAB	TAL SEA
Total/NA	Analysis	6020		5	1.0123 g	50 mL	203150	10/13/15 05:03	FCW	TAL SEA
Total/NA	Prep	7471B			0.66 g	50 mL	3806	10/06/15 09:26	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.66 g	50 mL	3836	10/06/15 15:33	JSP	TAL SPK

Client Sample ID: MCRA-WR-POW-01

Date Collected: 09/21/15 14:00

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-8

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-POW-01

Date Collected: 09/21/15 14:00

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-8

Matrix: Solid

Percent Solids: 61.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0137 g	50 mL	203045	10/12/15 09:04	PAB	TAL SEA

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Client Sample ID: MCRA-WR-POW-01

Date Collected: 09/21/15 14:00
Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-8

Matrix: Solid
Percent Solids: 61.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	6020		5	1.0137 g	50 mL	203150	10/13/15 06:48	FCW	TAL SEA
Total/NA	Prep	7471B			0.70 g	50 mL	3806	10/06/15 09:26	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.70 g	50 mL	3836	10/06/15 15:36	JSP	TAL SPK

Client Sample ID: MCRA-WR-POW-02

Date Collected: 09/21/15 14:20
Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-9

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-POW-02

Date Collected: 09/21/15 14:20
Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-9

Matrix: Solid
Percent Solids: 54.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0047 g	50 mL	203045	10/12/15 09:04	PAB	TAL SEA
Total/NA	Analysis	6020		5	1.0047 g	50 mL	203150	10/13/15 06:52	FCW	TAL SEA
Total/NA	Prep	7471B			0.60 g	50 mL	3806	10/06/15 09:26	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.60 g	50 mL	3836	10/06/15 15:38	JSP	TAL SPK

Client Sample ID: MCRA-WR-POW-03

Date Collected: 09/21/15 14:35
Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-10

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-POW-03

Date Collected: 09/21/15 14:35
Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-10

Matrix: Solid
Percent Solids: 87.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0276 g	50 mL	203045	10/12/15 09:04	PAB	TAL SEA
Total/NA	Analysis	6020		5	1.0276 g	50 mL	203150	10/13/15 04:54	FCW	TAL SEA
Total/NA	Prep	7471B			0.96 g	50 mL	3806	10/06/15 09:26	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.96 g	50 mL	3836	10/06/15 15:40	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Client Sample ID: MCRA-WR-POW-04

Date Collected: 09/21/15 14:45

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-11

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-POW-04

Date Collected: 09/21/15 14:45

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-11

Matrix: Solid

Percent Solids: 38.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0629 g	50 mL	203045	10/12/15 09:04	PAB	TAL SEA
Total/NA	Analysis	6020		5	1.0629 g	50 mL	203150	10/13/15 06:57	FCW	TAL SEA
Total/NA	Prep	7471B			0.87 g	50 mL	3808	10/06/15 09:32	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.87 g	50 mL	3836	10/06/15 15:52	JSP	TAL SPK

Client Sample ID: MCRA-WR-POW-05

Date Collected: 09/21/15 15:00

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-12

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-POW-05

Date Collected: 09/21/15 15:00

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-12

Matrix: Solid

Percent Solids: 90.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0252 g	50 mL	203045	10/12/15 09:04	PAB	TAL SEA
Total/NA	Analysis	6020		5	1.0252 g	50 mL	203150	10/13/15 04:59	FCW	TAL SEA
Total/NA	Prep	7471B			0.74 g	50 mL	3808	10/06/15 09:32	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.74 g	50 mL	3836	10/06/15 16:01	JSP	TAL SPK

Client Sample ID: MCRA-WR-RY-01

Date Collected: 09/24/15 07:35

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-13

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-RY-01

Date Collected: 09/24/15 07:35

Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-13

Matrix: Solid

Percent Solids: 77.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0954 g	50 mL	203044	10/12/15 08:59	PAB	TAL SEA

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Client Sample ID: MCRA-WR-RY-01

Date Collected: 09/24/15 07:35
Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-13

Matrix: Solid
Percent Solids: 77.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	6020		5	1.0954 g	50 mL	203150	10/13/15 03:41	FCW	TAL SEA
Total/NA	Prep	7471B			0.83 g	50 mL	3808	10/06/15 09:32	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.83 g	50 mL	3836	10/06/15 16:03	JSP	TAL SPK

Client Sample ID: MCRA-WR-RY-02

Date Collected: 09/24/15 07:45
Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-14

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-RY-02

Date Collected: 09/24/15 07:45
Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-14

Matrix: Solid
Percent Solids: 95.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0567 g	50 mL	203044	10/12/15 08:59	PAB	TAL SEA
Total/NA	Analysis	6020		5	1.0567 g	50 mL	203150	10/13/15 03:46	FCW	TAL SEA
Total/NA	Prep	7471B			0.58 g	50 mL	3808	10/06/15 09:32	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.58 g	50 mL	3836	10/06/15 16:06	JSP	TAL SPK

Client Sample ID: MCRA-WR-RY-03

Date Collected: 09/24/15 08:05
Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-15

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-RY-03

Date Collected: 09/24/15 08:05
Date Received: 10/01/15 10:15

Lab Sample ID: 590-2083-15

Matrix: Solid
Percent Solids: 89.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0513 g	50 mL	203044	10/12/15 08:59	PAB	TAL SEA
Total/NA	Analysis	6020		5	1.0513 g	50 mL	203150	10/13/15 03:50	FCW	TAL SEA
Total/NA	Prep	7471B			0.76 g	50 mL	3808	10/06/15 09:32	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.76 g	50 mL	3836	10/06/15 16:08	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Client Sample ID: MCRA-WR-RY-04

Lab Sample ID: 590-2083-16

Date Collected: 09/24/15 08:20

Matrix: Solid

Date Received: 10/01/15 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-RY-04

Lab Sample ID: 590-2083-16

Date Collected: 09/24/15 08:20

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 81.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0780 g	50 mL	203044	10/12/15 08:59	PAB	TAL SEA
Total/NA	Analysis	6020		5	1.0780 g	50 mL	203150	10/13/15 03:55	FCW	TAL SEA
Total/NA	Prep	7471B			0.65 g	50 mL	3808	10/06/15 09:32	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.65 g	50 mL	3836	10/06/15 16:15	JSP	TAL SPK

Client Sample ID: MCRA-WR-RY-05

Lab Sample ID: 590-2083-17

Date Collected: 09/24/15 08:35

Matrix: Solid

Date Received: 10/01/15 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-RY-05

Lab Sample ID: 590-2083-17

Date Collected: 09/24/15 08:35

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 88.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0414 g	50 mL	203044	10/12/15 08:59	PAB	TAL SEA
Total/NA	Analysis	6020		5	1.0414 g	50 mL	203150	10/13/15 03:59	FCW	TAL SEA
Total/NA	Prep	7471B			0.72 g	50 mL	3808	10/06/15 09:32	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.72 g	50 mL	3836	10/06/15 16:22	JSP	TAL SPK

Client Sample ID: MCRA-WR-RY-06

Lab Sample ID: 590-2083-18

Date Collected: 09/24/15 08:40

Matrix: Solid

Date Received: 10/01/15 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-WR-RY-06

Lab Sample ID: 590-2083-18

Date Collected: 09/24/15 08:40

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 53.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0433 g	50 mL	203044	10/12/15 08:59	PAB	TAL SEA

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Client Sample ID: MCRA-WR-RY-06

Lab Sample ID: 590-2083-18

Date Collected: 09/24/15 08:40

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 53.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	6020		5	1.0433 g	50 mL	203150	10/13/15 04:04	FCW	TAL SEA
Total/NA	Prep	7471B			0.64 g	50 mL	3808	10/06/15 09:32	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.64 g	50 mL	3836	10/06/15 16:25	JSP	TAL SPK

Client Sample ID: MCRA-CS-RY-01

Lab Sample ID: 590-2083-19

Date Collected: 09/24/15 10:30

Matrix: Solid

Date Received: 10/01/15 10:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			3811	10/06/15 11:00	JSP	TAL SPK

Client Sample ID: MCRA-CS-RY-01

Lab Sample ID: 590-2083-19

Date Collected: 09/24/15 10:30

Matrix: Solid

Date Received: 10/01/15 10:15

Percent Solids: 69.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0231 g	50 mL	203044	10/12/15 08:59	PAB	TAL SEA
Total/NA	Analysis	6020		5	1.0231 g	50 mL	203150	10/13/15 04:08	FCW	TAL SEA
Total/NA	Prep	7471B			0.79 g	50 mL	3808	10/06/15 09:32	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.79 g	50 mL	3836	10/06/15 16:27	JSP	TAL SPK

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Certification Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Laboratory: TestAmerica Spokane

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C569	01-06-16

Laboratory: TestAmerica Seattle

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska (UST)	State Program	10	UST-022	03-02-16
California	State Program	9	2901	01-31-17
L-A-B	DoD ELAP		L2236	01-19-16
L-A-B	ISO/IEC 17025		L2236	01-19-16
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-06-15
US Fish & Wildlife	Federal		LE058448-0	02-28-16
USDA	Federal		P330-14-00126	04-08-17
Washington	State Program	10	C553	02-17-16

Method Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2083-1

Method	Method Description	Protocol	Laboratory
6020	Metals (ICP/MS)	SW846	TAL SEA
7471B	Mercury (CVAA)	SW846	TAL SPK
Moisture	Percent Moisture	EPA	TAL SPK

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

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TestAmerica Spokane
 11922 East 1st Ave
 Spokane, WA 99206
 Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING

Client Information
 Client Contact: **Bernard Kronschnabel** Sampler: **Jan PM**
 Phone: **randee arrington@testamericainc.com** Arrington, Randee E
 Company: **Cascade Earth Sciences Inc.** Carrier/Tracking No(s):
 Address: **12720 E Nora Ave** Due Date Requested:
 City: **Spokane** TAT Requested (day(s)):
 State, Zip: **WA, 99216**
 Phone: **209-241-8852(Tel)** PO # **P201529026**
 Email: **bernard.kronschnabel@cascade-earth.com** W/O #:
 Project Name: **Monte Cristo Post-Removal Action Monitor** Project #: **59000677**
 Site: **SSOW#**

Analysis Requested
 Field Filtered Sample (Yes or No)
 Perform MS/MSD (Yes or No)
 Total Sb, As, Cd, Cu, Hg, Pb, Se, Tl, Zn
 Total Number of containers
 Preservation Codes:
 A - HCl M - Hexane
 B - NaOH N - None
 C - Zn Acetate O - AsHClO2
 D - Nitric Acid P - Na2OAS
 E - NaHSO4 Q - Na2SO3
 F - MeOH R - Na2S2O3
 G - Ammonia S - H2SO4
 H - Ascorbic Acid T - TSP Dodecalhydrate
 I - Ice U - Acetone
 J - DI Water V - MCAA
 K - EDTA W - pH 4.5
 L - EDA Z - other (specify)
 Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waterfall, B=trials, A=lab)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Total Number of containers	Special Instructions/Note:
MCRA-WR-CON-05	9/3/15	1255	6	S	X	X	X	
-06	9/3/15	1305	↓		X	X	X	
-07	9/3/15	1315	↓		X	X	X	
-08	9/3/15	1325	↓		X	X	X	
-09	9/11/15	1755	C		X	X	X	
-10	9/12/15	1755	C		X	X	X	
-11	9/12/15	1805	C		X	X	X	
MCRA-WR-POW-01	9/29/15	1400	G		X	X	X	
-02	9/29/15	1420	↓		X	X	X	
-03	9/29/15	1435	↓		X	X	X	
-04	9/29/15	1445	↓		X	X	X	

Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological
 Deliverable Requested: I, II, III, IV, Other (specify)
 Empty Kit Relinquished by: _____ Date: _____
 Relinquished by: **Bernard Kronschnabel** Date/Time: **9/29/15 1530** Company: **CES**
 Relinquished by: _____ Date/Time: _____ Company: _____
 Custody Seals Intact: Yes No Custody Seal No.: _____
 Cooler Temperature(s) °C and Other Remarks: **11.4 Spec 1**

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months
 Special Instructions/QC Requirements:
 590-2083-01 Chain of Custody

Received by: **Shelia Short** Date/Time: **10/1/15 10:15** Company: **Therapak**
Received by: _____ Date/Time: _____ Company: _____
 Method of Shipment: _____
 Date/Time: _____ Company: _____

TestAmerica Spokane
 11922 East 1st Ave
 Spokane, WA 99206
 Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record



TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)		Lab P.M.I.		Carrier Tracking No(s):							
Shipping/Receiving		Arrington, Randee E		590-826.1							
Company: TestAmerica Laboratories, Inc.		E-Mail: randee.arrington@testamericainc.com		Page: Page 1 of 2							
Address: 5755 8th Street East, Tacoma, WA, 98424		Phone: 253-922-2310 (Tel) 253-922-5047 (Fax)		Job #: 590-2083-1							
Project Name: Monte Cristo Post-Removal Action Monitor		Project #: 59000677		Preservation Codes:							
Site:		SSOW#:		A - HCL M - Hexane B - NaOH N - None O - AsNaO2 C - Zn Acetate P - Na2O4S D - Nitric Acid Q - Na2SO3 E - NaHSO4 R - Na2S2O3 F - MeOH S - H2SO4 G - Amchlor H - Ascorbic Acid T - TSP Dodecahydrate I - Ice J - DI Water U - Acetone V - MCAA K - EDTA W - ph 4-5 L - EDA Z - other (specify) Other:							
Sample Identification - Client ID (Lab ID)		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=air)	Field Filled Sample (Yes or No)	Form MS/MD (Yes or No)	6020A_LL305B (MOD) Template for building analyte list	Total Number of Containers	Special Instructions/Note:	
MCR-VR-CON-05 (590-2083-1)	9/3/15	12:55 Pacific	Solid	Solid	X	X					
MCR-VR-CON-06 (590-2083-2)	9/3/15	13:05 Pacific	Solid	Solid	X	X					
MCR-VR-CON-07 (590-2083-3)	9/3/15	13:15 Pacific	Solid	Solid	X	X					
MCR-VR-CON-08 (590-2083-4)	9/3/15	13:25 Pacific	Solid	Solid	X	X					
MCR-VR-CON-09 (590-2083-5)	9/11/15	17:55 Pacific	Solid	Solid	X	X					
MCR-VR-CON-10 (590-2083-6)	9/10/15	17:55 Pacific	Solid	Solid	X	X					
MCR-VR-CON-11 (590-2083-7)	9/10/15	18:05 Pacific	Solid	Solid	X	X					
MCR-VR-POW-01 (590-2083-8)	9/21/15	14:00 Pacific	Solid	Solid	X	X					
MCR-VR-POW-02 (590-2083-9)	9/21/15	14:20 Pacific	Solid	Solid	X	X					
MCR-VR-POW-03 (590-2083-10)	9/21/15	14:35 Pacific	Solid	Solid	X	X					
MCR-VR-POW-04 (590-2083-11)	9/21/15	14:45 Pacific	Solid	Solid	X	X					
Possible Hazard Identification											
Unconfirmed											
Deliverable Requested: I, II, III, IV, Other (specify)											
Empty Kit Relinquished by:											
Date:											
Time:											
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)											
<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months											
Special Instructions/QC Requirements: IEZ 5.0-6/MS											
Method of Shipment:											
Relinquished by: <i>Chela Lopez</i>		Date/Time: 9/15/15 1534		Company: THORX		Received by: <i>[Signature]</i>		Date/Time: 9/21/15 1000		Company: THORX	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:	



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 11922 East 1st Ave
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 Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)		Lab P/M: Arrington, Randee E		Carrier Tracking No(s):		COC No: 590-826.2	
Client Contact: Shipping/Receiving		Phone: randee.arrington@testamericainc.com		Page: Page 2 of 2		Job #: 590-2083-1	
Company: TestAmerica Laboratories, Inc.		Address: 5755 8th Street East, Tacoma, WA, 98424		Due Date Requested: 10/13/2015		Analysis Requested	
Phone: 253-922-2310 (Tel) 253-922-5047 (Fax)		TAT Requested (days):		6020A_LL/3050B (MOD) Template for building analyte list		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - ph 4-5 Z - other (specify)	
Project Name: Monte Cristo Post-Removal Action Monitor		PO #: WO #:		Perform MS/MSD (Yes or No)		Total Number of Containers	
Site:		Project #: 59000677		Field Filtered Sample (Yes or No)		Special Instructions/Note:	
SSOW#:		Sample Date		Sample Time		Sample Type (C=comp, G=grab)	
		Matrix (W=water, S=solid, O=water/oil)		Preservation Code:			
Sample Identification - Client ID (Lab ID)		Sample Date		Sample Time		Sample Type (C=comp, G=grab)	
MCRA-WR-POW-05 (590-2083-12)		9/21/15		15:00 Pacific		Solid	
MCRA-WR-RY-01 (590-2083-13)		9/24/15		07:35 Pacific		Solid	
MCRA-WR-RY-02 (590-2083-14)		9/24/15		07:45 Pacific		Solid	
MCRA-WR-RY-03 (590-2083-15)		9/24/15		08:05 Pacific		Solid	
MCRA-WR-RY-04 (590-2083-16)		9/24/15		08:20 Pacific		Solid	
MCRA-WR-RY-05 (590-2083-17)		9/24/15		08:35 Pacific		Solid	
MCRA-WR-RY-06 (590-2083-18)		9/24/15		08:40 Pacific		Solid	
MCRA-CS-RY-01 (590-2083-19)		9/24/15		10:30 Pacific		Solid	
<p>Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) Empty Kit Relinquished by: _____ Date: _____ Relinquished by: <i>Cherelle Sped</i> Date: 10/11/15 15:34 Relinquished by: <i>M. Epok</i> Date: 10/12/15 16:00 Relinquished by: _____ Date: _____ Relinquished by: _____ Date: _____</p>							
<p>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months Special Instructions/QC Requirements:</p>							
<p>Method of Shipment Received by: <i>M. Epok</i> Date: 10/11/15 15:34 Received by: <i>THSEK</i> Date: 10/12/15 16:00 Received by: _____ Date: _____ Cooler Temperature(s) °C and Other Remarks: <i>IRZ: 5.07ds</i></p>							
<p>Custody Seal No.: _____ Δ Yes Δ No</p>							

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Login Sample Receipt Checklist

Client: Cascade Earth Sciences Inc.

Job Number: 590-2083-1

Login Number: 2083

List Number: 1

Creator: Kratz, Sheila J

List Source: TestAmerica Spokane

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	False	Sample splitting required for subcontract purposes.
Residual Chlorine Checked.	N/A	



Login Sample Receipt Checklist

Client: Cascade Earth Sciences Inc.

Job Number: 590-2083-1

Login Number: 2083

List Number: 2

Creator: Blankinship, Tom X

List Source: TestAmerica Seattle

List Creation: 10/08/15 12:38 PM

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Spokane
11922 East 1st Ave
Spokane, WA 99206
Tel: (509)924-9200

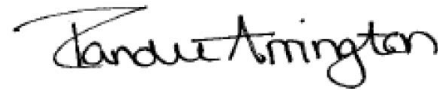
TestAmerica Job ID: 590-2169-1

Client Project/Site: Monte Cristo Post-Removal Action Monitor

For:

Cascade Earth Sciences Inc.
12720 E Nora Ave
Spokane, Washington 99216

Attn: Bernard Kronschnabel



Authorized for release by:
10/21/2015 3:11:11 PM

Randee Arrington, Project Manager II
(509)924-9200
randee.arrington@testamericainc.com



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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2169-1

Job ID: 590-2169-1

Laboratory: TestAmerica Spokane

Narrative

Receipt

The sample was received on 10/14/2015 11:25 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.1° C.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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Sample Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2169-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-2169-1	MCPRA-WR-POW-06	Solid	10/06/15 10:45	10/14/15 11:25

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Definitions/Glossary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2169-1

Qualifiers

Metals

Qualifier	Qualifier Description
F2	MS/MSD RPD exceeds control limits
F3	Duplicate RPD exceeds the control limit
F1	MS and/or MSD Recovery is outside acceptance limits.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2169-1

Client Sample ID: MCPRA-WR-POW-06

Lab Sample ID: 590-2169-1

Date Collected: 10/06/15 10:45

Matrix: Solid

Date Received: 10/14/15 11:25

Percent Solids: 73.5

Method: 6020 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	7200	F2	68		mg/Kg	☼	10/20/15 09:20	10/21/15 07:25	1000
Antimony	180		0.14		mg/Kg	☼	10/20/15 09:20	10/20/15 22:01	5
Cadmium	1.5		0.14		mg/Kg	☼	10/20/15 09:20	10/20/15 22:01	5
Copper	180		0.27		mg/Kg	☼	10/20/15 09:20	10/20/15 22:01	5
Lead	280		0.34		mg/Kg	☼	10/20/15 09:20	10/20/15 22:01	5
Selenium	1.4		0.68		mg/Kg	☼	10/20/15 09:20	10/20/15 22:01	5
Thallium	1.1		0.27		mg/Kg	☼	10/20/15 09:20	10/20/15 22:01	5
Zinc	300		3.4		mg/Kg	☼	10/20/15 09:20	10/20/15 22:01	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.89		0.38		mg/Kg	☼	10/15/15 07:29	10/15/15 15:02	10



QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2169-1

Method: 6020 - Metals (ICP/MS)

Lab Sample ID: MB 580-203781/21-A
Matrix: Solid
Analysis Batch: 203884

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 203781

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.25		mg/Kg		10/20/15 09:20	10/20/15 21:43	5
Antimony	ND		0.10		mg/Kg		10/20/15 09:20	10/20/15 21:43	5
Cadmium	ND		0.10		mg/Kg		10/20/15 09:20	10/20/15 21:43	5
Copper	ND		0.20		mg/Kg		10/20/15 09:20	10/20/15 21:43	5
Lead	ND		0.25		mg/Kg		10/20/15 09:20	10/20/15 21:43	5
Selenium	ND		0.50		mg/Kg		10/20/15 09:20	10/20/15 21:43	5
Thallium	ND		0.20		mg/Kg		10/20/15 09:20	10/20/15 21:43	5
Zinc	ND		2.5		mg/Kg		10/20/15 09:20	10/20/15 21:43	5

Lab Sample ID: LCS 580-203781/22-A
Matrix: Solid
Analysis Batch: 203884

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 203781

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	200	207		mg/Kg		103	80 - 120
Antimony	150	156		mg/Kg		104	80 - 120
Cadmium	5.00	4.98		mg/Kg		100	80 - 120
Copper	25.0	26.5		mg/Kg		106	80 - 120
Lead	50.0	50.8		mg/Kg		102	80 - 120
Selenium	200	205		mg/Kg		103	80 - 120
Thallium	200	189		mg/Kg		95	80 - 120
Zinc	200	208		mg/Kg		104	80 - 120

Lab Sample ID: LCSD 580-203781/23-A
Matrix: Solid
Analysis Batch: 203884

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 203781

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Arsenic	200	206		mg/Kg		103	80 - 120	0	20
Antimony	150	156		mg/Kg		104	80 - 120	0	20
Cadmium	5.00	4.93		mg/Kg		99	80 - 120	1	20
Copper	25.0	26.4		mg/Kg		106	80 - 120	0	20
Lead	50.0	50.7		mg/Kg		101	80 - 120	0	20
Selenium	200	202		mg/Kg		101	80 - 120	1	20
Thallium	200	189		mg/Kg		94	80 - 120	0	20
Zinc	200	208		mg/Kg		104	80 - 120	0	20

Lab Sample ID: 590-2169-1 MS
Matrix: Solid
Analysis Batch: 203884

Client Sample ID: MCPRA-WR-POW-06
Prep Type: Total/NA
Prep Batch: 203781

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Arsenic	7200	F2	268	15100	4	mg/Kg	☼	2966	80 - 120
Antimony	150	F1 F2	201	529	F1	mg/Kg	☼	190	80 - 120
Cadmium	ND	F1 F2	6.69	13.1	F1	mg/Kg	☼	196	80 - 120
Copper	160	F2	33.5	274	4	mg/Kg	☼	333	80 - 120
Lead	270	F1 F2	66.9	2960	F1	mg/Kg	☼	4024	80 - 120
Selenium	ND		268	269		mg/Kg	☼	101	80 - 120
Thallium	ND		268	254		mg/Kg	☼	95	80 - 120

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2169-1

Method: 6020 - Metals (ICP/MS) (Continued)

Lab Sample ID: 590-2169-1 MS
Matrix: Solid
Analysis Batch: 203884

Client Sample ID: MCPRA-WR-POW-06
Prep Type: Total/NA
Prep Batch: 203781
 %Rec.

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Zinc	ND	F1 F2	268	1220	F1	mg/Kg	☼	358	80 - 120

Lab Sample ID: 590-2169-1 MSD
Matrix: Solid
Analysis Batch: 203884

Client Sample ID: MCPRA-WR-POW-06
Prep Type: Total/NA
Prep Batch: 203781
 %Rec. RPD

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Arsenic	7200	F2	258	7300	4 F2	mg/Kg	☼	55	80 - 120	70	20
Antimony	150	F1 F2	194	410	F1 F2	mg/Kg	☼	136	80 - 120	25	20
Cadmium	ND	F1 F2	6.45	8.87	F1 F2	mg/Kg	☼	137	80 - 120	39	20
Copper	160	F2	32.3	207	4 F2	mg/Kg	☼	137	80 - 120	28	20
Lead	270	F1 F2	64.5	707	4 F2	mg/Kg	☼	683	80 - 120	123	20
Selenium	ND		258	269		mg/Kg	☼	104	80 - 120	0	20
Thallium	ND		258	251		mg/Kg	☼	97	80 - 120	1	20
Zinc	ND	F1 F2	258	674	F1 F2	mg/Kg	☼	159	80 - 120	58	20

Lab Sample ID: 590-2169-1 DU
Matrix: Solid
Analysis Batch: 203884

Client Sample ID: MCPRA-WR-POW-06
Prep Type: Total/NA
Prep Batch: 203781
 RPD

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Antimony	180		185		mg/Kg	☼	5	20
Cadmium	1.5		1.43		mg/Kg	☼	4	20
Copper	180		145	F3	mg/Kg	☼	22	20
Lead	280		302		mg/Kg	☼	6	20
Selenium	1.4		1.31		mg/Kg	☼	6	20
Thallium	1.1		0.981		mg/Kg	☼	14	20
Zinc	300		288		mg/Kg	☼	5	20

Lab Sample ID: 590-2169-1 DU
Matrix: Solid
Analysis Batch: 203884

Client Sample ID: MCPRA-WR-POW-06
Prep Type: Total/NA
Prep Batch: 203781
 RPD

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Arsenic	7200	F2	7010		mg/Kg	☼	2	20

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 590-3973/9-A
Matrix: Solid
Analysis Batch: 3981

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 3973

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.050		mg/Kg		10/15/15 07:29	10/15/15 14:22	1

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2169-1

Method: 7471B - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 590-3973/8-A
Matrix: Solid
Analysis Batch: 3981

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 3973

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg	0.200	0.195		mg/Kg		98	80 - 120

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Lab Chronicle

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2169-1

Client Sample ID: MCPRA-WR-POW-06

Date Collected: 10/06/15 10:45

Date Received: 10/14/15 11:25

Lab Sample ID: 590-2169-1

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			4009	10/16/15 11:36	JSP	TAL SPK

Client Sample ID: MCPRA-WR-POW-06

Date Collected: 10/06/15 10:45

Date Received: 10/14/15 11:25

Lab Sample ID: 590-2169-1

Matrix: Solid

Percent Solids: 73.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0023 g	50 mL	203781	10/20/15 09:20	MKN	TAL SEA
Total/NA	Analysis	6020		5	1.0023 g	50 mL	203884	10/20/15 22:01	FCW	TAL SEA
Total/NA	Prep	3050B			1.0023 g	50 mL	203781	10/20/15 09:20	MKN	TAL SEA
Total/NA	Analysis	6020		1000	1.0023 g	50 mL	203884	10/21/15 07:25	FCW	TAL SEA
Total/NA	Prep	7471B			0.90 g	50 mL	3973	10/15/15 07:29	JSP	TAL SPK
Total/NA	Analysis	7471B		10	0.90 g	50 mL	3981	10/15/15 15:02	JSP	TAL SPK

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Certification Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2169-1

Laboratory: TestAmerica Spokane

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C569	01-06-16

Laboratory: TestAmerica Seattle

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska (UST)	State Program	10	UST-022	03-02-16
California	State Program	9	2901	01-31-17
L-A-B	DoD ELAP		L2236	01-19-16
L-A-B	ISO/IEC 17025		L2236	01-19-16
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-06-16
US Fish & Wildlife	Federal		LE058448-0	02-28-16
USDA	Federal		P330-14-00126	04-08-17
Washington	State Program	10	C553	02-17-16

Method Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2169-1

Method	Method Description	Protocol	Laboratory
6020	Metals (ICP/MS)	SW846	TAL SEA
7471B	Mercury (CVAA)	SW846	TAL SPK
Moisture	Percent Moisture	EPA	TAL SPK

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

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Login Sample Receipt Checklist

Client: Cascade Earth Sciences Inc.

Job Number: 590-2169-1

Login Number: 2169

List Source: TestAmerica Spokane

List Number: 1

Creator: Kratz, Sheila J

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	False	Sample splitting required for subcontract purposes.
Residual Chlorine Checked.	N/A	



Login Sample Receipt Checklist

Client: Cascade Earth Sciences Inc.

Job Number: 590-2169-1

Login Number: 2169

List Number: 2

Creator: Luna, Francisco J

List Source: TestAmerica Seattle

List Creation: 10/17/15 01:00 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	IR2 1.0c/0.5c
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Monitoring Wells

TestAmerica Job ID: 590-1283-1

Client Sample ID: Field Blank

Date Collected: 07/02/15 17:45

Date Received: 07/06/15 10:50

Lab Sample ID: 590-1283-4

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050		mg/L		07/11/15 10:39	07/14/15 00:30	5
Lead	ND		0.0020		mg/L		07/11/15 10:39	07/14/15 00:30	5
Antimony	ND		0.0020		mg/L		07/11/15 10:39	07/14/15 00:30	5
Barium	ND		0.0060		mg/L		07/11/15 10:39	07/14/15 00:30	5
Beryllium	ND		0.0020		mg/L		07/11/15 10:39	07/14/15 00:30	5
Cadmium	ND		0.0020		mg/L		07/11/15 10:39	07/14/15 00:30	5
Chromium	0.0033		0.0020		mg/L		07/11/15 10:39	07/14/15 00:30	5
Cobalt	ND		0.0020		mg/L		07/11/15 10:39	07/14/15 00:30	5
Copper	ND		0.010		mg/L		07/11/15 10:39	07/14/15 00:30	5
Iron	ND		0.20		mg/L		07/11/15 10:39	07/14/15 00:30	5
Manganese	ND		0.010		mg/L		07/11/15 10:39	07/14/15 00:30	5
Nickel	ND		0.015		mg/L		07/11/15 10:39	07/14/15 00:30	5
Selenium	ND		0.0050		mg/L		07/11/15 10:39	07/14/15 00:30	5
Silver	ND		0.0020		mg/L		07/11/15 10:39	07/14/15 00:30	5
Thallium	ND		0.0050		mg/L		07/11/15 10:39	07/14/15 00:30	5
Vanadium	ND		0.020		mg/L		07/11/15 10:39	07/14/15 00:30	5
Zinc	ND		0.035		mg/L		07/11/15 10:39	07/14/15 00:30	5
Aluminum	ND		0.50		mg/L		07/11/15 10:39	07/14/15 00:30	5

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020		mg/L		07/13/15 16:03	07/13/15 19:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	ND		0.050		mg/L			07/09/15 15:48	1
Bicarbonate Alkalinity as CaCO3	5.0		4.0		mg/L			07/10/15 08:51	1
Carbonate Alkalinity as CaCO3	ND		4.0		mg/L			07/10/15 08:51	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.59	HF	0.100		SU			07/13/15 09:11	1

Client Sample ID: Spill A

Date Collected: 07/02/15 19:00

Date Received: 07/06/15 10:50

Lab Sample ID: 590-1283-5

Matrix: Solid

Percent Solids: 61.0

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	290		81		mg/Kg	☼	07/07/15 10:09	07/09/15 10:26	5
Residual Range Organics (RRO) (C25-C36)	1400		200		mg/Kg	☼	07/07/15 10:09	07/09/15 10:26	5
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	90		50 - 150				07/07/15 10:09	07/09/15 10:26	5
<i>n</i> -Triacontane-d62	111		50 - 150				07/07/15 10:09	07/09/15 10:26	5

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Monitoring Wells

TestAmerica Job ID: 590-1283-1

Client Sample ID: Spill B

Date Collected: 07/02/15 19:05

Date Received: 07/06/15 10:50

Lab Sample ID: 590-1283-6

Matrix: Solid

Percent Solids: 73.0

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	160		13		mg/Kg	☼	07/07/15 10:09	07/07/15 17:58	1
Residual Range Organics (RRO) (C25-C36)	230		33		mg/Kg	☼	07/07/15 10:09	07/07/15 17:58	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	91		50 - 150				07/07/15 10:09	07/07/15 17:58	1
<i>n</i> -Triacontane-d62	75		50 - 150				07/07/15 10:09	07/07/15 17:58	1

Client Sample ID: Spill C

Date Collected: 07/02/15 19:10

Date Received: 07/06/15 10:50

Lab Sample ID: 590-1283-7

Matrix: Solid

Percent Solids: 72.4

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	75		12		mg/Kg	☼	07/07/15 10:09	07/07/15 18:17	1
Residual Range Organics (RRO) (C25-C36)	240		31		mg/Kg	☼	07/07/15 10:09	07/07/15 18:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	91		50 - 150				07/07/15 10:09	07/07/15 18:17	1
<i>n</i> -Triacontane-d62	115		50 - 150				07/07/15 10:09	07/07/15 18:17	1

Appendix F.

2015 Year End Monitoring Report

TECHNICAL MEMORANDUM

DATE: October 14, 2016

TO: Joseph Gibbens, PE – United States Forest Service
Region 6 – Washington On-Scene Coordinator

FROM: Bernard Kronschnabel, PE – Cascade Earth Sciences

SUBJECT: **2015 Year End Report - Monte Cristo Mining Area
Mt. Baker-Snoqualmie National Forest, Snohomish County, Washington**

INTRODUCTION

Cascade Earth Sciences (CES) has prepared this summary of the post Removal Action (RA) monitoring activities and analytical results for the United States Forest Service (Forest Service) Monte Cristo Mining Area (MCMA; Site) located in the Mt. Baker-Snoqualmie National Forest, Snohomish County, Washington.

To maintain consistency with pre-RA monitoring and Data Gap Investigation (DGI) results, the sampling activities were conducted in general accordance with the June 2013 DGI Work Plan (CES, 2013b). Variances from the Work Plan are discussed below. The field activities involved collection of surface water, adit discharge, waste rock pile seep, sediment, and groundwater samples. Samples were collected at the stations shown in Figure 1. With the exception of the repository groundwater monitoring wells, all stations were previously established during the Site Inspection (SI; CES, 2008), Engineering Evaluation / Cost Analysis (EE/CA, CES 2010), and 2010-2013 DGI and Aquatic Monitoring (DGI, CES, 2011a-b, 2012, 2013a-b, 2014a-b).

BACKGROUND

The MCMA, illustrated in Figure 1, is located in the Mt. Baker-Snoqualmie National Forest in Snohomish County, Washington, near the west-center margin of the Henry M. Jackson Wilderness Area, and approximately 28 air miles east-southeast of Granite Falls, Washington. The Monte Cristo Townsite (Townsite) is located at an elevation of 2,755 feet above mean sea level (amsl; USGS, 1982b). Seventysix Creek originates at the southern extent of Seventysix Gulch and flows northwest about two miles to the confluence with Glacier Creek. Glacier Creek originates in Glacier Basin and flows west to northwest about 2.5 miles to the confluence with Seventysix Creek near the Townsite. The headwaters of both streams are situated at an elevation of over 5,000 feet amsl (USGS 1982a-b), and their confluence at the Townsite marks the beginning of the South Fork Sauk River (SFSR), which flows 6.25 miles northwest to Monte Cristo Lake (MCL) and continues into the mainstem of the Sauk River.

MONITORING ACTIVITIES

Water and/or sediment samples were collected at each of the sampling stations shown in Figure 1. Surface water and sediment were collected at stations located in Glacier Creek, Seventysix Creek, SFSR, and MCL. Surface water samples were collected from mine adit discharges and/or waste rock pile seeps at the mine stations. Groundwater samples were collected from monitoring wells established around the repository (Figure 2). The stations are detailed in the following sections.

Surface Water Stations

The following surface water monitoring stations have been established in Glacier Creek, Seventysix Creek, the SFSR, and MCL.

Glacier Creek

- GC-01 – 2.45 miles upstream from the Townsite, headwaters of Glacier Creek and background station
- GC-02 – 1.95 miles upstream from the Townsite, background station
- GC-02a – 1.85 miles upstream from the Townsite, downstream of the Pride of the Mountains and New Discovery Mines, upstream of the Pride of the Woods Mine
- GC-03 – 1.75 miles upstream from the Townsite, immediately downstream of the Pride of the Woods Mine
- GC-04 – 1.4 miles upstream from the Townsite, above the Glacier Creek waterfall
- GC-04a – 0.75 miles upstream from the Townsite, just below the confluence with the Justice Mine seep
- GC-05 – 0.4 miles upstream from the Townsite, between the Ore Collector and Concentrator

Seventysix Creek

- 76G-01 – 1.55 miles upstream from the Townsite, headwaters of Seventysix Creek and background station
- 76G-01a – 0.85 miles upstream from the Townsite, downstream of the Independence of Seventysix Mine
- 76G-01b – 0.5 miles upstream from the Townsite, located just downstream from the Sidney Mine
- 76G-02 – 0.3 miles upstream from the Townsite

South Fork Sauk River and Monte Cristo Lake

- SFSR-01 – Located just downstream from the Townsite at the bridge across the SFSR
- SFSR-02 – 0.7 miles downstream from the Townsite at the Sauk River Campground
- SFSR-03 – 1.5 miles downstream from the Townsite, downstream of the repository
- SFSR-04 – 2.7 miles downstream from the Townsite, below the confluence with Weden Creek
- SFSR-05 – 3.25 miles downstream from the Townsite
- SFSR-06 – 4.15 miles downstream from the Townsite, below Barlow Pass
- SFSR-07 – 4.6 miles downstream from the Townsite, located at the Mowich Camp Bridge
- SFSR-08 – 5.15 miles downstream from the Townsite
- MCL-01 – 6.25 miles downstream from the Townsite, in MCL
- SFSR-09 – 6.4 miles downstream from the Townsite, just downstream from MCL

Mine Stations

Samples of adit discharges and waste rock pile seeps are collected at the following stations.

Glacier Creek Drainage

- DW-JU-01 – Adit discharge from the Justice Mine
- SP-JU-01 – Seep from below the toe of the Justice Mine waste rock pile
- DW-MY-01 – Adit discharge from the Mystery Mine
- DW-ND-01 – Adit discharge from the New Discovery Mine
- DW-PM-01 – Adit discharge from the Pride of the Mountains Mine
- DW-PW-01 – Seep from below the toe of the Pride of the Woods Mine waste rock pile
- DW-RY-01 – Adit discharge from the Rainy Mine

Seventysix Creek Drainage

- SP-I76-01 – Seep from the Independence of Seventysix Mine and Ranger Prospect
- DW-SH-01 – Adit discharge from the Sheridan Mine
- DW-SY-01 – Adit discharge from the Sidney Mine

South Fork Sauk River Drainage

- DW-BA-01 – Adit discharge from the Boston-American Mine

Groundwater Stations

A monitoring well network was established in 2014-2015 to assess and monitor groundwater around the repository. The wells are listed below and locations of active wells are shown in Figure 2.

- MW-1 – Original upgradient well installed in August 2014 to a depth of 31 feet below ground surface (bgs). No groundwater was encountered in this well. This well was abandoned in June 2015.
- MW-1R – Replacement for MW-1 installed in June 2015 to a depth of 79.43 feet bgs. No groundwater was encountered in this well. This well is an active well in the monitoring network.
- MW-2 – Downgradient well located on the edge of the Snohomish County Road, installed in August 2014 to a depth of 30.5 feet bgs. Water samples collected from this well in August and October 2014 characterize pre-RA groundwater conditions. This well was abandoned in June 2015.
- MW-2R – Replacement for MW-2 installed in October 2015 to a depth of 55 feet bgs. This well is an active well in the monitoring network.
- MW-3 – Downgradient well located between the repository and the Snohomish County Road, installed in August 2014 to a depth of 30.5 feet bgs. Water samples collected from this well in August and October 2014 characterize pre-RA groundwater conditions. This well was abandoned in June 2015.
- MW-3R – Replacement for MW-3 installed in June 2015 to a depth of 29.05 feet bgs. This well is an active well in the monitoring network.
- MW-4 – Crossgradient well installed in June 2015 to a depth of 58.18 feet bgs. This well is an active well in the monitoring network.
- MW-5 – Crossgradient well installed in October 2015 to a depth of 60 feet bgs. This well is an active well in the monitoring network.

Field Procedures

Post-RA monitoring was completed in October 2015. The timing of the sampling event was intended to coincide with low flow conditions during the fall season, and occurred approximately less than a week prior to the onset of the wet weather.

All surface water, adit discharge, and seep samples were collected by direct immersion of a clean sample bottle into the medium. Field bottles containing nitric or sulfuric acid preservatives were filled by decanting sample from clean, unpreserved sample bottles into the preserved bottles. Stream sediment samples were collected using clean, sterile, plastic scoops that were discarded after collection of each sample. Sediment sample locations were selected to represent stream sediment deposition rather than slough from the side of the stream channel. Large gravels and organic material such as twigs, leaves, and roots were removed from the sediment samples when possible. Monitoring wells were purged in accordance with the *Implementation Guidance for the Ground Water Quality Standards* (Ecology, 2005), and sample bottles were filled directly from the outlet tube of the sampling pump.

The field parameters pH, electrical conductivity (EC), and temperature were measured using an Oakton pH/Con 10 multimeter. Dissolved oxygen (DO) was measured with a YSI 550 A series meter. All meters were calibrated daily according to manufacturer instructions and using National Institute of Standards and Technology – traceable standards, when applicable. Stream flow was measured if conditions permitted safe access to the stream cross-section. Stream flow was measured in general accordance with the US Geological Survey (USGS) conventional current meter method (USGS, 1982c). Velocity was measured with a Marsh-McBirney flow meter and stream depth was measured with a Rickly Hydrological USGS top setting wading rod.

Samples were placed on ice and maintained under 6 degrees Celsius (°C) during storage and transport to TestAmerica Laboratories in Spokane and/or Tacoma, Washington. All surface water, adit discharge, and seep samples were analyzed for total metals (antimony, arsenic, cadmium, copper, iron, lead, manganese, and zinc), pH, hardness, total dissolved solids (TDS), and total suspended solids (TSS). Adit discharge and seep samples were also analyzed for alkalinity, chloride, calcium, magnesium, sodium, potassium, and sulfate. Additionally, adit discharges collected from the Boston-American, Mystery, Pride of the Mountains, Rainy, and Sheridan Mines were analyzed for total acidity. Sediment samples were analyzed for nine total metals (antimony, arsenic, cadmium, copper, iron, lead, manganese, mercury, and zinc) and pH. Chain-of-custody (COC) forms are included with the laboratory results in Appendix A. Field notes are located in Appendix B.

MONITORING RESULTS

All water and sediment sample analyses were performed by TestAmerica Laboratories in Seattle, Spokane, or Tacoma, Washington, or Nashville, Tennessee. All analyses were performed according to US Environmental Protection Agency (EPA) approved methods with Level 2 reporting.

Stream Flow Monitoring

All aquatic stations were snow free during the post-RA monitoring event. Weather conditions during sampling of Seventysix Creek (October 5), all but one Glacier Creek station (October 5-6), and the two lowest SFSR stations (October 6) were warm and dry. The high temperature, as recorded in Startup, Washington, was 74 degrees Fahrenheit (°F) on October 5 and 79 °F on October 6, with no precipitation on either day (NWS, 2015). Conditions were cooler and rainy during sampling of the remaining SFSR stations (SFSR-01 through SFSR-07) and Glacier Creek station GC-04a on October 7 with a high temperature of 67 °F and 0.12 inches of rain (NWS, 2015). General observations of flow data are summarized in the following sections.

Glacier Creek

Calculated flows ranged from 1.4 – 3.7 cubic feet per second (cfs) at all stations except GC-03, at which flow was measured to be 0.3 cfs (Table 1a). All measurements were conducted in dry weather.

Seventysix Creek

Seventysix Creek was dry at the two upper stations (76G-01 and 76G-01a). Flow was measured as 4.3 cfs (76G-01b) and 4.2 cfs (76G-02) at the lower stations (Table 1a). All measurements were recorded in dry weather.

South Fork Sauk River

Flow measurements in the SFSR were variable. Flow was measured as 5.8 cfs at station SFSR-08 (just upstream of MCL) and 20.4 cfs at SFSR-09 (just downstream of MCL) in dry weather (Table 1a). While precipitation was occurring, flow measurements were the highest at the headwaters of the SFSR (30.4 cfs at SFSR-01), were low at the next two downstream stations (0.2 cfs at SFSR-02 and 2.8 cfs at SFSR-03), then ranged from 13.3 – 20.1 cfs at stations SFSR-04 through SFSR-07.

Summary of Results – Surface Water

Concentrations of metals detected in surface water samples collected at the MCMA were compared to the following:

- Washington Freshwater Aquatic Life Criteria (chronic) – Washington Administrative Code (WAC) 173-201A-240.
- Washington Criteria for Protection of Human Health – Cleanup Levels and Risk Calculations (Ecology, 2016).
- Washington Drinking Water Criteria Maximum Contaminant Levels (WAC 246-290).
- EPA Recommended Chronic Ambient Water Quality Criteria for Freshwater Aquatic Life (EPA, 2016a).
- EPA Recommended Ambient Water Quality Criteria for Protection of Human Consumption of Water and Fish (EPA, 2016b).
- Oak Ridge National Laboratory (ORNL) Preliminary Remediation Goals for Ecological Endpoints (ORNL, 1997).

Glacier Creek

Stations GC-01 and GC-02 are background stations located upstream of all known mining influences in the Glacier Creek system (Figure 3). All surface water samples collected from Glacier Creek stations during the October 2015 post-RA monitoring event exhibited total arsenic concentrations in excess of state and federal human health standards, but not state or federal ecological criteria (Table 1b). The 90% upper confidence limit (UCL) of the mean arsenic concentration in all background samples in the MCMA (stations GC-01, GC-02, 76G-01, and several other inactive background stations) throughout all monitoring since 2003 is 4.3 micrograms per liter ($\mu\text{g/L}$; Table 1b). This exceeds the 0.018 $\mu\text{g/L}$ standard for human health used by both the State of Washington and the EPA. Arsenic concentrations at GC-02, GC-04a, and GC-05 exceeded the Washington drinking water quality standards (10 $\mu\text{g/L}$) in addition to the human health criteria. All arsenic concentrations in Glacier Creek samples were higher than the background UCL except at GC-01. Furthermore, arsenic concentrations at all Glacier Creek stations exceeded each station's mean concentration throughout all prior monitoring (2005-2013; data not shown). No other metal concentrations measured in Glacier Creek exceeded any state or federal standards referenced in this study.

Temperatures in Glacier Creek ranged from 4.3 - 8.2 °C, EC ranged from 15 - 20 microsiemens per centimeter ($\mu\text{S}/\text{cm}$), and DO ranged from 9.09 - 10.92 milligrams per liter (mg/L; Table 1a). Field pH measurements ranged from 5.79 - 6.43 standard pH units (s.u.). Field measurements of low EC water are notoriously inaccurate (USGS, 1987). Laboratory pH measurements of the samples, although performed out of holding time, are more representative of stream pH. Laboratory pH measurements ranged from 6.54 - 7.20 s.u. Hardness ranged from 15 - 19 mg/L in all stations except GC-05, which exhibited a hardness of 390 mg/L. The SW-GC-05 hardness result has been confirmed by the laboratory, but is not consistent with historical monitoring at this station, the other hardness values for Glacier Creek stations, and the TDS result for this sample (<24 mg/L). TDS ranged from below the detection limit of 13 mg/L to 26 mg/L. TSS was below the detection limit of 4.0 mg/L at all stations except GC-04a, which exhibited a TSS of 7.0 mg/L.

Arsenic concentrations were 2.6 and 16 $\mu\text{g}/\text{L}$ at background stations GC-01 and GC-02, respectively (Table 1b). The concentration measured at GC-02 is the highest since monitoring began, but the result cannot be rejected as anomalous by the Q-test. Arsenic concentrations at downstream stations GC-02a, GC-03, and GC-04 ranged from 6.5 - 6.8 $\mu\text{g}/\text{L}$. These stations are successively downstream from influences by the Pride of the Mountains and New Discovery Mines (GC-02a), and the Pride of the Woods Mine (GC-03 and GC-04). Arsenic concentrations are highest at GC-04a (immediately downstream of the Justice Mine seep) at 18 $\mu\text{g}/\text{L}$, falling to 11 $\mu\text{g}/\text{L}$ at GC-05 (downstream of the Rainy Mine).

Seventysix Creek

Station 76G-01 is a background station located upstream of all known mining influences in the Seventysix Creek drainage (Figure 3). The two upper stations (76G-01 and 76G-01a) in Seventysix Creek were dry in October 2015. Arsenic concentrations at the two lower stations, 76G-01b (downstream of the Sheridan and Sidney Mines) and 76G-02 (downstream of Lincoln Mine and Liberty Prospect), were similar at 11 and 13 $\mu\text{g}/\text{L}$, respectively (Table 1b). These concentrations exceeded the background means for both stations throughout 2005-2013 monitoring, Washington drinking water standards, and both Washington and EPA human health criteria. Since we do not have background station data (76G-01) from this event, it is difficult to draw conclusions on the data available. No other metals concentrations measured in Seventysix Creek exceeded any state or federal standards referenced in this study.

Temperatures in Seventysix Creek ranged from 6.6 - 7.1 °C, EC ranged from 18 - 22 $\mu\text{S}/\text{cm}$, DO ranged from 7.78 - 9.05 mg/L, TDS ranged from 31 - 32 mg/L, and hardness was 12 mg/L at both stations (Table 1a). Field pH measurements ranged from 6.14 - 6.84 s.u. compared to a range of 7.18 - 7.21 s.u. measured in the lab. TSS was below the detection limit of 4.0 mg/L in both samples.

A cabin is located approximately 300 feet downstream from station 76G-01a, upslope of the western bank of Seventysix Creek (Figure 3). The cabin is located on a patented claim, and appears to be maintained and inhabited intermittently. Water is apparently withdrawn from the creek, as evidenced by a flexible pipe directed toward the building. Although dry during this monitoring event, pre-RA monitoring measured concentrations of total arsenic at station 76G-01a in excess of the EPA drinking water standard of 10 $\mu\text{g}/\text{L}$ by a factor of almost 2 (EPA, 2003). Thus, intermittent residences of the cabin may be exposed to arsenic in drinking water at concentrations above applicable EPA standards. It is recommended that the residents of the cabin be notified water from Seventysix Creek is not potable.

South Fork Sauk River and Monte Cristo Lake

The nine SFSR stations start just downstream of the confluence of Glacier and Seventysix Creeks (SFSR-01) and extend approximately 6.4 miles downstream to SFSR-09, which is located just downstream of MCL (Figure 4). Station MCL-01 is located in MCL, between SFSR-08 and SFSR-09. Stations SFSR-01 through SFSR-05 are referred to as the upper SFSR stations and are accessed by the Monte Cristo Trail or Snohomish County Road.

Stations SFSR-06 through SFSR-09 are referred to as the lower SFSR stations and are accessed from Mountain Loop Highway along with station MCL-01.

Arsenic concentrations exceeded the Washington and EPA human health criteria at all SFSR and MCL stations and exceeded the Washington drinking water standard at all stations except SFSR-03 (Table 1b). The arsenic concentration at MCL-01 exceeded the EPA aquatic life standard and was equal to the Washington aquatic life standard of 190 µg/L. Arsenic concentrations were similar at stations SFSR-01 through SFSR-08, ranging from 9.8 µg/L (SFSR-03) to 15 µg/L (SFSR-02). Arsenic at SFSR-09 was more than 5 times higher than at the other SFSR stations at 86 µg/L. Station MCL-01 had the highest measured arsenic concentration at 190 µg/L. This data reinforces the conclusion that MCL acts as a sink for arsenic and contributes to elevated arsenic concentrations in the SFSR downstream of the lake. As with the Glacier and Seventysix Creek stations, 2015 arsenic concentrations were higher than 2005-2013 means at all SFSR and MCL stations.

No other metals concentrations measured in stations SFSR-01 through SFSR-08 exceeded any state or federal standards referenced in this study. However, antimony, iron, lead, and manganese exceeded some or all state and federal standards at stations SFSR-09 and MCL-01.

Temperatures in the SFSR ranged from 8.5 - 10.7 °C, EC ranged from 17 - 33 µS/cm, DO ranged from 7.8 - 12.02 mg/L, and hardness ranged from 9.4 - 26 mg/L (Table 1a). Field pH measurements ranged from 5.30 - 6.85 s.u. compared to a range of 6.89 - 7.17 s.u. measured in the lab. TDS ranged 15 to 52 mg/L. TSS was below detection limits in all samples except at station SFSR-09 (8.0 mg/L). Field and miscellaneous parameters in MCL were similar to the SFSR results except for higher temperature (13.5 °C) and lower DO (3.65 mg/L). These differences were likely due to the fact that station MCL-01 was sampled on a warmer day than many of the SFSR stations and the lake was significantly lower than normal due to low precipitation.

Summary of Results - Adit Discharges and Seeps

Adit discharge samples were collected from seven mines and the Justice Mine seep. The Sidney Mine and Independence seep were both dry during the post-RA monitoring event. Prior to the RA, the Justice Mine adit discharge flowed over the surface of the waste rock pile below the adit, to the north towards Glacier Creek before going subsurface or beneath heavy vegetation below the toe of the waste rock pile. The adit discharge then daylighted as a seep further downslope of the toe of the waste rock pile, just upslope of Glacier Creek Trail. This seep, sample SP-JU-01, has been historically collected at its location adjacent to the Glacier Creek Trail. During the RA, the Justice Mine adit discharge was diverted from its historic path to bypass the waste rock pile and discharge directly into talus and vegetation approximately 300 feet west of the waste rock pile. This diversion was created by use of a prefabricated concrete barrier and an 8-inch high-density polyethylene (HDPE) pipe in late October 2015, after the 2015 post-RA monitoring event occurred. Therefore, a sample was collected from SP-JU-01 during the post-RA monitoring event. The seep was no longer observed at its historic sample location within three hours following the diversion of the adit discharge. It is not known if a surface seep from the diverted Justice Mine adit discharge will be present following the RA. The next post-RA monitoring event will include a search for a new seep, and sample collection if one is discovered.

Concentrations of metals in adit discharges and waste rock seeps were compared to the state and federal surface water quality criteria previously discussed. Concentrations of total antimony, arsenic, cadmium, copper, iron, lead, manganese, and zinc exceeded state and federal comparison criteria in samples collected from the mine adits and seeps (Table 2a). The highest concentrations of total arsenic were measured in the Pride of the Mountains Mine seep (2,200 µg/L) and the Mystery Mine adit discharge (1,100 µg/L). The Justice Mine adit discharge and seep were comparable to each other at 200 and 320 µg/L, respectively. The arsenic concentrations in the remaining adit discharges ranged from 14 µg/L (Boston-American Mine) to 52 µg/L (Rainy Mine). With the exception of the Justice Mine adit discharge, all arsenic concentrations exceeded the 2005-2013 means.

The Boston-American Mine and Sheridan Mine adit discharges did not exceed any state or federal standards for any metals other than arsenic (Table 2a). The Justice Mine adit discharge exceeded standards for antimony (9.3 µg/L), while the Justice Mine seep exceeded standards for antimony (11 µg/L), lead (1.1 µg/L), and zinc (47 µg/L). Concentrations of all metals except magnesium, manganese, and sodium were higher in the Justice Mine seep than in the Justice Mine adit discharge, indicating the waste rock pile as the source of the higher concentrations. The highest concentrations of antimony (26 µg/L), cadmium (26 µg/L), iron (12,000 µg/L), manganese (2,900 µg/L), and zinc (4,900 µg/L) were measured in the Mystery Mine adit discharge. The Pride of the Mountains seep exhibited the highest concentrations of arsenic (2,200 µg/L), copper (1,100 µg/L), and lead (190 µg/L).

Temperatures ranged from 5.0 - 10.0 °C, EC ranged from 77 - 564 µS/cm, DO ranged from 3.16 - 11.6 mg/L, hardness ranged from 19 - 250 mg/L, TDS ranged from 49 - 380 mg/L, and sulfate ranged from 7.1 - 300 mg/L. Field pH measurements ranged from 3.28 - 6.91 s.u. compared to lab measurements that ranged from 3.84 - 7.8 s.u. (Table 2b). TSS ranged from below the detection limit of 4.0 to 31 mg/L. Chloride ranged from 0.44 to 5 mg/L. Alkalinity ranged from below the detection limit of 1.7 to 65 mg/L. Total acidity was below the detection limit of 10 mg/L in all samples analyzed except for the Mystery Mine adit discharge (29 mg/L) and the Justice Mine adit discharge (1,900 mg/L). The total acidity result for the Justice Mine adit discharge is unrealistic and inconsistent with other parameters and is attributable to either sampling or laboratory error.

In general, adit discharges and waste rock pile seeps were observed infiltrating into surrounding talus and waste material. The Mystery Mine Adit #3 discharge was diverted from the waste rock pile to coarse talus for infiltration during the RA. The Pride of the Woods waste rock pile was removed to the extent practicable during the RA, and no adit seep was observed during the October 2015 event. Prior to the RA, the Pride of the Woods seep discharged into Glacier Creek. The seep from the Sidney Mine adit discharges to Seventysix Creek, while the Independence of Seventysix Seep provides the majority of flow to Seventysix Creek at station 76G-01a (when flowing). The pre-RA Justice Mine adit discharge and resulting seep (discussed previously) reached Glacier Creek immediately upstream from station GC-04a. It is not known where the diverted discharge will enter Glacier Creek; this location will be identified during the next monitoring event.

Summary of Results - Groundwater

Pre-RA groundwater monitoring was performed in August 2014, October 2014, and July 2015. Post-RA monitoring was performed in October 2015. Samples were collected from the monitoring wells described in Table 3. Field parameters pH, EC, temperature, and DO were measured at the time of sample collection. Samples were submitted to the laboratory for the following analyses: 23 total metals (aluminum, antimony, arsenic, barium, beryllium, calcium, cadmium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc), chloride, nitrate-nitrogen, sulfate, alkalinity (reported as carbonate and bicarbonate contributions), and hydrocarbon identification by the NWTPH-HCID method.

Groundwater Monitoring Well Network

Active and abandoned monitoring wells located around the repository are shown in Figure 2. Wells MW-1 (abandoned) and MW-1R (active) are intended to monitor groundwater that is presumed upgradient of the repository, but water was not encountered in either well. Wells MW-4 and MW-5 (both active) monitor groundwater that is presumed crossgradient of the repository. Wells MW-2 (abandoned), MW-2R (active), MW-3 (abandoned), and MW-3R (active) monitor groundwater that is presumed downgradient of the repository. Installation/abandonment dates, and well construction information is shown in Table 3.

Groundwater samples were collected from MW-2 and MW-3 in August and October 2014; MW-1 was dry during those monitoring events. Although these wells are presumed downgradient from the repository, the samples represent pre-RA conditions. Samples were collected from MW-3R and MW-4 on July 2, 2015, prior to

placement of waste rock and tailings in the repository. These samples also represent pre-RA conditions. Samples were collected from MW-2R, MW-3R, MW-4, and MW-5 in October 2015, following closure of the repository. MW-1R was dry during both the July and October 2015 monitoring events.

The October 2015 monitoring event is the only event in which at least 3 wells have had water to characterize a groundwater potentiometric surface. However, groundwater elevation data collected from MW-2R and MW-5 during this event were collected soon after installation of the wells and may not reflect accurate groundwater elevation. A preliminary potentiometric map was developed with the October 2015 data, but the projected flow regime does not likely represent actual conditions. Groundwater elevation data collected from the next monitoring event is expected to permit classification of upgradient and downgradient/crossgradient wells.

Analytical Results

October 2015 concentrations are equal to or lower than the pre-RA mean for all constituents in all wells, with the following exceptions (Tables 4a-4b):

- Calcium ranged from 2,900 to 3,300 µg/L compared to a pre-RA mean of 2,743 µg/L
- Chromium = 14 µg/L in MW-5 compared to a pre-RA mean of 3.9 µg/L
- Chloride ranged from 0.80 to 1.2 mg/L compared to a pre-RA mean of 0.54 mg/L
- Sulfate ranged from 3.3 to 3.6 mg/L compared to a pre-RA mean of 2.7 mg/L
- Bicarbonate alkalinity = 15 mg/L compared to a pre-RA mean of 10 mg/L

There were no detections of any petroleum hydrocarbons during pre- or post-RA monitoring (Table 4b). These constituents will continue to be monitored due to a small hydraulic fluid leak (less than 20 gallons) during the RA. The extent of the spill was assessed visually and the impacted soil was segregated and disposed off-site in accordance with all state and federal regulations. Results of confirmation samples of the soil left in place after removal of impacted soil demonstrates that all results were below Model Toxics Control Act Method A Cleanup Levels (Table 5).

Pre-RA means exceed Washington groundwater criteria for the following parameters: arsenic, iron, and manganese. Results were compared to Washington drinking water criteria under WAC 246-290-310, Washington primary and secondary contaminants under WAC 173-200-040, and to Model Toxics Control Act Method A Cleanup Levels for Ground Water (WAC 173-340-900).

Arsenic Loading Rates

Arsenic mass loadings based on streamflow measurements and total arsenic analytical results are tabulated in Table 6. The average loading of the background stations in Glacier Creek is 0.12 pounds per day (lb/d), corresponding to 43 pounds per year (lb/yr). By comparison, the downstream Glacier Creek stations had an average loading of 0.10 lb/d and 36 lb/yr. The arsenic concentration at station GC-02 (16 µg/L) is significantly higher than the station's 2005-2013 mean of 5.9 µg/L and the highest since monitoring began, but cannot be rejected as an outlier based on the Q-test. Similar variability is evident in the downstream Glacier Creek stations, with arsenic mass loading ranging from 0.01 lb/d and 4 lb/yr at GC-03 to 0.22 lb/d and 80 lb/yr at GC-05.

The background stations in Seventysix Creek were dry; therefore, background loading cannot be estimated for this stream. Arsenic mass loadings at stations 76G-01b and 76G-02 were very similar to each other, and averaged 0.27 lb/d and 100 lb/yr (Table 6).

Arsenic mass loading in the SFSR averaged 1.71 lb/d and 625 lb/yr for all stations (Table 6). The average loading of stations upstream from MCL was 0.85 lb/d and 311 lb/yr, whereas the mass loading downstream of

MCL was 9.46 lb/d and 3,452 lb/yr. There are no background stations for the SFSR, but the combined contributions from Glacier and Seventysix Creeks totals 0.37 lb/d and 137 lb/yr (based on the average of the downstream Glacier Creek stations and the average of the Seventysix Creek stations). The average mass loading at SFSR stations upstream of MCL was 0.48 lb/d and 174 lb/yr higher than the combined contributions from both Glacier and Seventysix Creeks. The increase in mass loading at station SFSR-09 compared to the average of the upstream SFSR stations indicates an arsenic mass loading from MCL of 8.60 lb/d and 3,141 lb yr.

Summary of Results - Sediment

Metals concentrations in sediment samples were compared to the following state and federal comparison criteria.

- Development of Freshwater Sediment Quality Values for use in Washington State (Ecology, 2003).
- Washington Sediment Management Standards - WAC 172-204-320 (Ecology, 1995).
- EPA Threshold Effects Levels (TELs) (NOAA, 1999).
- EPA Probable Effects Levels (PELs) (NOAA, 1999).
- ORNL Ecological Screening Level Values for Freshwater (ORNL, 1997).

Glacier Creek

Sediment samples collected from Glacier Creek stations exhibited concentrations of total antimony, arsenic, cadmium, copper, lead, mercury, and zinc in excess of state and federal comparison criteria (Table 7). Total arsenic concentrations ranged from 55 milligrams per kilogram (mg/kg) at station GC-01 (background) to 340 mg/kg at station GC-04a. The mean background concentration of total arsenic in MCMA sediment is 123 mg/kg, and the UCL of this mean is 181 mg/kg.

The highest total metals concentrations in Glacier Creek that exceed state and/or federal standards are summarized below (Table 7):

- Total antimony = 40 mg/kg at station GC-05
- Total arsenic = 340 mg/kg at station GC-04a
- Total cadmium = 2.0 mg/kg at station GC-04a
- Total copper = 94 mg/kg at station GC-04a
- Total lead = 83 mg/kg at station GC-04
- Total mercury = 0.41 mg/kg at station GC-04
- Total zinc = 360 mg/kg at station GC-04a

Seventysix Creek

Sediment samples collected from Seventysix Creek stations exhibited concentrations of total antimony, arsenic, cadmium, lead, mercury, and zinc in excess of state and federal comparison criteria (Table 7). Total arsenic concentrations ranged from 41 mg/kg at station 76G-01 (background) to 470 mg/kg at station 76G-01a.

The highest total metals concentrations in Seventysix Creek that exceed state and/or federal standards were all measured at station 76G-01a, and are summarized below (Table 7):

- Total antimony = 140 mg/kg
- Total arsenic = 470 mg/kg

- Total cadmium = 2.0 mg/kg
- Total lead = 410 mg/kg
- Total mercury = 0.48 mg/kg
- Total zinc = 400 mg/kg

South Fork Sauk River and Monte Cristo Lake

Sediment samples collected from SFSR and MCL stations exhibited concentrations of total antimony, arsenic, cadmium, copper, lead, and zinc in excess of state and federal comparison criteria (Table 7). Total arsenic concentrations in the SFSR samples ranged from 57 mg/kg at station SFSR-07 to 780 mg/kg at station SFSR-09, while the concentration of total arsenic from the MCL sample was 640 mg/kg.

The highest total metals concentrations in SFSR samples that exceed state and/or federal standards are summarized below (Table 7):

- Total antimony = 94 mg/kg at station SFSR-02
- Total arsenic = 780 mg/kg at station SFSR-09
- Total cadmium = 2.1 mg/kg at station SFSR-09
- Total copper = 120 mg/kg at stations SFSR-03 and SFSR-09
- Total lead = 210 mg/kg at station SFSR-09
- Total zinc = 340 mg/kg at station SFSR-09

Quality Assurance/Quality Control

Field and laboratory quality assurance/quality control (QA/QC) objectives and procedures for the annual aquatic monitoring are detailed in the Quality Assurance Project Plan, which is located in Section 5.0 of the DGI Work Plan (CES, 2013b). Results of the measurements of field precision, based on the submittal of blind duplicate samples for surface water and sediment are presented in Table 8.

Generally, relative percent difference (RPD) values for the 2015 sampling events were below 25% for duplicate samples. The highest RPDs, which ranged from 27 to 112%, were primarily due to overall low concentrations of the target analyte in the sample and duplicate, which typically yields higher percent differences. However, considering the overall low RPD values for all other analytes, field precision is considered acceptable for this monitoring event.

Rinsate blank samples were collected from decontaminated field equipment. Iron (9.8 µg/L) and manganese (0.53 µg/L) were detected in sample SW-EQ-01, which was the rinsate blank sample collected from the sample scoops for the sediment samples. Chromium was detected at a concentration of 2.5 µg/L in the blank sample collected from the water level meter used in the collection of groundwater samples.

No issues were noted with regard to laboratory QA/QC for this sampling event. The holding time for pH is 15 minutes per 40 CFR 136. As such, the holding time was exceeded for all aqueous samples submitted to the laboratory for analysis. However, pH is also measured as a field parameter and thus, pH data are considered valid for this investigation. Please refer to the laboratory analytical report (Appendix A) for further discussion of matrix spike and matrix spike duplicate results, and data qualifier descriptions.

CONCLUSIONS

Post-RA monitoring samples were collected from 21 aquatic stations, 8 adit seeps/discharges, and four groundwater monitoring wells. The highest concentration of total arsenic in stream/lake surface water was measured at station MCL-01 at 190 µg/L (Table 1b). This concentration equals or exceeds all applicable state and federal comparison criteria for human and ecological receptors. Concentrations of total arsenic exceeded the state and federal drinking water Maximum Contaminant Level of 10 µg/L at all non-background stations, with the exception of station SFSR-03 (9.8 µg/L).

Adit discharge and seep water samples were collected from eight locations. Concentrations of total antimony, arsenic, cadmium, copper, iron, lead, manganese, and zinc exceeded state and federal comparison criteria in these samples (Table 2a). The highest concentrations of total arsenic were measured in the Pride of the Mountains Mine adit discharge at 2,200 µg/L. The highest concentrations of antimony (26 µg/L), cadmium (26 µg/L), iron (12,000 µg/L), manganese (2,900 µg/L), and zinc (4,900 µg/L) were measured in the Mystery Mine adit discharge. The Pride of the Mountains seep exhibited the highest concentrations of copper (1,100 µg/L) and lead (190 µg/L).

Total acidity concentrations were below the detection limit of 20 mg/L for all adit discharges except the Mystery Mine and Justice Mine adit discharges; however the result for the Justice Mine adit discharge is suspect (Table 2b). The low pH and high sulfate concentration in the Mystery Mine adit discharge is consistent with the total acidity concentration and the presence of iron hydroxide precipitates in the adit discharge.

Total arsenic mass loading in Glacier Creek averaged 36 lb/yr at stations downstream of mining influences compared to 43 lb/yr at the background stations (Table 6). Total arsenic mass loading in Seventysix Creek averaged 100 lb/yr, although there was no surface flow at the background station for comparison. Total arsenic mass loading in the SFSR averaged 311 lb/yr upstream of MCL and 625 lb/yr for all SFSR stations combined, compared to a combined mass load from Glacier and Seventysix Creeks of 137 lb/yr. The station located downstream of MCL had a calculated mass loading of 3,452 lb/yr, indicating arsenic mass loading from MCL equal to 3,141 lb/yr. The arsenic mass loading from MCL is markedly higher than upstream stations. Further assessment of loading will be conducted during future post-RA sampling events to evaluate concentrations during high flow and low flow conditions.

Total arsenic concentrations in sediment varied across the stream reaches, with the highest concentration observed at station SFSR-09 (780 mg/kg; Table 7). The highest concentrations of all metals were measured in sediments at stations GC-04a, 76G-01a, and SFSR-09. These observations indicate influences by the Justice Mine seep (GC-04a), the Independence of 76 seep (76G-01a), and MCL (SFSR-09).

Post-RA groundwater monitoring did not indicate any immediate impact to groundwater quality from the repository. The only heavy metal detected in post-RA monitoring at a higher concentration than the pre-RA mean was chromium in MW-5 at a concentration of 14 µg/L compared to a pre-RA mean of 3.9 µg/L (Tables 4a-4b). Total arsenic concentrations were below the federal and state drinking water criteria and the pre-RA mean of 8.1 µg/L in each of wells sampled.

October 2015 total arsenic concentrations exceeded 2005-2013 means for every surface water sample collected, whereas arsenic concentrations in adit discharges, mine seeps, and stream sediments were within historical ranges at most stations. Based on surface flow measurements, water levels throughout the MCMA were observed to be the lowest in a decade during the summer of 2015. Low flows and lake water levels likely result in elevated concentrations of constituents in surface waters. Since it is difficult to draw conclusions regarding the performance of the RA based on results of this single post-RA monitoring event, sampling will be conducted on a bi-annual basis through 2019 to evaluate RA performance standards.

RECOMMENDATIONS

Based on the results of the 2015 post-RA monitoring, CES recommends the following:

- The Forest Service should continue monitoring of existing stations on a bi-annual basis through 2019 to properly evaluate the success of the RA.
- Notification to the landowner of the cabin in Seventysix Gulch regarding concentrations of arsenic in excess of state and federal drinking water standards and the health risks associated with consumption of water in this reach of the stream.
- Public notification of arsenic concentrations in excess of state and federal drinking water standards and the health risks associated with consumption of water in the SFSR from the Townsite downstream to MCL.

If you have any additional questions or concern regarding this project, please contact me at (509) 921-0290 or Ryan Tobias at (503) 931-3157.

BJK/mjb:sjr

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Table 1b. Surface Water Analytical Results – Laboratory Results
Tables 2a. Seep Water Analytical Results – Laboratory Results
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Appendix A. Laboratory Reports and Chain-of-Custody Forms
Appendix B. Field Notes
Doc: 2015230017 MCMA 2015Year End Report.docx

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TABLES

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Table 1a. Surface Water Analytical Results
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Sample ID	Sample Date	Flow Rate	Temperature (Field)	pH (Field)	pH (Lab)	Turbidity (Field)	Conductivity (Field)	Dissolved Oxygen (Field)	Oxygen Reduction Potential (Field)	Hardness as CaCO ₃	TDS, Residue, Filterable @180C	TSS, Residue, Non-Filterable @105C
		cfs	°C	s.u.		NTU	µS/cm	mg/L	mV	mg/L		
Glacier Creek												
MCPRA-SW-GC-01	10/6/2015	1.4	6.8	6.43	7.20 H	NM	18	9.5	NM	16	< 13	< 4.0
MCPRA-SW-GC-02	10/6/2015	2.5	4.3	6.18	6.98 H	NM	17	9.8	NM	17	23 J	< 4.0
MCPRA-SW-GC-02a	10/6/2015	2.7	5.2	5.97	7.10 H	NM	19	10.55	NM	18	26	< 4.0
MCPRA-SW-GC-03	10/6/2015	0.3	5.5	6.42	7.10 H	NM	18	10.5	NM	19	17 J	< 4.0
MCPRA-SW-GC-04	10/6/2015	2.0	6.0	6.10	6.75 H	NM	16	10.92	NM	16	20 J	< 4.0
MCPRA-SW-GC-04a	10/7/2015	NM	7.7	5.79	6.94 H	NM	15	9.09	NM	15	21 J	7.0 J
MCPRA-SW-GC-05	10/5/2015	3.7	8.2	5.99	6.54 H	NM	20	10.6	NM	390	24 J	< 4.0
Seventysix Creek												
MCPRA-SW-76G-01	10/5/2015	--	--	--	--	--	--	--	--	--	--	--
MCPRA-SW-76G-01a	10/5/2015	--	--	--	--	--	--	--	--	--	--	--
MCPRA-SW-76G-01b	10/5/2015	4.3	6.6	6.14	7.21 H	NM	22	7.78	NM	12	31	< 4.0
MCPRA-SW-76G-02	10/5/2015	4.2	7.1	6.84	7.18 H	NM	18	9.05	NM	12	32	< 4.0
South Fork Sauk River												
MCPRA-SW-SFSR-01	10/7/2015	30.4	8.5	5.65	6.96 H	NM	17	9.15	NM	11	20 J	< 4.0
MCPRA-SW-SFSR-02	10/7/2015	0.2	8.7	5.30	6.97 H	NM	17	7.8	NM	9.4	21 J	< 4.0
MCPRA-SW-SFSR-03	10/7/2015	2.8	8.7	5.30	6.93 H	NM	17	9.05	NM	9.4	15 J	< 4.0
MCPRA-SW-SFSR-04	10/7/2015	15.2	9.2	6.40	7.14 H	NM	23	8.2	NM	14	27	< 4.0
MCPRA-SW-SFSR-05	10/7/2015	17.7	9.4	6.23	7.10 H	NM	25	7.9	NM	16	26	< 4.0
MCPRA-SW-SFSR-06	10/7/2015	13.3	9.5	6.18	7.16 H	NM	28	9.99	NM	16	52	< 4.0
MCPRA-SW-SFSR-07	10/7/2015	20.1	9.4	6.39	7.15 H	NM	26	10.51	NM	17	26	< 4.0
MCPRA-SW-SFSR-08	10/6/2015	5.8	10.2	6.85	7.17 H	NM	28	12.02	NM	16	27	< 4.0
MCPRA-SW-SFSR-09	10/6/2015	20.4	10.7	6.73	6.89 H	NM	33	10.64	NM	26	26	8.0 J
Monte Cristo Lake												
MCPRA-SW-MCL-01	10/6/2015	NM	13.5	6.48	6.83 H	NM	38	3.65	NM	20	47	< 4.0

GENERAL NOTES:

Abbreviations: ID = identification, CaCO₃ = calcium carbonate, TDS = total dissolved solids, TSS = total suspended solids, cfs = cubic feet per second, °C = degrees Celsius, s.u. = standard pH units, NTU = nephelometric turbidity units, µS/cm = micro Siemens per centimeter, mg/L = milligrams per liter, mV = millivolts, -- = not sampled, H = denotes sample analyzed after holding time had been exceeded, NM = not measured, < = less than method detection limits, NS = no station
 All CES-Post Removal Action analyses were conducted by TestAmerica, Tacoma, Washington per EPA Method 6020A for total metals.

Table 1b. Surface Water Analytical Results (continued)
Monte Cristo Mining Area, Removal Action - 2015 Post-Removal Action Monitoring Report

Sample ID	Sample Date	Antimony	Arsenic	Cadmium	Copper	Iron	Lead	Manganese	Zinc
		µg/L							
Glacier Creek									
MCPRA-SW-GC-01	10/6/2015	2.4	2.6	< 0.028	< 0.60	14 J	0.067 J	1.7 J	< 1.9
MCPRA-SW-GC-02	10/6/2015	1.7	16	< 0.028	< 0.60	11 J	0.091 J	4.7	2.3
MCPRA-SW-GC-02a	10/6/2015	1.9	6.5	< 0.028	< 0.60	< 5.8	0.0730 J	1.9 J	2.9
MCPRA-SW-GC-03	10/6/2015	2.0	6.6	< 0.028	< 0.60	41	0.19 J	2.6	2.9
MCPRA-SW-GC-04	10/6/2015	2.0	6.8	< 0.028	< 0.60	17 J	0.13 J	1.9 J	3.6
MCPRA-SW-GC-04a	10/7/2015	2.2	18	0.094 J	1.3 J	51	0.33 J	8.5	12
MCPRA-SW-GC-05	10/5/2015	1.8	11	0.074 J	< 0.60	15 J	0.039 J	0.79 J	7.5
Seventysix Creek									
MCPRA-SW-76G-01	10/5/2015	--	--	--	--	--	--	--	--
MCPRA-SW-76G-01a	10/5/2015	--	--	--	--	--	--	--	--
MCPRA-SW-76G-01b	10/5/2015	2.0	11	0.0520 J	< 0.60	16 J	0.15 J	2.3	3.2 J
MCPRA-SW-76G-02	10/5/2015	2.0	13	0.0510 J	< 0.60	15 J	0.075 J	0.66 J	2.9 J
South Fork Sauk River									
MCPRA-SW-SFSR-01	10/7/2015	1.8	12	0.058 J	0.80 J	17 J	0.17 J	2.4	6.1 J
MCPRA-SW-SFSR-02	10/7/2015	3.6	15	0.13 J	1.1 J	5.9 J	0.12 J	0.61 J	11
MCPRA-SW-SFSR-03	10/7/2015	2.6	9.8	0.11 J	< 0.60	< 5.8 J	0.064 J	< 0.35	8.9
MCPRA-SW-SFSR-04	10/7/2015	3.8	11	0.063 J	0.68 J	12 J	0.057 J	0.64 J	4.4 J
MCPRA-SW-SFSR-05	10/7/2015	4.8	12	0.047 J	< 0.60	12 J	0.10 J	3.6	4.6 J
MCPRA-SW-SFSR-06	10/7/2015	5.4	13	0.051 J	0.83 J	21 J	0.087 J	1.9 J	13
MCPRA-SW-SFSR-07	10/7/2015	5.2	12	0.050 J	< 0.60	11 J	0.78	1.0 J	4.2 J
MCPRA-SW-SFSR-08	10/6/2015	5.1	13	0.048 J	< 0.60	11 J	0.087 J	4.6	3.0 J
MCPRA-SW-SFSR-09	10/6/2015	6.7	86	0.098 J	1.8 J	890	3.2	50	8.2
Monte Cristo Lake									
MCPRA-SW-MCL-01	10/6/2015	5.1	190	0.059 J	1.9 J	950	1.7	65	5.7 J
Background (2003 - 2015)									
Background Mean		1.9	3.1	0.06	1.0	14	0.33	1.8	3.3
Background 90% UCL		2.6	4.3	0.13	1.5	17	0.59	2.3	4.0
Standards¹ Average hardness of 36.1 mg/L used for hardness-corrected standards.									
Washington - Aquatic Life (Chronic) ²		NS	190	<u>1.03</u>	<u>4.8</u>	NS	<u>0.82</u>	NS	<u>44.08</u>
Washington - Human Health ³		14	0.018	NS	NS	NS	NS	NS	NS
Washington Drinking Water Criteria ⁴		6	10	5	NS	300	NS	50	5,000
EPA - Aquatic Life (CCC) ⁵		NS	150	<u>0.121</u>	<u>3.7</u>	1,000	<u>0.817</u>	NS	<u>49.83</u>
EPA - Human Health (Water+Organism) ⁶		5.6	0.018	NS	1,300	300	NS	50	7,400
ORNL - Surface Water PRGs ⁷		30	NS	<u>1.10</u>	<u>12</u>	1,000	<u>3.20</u>	120	<u>110</u>

GENERAL NOTES:

Abbreviations: ID = identification, µg/L = micrograms per liter, -- = not sampled, < = less than method detection limits, UCL = upper confidence limit, mg/L = milligrams per liter.

CCC = criterion continuous concentration, EPA = Environmental Protection Agency, ORNL = Oak Ridge National Laboratory, PRGs = Preliminary Remediation Goals.

Bold indicates an exceedence of the 90% UCL of the background mean (Note - background samples that exceed the mean background concentration are not bolded)

Shaded cells indicate that the value exceeds one or more standard; corresponding criteria also shaded.

All CES-Post Removal Action analyses were conducted by TestAmerica, Tacoma, Washington per EPA Method 6020A for total metals.

¹For standards corrected by hardness, the average hardness of all surface water samples collected in Glacier Creek, South Fork Sauk River, and Seventysix Gulch during current monitoring event was used

²State of Washington Aquatic Life criteria (WAC 173-201A), underline - corrected for hardness

³State of Washington criteria for protection of human health (<https://fortress.wa.gov/ecy/clarc/CLARHome.aspx>)

⁴State of Washington drinking water criteria (WAC 246-290-310)

⁵EPA recommended chronic ambient water quality criteria for freshwater aquatic life used (EPA, 2009), underline - corrected for hardness, *italics* - expressed as Dissolved

⁶EPA recommended ambient water quality criteria for protection of human consumption of water and fish (EPA, 2009), *italics* - expressed as Dissolved

⁷ORNL Preliminary Remediation Goals for Ecological Endpoints (ORNL, 1997), underline - corrected for hardness

Table 2a. Seep Water Analytical Results
Monte Cristo Mining Area, Removal Action - 2015 Post-Removal Action Monitoring Report

Sample ID	Sample Date	Antimony	Arsenic	Cadmium	Calcium	Copper	Iron	Lead	Magnesium	Manganese	Potassium	Sodium	Zinc
		µg/L											
Water Samples from Adit Drainage and Waste Rock Dump Seeps													
Boston-American Mine													
MCPRA-DW-BA-01	10/4/2015	0.82	14	0.0340 J	86,000	< 0.60	57	< 0.034	2,800	4.4	970 J	20,000	4.6 J
Justice Mine													
MCPRA-DW-JU-01	10/7/2015	9.3	200	0.19 J	24,000	1.8 J	46	0.23 J	2,900	15	450 J	2,800	27
MCPRA-SP-JU-01	10/7/2015	11	320	0.39 J	24,000	3.3	58	1.1	2,700	4.1	770 J	2,700	47
Mystery Mine													
MCPRA-DW-MY-01	10/5/2015	26	1,100	26	55,000	490	12,000	35	20,000	2,900	1,000	2,900	4,900
New Discovery Mine													
MCPRA-DW-ND-01	10/6/2015	2.2	34	6.8	24,000	110	910	14	8,500	1,100	1,100	1,900	710
Pride of the Mountains Mine													
MCPRA-DW-PM-01	10/6/2015	23	2,200	13	28,000	1,100	6,100	190	5,400	550	1,100	1,100	2,100
Rainy Mine													
MCPRA-DW-RY-01	10/4/2015	0.68	52	0.0750 J	5,100	3.9	410	5.5	1,000	18	390 J	1,400	14
Sheridan Mine													
MCPRA-DW-SH-01	10/5/2015	0.24 J	31	0.062 J	6,600	< 0.60	130	0.14 J	1,200	18	160 J	3,100	13
Background (2003 - 2015)													
Background Mean		1.9	3.1	0.1	2,872	1.0	14	0.3	229	1.8	< 250	< 250	3.3
Background 90% UCL		2.6	4.3	0.1	NC	1.5	17	0.6	NC	2.3	NC	NC	4.0
Standards¹ Average hardness of 36.1 mg/L used for hardness-corrected standards.													
Washington - Aquatic Life (Chronic) ²		NS	190	<u>1.03</u>	NS	<u>4.8</u>	NS	<u>0.82</u>	NS	NS	NS	NS	<u>44.08</u>
Washington - Human Health ³		14	0.018	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Washington Drinking Water Criteria ⁴		6	10	5	NS	NS	300	NS	NS	50	NS	NS	5,000
EPA - Aquatic Life (CCC) ⁵		NS	150	<u>0.121</u>	NS	<u>3.7</u>	1,000	<u>0.817</u>	NS	NS	NS	NS	<u>49.83</u>
EPA - Human Health (Water+Organism) ⁶		5.6	0.018	NS	NS	1,300	300	NS	NS	50	NS	20,000	7,400
ORNL - Surface Water PRGs ⁷		30	NS	<u>1.10</u>	NS	<u>12</u>	1,000	<u>3.20</u>	NS	120	NS	NS	<u>110</u>

GENERAL NOTES:

Abbreviations: ID = identification, µg/L = micrograms per liter, < = less than method detection limits, J = denotes result is greater than the method detection limit but less than the reporting limit, and is therefore an estimated value, UCL = upper confidence limit, mg/L = milligrams per liter, NC = not calculated, NS = no standard, CCC = criterion continuous concentration, EPA = Environmental Protection Agency, ORNL = Oak Ridge National Laboratory, PRGs = Preliminary Remediation Goals.

Bold indicates an exceedence of the 90% UCL of the background mean (Note - background samples that exceed the mean background concentration are not bolded)

Shaded cells indicate that the value exceeds one or more standard; corresponding criteria also shaded.

All CES-Post Removal Action analyses were conducted by TestAmerica, Tacoma, Washington per EPA Method 6020A for total metals.

¹For standards corrected by hardness, the average hardness of all surface water samples collected in Glacier Creek, South Fork Sauk River, and Seventysix Gulch during current monitoring event was used.

²State of Washington Aquatic Life criteria (WAC 173-201A), underline - corrected for hardness

³State of Washington criteria for protection of human health (CLARC-Part IIIf)

⁴State of Washington drinking water criteria (WAC 246-290-310)

⁵EPA recommended chronic ambient water quality criteria for freshwater aquatic life used (EPA, 2009), underline - corrected for hardness, *italics* - expressed as Dissolved

⁶EPA recommended ambient water quality criteria for protection of human consumption of water and fish (EPA, 2009), *italics* - expressed as Dissolved

⁷ORNL Preliminary Remediation Goals for Ecological Endpoints (ORNL, 1997), underline - corrected for hardness

Table 2b. Seep Water Analytical Results (continued)
Monte Cristo Mining Area, Removal Action - 2015 Post-Removal Action Monitoring Report

Sample ID	Sample Date	Flow Rate	Temperature (Field)	pH (Field)	pH (Lab)	Conductivity (Field)	Dissolved Oxygen (Field)	Oxygen Reduction Potential (Field)	Hardness as CaCO ₃ , TR	TDS, Residue, Filterable @180C	TSS, Residue, Non-Filterable @105C	Sulfate	Chloride	Alkalinity (Total as CaCO ₃)	Total Acidity
		cfs	°C	s.u.											
Boston-American Mine															
MCPRA-DW-BA-01	10/4/2015	0.007	6.3	6.91	7.8 H	532	8.46	NM	250	380	< 4.0	220	5	65 H	< 10.0
Justice Mine															
MCPRA-DW-JU-01	10/7/2015	NM	5.0	6.91	7.69 H	164	9.6	NM	73	110	< 4.0	44	1.2	43	1,900
MCPRA-SP-JU-01	10/7/2015	NM	7.7	6.6	7.53 H	158	9.4	NM	69	100	< 4.0	44	1.2	35	NM
Mystery Mine															
MCPRA-DW-MY-01	10/5/2015	0.07	4.2	3.28	3.84 H	564	11.0	NM	240	370	30	300	1.5	< 1.7	29
New Discovery Mine															
MCPRA-DW-ND-01	10/6/2015	NM	10.0	5.89	6.19 H	348	3.16	NM	91	140	4.0 J	93	0.94	15	NM
Pride of the Mountains															
MCPRA-DW-PM-01	10/6/2015	0.0022	5.0	6.13	7.16 H	196	11.6	NM	100	140	31	65	0.57 J	35	< 10.0
Rainy Mine															
MCEE-DW-RY-01	10/4/2015	0.0022	6.4	5.83	7.05 H	119	8.65	NM	19	68	23	7.1	0.62 J	14 H	< 10.0
Sheridan Mine															
MCRA1-DW-SH-01	10/5/2015	NM	6.9	6.35	7.34 H	77	9.77	NM	20	49	9.0 J	14	0.44 J	20	< 10.0

GENERAL NOTES:

Abbreviations: ID = identification, Ca CQ = calcium carbonate, TR = total recoverable, TDS = total dissolved solids, TSS = total suspended solids, cfs = cubic feet per second, °C = degrees Celcius, s.u. = standard pH units, µS/cm = microSiemens per centimeter,

mg/L = milligrams per liter, mV = millivolts, H = denotes sample analyzed after holding time had been exceeded, NM = not measured, < = less than method detection limits.

Shaded cells indicate that the value exceeds one or more standard; corresponding criteria also shaded.

All CES-Post Removal Action analyses were conducted by TestAmerica, Tacoma, Washington per EPA Method 6020A for total metals.

Table 3. Groundwater Monitoring Well Installation Details
Monte Cristo Mining Area, Removal Action - 2015 Post-Removal Action Monitoring Report

Well ID	Completion Date	Borehole		Casing			Screen		Filter Pack		Surveyed Elevation at Top of Casing (amsl)
		Depth (feet bgs)	Diameter (inches)	Length (feet)	Diameter (inches)	Material	Interval (feet bgs)	Slot size (inches)	Interval (feet)	Porosity	
MW-1 ¹	8/7/2014	31	6	34	2	PVC	16 - 31	0.01	14 - 31	30%	NS
MW-2 ¹	8/6/2014	30.5	6	33.5	2	PVC	10.5 - 30.5	0.01	8.5 - 30.5	30%	NS
MW-3 ¹	8/7/2014	30.5	6	33.5	2	PVC	15.5 - 30.5	0.01	13.5 - 30.5	30%	NS
MW-1R	6/18/2015	79.43	6	82.3	2	PVC	54.43 - 79.43	0.02	52.43 - 79.43	30%	2,645.20
MW-2R	10/20/2015	55	6	58.44	2	PVC	50 - 55	0.02	47 - 55	30%	2,600.14
MW-3R	6/18/2015	29.05	6	31.91	2	PVC	14.05 - 29.05	0.02	12.05 - 29.05	30%	2,584.36
MW-4	6/18/2015	58.18	6	60.92	2	PVC	33.18 - 58.18	0.02	30.18 - 58.18	30%	2,623.25
MW-5	10/23/2015	60	6	63.09	2	PVC	50 - 60	0.02	47 - 60	30%	2,606.07

GENERAL NOTES:

All wells were drilled by Cascade Drilling, LP, Federal Way, Washington using track-mounted mini sonic drilling methodology.

Abbreviations: ID = identification, bgs = below ground surface, amsl = above mean sea level, NS = not surveyed, PVC = polyvinyl chloride.

¹Abandoned on June 17, 2015.

Table 4a. Groundwater Analytical Results
Monte Cristo Mining Area, Removal Action - 2015 Post-Removal Action Monitoring Report

Sample ID	Sample Date	Total Metals																		
		Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
		µg/L																		
Pre-RA Monitoring																				
Upgradient																				
MW-1	8/6/2014	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1	10/4/2014	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW-1R	7/2/2015	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Crossgradient/Downgradient																				
MW-2	8/6/2014	< 50	< 2	< 5	< 6	< 2	< 2	< 2	< 2	< 5	< 200	< 2	21	< 0.2	< 15	< 5	< 2	< 5	< 10	< 20
MW-3	8/6/2014	14,000	< 2	31	63	< 2	< 2	11	6.6	26	8,700	6.1	230	< 0.2	< 15	< 5	< 2	< 5	20	36
MW-2	10/4/2014	< 20	1.8	6.6	2.3	< 2	< 1	< 2	< 1	< 2	< 25	< 1	< 2	NA	< 2	< 1	< 1	< 1	< 2	< 10
MW-3	10/4/2014	23	1.6	3.7	2.5	< 2	< 1	< 2	< 1	< 2	< 25	< 1	16	NA	< 2	< 1	< 1	< 1	< 2	< 10
MW-3R	7/2/2015	< 500	< 2	< 5	6.5	< 2	< 2	4.3	< 2	< 10	< 200	< 2	56	< 0.2	< 15	< 5	< 2	< 5	< 20	< 35
MW-4	7/2/2015	< 500	< 2	< 5	< 6	< 2	< 2	5.3	< 2	< 10	< 200	< 2	< 10	< 0.2	< 15	< 5	< 2	< 5	< 20	< 35
Pre-RA Mean		2426.3	1.2	8.1	13.4	< 1	< 1	3.9	1.8	7	1,504	1.7	55	< 0.1	< 7	< 2	1	< 2	8	15
Post-RA Monitoring																				
Upgradient																				
MW-1R	10/21/2015	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Crossgradient/Downgradient																				
MW-2R	10/21/2015	940	NA	5.1	8.2	< 0.4	< 0.4	2.5	1.1	2.5	530	0.41	49	< 0.2	< 3	< 1	< 0.4	< 1	< 4	< 7
MW-3R	10/21/2015	400	NA	5.5	4.1	< 0.4	< 0.4	1.7	< 0.4	< 2	230	< 0.4	5.3	< 0.2	< 3	< 1	< 0.4	< 1	< 4	< 7
MW-4	10/22/2015	< 100	NA	3.0	2.4	< 0.4	< 0.4	1.1	< 0.4	< 2	< 40	< 0.4	< 2	< 0.2	< 3	< 1	< 0.4	< 1	< 4	< 7
MW-5	10/23/2015	280	NA	<i>1</i>	3.6	< 0.4	< 0.4	14	0.68	< 2	270	< 0.4	35	< 0.2	11	< 1	< 0.4	< 1	< 4	< 7
Standards																				
MTCA Method A Cleanup Levels for Ground Water (Table 720-1) ¹		NS	NS	5	NS	NS	5	NS	NS	<u>NS</u>	NS	15	NS	2	NS	NS	NS	NS	NS	NS
Washington Groundwater Quality Criteria ²		NS	NS	0.05	1,000	NS	10	50	NS	1,000	300	50	50	2	NS	10	50	NS	NS	5,000
Washington Drinking Water Criteria ³		NS	6	10	2,000	4	5	100	NS	NS	300	NS	50	2	100	50	100	2	NS	5,000

GENERAL NOTES:

Abbreviations: ID = identification, CaCO₃ = calcium carbonate, mg/L = milligrams per liter, µg/L = micrograms per liter, -- = no sample collected, < = less than method detection limits, H = denotes sample analyzed after holding time had been exceeded, RA = Removal Action,

NA = not analyzed, MTCA = Model Toxics Control Act, NS = no standard.

Bold indicates an exceedence of background mean (Note - background samples that exceed the mean background concentration are not bolded)

Shaded cells indicate that the value exceeds one or more standard; corresponding criteria also shaded.

Italic values indicate that the MDL exceeds the lowest standard

All CES-Post Removal Action analyses were conducted by TestAmerica, Tacoma, Washington per EPA Method 6020A for total metals.

¹State of Washington, Model Toxics Control Act (MTCA) Cleanup Regulations (October, 2007) (WAC 173-340-900)

²State of Washington, Primary and Secondary Contaminants (WAC 173-200-040)

³State of Washington drinking water criteria (WAC 246-290-310)

Table 4b. Groundwater Monitoring Well Parameters and Elevations
Monte Cristo Mining Area, Removal Action - 2015 Post-Removal Action Monitoring Report

Well ID	Date	Top of Casing Elevation feet amsl	Field Measurements								Lab Parameters												
			Depth to Groundwater feet	Groundwater Elevation feet amsl	Temperature °C	pH s.u.	Conductivity µS/cm	Dissolved Oxygen mg/L	Oxygen Reduction Potential mV	Turbidity NTU	pH s.u.	Cations					Anions			Petroleum Hydrocarbons			
												Bicarbonate	Carbonate	Calcium	Magnesium	Potassium	Sodium	Chloride	Nitrate, N	Sulfate	Gas Range	Diesel Range	Heavy Oil Range
Pre-RA Monitoring																							
Upgradient																							
MW-1	8/6/2014	--	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-1	10/4/2014	--	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW-1R	7/2/2015	--	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Crossgradient/Downgradient																							
MW-2	8/6/2014	--	18.9	NC	8.9	6.3	12	8.4	NM	0.11	NM	15	< 1.68	2.74	< 0.5	< 1	2.85	< 0.8	< 0.2	2.14	NA	NA	NA
MW-3	8/7/2014	--	28.0	NC	10.4	6.3	17	8.1	NM	39.7	NM	5	< 1.68	2.63	< 0.5	< 1	5.31	0.81	< 0.2	2.63	NA	NA	NA
MW-2	10/4/2014	--	22.95	NC	7.6	6.5	23.7	10.2	60	NM	NM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	10/4/2014	--	31.65	NC	8.1	6.5	24.7	11.3	84	NM	NM	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-3R	7/2/2015	2,584.36	27.53	2,556.83	12.7	5.63	19	10.3	88	10.3	7.30 H	10	< 1.68	2.8	< 0.5	< 1	2.5	< 0.8	< 0.05	2.8	< 0.24	< 0.61	< 0.61
MW-4	7/2/2015	2,623.25	55.63	2,567.62	12.3	5.63	21	8.73	127	15.21	7.37 H	10	< 1.68	2.8	< 0.5	< 1	2.7	< 0.8	< 0.05	3.2	< 0.24	< 0.61	< 0.61
Pre-RA Mean		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	10	< 0.84	2.74	NC	NC	3.34	0.54	< 0.06	2.69	NC	NC	NC
Post-RA Monitoring																							
Upgradient																							
MW-1R	10/21/2015	2,645.20	Dry	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Crossgradient/Downgradient																							
MW-2R	10/21/2015	2,600.14			9.1	5.83	20	7.4	NM	NM	6.68 H	15	< 1.68	3.2	0.81	< 1	1	0.88	< 0.2 H	3.4	< 0.25	< 0.63	< 0.63
MW-3R	10/21/2015	2,584.36	27.53	2,556.83	8.9	5.69	18	5.6	NM	NM	6.71 H	10	< 1.68	3.2	0.57	< 1	0.87	0.8	< 0.2 H	3.3	< 0.25	< 0.64	< 0.64
MW-4	10/22/2015	2,623.25	55.63	2,567.62	7.7	5.6	21	5.1	NM	NM	6.62 H	10	< 1.68	3.3	< 0.5	< 1	0.9	0.88	< 0.2 H	3.6	< 0.25	< 0.62	< 0.62
MW-5	10/23/2015	2,606.07	46.46	2,559.61	6.6	5.6	20	5.3	NM	NM	6.59 H	5	< 1.68	2.9	< 0.5	< 1	1	1.2	< 0.2 H	3.3	< 0.25	< 0.62	< 0.62

GENERAL NOTES:

All CES-Post Removal Action analyses were conducted by TestAmerica, Tacoma, Washington per EPA Method 6020A for total metals.

Abbreviations: ID = identification, amsl = above mean sea level, °C = degrees Celsius, mg/L = milligrams per liter, µg/L = micrograms per liter, s.u. = standard units, µS/cm = microSiemens per centimeter, mV = millivolts, NTU = nephelometric turbidity units, -- = no sample collected,

< = less than method detection limits, H = denotes sample analyzed after holding time had been exceeded, NA = not analyzed.

Table 5. Hydraulic Spill

Monte Cristo Mining Area, Removal Action - 2015 Post-Removal Action Monitoring Report

Sample	Date Collected	Sample Location	Petroleum Hydrocarbon Analyses	
			Diesel Fuel Range Organics	Heavy Oil Range Organics
			mg/kg	
Spill A	7/2/2015	Main Spill Area (South)	290	1,400
Spill B	7/2/2015	Area of Potential Spray (NW)	160	230
Spill C	7/2/2015	Discolored Area (NE)	75	240
Standards				
MTCA Method A Soil Cleanup Levels for Unrestricted Land Uses (Table 740-1) ¹			2,000	2,000

GENERAL NOTES:

Soil analyses were conducted by TestAmerica, Spokane, Washington per Method NWTPH-HCID.

Abbreviations: mg/kg = milligrams per kilogram, NW = northwest, NE = northeast, MTCA = Model Toxics Control Act.

¹State of Washington, MTCA Cleanup Regulations (October, 2007) (WAC 173-340-900)

Table 6. Arsenic Mass Loading
Monte Cristo Mining Area, Removal Action - 2015 Post-Removal Action Monitoring Report

Station ID	Date	Flow		Arsenic		
		cfs	MGD	µg/L	lb/d	lb/yr
Glacier Creek						
MCPRA-SW-GC-01	10/6/2015	1.4	0.9	2.6	0.02	7
MCPRA-SW-GC-02	10/6/2015	2.5	1.6	16	0.22	79
Background Average					0.12	43
MCPRA-SW-GC-02a	10/6/2015	2.7	1.7	6.5	0.09	35
MCPRA-SW-GC-03	10/6/2015	0.3	0.2	6.6	0.01	4
MCPRA-SW-GC-04	10/6/2015	2.0	1.3	6.8	0.07	27
MCPRA-SW-GC-04a	10/7/2015	NM	NM	18	NC	NC
MCPRA-SW-GC-05	10/5/2015	3.7	2.4	11	0.22	80
Downstream Average					0.10	36
Seventysix Creek						
MCPRA-SW-76G-01	10/5/2015	0.0	0.0	NS	0.00	0
MCPRA-SW-76G-01a	10/5/2015	0.0	0.0	NS	0.00	0
Background Average					0.00	0
MCPRA-SW-76G-01b	10/5/2015	4.3	2.8	11	0.25	93
MCPRA-SW-76G-02	10/5/2015	4.2	2.7	13	0.29	107
Downstream Average					0.27	100
South Fork Sauk River						
MCPRA-SW-SFSR-01	10/7/2015	30.4	19.6	12	1.97	718
MCPRA-SW-SFSR-02	10/7/2015	0.2	0.1	15	0.02	6
MCPRA-SW-SFSR-03	10/7/2015	2.8	1.8	9.8	0.15	54
MCPRA-SW-SFSR-04	10/7/2015	15.2	9.8	11	0.90	329
MCPRA-SW-SFSR-05	10/7/2015	17.7	11.4	12	1.14	418
MCPRA-SW-SFSR-06	10/7/2015	13.3	8.6	13	0.93	340
MCPRA-SW-SFSR-07	10/7/2015	20.1	13.0	12	1.30	475
MCPRA-SW-SFSR-08	10/6/2015	5.8	3.7	13	0.41	148
Average (upstream of Monte Cristo Lake)					0.85	311
MCPRA-SW-SFSR-09	10/6/2015	20.4	13.2	86	9.46	3,452
Average (all SFSR stations)					1.71	625

GENERAL NOTES:

Abbreviations: ID = identification, cfs = cubic feet per second, MGD = million gallons per day, µg/L = micrograms per liter, lb/yr = pounds per year,

lb/d = pounds per day, NM = not measured, NC = not calculated, NS = no sample collected, SFSR = South Fork Sauk River.

All CES-Post Removal Action analyses were conducted by TestAmerica, Tacoma, Washington per EPA Method 6020A for total metals.

Table 7. Sediment Analytical Results

Monte Cristo Mining Area, Removal Action - 2015 Post-Removal Action Monitoring Report

Sample ID	Sample Date	Antimony, Total	Arsenic - Total	Cadmium, Total	Copper, Total	Iron, Total	Lead, Total	Manganese, Total	Mercury, Total	Zinc, Total	pH (Saturated Paste)
		mg/kg									
Glacier Creek											
MCPRA-SS-GC-01	10/6/2015	19	55	0.20	13	15,000	9.4	990	0.26	46	7.38 H
MCPRA-SS-GC-02	10/6/2015	35	310	0.65	36	30,000	41	1,200	0.19	160	7.06 H
MCPRA-SS-GC-02a	10/6/2015	24	130	0.85	29	21,000	73	1,300	0.36	140	7.21 H
MCPRA-SS-GC-03	10/6/2015	36	260	1.2	35	22,000	69	1,300	0.17	220	7.19 H
MCPRA-SS-GC-04	10/6/2015	30	300	1.2	43	22,000	83	1,100	0.41	190	7.48 H
MCPRA-SS-GC-04a	10/7/2015	8.0	340	2.0	94	25,000	49	750	0.11	360	7.41
MCPRA-SS-GC-05	10/5/2015	40	140	0.71	53	20,000	41	570	0.052	140	6.90
Seventysix Creek											
MCPRA-SS-76G-01	10/5/2015	8.3	41	0.23	13	22,000	28	560	0.047	68	6.77
MCPRA-SS-76G-01a	10/5/2015	140	470	2.0	17	21,000	410	1,200	0.48	400	7.00
MCPRA-SS-76G-01b	10/5/2015	7.4	100	0.80	13	15,000	61	560	0.18	180	7.92
MCPRA-SS-76G-02	10/5/2015	7.5	120	0.73	19	20,000	39	610	0.067	180	7.08
South Fork Sauk River											
MCPRA-SS-SFSR-01	10/7/2015	41	200	0.75	37	19,000	100	500	0.071	150	7.16 H
MCPRA-SS-SFSR-02	10/7/2015	94	630	0.58	83	16,000	150	260	0.056	100	7.41 H
MCPRA-SS-SFSR-03	10/7/2015	48	200	0.68	120	23,000	94	480	0.055	150	7.09 H
MCPRA-SS-SFSR-04	10/7/2015	47	330	0.81	95	29,000	97	600	0.045	190	7.08 H
MCPRA-SS-SFSR-05	10/7/2015	18	150	0.52	52	23,000	74	420	0.038 J	130	7.53 H
MCPRA-SS-SFSR-06	10/7/2015	44	180	0.73	53	23,000	140	480	0.054	140	7.56 H
MCPRA-SS-SFSR-07	10/7/2015	11	57	0.77	34	21,000	31	500	0.020 J	140	7.64 H
MCPRA-SS-SFSR-08	10/6/2015	34	300	1.1	80	29,000	100	680	0.026 J	210	7.57 H
MCPRA-SS-SFSR-09	10/6/2015	60	780	2.1	120	33,000	210	790	0.17	340	7.05 H
Monte Cristo Lake											
MCPRA-SS-MCL-01	10/6/2015	25	640	1.1	93	32,000	84	420	0.19	160	6.90 H
Background (2003 - 2013)											
Background Mean		12	123	1.1	24	25,996	42	1,151	0.25	109	6.61
Background 90% UCL¹		17.5	180.7	1.6	27	27,984	59	1,297	0.31	125	6.44 - 6.78
Standards											
Washington - Freshwater (under development) ²	0.6	51	1	830	NS	430	NS	0.75	160	NS	
Washington - Marine ³	NS	57	5.1	390	NS	450	NS	0.41	410	NS	
EPA - Freshwater TEL ⁴	NS	5.9	0.596	35.7	NS	35	NS	0.174	123.1	NS	
EPA - Freshwater PEL ⁵	NS	17	3.53	197	NS	91.3	NS	0.486	315	NS	
ORNL - Freshwater ⁶	NS	42	4.2	77.7	NS	110	NS	0.7	270	NS	

GENERAL NOTES:

Abbreviations: ID = identification, mg/kg = milligrams per kilogram, su = standard pH units, H = denotes sample analyzed after holding time had been exceeded, < = less than method detection limits,

UCL = upper confidence limit, NS = no standard, EPA = Environmental Protection Agency, TEL = threshold effects level, PEL = probable effects level, ORNL = Oak Ridge National Laboratory.

Bold values exceed the 90% Upper Confidence Limit for concentrations of background samples collected from 2003 - 2015 (or lie outside the 90% confidence interval for pH).

Shaded values indicate that the value exceeds one or more standard; corresponding criteria also shaded.

All CES Post-Removal Action analyses were conducted by TestAmerica in Spokane, Washington per EPA method 6020A.

¹For pH, the 90% confidence interval is presented.

²State of Washington, Development of Freshwater Sediment Quality Values (DOE recommendations, Sept 2003)

³State of Washington, Marine Sediment Management Standards (WAC 172-204-320)

⁴EPA Threshold Effects Level (NOAA, 1999)

⁵EPA Probable Effects Level (NOAA, 1999)

⁶ORNL ecological screening level values for freshwater, lowest chronic value used (ORNL, 1997)

**Table 8. Quality Assurance/Quality Control Summary
Monte Cristo Mining Area, Removal Action - 2015 Post-Removal Action Monitoring Report**

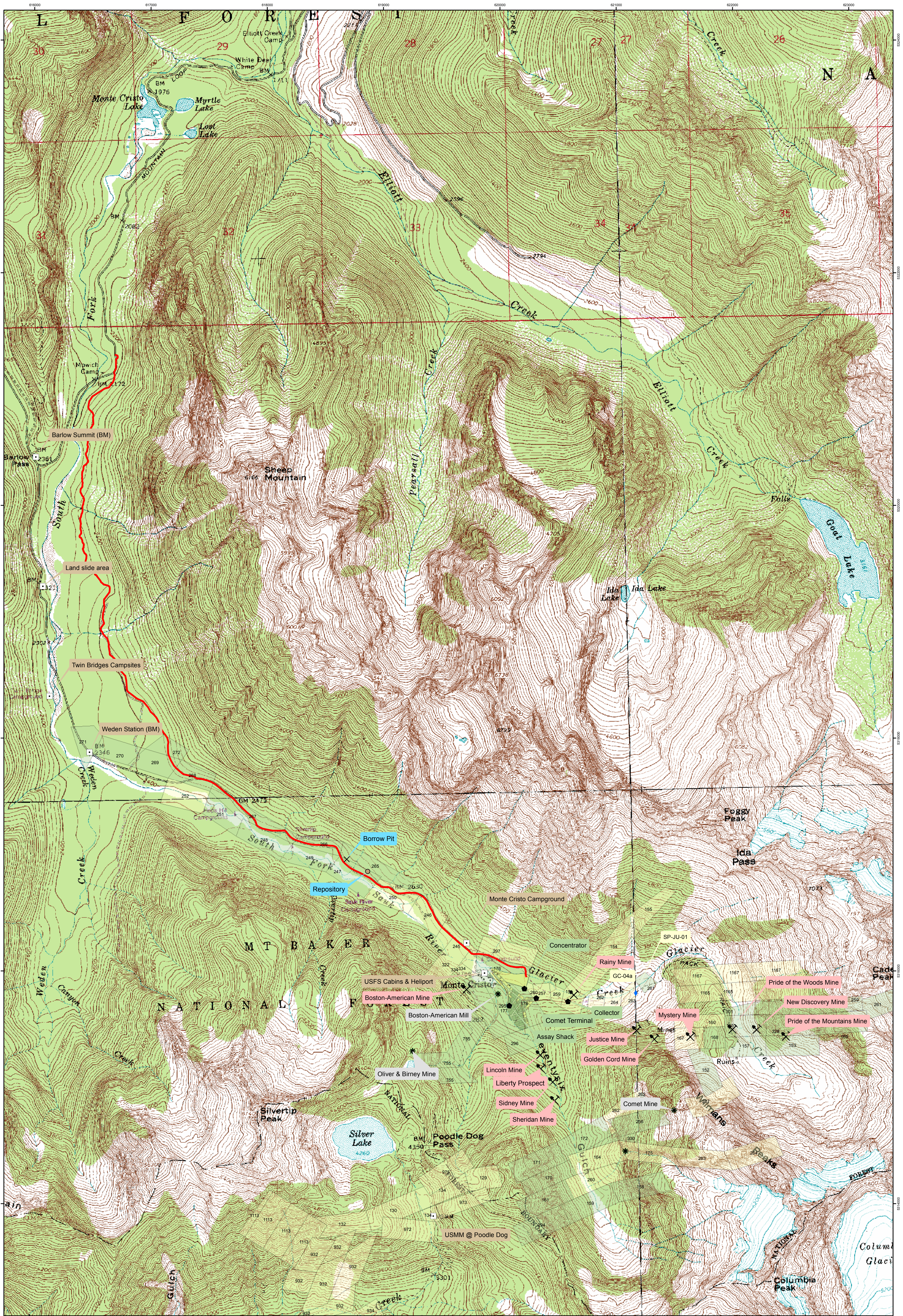
Sample ID	Sample Date	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
		µg/L																	
Mystery Mine																			
MCPRA-DW-MY-01	10/5/2015	--	26	1,100	--	--	26	--	--	490	12,000	35	2,900	--	--	--	--	--	4,900
MCPRA-SW-DP-01	10/5/2015	--	30	1,300	--	--	28	--	--	520	14,000	39	3,100	--	--	--	--	--	5,300
% Difference		--	14%	17%	--	--	7%	--	--	6%	15%	11%	7%	--	--	--	--	--	8%
Pride of the Mountains Mine																			
MCPRA-DW-PM-01	10/6/2015	--	23	2,200	--	--	13	--	--	1,100	6,100	190	550	--	--	--	--	--	2,100
MCPRA-SW-DP-02	10/6/2015	--	24	2,900	--	--	16	--	--	1,500	8,300	260	510	--	--	--	--	--	2,500
% Difference		--	4%	27%	--	--	21%	--	--	31%	31%	31%	8%	--	--	--	--	--	17%
Station SFSR-09																			
MCPRA-SW-SFSR-09	10/6/2015	--	6.7	86	--	--	0.098 J	--	--	1.8 J	890	3.2	50	--	--	--	--	--	8.2
MCPRA-SW-DP-03	10/6/2015	--	6.4	54	--	--	0.041 J	--	--	0.86 J	340	0.9	39	--	--	--	--	--	< 6.8 J
% Difference		--	5%	46%	--	--	82%	--	--	71%	89%	112%	25%	--	--	--	--	--	19%
MW-3R	10/21/2015	400	--	5.5	4.1	< 0.4	< 0.0280	1.7	< 0.4	< 2	230	< 0.034	5.3	< 3	< 1	< 0.4	< 1	< 4	< 1.90
MW-Duplicate	10/21/2015	370	--	5.4	3.8	< 0.4	< 0.0280	1.7	< 0.4	< 2	200	< 0.034	6.6	< 3	< 1	< 0.4	< 1	< 4	< 1.90
% Difference		8%	--	2%	8%	0%	0%	0%	0%	0%	14%	0%	22%	0%	0%	0%	0%	0%	0%
Rinsate Blanks																			
MCPRA-SW-EQ-01	10/7/2015	--	< 0.0800	< 0.270	--	--	< 0.028	--	--	< 2	9.8 J	< 0.0340	0.53 J	--	--	--	--	--	< 1.90
Blank	10/23/2015	< 100	--	< 0.270	< 1.2	< 0.4	< 0.028	2.5	< 0.4	< 2	< 5.80	< 0.0340	< 0.354	< 3	< 1	< 0.4	< 1	< 4	< 1.90

GENERAL NOTES:

All analyses were conducted by TestAmerica, Tacoma, Washington per EPA Method 6020A for total metals.
Abbreviations: ID = identification, µg/L = micrograms per liter, < = less than method detection limits.
SW-DP-01 is a field duplicate of the surface water sample collected at the Mystery Mine.
SW-DP-02 is a field duplicate of the surface water sample collected at the Pride of the Mountains Mine.
SW-DP-03 is a field duplicate of the surface water sample collected at station SFSR-09.
SW-EQ-01 is a rinsate blank collected from a stainless steel trowel or disposable trowel.
MW-Duplicate is a duplicate groundwater sample collected from monitoring well MW-3R.
Blank is a rinsate blank collected from decontaminated groundwater sampling equipment.

FIGURES

- Figure 1. Site Map: Monte Cristo Mining Area**
- Figure 2. Repository Monitoring Wells and Groundwater Elevations – October 2015**
- Figure 3. Glacier Basin and Seventysix Gulch Sample Stations**
- Figure 4. South Fork Sauk River and Monte Cristo Lake Sample Stations**



Legend

- | | | |
|--------------------------|----------------------|--------------------------|
| Mine | RA Features Proposed | Townsite & Adjacent Lots |
| Facility | Repository | Private |
| Other Mines & Facilities | Borrow Source | Mineral Surveys |
| Access Route | Reference Site | FS |
| | | Private |
| | | 152 |
| | | 932 |
| | | Private |

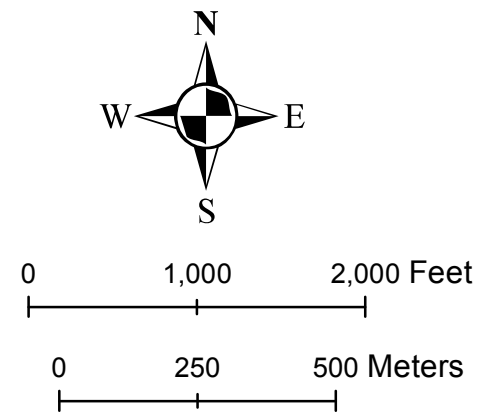
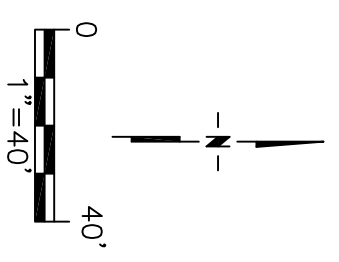


Figure 1. Site Map: Monte Cristo Mining Area

PROJECT NUMBER: 2015230017	Monte Cristo Mining Area 2015 Year End Report
DATE: 2/25/2016	USDA Forest Service Mt. Baker-Snoqualmie National Forest Monte Cristo, Washington
DWG BY: 6RKB	
PROJECT MANAGER: RMT	
REVISED:	
CASCADE EARTH SCIENCES A Valmont Industries Company	

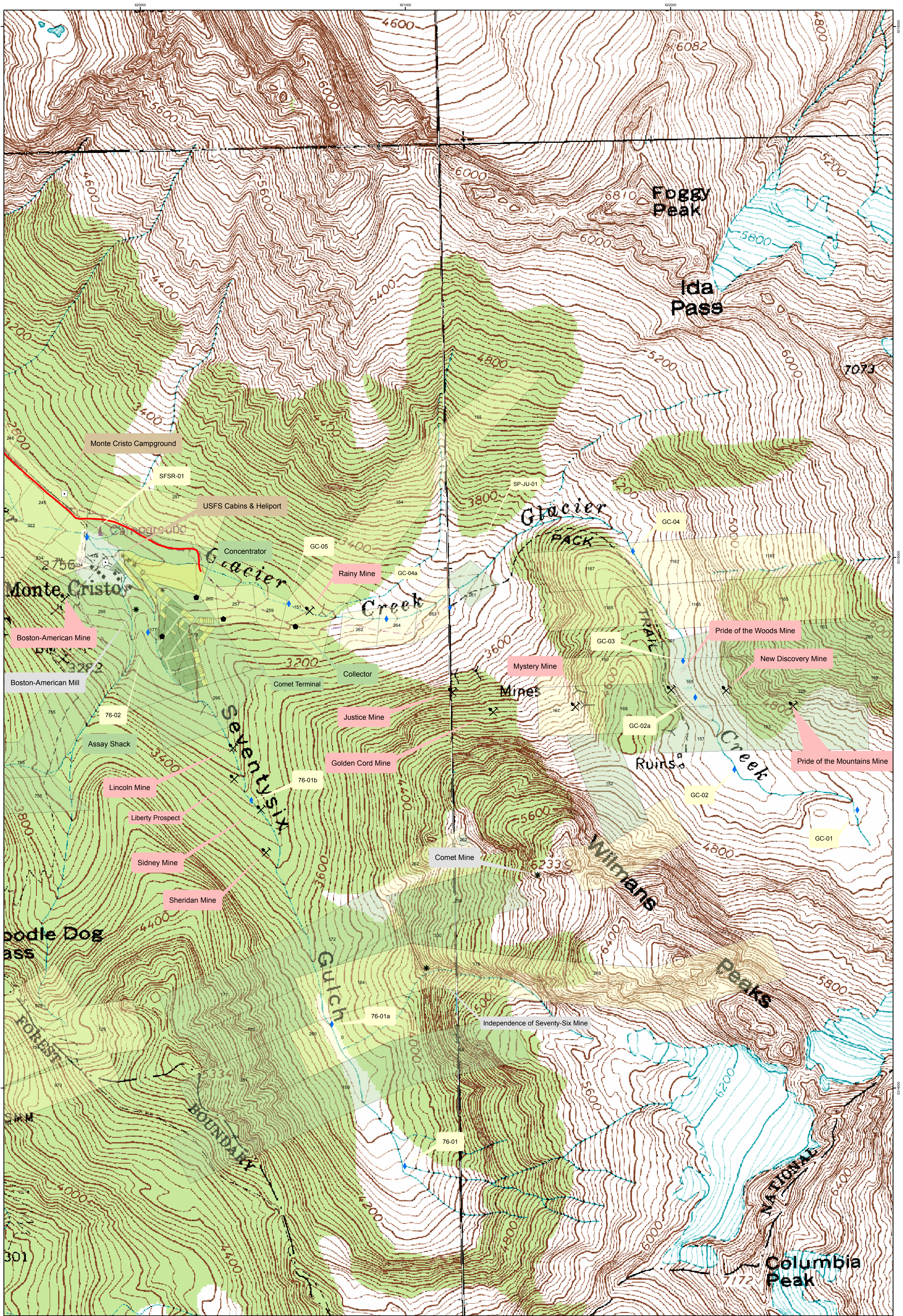


(SCALE AND LOCATIONS ARE APPROXIMATE)

EXPLANATION
 ● MW-4 MONITORING WELL LOCATION
 ● 2567.36 STATIC GROUNDWATER ELEVATION

Figure 2. Repository Monitoring Wells and Groundwater Elevations – October 2015

PROJECT NUMBER: 2015230017	Monte Cristo Mining Area
DATE: 2/26/2016	2015 Year End Report
DWG NO.: 2015230017 PRAMR F2.dwg	USDA Forest Service
DWG BY: PROJECT MANAGER: BRKB	Mt. Baker – Snoqualmie National Forest
REVISOR: 1RMT	Darrington Ranger District
	CASCADE EARTH SCIENCES A Valmont Industries Company



Legend

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> Mine Facility Other Mines & Facilities Aquatic Station | <p>RA Features Proposed</p> <ul style="list-style-type: none"> Repository Borrow Source Access Route Reference Site | <p>Townsite & Adjacent Lots</p> <ul style="list-style-type: none"> FS Private <p>Mineral Surveys</p> <ul style="list-style-type: none"> 152 FS 932 Private |
|---|--|--|

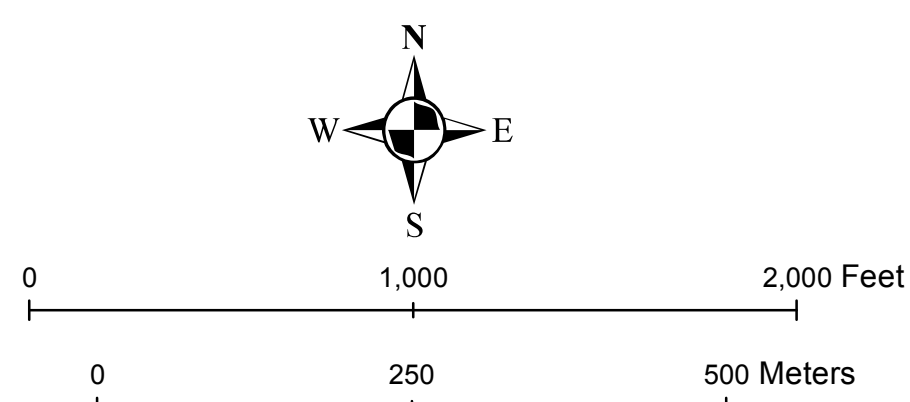


Figure 3. Glacier Basin and Seventysix Gulch Sample Stations

PROJECT NUMBER: 2015230017 DATE: 2/25/2016 DWG BY: BRKB PROJECT MANAGER: RMT	Monte Cristo Mining Area 2015 Year End Report USDA Forest Service Mt. Baker-Snoqualmie National Forest Monte Cristo, Washington CASCADE EARTH SCIENCES A Valmont Industries Company
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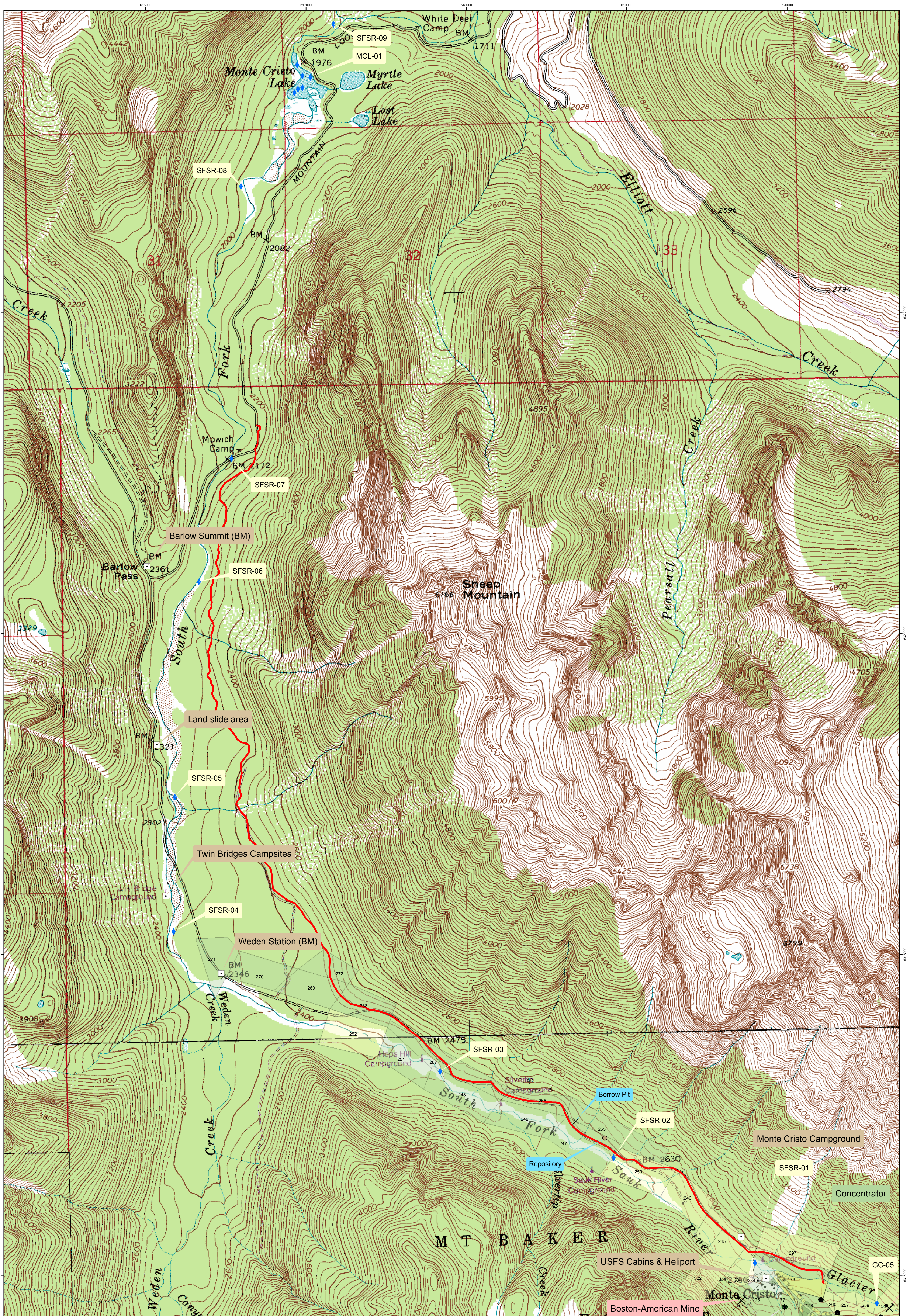
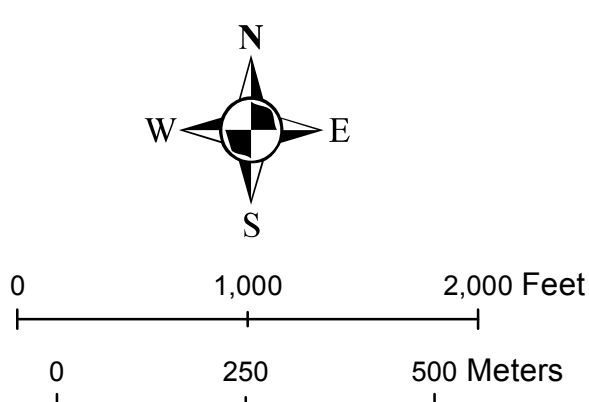


Figure 4. South Fork Sauk River and Monte Cristo Lake Sample Stations

Legend

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> Mine Facility Other Mines & Facilities Aquatic Station | <p>RA Features Proposed</p> <ul style="list-style-type: none"> Repository Borrow Source Access Route Reference Site | <p>Townsite & Adjacent Lots</p> <ul style="list-style-type: none"> FS Private <p>Mineral Surveys</p> <ul style="list-style-type: none"> 152 FS 932 Private |
|---|--|--|



PROJECT NUMBER: 2015230017
 DATE: 2/25/2016
 DWG BY: BRKB
 PROJECT MANAGER: RMT
 REVISED:

Monte Cristo Mining Area 2015 Year End Report	
USDA Forest Service Mt. Baker-Snoqualmie National Forest Monte Cristo, Washington	
	CASCADE EARTH SCIENCES A Valmont Industries Company

APPENDICES

- Appendix A. Laboratory Analysis – TestAmerica Laboratories, Inc.**
- Appendix B. Field Notes**

Appendix A.

Laboratory Analysis – TestAmerica Laboratories, Inc.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Spokane
11922 East 1st Ave
Spokane, WA 99206
Tel: (509)924-9200

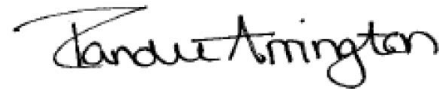
TestAmerica Job ID: 590-2232-1

Client Project/Site: Monte Cristo Post-Removal Action Monitor

For:

Cascade Earth Sciences Inc.
12720 E Nora Ave
Spokane, Washington 99216

Attn: Bernard Kronschnabel



Authorized for release by:
11/9/2015 2:38:29 PM

Randee Arrington, Project Manager II
(509)924-9200
randee.arrington@testamericainc.com

LINKS

Review your project
results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Chain of Custody	25
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Case Narrative

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Job ID: 590-2232-1

Laboratory: TestAmerica Spokane

Narrative

Receipt

The samples were received on 10/26/2015 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.4° C.

Receipt Exceptions

There were no labels on the 125ml HCL amber containers, they were included in a plastic ziploc bag with the sample ID written on the outside of the ziploc for the following samples: MW-2R (590-2232-1), MW-3R (590-2232-2), MW-4 (590-2232-3), MW-5 (590-2232-4), MW-Duplicate (590-2232-5) and Blank (590-2232-6).

IC

Method 300.0 Nitrate: The following samples were received outside of holding time: MW-2R (590-2232-1), MW-3R (590-2232-2), MW-4 (590-2232-3) and MW-5 (590-2232-4).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sample Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-2232-1	MW-2R	Water	10/21/15 11:00	10/26/15 09:45
590-2232-2	MW-3R	Water	10/21/15 12:15	10/26/15 09:45
590-2232-3	MW-4	Water	10/22/15 16:20	10/26/15 09:45
590-2232-4	MW-5	Water	10/23/15 11:25	10/26/15 09:45
590-2232-5	MW-Duplicate	Water	10/21/15 00:00	10/26/15 09:45
590-2232-6	Blank	Water	10/23/15 13:15	10/26/15 09:45

Definitions/Glossary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Client Sample ID: MW-2R

Date Collected: 10/21/15 11:00

Date Received: 10/26/15 09:45

Lab Sample ID: 590-2232-1

Matrix: Water

Method: NWTPH-HCID - Northwest - Hydrocarbon Identification (GC)

Analyte	Result	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		0.25		mg/L		10/28/15 14:14	10/28/15 15:49	1
Diesel Range Organics (DRO) (C10-C25)	ND		0.63		mg/L		10/28/15 14:14	10/28/15 15:49	1
Residual Range Organics (RRO) (C25-C36)	ND		0.63		mg/L		10/28/15 14:14	10/28/15 15:49	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	83		50 - 150				10/28/15 14:14	10/28/15 15:49	1
<i>n</i> -Triacontane-d62	80		50 - 150				10/28/15 14:14	10/28/15 15:49	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.88		0.80		mg/L			10/27/15 09:44	1
Nitrate as N	ND	H	0.20		mg/L			10/27/15 09:44	1
Sulfate	3.4		0.50		mg/L			10/27/15 09:44	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	3.2		1.0		mg/L		11/05/15 09:33	11/09/15 11:57	1
Magnesium	0.81		0.50		mg/L		11/05/15 09:33	11/09/15 11:57	1
Potassium	ND		1.0		mg/L		11/05/15 09:33	11/09/15 13:04	1
Sodium	1.0		0.50		mg/L		11/05/15 09:33	11/09/15 11:57	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0051		0.0010		mg/L		10/28/15 10:05	10/28/15 17:27	1
Cadmium	ND		0.00040		mg/L		10/28/15 10:05	10/28/15 17:27	1
Copper	0.0025		0.0020		mg/L		10/28/15 10:05	10/28/15 17:27	1
Iron	0.53		0.040		mg/L		10/28/15 10:05	10/28/15 17:27	1
Lead	0.00041		0.00040		mg/L		10/28/15 10:05	10/28/15 17:27	1
Manganese	0.049		0.0020		mg/L		10/28/15 10:05	10/28/15 17:27	1
Zinc	ND		0.0070		mg/L		10/28/15 10:05	10/28/15 17:27	1
Silver	ND		0.00040		mg/L		10/28/15 10:05	10/28/15 17:27	1
Aluminum	0.94		0.10		mg/L		10/28/15 10:05	10/28/15 17:27	1
Barium	0.0082		0.0012		mg/L		10/28/15 10:05	10/28/15 17:27	1
Beryllium	ND		0.00040		mg/L		10/28/15 10:05	10/28/15 17:27	1
Chromium	0.0025		0.00040		mg/L		10/28/15 10:05	10/28/15 17:27	1
Cobalt	0.0011		0.00040		mg/L		10/28/15 10:05	10/28/15 17:27	1
Nickel	ND		0.0030		mg/L		10/28/15 10:05	10/28/15 17:27	1
Selenium	ND		0.0010		mg/L		10/28/15 10:05	10/28/15 17:27	1
Vanadium	ND		0.0040		mg/L		10/28/15 10:05	10/28/15 17:27	1
Thallium	ND		0.0010		mg/L		10/28/15 10:05	10/28/15 17:27	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020		mg/L		10/28/15 11:28	10/28/15 15:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	15		4.0		mg/L			10/28/15 09:12	1
Carbonate Alkalinity as CaCO3	ND		4.0		mg/L			10/28/15 09:12	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Client Sample ID: MW-2R

Date Collected: 10/21/15 11:00

Date Received: 10/26/15 09:45

Lab Sample ID: 590-2232-1

Matrix: Water

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.68	HF	0.100		SU			11/05/15 09:27	1

Client Sample ID: MW-3R

Date Collected: 10/21/15 12:15

Date Received: 10/26/15 09:45

Lab Sample ID: 590-2232-2

Matrix: Water

Method: NWTPH-HCID - Northwest - Hydrocarbon Identification (GC)

Analyte	Result	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		0.25		mg/L		10/28/15 14:14	10/28/15 16:07	1
Diesel Range Organics (DRO) (C10-C25)	ND		0.64		mg/L		10/28/15 14:14	10/28/15 16:07	1
Residual Range Organics (RRO) (C25-C36)	ND		0.64		mg/L		10/28/15 14:14	10/28/15 16:07	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	94		50 - 150				10/28/15 14:14	10/28/15 16:07	1
<i>n</i> -Triacontane-d62	91		50 - 150				10/28/15 14:14	10/28/15 16:07	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.80		0.80		mg/L			10/27/15 09:58	1
Nitrate as N	ND	H	0.20		mg/L			10/27/15 09:58	1
Sulfate	3.3		0.50		mg/L			10/27/15 09:58	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	3.2		1.0		mg/L		11/05/15 09:33	11/09/15 12:01	1
Magnesium	0.57		0.50		mg/L		11/05/15 09:33	11/09/15 12:01	1
Potassium	ND		1.0		mg/L		11/05/15 09:33	11/09/15 13:08	1
Sodium	0.87		0.50		mg/L		11/05/15 09:33	11/09/15 12:01	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0055		0.0010		mg/L		10/28/15 10:05	10/28/15 17:31	1
Cadmium	ND		0.00040		mg/L		10/28/15 10:05	10/28/15 17:31	1
Copper	ND		0.0020		mg/L		10/28/15 10:05	10/28/15 17:31	1
Iron	0.23		0.040		mg/L		10/28/15 10:05	10/28/15 17:31	1
Lead	ND		0.00040		mg/L		10/28/15 10:05	10/28/15 17:31	1
Manganese	0.0053		0.0020		mg/L		10/28/15 10:05	10/28/15 17:31	1
Zinc	ND		0.0070		mg/L		10/28/15 10:05	10/28/15 17:31	1
Silver	ND		0.00040		mg/L		10/28/15 10:05	10/28/15 17:31	1
Aluminum	0.40		0.10		mg/L		10/28/15 10:05	10/28/15 17:31	1
Barium	0.0041		0.0012		mg/L		10/28/15 10:05	10/28/15 17:31	1
Beryllium	ND		0.00040		mg/L		10/28/15 10:05	10/28/15 17:31	1
Chromium	0.0017		0.00040		mg/L		10/28/15 10:05	10/28/15 17:31	1
Cobalt	ND		0.00040		mg/L		10/28/15 10:05	10/28/15 17:31	1
Nickel	ND		0.0030		mg/L		10/28/15 10:05	10/28/15 17:31	1
Selenium	ND		0.0010		mg/L		10/28/15 10:05	10/28/15 17:31	1
Vanadium	ND		0.0040		mg/L		10/28/15 10:05	10/28/15 17:31	1
Thallium	ND		0.0010		mg/L		10/28/15 10:05	10/28/15 17:31	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Client Sample ID: MW-3R

Date Collected: 10/21/15 12:15

Date Received: 10/26/15 09:45

Lab Sample ID: 590-2232-2

Matrix: Water

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020		mg/L		10/28/15 11:28	10/28/15 15:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	10		4.0		mg/L			10/28/15 09:12	1
Carbonate Alkalinity as CaCO3	ND		4.0		mg/L			10/28/15 09:12	1
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.71	HF	0.100		SU			11/05/15 09:27	1

Client Sample ID: MW-4

Date Collected: 10/22/15 16:20

Date Received: 10/26/15 09:45

Lab Sample ID: 590-2232-3

Matrix: Water

Method: NWTPH-HCID - Northwest - Hydrocarbon Identification (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		0.25	NONE	mg/L		10/28/15 14:14	10/28/15 16:24	1
Diesel Range Organics (DRO) (C10-C25)	ND		0.62		mg/L		10/28/15 14:14	10/28/15 16:24	1
Residual Range Organics (RRO) (C25-C36)	ND		0.62		mg/L		10/28/15 14:14	10/28/15 16:24	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	90		50 - 150				10/28/15 14:14	10/28/15 16:24	1
<i>n</i> -Triacontane-d62	85		50 - 150				10/28/15 14:14	10/28/15 16:24	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.88		0.80		mg/L			10/27/15 10:26	1
Nitrate as N	ND	H	0.20		mg/L			10/27/15 10:26	1
Sulfate	3.6		0.50		mg/L			10/27/15 10:26	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	3.3		1.0		mg/L		11/05/15 09:33	11/09/15 12:08	1
Magnesium	ND		0.50		mg/L		11/05/15 09:33	11/09/15 12:08	1
Potassium	ND		1.0		mg/L		11/05/15 09:33	11/09/15 13:15	1
Sodium	0.90		0.50		mg/L		11/05/15 09:33	11/09/15 12:08	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0030		0.0010		mg/L		10/28/15 10:06	10/28/15 17:36	1
Cadmium	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 17:36	1
Copper	ND		0.0020		mg/L		10/28/15 10:06	10/28/15 17:36	1
Iron	ND		0.040		mg/L		10/28/15 10:06	10/28/15 17:36	1
Lead	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 17:36	1
Manganese	ND		0.0020		mg/L		10/28/15 10:06	10/28/15 17:36	1
Zinc	ND		0.0070		mg/L		10/28/15 10:06	10/28/15 17:36	1
Silver	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 17:36	1
Aluminum	ND		0.10		mg/L		10/28/15 10:06	10/28/15 17:36	1
Barium	0.0024		0.0012		mg/L		10/28/15 10:06	10/28/15 17:36	1
Beryllium	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 17:36	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Client Sample ID: MW-4
Date Collected: 10/22/15 16:20
Date Received: 10/26/15 09:45

Lab Sample ID: 590-2232-3
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	0.0011		0.00040		mg/L		10/28/15 10:06	10/28/15 17:36	1
Cobalt	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 17:36	1
Nickel	ND		0.0030		mg/L		10/28/15 10:06	10/28/15 17:36	1
Selenium	ND		0.0010		mg/L		10/28/15 10:06	10/28/15 17:36	1
Vanadium	ND		0.0040		mg/L		10/28/15 10:06	10/28/15 17:36	1
Thallium	ND		0.0010		mg/L		10/28/15 10:06	10/28/15 17:36	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020		mg/L		10/28/15 11:28	10/28/15 15:57	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	10		4.0		mg/L			10/28/15 09:12	1
Carbonate Alkalinity as CaCO3	ND		4.0		mg/L			10/28/15 09:12	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.62	HF	0.100		SU			11/05/15 09:27	1

Client Sample ID: MW-5
Date Collected: 10/23/15 11:25
Date Received: 10/26/15 09:45

Lab Sample ID: 590-2232-4
Matrix: Water

Method: NWTPH-HCID - Northwest - Hydrocarbon Identification (GC)

Analyte	Result	Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		0.25		mg/L		10/28/15 14:14	10/28/15 16:42	1
Diesel Range Organics (DRO) (C10-C25)	ND		0.62		mg/L		10/28/15 14:14	10/28/15 16:42	1
Residual Range Organics (RRO) (C25-C36)	ND		0.62		mg/L		10/28/15 14:14	10/28/15 16:42	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	91		50 - 150				10/28/15 14:14	10/28/15 16:42	1
<i>n</i> -Triacontane-d62	87		50 - 150				10/28/15 14:14	10/28/15 16:42	1

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.2		0.80		mg/L			10/27/15 10:54	1
Nitrate as N	ND	H	0.20		mg/L			10/27/15 10:54	1
Sulfate	3.3		0.50		mg/L			10/27/15 10:54	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	2.9		1.0		mg/L		11/05/15 09:33	11/09/15 12:13	1
Magnesium	ND		0.50		mg/L		11/05/15 09:33	11/09/15 12:13	1
Potassium	ND		1.0		mg/L		11/05/15 09:33	11/09/15 13:19	1
Sodium	1.0		0.50		mg/L		11/05/15 09:33	11/09/15 12:13	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010		mg/L		10/28/15 10:06	10/28/15 17:40	1
Cadmium	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 17:40	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Client Sample ID: MW-5
Date Collected: 10/23/15 11:25
Date Received: 10/26/15 09:45

Lab Sample ID: 590-2232-4
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	ND		0.0020		mg/L		10/28/15 10:06	10/28/15 17:40	1
Iron	0.27		0.040		mg/L		10/28/15 10:06	10/28/15 17:40	1
Lead	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 17:40	1
Manganese	0.035		0.0020		mg/L		10/28/15 10:06	10/28/15 17:40	1
Zinc	ND		0.0070		mg/L		10/28/15 10:06	10/28/15 17:40	1
Silver	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 17:40	1
Aluminum	0.28		0.10		mg/L		10/28/15 10:06	10/28/15 17:40	1
Barium	0.0036		0.0012		mg/L		10/28/15 10:06	10/28/15 17:40	1
Beryllium	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 17:40	1
Chromium	0.014		0.00040		mg/L		10/28/15 10:06	10/28/15 17:40	1
Cobalt	0.00068		0.00040		mg/L		10/28/15 10:06	10/28/15 17:40	1
Nickel	0.011		0.0030		mg/L		10/28/15 10:06	10/28/15 17:40	1
Selenium	ND		0.0010		mg/L		10/28/15 10:06	10/28/15 17:40	1
Vanadium	ND		0.0040		mg/L		10/28/15 10:06	10/28/15 17:40	1
Thallium	ND		0.0010		mg/L		10/28/15 10:06	10/28/15 17:40	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020		mg/L		10/28/15 11:28	10/28/15 15:59	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	5.0		4.0		mg/L			10/28/15 09:12	1
Carbonate Alkalinity as CaCO3	ND		4.0		mg/L			10/28/15 09:12	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.59	HF	0.100		SU			11/05/15 09:27	1

Client Sample ID: MW-Duplicate
Date Collected: 10/21/15 00:00
Date Received: 10/26/15 09:45

Lab Sample ID: 590-2232-5
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0054		0.0010		mg/L		10/28/15 10:06	10/28/15 17:45	1
Cadmium	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 17:45	1
Copper	ND		0.0020		mg/L		10/28/15 10:06	10/28/15 17:45	1
Iron	0.20		0.040		mg/L		10/28/15 10:06	10/28/15 17:45	1
Lead	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 17:45	1
Manganese	0.0066		0.0020		mg/L		10/28/15 10:06	10/28/15 17:45	1
Zinc	ND		0.0070		mg/L		10/28/15 10:06	10/28/15 17:45	1
Silver	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 17:45	1
Aluminum	0.37		0.10		mg/L		10/28/15 10:06	10/28/15 17:45	1
Barium	0.0038		0.0012		mg/L		10/28/15 10:06	10/28/15 17:45	1
Beryllium	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 17:45	1
Chromium	0.0017		0.00040		mg/L		10/28/15 10:06	10/28/15 17:45	1
Cobalt	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 17:45	1
Nickel	ND		0.0030		mg/L		10/28/15 10:06	10/28/15 17:45	1
Selenium	ND		0.0010		mg/L		10/28/15 10:06	10/28/15 17:45	1
Vanadium	ND		0.0040		mg/L		10/28/15 10:06	10/28/15 17:45	1
Thallium	ND		0.0010		mg/L		10/28/15 10:06	10/28/15 17:45	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Client Sample ID: Blank
Date Collected: 10/23/15 13:15
Date Received: 10/26/15 09:45

Lab Sample ID: 590-2232-6
Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010		mg/L		10/29/15 08:20	10/30/15 14:03	1
Cadmium	ND		0.00040		mg/L		10/29/15 08:20	10/30/15 14:03	1
Copper	ND		0.0020		mg/L		10/29/15 08:20	10/30/15 14:03	1
Iron	ND		0.040		mg/L		10/29/15 08:20	10/30/15 14:03	1
Lead	ND		0.00040		mg/L		10/29/15 08:20	10/30/15 14:03	1
Manganese	ND		0.0020		mg/L		10/29/15 08:20	10/30/15 14:03	1
Zinc	ND		0.0070		mg/L		10/29/15 08:20	10/30/15 14:03	1
Silver	ND		0.00040		mg/L		10/29/15 08:20	10/30/15 14:03	1
Aluminum	ND		0.10		mg/L		10/29/15 08:20	10/30/15 14:03	1
Barium	ND		0.0012		mg/L		10/29/15 08:20	10/30/15 14:03	1
Beryllium	ND		0.00040		mg/L		10/29/15 08:20	10/30/15 14:03	1
Chromium	0.0025		0.00040		mg/L		10/29/15 08:20	10/30/15 14:03	1
Cobalt	ND		0.00040		mg/L		10/29/15 08:20	10/30/15 14:03	1
Nickel	ND		0.0030		mg/L		10/29/15 08:20	10/30/15 14:03	1
Selenium	ND		0.0010		mg/L		10/29/15 08:20	10/30/15 14:03	1
Vanadium	ND		0.0040		mg/L		10/29/15 08:20	10/30/15 14:03	1
Thallium	ND		0.0010		mg/L		10/29/15 08:20	10/30/15 14:03	1

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Method: NWTPH-HCID - Northwest - Hydrocarbon Identification (GC)

Lab Sample ID: MB 590-4207/1-A
Matrix: Water
Analysis Batch: 4202

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 4207

Analyte	MB Result	MB Qualifier	RL	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics [C6 - C10]	ND		0.25		mg/L		10/28/15 14:14	10/28/15 15:31	1
Diesel Range Organics (DRO) (C10-C25)	ND		0.63		mg/L		10/28/15 14:14	10/28/15 15:31	1
Residual Range Organics (RRO) (C25-C36)	ND		0.63		mg/L		10/28/15 14:14	10/28/15 15:31	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	86		50 - 150				10/28/15 14:14	10/28/15 15:31	1
<i>n</i> -Triacontane-d62	81		50 - 150				10/28/15 14:14	10/28/15 15:31	1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 590-4163/1011
Matrix: Water
Analysis Batch: 4163

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	ND		0.20		mg/L			10/27/15 11:22	1

Lab Sample ID: LCS 590-4163/1010
Matrix: Water
Analysis Batch: 4163

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	5.00	5.15		mg/L		103	90 - 110

Lab Sample ID: 590-2232-3 MS
Matrix: Water
Analysis Batch: 4163

Client Sample ID: MW-4
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	ND	H	4.55	4.69		mg/L		101	80 - 120

Lab Sample ID: 590-2232-3 MSD
Matrix: Water
Analysis Batch: 4163

Client Sample ID: MW-4
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate as N	ND	H	4.55	4.66		mg/L		101	80 - 120	1	12.1

Lab Sample ID: 590-2232-2 DU
Matrix: Water
Analysis Batch: 4163

Client Sample ID: MW-3R
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D		RPD	RPD Limit
Nitrate as N	ND	H		ND		mg/L			0.3	13.1

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Method: 300.0 - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 590-4164/1011
Matrix: Water
Analysis Batch: 4164

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.80		mg/L			10/27/15 11:22	1
Sulfate	ND		0.50		mg/L			10/27/15 11:22	1

Lab Sample ID: LCS 590-4164/1010
Matrix: Water
Analysis Batch: 4164

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	12.5	12.5		mg/L		100	90 - 110
Sulfate	12.5	12.6		mg/L		101	90 - 110

Lab Sample ID: 590-2232-3 MS
Matrix: Water
Analysis Batch: 4164

Client Sample ID: MW-4
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	0.88		11.4	12.0		mg/L		98	80 - 120
Sulfate	3.6		11.4	15.3		mg/L		102	80 - 120

Lab Sample ID: 590-2232-3 MSD
Matrix: Water
Analysis Batch: 4164

Client Sample ID: MW-4
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	0.88		11.4	11.9		mg/L		97	80 - 120	1	10
Sulfate	3.6		11.4	15.0		mg/L		100	80 - 120	2	10

Lab Sample ID: 590-2232-2 DU
Matrix: Water
Analysis Batch: 4164

Client Sample ID: MW-3R
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chloride	0.80		0.876		mg/L		9	18.8
Sulfate	3.3		3.62		mg/L		9	15.7

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 590-4343/2-A
Matrix: Water
Analysis Batch: 4396

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 4343

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	ND		1.0		mg/L		11/05/15 09:33	11/09/15 11:54	1
Magnesium	ND		0.50		mg/L		11/05/15 09:33	11/09/15 11:54	1
Sodium	ND		0.50		mg/L		11/05/15 09:33	11/09/15 11:54	1

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: MB 590-4343/2-A
Matrix: Water
Analysis Batch: 4397

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 4343

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil	Fac
Calcium	ND		1.0		mg/L		11/05/15 09:33	11/09/15 13:01	1	
Magnesium	ND		0.50		mg/L		11/05/15 09:33	11/09/15 13:01	1	
Potassium	ND		1.0		mg/L		11/05/15 09:33	11/09/15 13:01	1	

Lab Sample ID: LCS 590-4343/1-A
Matrix: Water
Analysis Batch: 4396

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 4343

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	10.0	10.1		mg/L		101	80 - 120
Magnesium	10.0	10.5		mg/L		105	80 - 120
Sodium	10.0	10.2		mg/L		102	80 - 154

Lab Sample ID: LCS 590-4343/1-A
Matrix: Water
Analysis Batch: 4397

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 4343

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	10.0	10.0		mg/L		100	80 - 120
Magnesium	10.0	10.1		mg/L		101	80 - 120
Potassium	10.0	10.1		mg/L		101	80 - 135

Lab Sample ID: 590-2232-2 MS
Matrix: Water
Analysis Batch: 4396

Client Sample ID: MW-3R
Prep Type: Total Recoverable
Prep Batch: 4343

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	3.2		16.7	20.7		mg/L		105	75 - 125
Magnesium	0.57		16.7	18.4		mg/L		107	75 - 125
Sodium	0.87		16.7	18.4		mg/L		105	75 - 125

Lab Sample ID: 590-2232-2 MS
Matrix: Water
Analysis Batch: 4397

Client Sample ID: MW-3R
Prep Type: Total Recoverable
Prep Batch: 4343

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	3.2		16.7	20.1		mg/L		101	75 - 125
Magnesium	0.54		16.7	17.4		mg/L		101	75 - 125
Potassium	ND		16.7	17.4		mg/L		102	75 - 125

Lab Sample ID: 590-2232-2 MSD
Matrix: Water
Analysis Batch: 4396

Client Sample ID: MW-3R
Prep Type: Total Recoverable
Prep Batch: 4343

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Calcium	3.2		16.7	20.0		mg/L		100	75 - 125	4	20
Magnesium	0.57		16.7	17.8		mg/L		104	75 - 125	3	20
Sodium	0.87		16.7	17.8		mg/L		101	75 - 125	3	20

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 590-2232-2 MSD
Matrix: Water
Analysis Batch: 4397

Client Sample ID: MW-3R
Prep Type: Total Recoverable
Prep Batch: 4343

Analyte	Sample	Sample	Spike	MSD		Unit	D	%Rec	%Rec.		RPD	Limit
	Result	Qualifier		Result	Qualifier				Limits	RPD		
Calcium	3.2		16.7	20.1		mg/L		101	75 - 125	0	20	
Magnesium	0.54		16.7	17.2		mg/L		100	75 - 125	1	20	
Potassium	ND		16.7	17.6		mg/L		103	75 - 125	1	20	

Lab Sample ID: 590-2232-1 DU
Matrix: Water
Analysis Batch: 4396

Client Sample ID: MW-2R
Prep Type: Total Recoverable
Prep Batch: 4343

Analyte	Sample	Sample	DU		Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Calcium	3.2		3.21		mg/L		0.3	20
Magnesium	0.81		0.816		mg/L		0.5	20
Sodium	1.0		0.982		mg/L		5	20

Lab Sample ID: 590-2232-1 DU
Matrix: Water
Analysis Batch: 4397

Client Sample ID: MW-2R
Prep Type: Total Recoverable
Prep Batch: 4343

Analyte	Sample	Sample	DU		Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Calcium	3.2		3.16		mg/L		1	20
Magnesium	0.78		0.762		mg/L		3	20
Potassium	ND		ND		mg/L		NC	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 580-204390/21-A
Matrix: Water
Analysis Batch: 204494

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 204390

Analyte	MB	MB	RL	MDL	Unit	D	Prepared		Analyzed		Dil Fac
	Result	Qualifier									
Arsenic	ND		0.0010		mg/L		10/28/15 10:06	10/28/15 15:42		1	
Cadmium	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 15:42		1	
Copper	ND		0.0020		mg/L		10/28/15 10:06	10/28/15 15:42		1	
Iron	ND		0.040		mg/L		10/28/15 10:06	10/28/15 15:42		1	
Lead	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 15:42		1	
Manganese	ND		0.0020		mg/L		10/28/15 10:06	10/28/15 15:42		1	
Zinc	ND		0.0070		mg/L		10/28/15 10:06	10/28/15 15:42		1	
Silver	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 15:42		1	
Aluminum	ND		0.10		mg/L		10/28/15 10:06	10/28/15 15:42		1	
Barium	ND		0.0012		mg/L		10/28/15 10:06	10/28/15 15:42		1	
Beryllium	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 15:42		1	
Chromium	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 15:42		1	
Cobalt	ND		0.00040		mg/L		10/28/15 10:06	10/28/15 15:42		1	
Nickel	ND		0.0030		mg/L		10/28/15 10:06	10/28/15 15:42		1	
Selenium	ND		0.0010		mg/L		10/28/15 10:06	10/28/15 15:42		1	
Vanadium	ND		0.0040		mg/L		10/28/15 10:06	10/28/15 15:42		1	
Thallium	ND		0.0010		mg/L		10/28/15 10:06	10/28/15 15:42		1	

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 580-204390/22-A
Matrix: Water
Analysis Batch: 204494

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 204390

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	4.00	4.01		mg/L		100	80 - 120
Cadmium	0.100	0.103		mg/L		103	80 - 120
Copper	0.500	0.496		mg/L		99	80 - 120
Iron	22.0	21.6		mg/L		98	80 - 120
Lead	1.00	1.05		mg/L		105	80 - 120
Manganese	1.00	0.983		mg/L		98	80 - 120
Zinc	4.00	3.94		mg/L		99	80 - 120
Silver	0.600	0.543		mg/L		91	80 - 120
Aluminum	10.0	9.77		mg/L		98	80 - 120
Barium	4.00	4.07		mg/L		102	80 - 120
Beryllium	0.100	0.0946		mg/L		95	80 - 120
Chromium	0.400	0.385		mg/L		96	80 - 120
Cobalt	1.00	0.956		mg/L		96	80 - 120
Nickel	1.00	0.999		mg/L		100	80 - 120
Selenium	4.00	4.00		mg/L		100	80 - 120
Vanadium	1.00	0.967		mg/L		97	80 - 120
Thallium	4.00	4.11		mg/L		103	80 - 120

Lab Sample ID: LCSD 580-204390/23-A
Matrix: Water
Analysis Batch: 204494

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 204390

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Arsenic	4.00	4.06		mg/L		101	80 - 120	1	20
Cadmium	0.100	0.103		mg/L		103	80 - 120	0	20
Copper	0.500	0.504		mg/L		101	80 - 120	2	20
Iron	22.0	21.5		mg/L		98	80 - 120	0	20
Lead	1.00	1.05		mg/L		105	80 - 120	1	20
Manganese	1.00	0.989		mg/L		99	80 - 120	1	20
Zinc	4.00	4.00		mg/L		100	80 - 120	1	20
Silver	0.600	0.546		mg/L		91	80 - 120	0	20
Aluminum	10.0	9.84		mg/L		98	80 - 120	1	20
Barium	4.00	4.11		mg/L		103	80 - 120	1	20
Beryllium	0.100	0.0999		mg/L		100	80 - 120	5	20
Chromium	0.400	0.394		mg/L		99	80 - 120	2	20
Cobalt	1.00	0.970		mg/L		97	80 - 120	1	20
Nickel	1.00	1.01		mg/L		101	80 - 120	1	20
Selenium	4.00	4.06		mg/L		102	80 - 120	1	20
Vanadium	1.00	0.978		mg/L		98	80 - 120	1	20
Thallium	4.00	4.11		mg/L		103	80 - 120	0	20

Lab Sample ID: LCSSRM 580-204390/24-A
Matrix: Water
Analysis Batch: 204494

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 204390

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	Limits
Arsenic	4.00	4.04		mg/L		101	80 - 120
Cadmium	0.100	0.100		mg/L		100	80 - 120

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSSRM 580-204390/24-A
Matrix: Water
Analysis Batch: 204494

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 204390

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits
Copper	0.500	0.505		mg/L		101	80 - 120
Iron	22.0	21.6		mg/L		98	80 - 120
Lead	1.00	1.05		mg/L		105	80 - 120
Manganese	1.00	0.991		mg/L		99	80 - 120
Zinc	4.00	3.97		mg/L		99	80 - 120
Silver	0.600	0.549		mg/L		92	80 - 120
Aluminum	10.0	9.90		mg/L		99	80 - 120
Barium	4.00	4.17		mg/L		104	80 - 120
Beryllium	0.100	0.0978		mg/L		98	80 - 120
Chromium	0.400	0.392		mg/L		98	80 - 120
Cobalt	1.00	0.965		mg/L		96	80 - 120
Nickel	1.00	1.02		mg/L		102	80 - 120
Selenium	4.00	4.08		mg/L		102	80 - 120
Vanadium	1.00	0.984		mg/L		98	80 - 120
Thallium	4.00	4.10		mg/L		102	80 - 120

Lab Sample ID: MB 580-204475/21-A
Matrix: Water
Analysis Batch: 204684

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 204475

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010		mg/L		10/29/15 08:20	10/30/15 13:13	1
Cadmium	ND		0.00040		mg/L		10/29/15 08:20	10/30/15 13:13	1
Copper	ND		0.0020		mg/L		10/29/15 08:20	10/30/15 13:13	1
Iron	ND		0.040		mg/L		10/29/15 08:20	10/30/15 13:13	1
Lead	ND		0.00040		mg/L		10/29/15 08:20	10/30/15 13:13	1
Manganese	ND		0.0020		mg/L		10/29/15 08:20	10/30/15 13:13	1
Zinc	ND		0.0070		mg/L		10/29/15 08:20	10/30/15 13:13	1
Silver	ND		0.00040		mg/L		10/29/15 08:20	10/30/15 13:13	1
Aluminum	ND		0.10		mg/L		10/29/15 08:20	10/30/15 13:13	1
Barium	ND		0.0012		mg/L		10/29/15 08:20	10/30/15 13:13	1
Beryllium	ND		0.00040		mg/L		10/29/15 08:20	10/30/15 13:13	1
Chromium	ND		0.00040		mg/L		10/29/15 08:20	10/30/15 13:13	1
Cobalt	ND		0.00040		mg/L		10/29/15 08:20	10/30/15 13:13	1
Nickel	ND		0.0030		mg/L		10/29/15 08:20	10/30/15 13:13	1
Selenium	ND		0.0010		mg/L		10/29/15 08:20	10/30/15 13:13	1
Vanadium	ND		0.0040		mg/L		10/29/15 08:20	10/30/15 13:13	1
Thallium	ND		0.0010		mg/L		10/29/15 08:20	10/30/15 13:13	1

Lab Sample ID: LCS 580-204475/22-A
Matrix: Water
Analysis Batch: 204684

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 204475

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	4.00	4.14		mg/L		104	80 - 120
Cadmium	0.100	0.106		mg/L		106	80 - 120
Copper	0.500	0.522		mg/L		104	80 - 120
Iron	22.0	23.1		mg/L		105	80 - 120
Lead	1.00	1.08		mg/L		108	80 - 120

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 580-204475/22-A
Matrix: Water
Analysis Batch: 204684

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 204475

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Manganese	1.00	1.02		mg/L		102	80 - 120
Zinc	4.00	4.03		mg/L		101	80 - 120
Silver	0.600	0.572		mg/L		95	80 - 120
Aluminum	10.0	10.0		mg/L		100	80 - 120
Barium	4.00	4.30		mg/L		108	80 - 120
Beryllium	0.100	0.104		mg/L		104	80 - 120
Chromium	0.400	0.419		mg/L		105	80 - 120
Cobalt	1.00	1.01		mg/L		101	80 - 120
Nickel	1.00	1.02		mg/L		102	80 - 120
Selenium	4.00	4.24		mg/L		106	80 - 120
Vanadium	1.00	1.02		mg/L		102	80 - 120
Thallium	4.00	4.43		mg/L		111	80 - 120

Lab Sample ID: LCSD 580-204475/23-A
Matrix: Water
Analysis Batch: 204684

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 204475

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Arsenic	4.00	4.11		mg/L		103	80 - 120	1	20
Cadmium	0.100	0.106		mg/L		106	80 - 120	1	20
Copper	0.500	0.525		mg/L		105	80 - 120	0	20
Iron	22.0	22.8		mg/L		104	80 - 120	1	20
Lead	1.00	1.08		mg/L		108	80 - 120	1	20
Manganese	1.00	1.01		mg/L		101	80 - 120	0	20
Zinc	4.00	4.13		mg/L		103	80 - 120	2	20
Silver	0.600	0.560		mg/L		93	80 - 120	2	20
Aluminum	10.0	10.0		mg/L		100	80 - 120	0	20
Barium	4.00	4.23		mg/L		106	80 - 120	2	20
Beryllium	0.100	0.102		mg/L		102	80 - 120	2	20
Chromium	0.400	0.413		mg/L		103	80 - 120	1	20
Cobalt	1.00	0.999		mg/L		100	80 - 120	1	20
Nickel	1.00	1.02		mg/L		102	80 - 120	0	20
Selenium	4.00	4.25		mg/L		106	80 - 120	0	20
Vanadium	1.00	1.01		mg/L		101	80 - 120	1	20
Thallium	4.00	4.44		mg/L		111	80 - 120	0	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 580-204404/17-A
Matrix: Water
Analysis Batch: 204474

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 204404

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020		mg/L		10/28/15 11:28	10/28/15 15:22	1

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 580-204404/18-A
Matrix: Water
Analysis Batch: 204474

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 204404

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00200	0.00195		mg/L		97	80 - 120

Lab Sample ID: LCSD 580-204404/19-A
Matrix: Water
Analysis Batch: 204474

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 204404

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Mercury	0.00200	0.00186		mg/L		93	80 - 120	4	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 590-4184/1
Matrix: Water
Analysis Batch: 4184

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	ND		4.0		mg/L			10/28/15 09:12	1
Carbonate Alkalinity as CaCO3	ND		4.0		mg/L			10/28/15 09:12	1

Lab Sample ID: LCS 590-4184/2
Matrix: Water
Analysis Batch: 4184

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Bicarbonate Alkalinity as CaCO3	500	475		mg/L		95	90 - 110

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 590-4342/1
Matrix: Water
Analysis Batch: 4342

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.030		SU		100	98.6 - 101.4

Lab Chronicle

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Client Sample ID: MW-2R

Date Collected: 10/21/15 11:00

Date Received: 10/26/15 09:45

Lab Sample ID: 590-2232-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			125.7 mL	2 mL	4207	10/28/15 14:14	IAB	TAL SPK
Total/NA	Analysis	NWTPH-HCID		1	125.7 mL	2 mL	4202	10/28/15 15:49	NMI	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		4163	10/27/15 09:44	MRS	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		4164	10/27/15 09:44	MRS	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	4343	11/05/15 09:33	JSP	TAL SPK
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	4396	11/09/15 11:57	JSP	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	4343	11/05/15 09:33	JSP	TAL SPK
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	4397	11/09/15 13:04	JSP	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	204390	10/28/15 10:05	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	204494	10/28/15 17:27	FCW	TAL SEA
Total/NA	Prep	7470A			50 mL	50 mL	204404	10/28/15 11:28	MKN	TAL SEA
Total/NA	Analysis	7470A		1	50 mL	50 mL	204474	10/28/15 15:52	FCW	TAL SEA
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	4184	10/28/15 09:12	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	4342	11/05/15 09:27	JSP	TAL SPK

Client Sample ID: MW-3R

Date Collected: 10/21/15 12:15

Date Received: 10/26/15 09:45

Lab Sample ID: 590-2232-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			123.6 mL	2 mL	4207	10/28/15 14:14	IAB	TAL SPK
Total/NA	Analysis	NWTPH-HCID		1	123.6 mL	2 mL	4202	10/28/15 16:07	NMI	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		4163	10/27/15 09:58	MRS	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		4164	10/27/15 09:58	MRS	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	4343	11/05/15 09:33	JSP	TAL SPK
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	4396	11/09/15 12:01	JSP	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	4343	11/05/15 09:33	JSP	TAL SPK
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	4397	11/09/15 13:08	JSP	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	204390	10/28/15 10:05	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	204494	10/28/15 17:31	FCW	TAL SEA
Total/NA	Prep	7470A			50 mL	50 mL	204404	10/28/15 11:28	MKN	TAL SEA
Total/NA	Analysis	7470A		1	50 mL	50 mL	204474	10/28/15 15:54	FCW	TAL SEA
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	4184	10/28/15 09:12	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	4342	11/05/15 09:27	JSP	TAL SPK

Client Sample ID: MW-4

Date Collected: 10/22/15 16:20

Date Received: 10/26/15 09:45

Lab Sample ID: 590-2232-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			127.2 mL	2 mL	4207	10/28/15 14:14	IAB	TAL SPK
Total/NA	Analysis	NWTPH-HCID		1	127.2 mL	2 mL	4202	10/28/15 16:24	NMI	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Client Sample ID: MW-4

Date Collected: 10/22/15 16:20

Date Received: 10/26/15 09:45

Lab Sample ID: 590-2232-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	5 mL		4163	10/27/15 10:26	MRS	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		4164	10/27/15 10:26	MRS	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	4343	11/05/15 09:33	JSP	TAL SPK
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	4396	11/09/15 12:08	JSP	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	4343	11/05/15 09:33	JSP	TAL SPK
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	4397	11/09/15 13:15	JSP	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	204390	10/28/15 10:06	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	204494	10/28/15 17:36	FCW	TAL SEA
Total/NA	Prep	7470A			50 mL	50 mL	204404	10/28/15 11:28	MKN	TAL SEA
Total/NA	Analysis	7470A		1	50 mL	50 mL	204474	10/28/15 15:57	FCW	TAL SEA
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	4184	10/28/15 09:12	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	4342	11/05/15 09:27	JSP	TAL SPK

Client Sample ID: MW-5

Date Collected: 10/23/15 11:25

Date Received: 10/26/15 09:45

Lab Sample ID: 590-2232-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			126.5 mL	2 mL	4207	10/28/15 14:14	IAB	TAL SPK
Total/NA	Analysis	NWTPH-HCID		1	126.5 mL	2 mL	4202	10/28/15 16:42	NMI	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		4163	10/27/15 10:54	MRS	TAL SPK
Total/NA	Analysis	300.0		1	5 mL		4164	10/27/15 10:54	MRS	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	4343	11/05/15 09:33	JSP	TAL SPK
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	4396	11/09/15 12:13	JSP	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	4343	11/05/15 09:33	JSP	TAL SPK
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	4397	11/09/15 13:19	JSP	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	204390	10/28/15 10:06	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	204494	10/28/15 17:40	FCW	TAL SEA
Total/NA	Prep	7470A			50 mL	50 mL	204404	10/28/15 11:28	MKN	TAL SEA
Total/NA	Analysis	7470A		1	50 mL	50 mL	204474	10/28/15 15:59	FCW	TAL SEA
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	4184	10/28/15 09:12	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	4342	11/05/15 09:27	JSP	TAL SPK

Client Sample ID: MW-Duplicate

Date Collected: 10/21/15 00:00

Date Received: 10/26/15 09:45

Lab Sample ID: 590-2232-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	204390	10/28/15 10:06	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	204494	10/28/15 17:45	FCW	TAL SEA

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Client Sample ID: Blank

Date Collected: 10/23/15 13:15

Date Received: 10/26/15 09:45

Lab Sample ID: 590-2232-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	204475	10/29/15 08:20	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	204684	10/30/15 14:03	FCW	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Certification Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Laboratory: TestAmerica Spokane

The certifications listed below are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C569	01-06-16

Laboratory: TestAmerica Seattle

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska (UST)	State Program	10	UST-022	03-02-16
California	State Program	9	2901	01-31-17
L-A-B	DoD ELAP		L2236	01-19-16
L-A-B	ISO/IEC 17025		L2236	01-19-16
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-06-16
US Fish & Wildlife	Federal		LE058448-0	02-28-16
USDA	Federal		P330-14-00126	04-08-17
Washington	State Program	10	C553	02-17-16

Method Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2232-1

Method	Method Description	Protocol	Laboratory
NWTPH-HCID	Northwest - Hydrocarbon Identification (GC)	NWTPH	TAL SPK
300.0	Anions, Ion Chromatography	MCAWW	TAL SPK
6010C	Metals (ICP)	SW846	TAL SPK
6020A	Metals (ICP/MS)	SW846	TAL SEA
7470A	Mercury (CVAA)	SW846	TAL SEA
SM 2320B	Alkalinity	SM	TAL SPK
SM 4500 H+ B	pH	SM	TAL SPK

Protocol References:

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

NWTPH = Northwest Total Petroleum Hydrocarbon

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Spokane, WA 99206
phone 509.924.9200 fax

11922 E. 1st Ave.

Regulatory Program: DW NPDES RCRA Other:

COC No: _____ of _____ COCs

Client Contact

Project Manager: Ryan Tobias

Site Contact: BJ Kronschnabel

Date: _____

Sampler: _____
For Lab Use Only:
Walk-in Client
Lab Sampling:
Job / SDG No.:

Tell/Fax: (503) 931-3157

Lab Contact: Rande Arrington

Carrier: _____

Analysis Turnaround Time

Carrier: _____

CALENDAR DAYS WORKING DAYS

Carrier: _____

TAT if different from Below

Carrier: _____

2 weeks

Carrier: _____

1 week

Carrier: _____

2 days

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Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013

Non-hazard Flammable Skin Irritant Poison B Unknown
 Return to Client Disposal by Lab Archive for _____ Months

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other _____
 Possible Hazard Identification: _____
 Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Sample Identification	Sample Date	Sample Time	Sample Type (G-Comp, G-Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Hg CVAA - 7471B	Ag, Al, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Mn, Ni, Pb, Se, Th, V, Zn - 6020A	NWTPH-HCID	Ca, Mg, K, Na	Cl, CO3, HCO3, NO3, SO4	H
MW-2R	10/21/15	1100	G	W	5			X	Y	Y	X	X	X
MW-3R	10/21/15	1215						X	Y	X	X	X	X
MW-4	10/22/15	1620						X	X	X	X	X	X
MW-5	10/23/15	1125						X	X	X	X	X	X
MW-Duplicate	10/23/15	-						X	X	X	X	X	X
Blank	10/23/15	1315						X	X	X	X	X	X

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

590-2232 Chain of Custody

Barcode: _____

Sample Specific Notes:
 Please analyze AS at lowest achievable MOL/RL.

Custody Seals Intact: Yes No
 Relinquished by: _____
 Relinquished by: _____
 Relinquished by: _____

Custody Seal No.: _____
 Company: _____
 Date/Time: _____
 Date/Time: _____
 Date/Time: _____

Cooler Temp. (°C): Obs'd: 3.8 Cor'd: 3.4 Therm ID No.: 41001
 Received by: _____
 Received by: _____
 Received by: _____

Company: _____
 Company: _____
 Company: _____

Date/Time: _____
 Date/Time: _____
 Date/Time: _____

TestAmerica Spokane
 11922 East 1st Ave
 Spokane, WA 99206
 Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)		Lab Pmt: Arrington, Randee E		Carrier Tracking No(s):							
Client Contact: Shipping/Receiving		E-Mail: randee.arrington@testamericainc.com		COC No: 590-961.1							
Company: TestAmerica Laboratories, Inc.		Analysis Requested		Job #: 590-2232-1							
Address: 5755 8th Street East, Tacoma WA, 98424		Due Date Requested: 11/5/2015		Preservation Codes:							
State, Zip: WA, 98424		TAT Requested (days):		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:							
Phone: 253-922-2310 (Tel) 253-922-5047 (Fax)		PO #:		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - ph 4-5 X - EDTA Z - other (specify)							
Email:		WO #:		Total Number of Containers							
Project Name: Monte Cristo Post-Removal Action Monitor		Project #: 59000677		Special Instructions/Note:							
Site:		SSON#:									
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=water/soil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9020A_LL/3005A (MOD) Template for building analyte list	7470A/7470A Prep Mercury	Total Number of Containers		
MW-2R (590-2232-1)	10/21/15	11:00 Pacific	Water	Water	X	X	X	X	1		
MW-3R (590-2232-2)	10/21/15	12:15 Pacific	Water	Water	X	X	X	X	1		
MW-4 (590-2232-3)	10/22/15	16:20 Pacific	Water	Water	X	X	X	X	1		
MW-5 (590-2232-4)	10/23/15	11:25 Pacific	Water	Water	X	X	X	X	1		
MW-Duplicate (590-2232-5)	10/21/15	Pacific	Water	Water	X	X	X	X	1		
Blank (590-2232-6)	10/23/15	13:15 Pacific	Water	Water	X	X	X	X	1		
<p>Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify)</p> <p>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months</p> <p>Special Instructions/QC Requirements:</p>											
Relinquished by: <i>Shirley Gray</i>		Date: 10/26/15 14:10		Company: TA Dept		Received by: <i>D Vance</i>		Date/Time: 10/27/15 1000		Company: TA Sea	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: <i>R#2=0.9/0.4</i>		Method of Shipment:		Date/Time:		Company:	

Login Sample Receipt Checklist

Client: Cascade Earth Sciences Inc.

Job Number: 590-2232-1

Login Number: 2232

List Number: 1

Creator: Kratz, Sheila J

List Source: TestAmerica Spokane

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	False	Refer to Job Narrative for details.
Sample containers have legible labels.	False	Refer to Job Narrative for details.
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	False	Sample splitting required for subcontract purposes.
Residual Chlorine Checked.	N/A	



Login Sample Receipt Checklist

Client: Cascade Earth Sciences Inc.

Job Number: 590-2232-1

Login Number: 2232

List Number: 2

Creator: Blankinship, Tom X

List Source: TestAmerica Seattle

List Creation: 10/27/15 04:31 PM

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	Thermal preservation not required.
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.9°C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Spokane

11922 East 1st Ave

Spokane, WA 99206

Tel: (509)924-9200

TestAmerica Job ID: 590-2117-1

Client Project/Site: Monte Cristo Post-Removal Action Monitor

Revision: 1

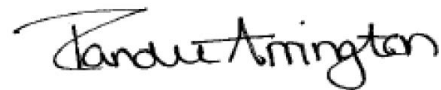
For:

Cascade Earth Sciences Inc.

12720 E Nora Ave

Spokane, Washington 99216

Attn: Bernard Kronschnabel



Authorized for release by:

2/16/2016 1:44:30 PM

Randee Arrington, Project Manager II

(509)924-9200

randee.arrington@testamericainc.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Job ID: 590-2117-1

Laboratory: TestAmerica Spokane

Narrative

Revision

Data was re-evaluated down to the MDL per the client's request.

Receipt

The samples were received on 10/7/2015 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.0° C.

GC Semi VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry

Method SM 2320B: The following samples were prepared outside of preparation holding time due to employee oversight : MCPRA-DW-BA-01 (590-2117-1) and MCPRA-DW-RY-01 (590-2117-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-2117-1	MCPRA-DW-BA-01	Water	10/04/15 16:30	10/07/15 09:50
590-2117-2	MCPRA-DW-RY-01	Water	10/04/15 15:25	10/07/15 09:50
590-2117-3	MCPRA-SW-76G-02	Water	10/05/15 08:30	10/07/15 09:50
590-2117-4	MCPRA-SW-76G-01B	Water	10/05/15 09:30	10/07/15 09:50
590-2117-5	MCPRA-DW-SH-01	Water	10/05/15 10:20	10/07/15 09:50
590-2117-6	MCPRA-DW-MY-01	Water	10/05/15 15:20	10/07/15 09:50
590-2117-7	MCPRA-SW-GC-05	Water	10/05/15 16:40	10/07/15 09:50
590-2117-8	MCPRA-SW-DP-01	Water	10/05/15 15:25	10/07/15 09:50
590-2117-9	MCPRA-SS-76G-02	Solid	10/05/15 08:35	10/07/15 09:50
590-2117-10	MCPRA-SS-76G-01B	Solid	10/05/15 09:35	10/07/15 09:50
590-2117-11	MCPRA-SS-76G-01A	Solid	10/05/15 10:55	10/07/15 09:50
590-2117-12	MCPRA-SS-76G-01	Solid	10/05/15 11:25	10/07/15 09:50
590-2117-13	MCPRA-SS-GC-05	Solid	10/05/15 16:45	10/07/15 09:50

Definitions/Glossary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
H	Sample was prepped or analyzed beyond the specified holding time
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL. The data are considered valid because the absolute difference is less than the RL.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Client Sample ID: MCPRA-DW-BA-01

Lab Sample ID: 590-2117-1

Date Collected: 10/04/15 16:30

Matrix: Water

Date Received: 10/07/15 09:50

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.0		0.80	0.15	mg/L			10/07/15 13:01	1
Sulfate	220		5.0	1.3	mg/L			10/07/15 14:40	10

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	86		1.0	0.022	mg/L		10/16/15 16:57	10/19/15 14:27	1
Magnesium	2.8		0.50	0.0056	mg/L		10/16/15 16:57	10/19/15 14:27	1
Potassium	0.97	J	1.0	0.13	mg/L		10/16/15 16:57	10/19/15 14:27	1
Sodium	20		0.50	0.021	mg/L		10/16/15 16:57	10/19/15 14:27	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.014		0.0010	0.00027	mg/L		10/15/15 10:10	10/15/15 19:14	1
Antimony	0.00082		0.00040	0.000080	mg/L		10/15/15 10:10	10/15/15 19:14	1
Cadmium	0.000034	J	0.00040	0.000028	mg/L		10/15/15 10:10	10/15/15 19:14	1
Copper	ND		0.0020	0.00060	mg/L		10/15/15 10:10	10/15/15 19:14	1
Iron	0.057		0.040	0.0058	mg/L		10/15/15 10:10	10/15/15 19:14	1
Lead	ND		0.00040	0.000034	mg/L		10/15/15 10:10	10/15/15 19:14	1
Manganese	0.0044		0.0020	0.00035	mg/L		10/15/15 10:10	10/15/15 19:14	1
Zinc	0.0046	J	0.0070	0.0019	mg/L		10/15/15 10:10	10/15/15 19:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acidity as CaCO3	ND		20	10	mg/L			10/17/15 14:42	1
Alkalinity	65	H	4.0	1.7	mg/L			10/19/15 08:08	1
Total Dissolved Solids	380		25	13	mg/L			10/09/15 06:27	1
Total Suspended Solids	ND		10	4.0	mg/L			10/09/15 06:31	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	250		20	20	mg/L			10/15/15 11:15	1
pH	7.80	HF	0.100	0.100	SU			10/12/15 09:34	1

Client Sample ID: MCPRA-DW-RY-01

Lab Sample ID: 590-2117-2

Date Collected: 10/04/15 15:25

Matrix: Water

Date Received: 10/07/15 09:50

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.62	J	0.80	0.15	mg/L			10/07/15 13:16	1
Sulfate	7.1		0.50	0.13	mg/L			10/07/15 13:16	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	5.1		1.0	0.022	mg/L		10/16/15 16:57	10/19/15 13:53	1
Magnesium	1.0		0.50	0.0056	mg/L		10/16/15 16:57	10/19/15 13:53	1
Potassium	0.39	J	1.0	0.13	mg/L		10/16/15 16:57	10/19/15 13:53	1
Sodium	1.4		0.50	0.021	mg/L		10/16/15 16:57	10/19/15 13:53	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.052		0.0010	0.00027	mg/L		10/15/15 10:10	10/15/15 19:18	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Client Sample ID: MCPRA-DW-RY-01

Lab Sample ID: 590-2117-2

Date Collected: 10/04/15 15:25

Matrix: Water

Date Received: 10/07/15 09:50

Method: 6020A - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00068		0.00040	0.000080	mg/L		10/15/15 10:10	10/15/15 19:18	1
Cadmium	0.000075	J	0.00040	0.000028	mg/L		10/15/15 10:10	10/15/15 19:18	1
Copper	0.0039		0.0020	0.00060	mg/L		10/15/15 10:10	10/15/15 19:18	1
Iron	0.41		0.040	0.0058	mg/L		10/15/15 10:10	10/15/15 19:18	1
Lead	0.0055		0.00040	0.000034	mg/L		10/15/15 10:10	10/15/15 19:18	1
Manganese	0.018		0.0020	0.00035	mg/L		10/15/15 10:10	10/15/15 19:18	1
Zinc	0.014		0.0070	0.0019	mg/L		10/15/15 10:10	10/15/15 19:18	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acidity as CaCO3	ND		20	10	mg/L			10/17/15 14:49	1
Alkalinity	14	H	5.8	2.4	mg/L			10/19/15 08:08	1
Total Dissolved Solids	68		25	13	mg/L			10/09/15 06:27	1
Total Suspended Solids	23		10	4.0	mg/L			10/09/15 06:31	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	19		2.0	2.0	mg/L			10/15/15 11:15	1
pH	7.05	HF	0.100	0.100	SU			10/12/15 09:34	1

Client Sample ID: MCPRA-SW-76G-02

Lab Sample ID: 590-2117-3

Date Collected: 10/05/15 08:30

Matrix: Water

Date Received: 10/07/15 09:50

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.013		0.0010	0.00027	mg/L		10/15/15 10:10	10/15/15 19:22	1
Antimony	0.0020		0.00040	0.000080	mg/L		10/15/15 10:10	10/15/15 19:22	1
Cadmium	0.000051	J	0.00040	0.000028	mg/L		10/15/15 10:10	10/15/15 19:22	1
Copper	ND		0.0020	0.00060	mg/L		10/15/15 10:10	10/15/15 19:22	1
Iron	0.015	J	0.040	0.0058	mg/L		10/15/15 10:10	10/15/15 19:22	1
Lead	0.000075	J	0.00040	0.000034	mg/L		10/15/15 10:10	10/15/15 19:22	1
Manganese	0.00066	J	0.0020	0.00035	mg/L		10/15/15 10:10	10/15/15 19:22	1
Zinc	0.0029	J	0.0070	0.0019	mg/L		10/15/15 10:10	10/15/15 19:22	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	32		25	13	mg/L			10/09/15 06:27	1
Total Suspended Solids	ND		10	4.0	mg/L			10/09/15 06:31	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	12		2.0	2.0	mg/L			10/15/15 11:15	1
pH	7.18	HF	0.100	0.100	SU			10/12/15 09:34	1

Client Sample ID: MCPRA-SW-76G-01B

Lab Sample ID: 590-2117-4

Date Collected: 10/05/15 09:30

Matrix: Water

Date Received: 10/07/15 09:50

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.011		0.0010	0.00027	mg/L		10/15/15 10:10	10/15/15 19:26	1
Antimony	0.0020		0.00040	0.000080	mg/L		10/15/15 10:10	10/15/15 19:26	1
Cadmium	0.000052	J	0.00040	0.000028	mg/L		10/15/15 10:10	10/15/15 19:26	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Client Sample ID: MCPRA-SW-76G-01B

Date Collected: 10/05/15 09:30

Date Received: 10/07/15 09:50

Lab Sample ID: 590-2117-4

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Copper	ND		0.0020	0.00060	mg/L		10/15/15 10:10	10/15/15 19:26	1
Iron	0.016	J	0.040	0.0058	mg/L		10/15/15 10:10	10/15/15 19:26	1
Lead	0.00015	J	0.00040	0.000034	mg/L		10/15/15 10:10	10/15/15 19:26	1
Manganese	0.0023		0.0020	0.00035	mg/L		10/15/15 10:10	10/15/15 19:26	1
Zinc	0.0032	J	0.0070	0.0019	mg/L		10/15/15 10:10	10/15/15 19:26	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	31		25	13	mg/L			10/09/15 06:27	1
Total Suspended Solids	ND		10	4.0	mg/L			10/09/15 06:31	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	12		2.0	2.0	mg/L			10/15/15 11:15	1
pH	7.21	HF	0.100	0.100	SU			10/12/15 09:34	1

Client Sample ID: MCPRA-DW-SH-01

Date Collected: 10/05/15 10:20

Date Received: 10/07/15 09:50

Lab Sample ID: 590-2117-5

Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.44	J	0.80	0.15	mg/L			10/07/15 13:30	1
Sulfate	14		0.50	0.13	mg/L			10/07/15 13:30	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	6.6		1.0	0.022	mg/L		10/16/15 16:57	10/19/15 13:59	1
Magnesium	1.2		0.50	0.0056	mg/L		10/16/15 16:57	10/19/15 13:59	1
Potassium	0.16	J	1.0	0.13	mg/L		10/16/15 16:57	10/19/15 13:59	1
Sodium	3.1		0.50	0.021	mg/L		10/16/15 16:57	10/19/15 13:59	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.031		0.0010	0.00027	mg/L		10/15/15 10:10	10/15/15 19:31	1
Antimony	0.00024	J	0.00040	0.000080	mg/L		10/15/15 10:10	10/15/15 19:31	1
Cadmium	0.000062	J	0.00040	0.000028	mg/L		10/15/15 10:10	10/15/15 19:31	1
Copper	ND		0.0020	0.00060	mg/L		10/15/15 10:10	10/15/15 19:31	1
Iron	0.13		0.040	0.0058	mg/L		10/15/15 10:10	10/15/15 19:31	1
Lead	0.00014	J	0.00040	0.000034	mg/L		10/15/15 10:10	10/15/15 19:31	1
Manganese	0.018		0.0020	0.00035	mg/L		10/15/15 10:10	10/15/15 19:31	1
Zinc	0.013		0.0070	0.0019	mg/L		10/15/15 10:10	10/15/15 19:31	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acidity as CaCO3	ND		20	10	mg/L			10/17/15 14:52	1
Alkalinity	20		4.0	1.7	mg/L			10/19/15 08:08	1
Total Dissolved Solids	49		25	13	mg/L			10/09/15 06:27	1
Total Suspended Solids	9.0	J	10	4.0	mg/L			10/09/15 06:31	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	20		2.0	2.0	mg/L			10/15/15 11:15	1
pH	7.34	HF	0.100	0.100	SU			10/12/15 09:34	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Client Sample ID: MCPRA-DW-MY-01

Lab Sample ID: 590-2117-6

Date Collected: 10/05/15 15:20

Matrix: Water

Date Received: 10/07/15 09:50

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.5		0.80	0.15	mg/L			10/07/15 13:44	1
Sulfate	300		5.0	1.3	mg/L			10/07/15 14:54	10

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	55		1.0	0.022	mg/L		10/16/15 16:57	10/19/15 14:04	1
Magnesium	20		0.50	0.0056	mg/L		10/16/15 16:57	10/19/15 14:04	1
Potassium	1.0		1.0	0.13	mg/L		10/16/15 16:57	10/19/15 14:04	1
Sodium	2.9		0.50	0.021	mg/L		10/16/15 16:57	10/19/15 14:04	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.1		0.0010	0.00027	mg/L		10/15/15 10:10	10/15/15 19:35	1
Antimony	0.026		0.00040	0.000080	mg/L		10/15/15 10:10	10/15/15 19:35	1
Cadmium	0.026		0.00040	0.000028	mg/L		10/15/15 10:10	10/15/15 19:35	1
Copper	0.49		0.0020	0.00060	mg/L		10/15/15 10:10	10/15/15 19:35	1
Iron	12		0.040	0.0058	mg/L		10/15/15 10:10	10/15/15 19:35	1
Lead	0.035		0.00040	0.000034	mg/L		10/15/15 10:10	10/15/15 19:35	1
Manganese	2.9		0.0020	0.00035	mg/L		10/15/15 10:10	10/15/15 19:35	1
Zinc	4.9		0.0070	0.0019	mg/L		10/15/15 10:10	10/15/15 19:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acidity as CaCO3	29		20	10	mg/L			10/17/15 14:56	1
Alkalinity	ND		4.0	1.7	mg/L			10/19/15 08:08	1
Total Dissolved Solids	370		25	13	mg/L			10/09/15 06:27	1
Total Suspended Solids	30		10	4.0	mg/L			10/09/15 06:31	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	240		10	10	mg/L			10/15/15 11:15	1
pH	3.84	HF	0.100	0.100	SU			10/12/15 09:34	1

Client Sample ID: MCPRA-SW-GC-05

Lab Sample ID: 590-2117-7

Date Collected: 10/05/15 16:40

Matrix: Water

Date Received: 10/07/15 09:50

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.011		0.0010	0.00027	mg/L		10/15/15 10:10	10/15/15 19:39	1
Antimony	0.0018		0.00040	0.000080	mg/L		10/15/15 10:10	10/15/15 19:39	1
Cadmium	0.000074	J	0.00040	0.000028	mg/L		10/15/15 10:10	10/15/15 19:39	1
Copper	ND		0.0020	0.00060	mg/L		10/15/15 10:10	10/15/15 19:39	1
Iron	0.015	J	0.040	0.0058	mg/L		10/15/15 10:10	10/15/15 19:39	1
Lead	0.000039	J	0.00040	0.000034	mg/L		10/15/15 10:10	10/15/15 19:39	1
Manganese	0.00079	J	0.0020	0.00035	mg/L		10/15/15 10:10	10/15/15 19:39	1
Zinc	0.0075		0.0070	0.0019	mg/L		10/15/15 10:10	10/15/15 19:39	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	24	J	25	13	mg/L			10/09/15 06:27	1
Total Suspended Solids	ND		10	4.0	mg/L			10/09/15 06:31	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Client Sample ID: MCPRA-SW-GC-05

Date Collected: 10/05/15 16:40

Date Received: 10/07/15 09:50

Lab Sample ID: 590-2117-7

Matrix: Water

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	390		4.0	4.0	mg/L			10/15/15 12:15	1
pH	6.54	HF	0.100	0.100	SU			10/12/15 09:34	1

Client Sample ID: MCPRA-SW-DP-01

Date Collected: 10/05/15 15:25

Date Received: 10/07/15 09:50

Lab Sample ID: 590-2117-8

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	1.3		0.0010	0.00027	mg/L		10/15/15 10:10	10/15/15 19:43	1
Antimony	0.030		0.00040	0.000080	mg/L		10/15/15 10:10	10/15/15 19:43	1
Cadmium	0.028		0.00040	0.000028	mg/L		10/15/15 10:10	10/15/15 19:43	1
Copper	0.52		0.0020	0.00060	mg/L		10/15/15 10:10	10/15/15 19:43	1
Iron	14		0.040	0.0058	mg/L		10/15/15 10:10	10/15/15 19:43	1
Lead	0.039		0.00040	0.000034	mg/L		10/15/15 10:10	10/15/15 19:43	1
Manganese	3.1		0.0020	0.00035	mg/L		10/15/15 10:10	10/15/15 19:43	1
Zinc	5.3		0.0070	0.0019	mg/L		10/15/15 10:10	10/15/15 19:43	1

Client Sample ID: MCPRA-SS-76G-02

Date Collected: 10/05/15 08:35

Date Received: 10/07/15 09:50

Lab Sample ID: 590-2117-9

Matrix: Solid

Percent Solids: 90.7

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	7.5		0.094	0.020	mg/Kg	☼	10/15/15 08:55	10/15/15 22:32	5
Arsenic	120		0.24	0.085	mg/Kg	☼	10/15/15 08:55	10/15/15 22:32	5
Cadmium	0.73		0.094	0.0090	mg/Kg	☼	10/15/15 08:55	10/15/15 22:32	5
Copper	19		0.19	0.046	mg/Kg	☼	10/15/15 08:55	10/15/15 22:32	5
Iron	20000		19	5.0	mg/Kg	☼	10/15/15 08:55	10/15/15 22:32	5
Lead	39		0.24	0.023	mg/Kg	☼	10/15/15 08:55	10/15/15 22:32	5
Manganese	610		0.47	0.080	mg/Kg	☼	10/15/15 08:55	10/15/15 22:32	5
Zinc	180		2.4	0.53	mg/Kg	☼	10/15/15 08:55	10/15/15 22:32	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.067		0.042	0.0017	mg/Kg	☼	10/08/15 07:49	10/08/15 14:53	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.08		0.100	0.100	SU			10/08/15 07:41	1

Client Sample ID: MCPRA-SS-76G-01B

Date Collected: 10/05/15 09:35

Date Received: 10/07/15 09:50

Lab Sample ID: 590-2117-10

Matrix: Solid

Percent Solids: 82.6

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	7.4		0.11	0.022	mg/Kg	☼	10/15/15 08:55	10/15/15 22:37	5
Arsenic	100		0.27	0.096	mg/Kg	☼	10/15/15 08:55	10/15/15 22:37	5
Cadmium	0.80		0.11	0.010	mg/Kg	☼	10/15/15 08:55	10/15/15 22:37	5
Copper	13		0.21	0.052	mg/Kg	☼	10/15/15 08:55	10/15/15 22:37	5
Iron	15000		21	5.7	mg/Kg	☼	10/15/15 08:55	10/15/15 22:37	5

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Client Sample ID: MCPRA-SS-76G-01B

Lab Sample ID: 590-2117-10

Date Collected: 10/05/15 09:35

Matrix: Solid

Date Received: 10/07/15 09:50

Percent Solids: 82.6

Method: 6020A - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	61		0.27	0.026	mg/Kg	☼	10/15/15 08:55	10/15/15 22:37	5
Manganese	560		0.53	0.091	mg/Kg	☼	10/15/15 08:55	10/15/15 22:37	5
Zinc	180		2.7	0.60	mg/Kg	☼	10/15/15 08:55	10/15/15 22:37	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.18		0.041	0.0017	mg/Kg	☼	10/08/15 07:49	10/08/15 14:55	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.92		0.100	0.100	SU			10/08/15 07:41	1

Client Sample ID: MCPRA-SS-76G-01A

Lab Sample ID: 590-2117-11

Date Collected: 10/05/15 10:55

Matrix: Solid

Date Received: 10/07/15 09:50

Percent Solids: 92.4

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	140		0.093	0.019	mg/Kg	☼	10/15/15 08:55	10/15/15 22:41	5
Arsenic	470		0.23	0.083	mg/Kg	☼	10/15/15 08:55	10/15/15 22:41	5
Cadmium	2.0		0.093	0.0088	mg/Kg	☼	10/15/15 08:55	10/15/15 22:41	5
Copper	17		0.19	0.045	mg/Kg	☼	10/15/15 08:55	10/15/15 22:41	5
Iron	21000		19	5.0	mg/Kg	☼	10/15/15 08:55	10/15/15 22:41	5
Lead	410		0.23	0.022	mg/Kg	☼	10/15/15 08:55	10/15/15 22:41	5
Manganese	1200		0.46	0.079	mg/Kg	☼	10/15/15 08:55	10/15/15 22:41	5
Zinc	400		2.3	0.52	mg/Kg	☼	10/15/15 08:55	10/15/15 22:41	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.48		0.036	0.0015	mg/Kg	☼	10/08/15 07:49	10/08/15 14:58	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.00		0.100	0.100	SU			10/08/15 07:41	1

Client Sample ID: MCPRA-SS-76G-01

Lab Sample ID: 590-2117-12

Date Collected: 10/05/15 11:25

Matrix: Solid

Date Received: 10/07/15 09:50

Percent Solids: 93.3

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	8.3		0.091	0.019	mg/Kg	☼	10/15/15 08:55	10/15/15 22:46	5
Arsenic	41		0.23	0.082	mg/Kg	☼	10/15/15 08:55	10/15/15 22:46	5
Cadmium	0.23		0.091	0.0087	mg/Kg	☼	10/15/15 08:55	10/15/15 22:46	5
Copper	13		0.18	0.045	mg/Kg	☼	10/15/15 08:55	10/15/15 22:46	5
Iron	22000		18	4.9	mg/Kg	☼	10/15/15 08:55	10/15/15 22:46	5
Lead	28		0.23	0.022	mg/Kg	☼	10/15/15 08:55	10/15/15 22:46	5
Manganese	560		0.46	0.078	mg/Kg	☼	10/15/15 08:55	10/15/15 22:46	5
Zinc	68		2.3	0.51	mg/Kg	☼	10/15/15 08:55	10/15/15 22:46	5

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Client Sample ID: MCPRA-SS-76G-01

Lab Sample ID: 590-2117-12

Date Collected: 10/05/15 11:25

Matrix: Solid

Date Received: 10/07/15 09:50

Percent Solids: 93.3

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.047		0.039	0.0016	mg/Kg	☼	10/08/15 07:49	10/08/15 15:00	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.77		0.100	0.100	SU			10/08/15 07:41	1

Client Sample ID: MCPRA-SS-GC-05

Lab Sample ID: 590-2117-13

Date Collected: 10/05/15 16:45

Matrix: Solid

Date Received: 10/07/15 09:50

Percent Solids: 92.8

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	40		0.096	0.020	mg/Kg	☼	10/15/15 08:55	10/15/15 23:08	5
Arsenic	140		0.24	0.087	mg/Kg	☼	10/15/15 08:55	10/15/15 23:08	5
Cadmium	0.71		0.096	0.0091	mg/Kg	☼	10/15/15 08:55	10/15/15 23:08	5
Copper	53		0.19	0.047	mg/Kg	☼	10/15/15 08:55	10/15/15 23:08	5
Iron	20000		19	5.1	mg/Kg	☼	10/15/15 08:55	10/15/15 23:08	5
Lead	41		0.24	0.023	mg/Kg	☼	10/15/15 08:55	10/15/15 23:08	5
Manganese	570		0.48	0.082	mg/Kg	☼	10/15/15 08:55	10/15/15 23:08	5
Zinc	140		2.4	0.54	mg/Kg	☼	10/15/15 08:55	10/15/15 23:08	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.052		0.043	0.0018	mg/Kg	☼	10/08/15 07:49	10/08/15 15:02	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.90		0.100	0.100	SU			10/08/15 07:41	1

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 590-3851/1008
Matrix: Water
Analysis Batch: 3851

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.80	0.15	mg/L			10/07/15 14:12	1
Sulfate	ND		0.50	0.13	mg/L			10/07/15 14:12	1

Lab Sample ID: LCS 590-3851/1018
Matrix: Water
Analysis Batch: 3851

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	12.5	12.6		mg/L		100	90 - 110
Sulfate	12.5	12.5		mg/L		100	90 - 110

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 590-4013/2-A
Matrix: Water
Analysis Batch: 4036

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 4013

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	ND		1.0	0.022	mg/L		10/16/15 16:57	10/19/15 14:25	1
Magnesium	ND		0.50	0.0056	mg/L		10/16/15 16:57	10/19/15 14:25	1
Potassium	ND		1.0	0.13	mg/L		10/16/15 16:57	10/19/15 14:25	1
Sodium	ND		0.50	0.021	mg/L		10/16/15 16:57	10/19/15 14:25	1

Lab Sample ID: LCS 590-4013/1-A
Matrix: Water
Analysis Batch: 4036

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 4013

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	10.0	10.1		mg/L		101	80 - 120
Magnesium	10.0	9.92		mg/L		99	80 - 120
Potassium	10.0	10.2		mg/L		102	80 - 135
Sodium	10.0	10.1		mg/L		101	80 - 154

Lab Sample ID: 590-2117-2 MS
Matrix: Water
Analysis Batch: 4036

Client Sample ID: MCPRA-DW-RY-01
Prep Type: Total Recoverable
Prep Batch: 4013

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	5.1		16.7	22.1		mg/L		102	75 - 125
Magnesium	1.0		16.7	17.8		mg/L		101	75 - 125
Potassium	0.39	J	16.7	17.6		mg/L		104	75 - 125
Sodium	1.4		16.7	18.4		mg/L		102	75 - 125

Lab Sample ID: 590-2117-2 MSD
Matrix: Water
Analysis Batch: 4036

Client Sample ID: MCPRA-DW-RY-01
Prep Type: Total Recoverable
Prep Batch: 4013

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Calcium	5.1		16.7	22.1		mg/L		102	75 - 125	0	20

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: 590-2117-2 MSD
Matrix: Water
Analysis Batch: 4036

Client Sample ID: MCPRA-DW-RY-01
Prep Type: Total Recoverable
Prep Batch: 4013

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier				Limits		
Magnesium	1.0		16.7	17.4		mg/L		98	75 - 125	2	20
Potassium	0.39	J	16.7	17.6		mg/L		103	75 - 125	0	20
Sodium	1.4		16.7	18.5		mg/L		103	75 - 125	0	20

Lab Sample ID: 590-2117-1 DU
Matrix: Water
Analysis Batch: 4036

Client Sample ID: MCPRA-DW-BA-01
Prep Type: Total Recoverable
Prep Batch: 4013

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Calcium	86		88.4		mg/L		2	20
Magnesium	2.8		2.79		mg/L		0.9	20
Potassium	0.97	J	1.06		mg/L		NC	20
Sodium	20		20.4		mg/L		3	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 580-203402/21-A
Matrix: Solid
Analysis Batch: 203564

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 203402

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Antimony	ND		0.10	0.021	mg/Kg		10/15/15 08:55	10/15/15 21:16	5
Arsenic	ND		0.25	0.090	mg/Kg		10/15/15 08:55	10/15/15 21:16	5
Cadmium	ND		0.10	0.0095	mg/Kg		10/15/15 08:55	10/15/15 21:16	5
Copper	ND		0.20	0.049	mg/Kg		10/15/15 08:55	10/15/15 21:16	5
Iron	ND		20	5.4	mg/Kg		10/15/15 08:55	10/15/15 21:16	5
Lead	ND		0.25	0.024	mg/Kg		10/15/15 08:55	10/15/15 21:16	5
Manganese	ND		0.50	0.085	mg/Kg		10/15/15 08:55	10/15/15 21:16	5
Zinc	ND		2.5	0.56	mg/Kg		10/15/15 08:55	10/15/15 21:16	5

Lab Sample ID: LCS 580-203402/22-A
Matrix: Solid
Analysis Batch: 203564

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 203402

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.
							Limits
Antimony	150	149		mg/Kg		99	80 - 120
Arsenic	200	197		mg/Kg		99	80 - 120
Cadmium	5.00	4.96		mg/Kg		99	80 - 120
Copper	25.0	24.2		mg/Kg		97	80 - 120
Iron	1100	1180		mg/Kg		107	80 - 120
Lead	50.0	48.2		mg/Kg		96	80 - 120
Manganese	50.0	51.9		mg/Kg		104	80 - 120
Zinc	200	197		mg/Kg		99	80 - 120

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 580-203402/23-A
Matrix: Solid
Analysis Batch: 203564

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 203402

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	150	149		mg/Kg		99	80 - 120	0	20
Arsenic	200	198		mg/Kg		99	80 - 120	0	20
Cadmium	5.00	5.08		mg/Kg		102	80 - 120	2	20
Copper	25.0	24.2		mg/Kg		97	80 - 120	0	20
Iron	1100	1150		mg/Kg		105	80 - 120	2	20
Lead	50.0	48.4		mg/Kg		97	80 - 120	0	20
Manganese	50.0	51.4		mg/Kg		103	80 - 120	1	20
Zinc	200	197		mg/Kg		99	80 - 120	0	20

Lab Sample ID: MB 580-203445/20-A
Matrix: Water
Analysis Batch: 203523

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 203445

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.00040	0.000080	mg/L		10/15/15 10:10	10/15/15 18:25	1
Arsenic	ND		0.0010	0.00027	mg/L		10/15/15 10:10	10/15/15 18:25	1
Cadmium	ND		0.00040	0.000028	mg/L		10/15/15 10:10	10/15/15 18:25	1
Copper	ND		0.0020	0.00060	mg/L		10/15/15 10:10	10/15/15 18:25	1
Iron	ND		0.040	0.0058	mg/L		10/15/15 10:10	10/15/15 18:25	1
Lead	ND		0.00040	0.000034	mg/L		10/15/15 10:10	10/15/15 18:25	1
Manganese	ND		0.0020	0.00035	mg/L		10/15/15 10:10	10/15/15 18:25	1
Zinc	ND		0.0070	0.0019	mg/L		10/15/15 10:10	10/15/15 18:25	1

Lab Sample ID: LCS 580-203445/21-A
Matrix: Water
Analysis Batch: 203523

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 203445

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	3.00	2.97		mg/L		99	80 - 120		
Arsenic	4.00	3.98		mg/L		99	80 - 120		
Cadmium	0.100	0.105		mg/L		105	80 - 120		
Copper	0.500	0.480		mg/L		96	80 - 120		
Iron	22.0	23.0		mg/L		104	80 - 120		
Lead	1.00	0.987		mg/L		99	80 - 120		
Manganese	1.00	0.952		mg/L		95	80 - 120		
Zinc	4.00	4.03		mg/L		101	80 - 120		

Lab Sample ID: LCSD 580-203445/22-A
Matrix: Water
Analysis Batch: 203523

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 203445

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	3.00	2.95		mg/L		98	80 - 120	1	20
Arsenic	4.00	3.97		mg/L		99	80 - 120	0	20
Cadmium	0.100	0.102		mg/L		102	80 - 120	2	20
Copper	0.500	0.475		mg/L		95	80 - 120	1	20
Iron	22.0	22.5		mg/L		102	80 - 120	2	20
Lead	1.00	0.988		mg/L		99	80 - 120	0	20
Manganese	1.00	0.946		mg/L		95	80 - 120	1	20

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 580-203445/22-A
 Matrix: Water
 Analysis Batch: 203523

Client Sample ID: Lab Control Sample Dup
 Prep Type: Total Recoverable
 Prep Batch: 203445

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Zinc	4.00	4.01		mg/L		100	80 - 120	1	20

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 590-3863/9-A
 Matrix: Solid
 Analysis Batch: 3883

Client Sample ID: Method Blank
 Prep Type: Total/NA
 Prep Batch: 3863

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.050	0.0020	mg/Kg		10/08/15 07:49	10/08/15 14:26	1

Lab Sample ID: LCS 590-3863/8-A
 Matrix: Solid
 Analysis Batch: 3883

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA
 Prep Batch: 3863

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hg	0.200	0.193		mg/Kg		97	80 - 120

Method: 9045D - pH

Lab Sample ID: LCS 590-3861/1
 Matrix: Solid
 Analysis Batch: 3861

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.050		SU		101	98.6 - 101.4

Method: SM 2310B - Acidity

Lab Sample ID: MB 490-290844/4
 Matrix: Water
 Analysis Batch: 290844

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acidity as CaCO3	ND		20	10	mg/L			10/17/15 14:35	1

Lab Sample ID: LCS 490-290844/5
 Matrix: Water
 Analysis Batch: 290844

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acidity as CaCO3	500	471		mg/L		94	90 - 110

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Method: SM 2310B - Acidity (Continued)

Lab Sample ID: LCSD 490-290844/11
Matrix: Water
Analysis Batch: 290844

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acidity as CaCO3	500	489		mg/L		98	90 - 110	4	20

Lab Sample ID: 590-2117-1 DU
Matrix: Water
Analysis Batch: 290844

Client Sample ID: MCPRA-DW-BA-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Acidity as CaCO3	ND		ND		mg/L		NC	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 590-4021/1
Matrix: Water
Analysis Batch: 4021

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	ND		4.0	1.7	mg/L			10/19/15 08:08	1

Lab Sample ID: LCS 590-4021/2
Matrix: Water
Analysis Batch: 4021

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Alkalinity	500	475		mg/L		95	90 - 110
Bicarbonate Alkalinity as CaCO3	500	475		mg/L		95	90 - 110

Lab Sample ID: 590-2117-1 DU
Matrix: Water
Analysis Batch: 4021

Client Sample ID: MCPRA-DW-BA-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Alkalinity	65	H	65.0		mg/L		0	10

Method: SM 2340C - Hardness, Total (mg/l as CaCO3)

Lab Sample ID: MB 580-203468/1
Matrix: Water
Analysis Batch: 203468

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	ND		2.0	2.0	mg/L			10/15/15 11:15	1

Lab Sample ID: LCS 580-203468/2
Matrix: Water
Analysis Batch: 203468

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Hardness as calcium carbonate	150	146		mg/L		97	90 - 110

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 590-3889/1
Matrix: Water
Analysis Batch: 3889

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		25	13	mg/L			10/09/15 06:27	1

Lab Sample ID: LCS 590-3889/2
Matrix: Water
Analysis Batch: 3889

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	250	259		mg/L		104	80 - 120

Lab Sample ID: 590-2117-3 DU
Matrix: Water
Analysis Batch: 3889

Client Sample ID: MCPRA-SW-76G-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	32		38.0	F5	mg/L		17	10

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 590-3890/1
Matrix: Water
Analysis Batch: 3890

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		10	4.0	mg/L			10/09/15 06:31	1

Lab Sample ID: LCS 590-3890/2
Matrix: Water
Analysis Batch: 3890

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	97.0		mg/L		97	80 - 120

Lab Sample ID: 590-2117-3 DU
Matrix: Water
Analysis Batch: 3890

Client Sample ID: MCPRA-SW-76G-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	ND		ND		mg/L		NC	30

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 590-3905/1
Matrix: Water
Analysis Batch: 3905

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.040		SU		101	98.6 - 101.4

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Client Sample ID: MCPRA-DW-BA-01

Date Collected: 10/04/15 16:30

Date Received: 10/07/15 09:50

Lab Sample ID: 590-2117-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	5 mL		3851	10/07/15 13:01	CBW	TAL SPK
Total/NA	Analysis	300.0		10	5 mL		3851	10/07/15 14:40	CBW	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	4013	10/16/15 16:57	JSP	TAL SPK
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	4036	10/19/15 14:27	JSP	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	203445	10/15/15 10:10	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203523	10/15/15 19:14	FCW	TAL SEA
Total/NA	Analysis	SM 2310B		1	50 mL	50 mL	290844	10/17/15 14:42	BLM	TAL NSH
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	4021	10/19/15 08:08	JSP	TAL SPK
Total/NA	Analysis	SM 2340C		1	5 mL	50 mL	203468	10/15/15 11:15	JLS	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3889	10/09/15 06:27	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3890	10/09/15 06:31	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

Client Sample ID: MCPRA-DW-RY-01

Date Collected: 10/04/15 15:25

Date Received: 10/07/15 09:50

Lab Sample ID: 590-2117-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	5 mL		3851	10/07/15 13:16	CBW	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	4013	10/16/15 16:57	JSP	TAL SPK
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	4036	10/19/15 13:53	JSP	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	203445	10/15/15 10:10	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203523	10/15/15 19:18	FCW	TAL SEA
Total/NA	Analysis	SM 2310B		1	50 mL	50 mL	290844	10/17/15 14:49	BLM	TAL NSH
Total/NA	Analysis	SM 2320B		1	69 mL	100 mL	4021	10/19/15 08:08	JSP	TAL SPK
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203468	10/15/15 11:15	JLS	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3889	10/09/15 06:27	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3890	10/09/15 06:31	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

Client Sample ID: MCPRA-SW-76G-02

Date Collected: 10/05/15 08:30

Date Received: 10/07/15 09:50

Lab Sample ID: 590-2117-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203445	10/15/15 10:10	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203523	10/15/15 19:22	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203468	10/15/15 11:15	JLS	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3889	10/09/15 06:27	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3890	10/09/15 06:31	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Client Sample ID: MCPRA-SW-76G-01B

Lab Sample ID: 590-2117-4

Date Collected: 10/05/15 09:30

Matrix: Water

Date Received: 10/07/15 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203445	10/15/15 10:10	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203523	10/15/15 19:26	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203468	10/15/15 11:15	JLS	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3889	10/09/15 06:27	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3890	10/09/15 06:31	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

Client Sample ID: MCPRA-DW-SH-01

Lab Sample ID: 590-2117-5

Date Collected: 10/05/15 10:20

Matrix: Water

Date Received: 10/07/15 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	5 mL		3851	10/07/15 13:30	CBW	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	4013	10/16/15 16:57	JSP	TAL SPK
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	4036	10/19/15 13:59	JSP	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	203445	10/15/15 10:10	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203523	10/15/15 19:31	FCW	TAL SEA
Total/NA	Analysis	SM 2310B		1	50 mL	50 mL	290844	10/17/15 14:52	BLM	TAL NSH
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	4021	10/19/15 08:08	JSP	TAL SPK
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203468	10/15/15 11:15	JLS	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3889	10/09/15 06:27	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3890	10/09/15 06:31	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

Client Sample ID: MCPRA-DW-MY-01

Lab Sample ID: 590-2117-6

Date Collected: 10/05/15 15:20

Matrix: Water

Date Received: 10/07/15 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	5 mL		3851	10/07/15 13:44	CBW	TAL SPK
Total/NA	Analysis	300.0		10	5 mL		3851	10/07/15 14:54	CBW	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	4013	10/16/15 16:57	JSP	TAL SPK
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	4036	10/19/15 14:04	JSP	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	203445	10/15/15 10:10	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203523	10/15/15 19:35	FCW	TAL SEA
Total/NA	Analysis	SM 2310B		1	50 mL	50 mL	290844	10/17/15 14:56	BLM	TAL NSH
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	4021	10/19/15 08:08	JSP	TAL SPK
Total/NA	Analysis	SM 2340C		1	10 mL	50 mL	203468	10/15/15 11:15	JLS	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3889	10/09/15 06:27	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3890	10/09/15 06:31	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Client Sample ID: MCPRA-SW-GC-05

Date Collected: 10/05/15 16:40

Date Received: 10/07/15 09:50

Lab Sample ID: 590-2117-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203445	10/15/15 10:10	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203523	10/15/15 19:39	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	25 mL	50 mL	203468	10/15/15 12:15	JLS	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3889	10/09/15 06:27	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3890	10/09/15 06:31	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

Client Sample ID: MCPRA-SW-DP-01

Date Collected: 10/05/15 15:25

Date Received: 10/07/15 09:50

Lab Sample ID: 590-2117-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203445	10/15/15 10:10	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203523	10/15/15 19:43	FCW	TAL SEA

Client Sample ID: MCPRA-SS-76G-02

Date Collected: 10/05/15 08:35

Date Received: 10/07/15 09:50

Lab Sample ID: 590-2117-9

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	3861	10/08/15 07:41	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			3876	10/08/15 09:29	JSP	TAL SPK

Client Sample ID: MCPRA-SS-76G-02

Date Collected: 10/05/15 08:35

Date Received: 10/07/15 09:50

Lab Sample ID: 590-2117-9

Matrix: Solid

Percent Solids: 90.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1696 g	50 mL	203402	10/15/15 08:55	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1696 g	50 mL	203564	10/15/15 22:32	FCW	TAL SEA
Total/NA	Prep	7471B			0.65 g	50 mL	3863	10/08/15 07:49	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.65 g	50 mL	3883	10/08/15 14:53	JSP	TAL SPK

Client Sample ID: MCPRA-SS-76G-01B

Date Collected: 10/05/15 09:35

Date Received: 10/07/15 09:50

Lab Sample ID: 590-2117-10

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	3861	10/08/15 07:41	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			3876	10/08/15 09:29	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Client Sample ID: MCPRA-SS-76G-01B

Lab Sample ID: 590-2117-10

Date Collected: 10/05/15 09:35

Matrix: Solid

Date Received: 10/07/15 09:50

Percent Solids: 82.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1360 g	50 mL	203402	10/15/15 08:55	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1360 g	50 mL	203564	10/15/15 22:37	FCW	TAL SEA
Total/NA	Prep	7471B			0.74 g	50 mL	3863	10/08/15 07:49	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.74 g	50 mL	3883	10/08/15 14:55	JSP	TAL SPK

Client Sample ID: MCPRA-SS-76G-01A

Lab Sample ID: 590-2117-11

Date Collected: 10/05/15 10:55

Matrix: Solid

Date Received: 10/07/15 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	3861	10/08/15 07:41	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			3876	10/08/15 09:29	JSP	TAL SPK

Client Sample ID: MCPRA-SS-76G-01A

Lab Sample ID: 590-2117-11

Date Collected: 10/05/15 10:55

Matrix: Solid

Date Received: 10/07/15 09:50

Percent Solids: 92.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1689 g	50 mL	203402	10/15/15 08:55	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1689 g	50 mL	203564	10/15/15 22:41	FCW	TAL SEA
Total/NA	Prep	7471B			0.75 g	50 mL	3863	10/08/15 07:49	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.75 g	50 mL	3883	10/08/15 14:58	JSP	TAL SPK

Client Sample ID: MCPRA-SS-76G-01

Lab Sample ID: 590-2117-12

Date Collected: 10/05/15 11:25

Matrix: Solid

Date Received: 10/07/15 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	3861	10/08/15 07:41	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			3876	10/08/15 09:29	JSP	TAL SPK

Client Sample ID: MCPRA-SS-76G-01

Lab Sample ID: 590-2117-12

Date Collected: 10/05/15 11:25

Matrix: Solid

Date Received: 10/07/15 09:50

Percent Solids: 93.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1728 g	50 mL	203402	10/15/15 08:55	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1728 g	50 mL	203564	10/15/15 22:46	FCW	TAL SEA
Total/NA	Prep	7471B			0.69 g	50 mL	3863	10/08/15 07:49	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.69 g	50 mL	3883	10/08/15 15:00	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Client Sample ID: MCPRA-SS-GC-05

Lab Sample ID: 590-2117-13

Date Collected: 10/05/15 16:45

Matrix: Solid

Date Received: 10/07/15 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	3861	10/08/15 07:41	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			3876	10/08/15 09:29	JSP	TAL SPK

Client Sample ID: MCPRA-SS-GC-05

Lab Sample ID: 590-2117-13

Date Collected: 10/05/15 16:45

Matrix: Solid

Date Received: 10/07/15 09:50

Percent Solids: 92.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1209 g	50 mL	203402	10/15/15 08:55	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1209 g	50 mL	203564	10/15/15 23:08	FCW	TAL SEA
Total/NA	Prep	7471B			0.62 g	50 mL	3863	10/08/15 07:49	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.62 g	50 mL	3883	10/08/15 15:02	JSP	TAL SPK

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

Certification Summary

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Laboratory: TestAmerica Spokane

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C569	01-06-17

The following analytes are included in this report, but are not certified under this certification:

Analysis Method	Prep Method	Matrix	Analyte
6010C	3005A	Water	Sodium

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids
SM 4500 H+ B		Water	pH

Laboratory: TestAmerica Nashville

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	A2LA		NA: NELAP & A2LA	12-31-15
A2LA	ISO/IEC 17025		0453.07	02-29-16 *
Alaska (UST)	State Program	10	UST-087	07-24-16
Arizona	State Program	9	AZ0473	05-05-16
Arkansas DEQ	State Program	6	88-0737	04-25-16
California	State Program	9	2938	10-31-16
Connecticut	State Program	1	PH-0220	12-31-17
Florida	NELAP	4	E87358	06-30-16
Georgia	State Program	4	N/A	06-30-16
Illinois	NELAP	5	200010	12-09-16
Iowa	State Program	7	131	04-01-16 *
Kansas	NELAP	7	E-10229	05-31-16
Kentucky (UST)	State Program	4	19	06-30-16
Kentucky (WW)	State Program	4	90038	12-31-16
Louisiana	NELAP	6	30613	06-30-16
Maine	State Program	1	TN00032	11-03-17
Maryland	State Program	3	316	03-31-16 *
Massachusetts	State Program	1	M-TN032	06-30-16
Minnesota	NELAP	5	047-999-345	12-31-16
Mississippi	State Program	4	N/A	06-30-16
Montana (UST)	State Program	8	NA	02-24-20
Nevada	State Program	9	TN00032	07-31-16
New Hampshire	NELAP	1	2963	10-09-16
New Jersey	NELAP	2	TN965	06-30-16
New York	NELAP	2	11342	03-31-16
North Carolina (WW/SW)	State Program	4	387	12-31-16
North Dakota	State Program	8	R-146	06-30-16
Ohio VAP	State Program	5	CL0033	07-10-17
Oklahoma	State Program	6	9412	08-31-16
Oregon	NELAP	10	TN200001	04-27-16
Pennsylvania	NELAP	3	68-00585	06-30-16
Rhode Island	State Program	1	LAO00268	12-30-15 *
South Carolina	State Program	4	84009 (001)	02-28-16 *
South Carolina (Do Not Use - DW)	State Program	4	84009 (002)	12-16-17
Tennessee	State Program	4	2008	02-23-17

* Certification renewal pending - certification considered valid.

TestAmerica Spokane

Certification Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Laboratory: TestAmerica Nashville (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Texas	NELAP	6	T104704077	08-31-16
USDA	Federal		S-48469	10-30-16
Utah	NELAP	8	TN00032	07-31-16
Virginia	NELAP	3	460152	06-14-16
Washington	State Program	10	C789	07-19-16
West Virginia DEP	State Program	3	219	02-28-16 *
Wisconsin	State Program	5	998020430	08-31-16
Wyoming (UST)	A2LA	8	453.07	02-29-16 *

Laboratory: TestAmerica Seattle

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska (UST)	State Program	10	UST-022	03-02-16
California	State Program	9	2901	01-31-18
L-A-B	DoD ELAP		L2236	01-19-19
L-A-B	ISO/IEC 17025		L2236	01-19-19
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-06-16
US Fish & Wildlife	Federal		LE058448-0	02-28-16
USDA	Federal		P330-14-00126	04-08-17
Washington	State Program	10	C553	02-17-16

* Certification renewal pending - certification considered valid.

TestAmerica Spokane

Method Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2117-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL SPK
6010C	Metals (ICP)	SW846	TAL SPK
6020A	Metals (ICP/MS)	SW846	TAL SEA
7471B	Mercury (CVAA)	SW846	TAL SPK
9045D	pH	SW846	TAL SPK
Moisture	Percent Moisture	EPA	TAL SPK
SM 2310B	Acidity	SM	TAL NSH
SM 2320B	Alkalinity	SM	TAL SPK
SM 2340C	Hardness, Total (mg/l as CaCO ₃)	SM	TAL SEA
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL SPK
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL SPK
SM 4500 H+ B	pH	SM	TAL SPK

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

TestAmerica Spokane

11922 East 1st Ave
Spokane, WA 99206

Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record

590-2117-01 Chain of Custody



estAmerica

11922 East 1st Ave, Spokane, WA 99206

Client Information

Client Contact: Bernard Kronschnabel

Company: Cascade Earth Sciences Inc.

Address: 12720 E Nora Ave

City: Spokane

State, Zip: WA, 99216

Phone: 208-241-8862(Tel)

Email: bernard.kronschnabel@cascade-earth.com

Project Name: Monte Cristo Post-Removal Action Monitor

Site: S50W#

Sampler:
 Phone:
 E-Mail: randee.arrington@testamericainc.com

Lab: PM
 Arrington, Randee E

Date Date Requested:

TAT Requested (days):

PO #

WO #

Project #

59000677

Analysis Requested

Field Filtered Sample (Yes or No)
 Performed MS/MSD (Yes or No)
 Pb, As, Cd, Cu, Fe, Pb, Mn, Zn
 pH, Hardness
 TSS, TDS
 Cl, SO₄, Alk, Ca, Mg, Na, K
 Total Acidity

Job #: 590-767-263-1
 Page: Page 1 of 8

Preservation Codes:

- A - HCL
- B - NaOH
- C - Zn Acetate
- D - Nitric Acid
- E - NaHSO₄
- F - MeOH
- G - Amchlor
- H - Ascorbic Acid
- I - Ice
- J - DI Water
- K - EDTA
- L - EDA
- M - Hexane
- N - None
- O - Ashlar2
- P - H₂O₂/S
- Q - Na₂SO₃
- R - Na₂S₂O₃
- S - H₂SO₄
- T - TSP Docuacrylate
- U - Acetone
- V - MCAA
- W - pH 4.5
- Z - other (Specify)

Total Number of containers

Special Instructions/Note:

Please run As at the lowest achievable MDL/RL.

Cooler/IR Dig/TB cor 4.8 unc 4.3
 Cooler Dsc Lo Redwood @ Lab
 WetPacks Packing Lab
 c/dra

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Preservation Code	Matrix (W=water, S=solid, O=volatile, B=trace, A=air)	Field Filtered Sample (Yes or No)	Performed MS/MSD (Yes or No)	Analysis Requested	Total Number of containers	Special Instructions/Note
MCPA-DW-BA-01	10/4/15	1630	G		W	X	X			
-DW-RY-01	10/5/15	1535				X	X			
-SW-766-02		0830				X	X			
-SW-766-01b		0930				X	X			
-DW-5H-01		1020				X	X			
-DW-MY-01		1520				X	X			
-SW-GE-05		1640				X	X			
-SW-DP-01		1535				X	X			

Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological
 Deliverable Requested: I, II, III, IV, Other (specify)

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For
 Special Instructions/QC Requirements:

Relinquished by:	Date/Time	Company	Time	Method of Shipment	Relinquished by:	Date/Time	Company
<i>[Signature]</i>	10/6/15 0900	CEES			<i>[Signature]</i>	10/6/15 1542	TA-Ser
<i>[Signature]</i>	10/6/15 1605	TA-S			<i>[Signature]</i>	10/7/15 9:35	TA-Ser

TestAmerica Spokane

11922 East 1st Ave
Spokane, WA 99206
Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record

590-2117-02 Chain of Custody



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ESTAMERICA

Client Information
Client Contact: **Bernard Kronschnabel**
Company: **Cascade Earth Sciences Inc.**
Address: **12720 E Nora Ave**
City: **Spokane**
State/Zip: **WA, 99216**
Phone: **208-241-8882(Tel)**
Email: **bernard.kronschnabel@cascade-earth.com**
Project Name: **Monte Cristo Post-Removal Action Monitor**
Site: **SSCOW#**

Analysis Requested
Lab P/N: **Arrington, Rande E**
E-Mail: **randee.arrington@estamericarc.com**

C/N: **590-767-2632**
Page: **2 of 8**
Job #:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	MATRIX (W=water, S=solid, O=ore/dust, E=effluent, A=air)	Field Filtered Sample (Yes or No)	Perform MS/MSB (Yes or No)	Special Instructions/Note:
MCRA-SS-766-02	10/5/15	0935	G	S	X	X	Sb, As, Cd, Cu, Fe, Pb, Mn, Zn Hg PH
-766-01b		0935					
-766-01a		1055					
-766-01		1125					
-66-05		1045					

Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological
 Deliverable Requested 1, II, III, IV, Other (specify):
 Empty Kit Relinquished by: _____ Date: _____
 Relinquished by: **Steve Cook** Date/Time: **10/6/15 0900** Company: **CEIS**
 Relinquished by: **Kevin Klesley** Date/Time: **10/15/15 1605** Company: **1888**
 Relinquished by: _____ Date/Time: _____ Company: _____

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months
 Special Instructions/QC Requirements:

Method of Shipment: _____ Date/Time: **10/6/15 1542** Company: **TA-Sea**
 Received by: **Steve Cook** Date/Time: **10/7/15 9:50** Company: **TA-SEA**
 Received by: **Shella Spatz** Date/Time: _____ Company: _____

TestAmerica Spokane

11922 East 1st Ave
Spokane, WA 99206
Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record



TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)

Company: TestAmerica Laboratories, Inc
Address: 2960 Foster Creighton Drive,
City: Nashville
State, Zip: TN, 37204
Phone: 615-726-0177(Tel) 615-726-3404(Fax)
Email: WOC #:
Project Name: Monte Cristo Post-Removal Action Monitor
Site: SSONW#:

Sampler: Arrington, Randee E
Phone: randee.arrington@testamericainc.com
E-Mail:

Carrier Tracking No(s):

COC No: 590-851-1
Page: Page 1 of 1
Job #: 590-217-1

Analysis Requested

Due Date Requested: 10/19/2015
TAT Requested (days):

Sample ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Viewwater, Seawater, O-wastefield, BT-Tissue, A-Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SM2310B/ Acidity	Total Number of containers	Special Instructions/Note:
MCPRA-DW-BA-01 (590-217-1)	10/4/15	16:30 Pacific		Water				1	
MCPRA-DW-RY-01 (590-217-2)	10/4/15	15:25 Pacific		Water				1	
MCPRA-DW-SH-01 (590-217-5)	10/5/15	10:20 Pacific		Water				1	
MCPRA-DW-MY-01 (590-217-6)	10/5/15	15:20 Pacific		Water				1	

Possible Hazard Identification

Unconfirmed

Deliverable Requested: I, II, III, IV, Other (specify)

Empty Kit Relinquished by:

Date:

Time:

Method of Shipment:

Relinquished by: *Shella Spatz*
Date/Time: 10/7/15 15:00
Company: TA Spax

Received by: *[Signature]*
Date/Time: 10-8-15 10:05
Company: TWA

Relinquished by: *[Signature]*
Date/Time:

Received by: *[Signature]*
Date/Time:

Custody Seals Intact: Yes No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Special Instructions/OC Requirements:

Return To Client Disposal By Lab Archive For Months

COOLER RECEIPT FORM

Cooler Received/Opened On 10/8/2015 @1005

1. Tracking # 4489 (last 4 digits, FedEx)

Courier: FedEx IR Gun ID 97310166

2. Temperature of rep. sample or temp blank when opened: 3.7 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO... NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: 1 front

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial) HG

7. Were custody seals on containers: YES NO and Intact YES...NO... NA

Were these signed and dated correctly? YES...NO... NA

8. Packing mat'l used? ~~Bubblewrap~~ Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: ~~Ice~~ Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES NO NA ^{EF} 10-8-15

b. Was there any observable headspace present in any VOA vial? YES NO NA

14. Was there a Trip Blank in this cooler? YES...NO... NA If multiple coolers, sequence # NA

I certify that I unloaded the cooler and answered questions 7-14 (initial) HG

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO... NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO... NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) HG

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

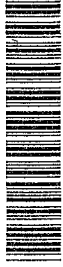
20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) HG

I certify that I attached a label with the unique LIMS number to each container (initial) HG

21. Were there Non-Conformance issues at login? YES... NO Was a NCM generated? YES... NO

Chain of Custody Record



Client Information (Sub Contract Lab)		Lab PM: Arrington, Randee E		Carrier Tracking No(s):		COC No: 590-850.1	
Shipping/Receiving		E-Mail: randee.arrington@testamericainc.com		Page 1 of 2		Job #: 590-2117-1	
Company: TestAmerica Laboratories, Inc.		Address: 5755 8th Street East, Tacoma, WA, 98424		Due Date Requested: 10/19/2015		TAT Requested (days):	
Phone: 253-922-2310(Tel) 253-922-5047(Fax)		PO #:		Project #: 59000677		SSOW#:	
Project Name: Monte Cristo Post-Removal Action Monitor		Site:		Sample Date		Sample Time	
Sample ID		Sample Date		Sample Time		Sample Type (C=comp, G=grab)	
Matrix (W=water, S=solid, O=waste/oil)		Preservation Code:		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)	
6020A_LL3068 Metals (Sb,As,Cd,Cu,Fe,Pb,Mn,Zn), low le		6020A_LL3068A (MDD) Template for building analyte list		2340C		6020A_LL3068 Metals (Sb,As,Cd,Cu,Fe,Pb,Mn,Zn), low le	
MCPRA-DW-BA-01		10/4/15		16:30 Pacific		Water	
MCPRA-DW-RY-01		10/4/15		15:25 Pacific		Water	
MCPRA-SW-76G-02		10/5/15		08:30 Pacific		Water	
MCPRA-SW-76G-01B		10/5/15		09:30 Pacific		Water	
MCPRA-DW-SH-01		10/5/15		10:20 Pacific		Water	
MCPRA-DW-MY-01		10/5/15		15:20 Pacific		Water	
MCPRA-SW-GC-05		10/5/15		16:40 Pacific		Water	
MCPRA-SW-DP-01		10/5/15		15:25 Pacific		Water	
MCPRA-SS-76G-02		10/5/15		08:35 Pacific		Solid	
MCPRA-SS-76G-01B		10/5/15		09:35 Pacific		Solid	
MCPRA-SS-76G-01A		10/5/15		10:55 Pacific		Solid	
Possible Hazard Identification							
Unconfirmed							
Deliverable Requested: I, II, III, IV, Other (specify)							
Empty Kit Relinquished by: _____ Date: _____							
Relinquished by: _____ Date/Time: _____ Company: _____							
Relinquished by: _____ Date/Time: _____ Company: _____							
Relinquished by: _____ Date/Time: _____ Company: _____							
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No							
Custody Seal No.: _____							
Cooler Temperature(s) °C and Other Remarks:							
Special Instructions/QC Requirements:							
Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months							
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)							
Method of Shipment: _____							
Received by: _____ Date/Time: 10/6/15 1542 Company: TASC							
Received by: _____ Date/Time: _____ Company: _____							
Received by: _____ Date/Time: _____ Company: _____							



Chain of Custody Record

Client Information (Sub Contract Lab)		Sampler:	Lab PM:	Carrier Tracking No(s):		COC No:
Shipping/Receiving		Phone:	Arrington, Randee E			590-850.2
Company:		E-Mail:		Page:		Page 2 of 2
TestAmerica Laboratories, Inc.		randee.arrington@testamericainc.com		Job #:		590-2117-1
Address:		Due Date Requested:		Analysis Requested		Preservation Codes: M - Hexane N - None O - AsH2O2 P - Na2SO4 Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - ph 4-5 Z - other (specify) A - HCl B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:
City:		TAT Requested (days):		6020A_LL/306B Metals (Sb,As,Cd,Cu,Fe,Pb,Mn,Zn), low le		
State, Zip:		PO #:		6020A_LL/306A (MOD) Template for building analyte list		
WA, 98424		WO #:		2340C		
Phone:		Project #:		Perform MS/MSD (Yes or No)		
253-922-2310(Tel) 253-922-5047(Fax)		59000677		Field Filtered Sample (Yes or No)		
Email:		SSOW#:		Total Number of containers		
Project Name:		Sample Date		Special Instructions/Note:		
Monte Cristo Post-Removal Action Monitor		10/5/15				
Site:		Sample Time				
		11:25 Pacific				
Sample Identification - Client ID		Sample Type (C=Comp, G=grab)				
MCPRA-SS-76G-01		Solid				
MCPRA-SS-GC-05		Solid				
Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)		Preservation Code:				
Possible Hazard Identification		Date/Time:		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)		
Unconfirmed		Date/Time:		<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months		
Deliverable Requested: I, II, III, IV, Other (specify)		Date:		Special Instructions/QC Requirements:		
Empty Kit Relinquished by:		Date/Time:		Method of Shipment:		
Relinquished by:		Date/Time:		Received by: <i>R. Khresen</i>		
Relinquished by:		Date/Time:		Received by:		
Relinquished by:		Date/Time:		Received by:		
Custody Seals Intact: Δ Yes Δ No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		



Login Sample Receipt Checklist

Client: Cascade Earth Sciences Inc.

Job Number: 590-2117-1

Login Number: 2117

List Source: TestAmerica Spokane

List Number: 1

Creator: Kratz, Sheila J

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Login Sample Receipt Checklist

Client: Cascade Earth Sciences Inc.

Job Number: 590-2117-1

Login Number: 2117
List Number: 3
Creator: Ford, Easton

List Source: TestAmerica Nashville
List Creation: 10/09/15 05:23 PM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



Login Sample Receipt Checklist

Client: Cascade Earth Sciences Inc.

Job Number: 590-2117-1

Login Number: 2117
List Number: 2
Creator: Presley, Kim A

List Source: TestAmerica Seattle
List Creation: 10/07/15 01:46 PM

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	4.8C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Spokane
11922 East 1st Ave
Spokane, WA 99206
Tel: (509)924-9200

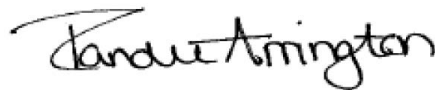
TestAmerica Job ID: 590-2141-1

Client Project/Site: Monte Cristo Post-Removal Action Monitor
Revision: 1

For:

Cascade Earth Sciences Inc.
12720 E Nora Ave
Spokane, Washington 99216

Attn: Bernard Kronschnabel



Authorized for release by:
2/16/2016 1:57:49 PM

Randee Arrington, Project Manager II
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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Job ID: 590-2141-1

Laboratory: TestAmerica Spokane

Narrative

Revision

Data was re-evaluated down to the MDL per the client's request.

Receipt

The samples were received on 10/8/2015 11:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.5° C.

Receipt Exceptions

The following sample was submitted for analysis; however, it was not listed on the Chain-of-Custody (COC): MCPRA-SS-GC-04 (590-2141-39)

GC Semi VOA

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals

Method 6020A: The continuing calibration blank (CCB) for analytical batch 203902 contained Fe above the reporting limit (RL). All reported samples associated with this CCB were either ND for this analyte or contained this analyte at a concentration greater than 10X the value found in the CCB; therefore, re-analysis of samples was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Sample Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
590-2141-1	MCPRA-SW-GC-04	Water	10/06/15 09:35	10/08/15 11:35
590-2141-2	MCPRA-SW-GC-03	Water	10/06/15 10:15	10/08/15 11:35
590-2141-3	MCPRA-SW-GC-02b	Water	10/06/15 10:50	10/08/15 11:35
590-2141-4	MCPRA-SW-GC-02	Water	10/06/15 11:10	10/08/15 11:35
590-2141-5	MCPRA-SW-GC-01	Water	10/06/15 12:00	10/08/15 11:35
590-2141-6	MCPRA-DW-PM-01	Water	10/06/15 12:55	10/08/15 11:35
590-2141-7	MCPRA-SW-DP-02	Water	10/06/15 13:00	10/08/15 11:35
590-2141-8	MCPRA-DW-ND-01	Water	10/06/15 13:40	10/08/15 11:35
590-2141-9	MCPRA-SW-SFSR-09	Water	10/06/15 16:50	10/08/15 11:35
590-2141-10	MCPRA-SW-DP-03	Water	10/06/15 17:00	10/08/15 11:35
590-2141-11	MCPRA-SW-MCL-01	Water	10/06/15 17:30	10/08/15 11:35
590-2141-12	MCPRA-SW-SFSR-08	Water	10/06/15 17:50	10/08/15 11:35
590-2141-13	MCPRA-SW-SFSR-07	Water	10/07/15 08:15	10/08/15 11:35
590-2141-14	MCPRA-SW-SFSR-06	Water	10/07/15 09:00	10/08/15 11:35
590-2141-15	MCPRA-SW-SFSR-05	Water	10/07/15 11:10	10/08/15 11:35
590-2141-16	MCPRA-SW-SFSR-04	Water	10/07/15 11:55	10/08/15 11:35
590-2141-17	MCPRA-SW-SFSR-03	Water	10/07/15 13:55	10/08/15 11:35
590-2141-18	MCPRA-SW-SFSR-02	Water	10/07/15 14:35	10/08/15 11:35
590-2141-19	MCPRA-SW-SFSR-01	Water	10/07/15 15:15	10/08/15 11:35
590-2141-20	MCPRA-SW-GC-04a	Water	10/07/15 16:55	10/08/15 11:35
590-2141-21	MCPRA-SP-JV-01	Water	10/07/15 17:05	10/08/15 11:35
590-2141-22	MCPRA-DW-JV-01	Water	10/07/15 17:40	10/08/15 11:35
590-2141-23	MCPRA-SS-GC-03	Solid	10/06/15 10:20	10/08/15 11:35
590-2141-24	MCPRA-SS-GC-02b	Solid	10/06/15 10:55	10/08/15 11:35
590-2141-25	MCPRA-SS-GC-02	Solid	10/06/15 11:15	10/08/15 11:35
590-2141-26	MCPRA-SS-GC-01	Solid	10/06/15 12:05	10/08/15 11:35
590-2141-27	MCPRA-SS-SFSR-09	Solid	10/06/15 16:55	10/08/15 11:35
590-2141-28	MCPRA-SS-MCL-01	Solid	10/06/15 17:35	10/08/15 11:35
590-2141-29	MCPRA-SS-SFSR-08	Solid	10/06/15 17:55	10/08/15 11:35
590-2141-30	MCPRA-SS-SFSR-07	Solid	10/07/15 08:20	10/08/15 11:35
590-2141-31	MCPRA-SS-SFSR-06	Solid	10/07/15 09:05	10/08/15 11:35
590-2141-32	MCPRA-SS-SFSR-05	Solid	10/07/15 11:15	10/08/15 11:35
590-2141-33	MCPRA-SS-SFSR-04	Solid	10/07/15 12:00	10/08/15 11:35
590-2141-34	MCPRA-SS-SFSR-03	Solid	10/07/15 14:00	10/08/15 11:35
590-2141-35	MCPRA-SS-SFSR-02	Solid	10/07/15 14:40	10/08/15 11:35
590-2141-36	MCPRA-SS-SFSR-01	Solid	10/07/15 15:20	10/08/15 11:35
590-2141-37	MCPRA-SS-GC-04a	Solid	10/07/15 16:55	10/08/15 11:35
590-2141-38	MCPRA-SW-EQ-01	Water	10/07/15 20:40	10/08/15 11:35
590-2141-39	MCPRA-SS-GC-04	Solid	10/06/15 09:40	10/08/15 11:35

TestAmerica Spokane

Definitions/Glossary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL. The data are considered valid because the absolute difference is less than the RL.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL. The data are considered valid because the absolute difference is less than the RL.
F1	MS and/or MSD Recovery is outside acceptance limits.
F2	MS/MSD RPD exceeds control limits
F3	Duplicate RPD exceeds the control limit
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL. The data are considered valid because the absolute difference is less than the RL.
H	Sample was prepped or analyzed beyond the specified holding time

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SW-GC-04

Lab Sample ID: 590-2141-1

Date Collected: 10/06/15 09:35

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0068		0.0010	0.00027	mg/L		10/20/15 20:39	10/21/15 13:34	1
Antimony	0.0020		0.00040	0.000080	mg/L		10/20/15 20:39	10/21/15 13:34	1
Cadmium	ND		0.00040	0.000028	mg/L		10/20/15 20:39	10/21/15 13:34	1
Copper	ND		0.0020	0.00060	mg/L		10/20/15 20:39	10/21/15 13:34	1
Iron	0.017	J	0.040	0.0058	mg/L		10/20/15 20:39	10/21/15 13:34	1
Lead	0.00013	J B	0.00040	0.000034	mg/L		10/20/15 20:39	10/21/15 13:34	1
Manganese	0.0019	J	0.0020	0.00035	mg/L		10/20/15 20:39	10/21/15 13:34	1
Zinc	0.0036	J	0.0070	0.0019	mg/L		10/20/15 20:39	10/21/15 13:34	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	20	J	25	13	mg/L			10/12/15 09:03	1
Total Suspended Solids	ND		10	4.0	mg/L			10/13/15 08:51	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	16		2.0	2.0	mg/L			10/20/15 17:03	1
pH	6.75	HF	0.100	0.100	SU			10/12/15 09:34	1

Client Sample ID: MCPRA-SW-GC-03

Lab Sample ID: 590-2141-2

Date Collected: 10/06/15 10:15

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0066		0.0010	0.00027	mg/L		10/20/15 20:39	10/21/15 14:11	1
Antimony	0.0020		0.00040	0.000080	mg/L		10/20/15 20:39	10/21/15 14:11	1
Cadmium	ND		0.00040	0.000028	mg/L		10/20/15 20:39	10/21/15 14:11	1
Copper	ND		0.0020	0.00060	mg/L		10/20/15 20:39	10/21/15 14:11	1
Iron	0.041		0.040	0.0058	mg/L		10/20/15 20:39	10/21/15 14:11	1
Lead	0.00019	J B	0.00040	0.000034	mg/L		10/20/15 20:39	10/21/15 14:11	1
Manganese	0.0026		0.0020	0.00035	mg/L		10/20/15 20:39	10/21/15 14:11	1
Zinc	0.0029	J	0.0070	0.0019	mg/L		10/20/15 20:39	10/21/15 14:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	17	J	25	13	mg/L			10/12/15 09:03	1
Total Suspended Solids	ND		10	4.0	mg/L			10/13/15 08:51	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	19		2.0	2.0	mg/L			10/20/15 17:03	1
pH	7.10	HF	0.100	0.100	SU			10/12/15 09:34	1

Client Sample ID: MCPRA-SW-GC-02b

Lab Sample ID: 590-2141-3

Date Collected: 10/06/15 10:50

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0065		0.0010	0.00027	mg/L		10/20/15 20:39	10/21/15 14:15	1
Antimony	0.0019		0.00040	0.000080	mg/L		10/20/15 20:39	10/21/15 14:15	1
Cadmium	ND		0.00040	0.000028	mg/L		10/20/15 20:39	10/21/15 14:15	1
Copper	ND		0.0020	0.00060	mg/L		10/20/15 20:39	10/21/15 14:15	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SW-GC-02b

Lab Sample ID: 590-2141-3

Date Collected: 10/06/15 10:50

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	ND		0.040	0.0058	mg/L		10/20/15 20:39	10/21/15 14:15	1
Lead	0.000073	J B	0.00040	0.000034	mg/L		10/20/15 20:39	10/21/15 14:15	1
Manganese	0.0019	J	0.0020	0.00035	mg/L		10/20/15 20:39	10/21/15 14:15	1
Zinc	0.0029	J	0.0070	0.0019	mg/L		10/20/15 20:39	10/21/15 14:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	26		25	13	mg/L			10/12/15 09:03	1
Total Suspended Solids	ND		10	4.0	mg/L			10/13/15 08:51	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	18		2.0	2.0	mg/L			10/20/15 17:03	1
pH	7.10	HF	0.100	0.100	SU			10/12/15 09:34	1

Client Sample ID: MCPRA-SW-GC-02

Lab Sample ID: 590-2141-4

Date Collected: 10/06/15 11:10

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.016		0.0010	0.00027	mg/L		10/20/15 20:39	10/21/15 14:19	1
Antimony	0.0017		0.00040	0.000080	mg/L		10/20/15 20:39	10/21/15 14:19	1
Cadmium	ND		0.00040	0.000028	mg/L		10/20/15 20:39	10/21/15 14:19	1
Copper	ND		0.0020	0.00060	mg/L		10/20/15 20:39	10/21/15 14:19	1
Iron	0.011	J	0.040	0.0058	mg/L		10/20/15 20:39	10/21/15 14:19	1
Lead	0.000091	J B	0.00040	0.000034	mg/L		10/20/15 20:39	10/21/15 14:19	1
Manganese	0.0047		0.0020	0.00035	mg/L		10/20/15 20:39	10/21/15 14:19	1
Zinc	0.0023	J	0.0070	0.0019	mg/L		10/20/15 20:39	10/21/15 14:19	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	23	J	25	13	mg/L			10/12/15 09:03	1
Total Suspended Solids	ND		10	4.0	mg/L			10/13/15 08:51	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	17		2.0	2.0	mg/L			10/20/15 17:03	1
pH	6.98	HF	0.100	0.100	SU			10/12/15 09:34	1

Client Sample ID: MCPRA-SW-GC-01

Lab Sample ID: 590-2141-5

Date Collected: 10/06/15 12:00

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0026		0.0010	0.00027	mg/L		10/20/15 20:39	10/21/15 14:23	1
Antimony	0.0024		0.00040	0.000080	mg/L		10/20/15 20:39	10/21/15 14:23	1
Cadmium	ND		0.00040	0.000028	mg/L		10/20/15 20:39	10/21/15 14:23	1
Copper	ND		0.0020	0.00060	mg/L		10/20/15 20:39	10/21/15 14:23	1
Iron	0.014	J	0.040	0.0058	mg/L		10/20/15 20:39	10/21/15 14:23	1
Lead	0.000067	J B	0.00040	0.000034	mg/L		10/20/15 20:39	10/21/15 14:23	1
Manganese	0.0017	J	0.0020	0.00035	mg/L		10/20/15 20:39	10/21/15 14:23	1
Zinc	ND		0.0070	0.0019	mg/L		10/20/15 20:39	10/21/15 14:23	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		25	13	mg/L			10/12/15 09:03	1
Total Suspended Solids	ND		10	4.0	mg/L			10/13/15 08:51	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	16		2.0	2.0	mg/L			10/20/15 17:03	1
pH	7.20	HF	0.100	0.100	SU			10/12/15 09:34	1

Client Sample ID: MCPRA-DW-PM-01

Lab Sample ID: 590-2141-6

Date Collected: 10/06/15 12:55

Matrix: Water

Date Received: 10/08/15 11:35

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.57	J	0.80	0.15	mg/L			10/12/15 11:56	1
Sulfate	65		0.50	0.13	mg/L			10/12/15 11:56	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	28		1.0	0.022	mg/L		10/16/15 17:02	10/19/15 14:14	1
Magnesium	5.4		0.50	0.0056	mg/L		10/16/15 17:02	10/19/15 14:14	1
Potassium	1.1		1.0	0.13	mg/L		10/16/15 17:02	10/19/15 14:14	1
Sodium	1.1		0.50	0.021	mg/L		10/16/15 17:02	10/19/15 14:14	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.2		0.0010	0.00027	mg/L		10/20/15 20:39	10/21/15 14:27	1
Antimony	0.023		0.00040	0.000080	mg/L		10/20/15 20:39	10/21/15 14:27	1
Cadmium	0.013		0.00040	0.000028	mg/L		10/20/15 20:39	10/21/15 14:27	1
Copper	1.1		0.0020	0.00060	mg/L		10/20/15 20:39	10/21/15 14:27	1
Iron	6.1		0.040	0.0058	mg/L		10/20/15 20:39	10/21/15 14:27	1
Lead	0.19	B	0.00040	0.000034	mg/L		10/20/15 20:39	10/21/15 14:27	1
Manganese	0.55		0.0020	0.00035	mg/L		10/20/15 20:39	10/21/15 14:27	1
Zinc	2.1		0.0070	0.0019	mg/L		10/20/15 20:39	10/21/15 14:27	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acidity as CaCO3	ND		20	10	mg/L			10/20/15 17:48	1
Alkalinity	35		4.0	1.7	mg/L			10/19/15 08:09	1
Total Dissolved Solids	140		25	13	mg/L			10/12/15 09:03	1
Total Suspended Solids	31		19	7.7	mg/L			10/13/15 08:51	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	100		2.0	2.0	mg/L			10/20/15 17:03	1
pH	7.16	HF	0.100	0.100	SU			10/12/15 09:34	1

Client Sample ID: MCPRA-SW-DP-02

Lab Sample ID: 590-2141-7

Date Collected: 10/06/15 13:00

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.9		0.0010	0.00027	mg/L		10/20/15 20:39	10/21/15 14:31	1
Antimony	0.024		0.00040	0.000080	mg/L		10/20/15 20:39	10/21/15 14:31	1
Cadmium	0.016		0.00040	0.000028	mg/L		10/20/15 20:39	10/21/15 14:31	1
Copper	1.5		0.0020	0.00060	mg/L		10/20/15 20:39	10/21/15 14:31	1
Iron	8.3		0.040	0.0058	mg/L		10/20/15 20:39	10/21/15 14:31	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SW-DP-02

Date Collected: 10/06/15 13:00

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-7

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	0.26	B	0.00040	0.000034	mg/L		10/20/15 20:39	10/21/15 14:31	1
Manganese	0.51		0.0020	0.00035	mg/L		10/20/15 20:39	10/21/15 14:31	1
Zinc	2.5		0.0070	0.0019	mg/L		10/20/15 20:39	10/21/15 14:31	1

Client Sample ID: MCPRA-DW-ND-01

Date Collected: 10/06/15 13:40

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-8

Matrix: Water

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.94		0.80	0.15	mg/L			10/12/15 12:10	1
Sulfate	93		0.50	0.13	mg/L			10/12/15 12:10	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	24		1.0	0.022	mg/L		10/16/15 17:02	10/19/15 14:16	1
Magnesium	8.5		0.50	0.0056	mg/L		10/16/15 17:02	10/19/15 14:16	1
Potassium	1.1		1.0	0.13	mg/L		10/16/15 17:02	10/19/15 14:16	1
Sodium	1.9		0.50	0.021	mg/L		10/16/15 17:02	10/19/15 14:16	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.034		0.0010	0.00027	mg/L		10/20/15 20:39	10/21/15 14:35	1
Antimony	0.0022		0.00040	0.000080	mg/L		10/20/15 20:39	10/21/15 14:35	1
Cadmium	0.0068		0.00040	0.000028	mg/L		10/20/15 20:39	10/21/15 14:35	1
Copper	0.11		0.0020	0.00060	mg/L		10/20/15 20:39	10/21/15 14:35	1
Iron	0.91		0.040	0.0058	mg/L		10/20/15 20:39	10/21/15 14:35	1
Lead	0.014	B	0.00040	0.000034	mg/L		10/20/15 20:39	10/21/15 14:35	1
Manganese	1.1		0.0020	0.00035	mg/L		10/20/15 20:39	10/21/15 14:35	1
Zinc	0.71		0.0070	0.0019	mg/L		10/20/15 20:39	10/21/15 14:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	15		4.0	1.7	mg/L			10/19/15 08:09	1
Total Dissolved Solids	140		25	13	mg/L			10/12/15 09:03	1
Total Suspended Solids	4.0	J	10	4.0	mg/L			10/13/15 08:51	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	91		2.0	2.0	mg/L			10/20/15 17:03	1
pH	6.19	HF	0.100	0.100	SU			10/12/15 09:34	1

Client Sample ID: MCPRA-SW-SFSR-09

Date Collected: 10/06/15 16:50

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-9

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.086		0.0010	0.00027	mg/L		10/20/15 20:39	10/21/15 14:39	1
Antimony	0.0067		0.00040	0.000080	mg/L		10/20/15 20:39	10/21/15 14:39	1
Cadmium	0.000098	J	0.00040	0.000028	mg/L		10/20/15 20:39	10/21/15 14:39	1
Copper	0.0018	J	0.0020	0.00060	mg/L		10/20/15 20:39	10/21/15 14:39	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SW-SFSR-09

Date Collected: 10/06/15 16:50

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-9

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.89		0.040	0.0058	mg/L		10/20/15 20:39	10/21/15 14:39	1
Lead	0.0032	B	0.00040	0.000034	mg/L		10/20/15 20:39	10/21/15 14:39	1
Manganese	0.050		0.0020	0.00035	mg/L		10/20/15 20:39	10/21/15 14:39	1
Zinc	0.0082		0.0070	0.0019	mg/L		10/20/15 20:39	10/21/15 14:39	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	26		25	13	mg/L			10/12/15 09:03	1
Total Suspended Solids	8.0	J	10	4.0	mg/L			10/13/15 08:51	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	26		2.0	2.0	mg/L			10/20/15 17:03	1
pH	6.89	HF	0.100	0.100	SU			10/12/15 09:34	1

Client Sample ID: MCPRA-SW-DP-03

Date Collected: 10/06/15 17:00

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-10

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.054		0.0010	0.00027	mg/L		10/20/15 20:39	10/21/15 14:43	1
Antimony	0.0064		0.00040	0.000080	mg/L		10/20/15 20:39	10/21/15 14:43	1
Cadmium	0.000041	J	0.00040	0.000028	mg/L		10/20/15 20:39	10/21/15 14:43	1
Copper	0.00086	J	0.0020	0.00060	mg/L		10/20/15 20:39	10/21/15 14:43	1
Iron	0.34		0.040	0.0058	mg/L		10/20/15 20:39	10/21/15 14:43	1
Lead	0.00090	B	0.00040	0.000034	mg/L		10/20/15 20:39	10/21/15 14:43	1
Manganese	0.039		0.0020	0.00035	mg/L		10/20/15 20:39	10/21/15 14:43	1
Zinc	0.0068	J	0.0070	0.0019	mg/L		10/20/15 20:39	10/21/15 14:43	1

Client Sample ID: MCPRA-SW-MCL-01

Date Collected: 10/06/15 17:30

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-11

Matrix: Water

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.19		0.0010	0.00027	mg/L		10/20/15 20:39	10/21/15 14:47	1
Antimony	0.0051		0.00040	0.000080	mg/L		10/20/15 20:39	10/21/15 14:47	1
Cadmium	0.000059	J	0.00040	0.000028	mg/L		10/20/15 20:39	10/21/15 14:47	1
Copper	0.0019	J	0.0020	0.00060	mg/L		10/20/15 20:39	10/21/15 14:47	1
Iron	0.95		0.040	0.0058	mg/L		10/20/15 20:39	10/21/15 14:47	1
Lead	0.0017	B	0.00040	0.000034	mg/L		10/20/15 20:39	10/21/15 14:47	1
Manganese	0.065		0.0020	0.00035	mg/L		10/20/15 20:39	10/21/15 14:47	1
Zinc	0.0057	J	0.0070	0.0019	mg/L		10/20/15 20:39	10/21/15 14:47	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	47		25	13	mg/L			10/12/15 09:03	1
Total Suspended Solids	ND		10	4.0	mg/L			10/13/15 08:51	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	20		2.0	2.0	mg/L			10/20/15 17:03	1
pH	6.83	HF	0.100	0.100	SU			10/12/15 09:34	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SW-SFSR-08

Lab Sample ID: 590-2141-12

Date Collected: 10/06/15 17:50

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.013		0.0010	0.00027	mg/L		10/20/15 20:39	10/21/15 15:08	1
Antimony	0.0051		0.00040	0.000080	mg/L		10/20/15 20:39	10/21/15 15:08	1
Cadmium	0.000048	J	0.00040	0.000028	mg/L		10/20/15 20:39	10/21/15 15:08	1
Copper	ND		0.0020	0.00060	mg/L		10/20/15 20:39	10/21/15 15:08	1
Iron	0.011	J	0.040	0.0058	mg/L		10/20/15 20:39	10/21/15 15:08	1
Lead	0.000087	J B	0.00040	0.000034	mg/L		10/20/15 20:39	10/21/15 15:08	1
Manganese	0.0046		0.0020	0.00035	mg/L		10/20/15 20:39	10/21/15 15:08	1
Zinc	0.0030	J	0.0070	0.0019	mg/L		10/20/15 20:39	10/21/15 15:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	27		25	13	mg/L			10/12/15 09:03	1
Total Suspended Solids	ND		10	4.0	mg/L			10/13/15 08:51	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	16		2.0	2.0	mg/L			10/20/15 17:03	1
pH	7.17	HF	0.100	0.100	SU			10/12/15 09:34	1

Client Sample ID: MCPRA-SW-SFSR-07

Lab Sample ID: 590-2141-13

Date Collected: 10/07/15 08:15

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.012		0.0010	0.00027	mg/L		10/20/15 20:39	10/21/15 15:12	1
Antimony	0.0052		0.00040	0.000080	mg/L		10/20/15 20:39	10/21/15 15:12	1
Cadmium	0.000050	J	0.00040	0.000028	mg/L		10/20/15 20:39	10/21/15 15:12	1
Copper	ND		0.0020	0.00060	mg/L		10/20/15 20:39	10/21/15 15:12	1
Iron	0.011	J	0.040	0.0058	mg/L		10/20/15 20:39	10/21/15 15:12	1
Lead	0.00078	B	0.00040	0.000034	mg/L		10/20/15 20:39	10/21/15 15:12	1
Manganese	0.0010	J	0.0020	0.00035	mg/L		10/20/15 20:39	10/21/15 15:12	1
Zinc	0.0042	J	0.0070	0.0019	mg/L		10/20/15 20:39	10/21/15 15:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	26		25	13	mg/L			10/14/15 14:04	1
Total Suspended Solids	ND		10	4.0	mg/L			10/13/15 08:52	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	17		2.0	2.0	mg/L			10/20/15 17:03	1
pH	7.15	HF	0.100	0.100	SU			10/12/15 09:34	1

Client Sample ID: MCPRA-SW-SFSR-06

Lab Sample ID: 590-2141-14

Date Collected: 10/07/15 09:00

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.013		0.0010	0.00027	mg/L		10/20/15 20:39	10/21/15 15:16	1
Antimony	0.0054		0.00040	0.000080	mg/L		10/20/15 20:39	10/21/15 15:16	1
Cadmium	0.000051	J	0.00040	0.000028	mg/L		10/20/15 20:39	10/21/15 15:16	1
Copper	0.00083	J	0.0020	0.00060	mg/L		10/20/15 20:39	10/21/15 15:16	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SW-SFSR-06

Lab Sample ID: 590-2141-14

Date Collected: 10/07/15 09:00

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	0.021	J	0.040	0.0058	mg/L		10/20/15 20:39	10/21/15 15:16	1
Lead	0.000087	J B	0.00040	0.000034	mg/L		10/20/15 20:39	10/21/15 15:16	1
Manganese	0.0019	J	0.0020	0.00035	mg/L		10/20/15 20:39	10/21/15 15:16	1
Zinc	0.013		0.0070	0.0019	mg/L		10/20/15 20:39	10/21/15 15:16	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	52		25	13	mg/L			10/14/15 14:04	1
Total Suspended Solids	ND		10	4.0	mg/L			10/13/15 08:52	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	16		2.0	2.0	mg/L			10/20/15 17:03	1
pH	7.16	HF	0.100	0.100	SU			10/20/15 08:56	1

Client Sample ID: MCPRA-SW-SFSR-05

Lab Sample ID: 590-2141-15

Date Collected: 10/07/15 11:10

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.012		0.0010	0.00027	mg/L		10/20/15 20:39	10/21/15 15:20	1
Antimony	0.0048		0.00040	0.000080	mg/L		10/20/15 20:39	10/21/15 15:20	1
Cadmium	0.000047	J	0.00040	0.000028	mg/L		10/20/15 20:39	10/21/15 15:20	1
Copper	ND		0.0020	0.00060	mg/L		10/20/15 20:39	10/21/15 15:20	1
Iron	0.012	J	0.040	0.0058	mg/L		10/20/15 20:39	10/21/15 15:20	1
Lead	0.00010	J B	0.00040	0.000034	mg/L		10/20/15 20:39	10/21/15 15:20	1
Manganese	0.0036		0.0020	0.00035	mg/L		10/20/15 20:39	10/21/15 15:20	1
Zinc	0.0046	J	0.0070	0.0019	mg/L		10/20/15 20:39	10/21/15 15:20	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	26		25	13	mg/L			10/14/15 14:04	1
Total Suspended Solids	ND		10	4.0	mg/L			10/13/15 08:52	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	16		2.0	2.0	mg/L			10/20/15 17:03	1
pH	7.10	HF	0.100	0.100	SU			10/20/15 08:56	1

Client Sample ID: MCPRA-SW-SFSR-04

Lab Sample ID: 590-2141-16

Date Collected: 10/07/15 11:55

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.011		0.0010	0.00027	mg/L		10/21/15 11:25	10/22/15 12:46	1
Antimony	0.0038		0.00040	0.000080	mg/L		10/21/15 11:25	10/22/15 12:46	1
Cadmium	0.000063	J	0.00040	0.000028	mg/L		10/21/15 11:25	10/22/15 12:46	1
Copper	0.00068	J	0.0020	0.00060	mg/L		10/21/15 11:25	10/22/15 12:46	1
Iron	0.012	J B	0.040	0.0058	mg/L		10/21/15 11:25	10/22/15 12:46	1
Lead	0.000057	J	0.00040	0.000034	mg/L		10/21/15 11:25	10/22/15 12:46	1
Manganese	0.00064	J	0.0020	0.00035	mg/L		10/21/15 11:25	10/22/15 12:46	1
Zinc	0.0044	J	0.0070	0.0019	mg/L		10/21/15 11:25	10/22/15 12:46	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	27		25	13	mg/L			10/14/15 14:04	1
Total Suspended Solids	ND		10	4.0	mg/L			10/13/15 08:52	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	14		2.0	2.0	mg/L			10/20/15 17:03	1
pH	7.14	HF	0.100	0.100	SU			10/20/15 08:56	1

Client Sample ID: MCPRA-SW-SFSR-03

Lab Sample ID: 590-2141-17

Date Collected: 10/07/15 13:55

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0098		0.0010	0.00027	mg/L		10/21/15 11:25	10/22/15 12:51	1
Antimony	0.0026		0.00040	0.000080	mg/L		10/21/15 11:25	10/22/15 12:51	1
Cadmium	0.00011	J	0.00040	0.000028	mg/L		10/21/15 11:25	10/22/15 12:51	1
Copper	ND		0.0020	0.00060	mg/L		10/21/15 11:25	10/22/15 12:51	1
Iron	ND		0.040	0.0058	mg/L		10/21/15 11:25	10/22/15 12:51	1
Lead	0.000064	J	0.00040	0.000034	mg/L		10/21/15 11:25	10/22/15 12:51	1
Manganese	ND		0.0020	0.00035	mg/L		10/21/15 11:25	10/22/15 12:51	1
Zinc	0.0089		0.0070	0.0019	mg/L		10/21/15 11:25	10/22/15 12:51	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	15	J	25	13	mg/L			10/14/15 14:04	1
Total Suspended Solids	ND		10	4.0	mg/L			10/13/15 08:52	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	9.4		2.0	2.0	mg/L			10/20/15 17:03	1
pH	6.93	HF	0.100	0.100	SU			10/20/15 08:56	1

Client Sample ID: MCPRA-SW-SFSR-02

Lab Sample ID: 590-2141-18

Date Collected: 10/07/15 14:35

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.015		0.0010	0.00027	mg/L		10/21/15 11:25	10/22/15 12:56	1
Antimony	0.0036		0.00040	0.000080	mg/L		10/21/15 11:25	10/22/15 12:56	1
Cadmium	0.00013	J	0.00040	0.000028	mg/L		10/21/15 11:25	10/22/15 12:56	1
Copper	0.0011	J	0.0020	0.00060	mg/L		10/21/15 11:25	10/22/15 12:56	1
Iron	0.0059	J B	0.040	0.0058	mg/L		10/21/15 11:25	10/22/15 12:56	1
Lead	0.00012	J	0.00040	0.000034	mg/L		10/21/15 11:25	10/22/15 12:56	1
Manganese	0.00061	J	0.0020	0.00035	mg/L		10/21/15 11:25	10/22/15 12:56	1
Zinc	0.011		0.0070	0.0019	mg/L		10/21/15 11:25	10/22/15 12:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	21	J	25	13	mg/L			10/14/15 14:04	1
Total Suspended Solids	ND		10	4.0	mg/L			10/13/15 08:52	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	9.4		2.0	2.0	mg/L			10/20/15 17:03	1
pH	6.97	HF	0.100	0.100	SU			10/20/15 08:56	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SW-SFSR-01

Lab Sample ID: 590-2141-19

Date Collected: 10/07/15 15:15

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.012		0.0010	0.00027	mg/L		10/21/15 11:25	10/22/15 13:00	1
Antimony	0.0018		0.00040	0.000080	mg/L		10/21/15 11:25	10/22/15 13:00	1
Cadmium	0.000058	J	0.00040	0.000028	mg/L		10/21/15 11:25	10/22/15 13:00	1
Copper	0.00080	J	0.0020	0.00060	mg/L		10/21/15 11:25	10/22/15 13:00	1
Iron	0.017	J B	0.040	0.0058	mg/L		10/21/15 11:25	10/22/15 13:00	1
Lead	0.00017	J	0.00040	0.000034	mg/L		10/21/15 11:25	10/22/15 13:00	1
Manganese	0.0024		0.0020	0.00035	mg/L		10/21/15 11:25	10/22/15 13:00	1
Zinc	0.0061	J	0.0070	0.0019	mg/L		10/21/15 11:25	10/22/15 13:00	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	20	J	25	13	mg/L			10/14/15 14:04	1
Total Suspended Solids	ND		10	4.0	mg/L			10/13/15 08:52	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	11		2.0	2.0	mg/L			10/20/15 17:03	1
pH	6.96	HF	0.100	0.100	SU			10/20/15 08:56	1

Client Sample ID: MCPRA-SW-GC-04a

Lab Sample ID: 590-2141-20

Date Collected: 10/07/15 16:55

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.018		0.0010	0.00027	mg/L		10/21/15 11:25	10/22/15 13:05	1
Antimony	0.0022		0.00040	0.000080	mg/L		10/21/15 11:25	10/22/15 13:05	1
Cadmium	0.000094	J	0.00040	0.000028	mg/L		10/21/15 11:25	10/22/15 13:05	1
Copper	0.0013	J	0.0020	0.00060	mg/L		10/21/15 11:25	10/22/15 13:05	1
Iron	0.051	B	0.040	0.0058	mg/L		10/21/15 11:25	10/22/15 13:05	1
Lead	0.00033	J	0.00040	0.000034	mg/L		10/21/15 11:25	10/22/15 13:05	1
Manganese	0.0085		0.0020	0.00035	mg/L		10/21/15 11:25	10/22/15 13:05	1
Zinc	0.012		0.0070	0.0019	mg/L		10/21/15 11:25	10/22/15 13:05	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	21	J	25	13	mg/L			10/14/15 14:04	1
Total Suspended Solids	7.0	J	10	4.0	mg/L			10/13/15 08:52	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	15		2.0	2.0	mg/L			10/20/15 17:03	1
pH	6.94	HF	0.100	0.100	SU			10/20/15 08:56	1

Client Sample ID: MCPRA-SP-JV-01

Lab Sample ID: 590-2141-21

Date Collected: 10/07/15 17:05

Matrix: Water

Date Received: 10/08/15 11:35

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	2.3		0.80	0.15	mg/L			10/12/15 12:24	1
Sulfate	43		0.50	0.13	mg/L			10/12/15 12:24	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SP-JV-01

Lab Sample ID: 590-2141-21

Date Collected: 10/07/15 17:05

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	24		1.0	0.022	mg/L		10/16/15 17:02	10/19/15 14:19	1
Magnesium	2.7		0.50	0.0056	mg/L		10/16/15 17:02	10/19/15 14:19	1
Potassium	0.77	J	1.0	0.13	mg/L		10/16/15 17:02	10/19/15 14:19	1
Sodium	2.7		0.50	0.021	mg/L		10/16/15 17:02	10/19/15 14:19	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.32		0.0010	0.00027	mg/L		10/21/15 11:25	10/22/15 13:10	1
Antimony	0.011		0.00040	0.000080	mg/L		10/21/15 11:25	10/22/15 13:10	1
Cadmium	0.00039	J	0.00040	0.000028	mg/L		10/21/15 11:25	10/22/15 13:10	1
Copper	0.0033		0.0020	0.00060	mg/L		10/21/15 11:25	10/22/15 13:10	1
Iron	0.058	B	0.040	0.0058	mg/L		10/21/15 11:25	10/22/15 13:10	1
Lead	0.0011		0.00040	0.000034	mg/L		10/21/15 11:25	10/22/15 13:10	1
Manganese	0.0041		0.0020	0.00035	mg/L		10/21/15 11:25	10/22/15 13:10	1
Zinc	0.047		0.0070	0.0019	mg/L		10/21/15 11:25	10/22/15 13:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	35		4.0	1.7	mg/L			10/19/15 08:09	1
Total Dissolved Solids	100		25	13	mg/L			10/14/15 14:04	1
Total Suspended Solids	ND		10	4.0	mg/L			10/13/15 08:52	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	69		2.0	2.0	mg/L			10/20/15 17:03	1
pH	7.53	HF	0.100	0.100	SU			10/20/15 08:56	1

Client Sample ID: MCPRA-DW-JV-01

Lab Sample ID: 590-2141-22

Date Collected: 10/07/15 17:40

Matrix: Water

Date Received: 10/08/15 11:35

Method: 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.2		0.80	0.15	mg/L			10/12/15 12:38	1
Sulfate	44	F1	0.50	0.13	mg/L			10/12/15 12:38	1

Method: 6010C - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	24		1.0	0.022	mg/L		10/16/15 17:02	10/19/15 14:22	1
Magnesium	2.9		0.50	0.0056	mg/L		10/16/15 17:02	10/19/15 14:22	1
Potassium	0.45	J	1.0	0.13	mg/L		10/16/15 17:02	10/19/15 14:22	1
Sodium	2.8		0.50	0.021	mg/L		10/16/15 17:02	10/19/15 14:22	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.20		0.0010	0.00027	mg/L		10/21/15 11:25	10/22/15 12:37	1
Antimony	0.0093		0.00040	0.000080	mg/L		10/21/15 11:25	10/22/15 12:37	1
Cadmium	0.00019	J	0.00040	0.000028	mg/L		10/21/15 11:25	10/22/15 12:37	1
Copper	0.0018	J	0.0020	0.00060	mg/L		10/21/15 11:25	10/22/15 12:37	1
Iron	0.046	B	0.040	0.0058	mg/L		10/21/15 11:25	10/22/15 12:37	1
Lead	0.00023	J	0.00040	0.000034	mg/L		10/21/15 11:25	10/22/15 12:37	1
Manganese	0.015		0.0020	0.00035	mg/L		10/21/15 11:25	10/22/15 12:37	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-DW-JV-01

Lab Sample ID: 590-2141-22

Date Collected: 10/07/15 17:40

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Zinc	0.027		0.0070	0.0019	mg/L		10/21/15 11:25	10/22/15 12:37	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acidity as CaCO3	1900		20	10	mg/L			10/20/15 17:55	1
Alkalinity	43		4.3	1.8	mg/L			10/19/15 08:09	1
Total Dissolved Solids	110		25	13	mg/L			10/14/15 14:04	1
Total Suspended Solids	ND		10	4.0	mg/L			10/13/15 08:52	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	73		2.0	2.0	mg/L			10/20/15 17:03	1
pH	7.69	HF	0.100	0.100	SU			10/20/15 08:56	1

Client Sample ID: MCPRA-SS-GC-03

Lab Sample ID: 590-2141-23

Date Collected: 10/06/15 10:20

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 71.6

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	36		0.13	0.026	mg/Kg	☼	10/21/15 09:22	10/21/15 18:17	5
Arsenic	260		0.31	0.11	mg/Kg	☼	10/21/15 09:22	10/21/15 18:17	5
Cadmium	1.2		0.13	0.012	mg/Kg	☼	10/21/15 09:22	10/21/15 18:17	5
Copper	35	F1	0.25	0.062	mg/Kg	☼	10/21/15 09:22	10/21/15 18:17	5
Iron	22000		25	6.7	mg/Kg	☼	10/21/15 09:22	10/21/15 18:17	5
Lead	69		0.31	0.030	mg/Kg	☼	10/21/15 09:22	10/21/15 18:17	5
Manganese	1300		0.63	0.11	mg/Kg	☼	10/21/15 09:22	10/21/15 18:17	5
Zinc	220		3.1	0.70	mg/Kg	☼	10/21/15 09:22	10/21/15 18:17	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.17	F1 F2	0.052	0.0021	mg/Kg	☼	10/19/15 08:15	10/19/15 14:16	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.19	H	0.100	0.100	SU			10/20/15 09:08	1

Client Sample ID: MCPRA-SS-GC-02b

Lab Sample ID: 590-2141-24

Date Collected: 10/06/15 10:55

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 77.5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	24		0.12	0.024	mg/Kg	☼	10/21/15 09:22	10/21/15 18:53	5
Arsenic	130		0.29	0.10	mg/Kg	☼	10/21/15 09:22	10/21/15 18:53	5
Cadmium	0.85		0.12	0.011	mg/Kg	☼	10/21/15 09:22	10/21/15 18:53	5
Copper	29		0.23	0.057	mg/Kg	☼	10/21/15 09:22	10/21/15 18:53	5
Iron	21000	^	23	6.2	mg/Kg	☼	10/21/15 09:22	10/21/15 18:53	5
Lead	73		0.29	0.028	mg/Kg	☼	10/21/15 09:22	10/21/15 18:53	5
Manganese	1300		0.58	0.098	mg/Kg	☼	10/21/15 09:22	10/21/15 18:53	5
Zinc	140		2.9	0.65	mg/Kg	☼	10/21/15 09:22	10/21/15 18:53	5

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SS-GC-02b

Date Collected: 10/06/15 10:55

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-24

Matrix: Solid

Percent Solids: 77.5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.36		0.045	0.0018	mg/Kg	☼	10/19/15 08:15	10/19/15 14:25	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.21	H	0.100	0.100	SU			10/20/15 09:08	1

Client Sample ID: MCPRA-SS-GC-02

Date Collected: 10/06/15 11:15

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-25

Matrix: Solid

Percent Solids: 72.8

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	35		0.12	0.026	mg/Kg	☼	10/21/15 09:22	10/21/15 18:58	5
Arsenic	310		0.31	0.11	mg/Kg	☼	10/21/15 09:22	10/21/15 18:58	5
Cadmium	0.65		0.12	0.012	mg/Kg	☼	10/21/15 09:22	10/21/15 18:58	5
Copper	36		0.25	0.061	mg/Kg	☼	10/21/15 09:22	10/21/15 18:58	5
Iron	30000	^	25	6.7	mg/Kg	☼	10/21/15 09:22	10/21/15 18:58	5
Lead	41		0.31	0.030	mg/Kg	☼	10/21/15 09:22	10/21/15 18:58	5
Manganese	1200		0.62	0.11	mg/Kg	☼	10/21/15 09:22	10/21/15 18:58	5
Zinc	160		3.1	0.70	mg/Kg	☼	10/21/15 09:22	10/21/15 18:58	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.19		0.054	0.0022	mg/Kg	☼	10/19/15 08:15	10/19/15 14:28	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.06	H	0.100	0.100	SU			10/20/15 09:08	1

Client Sample ID: MCPRA-SS-GC-01

Date Collected: 10/06/15 12:05

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-26

Matrix: Solid

Percent Solids: 80.8

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	19		0.11	0.022	mg/Kg	☼	10/21/15 09:22	10/21/15 19:03	5
Arsenic	55		0.26	0.095	mg/Kg	☼	10/21/15 09:22	10/21/15 19:03	5
Cadmium	0.20		0.11	0.010	mg/Kg	☼	10/21/15 09:22	10/21/15 19:03	5
Copper	13		0.21	0.052	mg/Kg	☼	10/21/15 09:22	10/21/15 19:03	5
Iron	15000	^	21	5.7	mg/Kg	☼	10/21/15 09:22	10/21/15 19:03	5
Lead	9.4		0.26	0.025	mg/Kg	☼	10/21/15 09:22	10/21/15 19:03	5
Manganese	990		0.53	0.090	mg/Kg	☼	10/21/15 09:22	10/21/15 19:03	5
Zinc	46		2.6	0.59	mg/Kg	☼	10/21/15 09:22	10/21/15 19:03	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.26		0.054	0.0022	mg/Kg	☼	10/19/15 08:15	10/19/15 14:30	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.38	H	0.100	0.100	SU			10/20/15 09:08	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SS-SFSR-09

Date Collected: 10/06/15 16:55

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-27

Matrix: Solid

Percent Solids: 57.7

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	60		0.16	0.033	mg/Kg	☼	10/21/15 09:22	10/21/15 19:07	5
Arsenic	780		0.39	0.14	mg/Kg	☼	10/21/15 09:22	10/21/15 19:07	5
Cadmium	2.1		0.16	0.015	mg/Kg	☼	10/21/15 09:22	10/21/15 19:07	5
Copper	120		0.32	0.077	mg/Kg	☼	10/21/15 09:22	10/21/15 19:07	5
Iron	33000	^	32	8.4	mg/Kg	☼	10/21/15 09:22	10/21/15 19:07	5
Lead	210		0.39	0.038	mg/Kg	☼	10/21/15 09:22	10/21/15 19:07	5
Manganese	790		0.79	0.13	mg/Kg	☼	10/21/15 09:22	10/21/15 19:07	5
Zinc	340		3.9	0.88	mg/Kg	☼	10/21/15 09:22	10/21/15 19:07	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.17		0.069	0.0028	mg/Kg	☼	10/19/15 08:15	10/19/15 14:32	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.05	H	0.100	0.100	SU	-		10/20/15 09:08	1

Client Sample ID: MCPRA-SS-MCL-01

Date Collected: 10/06/15 17:35

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-28

Matrix: Solid

Percent Solids: 40.6

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	25		0.22	0.046	mg/Kg	☼	10/21/15 09:22	10/21/15 19:12	5
Arsenic	640		0.55	0.20	mg/Kg	☼	10/21/15 09:22	10/21/15 19:12	5
Cadmium	1.1		0.22	0.021	mg/Kg	☼	10/21/15 09:22	10/21/15 19:12	5
Copper	93		0.44	0.11	mg/Kg	☼	10/21/15 09:22	10/21/15 19:12	5
Iron	32000	^	44	12	mg/Kg	☼	10/21/15 09:22	10/21/15 19:12	5
Lead	84		0.55	0.053	mg/Kg	☼	10/21/15 09:22	10/21/15 19:12	5
Manganese	420		1.1	0.19	mg/Kg	☼	10/21/15 09:22	10/21/15 19:12	5
Zinc	160		5.5	1.2	mg/Kg	☼	10/21/15 09:22	10/21/15 19:12	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.19		0.080	0.0032	mg/Kg	☼	10/19/15 08:15	10/19/15 14:39	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	6.90	H	0.100	0.100	SU	-		10/20/15 09:08	1

Client Sample ID: MCPRA-SS-SFSR-08

Date Collected: 10/06/15 17:55

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-29

Matrix: Solid

Percent Solids: 71.9

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	34		0.13	0.027	mg/Kg	☼	10/21/15 09:22	10/21/15 19:16	5
Arsenic	300		0.32	0.11	mg/Kg	☼	10/21/15 09:22	10/21/15 19:16	5
Cadmium	1.1		0.13	0.012	mg/Kg	☼	10/21/15 09:22	10/21/15 19:16	5
Copper	80		0.25	0.062	mg/Kg	☼	10/21/15 09:22	10/21/15 19:16	5
Iron	29000	^	25	6.8	mg/Kg	☼	10/21/15 09:22	10/21/15 19:16	5

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SS-SFSR-08

Date Collected: 10/06/15 17:55

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-29

Matrix: Solid

Percent Solids: 71.9

Method: 6020A - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	100		0.32	0.030	mg/Kg	☼	10/21/15 09:22	10/21/15 19:16	5
Manganese	680		0.63	0.11	mg/Kg	☼	10/21/15 09:22	10/21/15 19:16	5
Zinc	210		3.2	0.71	mg/Kg	☼	10/21/15 09:22	10/21/15 19:16	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.026	J	0.042	0.0017	mg/Kg	☼	10/19/15 08:15	10/19/15 14:41	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.57	H	0.100	0.100	SU			10/20/15 09:08	1

Client Sample ID: MCPRA-SS-SFSR-07

Date Collected: 10/07/15 08:20

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-30

Matrix: Solid

Percent Solids: 88.9

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	11		0.10	0.021	mg/Kg	☼	10/21/15 09:22	10/21/15 19:21	5
Arsenic	57		0.25	0.090	mg/Kg	☼	10/21/15 09:22	10/21/15 19:21	5
Cadmium	0.77		0.10	0.0095	mg/Kg	☼	10/21/15 09:22	10/21/15 19:21	5
Copper	34		0.20	0.049	mg/Kg	☼	10/21/15 09:22	10/21/15 19:21	5
Iron	21000	^	20	5.3	mg/Kg	☼	10/21/15 09:22	10/21/15 19:21	5
Lead	31		0.25	0.024	mg/Kg	☼	10/21/15 09:22	10/21/15 19:21	5
Manganese	500		0.50	0.085	mg/Kg	☼	10/21/15 09:22	10/21/15 19:21	5
Zinc	140		2.5	0.56	mg/Kg	☼	10/21/15 09:22	10/21/15 19:21	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.020	J	0.030	0.0012	mg/Kg	☼	10/19/15 08:15	10/19/15 14:44	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.64	H	0.100	0.100	SU			10/20/15 09:08	1

Client Sample ID: MCPRA-SS-SFSR-06

Date Collected: 10/07/15 09:05

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-31

Matrix: Solid

Percent Solids: 81.9

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	44		0.11	0.022	mg/Kg	☼	10/21/15 09:22	10/21/15 19:25	5
Arsenic	180		0.26	0.095	mg/Kg	☼	10/21/15 09:22	10/21/15 19:25	5
Cadmium	0.73		0.11	0.010	mg/Kg	☼	10/21/15 09:22	10/21/15 19:25	5
Copper	53		0.21	0.052	mg/Kg	☼	10/21/15 09:22	10/21/15 19:25	5
Iron	23000	^	21	5.7	mg/Kg	☼	10/21/15 09:22	10/21/15 19:25	5
Lead	140		0.26	0.025	mg/Kg	☼	10/21/15 09:22	10/21/15 19:25	5
Manganese	480		0.53	0.090	mg/Kg	☼	10/21/15 09:22	10/21/15 19:25	5
Zinc	140		2.6	0.59	mg/Kg	☼	10/21/15 09:22	10/21/15 19:25	5

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SS-SFSR-06

Date Collected: 10/07/15 09:05

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-31

Matrix: Solid

Percent Solids: 81.9

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.054		0.048	0.0019	mg/Kg	☼	10/19/15 08:15	10/19/15 14:46	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.56	H	0.100	0.100	SU			10/20/15 09:08	1

Client Sample ID: MCPRA-SS-SFSR-05

Date Collected: 10/07/15 11:15

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-32

Matrix: Solid

Percent Solids: 83.1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	18		0.10	0.021	mg/Kg	☼	10/21/15 09:22	10/21/15 19:30	5
Arsenic	150		0.25	0.091	mg/Kg	☼	10/21/15 09:22	10/21/15 19:30	5
Cadmium	0.52		0.10	0.0096	mg/Kg	☼	10/21/15 09:22	10/21/15 19:30	5
Copper	52		0.20	0.050	mg/Kg	☼	10/21/15 09:22	10/21/15 19:30	5
Iron	23000	^	20	5.4	mg/Kg	☼	10/21/15 09:22	10/21/15 19:30	5
Lead	74		0.25	0.024	mg/Kg	☼	10/21/15 09:22	10/21/15 19:30	5
Manganese	420		0.51	0.086	mg/Kg	☼	10/21/15 09:22	10/21/15 19:30	5
Zinc	130		2.5	0.57	mg/Kg	☼	10/21/15 09:22	10/21/15 19:30	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.038	J	0.040	0.0016	mg/Kg	☼	10/19/15 08:15	10/19/15 14:48	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.53	H	0.100	0.100	SU			10/20/15 09:08	1

Client Sample ID: MCPRA-SS-SFSR-04

Date Collected: 10/07/15 12:00

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-33

Matrix: Solid

Percent Solids: 72.8

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	47		0.13	0.027	mg/Kg	☼	10/21/15 09:22	10/21/15 19:53	5
Arsenic	330		0.32	0.11	mg/Kg	☼	10/21/15 09:22	10/21/15 19:53	5
Cadmium	0.81		0.13	0.012	mg/Kg	☼	10/21/15 09:22	10/21/15 19:53	5
Copper	95		0.25	0.062	mg/Kg	☼	10/21/15 09:22	10/21/15 19:53	5
Iron	29000		25	6.8	mg/Kg	☼	10/21/15 09:22	10/21/15 19:53	5
Lead	97		0.32	0.030	mg/Kg	☼	10/21/15 09:22	10/21/15 19:53	5
Manganese	600		0.64	0.11	mg/Kg	☼	10/21/15 09:22	10/21/15 19:53	5
Zinc	190		3.2	0.71	mg/Kg	☼	10/21/15 09:22	10/21/15 19:53	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.045		0.030	0.0012	mg/Kg	☼	10/19/15 08:15	10/19/15 14:51	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.08	H	0.100	0.100	SU			10/20/15 09:08	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SS-SFSR-03

Lab Sample ID: 590-2141-34

Date Collected: 10/07/15 14:00

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 74.7

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	48		0.12	0.025	mg/Kg	☼	10/21/15 09:22	10/21/15 19:57	5
Arsenic	200		0.30	0.11	mg/Kg	☼	10/21/15 09:22	10/21/15 19:57	5
Cadmium	0.68		0.12	0.011	mg/Kg	☼	10/21/15 09:22	10/21/15 19:57	5
Copper	120		0.24	0.059	mg/Kg	☼	10/21/15 09:22	10/21/15 19:57	5
Iron	23000		24	6.4	mg/Kg	☼	10/21/15 09:22	10/21/15 19:57	5
Lead	94		0.30	0.029	mg/Kg	☼	10/21/15 09:22	10/21/15 19:57	5
Manganese	480		0.60	0.10	mg/Kg	☼	10/21/15 09:22	10/21/15 19:57	5
Zinc	150		3.0	0.67	mg/Kg	☼	10/21/15 09:22	10/21/15 19:57	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.055		0.043	0.0018	mg/Kg	☼	10/19/15 08:15	10/19/15 14:53	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.09	H	0.100	0.100	SU			10/20/15 09:08	1

Client Sample ID: MCPRA-SS-SFSR-02

Lab Sample ID: 590-2141-35

Date Collected: 10/07/15 14:40

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 86.0

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	94		0.11	0.022	mg/Kg	☼	10/21/15 09:22	10/21/15 20:02	5
Arsenic	630		0.26	0.095	mg/Kg	☼	10/21/15 09:22	10/21/15 20:02	5
Cadmium	0.58		0.11	0.010	mg/Kg	☼	10/21/15 09:22	10/21/15 20:02	5
Copper	83		0.21	0.052	mg/Kg	☼	10/21/15 09:22	10/21/15 20:02	5
Iron	16000		21	5.7	mg/Kg	☼	10/21/15 09:22	10/21/15 20:02	5
Lead	150		0.26	0.025	mg/Kg	☼	10/21/15 09:22	10/21/15 20:02	5
Manganese	260		0.53	0.090	mg/Kg	☼	10/21/15 09:22	10/21/15 20:02	5
Zinc	100		2.6	0.59	mg/Kg	☼	10/21/15 09:22	10/21/15 20:02	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.056		0.040	0.0016	mg/Kg	☼	10/19/15 08:15	10/19/15 14:55	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.41	H	0.100	0.100	SU			10/20/15 09:08	1

Client Sample ID: MCPRA-SS-SFSR-01

Lab Sample ID: 590-2141-36

Date Collected: 10/07/15 15:20

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 82.2

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	41		0.11	0.023	mg/Kg	☼	10/21/15 09:22	10/21/15 20:06	5
Arsenic	200		0.28	0.10	mg/Kg	☼	10/21/15 09:22	10/21/15 20:06	5
Cadmium	0.75		0.11	0.011	mg/Kg	☼	10/21/15 09:22	10/21/15 20:06	5
Copper	37		0.22	0.054	mg/Kg	☼	10/21/15 09:22	10/21/15 20:06	5
Iron	19000		22	5.9	mg/Kg	☼	10/21/15 09:22	10/21/15 20:06	5

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SS-SFSR-01

Lab Sample ID: 590-2141-36

Date Collected: 10/07/15 15:20

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 82.2

Method: 6020A - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	100		0.28	0.027	mg/Kg	☼	10/21/15 09:22	10/21/15 20:06	5
Manganese	500		0.55	0.094	mg/Kg	☼	10/21/15 09:22	10/21/15 20:06	5
Zinc	150		2.8	0.62	mg/Kg	☼	10/21/15 09:22	10/21/15 20:06	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.071		0.046	0.0019	mg/Kg	☼	10/19/15 08:15	10/19/15 14:57	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.16	H	0.100	0.100	SU			10/20/15 09:08	1

Client Sample ID: MCPRA-SS-GC-04a

Lab Sample ID: 590-2141-37

Date Collected: 10/07/15 16:55

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 68.6

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	8.0		0.14	0.029	mg/Kg	☼	10/21/15 09:22	10/21/15 20:11	5
Arsenic	340		0.34	0.12	mg/Kg	☼	10/21/15 09:22	10/21/15 20:11	5
Cadmium	2.0		0.14	0.013	mg/Kg	☼	10/21/15 09:22	10/21/15 20:11	5
Copper	94		0.27	0.067	mg/Kg	☼	10/21/15 09:22	10/21/15 20:11	5
Iron	25000		27	7.3	mg/Kg	☼	10/21/15 09:22	10/21/15 20:11	5
Lead	49		0.34	0.033	mg/Kg	☼	10/21/15 09:22	10/21/15 20:11	5
Manganese	750		0.68	0.12	mg/Kg	☼	10/21/15 09:22	10/21/15 20:11	5
Zinc	360		3.4	0.76	mg/Kg	☼	10/21/15 09:22	10/21/15 20:11	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.11		0.032	0.0013	mg/Kg	☼	10/19/15 08:15	10/19/15 15:00	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.41	H	0.100	0.100	SU			10/20/15 09:08	1

Client Sample ID: MCPRA-SW-EQ-01

Lab Sample ID: 590-2141-38

Date Collected: 10/07/15 20:40

Matrix: Water

Date Received: 10/08/15 11:35

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0010	0.00027	mg/L		10/21/15 11:25	10/22/15 12:42	1
Antimony	ND		0.00040	0.000080	mg/L		10/21/15 11:25	10/22/15 12:42	1
Cadmium	ND		0.00040	0.000028	mg/L		10/21/15 11:25	10/22/15 12:42	1
Copper	ND		0.0020	0.00060	mg/L		10/21/15 11:25	10/22/15 12:42	1
Iron	0.0098	J B	0.040	0.0058	mg/L		10/21/15 11:25	10/22/15 12:42	1
Lead	ND		0.00040	0.000034	mg/L		10/21/15 11:25	10/22/15 12:42	1
Manganese	0.00053	J	0.0020	0.00035	mg/L		10/21/15 11:25	10/22/15 12:42	1
Zinc	ND		0.0070	0.0019	mg/L		10/21/15 11:25	10/22/15 12:42	1

TestAmerica Spokane

Client Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SS-GC-04

Lab Sample ID: 590-2141-39

Date Collected: 10/06/15 09:40

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 75.6

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	30		0.12	0.025	mg/Kg	☼	10/21/15 09:22	10/21/15 20:15	5
Arsenic	300		0.30	0.11	mg/Kg	☼	10/21/15 09:22	10/21/15 20:15	5
Cadmium	1.2		0.12	0.011	mg/Kg	☼	10/21/15 09:22	10/21/15 20:15	5
Copper	43		0.24	0.058	mg/Kg	☼	10/21/15 09:22	10/21/15 20:15	5
Iron	22000		24	6.4	mg/Kg	☼	10/21/15 09:22	10/21/15 20:15	5
Lead	83		0.30	0.029	mg/Kg	☼	10/21/15 09:22	10/21/15 20:15	5
Manganese	1100		0.59	0.10	mg/Kg	☼	10/21/15 09:22	10/21/15 20:15	5
Zinc	190		3.0	0.67	mg/Kg	☼	10/21/15 09:22	10/21/15 20:15	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	0.41		0.039	0.0016	mg/Kg	☼	10/19/15 08:15	10/19/15 15:07	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	7.48	H	0.100	0.100	SU			10/20/15 09:08	1

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 590-3917/1012
Matrix: Water
Analysis Batch: 3917

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		0.80	0.15	mg/L			10/12/15 16:23	1
Sulfate	ND		0.50	0.13	mg/L			10/12/15 16:23	1

Lab Sample ID: LCS 590-3917/1011
Matrix: Water
Analysis Batch: 3917

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	12.5	12.8		mg/L		103	90 - 110
Sulfate	12.5	12.5		mg/L		100	90 - 110

Lab Sample ID: 590-2141-22 MS
Matrix: Water
Analysis Batch: 3917

Client Sample ID: MCPRA-DW-JV-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	1.2		11.4	12.9		mg/L		102	80 - 120
Sulfate	44	F1	11.4	52.3	F1	mg/L		73	80 - 120

Lab Sample ID: 590-2141-22 MSD
Matrix: Water
Analysis Batch: 3917

Client Sample ID: MCPRA-DW-JV-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	1.2		11.4	12.8		mg/L		102	80 - 120	1	10
Sulfate	44	F1	11.4	52.2	F1	mg/L		72	80 - 120	0	10

Lab Sample ID: 590-2141-22 DU
Matrix: Water
Analysis Batch: 3917

Client Sample ID: MCPRA-DW-JV-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chloride	1.2		1.68	F5	mg/L		31	18.8
Sulfate	44	F1	44.2		mg/L		0.3	15.7

Method: 6010C - Metals (ICP)

Lab Sample ID: LCS 590-4013/1-A
Matrix: Water
Analysis Batch: 4036

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 4013

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	10.0	10.1		mg/L		101	80 - 120
Magnesium	10.0	9.92		mg/L		99	80 - 120
Potassium	10.0	10.2		mg/L		102	80 - 135
Sodium	10.0	10.1		mg/L		101	80 - 154

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 580-203902/22-A
Matrix: Solid
Analysis Batch: 203971

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 203902

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.10	0.021	mg/Kg		10/21/15 09:22	10/21/15 17:58	5
Arsenic	ND		0.25	0.090	mg/Kg		10/21/15 09:22	10/21/15 17:58	5
Cadmium	ND		0.10	0.0095	mg/Kg		10/21/15 09:22	10/21/15 17:58	5
Copper	ND		0.20	0.049	mg/Kg		10/21/15 09:22	10/21/15 17:58	5
Iron	ND		20	5.4	mg/Kg		10/21/15 09:22	10/21/15 17:58	5
Lead	ND		0.25	0.024	mg/Kg		10/21/15 09:22	10/21/15 17:58	5
Manganese	ND		0.50	0.085	mg/Kg		10/21/15 09:22	10/21/15 17:58	5
Zinc	ND		2.5	0.56	mg/Kg		10/21/15 09:22	10/21/15 17:58	5

Lab Sample ID: LCS 580-203902/23-A
Matrix: Solid
Analysis Batch: 203971

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 203902

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Antimony	150	151		mg/Kg		100	80 - 120
Arsenic	200	204		mg/Kg		102	80 - 120
Cadmium	5.00	4.73		mg/Kg		95	80 - 120
Copper	25.0	25.0		mg/Kg		100	80 - 120
Iron	1100	1150		mg/Kg		104	80 - 120
Lead	50.0	50.4		mg/Kg		101	80 - 120
Manganese	50.0	50.0		mg/Kg		100	80 - 120
Zinc	200	202		mg/Kg		101	80 - 120

Lab Sample ID: LCSD 580-203902/24-A
Matrix: Solid
Analysis Batch: 203971

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 203902

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Antimony	150	152		mg/Kg		101	80 - 120	1	20
Arsenic	200	205		mg/Kg		103	80 - 120	0	20
Cadmium	5.00	4.79		mg/Kg		96	80 - 120	1	20
Copper	25.0	25.3		mg/Kg		101	80 - 120	1	20
Iron	1100	1130		mg/Kg		102	80 - 120	2	20
Lead	50.0	50.1		mg/Kg		100	80 - 120	1	20
Manganese	50.0	49.8		mg/Kg		100	80 - 120	0	20
Zinc	200	206		mg/Kg		103	80 - 120	2	20

Lab Sample ID: 590-2141-23 MS
Matrix: Solid
Analysis Batch: 203971

Client Sample ID: MCPRA-SS-GC-03
Prep Type: Total/NA
Prep Batch: 203902

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Antimony	36		190	238		mg/Kg	☼	107	80 - 120
Arsenic	260		253	540		mg/Kg	☼	109	80 - 120
Cadmium	1.2		6.32	7.47		mg/Kg	☼	100	80 - 120
Copper	35	F1	31.6	73.7	F1	mg/Kg	☼	121	80 - 120
Iron	22000		1390	28200	4	mg/Kg	☼	409	80 - 120
Lead	69		63.2	134		mg/Kg	☼	102	80 - 120
Manganese	1300		63.2	1600	4	mg/Kg	☼	534	80 - 120

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 590-2141-23 MS
Matrix: Solid
Analysis Batch: 203971

Client Sample ID: MCPRA-SS-GC-03
Prep Type: Total/NA
Prep Batch: 203902

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Zinc	220		253	473		mg/Kg	☼	99	80 - 120

Lab Sample ID: 590-2141-23 MSD
Matrix: Solid
Analysis Batch: 203971

Client Sample ID: MCPRA-SS-GC-03
Prep Type: Total/NA
Prep Batch: 203902

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Antimony	36		188	236		mg/Kg	☼	106	80 - 120	1	20
Arsenic	260		251	561		mg/Kg	☼	118	80 - 120	4	20
Cadmium	1.2		6.27	7.31		mg/Kg	☼	98	80 - 120	2	20
Copper	35	F1	31.4	72.9		mg/Kg	☼	120	80 - 120	1	20
Iron	22000		1380	28000	4	mg/Kg	☼	399	80 - 120	1	20
Lead	69		62.7	142		mg/Kg	☼	116	80 - 120	6	20
Manganese	1300		62.7	1750	4	mg/Kg	☼	778	80 - 120	9	20
Zinc	220		251	454		mg/Kg	☼	92	80 - 120	4	20

Lab Sample ID: 590-2141-23 DU
Matrix: Solid
Analysis Batch: 203971

Client Sample ID: MCPRA-SS-GC-03
Prep Type: Total/NA
Prep Batch: 203902

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Antimony	36		27.0	F3	mg/Kg	☼	29	20
Arsenic	260		317		mg/Kg	☼	18	20
Cadmium	1.2		0.777	F3	mg/Kg	☼	40	20
Copper	35	F1	36.4		mg/Kg	☼	3	20
Iron	22000		23400		mg/Kg	☼	4	20
Lead	69		78.8		mg/Kg	☼	14	20
Manganese	1300		1230		mg/Kg	☼	3	20
Zinc	220		167	F3	mg/Kg	☼	29	20

Lab Sample ID: MB 580-203872/21-A
Matrix: Water
Analysis Batch: 203959

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 203872

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.00040	0.000080	mg/L		10/20/15 20:39	10/21/15 13:17	1
Arsenic	ND		0.0010	0.00027	mg/L		10/20/15 20:39	10/21/15 13:17	1
Cadmium	ND		0.00040	0.000028	mg/L		10/20/15 20:39	10/21/15 13:17	1
Copper	ND		0.0020	0.00060	mg/L		10/20/15 20:39	10/21/15 13:17	1
Iron	ND		0.040	0.0058	mg/L		10/20/15 20:39	10/21/15 13:17	1
Lead	0.0000397	J	0.00040	0.000034	mg/L		10/20/15 20:39	10/21/15 13:17	1
Manganese	ND		0.0020	0.00035	mg/L		10/20/15 20:39	10/21/15 13:17	1
Zinc	ND		0.0070	0.0019	mg/L		10/20/15 20:39	10/21/15 13:17	1

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 580-203872/22-A
Matrix: Water
Analysis Batch: 203959

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 203872

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Antimony	3.00	3.05		mg/L		102	80 - 120
Arsenic	4.00	4.01		mg/L		100	80 - 120
Cadmium	0.100	0.101		mg/L		101	80 - 120
Copper	0.500	0.493		mg/L		99	80 - 120
Iron	22.0	23.2		mg/L		106	80 - 120
Lead	1.00	0.977		mg/L		98	80 - 120
Manganese	1.00	1.03		mg/L		103	80 - 120
Zinc	4.00	4.03		mg/L		101	80 - 120

Lab Sample ID: LCSD 580-203872/23-A
Matrix: Water
Analysis Batch: 203959

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 203872

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Antimony	3.00	3.05		mg/L		102	80 - 120	0	20
Arsenic	4.00	4.03		mg/L		101	80 - 120	1	20
Cadmium	0.100	0.104		mg/L		104	80 - 120	3	20
Copper	0.500	0.500		mg/L		100	80 - 120	1	20
Iron	22.0	23.4		mg/L		106	80 - 120	1	20
Lead	1.00	1.00		mg/L		100	80 - 120	2	20
Manganese	1.00	1.05		mg/L		105	80 - 120	2	20
Zinc	4.00	4.06		mg/L		101	80 - 120	1	20

Lab Sample ID: 590-2141-1 MS
Matrix: Water
Analysis Batch: 203959

Client Sample ID: MCPRA-SW-GC-04
Prep Type: Total Recoverable
Prep Batch: 203872

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Antimony	0.0020		3.00	3.22		mg/L		107	80 - 120
Arsenic	0.0068		4.00	4.19		mg/L		105	80 - 120
Cadmium	ND		0.100	0.111		mg/L		111	80 - 120
Copper	ND		0.500	0.514		mg/L		103	80 - 120
Iron	0.017	J	22.0	24.3		mg/L		111	80 - 120
Lead	0.00013	J B	1.00	1.06		mg/L		106	80 - 120
Manganese	0.0019	J	1.00	1.11		mg/L		111	80 - 120
Zinc	0.0036	J	4.00	4.23		mg/L		106	80 - 120

Lab Sample ID: 590-2141-1 MSD
Matrix: Water
Analysis Batch: 203959

Client Sample ID: MCPRA-SW-GC-04
Prep Type: Total Recoverable
Prep Batch: 203872

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Antimony	0.0020		3.00	3.20		mg/L		106	80 - 120	1	20
Arsenic	0.0068		4.00	4.25		mg/L		106	80 - 120	1	20
Cadmium	ND		0.100	0.108		mg/L		108	80 - 120	3	20
Copper	ND		0.500	0.523		mg/L		105	80 - 120	2	20
Iron	0.017	J	22.0	24.5		mg/L		111	80 - 120	1	20
Lead	0.00013	J B	1.00	1.07		mg/L		107	80 - 120	1	20
Manganese	0.0019	J	1.00	1.12		mg/L		112	80 - 120	1	20

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 590-2141-1 MSD
Matrix: Water
Analysis Batch: 203959

Client Sample ID: MCPRA-SW-GC-04
Prep Type: Total Recoverable
Prep Batch: 203872

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Zinc	0.0036	J	4.00	4.28		mg/L		107	80 - 120	1	20

Lab Sample ID: 590-2141-1 DU
Matrix: Water
Analysis Batch: 203959

Client Sample ID: MCPRA-SW-GC-04
Prep Type: Total Recoverable
Prep Batch: 203872

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Antimony	0.0020		0.00203		mg/L		0.5	20
Arsenic	0.0068		0.00702		mg/L		3	20
Cadmium	ND		ND		mg/L		NC	20
Copper	ND		ND		mg/L		NC	20
Iron	0.017	J	0.0200	J	mg/L		18	20
Lead	0.00013	J B	0.000128	J	mg/L		0.3	20
Manganese	0.0019	J	0.00215		mg/L		12	20
Zinc	0.0036	J	0.00272	J F5	mg/L		28	20

Lab Sample ID: MB 580-203915/20-A
Matrix: Water
Analysis Batch: 204071

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 203915

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.00040	0.000080	mg/L		10/21/15 11:25	10/22/15 11:33	1
Arsenic	ND		0.0010	0.00027	mg/L		10/21/15 11:25	10/22/15 11:33	1
Cadmium	ND		0.00040	0.000028	mg/L		10/21/15 11:25	10/22/15 11:33	1
Copper	ND		0.0020	0.00060	mg/L		10/21/15 11:25	10/22/15 11:33	1
Iron	0.00596	J	0.040	0.0058	mg/L		10/21/15 11:25	10/22/15 11:33	1
Lead	ND		0.00040	0.000034	mg/L		10/21/15 11:25	10/22/15 11:33	1
Manganese	ND		0.0020	0.00035	mg/L		10/21/15 11:25	10/22/15 11:33	1
Zinc	ND		0.0070	0.0019	mg/L		10/21/15 11:25	10/22/15 11:33	1

Lab Sample ID: LCS 580-203915/21-A
Matrix: Water
Analysis Batch: 204071

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 203915

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	3.00	3.03		mg/L		101	80 - 120
Arsenic	4.00	4.11		mg/L		103	80 - 120
Cadmium	0.100	0.103		mg/L		103	80 - 120
Copper	0.500	0.522		mg/L		104	80 - 120
Iron	22.0	23.3		mg/L		106	80 - 120
Lead	1.00	0.975		mg/L		97	80 - 120
Manganese	1.00	1.02		mg/L		102	80 - 120
Zinc	4.00	4.14		mg/L		104	80 - 120

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCSD 580-203915/22-A
Matrix: Water
Analysis Batch: 204071

Client Sample ID: Lab Control Sample Dup
Prep Type: Total Recoverable
Prep Batch: 203915

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	3.00	3.01		mg/L		100	80 - 120	1	20
Arsenic	4.00	4.10		mg/L		103	80 - 120	0	20
Cadmium	0.100	0.100		mg/L		100	80 - 120	3	20
Copper	0.500	0.513		mg/L		103	80 - 120	2	20
Iron	22.0	23.9		mg/L		109	80 - 120	3	20
Lead	1.00	0.977		mg/L		98	80 - 120	0	20
Manganese	1.00	1.03		mg/L		103	80 - 120	1	20
Zinc	4.00	4.12		mg/L		103	80 - 120	1	20

Lab Sample ID: LCSSRM 580-203915/23-A
Matrix: Water
Analysis Batch: 204071

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 203915

Analyte	Spike Added	LCSSRM Result	LCSSRM Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	3.00	3.01		mg/L		100	80 - 120		
Arsenic	4.00	4.14		mg/L		104	80 - 120		
Cadmium	0.100	0.104		mg/L		104	80 - 120		
Copper	0.500	0.518		mg/L		104	80 - 120		
Iron	22.0	23.5		mg/L		107	80 - 120		
Lead	1.00	0.968		mg/L		97	80 - 120		
Manganese	1.00	1.01		mg/L		101	80 - 120		
Zinc	4.00	4.13		mg/L		103	80 - 120		

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 590-4022/9-A
Matrix: Solid
Analysis Batch: 4037

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 4022

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Hg	ND		0.050	0.0020	mg/Kg		10/19/15 08:15	10/19/15 14:14	1

Lab Sample ID: LCS 590-4022/8-A
Matrix: Solid
Analysis Batch: 4037

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 4022

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg	0.200	0.190		mg/Kg		95	80 - 120		

Lab Sample ID: 590-2141-23 MS
Matrix: Solid
Analysis Batch: 4037

Client Sample ID: MCPRA-SS-GC-03
Prep Type: Total/NA
Prep Batch: 4022

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg	0.17	F1 F2	0.149	0.359	F1	mg/Kg	☼	126	80 - 120		

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Method: 7471B - Mercury (CVAA) (Continued)

Lab Sample ID: 590-2141-23 MSD
Matrix: Solid
Analysis Batch: 4037

Client Sample ID: MCPRA-SS-GC-03
Prep Type: Total/NA
Prep Batch: 4022

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Hg	0.17	F1 F2	0.274	0.455	F2	mg/Kg	☼	103	80 - 120	24	20

Lab Sample ID: 590-2141-23 DU
Matrix: Solid
Analysis Batch: 4037

Client Sample ID: MCPRA-SS-GC-03
Prep Type: Total/NA
Prep Batch: 4022

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Hg	0.17	F1 F2	0.222	F5	mg/Kg	☼	25	20

Method: 9045D - pH

Lab Sample ID: LCS 590-4052/1
Matrix: Solid
Analysis Batch: 4052

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	6.960		SU		99	98.6 - 101.4

Lab Sample ID: 590-2141-23 DU
Matrix: Solid
Analysis Batch: 4052

Client Sample ID: MCPRA-SS-GC-03
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.19	H	7.180		SU		0.1	20

Method: SM 2310B - Acidity

Lab Sample ID: MB 490-291621/57
Matrix: Water
Analysis Batch: 291621

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acidity as CaCO3	ND		20	10	mg/L			10/20/15 16:45	1

Lab Sample ID: LCS 490-291621/58
Matrix: Water
Analysis Batch: 291621

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acidity as CaCO3	500	492		mg/L		98	90 - 110

Lab Sample ID: LCSD 490-291621/54
Matrix: Water
Analysis Batch: 291621

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acidity as CaCO3	500	492		mg/L		98	90 - 110	1	20

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Method: SM 2310B - Acidity (Continued)

Lab Sample ID: LCSD 490-291621/81
 Matrix: Water
 Analysis Batch: 291621

Client Sample ID: Lab Control Sample Dup
 Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acidity as CaCO3	500	491		mg/L		98	90 - 110	0	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 590-4021/1
 Matrix: Water
 Analysis Batch: 4021

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Alkalinity	ND		4.0	1.7	mg/L			10/19/15 08:08	1

Lab Sample ID: LCS 590-4021/2
 Matrix: Water
 Analysis Batch: 4021

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Alkalinity	500	475		mg/L		95	90 - 110		
Bicarbonate Alkalinity as CaCO3	500	475		mg/L		95	90 - 110		

Method: SM 2340C - Hardness, Total (mg/l as CaCO3)

Lab Sample ID: MB 580-203862/1
 Matrix: Water
 Analysis Batch: 203862

Client Sample ID: Method Blank
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Hardness as calcium carbonate	ND		2.0	2.0	mg/L			10/20/15 17:03	1

Lab Sample ID: LCS 580-203862/2
 Matrix: Water
 Analysis Batch: 203862

Client Sample ID: Lab Control Sample
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Hardness as calcium carbonate	1000	977		mg/L		98	90 - 110		

Lab Sample ID: 590-2141-22 DU
 Matrix: Water
 Analysis Batch: 203862

Client Sample ID: MCPRA-DW-JV-01
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D		RPD	RPD Limit
Hardness as calcium carbonate	73		73.8		mg/L			1	20

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 590-3903/1
Matrix: Water
Analysis Batch: 3903

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		25	13	mg/L			10/12/15 09:03	1

Lab Sample ID: LCS 590-3903/2
Matrix: Water
Analysis Batch: 3903

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	250	234		mg/L		94	80 - 120

Lab Sample ID: 590-2141-1 DU
Matrix: Water
Analysis Batch: 3903

Client Sample ID: MCPRA-SW-GC-04
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	20	J	22.0	J	mg/L		10	10

Lab Sample ID: MB 590-3955/1
Matrix: Water
Analysis Batch: 3955

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	ND		25	13	mg/L			10/14/15 14:04	1

Lab Sample ID: LCS 590-3955/2
Matrix: Water
Analysis Batch: 3955

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	250	258		mg/L		103	80 - 120

Lab Sample ID: 590-2141-13 DU
Matrix: Water
Analysis Batch: 3955

Client Sample ID: MCPRA-SW-SFSR-07
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	26		32.0	F5	mg/L		21	10

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 590-3927/1
Matrix: Water
Analysis Batch: 3927

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		10	4.0	mg/L			10/13/15 08:51	1

TestAmerica Spokane

QC Sample Results

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: LCS 590-3927/2
Matrix: Water
Analysis Batch: 3927

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	104		mg/L		104	80 - 120

Lab Sample ID: 590-2141-4 DU
Matrix: Water
Analysis Batch: 3927

Client Sample ID: MCPRA-SW-GC-02
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	ND		ND		mg/L		NC	30

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 590-3905/1
Matrix: Water
Analysis Batch: 3905

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.040		SU		101	98.6 - 101.4

Lab Sample ID: LCS 590-4048/1
Matrix: Water
Analysis Batch: 4048

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.020		SU		100	98.6 - 101.4

Lab Sample ID: 590-2141-14 DU
Matrix: Water
Analysis Batch: 4048

Client Sample ID: MCPRA-SW-SFSR-06
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.16	HF	7.180		SU		0.3	10

Lab Chronicle

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SW-GC-04

Date Collected: 10/06/15 09:35

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203872	10/20/15 20:39	PAB	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203959	10/21/15 13:34	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3903	10/12/15 09:03	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:51	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

Client Sample ID: MCPRA-SW-GC-03

Date Collected: 10/06/15 10:15

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203872	10/20/15 20:39	PAB	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203959	10/21/15 14:11	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3903	10/12/15 09:03	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:51	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

Client Sample ID: MCPRA-SW-GC-02b

Date Collected: 10/06/15 10:50

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203872	10/20/15 20:39	PAB	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203959	10/21/15 14:15	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3903	10/12/15 09:03	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:51	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

Client Sample ID: MCPRA-SW-GC-02

Date Collected: 10/06/15 11:10

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203872	10/20/15 20:39	PAB	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203959	10/21/15 14:19	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3903	10/12/15 09:03	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:51	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SW-GC-02

Date Collected: 10/06/15 11:10
Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

Client Sample ID: MCPRA-SW-GC-01

Date Collected: 10/06/15 12:00
Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203872	10/20/15 20:39	PAB	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203959	10/21/15 14:23	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3903	10/12/15 09:03	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:51	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

Client Sample ID: MCPRA-DW-PM-01

Date Collected: 10/06/15 12:55
Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	5 mL		3917	10/12/15 11:56	MRS	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	4013	10/16/15 17:02	JSP	TAL SPK
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	4036	10/19/15 14:14	JSP	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	203872	10/20/15 20:39	PAB	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203959	10/21/15 14:27	FCW	TAL SEA
Total/NA	Analysis	SM 2310B		1	50 mL	50 mL	291621	10/20/15 17:48	BLM	TAL NSH
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	4021	10/19/15 08:09	JSP	TAL SPK
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3903	10/12/15 09:03	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	52 mL	100 mL	3927	10/13/15 08:51	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

Client Sample ID: MCPRA-SW-DP-02

Date Collected: 10/06/15 13:00
Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203872	10/20/15 20:39	PAB	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203959	10/21/15 14:31	FCW	TAL SEA

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-DW-ND-01

Date Collected: 10/06/15 13:40

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	5 mL		3917	10/12/15 12:10	MRS	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	4013	10/16/15 17:02	JSP	TAL SPK
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	4036	10/19/15 14:16	JSP	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	203872	10/20/15 20:39	PAB	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203959	10/21/15 14:35	FCW	TAL SEA
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	4021	10/19/15 08:09	JSP	TAL SPK
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3903	10/12/15 09:03	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:51	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

Client Sample ID: MCPRA-SW-SFSR-09

Date Collected: 10/06/15 16:50

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203872	10/20/15 20:39	PAB	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203959	10/21/15 14:39	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3903	10/12/15 09:03	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:51	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

Client Sample ID: MCPRA-SW-DP-03

Date Collected: 10/06/15 17:00

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-10

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203872	10/20/15 20:39	PAB	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203959	10/21/15 14:43	FCW	TAL SEA

Client Sample ID: MCPRA-SW-MCL-01

Date Collected: 10/06/15 17:30

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203872	10/20/15 20:39	PAB	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203959	10/21/15 14:47	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3903	10/12/15 09:03	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:51	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SW-SFSR-08

Date Collected: 10/06/15 17:50

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-12

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203872	10/20/15 20:39	PAB	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203959	10/21/15 15:08	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3903	10/12/15 09:03	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:51	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

Client Sample ID: MCPRA-SW-SFSR-07

Date Collected: 10/07/15 08:15

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-13

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203872	10/20/15 20:39	PAB	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203959	10/21/15 15:12	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3955	10/14/15 14:04	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:52	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	3905	10/12/15 09:34	JSP	TAL SPK

Client Sample ID: MCPRA-SW-SFSR-06

Date Collected: 10/07/15 09:00

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-14

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203872	10/20/15 20:39	PAB	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203959	10/21/15 15:16	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3955	10/14/15 14:04	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:52	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	4048	10/20/15 08:56	JSP	TAL SPK

Client Sample ID: MCPRA-SW-SFSR-05

Date Collected: 10/07/15 11:10

Date Received: 10/08/15 11:35

Lab Sample ID: 590-2141-15

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203872	10/20/15 20:39	PAB	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	203959	10/21/15 15:20	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3955	10/14/15 14:04	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:52	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SW-SFSR-05

Lab Sample ID: 590-2141-15

Date Collected: 10/07/15 11:10

Matrix: Water

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	4048	10/20/15 08:56	JSP	TAL SPK

Client Sample ID: MCPRA-SW-SFSR-04

Lab Sample ID: 590-2141-16

Date Collected: 10/07/15 11:55

Matrix: Water

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203915	10/21/15 11:25	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	204071	10/22/15 12:46	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3955	10/14/15 14:04	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:52	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	4048	10/20/15 08:56	JSP	TAL SPK

Client Sample ID: MCPRA-SW-SFSR-03

Lab Sample ID: 590-2141-17

Date Collected: 10/07/15 13:55

Matrix: Water

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203915	10/21/15 11:25	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	204071	10/22/15 12:51	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3955	10/14/15 14:04	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:52	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	4048	10/20/15 08:56	JSP	TAL SPK

Client Sample ID: MCPRA-SW-SFSR-02

Lab Sample ID: 590-2141-18

Date Collected: 10/07/15 14:35

Matrix: Water

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203915	10/21/15 11:25	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	204071	10/22/15 12:56	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3955	10/14/15 14:04	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:52	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	4048	10/20/15 08:56	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SW-SFSR-01

Lab Sample ID: 590-2141-19

Date Collected: 10/07/15 15:15

Matrix: Water

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203915	10/21/15 11:25	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	204071	10/22/15 13:00	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3955	10/14/15 14:04	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:52	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	4048	10/20/15 08:56	JSP	TAL SPK

Client Sample ID: MCPRA-SW-GC-04a

Lab Sample ID: 590-2141-20

Date Collected: 10/07/15 16:55

Matrix: Water

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203915	10/21/15 11:25	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	204071	10/22/15 13:05	FCW	TAL SEA
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3955	10/14/15 14:04	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:52	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	4048	10/20/15 08:56	JSP	TAL SPK

Client Sample ID: MCPRA-SP-JV-01

Lab Sample ID: 590-2141-21

Date Collected: 10/07/15 17:05

Matrix: Water

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	5 mL		3917	10/12/15 12:24	MRS	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	4013	10/16/15 17:02	JSP	TAL SPK
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	4036	10/19/15 14:19	JSP	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	203915	10/21/15 11:25	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	204071	10/22/15 13:10	FCW	TAL SEA
Total/NA	Analysis	SM 2320B		1	100 mL	100 mL	4021	10/19/15 08:09	JSP	TAL SPK
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3955	10/14/15 14:04	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:52	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	4048	10/20/15 08:56	JSP	TAL SPK

Client Sample ID: MCPRA-DW-JV-01

Lab Sample ID: 590-2141-22

Date Collected: 10/07/15 17:40

Matrix: Water

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	300.0		1	5 mL		3917	10/12/15 12:38	MRS	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-DW-JV-01

Lab Sample ID: 590-2141-22

Date Collected: 10/07/15 17:40

Matrix: Water

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	4013	10/16/15 17:02	JSP	TAL SPK
Total Recoverable	Analysis	6010C		1	50 mL	50 mL	4036	10/19/15 14:22	JSP	TAL SPK
Total Recoverable	Prep	3005A			50 mL	50 mL	203915	10/21/15 11:25	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	204071	10/22/15 12:37	FCW	TAL SEA
Total/NA	Analysis	SM 2310B		1	50 mL	50 mL	291621	10/20/15 17:55	BLM	TAL NSH
Total/NA	Analysis	SM 2320B		1	94 mL	100 mL	4021	10/19/15 08:09	JSP	TAL SPK
Total/NA	Analysis	SM 2340C		1	50 mL	50 mL	203862	10/20/15 17:03	JSM	TAL SEA
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	3955	10/14/15 14:04	JSP	TAL SPK
Total/NA	Analysis	SM 2540D		1	100 mL	100 mL	3927	10/13/15 08:52	JSP	TAL SPK
Total/NA	Analysis	SM 4500 H+ B		1		100 mL	4048	10/20/15 08:56	JSP	TAL SPK

Client Sample ID: MCPRA-SS-GC-03

Lab Sample ID: 590-2141-23

Date Collected: 10/06/15 10:20

Matrix: Solid

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	4052	10/20/15 09:08	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			4030	10/19/15 11:32	JSP	TAL SPK

Client Sample ID: MCPRA-SS-GC-03

Lab Sample ID: 590-2141-23

Date Collected: 10/06/15 10:20

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 71.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1123 g	50 mL	203902	10/21/15 09:22	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1123 g	50 mL	203971	10/21/15 18:17	FCW	TAL SEA
Total/NA	Prep	7471B			0.67 g	50 mL	4022	10/19/15 08:15	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.67 g	50 mL	4037	10/19/15 14:16	JSP	TAL SPK

Client Sample ID: MCPRA-SS-GC-02b

Lab Sample ID: 590-2141-24

Date Collected: 10/06/15 10:55

Matrix: Solid

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	4052	10/20/15 09:08	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			4030	10/19/15 11:32	JSP	TAL SPK

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SS-GC-02b

Lab Sample ID: 590-2141-24

Date Collected: 10/06/15 10:55

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 77.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1159 g	50 mL	203902	10/21/15 09:22	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1159 g	50 mL	203971	10/21/15 18:53	FCW	TAL SEA
Total/NA	Prep	7471B			0.71 g	50 mL	4022	10/19/15 08:15	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.71 g	50 mL	4037	10/19/15 14:25	JSP	TAL SPK

Client Sample ID: MCPRA-SS-GC-02

Lab Sample ID: 590-2141-25

Date Collected: 10/06/15 11:15

Matrix: Solid

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	4052	10/20/15 09:08	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			4030	10/19/15 11:32	JSP	TAL SPK

Client Sample ID: MCPRA-SS-GC-02

Lab Sample ID: 590-2141-25

Date Collected: 10/06/15 11:15

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 72.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1011 g	50 mL	203902	10/21/15 09:22	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1011 g	50 mL	203971	10/21/15 18:58	FCW	TAL SEA
Total/NA	Prep	7471B			0.64 g	50 mL	4022	10/19/15 08:15	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.64 g	50 mL	4037	10/19/15 14:28	JSP	TAL SPK

Client Sample ID: MCPRA-SS-GC-01

Lab Sample ID: 590-2141-26

Date Collected: 10/06/15 12:05

Matrix: Solid

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	4052	10/20/15 09:08	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			4030	10/19/15 11:32	JSP	TAL SPK

Client Sample ID: MCPRA-SS-GC-01

Lab Sample ID: 590-2141-26

Date Collected: 10/06/15 12:05

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 80.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1685 g	50 mL	203902	10/21/15 09:22	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1685 g	50 mL	203971	10/21/15 19:03	FCW	TAL SEA
Total/NA	Prep	7471B			0.57 g	50 mL	4022	10/19/15 08:15	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.57 g	50 mL	4037	10/19/15 14:30	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SS-SFSR-09

Lab Sample ID: 590-2141-27

Date Collected: 10/06/15 16:55

Matrix: Solid

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	4052	10/20/15 09:08	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			4030	10/19/15 11:32	JSP	TAL SPK

Client Sample ID: MCPRA-SS-SFSR-09

Lab Sample ID: 590-2141-27

Date Collected: 10/06/15 16:55

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 57.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0982 g	50 mL	203902	10/21/15 09:22	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.0982 g	50 mL	203971	10/21/15 19:07	FCW	TAL SEA
Total/NA	Prep	7471B			0.63 g	50 mL	4022	10/19/15 08:15	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.63 g	50 mL	4037	10/19/15 14:32	JSP	TAL SPK

Client Sample ID: MCPRA-SS-MCL-01

Lab Sample ID: 590-2141-28

Date Collected: 10/06/15 17:35

Matrix: Solid

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	4052	10/20/15 09:08	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			4030	10/19/15 11:32	JSP	TAL SPK

Client Sample ID: MCPRA-SS-MCL-01

Lab Sample ID: 590-2141-28

Date Collected: 10/06/15 17:35

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 40.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1194 g	50 mL	203902	10/21/15 09:22	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1194 g	50 mL	203971	10/21/15 19:12	FCW	TAL SEA
Total/NA	Prep	7471B			0.77 g	50 mL	4022	10/19/15 08:15	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.77 g	50 mL	4037	10/19/15 14:39	JSP	TAL SPK

Client Sample ID: MCPRA-SS-SFSR-08

Lab Sample ID: 590-2141-29

Date Collected: 10/06/15 17:55

Matrix: Solid

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	4052	10/20/15 09:08	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			4030	10/19/15 11:32	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SS-SFSR-08

Lab Sample ID: 590-2141-29

Date Collected: 10/06/15 17:55

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 71.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0965 g	50 mL	203902	10/21/15 09:22	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.0965 g	50 mL	203971	10/21/15 19:16	FCW	TAL SEA
Total/NA	Prep	7471B			0.82 g	50 mL	4022	10/19/15 08:15	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.82 g	50 mL	4037	10/19/15 14:41	JSP	TAL SPK

Client Sample ID: MCPRA-SS-SFSR-07

Lab Sample ID: 590-2141-30

Date Collected: 10/07/15 08:20

Matrix: Solid

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	4052	10/20/15 09:08	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			4030	10/19/15 11:32	JSP	TAL SPK

Client Sample ID: MCPRA-SS-SFSR-07

Lab Sample ID: 590-2141-30

Date Collected: 10/07/15 08:20

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 88.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1262 g	50 mL	203902	10/21/15 09:22	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1262 g	50 mL	203971	10/21/15 19:21	FCW	TAL SEA
Total/NA	Prep	7471B			0.93 g	50 mL	4022	10/19/15 08:15	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.93 g	50 mL	4037	10/19/15 14:44	JSP	TAL SPK

Client Sample ID: MCPRA-SS-SFSR-06

Lab Sample ID: 590-2141-31

Date Collected: 10/07/15 09:05

Matrix: Solid

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	4052	10/20/15 09:08	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			4030	10/19/15 11:32	JSP	TAL SPK

Client Sample ID: MCPRA-SS-SFSR-06

Lab Sample ID: 590-2141-31

Date Collected: 10/07/15 09:05

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 81.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1557 g	50 mL	203902	10/21/15 09:22	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1557 g	50 mL	203971	10/21/15 19:25	FCW	TAL SEA
Total/NA	Prep	7471B			0.64 g	50 mL	4022	10/19/15 08:15	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.64 g	50 mL	4037	10/19/15 14:46	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SS-SFSR-05

Lab Sample ID: 590-2141-32

Date Collected: 10/07/15 11:15

Matrix: Solid

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	4052	10/20/15 09:08	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			4030	10/19/15 11:32	JSP	TAL SPK

Client Sample ID: MCPRA-SS-SFSR-05

Lab Sample ID: 590-2141-32

Date Collected: 10/07/15 11:15

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 83.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1884 g	50 mL	203902	10/21/15 09:22	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1884 g	50 mL	203971	10/21/15 19:30	FCW	TAL SEA
Total/NA	Prep	7471B			0.75 g	50 mL	4022	10/19/15 08:15	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.75 g	50 mL	4037	10/19/15 14:48	JSP	TAL SPK

Client Sample ID: MCPRA-SS-SFSR-04

Lab Sample ID: 590-2141-33

Date Collected: 10/07/15 12:00

Matrix: Solid

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	4052	10/20/15 09:08	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			4030	10/19/15 11:32	JSP	TAL SPK

Client Sample ID: MCPRA-SS-SFSR-04

Lab Sample ID: 590-2141-33

Date Collected: 10/07/15 12:00

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 72.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0817 g	50 mL	203902	10/21/15 09:22	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.0817 g	50 mL	203971	10/21/15 19:53	FCW	TAL SEA
Total/NA	Prep	7471B			1.15 g	50 mL	4022	10/19/15 08:15	JSP	TAL SPK
Total/NA	Analysis	7471B		1	1.15 g	50 mL	4037	10/19/15 14:51	JSP	TAL SPK

Client Sample ID: MCPRA-SS-SFSR-03

Lab Sample ID: 590-2141-34

Date Collected: 10/07/15 14:00

Matrix: Solid

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	4052	10/20/15 09:08	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			4030	10/19/15 11:32	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SS-SFSR-03

Lab Sample ID: 590-2141-34

Date Collected: 10/07/15 14:00

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 74.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1202 g	50 mL	203902	10/21/15 09:22	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1202 g	50 mL	203971	10/21/15 19:57	FCW	TAL SEA
Total/NA	Prep	7471B			0.77 g	50 mL	4022	10/19/15 08:15	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.77 g	50 mL	4037	10/19/15 14:53	JSP	TAL SPK

Client Sample ID: MCPRA-SS-SFSR-02

Lab Sample ID: 590-2141-35

Date Collected: 10/07/15 14:40

Matrix: Solid

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	4052	10/20/15 09:08	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			4030	10/19/15 11:32	JSP	TAL SPK

Client Sample ID: MCPRA-SS-SFSR-02

Lab Sample ID: 590-2141-35

Date Collected: 10/07/15 14:40

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 86.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0974 g	50 mL	203902	10/21/15 09:22	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.0974 g	50 mL	203971	10/21/15 20:02	FCW	TAL SEA
Total/NA	Prep	7471B			0.73 g	50 mL	4022	10/19/15 08:15	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.73 g	50 mL	4037	10/19/15 14:55	JSP	TAL SPK

Client Sample ID: MCPRA-SS-SFSR-01

Lab Sample ID: 590-2141-36

Date Collected: 10/07/15 15:20

Matrix: Solid

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	4052	10/20/15 09:08	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			4030	10/19/15 11:32	JSP	TAL SPK

Client Sample ID: MCPRA-SS-SFSR-01

Lab Sample ID: 590-2141-36

Date Collected: 10/07/15 15:20

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 82.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0971 g	50 mL	203902	10/21/15 09:22	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.0971 g	50 mL	203971	10/21/15 20:06	FCW	TAL SEA
Total/NA	Prep	7471B			0.66 g	50 mL	4022	10/19/15 08:15	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.66 g	50 mL	4037	10/19/15 14:57	JSP	TAL SPK

TestAmerica Spokane

Lab Chronicle

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Client Sample ID: MCPRA-SS-GC-04a

Lab Sample ID: 590-2141-37

Date Collected: 10/07/15 16:55

Matrix: Solid

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	4052	10/20/15 09:08	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			4030	10/19/15 11:32	JSP	TAL SPK

Client Sample ID: MCPRA-SS-GC-04a

Lab Sample ID: 590-2141-37

Date Collected: 10/07/15 16:55

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 68.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.0696 g	50 mL	203902	10/21/15 09:22	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.0696 g	50 mL	203971	10/21/15 20:11	FCW	TAL SEA
Total/NA	Prep	7471B			1.13 g	50 mL	4022	10/19/15 08:15	JSP	TAL SPK
Total/NA	Analysis	7471B		1	1.13 g	50 mL	4037	10/19/15 15:00	JSP	TAL SPK

Client Sample ID: MCPRA-SW-EQ-01

Lab Sample ID: 590-2141-38

Date Collected: 10/07/15 20:40

Matrix: Water

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	203915	10/21/15 11:25	MKN	TAL SEA
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	204071	10/22/15 12:42	FCW	TAL SEA

Client Sample ID: MCPRA-SS-GC-04

Lab Sample ID: 590-2141-39

Date Collected: 10/06/15 09:40

Matrix: Solid

Date Received: 10/08/15 11:35

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9045D		1	10 g	10 mL	4052	10/20/15 09:08	JSP	TAL SPK
Total/NA	Analysis	Moisture		1			4030	10/19/15 11:32	JSP	TAL SPK

Client Sample ID: MCPRA-SS-GC-04

Lab Sample ID: 590-2141-39

Date Collected: 10/06/15 09:40

Matrix: Solid

Date Received: 10/08/15 11:35

Percent Solids: 75.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.1128 g	50 mL	203902	10/21/15 09:22	MKN	TAL SEA
Total/NA	Analysis	6020A		5	1.1128 g	50 mL	203971	10/21/15 20:15	FCW	TAL SEA
Total/NA	Prep	7471B			0.84 g	50 mL	4022	10/19/15 08:15	JSP	TAL SPK
Total/NA	Analysis	7471B		1	0.84 g	50 mL	4037	10/19/15 15:07	JSP	TAL SPK

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

TestAmerica Spokane

Certification Summary

Client: Cascade Earth Sciences Inc.
 Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Laboratory: TestAmerica Spokane

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Washington	State Program	10	C569	01-06-17

The following analytes are included in this report, but are not certified under this certification:

Analysis Method	Prep Method	Matrix	Analyte
6010C	3005A	Water	Sodium

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids
SM 4500 H+ B		Water	pH

Laboratory: TestAmerica Nashville

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	A2LA		NA: NELAP & A2LA	12-31-15
A2LA	ISO/IEC 17025		0453.07	02-29-16 *
Alaska (UST)	State Program	10	UST-087	07-24-16
Arizona	State Program	9	AZ0473	05-05-16
Arkansas DEQ	State Program	6	88-0737	04-25-16
California	State Program	9	2938	10-31-16
Connecticut	State Program	1	PH-0220	12-31-17
Florida	NELAP	4	E87358	06-30-16
Georgia	State Program	4	N/A	06-30-16
Illinois	NELAP	5	200010	12-09-16
Iowa	State Program	7	131	04-01-16 *
Kansas	NELAP	7	E-10229	05-31-16
Kentucky (UST)	State Program	4	19	06-30-16
Kentucky (WW)	State Program	4	90038	12-31-16
Louisiana	NELAP	6	30613	06-30-16
Maine	State Program	1	TN00032	11-03-17
Maryland	State Program	3	316	03-31-16 *
Massachusetts	State Program	1	M-TN032	06-30-16
Minnesota	NELAP	5	047-999-345	12-31-16
Mississippi	State Program	4	N/A	06-30-16
Montana (UST)	State Program	8	NA	02-24-20
Nevada	State Program	9	TN00032	07-31-16
New Hampshire	NELAP	1	2963	10-09-16
New Jersey	NELAP	2	TN965	06-30-16
New York	NELAP	2	11342	03-31-16
North Carolina (WW/SW)	State Program	4	387	12-31-16
North Dakota	State Program	8	R-146	06-30-16
Ohio VAP	State Program	5	CL0033	07-10-17
Oklahoma	State Program	6	9412	08-31-16
Oregon	NELAP	10	TN200001	04-27-16
Pennsylvania	NELAP	3	68-00585	06-30-16
Rhode Island	State Program	1	LAO00268	12-30-15 *
South Carolina	State Program	4	84009 (001)	02-28-16 *
South Carolina (Do Not Use - DW)	State Program	4	84009 (002)	12-16-17
Tennessee	State Program	4	2008	02-23-17

* Certification renewal pending - certification considered valid.

TestAmerica Spokane

Certification Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Laboratory: TestAmerica Nashville (Continued)

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Texas	NELAP	6	T104704077	08-31-16
USDA	Federal		S-48469	10-30-16
Utah	NELAP	8	TN00032	07-31-16
Virginia	NELAP	3	460152	06-14-16
Washington	State Program	10	C789	07-19-16
West Virginia DEP	State Program	3	219	02-28-16 *
Wisconsin	State Program	5	998020430	08-31-16
Wyoming (UST)	A2LA	8	453.07	02-29-16 *

Laboratory: TestAmerica Seattle

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska (UST)	State Program	10	UST-022	03-02-16
California	State Program	9	2901	01-31-18
L-A-B	DoD ELAP		L2236	01-19-19
L-A-B	ISO/IEC 17025		L2236	01-19-19
Montana (UST)	State Program	8	N/A	04-30-20
Oregon	NELAP	10	WA100007	11-06-16
US Fish & Wildlife	Federal		LE058448-0	02-28-16
USDA	Federal		P330-14-00126	04-08-17
Washington	State Program	10	C553	02-17-16

* Certification renewal pending - certification considered valid.

TestAmerica Spokane

Method Summary

Client: Cascade Earth Sciences Inc.
Project/Site: Monte Cristo Post-Removal Action Monitor

TestAmerica Job ID: 590-2141-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	MCAWW	TAL SPK
6010C	Metals (ICP)	SW846	TAL SPK
6020A	Metals (ICP/MS)	SW846	TAL SEA
7471B	Mercury (CVAA)	SW846	TAL SPK
9045D	pH	SW846	TAL SPK
Moisture	Percent Moisture	EPA	TAL SPK
SM 2310B	Acidity	SM	TAL NSH
SM 2320B	Alkalinity	SM	TAL SPK
SM 2340C	Hardness, Total (mg/l as CaCO ₃)	SM	TAL SEA
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL SPK
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL SPK
SM 4500 H+ B	pH	SM	TAL SPK

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "Methods For Chemical Analysis Of Water And Wastes", EPA-600/4-79-020, March 1983 And Subsequent Revisions.

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st Ave, Spokane, WA 99206, TEL (509)924-9200

TestAmerica Spokane
 11922 East 1st Ave
 Spokane, WA 99206
 Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record



590-21-41-01 Chain of Custody

TestAmerica
 THE LABORATORY CONNECTION

COCC No.
 590-767-263.3

Page
 Page 3 of 8

Client Information
 Client Contact: Bernard Kronschnabel Phone: _____
 Company: Cascade Earth Sciences Inc. Lab PM: Arrington, Randa.
 Address: 12720 E Nora Ave E-Mail: randee.arrington@testamericainc.com
 City: Spokane State: WA ZIP: 99216 PO #: P201523026
 Phone: 509-244-8892(Fax) 402-613-8793 WAO #: _____
 Email: bernard.kronschnabel@cascade-earth.com Project #: 59000617
 Project Name: Monte Cristo Post-Removal Action Monitor SDCW#: _____
 Site: _____

Sample Identification	Sample Date	Sample Time	Sample Type (G=Comp, G=grab)	MATRIX (Invert, Seawater, Overstabil, etc. - 4-4)	Analysis Requested	Special Instructions/Note
<u>NCRA-SW-GC-04</u>	<u>10/6/15</u>	<u>0935</u>	<u>G</u>	<u>W</u>	<u>Sb, As, Cd, Cu, Fe, Pb, Mn, Zn pH, Hardness, TSS, TDS Cl, SO4, Alk, Ca, Mg, Na/K Total Acidity</u>	<u>Please analyze AS for the lowest achievable NDL/PL</u>
<u>-GC-03</u>		<u>1015</u>				
<u>-GC-02a</u>		<u>1050</u>				
<u>-GC-02</u>		<u>1110</u>				
<u>-GC-01</u>		<u>1200</u>				
<u>-DW-PA-01</u>		<u>1255</u>				
<u>-SW-DP-02</u>		<u>1300</u>				
<u>-DW-ND-01</u>		<u>1340</u>				
<u>-SW-SFSR-09</u>		<u>1650</u>				
<u>-DP-03</u>		<u>1700</u>				
<u>-MCL-01</u>		<u>1730</u>				

Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological
 Deliverable Requested: I, II, III, IV, Other (specify) Special Instructions/QC Requirements: _____

Empty Kit Relinquished by: _____ Date: _____
 Relinquished by: _____ Date/Time: _____
 Relinquished by: _____ Date/Time: _____

Analysis Requested
 Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months

Received by: [Signature] Date/Time: 10/8/15 1000 Company: CES
Received by: [Signature] Date/Time: 10/8/15 1135 Company: THA

TestAmerica Spokane
 11922 East 1st Ave
 Spokane, WA 99206
 Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record

590-2141-01 Chain of Custody



TestAmerica
 11922 East 1st Ave
 Spokane, WA 99206
 Phone (509) 924-9200 Fax (509) 924-9290

Client Information
 Client Contact: Bernard Kronschnabel
 Phone: [Blank]
 Company: Cascade Earth Sciences Inc.
 Address: 12720 E Nora Ave
 City: Spokane
 State: WA, Zip: 99216
 Email: bernard.kronschnabel@cascade-earth.com
 Project Name: Monte Cristo Post Removal Action Monitor
 Site: [Blank]

Sampler: [Blank]
Phone: [Blank]
Lab PM: Arrington, Randee E
E-Mail: randee.arrington@testamericainc.com

Due Date Requested: [Blank]
TAT Requested (days): [Blank]

PO #: P201523026
WOC #: [Blank]

Project #: 59000677
SSOW#: [Blank]

QC No.: 590-767-263.3
Page: Page 3 of 8
Job #: [Blank]

Analysis Requested

Field Filtered Sample (Yes or No)
 Perform MS/MSD (Yes or No)

Sb, As, Cd, Cu, Fe, Pb, Mn, Zn
 pH, Hardness, TSS, TDS
 Cl, SO₄, Alk, Ca, Mg, Na, K
 Total Acidity

Preservation Codes:
 A - HCL
 B - NaOH
 C - Zn Acetate
 D - Nitric Acid
 E - NaHSO₄
 F - MeOH
 G - Ammonia
 H - Ascorbic Acid
 I - Ice
 J - DI Water
 K - EDTA
 L - EDTA
 M - Hexane
 N - None
 O - AsHac2
 P - Na2O4S
 Q - Na2SO3
 R - Na2S2O3
 S - H2SO4
 T - TSP Dodecylhydrate
 U - Acetone
 V - MCAA
 W - Ph 4.5
 Z - other (specify)
 other: [Blank]

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	MATRIX (Water, Seawater, Urine, etc.)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Total Number of containers	Special Instructions/Note
MCRA-SW-004	10/6/15	0935	G	W	X	X		Please analyze AS for the lowest achievable MDL/RL
-GC-03	10/15	1015			X			
-GC-02b	10/15	1050			X			
-GC-02a	11/10	1110			X			
-GC-01	12/00	1200			X			
-DW-PM-01	12/53	1253			X			
-SW-DP-02	13/00	1300			X			
-DW-MD-01	13/40	1340			X			
-SW-SFSR-09	16/50	1650			X			
-DP-03	17/00	1700			X			
-MCL-01	17/30	1730			X			

Possible Hazard Identification
 Non-Hazard
 Flammable
 Skin Irritant
 Poison B
 Unknown
 Radiological

Deliverable Requested: I, II, III, IV, Other (specify): [Blank]

Empty Kit Relinquished by: [Blank] Date: [Blank]

Relinquished by: [Signature] Date/Time: 10/8/15 1000 Company: CES

Relinquished by: [Signature] Date/Time: 10/10/15 0900 Company: TSS

Relinquished by: [Signature] Date/Time: [Blank] Company: [Blank]

Received by: [Signature] Date/Time: 10/9/15 1135 Company: TH Sea

Received by: [Signature] Date/Time: 10/15/15 9:45 Company: TH spot

Special Instructions/OC Requirements: [Blank]

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client
 Disposal By Lab
 Archive For [Blank] Months

Method of Shipment: [Blank]

Cooler/IR Dig/TB cor 2.5 mc 2.0 L
 Cooler Desc 1/2 Blight@Lab
 WetPacks Packing Bubble
 Red X Client d.o w/o P.S.

11922 East 1st Ave
Spokane, WA 99206
Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record

590-2141-02 Chain of Custody



Client Information
 Client Contact: Bernard Kronschnabel
 Phone: [blank]
 E-Mail: randee.arrington@testamericainc.com

Company: Cascade Earth Sciences Inc.
 Address: 12720 E Nora Ave
 City: Spokane
 State, Zip: WA, 99216
 Phone: 208-241-8852 (Tel)
 Email: bernard.kronschnabel@cascade-earth.com
 Project Name: Monte Cristo Post-Removal Action Monitor
 Site: [blank]

Sampler: Arrington, Randee E
Lab F.M.I.: [blank]
Job #: [blank]

QC No.: 590-767-263.4
Page: Page 4 of 8

Analysis Requested
 Date Date Requested: [blank]
 TAT Requested (days): [blank]

PO #: P201523026
WOC #: [blank]

Project #: 590000677
SSOV#: [blank]

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	MATRIX (W=water, S=solid, O=organic, BT=trace, A=air)	Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		Total Number of containers	Special Instructions/Note:
					Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)				
MCRA-SW-SER-08	10/6/15	1750	G	W	X	X	Sb, As, Cd, Cu, Fe, Pb, Mn, Zn pH, Hardness, TSS, TDS Cl, SO ₄ , Alk, Ca, Mg, Na, K Total Acidity		X	Please analyze AS for the lowest achievable MDL/PL
-SFSR-07	10/7/15	0815	G	W	X	X			X	
-SFSR-06		0900	G	W	X	X			X	
-SFSR-05		1110	G	W	X	X			X	
-SFSR-04		1155	G	W	X	X			X	
-SFSR-03		1355	G	W	X	X			X	
-SFSR-02		1435	G	W	X	X			X	
-SFSR-01		1515	G	W	X	X			X	
-6C-01a		1655	G	W	X	X			X	
-SP-SU-01		1705	G	W	X	X			X	
-DW-SU-01		1740	G	W	X	X			X	

Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological

Deliverable Requested: I, II, III, IV, Other (specify) [blank]

Special Instructions/OC Requirements:
 Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For [blank] Months

Empty Kit Relinquished by: [blank] **Date:** [blank]

Relinquished by: [blank] **Date/Time:** 10/8/15 1000 **Company:** CES

Relinquished by: [blank] **Date/Time:** 10/10/15 0930 **Company:** [blank]

Received by: [blank] **Date/Time:** 10/8/16 1135 **Company:** [blank]

Received by: [blank] **Date/Time:** [blank] **Company:** [blank]

Method of Shipment: [blank]

Special Instructions/Note:
 Cooler IR Dig/TB cor 2.9 unc 33
 Cooler Dsc 1g B 11/14/15 Lab
 WebPacks Packing Bubble
 Client d.o. w/c e.s.

TestAmerica Spokane

11922 East 1st Ave
 Spokane, WA 99208
 Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Client Information
 Client Contact: Bernard Kronschnabel
 Phone: _____
 E-Mail: rrandee.arlington@testamericainc.com

Carrier Tracking No(s): _____

Lab P/N: Arrington, Randlee E

COC No: 590-767-263 5
 Page 5 of 9
 Page # of 9

Company: Cascade Earth Sciences Inc
 Address: 12720 E Nova Ave
 City: Spokane
 State, Zip: WA, 99216
 Phone: 208-241-8832(Tel)
 Email: bernard.kronschnabel@cascade-earth.com
 Project Name: Monroe Cristo Post-Removal Action Monitor
 Site: _____

Due Date Requested: _____
TAT Requested (days): _____
PO #: P201523026
W/O #: _____

Analysis Requested: Sb, As, Cd, Cu, Fe, Pb, Mn, Zn, Hg, P, H

Preservation Codes:
 A - HCl
 B - NaOH
 C - Zn Acetate
 D - Nitric Acid
 E - NaHSO4
 F - MeOH
 G - Acetone
 H - Ascorbic Acid
 I - Ice
 J - DI Water
 K - EDTA
 L - EDTA
 M - Hexane
 N - None
 O - AsNaO2
 P - Na2O4S
 Q - Na2SO4
 R - Na2S2O3
 S - H2SO4
 T - TSP Dose/analyte
 U - Folic Acid
 V - MCA
 W - pH 4.5
 Z - other (specify) _____

Sample Identification	Sample Date	Sample Type (G=Comp, G=grab)	Matrix (Inorganic, Organic, BT-Tissue, n/a)	Special Instructions/Note
MCRA-SS-6C-03	10/4/15	G	S	
-6C-02b	10/5/15	G	S	
-6C-02a	11/10/15	G	S	
-6C-01	10/20/15	G	S	
-SFSR-09	10/5/15	G	S	
-MCL-01	10/7/15	G	S	
-SFSR-08	10/7/15	G	S	
-SFSR-07	10/7/15	G	S	
-SFSR-06	9/05/15	G	S	
-SFSR-05	11/5/15	G	S	
-SFSR-04	12/00/15	G	S	

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client
 Disposal By Lab
 Archive For _____ Months

Special Instructions/Note:
 Cooler/IR Dig/TB cor 22 unc 2 L
 Cooler Disc la @ Lab
 WePacks Packing Bulbada
 FedEx P.O. 12/2.5.

Relinquished by: _____
 Date/Time: 10/8/15 1000

Relinquished by: _____
 Date/Time: _____

Relinquished by: _____
 Date/Time: _____

Relinquished by: _____
 Date/Time: _____

TestAmerica Spokane

11922 East 1st Ave
Spokane, WA 99206
Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record

590-2741-03 Chain of Custody



OC No:
190-767-263.5

Page 5 of 8

Client Information
Client Contact: Bernard Kronschnabel
Company: Cascade Earth Sciences Inc.
Address: 12720 E Nora Ave
City: Spokane
State Zip: WA, 99216
Phone: 208-241-8852(Tel)
Email: bernard.kronschnabel@cascaade-earth.com
Project Name: Monte Cristo Post-Removal Action Monitor
Site: S50W#

Sampler: Airrrington, Randee E
Phone: E-mail: randee.airrrington@testamericainc.com

Lab PM
Analysis Requested

Due Date Requested:
TAT Requested (days):
PO # P201523026
MO #:

Field Filtered Sample (Yes or No)
Platform MS/MSD (Yes or No)

Preservation Codes:
A - HCl
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDTA
M - Hexane
N - None
O - AsNaO2
P - Na2OAS
Q - Na2SO3
R - Na2SSO3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - Ph-4.5
Z - other (specify)

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Water, Seawater, Strippable, A-AI)	Field Filtered Sample (Yes or No)	Platform MS/MSD (Yes or No)	Analysis Requested	Total Number of Containers	Special Instructions/Note
MCRA-SS-6C-03	10/6/15	1055	G	S	X	X	Sb, As, Cd, Cu, Fe, Pb, Mn, Zn Hg Pb		
-6C-02b		1115							
-6C-02a		1305							
-6C-01		1655							
-SFSR-09		1735							
-MCL-01		1755							
-SFSR-08		0800							
-SFSR-07	10/7/15	905							
-SFSR-06		1115							
-SFSR-05		1200							
-SFSR-04									

Special Instructions/Note:
Cooler (IR Dig TB cor 22 unc 2 L
Cooler Dsc Ls Blubh @ Lab
WebPacks Packing Bubble
Fed Ex P.O. 10/e.S.

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Return To Client
Dispose By Lab
Archive For
Months

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: <i>[Signature]</i>	10/18/15	1135	Company: THA SA
Relinquished by: <i>[Signature]</i>	10/18/15	1000	Company: CES
Relinquished by: <i>[Signature]</i>	10/18/15	0720	Company: 74882A
Relinquished by: <i>[Signature]</i>			Company:

TestAmerica Spokane

11922 East 1st Ave
Spokane, WA 99206
Phone (509) 924-8200 Fax (509) 924-9290

Chain of Custody Record 590-2141-04 Chain of Custody



TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information
 Client Contact: Bernard Kronschnabel
 Company: Cascade Earth Sciences Inc.
 Address: 12720 E Nora Ave
 City: Spokane
 State, Zip: WA, 99216
 Phone: 208-241-8892(Tel)
 Email: bernard.kronschnabel@cascade-earth.com
 Project Name: Monte Cristo Post-Removal Action Monitor
 Site:

Sample:
Phone:
Lab P/N: Arrington, Randae E
E-Mail: randae.arrington@testamericainc.com
Carrier Tracking Note:

COC No: 590-767-283.7
Page: 7 of 8
Job #:

Analysis Requested

Due Date Requested:
TAT Requested (days):
PO #: P201623026
WD #:
Project #: 59000677
SSOW#:

Preservation Codes:
 A - HCl
 B - NaOH
 C - Zn Acetate
 D - Nitric Acid
 E - NaHSO4
 F - MeOH
 G - Acetic Acid
 H - Ascorbic Acid
 I - Ice
 J - DI Water
 K - EDTA
 L - EDTA
 Other:

M - Hexamine
 N - None
 O - AsHClO2
 P - NiSO4S
 Q - NiSO4S
 R - NiSO4S
 S - H2SO4
 T - TSP Dodecylhydrate
 U - Asstona
 V - MCAA
 W - Ph 4.5
 Z - other (specify)

Sample Identification	Sample Date	Sample Time	Sample Type (G-comp, G-Grab)	(Invert, Special, Special, Pre-Treat, Arch)	Analysis Requested	Special Instructions/Notes
<u>NCPRA-SS-SFSR-03</u>	<u>10/11/15</u>	<u>1400</u>	<u>G</u>	<u>S</u>	<u>Sb, As, Cd, Cu, Fe, Pb, Mn, Zn</u>	<u></u>
<u>-SFSR-02</u>	<u>1446</u>	<u>1500</u>	<u>G</u>	<u>S</u>	<u>Hg</u>	<u></u>
<u>-SFSR-01</u>	<u>1655</u>	<u>1655</u>	<u>G</u>	<u>S</u>	<u>Pb</u>	<u></u>
<u>-GC-04a</u>	<u>2040</u>	<u>G</u>	<u>W</u>	<u>X</u>	<u></u>	<u></u>
<u>NCPRA-SW-ETG-01</u>	<u></u>	<u></u>	<u></u>	<u></u>	<u></u>	<u></u>

Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological

Deliverable Requested: I, II, III, IV, Other (specify)

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For Months

Empty Kit Requisitioned by: **Date:**

Requisitioned by: **Date/Time:** 10/5/15 **Time:** 1800 **Company:** CES

Requisitioned by: **Date/Time:** 10/6/15 **Time:** 1135 **Company:** TH Sun

Requisitioned by: **Date/Time:** **Time:** **Company:**

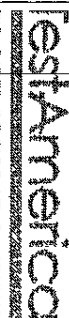
Cooler (IR) Dig TB cor 1.1. June 9/15
 Cooler Disc 1.1. 11/16/15 @ Lab
 WetPacks Packing envelopes
 already d.o. v/c n.s.

TestAmerica Spokane

11922 East 1st Ave
Spokane, WA 99206
Phone (509) 924-9200 Fax (509) 924-9290

Chain of Custody Record

590-2141-04 Chain of Custody



THE LEADERS IN ENVIRONMENTAL TESTING

Client Information

Client Contact: Bernard Kronschnabel

Company: Cascade Earth Sciences Inc.

Address: 12720 E Nora Ave

City: Spokane

State Zip: WA, 99216

Phone: 208-241-8852 (Tel)

Email: bernard.kronschnabel@cascade-earth.com

Project Name: Monte Cristo Post-Removal Action Monitor

Site: S50W#

Sampler Arrington, Randee E

Phone: randee.arrington@testamericainc.com

Lab P/N:

Arrington, Randee E

E-Mail: randee.arrington@testamericainc.com

Analysis Requested

Due Date Requested:

TAT Requested (days):

PO #

WO #

Project #

SSOW#

Sample Identification

Sample Date

Sample Time

Sample Type (C=comp, G=grab)

Preparation Codes

Matrix (Inorganic, Organic, BTEX, A-44)

Field Filtered Sample (Yes or No)

Element MS/MSD (Yes or No)

Total Number of containers

Special Instructions/Note:

Sample ID	Sample Date	Sample Time	Sample Type	Preparation Codes	Matrix	Field Filtered Sample (Yes or No)	Element MS/MSD (Yes or No)	Total Number of containers	Special Instructions/Note:
MCRA-SS-SER-03	10/7/15	1400	G		S	X	Sb, As, Cd, Cu, Fe, Pb, Mn, Zn		
-SER-02		1446					Hg		
-SER-01		1520					P, H		
-GC-04G		1655							
MCRA-SW-EG-01		2040	G		W	X			

Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological

Deliverable Requested: I, II, III, IV, Other (specify)

Empty Kit Relinquished by: _____ Date: _____

Relinquished by: _____ Date/Time: _____

Relinquished by: _____ Date/Time: _____

Relinquished by: _____ Date/Time: _____

Relinquished by: _____ Date/Time: _____

Relinquished by: _____ Date/Time: _____

Relinquished by: _____ Date/Time: _____

Relinquished by: _____ Date/Time: _____

Relinquished by: _____ Date/Time: _____

Job #

Page 7 of 8

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Preservation Codes:

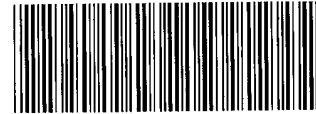
- A - HCl
- B - NaOH
- C - Zn Acetate
- D - Nitric Acid
- E - NaHSO4
- F - MeOH
- G - Amchlor
- H - Ascorbic Acid
- I - Ice
- J - DI Water
- K - EDTA
- L - EDTA
- M - Hexane
- N - None
- O - AsNaO2
- P - Na2OAS
- Q - Na2SO3
- R - Na2S2O3
- S - H2SO4
- T - TSP Dodecylsulfate
- U - Acetone
- V - MCAA
- W - Ph 4-5
- Z - other (Specify)

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months

Special Instructions/QC Requirements:

Cooler (IR) Dig/TB cor 4.8unc 5.2
 Cooler Disc in 6/11/14 @ Lab
 WetPacks Packing Buckle
 Alert d.o. w/c e.s.

COOLER RECEIPT FORM



590-2141 Chain of Custody

Cooler Received/Opened On 10/13/2015 @ 0915

1. Tracking # 4581 (last 4 digits, FedEx)

Courier: FedEx IR Gun ID 17960353

2. Temperature of rep. sample or temp blank when opened: 9.5 Degrees Celsius

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: Ø

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (initial) LEV

7. Were custody seals on containers: YES NO and intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # _____

I certify that I unloaded the cooler and answered questions 7-14 (initial) MS

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used? YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (initial) MS

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (initial) MS

I certify that I attached a label with the unique LIMS number to each container (initial) MS

21. Were there Non-Conformance issues at login? YES...NO... Was a NCM generated? YES...NO...# _____

Client Information (Sub Contract Lab) Client Contact: Arrington, Randee E Shipping/Receiving: randee.arrington@testamericainc.com Company: TestAmerica Laboratories, Inc Address: 2960 Foster Creighton Drive, Nashville, TN, 37204 Phone: 615-726-0177 (Tel) 615-726-3404 (Fax) Email: Project Name: Monte Cristo Post-Removal Action Monitor Site:		Sample: Lab PM: Arrington, Randee E Phone: E-Mail: randee.arrington@testamericainc.com	
Due Date Requested: 10/20/2015 TAT Requested (days):		Job #: 590-2141-1 Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - ph 4-5 Z - other (specify)	
Sample Identification - Client ID (Lab ID) MCPRA-DW-PM-01 (590-2141-6) MCPRA-DW-JV-01 (590-2141-22)		Total Number of Containers: 1 Special Instructions/Note: W478	
Sample Date 10/6/15 10/7/15	Sample Time 12:55 Pacific 17:40 Pacific	Sample Type (C=Comp, G=grab) Preservation Code: Water Water	Perform MS/MSD (Yes or No) X Field Filtered Sample (Yes or No) X SM2310B/ Acidity X X X
Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify)			
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Special Instructions/QC Requirements:			
Relinquished by: <i>[Signature]</i> Date/Time: 10/15/15 16:00 Company: TA		Method of Shipment:	
Relinquished by: <i>[Signature]</i> Date/Time: 10/13/15 9:15 Company: TA		Date/Time:	
Relinquished by: <i>[Signature]</i> Date/Time:		Date/Time:	
Relinquished by: <i>[Signature]</i> Date/Time:		Date/Time:	
Custody Seals Intact: Δ Yes Δ No		Cooler Temperature(s) °C and Other Remarks:	



Login Sample Receipt Checklist

Client: Cascade Earth Sciences Inc.

Job Number: 590-2141-1

Login Number: 2141

List Source: TestAmerica Spokane

List Number: 1

Creator: Arrington, Randee E

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	Not requested on COC.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Cascade Earth Sciences Inc.

Job Number: 590-2141-1

Login Number: 2141

List Number: 2

Creator: Sutek, Nick

List Source: TestAmerica Nashville

List Creation: 10/13/15 11:02 AM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Cascade Earth Sciences Inc.

Job Number: 590-2141-1

Login Number: 2141
List Number: 3
Creator: Presley, Kim A

List Source: TestAmerica Seattle
List Creation: 10/20/15 02:42 PM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix B.

Field Notes

SATURDAY, 10/3/15

SUNNY

0700 SHREY, TAKE CARE AT JUSTICE MINE TO NOT FALL

0815 VACUUMING WITH OFF LINE, ACF CREW PREP FOR FINAL LINE SECTION. PHAM CREW FIRM WITH MINI-DROVE, ASSIST ACF WITH LINE.

1240 LUNCH

1230 PHAM CREW (JUSTIN, CHRIS, JERRY) TO JUSTICE - PAVING CONE, DAM BLOCK, EXCAVATING. PLACING 1 1/2 SECTIONS OF 8" HDPE PIPE, ATTACHING RESINS. WYLE & DON, REPAIR LOW SPOT W/ RD. (PITTED), WENT TO M/H FOR GEORGE.

1800 END WORK - ACF CREW OFF SITE

NOTE: USES CREW ON SITE FROM

1200 TO 1600. TO REINFORCE AIRFRAME DEMOLITION: TOP (CAMP GROUND) PIT TONNET TO BE DEMOLISHED. WE WILL ON CRT TONNET AT BOTTOM OF HILL, CES PROPOSES TO EXPOSE TOP 8" BELOW FLOOR LEVEL TO ELIMINATE INFLOW AT SEAM BETWEEN TOP SUB & TANK.



SUNDAY, 10/4/15

SUNNY

0700 PHAM INTO WYLE & DON TO CLEAN EQUIPMENT, PREP TO SORT COVER SOIL AT CELLS. REMOVE ROAD TO RAINY MINE. JUSTIN, CHRIS, JERRY TO JUSTICE MINE TO BOB TOGETHER HDPE PIPE.

0830 TO TO GILCHRIST PILES TO DO TIMESHEET
1300 TO BACK TO CAMP - HEAD TO JUSTICE MINE. 1 1/2 PIPE SECTIONS IN PLACE. BOLTED TOGETHER REMAINING PIPE (AFTER LOWERING)

DIAGONALLY DOWN CLIFF FACE & ANCHOR IN PLACE WITH ROCK ANCHORS & CABLE. USED EXISTING (ORIGINAL MINE) EYE BOLTS ALONG BACK WALL OF ROCK SHELF. TO LOWER PIPE INTO PLACE. INSTALLED

ALL WITHOUT INCIDENT

1700 RYAN TO BAS ON-SITE

1800 BS ON-SITE

1830 TO BACK TO CAMP

Rainy MINE

MCPIRA - DW-124-01 1525

DO = 8.65 mg/L Flow = 1 GPM

pH = 5.83 S.D.

COND = 119 UDS

TEMP = 6.4°C

10/4/15 Sunny

Boston - American Lake

MCPPRA-SW-3A-01

1635

DO = 8.46

pH = 6.91

COND = 532

TEMP = 6.3

Flow = 3 GPM

10/5/15 Monday

76 GARCH

MCPPRA-SW-76G-02

0830

DO = 9.05

pH = 6.84

COND = 181 μ S

TEMP = 7.1°C

Flow =

MCPPRA-SS-766-02

835

Flow

Depth

0

0.7

0.8

Dist

0

1

2

3

Vel

Flow

0

1.6 ft/s

1.5

2.9

76-02

Flow (cont)

Depth

0.7

0

Dist

4

5

Vel

0.35

0

10/5/15

MCPPRA-SW-766-01b

DO = 7.78

pH = 6.14

COND = 22

TEMP = 6.6

MCPPRA-SS-766-01b

935

Flow

Depth

0

3.4

3.4

2.9

1.4

0.8

0

Dist

0

0.5

1

1.5

2

2.5

3

Vel

0

1.4

0.75

0.45

0.30

0.25

0

MCPPRA-SW-SY-01

NO sample

- dry

10/5/15

MC PRA - SW - 514 - 01

1020

DO = 9.77

PH = 6.35

Cond = 77

Temp = 6.9

Flow = NM

MC PRA - SW - 766 - 01a

Dry

No sample

MC PRA - SS - 766 - 01a

1055

MC PRA - SP - 766 - 01

Dry

No sample

MC PRA - SW - 766 - 01

Dry

No sample

MC PRA - SS - 766 - 01

1125

MC PRA - SW - 114 - 01

1520

DO = 11.0

Temp = 4.2

PH = 3.28

Cond = 564

Flow = 30 GPM

10/5/15

MC PRA - SW - 114 - 01

1525

MC PRA - SW - GC - 05

1640

DO = 10.4

Temp = 8.2

PH = 5.99

Cond = 20

MC PRA - SS - GC - 05

1645

Flow

Dist

0

1

2

3

4

5

6

Depth

0

0.8

0.85

0.7

0.2

0.1

0

V/L

0

2.3

1.1

1.4

0.6

0.5

0

10/6/15 P/C

MCPRA - SW - GC-04

935

pH = 6.10

Cond = 14

Temp = 6.0

DO = 10.92

MCPRA - SS - GC-04

940

Flow

Dist

Depth

Vel

0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

~~0.85~~
0.15
0.4
1
0.85
0.85
0.7
0.3
0.7
0.9
0.1
0.2
0.1
0.2
0.4
0.15
0.15
0.5
0
0.4
0
0.05
0.05
0.1
0.05
0
0
0.25
0.15
0

0.35
0.7
0.7
0.15
0.5
0
0.4
0
0.05
0.05
0.1
0.05
0
0
0.25
0.15
0

10/6/15

MCPRA - SW - GC-03

1015

pH = ~~6.10~~ 6.42

Cond = 18 $\mu\text{mho/cm}$

Temp = 5.5°C

DO = 10.5 mg/L

MCPRA - SS - GC-03

1020

Flow

Dist

Depth

Vel

0
1
2
3
4
5
6

0
0.2
0.3
0.2
0.1
0.0
0

0
0.5
0.5
0.4
0.2
0.2
0

MCPRA - DW - Pw-01

NO Seep

Dry

10/6/15-

MCPRA-SW-GC-026

1050

pH = 5.97

Cond = 19

Temp = 5.2

DO = 10.55

MCPRA-SS-GC-026

1035

Flow

Channel A

Dist

0

1

2

3

4

5

Channel B

0

2

4

6

8

Depth

0

0.15

0.1

0.15

0.1

0

0

0

0.25

0.2

0.3

0

Vel

0

0.4

0.8

0.9

0.4

0

0

0

0.8

1.75

2.5

0

10/6/15-

MCPRA-SW-GC-02

1110

pH = 6.18

Cond = 17 μ mho/cm

Temp = 4.3°C

DO = 9.8 mg/L

MCPRA-SS-GC-02

1115

Channel A

Dist

0

1

2

3

4

5

6

Channel B

0

4

6

8

9

Depth

0

0.3

0.4

0.1

0.25

0.2

0

0

0

0.2

0.35

0.4

0.25

0

Vel

0

0.05

0.25

0.35

0.55

0.45

0

0

0

0.65

0.6

0.43

0.2

0

10/6/15

MCPRA-SW-GC-01

1200

pH = ~~6.43~~ 6.43

Temp = 6.8

Cond = 18

DO = 9.48

MCPRA-SS-GC-01

1205

Dist	Depth	Vel
0	0	0
1	0.2	0.7
2	0.25	0.85
3	0.3	0.75
4	0.4	1.0
5	0.6	0.8
6	0.5	0.4
7	0.15	0
8	0.4	0.05
9	0.2	0.1
11	0	0

10/6/15

MCPRA-DW-FM-01

1355

MCPRA-SW-DP-02

1300

pH 6.13 SU
 Cond 196 $\mu\text{mho/cm}$
 DO 11.6 mg/L
 Temp 5.0 $^{\circ}\text{C}$
 Flow = 1.6 gpm

MCPRA-DW-ND-01

1340

pH = 5.89

Cond = 348

Temp = 10.0

DO = 3.16

MCPRA-SW-SFSR-09

1650

Temp = 10.7

pH = 6.73

Cond = 33

DO = ~~10.64~~ 10.64

MCPRA-SS-SFSR-09

1655

MCPRA-SW-DP-03

1700

10/6/15

SFSR-0A
Flow

Dist

0
5
10
15
20
25
30
35
40
45
46

Depth

0
0.65
1.3
0.8
2.5
1.9
2.05
1.3
0.4
0

Vel

0
0
0.05
0.55
0.25
0.35
0.35
0.25
0.15
0.2
0

MCPRA-SW-MCL-01

PIT = 6.48

Cond = 38

Temp = 13.5

DO = 3.65

MCPRA-SS-MCL-01

1.735

10/6/15

MCPRA-SW-SFSR-08

1750

PIT = 6.85

Cond = 28

Temp = 10.2

DO = 12.02

MCPRA-SS-SFSR-08

1755

Flow

Dist

0
4
8
12
16
20
24

Depth

0
0.9
0.75
1.2
0.8
0.3
0

Vel

0
0.1
0.1
0.6
0.75
0.13
0

MCPRA

10/7/15 Rain

MCRA-SW-SFSR-07

815

pH = 6.39

Cond = 260

Temp = 9.4°

DO = ~~10.51~~ 10.51

MCRA-SS-SFSR-07

820

Flow

Depth

Vel

0

4

8

12

16

20

24

27

0

0.7

0.25

1.15

0.4

0.05

0.01

0

MCRA-SW-SFSR-06

900

pH = 6.18

Cond = 280

Temp = 9.5

DO = 9.99

MCRA-SS-SFSR-06

905

10/7/15

SFSR-06

Flow

Dist

Depth

Vel

0

4

8

12

16

20

24

~~28~~ 32

36

0

0.3

0.8

1

1.5

1.7

0.6

1.1

0.8

0

0

0.05

0.3

0.45

0.9

0.3

0.55

0.35

0.05

0

MCRA-SW-SFSR-05

110

pH = ~~5.25~~ 6.23

Cond = 25 umho/cm

Temp = 9.40C

DO = 7.9 mg/L

MCRA-SS-SFSR-05

115

10/7/15 SF5R-05 Flow

Dist	Depth	Vel
0	0	0
4	0.6	0.9
8	1.3	1.5
12	1.65	0.35
16	1.0	1.2
30	0.35	0.55
33	0	0
Channel A	↑	
Channel B	↓	
0	0	0
1	0.1	0.05
2	0.2	0.12
3	0.4	0.15
4	0.4	0.25
5	0.45	0.2
6	0.4	0.02
7	0.2	0.0
7.5	0	0

10/1/15
 MUPRA-SW-SFSR-04 1135
 PTA = 6.40
 Cond = 33 $\mu\text{mho/cm}$
 Temp = 9.2°C
 DO = 8.7 mg/L
 MUPRA-SS-SFSR-04 1200

Flow Dist	Depth	Vel
0	0	0
4	0.8	0.1
8	1.25	0.4
12	1.25	0.6
16	1.3	1.2
20	1.25	0.45
24	0.9	0.5
28	0.7	0.3
32	0	0
BVA		

MUPRA-SW-SFSR-09 1335
 PTA = 5.30 Temp = 8.7
 Cond = 17 DO = 4.05
 MUPRA-SS-SFSR-03 1400

MCPRA-SFSR-03

Flow

Dist

~~0~~

2

4

6

8

10

12

14

16

18

20

22

Depth

~~0~~

0.1

0.2

0.2

0.3

0.4

0.55

0.45

0.55

0.3

0.2

0

Vel

0

0

0.15

0.05

0.05

0.3

1.2

0.4

0.7

0.5

0.2

0

MCPRA-SW-SFSR-02 1435

MCPRA-SS-SFSR-02 1440

* collected w/out gloves

Gloves too small - tear

White denning *

pH

Cond

Temp

DO

5.3

17

8.9

7.8

5.8

17

8.9

7.8

5.8

17

8.9

7.8

5.8

17

8.9

7.8

10/7/15

MCPRA-SFSR-03

Flow

Dist

0

~~1~~

~~2~~

~~3~~

4

5

6

Depth

0

0.3

0.35

0.1

0.35

0.2

0

Vel

0

0.07

0.14

0.30

0.35

0.22

0

MCPRA-SW-SFSR-01

pH = 5.65

Cond = 17

Temp = 8.5

DO = 9.15

1515

MCPRA-SS-SFSR-01

Flow

Dist

0

4

8

12

Depth

0

1.5

2.1

0.7

0.9

Dist

16

20

Depth

1.3

1.4

0

0

1520

10/7/15

MCPRA-SW-GC-04a 1650

pH = 5.79

Cond = 15

Temp = 7.7

DO = 9.09

MCPRA-SS-GC-04a 1655

MCPRA-SF-JU-01 1705

pH = 6.6

Cond = 158 $\mu\text{mho/cm}$

Temp = 7.7 °C

DO = 9.4 mg/L

MCPRA-DW-JU-01 1740

pH = 6.91

Cond = 164 $\mu\text{mho/cm}$

Temp = 5.0 °C

DO = 9.6

10/22/15 P/C

830 - Tobias, Izem OTS on site

Met w. J. Pullm at 'Sheeping area'

Palmer crew on excavation at Ref

placing Gash/Logs on cover soil

1000 = Walker Reclaimed areas

w/ OTS / Izem sloping across

at TOP of contour. Silt

Flowing down.

1200 - Izem / OTS offsite

1500 - BT Sampling at WI

Jerry placing rock for drainage

1700 - Rmg / BTC offsite

Wednesday, October 21, 2015

Drillers on site @ 7:30
H₂O in MW-5 @ 57.5' bgs, but
in casing - may be sealed by confining
layer.

Build well to 60' bgs w/ 10' of screen

Jerry @ repository @ 9:10 am w/ Justin
+ Jeff.

Start pumping MW-2R @ 9:15 am
- muddy @ 1st

MW-2R = B14951

MW-5 = B14952

Pumping MW-2R @ about 1-2 gpm and
surging across the screen periodically

10:30 - Start reading parameters

Time	pH	Cond	Temp	DO	Appearance
10:30	5.65	33 μ mho/cm	9.5°C	7.5mg/L	turbid
10:40	5.70	28	9.1	7.2	clearing up 250 NTU
10:46	5.80	20	9.2	7.4	same
10:52	5.81	20	9.2	7.4	same
11:00	5.83	20	9.1	7.4	very clear

collect @ 11:00

Wednesday, October 21, 2015, continued
Don't trust pH as was unable to
calibrate w/ low ionic strength
buffer \rightarrow used regular buffer
and did not have a pH 4, so
it's a 1-point-cal

10:30 -

Jerry setting coconut mat above
repository (and crew)

11:45 - MW-3R SWL = 27.53' below TC
2.4 gallon casing ~~volume~~

Start purging @ 11:57 \rightarrow 2 gpm

Time	pH	Cond	Temp	DO	Appearance
11:58	5.58	33 μ mho/cm	9.7°C	5.7mg/L	turbid
12:03	5.49	20	9.0	5.2	clear
12:08	5.71	20	8.9	5.4	clear
12:13	5.69	18	8.9	5.6	clear

12:45 MW-5

46-13' bgs to H₂O 60.15' bgs to bottom
Bailed 5-10 bailers (1.66 L/bail)
13:00 - started pumping

Wednesday, October 21, 2015, continued

Our pump can't handle the mud in MW-5 and depth. Bailed and pumped approx 25-30 gallons before giving up. Drillers will be coming back on Friday to set monuments and they will have to develop

1555 - on MW-4

SWL = 55.63' below TOC

Casing volume = 5.5 gallons

Let's try pump on this well full of Clean H₂O...

1615 - Gave up... Pump not working...

Thursday, October 22, 2015

Ryan, Tim & Abe on site ~ 8:30-9:00ish

Gave them tour/orientation

1000 - needed to GeoTech in Kirkland

for pump

1500 - @ MW-5 - bail it a few/Ave

4 times before deploying pump.

SWL = 46.46' bgs

60-20' bgs to bottom

1530 - Drillers are back to pour monument

@ MW-5

Ryan and I move to MW-4 to sample

SWL = 55.89' below TOC

5.5 gallon ~~of~~ casing volume

Start pumping @ 1605

Time	pH	Cond	Temp	DO	Appearance
1606	5.8	33	9.0°C	3.1 mg/L	clear - 30l
1609	5.7	21	8.2	3.3	5.5 gal
1614	5.6	21	7.9	4.1	11 gal
1616	5.6	21	7.8	4.8	16.5
1619	5.6	21	7.7	5.1	22

Collect @ 1620

Friday, October 23, 2015

RMT + BTK hunted down reflectors
for gate in Everett

- Signs Now in Marysville will call
back w/ quote

Jerry's crew demobing as we arrived
on site @ 9:30 am

Had to make Jerry bring loader back
up to clear up area below
repository where trucks checked
up road

Deployed GeoTech pump into MW-5
and started pumping @ 10:30

Drill crew and I have pumped + bailed
100 gallons as 10:55 am

Well has been surged multiple times
- let clear up then sample

Time	pH	Cond	Temp	DO	Comments
11:08	5.2	19 $\mu\text{mhos/cm}$	7.2°C	3.3 mg/L	pretty clear ~12.5 gal
11:14	5.5	20	6.9	4.0	130 gal
11:18	5.5	19	6.6	5.0	135
11:21	5.4	20	6.6	5.3	140

Collected @ 11:25

Friday, October 23, 2015, continued

MW5 pH = 2602.86 @ grade

1145-1215 - RMT and BTK deployed

new padlocks and wildlife cameras
- we'll see if cameras work

1200 - leave repository
1575 - left site!

MW5 stickup = 5.00 feet - 1.91 feet =
3.09 feet

MW5-TOC = 2602.98

3.09

2606.07