APPENDICES

APPENDIX A
FINAL EE/CA APPROVAL MEMORANDUM

To: Laura Joss, Regional Director, Pacific West Region

From: Jim F. Milestone, Superintendent, Whiskeytown National Recreation Area
David L. Harabee (ACTING) 10/20/2016

Subject: Engineering Evaluation & Cost Analysis Approval Memorandum
Coggins Flat Placer Mine
Whiskeytown National Recreation Area, California

PURPOSE

This memorandum recommends and documents the decision of the National Park Service (NPS) to conduct an Engineering Evaluation/Cost Analysis (EE/CA) pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. 9601 et seq., for Coggins Flat Area Placer Mine (Site), Whiskeytown National Recreation Area (WHIS) in Shasta County, California. NPS is the CERCLA lead agency with authority to respond to the release or threatened release of hazardous substances at or from the Site. This Memorandum was prepared in accordance with CERCLA, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300, and the U.S. Environmental Protection Agency's (EPA) *Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA*, OSWER Publication 9360.0-32 (August, 1993).

BACKGROUND

The Coggins Flat Area is located within WHIS, approximately fourteen miles west-northwest of Redding, Shasta County, California. The Coggins Flat Area is an abandoned placer mine site located approximately ¼ to 1 mile north of CA State Route 299 along Trinity Mountain Road and is situated along Clear Creek at approximately 1,300 feet elevation. The Site is located in Section 34, Township 33 North, Range 7 West of the Mount Diablo Meridian (latitude 40° 40' 18.1" north and longitude 122° 38' 17.5" west). Placer gold mining occurred along Clear Creek from the late 1880's to the early 1900's. Placer mining started in Shasta County in the spring of 1848. By the late 1800's, mining was taking place along Clear Creek in the Site area. Dredge mining, one of the methods used in the Site area, consists of dredging creek bed sediments and washing them through sluice boxes over mercury held in the riffles and troughs. Mercury amalgamates with the fine-grained gold in the sediments. The mercury-gold amalgam was

treated to remove the gold and the remaining material discarded along the creek bank. Lode mining also took place in the Site area, particularly upstream along Clear Creek. In 1852 the Washington Mine was discovered in the French Gulch Mining District upstream from the Site outside of NPS lands. Other lode mines upstream from the Site include the American, Black Tom, Franklin, Gladstone, Milkmaid, and Philadelphia mines. In the 1940's, a portion of the Site was used for a lumber mill which was owned and operated by the Shasta-Trinity Lumber Company.

The primary pollutant of concern is mercury derived from past dredging and gold processing. The Site is approximately 150 acres in size and extends north along upper Clear Creek from the Clear Creek picnic area north to the park boundary. Contamination may extend outside this area, particularly to the north on private lands, however this is unknown. The Site has fairly low visitation but immediate public access from Trinity Mountain Road includes a developed day use picnic area and undeveloped parking areas that provide access for Clear Creek recreation. No structures exist on the Site, with the exception a bridge, a vault toilet, and tables at the picnic area and only Trinity Mountain Road is paved. The alluvial terrain in the area is highly altered by the dredging and subsequent land uses. Where the dredge piles are still intact a series of sub-parallel berms created by dredge form large hill-like piles. In other areas, the terrain has been leveled out by heavy equipment or flooding and the piles do not exist. Access to some areas is difficult or impassable by 4x4 truck due to the difficult terrain and vegetation which mostly consists of grasses, riparian vegetation, shrubs, and pines. In past investigations, an all-terrain drill rig was required to complete soil sampling due to the access and terrain which included crossing Clear Creek in low water conditions.

Four studies have been performed at the Coggins Flat Area from 2005 to 2015, a Preliminary Assessment (PA), a Potentially Responsible Party search (PRP), a Site Investigation (SI) and a Supplemental Site Investigation (SSI).

A PA was completed in January 2006 by Versar Inc. The results of the PA showed that based on the observations of the Site and review of available information regarding the past use of the Site, it was likely that a release of mercury to soil and surface water had occurred. Also

identified by the study was a lumber mill on the Site that had potential to release oil and grease, and pentachlorophenol to the Site. A SI was recommended by Versar, Inc.

A SI was completed in February 2011 by Advanced Environmental Services, Inc. (AESI) in which soil, groundwater and surface water samples were collected. Twelve continuous core soil borings and three surface water samples from Clear Creek were analyzed for mercury. Four groundwater borings were also sampled and analyzed for mercury, polychlorinated biphenyls (PCBs), and total petroleum hydrocarbon (TPH). Analytical results from soil samples revealed concentrations of mercury between 0.019 and 0.052 mg/kg in 9 samples from 4 of the 12 locations. All samples analyzed for PCBs and TPH were below method detection levels and all surface water samples analyzed for mercury from Clear Creek were also below method detection levels. AESI recommended a further investigation to verify the distribution and quantity of mercury impacted soil before any remedial options could be effectively evaluated.

A SSI was completed in February 2015 by AESI in which soil and water samples were collected. Thirty-two continuous core soil borings and three surface water samples from Clear Creek were collected and analyzed for mercury. Analytical results from soil samples revealed concentrations of mercury between 0.03 and 0.193 mg/kg in 17 samples from 6 of the 32 locations. Mercury concentration results in 5 soil samples, collected at 4 locations, exceeded the federal and State of California soil screening levels (SSLs) based on maximum contaminant levels (MCLs) for groundwater protection of 0.1 mg/kg. Additionally, comparing the laboratory soil analytical results against environmental screening values (ESVs), seventeen samples exceeded the Birds ESV of 0.013 mg/kg and five soil samples exceeded the Soil Invertebrates ESVs of 0.1 mg/kg for mercury.

USE OF REMOVAL ACTION AUTHORITY

Pursuant to Sections 104(a)(1) and (b)(1) of CERCLA, 42 U.S.C. 9604(a)(1) and (b)(1), whenever there is a release or substantial threat of release of a hazardous substance into the environment, the President is authorized to act, consistent with the NCP, to remove or arrange for the removal of such hazardous substance or take any other response action, including appropriate investigation, deemed necessary to protect public health or welfare of the

environment. Section 104(a) and (b) response authority (including the authority to perform an NTCRA, including the EE/CA that is the subject of this Memorandum) has been delegated to the Secretary of the Department of the Interior (DOI) pursuant to Executive Order 1258, 52 Fed. Reg. 2923 (1987), and further delegated to NPS by DOI Departmental Manual Part 207, Chapter 7, with respect to property under the jurisdiction, custody, or control of NPS.

Section 300.415(b)(2) of the NCP establishes the criteria for determining the appropriateness of a removal action. The following are applicable criteria that support the determination to consider a removal action at the Site:

i. Actual or potential exposure to nearby human population, animals, or the food chain from hazardous substances or pollutants or contaminants;

ii. Actual or potential contamination of drinking water supplies or sensitive ecosystems;

iii. High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate and;

iv. Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.

The AESI SSI found that mercury concentrations exceeded both human health and ecological benchmarks, posing a potential danger to the human population and the surrounding environment and satisfying criterion i and iii. Furthermore, satisfying criterion ii, areas within the National Park System are considered sensitive ecosystems as presented in the NPS Organic Act, 16 U.S.C 1. These results suggest further characterization of the Site and declare the Site to be of potential environmental concern.

Based on these findings, NPS has determined that the use of removal action authority at WHIS to investigate, abate, prevent, minimize, stabilize, mitigate, and/or eliminate the release or threat of release of hazardous substances at or from the Site is appropriate. Additionally, NPS has determined that a planning period of at least six months exists before on-site activities must be initiated. Therefore, NPS is authorized to conduct an EE/CA pursuant to and in accordance with Section 300.414(b)(4) of the NCP. An EE/CA is performed to determine the nature and extent of contamination, assess potential risks posed to human and ecological receptors from exposure to

such contamination, identify and evaluate removal action alternatives to address unacceptable risks, and identify a recommended removal action alternative that best meets the evaluation criteria.

EE/CA IMPLEMENTATION AND FUNDING

NPS has received funding from the DOI to implement the Site EE/CA. Upon approval of the recommendation, the Site EE/CA will be implemented.

APPROVAL

Based on the information and analysis presented in this memorandum, please indicate your concurrence or non-concurrence with the recommendation to perform an EE/CA as part of a NTCRA at the Coggins Flat Area Placer Mine at the Whiskeytown National Recreation Area. If you have any questions, please contact Stephen Mitchell at (415) 623-2286.

I Concur

Patricia L. Neubacher Date: 10/26/16

for Laura Joss, Regional Director
National Park Service, Pacific West Region

I Do Not Concur

_____ Date: _____

APPENDIX B
WHIS SPECIES LIST

Table B-1
WHIS Species- Vascular Plants
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Vascular Plant			Active	Notholithocarpus densiflorus var. echinoide	tan oak shrub	No	Approved	Present	Native	Common			
WHIS	Vascular Plant			Active	Sceptridium multifidum	clausen grape fern	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Alismatales	Alismataceae	Active	Alisma triviale	WATER PLANTAIN	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Alismatales	Alismataceae	Active	Sagittaria cuneata	arum-leaf arrowhead	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Alismatales	Alismataceae	Active	Sagittaria latifolia	Broadleaf Arrowhead	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Alismatales	Alismataceae	Active	Sagittaria montevidensis ssp. calycina	MONTEVIDEO ARROWHEAD	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Alismatales	Alismataceae	Active	Sagittaria sanfordii	SANFORD'S ARROWHEAD	No	Approved	Present	Native	Rare	Management Priority		SC
WHIS	Vascular Plant	Alismatales	Araceae	Active	Lemna minuta	LEAST DUCKWEED	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Alismatales	Hydrocharitaceae	Active	Elodea canadensis	COMMON WATERWEED	No	Approved	Present	Native	Unknown			RT
WHIS	Vascular Plant	Alismatales	Juncaginaceae	Active	Triglochin maritima	ARROW GRASS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Alismatales	Potamogetonaceae	Active	Potamogeton crispus	CUT-LEAVED PONDWEED	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Alismatales	Potamogetonaceae	Active	Potamogeton diversifolius	RAFINIQUE'S PONDWEED	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Alismatales	Potamogetonaceae	Active	Potamogeton epihydrus	NUTTALL'S PONDWEED	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Alismatales	Potamogetonaceae	Active	Potamogeton foliosus	LEAFY PONDWEED	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Alismatales	Potamogetonaceae	Active	Potamogeton gramineus	Variableleaf Pondweed	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Alismatales	Potamogetonaceae	Active	Potamogeton illinoensis	illinois pondweed	No	Approved	Present	Native				
WHIS	Vascular Plant	Alismatales	Potamogetonaceae	Active	Potamogeton nodosus	longleaf pondweed	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Alismatales	Potamogetonaceae	Active	Potamogeton pusillus	SMALL PONDWEED	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Alismatales	Potamogetonaceae	Active	Potamogeton richardsonii	richardson's pondweed	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Angelica arguta	angelica	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Angelica tomentosa	WOOLY ANGELICA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Anthriscus caucalis	BUR-CHERVIL	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Conium maculatum	POISON HEMLOCK	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Daucus pusillus	WILD CARROT, RATTLESNAKE WEED	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Foeniculum vulgare	BISCUIT ROOT, SWEET FENNEL	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Heracleum maximum	cow parsnip	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Ligusticum californicum	CALIFORNIA LOVAGE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Lomatium macrocarpum	LARGE-FRUITED LOMATIUM	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Lomatium triternatum var. triternatum	nineleaf biscuitroot	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Lomatium utriculatum	COMMON LOMATIUM	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Osmorhiza berteroi	mountain sweet cicely	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Oxypolis occidentalis	western cowbane	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Perideridia kelloggii	KELLOGG'S YAMPAH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Sanicula bipinnatifida	PURPLE SANICLE, SNAKEROOT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Sanicula crassicaulis	PACIFIC SANICLE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Sanicula graveolens	northern sanicle	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Sanicula tuberosa	TUBEROUS SANICLE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Scandix pecten-veneris	SHEPHERD'S NEEDLE	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Torilis arvensis	HEDGE PARSLEY	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Torilis nodosa	WILD PARSLEY	No	Approved	Present	Non-native	Abundant			
WHIS	Vascular Plant	Apiales	Apiaceae	Active	Yabea microcarpa	HEDGE PARSLEY	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Apiales	Araliaceae	Active	Aralia californica	CALIFORNIA SPIKENARD	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Apiales	Araliaceae	Active	Hedera helix	ENGLISH IVY	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Asparagales	Amaryllidaceae	Active	Allium amplectens	NARROW-LEAVED ONION	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asparagales	Amaryllidaceae	Active	Allium campanulatum	DUSKY ONION	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Amaryllidaceae	Active	Allium cratericola	Three-bracted onion	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Amaryllidaceae	Active	Allium falcifolium	scytheleaf onion	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Amaryllidaceae	Active	Allium membranaceum	PAPERY ONION	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Amaryllidaceae	Active	Allium obtusum	RED SIERRA ONION	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Amaryllidaceae	Active	Allium obtusum var. obtusum	red Sierra onion	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Asparagales	Amaryllidaceae	Active	Allium parvum	small onion	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Asparagales	Amaryllidaceae	Active	Allium sanbornii var. sanbornii	SANBORN'S ALLIUM	No	Approved	Present	Native	Uncommon	Management Priority		
WHIS	Vascular Plant	Asparagales	Amaryllidaceae	Active	Allium tribracteatum	THREE-BRACTED ONION	No	Approved	Present	Native	Rare	Management Priority		SC
WHIS	Vascular Plant	Asparagales	Amaryllidaceae	Active	Allium validum	SWAMP ONION	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asparagales	Asparagaceae	Active	Asparagus officinalis	ASPARAGUS	No	Approved	Present	Non-native	Rare			
WHIS	Vascular Plant	Asparagales	Asparagaceae	Active	Brodiaea coronaria	HARVEST BRODIAEA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Asparagaceae	Active	Brodiaea elegans	ELEGANT BRODIAEA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Asparagaceae	Active	Chlorogalum pomeridianum	SOAP ROOT, SOAP PLANT, AMOLE	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asparagales	Asparagaceae	Active	Chlorogalum pomeridianum var. pomeridian	wavyleaf soap plant	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Asparagales	Asparagaceae	Active	Dichelostemma capitatum	BLUE DICKS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Asparagaceae	Active	Dichelostemma capitatum ssp. capitatum	bluedicks	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Asparagaceae	Active	Dichelostemma congestum	OOKOW	No	Approved	Present	Native	Unknown			

Table B-1
WHIS Species- Vascular Plants
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Vascular Plant	Asparagales	Asparagaceae	Active	Dichelostemma ida-maia	FIRECRACKER FLOWER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Asparagaceae	Active	Dichelostemma multiflorum	MANY-FLOWERED BRODIAEA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Asparagaceae	Active	Maianthemum racemosum	branched solomon's seal	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Asparagaceae	Active	Maianthemum stellatum	false solomon's seal	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Asparagaceae	Active	Triteleia crocea	yellow triteleia	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Asparagaceae	Active	Triteleia crocea var. crocea	YELLOW TRITELEIA	No	Approved	Present	Native	Rare	Management Priority		
WHIS	Vascular Plant	Asparagales	Asparagaceae	Active	Triteleia hyacinthina	WHITE TRITELEIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Asparagaceae	Active	Triteleia ixioides ssp. anilina	Golden Brodiaea, Golden face	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Iridaceae	Active	Iris hartwegii	HARTWEG'S IRIS	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asparagales	Iridaceae	Active	Iris hartwegii ssp. pinetorum	rainbow iris	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Iridaceae	Active	Iris macrosiphon	BOWL TUBE IRIS	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Asparagales	Iridaceae	Active	Iris purdyi	PURDY'S IRIS	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asparagales	Iridaceae	Active	Iris tenuissima	longtube iris	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Asparagales	Iridaceae	Active	Iris tenuissima ssp. purdyiformis	longtube iris	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Asparagales	Iridaceae	Active	Iris tenuissima ssp. tenuissima	LONG TUBE IRIS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Iridaceae	Active	Sisyrinchium bellum	BLUE-EYED GRASS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Orchidaceae	Active	Calypso bulbosa	fairyslipper orchid	No	Approved	Present	Native	Rare			
WHIS	Vascular Plant	Asparagales	Orchidaceae	Active	Calypso bulbosa var. occidentalis	fairyslipper orchid	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Orchidaceae	Active	Cephalanthera austiniae	PHANTOM ORCHID	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asparagales	Orchidaceae	Active	Corallorhiza maculata	spotted coral root	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asparagales	Orchidaceae	Active	Corallorhiza mertensiana	western coral root	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Orchidaceae	Active	Corallorhiza striata	striped coral root	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asparagales	Orchidaceae	Active	Cypripedium fasciculatum	CLUSTERED LADY'S SLIPPER	No	Approved	Present	Native	Rare	Management Priority		SC
WHIS	Vascular Plant	Asparagales	Orchidaceae	Active	Goodyera oblongifolia	RATTLESNAKE PLANTAIN	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asparagales	Orchidaceae	Active	Listera convallarioides	BROAD-LEAVED TWAYBLADE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asparagales	Orchidaceae	Active	Piperia elegans	ELEGANT PIPERIA	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asparagales	Orchidaceae	Active	Piperia transversa	PIPERIA	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asparagales	Orchidaceae	Active	Piperia unalascensis	ALASKA PIPERIA	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asparagales	Orchidaceae	Active	Platanthera dilatata var. leucostachys	WHITE FLOWERED BOG ORCHID	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asparagales	Orchidaceae	Active	Spiranthes romanzoffiana	HOODED LADIES TRESSES	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asparagales	Tecophilaeaceae	Active	Odontostomum hartwegii	HARTWEG'S ODONTOSTONUM	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Achillea millefolium	YARROW	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Achyrachaena mollis	BLOW WIVES	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Adenocaulon bicolor	TRAIL PLANT	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Agoseris grandiflora	LARGE-FLOWERED AGOSERIS	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Agoseris heterophylla	ANNUAL AGOSERIS	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Agoseris monticola	pale agoseris	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Agoseris retrorsa	SPEAR-LEAVED AGOSERIS	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Ambrosia psilostachya	WESTERN RAGWEED	No	Approved	Present	Native	Rare			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Anaphalis margaritacea	western pearly everlasting	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Antennaria argentea	SILVERY EVERLASTING	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Antennaria rosea	ROSY EVERLASTING	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Anthemis cotula	MAYWEED	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Arctium minus	COMMON BURDOCK	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Arnica cordifolia	heartleaf arnica	No	Approved	Probably Pres	Native				RT
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Arnica discoidea	RAYLESS ARNICA	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Arnica venosa	SHASTA COUNTY ARNICA	No	Approved	Present	Native	Uncommon	Management Priority		RT
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Artemisia douglasiana	CALIFORNIA MUGWORT	No	Approved	Present	Native	Abundant			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Baccharis pilularis	COYOTE BRUSH, CHAPARRAL BROOM	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Balsamorhiza deltoidea	BALSAM DELTOID	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Bidens frondosa	STICK-TIGHT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Brickellia californica	CALIFORNIA BRICKELLIA	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Calycadenia fremontii	FREMONT'S ROSIN WEED	No	Approved	Present	Native	Uncommon			SC
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Calycadenia truncata	ROSIN WEED	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Centaurea	knapweed, star thistle	No	In Review	Present	Non-native				
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Centaurea diffusa	Diffuse knapweed	No	Approved	Present	Non-native	Rare	Management Priority		
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Centaurea melitensis	TOCALOTE, NAPA THISTLE	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Centaurea solstitialis	YELLOW STAR THISTLE	No	Approved	Present	Non-native	Abundant	Management Priority		
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Centaurea stoebe ssp. micranthos	spotted knapweed	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Chaenactis douglasii	HOARY CHAENACTIS	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Chrysothamnus viscidiflorus	STICKY-LEAVED RABBIT BUSH	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Cichorium intybus	CHICORY	No	Approved	Present	Non-native	Uncommon			

Table B-1
WHIS Species- Vascular Plants
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Cirsium occidentale var. candidissimum	SNOWY THISTLE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Cirsium occidentale var. venustum	RED THISTLE, COULTER'S THISTLE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Cirsium vulgare	BULL THISTLE	No	Approved	Present	Non-native	Common	Management Priority		
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Ericameria bloomeri	BLOOMER'S GOLDBUSH	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Erigeron bioletti	biolett's erigeron	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Erigeron canadensis	horseweed	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Erigeron inornatus	FLEABANE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Erigeron inornatus var. inornatus	California rayless daisy, California rayless fleab	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Erigeron inornatus var. viscidulus	rockloving erigeron	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Erigeron reductus	FLEABANE, RAYLESS DAISY	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Eriophyllum lanatum	WOOLY SUNFLOWER	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Eriophyllum lanatum var. grandiflorum	common woolly sunflower	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Euthamia occidentalis	WESTERN GOLDENROD	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Gnaphalium palustre	LOWLAND CUDWEED	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Grindelia camporum	GUMWEED	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Grindelia hirsutula	Gumweed	No	Approved	Present	Native	Unknown			RT
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Helenium bigelovii	Bigelow's sneezeweed	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Helenium puberulum	SNEEZEWEED	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Helianthella californica var. californica	California helianthella	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Helianthella californica var. nevadensis	Nevada helianthella	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Hemizonella minima	small madia	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Hesperevax acaulis	DWARF EVAX	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Heterotheca grandiflora	TELEGRAPH WEED	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Heterotheca oregona	OREGON GOLDEN-ASTER	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Heterotheca oregona var. compacta	Oregon false goldenaster	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Hieracium albiflorum	WHITE HAWKWEED	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Hieracium greenei	Greene's hawkweed	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Holozonia filipes	HOLOZONIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Hypochaeris glabra	SMOOTH CAT'S EAR	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Hypochaeris radicata	HAIRY CAT'S EAR	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Lactuca serriola	PRICKLY LETTUCE	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Lapsana communis	NIPPLEWORT	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Leontodon saxatilis	hawkbit	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Lessingia nemaclada	SLENDER-STEMMED LESSINGIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Logfia filaginoides	california filago	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Logfia gallica	narrow-leaved filago	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Madia elegans	COMMON MADIA	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Madia elegans ssp. vernalis	COMMON MADIA	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Madia elegans var. densifolia	common madia	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Madia exigua	SMALL TARWEED	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Madia gracilis	GUMWEED	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Malacothrix clevelandii	CLEVELAND'S MALACOTHRIX	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Malacothrix floccifera	WOOLY MALACOTHRIX	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Matricaria discoidea	pineapple weed	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Micropus californicus	Q TIPS, SLENDER COTTONWEED	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Micropus californicus var. californicus	slender cottonweed	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Microseris nutans	NODDING SCORZONELLA	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Packera eurycephala var. eurycephala	cut-leaved butterweed	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Inactive	Pseudognaphalium beneolens	Frgrant Everlasting, wright's cudweed	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Pseudognaphalium californicum	california cudweed	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Pseudognaphalium luteoalbum	Weedy Cudweed	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Pseudognaphalium thermale	cudweed	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Psilocarphus oregonus	WOOLY MARBLES	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Scorzonera hispanica	VIPER'S GRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Senecio aronicoides	CALIFORNIA BUTTERWEED	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Senecio eurycephalus	CUT-LEAVED BUTTERWEED	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Senecio integerrimus	lambstongue ragwort	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Senecio sylvaticus	woodland ragwort	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Senecio triangularis	ARROW BUTTERWEED	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Senecio vulgaris	OLD MAN OF SPRING, GROUNDSEL	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Sericocarpus oregonensis ssp. oregonensis	oregon white-topped aster	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Solidago elongata	meadow goldenrod	No	Approved	Present	Native	Unknown			

Table B-1
WHIS Species- Vascular Plants
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Solidago velutina ssp. californica	california goldenrod	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Soliva sessilis	SOUTH AMERICAN SOLIVA	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Sonchus asper	PRICKLY SOW THISTLE	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Stephanomeria virgata	TALL STEPHANOMERIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Stephanomeria virgata ssp. pleurocarpa	wand wirelettuce	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Tanacetum balsamita	costmary	No	Approved	Probably Pres	Non-native				
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Tanacetum parthenium	FEVERFEW	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Tanacetum vulgare	TANSY	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Taraxacum officinale	COMMON DANDELION	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Tragopogon dubius	YELLOW SALSIFY	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Uropappus lindleyi	SILVER PUFFS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Wyethia angustifolia	NARROW-LEAVED MULE EARS	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Wyethia glabra	Coast Range mule-ears	No	Approved	Present	Native				
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Wyethia helenioides	GRAY MULE EARS	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Wyethia mollis	woolly mule-ears	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Asterales	Asteraceae	Active	Xanthium strumarium	COCKLEBUR	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Campanulaceae	Active	Asyneuma prenanthoides	creeping bellflower	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Campanulaceae	Active	Campanula medium	BLUEBELL	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Campanulaceae	Active	Githopsis specularioides	BLUE CUP, VENUS'LOOKING GLASS	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Asterales	Campanulaceae	Active	Heterocodon rariflorum	HETEROCODON	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Amsinckia intermedia	FIDDLENECK	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Amsinckia menziesii	rancher's fireweed	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Cryptantha affinis	COMMON CRYPTANTHA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Cryptantha clokeyi	PRICKLY CRYPTANTHA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Cryptantha intermedia	COMMON CRYPTANTHA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Cryptantha milobakeri	MILO BAKER'S CRYPTANTHA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Cryptantha muricata	PRICKLY CRYPTANTHA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Cryptantha torreyana	TORREY'S CRYPTANTHA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Cynoglossum grande	WESTERN HOUND'S TONGUE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Cynoglossum occidentale	HOUND'S TONGUE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Eriodictyon californicum	YERBA SANTA	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Lithospermum californicum	GROMWELL, SHASTA PUCCOON	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Myosotis discolor	changing forget-me-not	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Pectocarya penicillata	SHORT LEAF COMB SEED	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Plagiobothrys cognatus	POPCORN FLOWER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Plagiobothrys nothofulvus	RUSTY POPCORN FLOWER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Plagiobothrys tenellus	SLENDER POPCORN FLOWER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Boraginaceae	Active	Plagiobothrys tener	SLENDER POPCORN FLOWER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Hydrophyllaceae	Active	Draperia systyla	DRAPERIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Hydrophyllaceae	Active	Hydrophyllum occidentale	WESTERN WATERLEAF	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Hydrophyllaceae	Active	Nemophila heterophylla	CANYON NEMOPHILA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Hydrophyllaceae	Active	Nemophila parviflora	SMALL-FLOWERED NEMOPHILA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Hydrophyllaceae	Active	Nemophila pedunculata	MEADOW NEMOPHILA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Hydrophyllaceae	Active	Phacelia corymbosa	SERPENTINE PHACELIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Hydrophyllaceae	Active	Phacelia egena	SCORPIAN WEED	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Hydrophyllaceae	Active	Phacelia hastata ssp. compacta	Timberline Phacelia	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Hydrophyllaceae	Active	Phacelia heterophylla ssp. virgata	VIRGATE PHACELIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Hydrophyllaceae	Active	Phacelia imbricata	IMBRICATE PHACELIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Boraginales	Hydrophyllaceae	Active	Phacelia mutabilis	CHANGEABLE PHACELIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Arabidopsis thaliana	MOUSE EAR	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Athysanus pusillus	DWARF ATHYSANUS	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Barbarea orthoceras	American yellowrocket	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Barbarea verna	WINTERCRESS	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Barbarea vulgaris	COMMON WINTERCRESS	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Boechera platysperma	pioneer rockcress	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Brassica nigra	BLACK MUSTARD	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Brassica tournefortii	ASIAN MUSTARD	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Camelina microcarpa	false flax	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Capsella bursa-pastoris	SHEPHERD'S PURSE	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Cardamine californica	MILKMAIDS, TOOTHWORT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Cardamine californica var. sinuata	MILKMAIDS, TOOTHWORT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Cardamine oligosperma	IDAHO BITTER CRESS	No	Approved	Present	Native	Unknown			

Table B-1
WHIS Species- Vascular Plants
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Draba verna	WHITLOW GRASS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Erysimum capitatum	WALLFLOWER	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Hirschfeldia incana	WILD MUSTARD	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Isatis tinctoria	DYER'S WOAD	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Lepidium campestre	ENGLISH PEPPER GRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Lepidium latifolium	broadleaved pepperweed, perennial pepperwe	No	Approved	Present	Non-native	Rare	Management Priority		
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Lepidium nitidum	SHINING PEPPER GRASS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Lepidium virginicum ssp. menziesii	wild pepper grass	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Nasturtium officinale	WATER CRESS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Raphanus sativus	WILD RADISH	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Rorippa curvisiliqua	curvepod yellowcress	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Sisymbrium altissimum	TUMBLE MUSTARD	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Sisymbrium officinale	HEDGE MUSTARD	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Streptanthus barbatus	Pacific jewelflower	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Streptanthus tortuosus	JEWELWEED	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Streptanthus tortuosus var. tortuosus	mountain jewelflower	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Thysanocarpus curvipes	FRINGE POD	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Brassicales	Brassicaceae	Active	Turritis glabra	tower mustard	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Brassicales	Limnanthaceae	Active	Limnanthes alba	WHITE MEADOW FOAM	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Amaranthaceae	Active	Atriplex rosea	TUMBLING ORACLE	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Caryophyllales	Amaranthaceae	Active	Chenopodium album	LAMB'S QUARTERS	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Caryophyllales	Amaranthaceae	Active	Dysphania botrys	jerusalem oak, goosefoot	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Amaranthaceae	Active	Dysphania pumilio	tasmanian goosefoot	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Caryophyllaceae	Active	Cerastium glomeratum	MOUSE-EAR CHICKWEED	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Caryophyllales	Caryophyllaceae	Active	Eremogone congesta var. crassula	capitate sandwort	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Caryophyllales	Caryophyllaceae	Active	Eremogone congesta var. suffrutescens	suffrutescent sandwort	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Caryophyllales	Caryophyllaceae	Active	Minuartia douglasii	DOUGLAS' SANDWORT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Caryophyllaceae	Active	Minuartia nuttallii	NUTTALL'S SANDWORT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Caryophyllaceae	Active	Minuartia nuttallii var. gregaria	nuttalll's sandward	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Caryophyllaceae	Active	Petrorhagia dubia	WINDMILL PINK	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Caryophyllales	Caryophyllaceae	Active	Saponaria officinalis	SOAPWORT, BOUNCING BET	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Caryophyllales	Caryophyllaceae	Inactive	Scleranthus annuus ssp. annuus	GERMAN KNOTGRASS	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Caryophyllales	Caryophyllaceae	Active	Silene antirrhina	SLEEPY CATCHFLY	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Caryophyllaceae	Active	Silene campanulata ssp. glandulosa	BELL CATCHFLY	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Caryophyllaceae	Active	Silene gallica	COMMON CATCHFLY	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Caryophyllaceae	Active	Silene laciniata ssp. californica	california indian pink	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Caryophyllaceae	Active	Silene lemmonii	lemmon's catchfly	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Caryophyllaceae	Active	Spergularia bocconii	BOCCONE'S SAND SPURRY	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Caryophyllaceae	Active	Spergularia marina	SALTMARSH SPURRY	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Caryophyllaceae	Active	Stellaria media	CHICKWEED	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Caryophyllales	Molluginaceae	Active	Mollugo verticillata	INDIAN CHICKWEED	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Montiaceae	Active	Calandrinia ciliata	RED MAIDS	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Caryophyllales	Montiaceae	Active	Calyptridium umbellatum	PUSSY TOES	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Caryophyllales	Montiaceae	Active	Claytonia exigua ssp. exigua	PALE SPRING BEAUTY	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Montiaceae	Active	Claytonia exigua ssp. glauca	serpentine springbeauty	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Montiaceae	Active	Claytonia parviflora	miner's lettuce	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Montiaceae	Active	Claytonia parviflora ssp. parviflora	streambank springbeauty	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Montiaceae	Active	Claytonia perfoliata	MINER'S LETTUCE	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Caryophyllales	Montiaceae	Active	Claytonia rubra ssp. rubra	RED STEM MINER'S LETTUCE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Eriogonum lobbii var. lobbii	LOBB'S BUCKWHEAT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Eriogonum nudum	NAKED BUCKWHEAT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Eriogonum nudum var. pubiflorum	NAKED BUCKWHEAT	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Eriogonum umbellatum	SULPHUR BUCKWHEAT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Eriogonum umbellatum var. bahiiforme	sulphur-flower buckwheat	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Eriogonum umbellatum var. furcosum	sulphur-flower buckwheat	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Eriogonum umbellatum var. polyanthum	American river sulphur-flower buckwheat, sulp	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Eriogonum vimineum	WICKER BUCKWHEAT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Persicaria hydropiper	common smartweed	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Persicaria hydropiperoides	waterpepper	No	Approved	Present	Native	Unknown			RT
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Persicaria lapathifolia	willow smartweed	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Persicaria maculosa	lady's thumb	No	Approved	Present	Non-native	Unknown			RT
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Polygonum aviculare ssp. depressum	common knotweed	No	Approved	Present	Non-native	Unknown			RT

Table B-1
WHIS Species- Vascular Plants
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Polygonum bolanderi	BOLANDER'S KNOTWEED	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Polygonum californicum	California knotweed	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Polygonum sawatchense ssp. sawatchense	knotweed	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Rumex acetosella	SHEEP SORREL	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Rumex californicus	willow dock	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Rumex crispus	CURLY DOCK	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Rumex salicifolius	WILLOW DOCK	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Polygonaceae	Active	Rumex salicifolius var. salicifolius	WILLOW DOCK	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Caryophyllales	Portulacaceae	Active	Portulaca oleracea	PURSLANE	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Caryophyllales	Tamaricaceae	Active	Tamarix chinensis	SALT CEDAR	No	Approved	Present	Non-native	Rare	Management Priority		
WHIS	Vascular Plant	Cornales	Cornaceae	Active	Cornus glabrata	BROWN DOGWOOD	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Cornales	Cornaceae	Active	Cornus nuttallii	PACIFIC MOUNTAIN DOGWOOD	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Cornales	Cornaceae	Active	Cornus sericea ssp. occidentalis	western dogwood	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Cornales	Cornaceae	Active	Cornus sericea ssp. sericea	AMERICAN DOGWOOD	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Cornales	Cornaceae	Active	Cornus sessilis	MINER'S DOGWWOD	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Cornales	Hydrangeaceae	Active	Philadelphus lewisii	MOCK ORANGE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Cornales	Hydrangeaceae	Active	Whipplea modesta	YERBA DE SELVA	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Cornales	Loasaceae	Active	Mentzelia laevicaulis	GIANT BLAZING STAR	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Cucurbitales	Cucurbitaceae	Active	Marah watsonii	MANROOT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Cucurbitales	Datiscaceae	Active	Datisca glomerata	DURANGO ROOT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Dipsacales	Adoxaceae	Active	Sambucus nigra ssp. caerulea	blue elderberry	No	Approved	Present	Native	Rare			
WHIS	Vascular Plant	Dipsacales	Caprifoliaceae	Active	Lonicera ciliosa	ORANGE HONEYSUCKLE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Dipsacales	Caprifoliaceae	Active	Lonicera hispidula	HAIRY HONEYSUCKLE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Dipsacales	Caprifoliaceae	Active	Lonicera interrupta	CHAPARRAL HONEYSUCKLE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Dipsacales	Caprifoliaceae	Active	Symphoricarpos albus var. laevigatus	snowberry	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Dipsacales	Caprifoliaceae	Active	Symphoricarpos mollis	CREEPING SNOWBERRY	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Dipsacales	Linnaeaceae	Active	Linnaea borealis var. longiflora	twinflower	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Dipsacales	Valerianaceae	Active	Plectritis macrocera	WHITE PLECTRITIS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Dipsacales	Valerianaceae	Active	Valerianella carinata	CORN SALAD	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Dipsacales	Valerianaceae	Active	Valerianella locusta	Corn Salad	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Equisetales	Equisetaceae	Active	Equisetum arvense	COMMON HORSETAIL	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Equisetales	Equisetaceae	Active	Equisetum hyemale ssp. affine	Horsetail	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Equisetales	Equisetaceae	Active	Equisetum laevigatum	SMOOTH SCOURING RUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Equisetales	Equisetaceae	Active	Equisetum telmateia ssp. braunii	Giant Horsetail	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ericales	Ebenaceae	Active	Diospyros virginiana	COMMON PERSIMMON	No	Approved	Present	Non-native	Rare			
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Arbutus menziesii	MADRONE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Arctostaphylos malloryi	Balaklala manzanita, Mallory's manzanita	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Arctostaphylos manzanita	COMMON MANZANITA	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Arctostaphylos manzanita ssp. manzanita	New Name	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Arctostaphylos manzanita ssp. roofii	COMMON MANZANITA	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Arctostaphylos manzanita ssp. wieslanderi	COMMON MANZANITA	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Arctostaphylos nevadensis	PINEMAT MANZANITA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Arctostaphylos patula	GREENLEAF MANZANITA	No	Approved	Present	Native	Abundant			
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Arctostaphylos viscida	WHITELEAF MANZANITA	No	Approved	Present	Native	Abundant			
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Arctostaphylos viscida ssp. viscida	whiteleaf manzanita	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Chimaphila menziesii	LITTLE PRINCE'S PINE, PIPSISSEWA	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Chimaphila umbellata	BLAKE'S PRINCE'S PINE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Leucothoe davisiae	SIERRA LAUREL	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Orthilia secunda	sidebells wintergreen	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Pleuricospora fimbriolata	fringed pinesap	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Pterospora andromedea	woodland pinedrops	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Pyrola asarifolia ssp. asarifolia	BOG WINTERGREEN	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Pyrola picta	WINTERGREEN	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Rhododendron occidentale	WESTERN AZALEA	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Vaccinium cespitosum	dwarf bilberry	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Vaccinium deliciosum	Cascade bilberry	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ericales	Ericaceae	Active	Vaccinium membranaceum	mountain bilberry, thinleaf huckleberry	No	Approved	Present	Native	Unknown			RT
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Allophyllum divaricatum	STRAGGLING GILIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Allophyllum gilioides	DENSE FALSE GILY FLOWER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Collomia grandiflora	LARGE-FLOWERED COLLOMIA	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Collomia heterophylla	VARIABLE LEAF COLLOMIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Gilia capitata	BLUE FIELD GILIA	No	Approved	Present	Native	Unknown			

Table B-1
WHIS Species- Vascular Plants
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Gilia capitata ssp. capitata	bluehead gilia	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Gilia tricolor	Bird's Eyes	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Leptosiphon androsaceus	false baby stars	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Leptosiphon bicolor	bicolored linanthus	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Leptosiphon ciliatus	whisker brush linanthus	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Leptosiphon filipes	thread linanthus	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Leptosiphon parviflorus	variable linanthus	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Leptosiphon rattanii	rattan's linanthus	No	Approved	Present	Native	Rare	Management Priority		
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Microsteris gracilis	BEGGAR'S GILIA	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Navarretia capillaris	smooth-leaved gilia	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Navarretia divaricata	mountain navarretia	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Navarretia heterandra	TEHAMA NAVARRETIA	No	Approved	Present	Native	Unknown	Management Priority		SC
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Navarretia intertexta	NEEDLE-LEAVED NAVERRETIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Navarretia intertexta ssp. intertexta	Needle-Leaved Navarretia	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ericales	Polemoniaceae	Active	Phlox speciosa	showy phlox	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Ericales	Primulaceae	Active	Anagallis arvensis	SCARLET PIMPERNEL	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Ericales	Primulaceae	Active	Dodecatheon hendersonii	SHOOTING STAR	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ericales	Primulaceae	Active	Trientalis latifolia	WESTERN STAR FLOWER	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ericales	Styracaceae	Active	Styrax redivivus	snowdrop bush	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Acmispon americanus var. americanus	american bird's-foot trefoil	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Acmispon brachycarpus	bird's foot lotus	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Acmispon grandiflorus var. grandiflorus	chaparral bird's-foot trefoil	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Acmispon parviflorus	small-flowered lotus	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Acmispon wrangelianus	chile lotus	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Albizia julibrissin	MIMOSA, SILK TREE	No	Approved	Probably Pres	Non-native				
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Amorpha californica	FALSE INDIGO	No	Approved	Present	Native	Rare			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Amorpha californica var. californica	False Indigo	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Amorpha californica var. napensis	INDIGO BUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Astragalus gambelianus	GAMBEL'S LOCOWEED	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Cercis occidentalis	REDBUD	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Cytisus scoparius	SCOTCH BROOM	No	Approved	Present	Non-native	Common	Management Priority		
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Genista monspessulana	FRENCH BROOM	No	Approved	Present	Non-native	Abundant	Management Priority		
WHIS	Vascular Plant	Fabales	Fabaceae	Inactive	Gleditsia sinensis	CHINESE HONEY LOCUST	No	Approved	Present	Non-native	Rare			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Hosackia crassifolia var. crassifolia	big deervetch	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Hosackia oblongifolia var. oblongifolius	streamside trefoil	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Hosackia pinnata	pinnate lotus	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Hosackia stipularis var. stipularis	balsam lotus	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lathyrus latifolius	SWEET PEA	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lathyrus sulphureus	SULPHUR PEA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lathyrus vestitus	COMMON PACIFIC PEA	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lathyrus vestitus ssp. bolanderi	BOLANDER'S PACIFIC PEA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lathyrus vestitus var. ochropetalus	common pacific pea	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lotus corniculatus	BIRD'S FOOT TREFOIL	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lotus crassifolius	BROAD-LEAVED LOTUS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lotus grandiflorus	LARGE-LEAVED LOTUS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lotus purshianus	SPANISH LOTUS	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lupinus albicaulis	Summer Lupine, sicklekeel lupine	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lupinus albifrons	SILVER BUSH LUPINE	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lupinus albifrons var. albifrons	silver lupine	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lupinus albifrons var. collinus	Silver Lupine	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lupinus andersonii	Anderson's lupine	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lupinus bicolor	BICOLORED LUPINE	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lupinus formosus	SUMMER LUPINE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lupinus latifolius	BROAD-LEAVED LUPINE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lupinus latifolius var. latifolius	broadleaf lupine	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lupinus lepidus var. sellulus	DWARF LUPINE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lupinus nanus	VALLEY SKY LUPINE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lupinus onustus	plumas lupine	No	Approved	Probably Pres	Native				RT
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Lupinus succulentus	ARROYO LUPINE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Medicago lupulina	BLACK MEDICK	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Medicago minima	SMALL BUR CLOVER	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Medicago polymorpha	BUR CLOVER	No	Approved	Present	Non-native	Unknown			

Table B-1
WHIS Species- Vascular Plants
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Medicago sativa	ALFALFA	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Melilotus albus	white sweet clover	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Melilotus indicus	yellow sweet clover	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Pickeringia montana var. montana	Montana chaparral pea	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Robinia pseudoacacia	BLACK LOCUST	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Spartium junceum	SPANISH BROOM	No	Approved	Present	Non-native	Common	Management Priority		
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Thermopsis gracilis	SLENDER FALSE LUPINE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Trifolium bifidum	NOTCH LEAF CLOVER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Trifolium campestre	LOW HOP CLOVER	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Trifolium ciliolatum	TREE CLOVER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Trifolium dubium	SHAMROCK	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Trifolium gracilentum	PINPOINT CLOVER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Trifolium hirtum	ROSE CLOVER	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Trifolium microcephalum	SMALL-HEAD CLOVER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Trifolium microdon	VALPARAISO CLOVER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Trifolium obtusiflorum	CLAMMY CLOVER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Trifolium olivaceum	owl's clover	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Trifolium repens	WHITE CLOVER	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Trifolium subterraneum	BURROWING CLOVER	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Trifolium variegatum	WHITE TIPPED CLOVER	No	Approved	Present	Native	Unknown			RT
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Trifolium willdenovii	TOMCAT CLOVER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Trifolium wormskioldii	COW CLOVER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Vicia americana ssp. americana	American Vetch, California Vetch	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Vicia cracca	bird vetch	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Vicia sativa	common vetch, spring vetch	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Vicia sativa ssp. nigra	SPRING VETCH	No	Approved	Probably Pres	Non-native				
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Vicia villosa	winter vetch, hairy vetch	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Fabales	Fabaceae	Active	Vicia villosa ssp. varia	WINTER VETCH	No	Approved	Probably Pres	Non-native				
WHIS	Vascular Plant	Fabales	Polygalaceae	Active	Polygala cornuta	SIERRA MILKWORT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fabales	Polygalaceae	Active	Polygala cornuta var. cornuta	Sierra milkwort	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Fagales	Betulaceae	Active	Alnus incana ssp. tenuifolia	MOUNTAIN ALDER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fagales	Betulaceae	Active	Alnus rhombifolia	WHITE ALDER	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Fagales	Betulaceae	Active	Alnus rubra	red alder	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Fagales	Betulaceae	Active	Alnus viridis ssp. sinuata	SITKA ALDER	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Fagales	Betulaceae	Active	Corylus cornuta ssp. californica	california hazelnut	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Chrysolepis chrysophylla	giant chinquapin	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Chrysolepis sempervirens	CHINQUAPIN	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Lithocarpus densiflorus	tanoak	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Fagales	Fagaceae	Inactive	Notholithocarpus densiflorus var. densiflorus	tan oak	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Quercus agrifolia	COAST LIVE OAK	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Quercus berberidifolia	scrub oak	No	Approved	Probably Pres	Native				SC
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Quercus chrysolepis	CANYON LIVE OAK	No	Approved	Present	Native	Abundant			
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Quercus douglasii	BLUE OAK	No	Approved	Present	Native	Uncommon			RT
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Quercus durata	LEATHER OAK	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Quercus garryana	OREGON OAK, GARRY'S OAK	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Quercus garryana var. breweri	BREWER'S OAK, OREGON OAK	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Quercus kelloggii	BLACK OAK	No	Approved	Present	Native	Abundant			RT
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Quercus kelloggii X wislizeni	ORACLE OAK	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Quercus lobata	VALLEY OAK	No	Approved	Present	Native	Uncommon			RT
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Quercus moreha	oracle oak	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Quercus vacciniifolia	huckleberry oak	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Quercus wislizeni	INTERIOR LIVE OAK	No	Approved	Present	Native	Abundant			
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Quercus wislizeni var. frutescens	LIVE OAK	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fagales	Fagaceae	Active	Quercus wislizeni var. wislizeni	interior live oak	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Fagales	Fagaceae	Inactive	Quercus X morehus	Oracle Oak	No	Approved	Present	Native				
WHIS	Vascular Plant	Fagales	Juglandaceae	Active	Juglans hindsii	california black walnut	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Garryales	Garryaceae	Active	Garrya fremontii	FREMONT'S SILKTASSEL	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Gentianales	Apocynaceae	Active	Apocynum androsaemifolium	MOUNTAIN DOGBANE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Gentianales	Apocynaceae	Active	Asclepias californica	CALIFORNA MILKWEED	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Gentianales	Apocynaceae	Active	Asclepias cordifolia	PURPLE MILKWEED	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Gentianales	Apocynaceae	Active	Asclepias eriocarpa	California milkweed, indian milkweed, kotolo	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Gentianales	Apocynaceae	Active	Asclepias fascicularis	NARROW-LEAVED MILKWEED	No	Approved	Present	Native	Uncommon			

Table B-1
WHIS Species- Vascular Plants
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Vascular Plant	Gentianales	Apocynaceae	Active	Cycladenia humilis	CYCLADENIA, LAMB'S HORNS	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Gentianales	Apocynaceae	Active	Nerium oleander	OLEANDER	No	Approved	Present	Non-native	Rare			
WHIS	Vascular Plant	Gentianales	Apocynaceae	Active	Vinca major	VINCA, PERIWINKLE	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Gentianales	Gentianaceae	Active	Frasera albicaulis ssp. nitida	SHINING SWERTIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Gentianales	Gentianaceae	Active	Zeltnera venusta	beautiful centaury	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Gentianales	Rubiaceae	Active	Cephalanthus occidentalis	button bush	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Gentianales	Rubiaceae	Active	Cephalanthus occidentalis var. californicus	BUTTON BUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Gentianales	Rubiaceae	Active	Crucianella angustifolia	NARROW-LEAVED CROSSWORT	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Gentianales	Rubiaceae	Active	Galium aparine	GOOSE GRASS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Gentianales	Rubiaceae	Active	Galium bolanderi	BOLANDER'S BEDSTRAW	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Gentianales	Rubiaceae	Active	Galium divaricatum	LAMARCK'S BEDSTRAW	No	Approved	Probably Pres	Non-native				
WHIS	Vascular Plant	Gentianales	Rubiaceae	Active	Galium grayanum	GRAY'S BEDSTRAW	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Gentianales	Rubiaceae	Active	Galium grayanum var. grayanum	Gray's bedstraw	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Gentianales	Rubiaceae	Active	Galium mollugo	WILD MADDER	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Gentianales	Rubiaceae	Active	Galium nuttallii	NUTTALL'S BEDSTRAW	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Gentianales	Rubiaceae	Active	Galium parisiense	WALL BEDSTRAW	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Gentianales	Rubiaceae	Active	Galium porrigens var. porrigens	Climbing Bedstraw, graceful bedstraw	No	Approved	Present	Unknown	Unknown			
WHIS	Vascular Plant	Gentianales	Rubiaceae	Active	Galium porrigens var. tenue	GRACEFUL BEDSTRAW	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Gentianales	Rubiaceae	Active	Galium triflorum	SWEET BEDSTRAW	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Gentianales	Rubiaceae	Active	Kelloggia galioides	KELLOGGIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Geraniales	Geraniaceae	Active	Erodium botrys	BIG HERON BILL, FILAREE	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Geraniales	Geraniaceae	Active	Erodium brachycarpum	WHITE-STEMMED FILAREE	No	Approved	Probably Pres	Non-native				
WHIS	Vascular Plant	Geraniales	Geraniaceae	Active	Erodium cicutarium	RED-STEMMED FILAREE	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Geraniales	Geraniaceae	Active	Erodium moschatum	white stemmed filaree	No	Approved	Probably Pres	Non-native				
WHIS	Vascular Plant	Geraniales	Geraniaceae	Active	Geranium carolinianum	CAROLINA GERANIUM	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Geraniales	Geraniaceae	Active	Geranium dissectum	CUT-LEAVED GERANIUM	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Geraniales	Geraniaceae	Active	Geranium molle	DOVE'S FOOT GERANIUM	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Geraniales	Geraniaceae	Active	Geranium potentilloides	NEW ZEALAND GERANIUM	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Lamiales	Bignoniaceae	Active	Catalpa bignonioides	chinese catalpa, Indian bean tree	No	Approved	Present	Non-native	Rare			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Lamium amplexicaule	HENBIT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Marrubium vulgare	HOREHOUND	No	Approved	Present	Non-native	Rare			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Melissa officinalis	LEMON BALM	No	Approved	Present	Non-native	Rare			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Mentha arvensis	Field Mint	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Mentha pulegium	PENNYROYAL	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Mentha spicata	SPEARMINT	No	Approved	Present	Non-native	Rare			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Mentha X piperita	PEPPERMINT	No	Approved	Present	Non-native	Rare			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Monardella lanceolata	MUSTANG MINT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Monardella odoratissima	COYOTE MINT	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Monardella sheltonii	COYOTE MINT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Monardella villosa	COYOTE MINT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Prunella vulgaris var. lanceolata	SELF-HEAL	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Pycnanthemum californicum	MOUNTAIN MINT, CALIFORNIA MINT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Salvia sonomensis	CREEPING SAGE	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Scutellaria siphocampyloides	SKULLCAP	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Scutellaria tuberosa	danny's skullcap	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Stachys ajugoides	bugle hedgenettle	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Stachys ajugoides var. rigida	RIGID HEDGE NETTLE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Trichostema lanceolatum	VINEGAR WEED	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Lamiaceae	Active	Trichostema oblongum	bluegirls	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Linderniaceae	Active	Lindernia dubia	yellow-seed false pimpernel	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Linderniaceae	Active	Lindernia dubia var. anagallidea	FALSE PIMPERNEL	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Lamiales	Oleaceae	Active	Fraxinus dipetala	FLOWERING ASH	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Lamiales	Oleaceae	Active	Fraxinus latifolia	OREGON ASH	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Lamiales	Oleaceae	Active	Syringa reticulata	LILAC	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Lamiales	Orobanchaceae	Active	Castilleja applegatei	WAVY-LEAVED INDIAN PAINTBRUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Orobanchaceae	Active	Castilleja attenuata	NARROW-LEAVED OWL'S CLOVER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Orobanchaceae	Active	Castilleja lacera	CUT-LEAVED OWL'S CLOVER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Orobanchaceae	Active	Cordylanthus tenuis ssp. viscidus	VISCID BIRD'S BEAK	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Orobanchaceae	Active	Kopsiopsis strobilacea	ground cone	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Lamiales	Orobanchaceae	Active	Orobanche fasciculata	CLUSTERED BROOMRAPE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Lamiales	Orobanchaceae	Active	Orobanche uniflora	NAKED BROOMRAPE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Lamiales	Orobanchaceae	Active	Pedicularis densiflora	INDIAN WARRIOR	No	Approved	Present	Native	Unknown			

Table B-1
WHIS Species- Vascular Plants
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Vascular Plant	Lamiales	Orobanchaceae	Active	Triphysaria pusilla	DWARF OWL'S CLOVER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Phrymaceae	Active	Mimulus aurantiacus		No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Phrymaceae	Active	Mimulus cardinalis	Scarlet Monkeyflower	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Phrymaceae	Active	Mimulus floribundus	MANY-FLOWERED MONKEYFLOWER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Phrymaceae	Active	Mimulus guttatus	COMMON MONKEYFLOWER	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Lamiales	Phrymaceae	Active	Mimulus kelloggii	KELLOGG'S MONKEYFLOWER	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Lamiales	Phrymaceae	Active	Mimulus layneae	LAYNE'S MONKEYFLOWER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Phrymaceae	Active	Mimulus moschatus	MUSK MONKEYFLOWER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Phrymaceae	Active	Mimulus nanus	DWARF MONKEYFLOWER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Phrymaceae	Active	Mimulus pilosus	SNOUTED MONKEYFLOWER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Phrymaceae	Active	Mimulus pulsiferae	candelabrum monkeyflower	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Lamiales	Phrymaceae	Active	Mimulus torreyi	TORREY'S MONKEYFLOWER	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Antirrhinum vexillocalyculatum	BREWER'S SNAPDRAGON	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Antirrhinum vexillocalyculatum ssp. breweri	brewer's snapdragon	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Collinsia parviflora	FEW-FLOWERED BLUE-EYED MARY	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Collinsia rattanii	RATTAN'S BLUE-EYED MARY	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Collinsia tinctoria	STICKY CHINESE HOUSES	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Digitalis purpurea	FOXGLOVE	No	Approved	Present	Non-native	Rare			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Dopatrium junceum	HORSEFLY'S EYE	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Keckiella breviflora	BEARD TONGUE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Keckiella breviflora var. glabrisepala	BEARD TONGUE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Keckiella corymbosa	BUSH BEARD TONGUE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Keckiella lemmonii	SHRUBBY PENSTEMON	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Kickxia elatine	SHARP-LEAVED FLUELLIN	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Limosella acaulis	SOUTHERN MUDWORT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Linaria dalmatica ssp. dalmatica	dalmation toadflax	No	Approved	Present	Non-native	Uncommon	Management Priority		
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Penstemon azureus	BLUE PENSTEMON	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Inactive	Penstemon azureus var. azureus	BLUE PENSTEMON	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Penstemon neotericus	DERIVED PENSTEMON	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Inactive	Penstemon newberryi var. newberryi	mountain pride	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Penstemon parvulus	SMALL PENSTEMON	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Penstemon purpusii	SNOW MOUNTAIN BEARDTONGUE	No	Approved	Present	Native	Rare	Management Priority		
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Penstemon rupicola	ROCK PENSTEMON	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Plantago coronopus	CUT-LEAVED PLANTAIN	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Plantago erecta	ENGLISH PLANTAIN	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Plantago lanceolata	NARROW-LEAVED PLANTAIN	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Plantago major	COMMON PLANTAIN	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Plantago virginica	DWARF PLANTAIN	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Tonella tenella	SMALL-FLOWERED TONELLA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Veronica arvensis	SPEEDWELL	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Lamiales	Plantaginaceae	Active	Veronica peregrina ssp. xalapensis	PURSLANE, SPEEDWELL	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Scrophulariaceae	Active	Scrophularia californica	FIGWORT, BEE PLANT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Lamiales	Scrophulariaceae	Active	Verbascum blattaria	MOTH MULLEIN	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Lamiales	Scrophulariaceae	Active	Verbascum thapsus	COMMON MULLEIN	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Lamiales	Verbenaceae	Active	Verbena lasiostachys var. scabrida	ROBUST VERVAIN	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Laurales	Calycanthaceae	Active	Calycanthus occidentalis	SPICE BUSH	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Laurales	Lauraceae	Active	Umbellularia californica	california bay	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Liliales	Liliaceae	Active	Calochortus superbus	SUPERB MARIPOSA LILY	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Liliales	Liliaceae	Active	Calochortus tolmiei	WHITE PUSSY EARS	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Liliales	Liliaceae	Active	Clintonia uniflora	BRIDE'S BONNET	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Liliales	Liliaceae	Active	Erythronium californicum	CALIFORNIA FAWN LILY	No	Approved	Present	Native	Rare			
WHIS	Vascular Plant	Liliales	Liliaceae	Active	Fritillaria affinis	MISSION BELLS	No	Approved	Present	Native	Rare			
WHIS	Vascular Plant	Liliales	Liliaceae	Active	Fritillaria atropurpurea	PURPLE FRITILLARY	No	Approved	Present	Native	Rare			RT
WHIS	Vascular Plant	Liliales	Liliaceae	Active	Lilium pardalinum	LEOPARD LILY, TIGER LILY	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Liliales	Liliaceae	Active	Prosartes hookeri	fairy bells	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Liliales	Liliaceae	Active	Streptopus amplexifolius var. americanus	TWISTED STALK	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Liliales	Melanthiaceae	Active	Toxicoscordion fremontii	death camas	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Liliales	Melanthiaceae	Active	Toxicoscordion venenosum var. venenosum	death camas	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Liliales	Melanthiaceae	Active	Trillium ovatum ssp. oettingeri	TRILLIUM, WESTERN WAKE-ROBIN	No	Approved	Present	Native	Rare	Management Priority		RT
WHIS	Vascular Plant	Liliales	Melanthiaceae	Active	Veratrum californicum var. californicum	FALSE HELLEBORE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Liliales	Smilacaceae	Active	Smilax californica	GREENBRIAR	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Malpighiales	Euphorbiaceae	Active	Chamaesyce glyptosperma	RIDGE-SEEDED SPURGE	No	Approved	Present	Native	Unknown			

Table B-1
WHIS Species- Vascular Plants
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Vascular Plant	Malpighiales	Euphorbiaceae	Active	Chamaesyce maculata	SPOTTED SPURGE	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Malpighiales	Euphorbiaceae	Active	Chamaesyce nutans	LARGE SPURGE	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Malpighiales	Euphorbiaceae	Active	Chamaesyce ocellata ssp. ocellata	Ridge-Seeded Spurge, contura creek sandmat	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Malpighiales	Euphorbiaceae	Active	Chamaesyce prostrata	PROSTRATE SPURGE	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Malpighiales	Euphorbiaceae	Active	Chamaesyce serpyllifolia	THYME LEAF SPURGE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Malpighiales	Euphorbiaceae	Active	Croton setiger	doveweed, turkey mullein	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Malpighiales	Euphorbiaceae	Active	Euphorbia crenulata	CHINESE CAPS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Malpighiales	Euphorbiaceae	Active	Euphorbia esula	leafy spurge, spurge, wolf's milk, wolf's-milk	No	In Review	Present	Non-native				
WHIS	Vascular Plant	Malpighiales	Hypericaceae	Active	Hypericum calycinum	ST. JOHN'S WORT	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Malpighiales	Hypericaceae	Active	Hypericum concinnum	GOLDWIRE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Malpighiales	Hypericaceae	Active	Hypericum mutilum	SMALL-FLOWERED ST.JOHNS WORT	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Malpighiales	Hypericaceae	Active	Hypericum perforatum	KLAMATH WEED	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Malpighiales	Linaceae	Active	Hesperolinon micranthum	THREADSTEM FLAX	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Malpighiales	Linaceae	Active	Linum bienne	NARROW-LEAVED FLAX	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Malpighiales	Salicaceae	Active	Populus fremontii ssp. fremontii	FREMONT COTTONWOOD	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Malpighiales	Salicaceae	Active	Populus trichocarpa	black cottonwood	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Malpighiales	Salicaceae	Active	Salix exigua	SAND BAR WILLOW	No	Approved	Present	Native	Abundant			
WHIS	Vascular Plant	Malpighiales	Salicaceae	Active	Salix laevigata	RED WILLOW	No	Approved	Present	Native	Abundant			
WHIS	Vascular Plant	Malpighiales	Salicaceae	Active	Salix lasiolepis	ARROYO WILLOW	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Malpighiales	Salicaceae	Active	Salix lucida ssp. lasiandra	PACIFIC WILLOW	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Malpighiales	Salicaceae	Active	Salix melanopsis	DUSKY WILLOW	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Malpighiales	Salicaceae	Active	Salix scouleriana	SCOULER'S WILLOW	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Malpighiales	Salicaceae	Active	Salix sessilifolia	NORTHWEST WILLOW,VELVET WILLOW	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Malpighiales	Violaceae	Active	Viola glabella	STREAM VIOLET	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Malpighiales	Violaceae	Active	Viola lobata	YELLOW VIOLET, PINE VIOLET	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Malpighiales	Violaceae	Active	Viola lobata ssp. integrifolia	yellow violet	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Malpighiales	Violaceae	Active	Viola lobata ssp. lobata	yellow violet, pine violet	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Malpighiales	Violaceae	Active	Viola odorata	ENGLISH VIOLET	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Malpighiales	Violaceae	Active	Viola purpurea	MOUNTAIN VIOLET	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Malpighiales	Violaceae	Active	Viola sheltonii	SHELTON'S VIOLET	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Malvales	Malvaceae	Active	Fremontodendron californicum	flannel bush	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Myrtales	Lythraceae	Active	Lythrum hyssopifolia	LOOSESTRIFE	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Chamerion angustifolium ssp. circumvagum	fireweed	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Circaea alpina ssp. pacifica	Enchanter's Nightshade	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Clarkia gracilis	CLARKIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Clarkia heterandra	CALIFORNIA GAURA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Clarkia mildrediae	CLARKIA	No	Approved	Present	Native	Rare	Management Priority		
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Clarkia purpurea ssp. quadrivulnera	CLARKIA	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Clarkia rhomboidea	CLARKIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Clarkia stellata	Mildred's Clarkia, Virgate Clarkia	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Clarkia virgata	CLARKIA	No	Approved	Present	Native	Rare	Management Priority		
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Epilobium brachycarpum	WILLOW HERB	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Epilobium canum	California fuchsia	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Epilobium canum ssp. latifolium	California fuchsia	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Epilobium ciliatum	FRINGED WILLOW HERB	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Epilobium ciliatum ssp. ciliatum	Northern Willow Herb	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Epilobium densiflorum	WILLOW HERB	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Epilobium foliosum	california willowherb	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Epilobium glaberrimum	GLAUCOUS WILLOW HERB	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Epilobium hallianum	glandular willowherb	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Epilobium minutum	CHAPARRAL WILLOW HERB	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Epilobium pallidum	largeflower spike-primrose	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Gayophytum diffusum	DIFFUSE GAYOPHYTUM	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Gayophytum heterozygum	ZIGZAG GROUNDSMOKE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Gayophytum humile	LOW GAYOPHYTUM	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Ludwigia palustris	MARSH PURSLANE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Oenothera elata ssp. hirsutissima	hooker's evening-primrose	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Myrtales	Onagraceae	Active	Oenothera elata ssp. hookeri	EVENING PRIMROSE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Oxalidales	Oxalidaceae	Active	Oxalis corniculata	CREEPING WOOD SORREL	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Oxalidales	Oxalidaceae	Active	Oxalis laxa	OXALIS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Pinales	Cupressaceae	Active	Calocedrus decurrens	INCENSE CEDAR	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Pinales	Cupressaceae	Active	Hesperocyparis macnabiana	mcnab cypress	No	Approved	Present	Native	Rare			

Table B-1
WHIS Species- Vascular Plants
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Vascular Plant	Pinales	Cupressaceae	Active	Juniperus occidentalis	western juniper	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Pinales	Pinaceae	Active	Abies concolor	WHITE FIR	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Pinales	Pinaceae	Active	Abies magnifica var. shastensis	Shasta Red Fir	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Pinales	Pinaceae	Active	Pinus attenuata	KNOBCONE PINE	No	Approved	Present	Native	Abundant			
WHIS	Vascular Plant	Pinales	Pinaceae	Active	Pinus jeffreyi	JEFFREY PINE	No	Approved	Present	Native	Rare			
WHIS	Vascular Plant	Pinales	Pinaceae	Active	Pinus lambertiana	SUGAR PINE	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Pinales	Pinaceae	Active	Pinus ponderosa	PONDEROSA PINE	No	Approved	Present	Native	Abundant			RT
WHIS	Vascular Plant	Pinales	Pinaceae	Active	Pinus sabiniana	GREY PINE	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Pinales	Pinaceae	Active	Pseudotsuga menziesii	DOUGLAS FIR	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Pinales	Taxaceae	Active	Taxus brevifolia	CALIFORNIA YEW	No	Approved	Present	Native	Uncommon			RT
WHIS	Vascular Plant	Piperales	Aristolochiaceae	Active	Aristolochia californica	CALIFORNIA PIPEVINE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Piperales	Aristolochiaceae	Active	Asarum hartwegii	WILD GINGER	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex amplifolia	AMPLE-LEAVED SEDGE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex athrostachya	slenderbeak sedge	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex barbarae	SANTA BARBARA SEDGE	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex bolanderi	BOLANDER'S SEDGE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex cusickii	CUSICK'S SEDGE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex densa	dense sedge	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex feta	GREEN SHEATHED SEDGE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex fracta	FRAGILE SHEATHED SEDGE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex geyeri	elk sedge	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex gynodynama	olney's hairy sedge	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex illota	SMALL HEADED SEDGE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex leptopoda	shorter scaled sedge	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex mariposana	MARIPOSA SEDGE	No	Approved	Present	Native	Unknown			RT
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex multicaulis	MANY-STEMMED SEDGE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex multicostata	MANY RIBBED SEDGE	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex nudata	NAKED SEDGE	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex stipata	AWL-FRUITED SEDGE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex stipata var. stipata	Awl-Fruited Sedge	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex subbracteata	Dudley's Sedge	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex utriculata	BEAKED SEDGE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Carex vulpinoidea	fox sedge	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Cyperus acuminatus	SHORT POINTED CYPERUS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Cyperus bipartitus	slender flatsedge	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Cyperus eragrostis	TALL FLAT SEDGE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Cyperus erythrorhizos	RED-ROOTED CYPERUS	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Cyperus niger	BROWN CYPERUS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Cyperus squarrosus	AWNED CYPERUS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Cyperus strigosus	NUTSEDGE	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Eleocharis bella	beautiful spikerush	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Eleocharis macrostachya	CREEPING SPIKE RUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Eleocharis montevidensis	MONTEVIDEO SPIKE RUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Eleocharis obtusa	BLUNT SPIKE RUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Eleocharis parvula	SMALL SPIKE RUSH	No	Approved	Present	Native	Rare	Management Priority		
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Lipocarpha micrantha	smallflower halfchaff sedge	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Schoenoplectus acutus var. occidentalis	viscid bulrush, tule	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Schoenoplectus americanus	olney's bulrush	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Scirpus microcarpus	SMALL-FRUITED BULRUSH	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Cyperaceae	Active	Scirpus tabernaemontani	AMERICAN GREAT BULRUSH, TULE	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus acuminatus	SHARP-FRUITED RUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus articulatus	JOINTED RUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus balticus	BALTIC RUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus bolanderi	BOLANDER'S RUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus bufonius	TOAD RUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus bufonius var. occidentalis	Toad Rush	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus confusus	COLORADO RUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus covillei	COVILLE'S RUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus covillei var. obtusatus	Coville's rush	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus dubius	MARIPOSA RUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus effusus ssp. pacificus	Pacific rush	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus ensifolius	THREE-STEMMED RUSH	No	Approved	Present	Native	Unknown			

Table B-1
WHIS Species- Vascular Plants
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus exiguus	lamp rush	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus marginatus var. marginatus	GRASS LEAF RUSH	No	Approved	Present	Native	Rare	Management Priority		
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus occidentalis	SLENDER JUNCUS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus orthophyllus	STRAIGHT-LEAVED RUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus parryi	PARRY'S RUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus patens	spreading rush	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus tenuis	SLENDER RUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Juncus xiphioides	IRIS-LEAVED RUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Luzula comosa	HEATHWOOD RUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Juncaceae	Active	Luzula parviflora	smallflowered woodrush	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Poales	Poaceae	Active	Achnatherum occidentale	CALIFORNIA STIPA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Aegilops triuncialis	GOAT GRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Agrostis capillaris	COLONIAL BENTGRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Agrostis exarata	SPIKE REDTOP, WESTERN BENTGRASS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Agrostis gigantea	CREEPING BENTGRASS	No	Approved	Probably Pres	Non-native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Agrostis idahoensis	COLONIAL BENTGRASS	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Agrostis oregonensis	OREGON BENTGRASS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Agrostis pallens	BENT GRASS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Agrostis scabra	ROUGH BENTGRASS	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Agrostis stolonifera	CREEPING BENT GRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Aira caryophyllea	SILVER HAIR GRASS	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Poales	Poaceae	Active	Alopecurus pratensis	MEADOW FOXTAIL	No	Approved	Probably Pres	Non-native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Andropogon virginicus var. virginicus	BLUESEDGE BLUESTEM	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Poales	Poaceae	Active	Anthoxanthum aristatum	vernal grass	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Anthoxanthum odoratum	sweet vernal grass	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Aristida oligantha	OLDFIELD THREE-AWN	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Arundo donax	GIANT REED	No	Approved	Present	Non-native	Uncommon	Management Priority		
WHIS	Vascular Plant	Poales	Poaceae	Active	Avena barbata	SLENDER WILD OAT	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Poales	Poaceae	Active	Avena fatua	WILD OAT	No	Approved	Present	Non-native	Abundant			
WHIS	Vascular Plant	Poales	Poaceae	Active	Briza maxima	RATTLESNAKE GRASS	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Poales	Poaceae	Active	Briza minor	LITTLE RATTLESNAKE GRASS	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Poales	Poaceae	Active	Bromus carinatus	CALIFORNIA BROME	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Poales	Poaceae	Inactive	Bromus carinatus var. carinatus	CALIFORNIA BROME	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Poales	Poaceae	Active	Bromus diandrus	RIPGUT BROME	No	Approved	Present	Non-native	Common			
WHIS	Vascular Plant	Poales	Poaceae	Active	Bromus hordeaceus	SOFT CHESS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Bromus inermis	SMOOTH BROME	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Bromus inermis ssp. inermis	smooth brome	No	Approved	Probably Pres	Non-native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Bromus japonicus	DOWNY-SHEATHED CHEAT	No	Approved	Probably Pres	Non-native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Bromus laevipes	NARROW-FLOWERED BROME	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Bromus madritensis ssp. rubens	RED BROME, FOXTAIL	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Bromus orcuttianus	ORCUTT'S BROME-GRASS	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Bromus sterilis	STERILE BROME	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Bromus tectorum	DOWNY BROME, CHEATGRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Cynodon dactylon	BERMUDA GRASS	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Poales	Poaceae	Active	Cynosurus echinatus	DOGTAIL GRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Dactylis glomerata	ORCHARD GRASS	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Poales	Poaceae	Active	Deschampsia danthonioides	ANNUAL HAIR GRASS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Deschampsia elongata	SLENDER HAIRGRASS	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Poales	Poaceae	Active	Digitaria ischaemum	SMOOTH CRABGRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Digitaria sanguinalis	hairy crabgrass	No	Approved	Probably Pres	Non-native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Distichlis spicata	SALT GRASS	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Poales	Poaceae	Active	Echinochloa crus-galli	BARNYARD GRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Elymus caput-medusae	medusa head	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Elymus elymoides	BOTTLEBRUSH,SQUIRREL TAIL	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Elymus elymoides var. californicus	bottlebrush, squirrel tail	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Elymus glaucus	blue wild rye	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Poales	Poaceae	Active	Elymus glaucus ssp. glaucus	blue wild rye	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Elymus multisetus	BIG SQUIRRELTAIL	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Poales	Poaceae	Active	Elymus ponticus	rush wheat grass	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Elymus stebbinsii	CALIFORNIA RYE GRASS	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Elymus triticoides	creeping wild rye	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Poales	Poaceae	Active	Eragrostis curvula	WEEPING LOVEGRASS	No	Approved	Present	Non-native	Common			

Table B-1
WHIS Species- Vascular Plants
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Vascular Plant	Poales	Poaceae	Active	Eragrostis mexicana	Mexican lovegrass	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Eragrostis mexicana ssp. virescens	ORCUTT'S ERAGROSTIS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Festuca bromoides	brome fescue	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Festuca californica	CALIFORNIIA FESCUE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Poales	Poaceae	Active	Festuca idahoensis	IDAHO FESCUE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Festuca microstachys	few-flowered fescue	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Poales	Poaceae	Active	Festuca myuros	Rattail sixweeks grass	No	Approved	Probably Pres	Non-native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Festuca occidentalis	WESTERN FESCUE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Festuca octoflora	siyes weeks fescue	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Festuca perennis	Italian rye grass	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Gastridium phleoides	nit grass	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Holcus lanatus	VELVET GRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Hordeum depressum	LOW BARLEY	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Hordeum murinum ssp. leporinum	HARE BARLEY	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Koeleria macrantha	JUNEGRASS	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Leersia oryzoides	RICE CUTGRASS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Melica aristata	AWNED MELICA	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Melica californica	CALIFORNIA MELICA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Melica geyeri	GEYER'S ONION GRASS	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Melica harfordii	HARFORD'S MELICA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Panicum acuminatum	pacific panic grass	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Panicum acuminatum var. lindheimeri	PACIFIC PANIC GRASS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Panicum capillare	OLD WITCH GRASS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Panicum dichotomiflorum	SMOOTH WITCHGRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Paspalum dilatatum	DALLIS GRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Phalaris californica	CANARY GRASS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Phalaris minor	canarygrass	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Phleum pratense	cultivated timothy	No	Approved	Probably Pres	Non-native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Poa annua	ANNUAL BLUEGRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Poa bulbosa	BULBOUS BLUEGRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Poa compressa	CANADA BLUEGRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Poa pratensis ssp. pratensis	KENTUCKY BLUEGRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Inactive	Poa secunda ssp. secunda	ONE-SIDED BLUEGRASS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Polypogon australis	CHILEAN BEARD GRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Polypogon maritimus	Mediterranean beard grass	No	Approved	Probably Pres	Non-native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Polypogon monspeliensis	RABBIT'S FOOT	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Polypogon viridis	beardless rabbitsfoot grass, beardless rabbit'sf	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Puccinellia howellii	HOWELL'S ALKALAI GRASS	No	Approved	Present	Native	Rare	Management Priority		SC
WHIS	Vascular Plant	Poales	Poaceae	Active	Scribneria bolanderi	SCRIBNER GRASS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Secale cereale	RYE	No	Approved	Probably Pres	Non-native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Sorghum halepense	JOHNSON GRASS	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Stipa lemmonii	lemmon's stipa	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Stipa miliacea	millet mountain rice	No	Approved	Probably Pres	Non-native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Stipa occidentalis var. californica	california stipa	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Stipa occidentalis var. occidentalis	western needlegrass	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Poaceae	Active	Stipa stillmanii	stillman's stipa	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Poales	Poaceae	Active	Trisetum canescens	NODDING TRISETUM	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Poales	Typhaceae	Active	Typha domingensis	CATTAIL	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Poales	Typhaceae	Active	Typha latifolia	BROAD-LEAVED CATTAIL	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Polypodiales	Blechnaceae	Active	Woodwardia fimbriata	GIANT CHAIN FERN	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Polypodiales	Dennstaedtiaceae	Active	Pteridium aquilinum var. pubescens	BRACKEN FERN	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Polypodiales	Dryopteridaceae	Active	Dryopteris arguta	WOOD FERN	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Polypodiales	Dryopteridaceae	Active	Polystichum imbricans	narrowleaf swordfern	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Polypodiales	Dryopteridaceae	Active	Polystichum imbricans ssp. imbricans	narrowleaf swordfern	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Polypodiales	Dryopteridaceae	Active	Polystichum munitum	SWORD FERN	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Polypodiales	Polypodiaceae	Active	Polypodium californicum	CALIFORNIA POLYPODY	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Polypodiales	Polypodiaceae	Active	Polypodium calirhiza	California Polypody, california knotweed	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Polypodiales	Polypodiaceae	Active	Polypodium hesperium	western polypody	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Polypodiales	Pteridaceae	Active	Adiantum capillus-veneris	MAIDENHAIR FERN	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Polypodiales	Pteridaceae	Active	Aspidotis densa	INDIAN'S DREAM	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Polypodiales	Pteridaceae	Active	Cheilanthes gracillima	LACE FERN	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Polypodiales	Pteridaceae	Active	Cryptogramma acrostichoides	PARSLEY FERN	No	Approved	Present	Native	Unknown			

Table B-1
WHIS Species- Vascular Plants
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Vascular Plant	Polypodiales	Pteridaceae	Active	Pellaea mucronata	BIRD'S FOOT FERN	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Polypodiales	Pteridaceae	Active	Pentagramma triangularis	GOLDBACK FERN	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Polypodiales	Woodsiaceae	Active	Athyrium filix-femina var. cyclosorum	LADY FERN	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Polypodiales	Woodsiaceae	Active	Cystopteris fragilis	BRITTLE FERN	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ranunculales	Berberidaceae	Inactive	Berberis aquifolium var. aquifolium	PIPER'S BARBERRY	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ranunculales	Berberidaceae	Active	Berberis aquifolium var. dictyota	JEPSON'S OREGON GRAPE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ranunculales	Berberidaceae	Active	Berberis aquifolium var. repens	DWARF MAHONIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ranunculales	Berberidaceae	Active	Berberis pinnata ssp. pinnata	jepson's oregon-grape	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ranunculales	Berberidaceae	Active	Berberis vulgaris	EUROPEAN BARBERRY	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Ranunculales	Papaveraceae	Active	Dendromecon rigida	BUSH POPPY	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ranunculales	Papaveraceae	Active	Dicentra formosa	BLEEDING HEARTS	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ranunculales	Papaveraceae	Active	Eschscholzia caespitosa	FOOTHILL POPPY, TUFTED POPPY	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Ranunculales	Papaveraceae	Active	Eschscholzia californica	CALIFORNIA POPPY	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Aconitum columbianum	MONKSHOOD	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Actaea rubra	BEARBERRY	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Aquilegia formosa	WESTERN COLUMBINE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Clematis lasiantha	PIPESTEM CLEMATIS	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Clematis ligusticifolia	WESTERN VIRGIN'S BOWER	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Delphinium cardinale	scarlet larkspur	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Delphinium decorum ssp. tracyi	COAST LARKSPUR	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Delphinium depauperatum	DWARF LARKSPUR	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Delphinium gracilentum	pine forest larkspur	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Delphinium hansenii	HANSEN'S LARKSPUR	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Delphinium hesperium	WESTERN LARKSPUR	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Delphinium hesperium ssp. hesperium	Western Larkspur	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Delphinium hesperium ssp. pallescens	PALE WESTERN LARKSPUR	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Delphinium nudicaule	CANYON LARKSPUR, RED LARKSPUR	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Delphinium nuttallianum	nuttall's larkspur	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Enemion stipitatum	siskiyou rue-anemone	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Myosurus minimus	COMMON MOUSE TAIL	No	Approved	Present	Native	Unknown			SC
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Ranunculus aquatilis var. aquatilis	whitewater crowfoot	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Ranunculus aquatilis var. diffusus	whitewater crowfoot	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Ranunculus californicus	CALIFORNIA BUTTERCUP	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Ranunculales	Ranunculaceae	Active	Ranunculus occidentalis	WESTERN BUTTERCUP	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Rosales	Moraceae	Active	Ficus carica	EDIBLE FIG	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Rosales	Moraceae	Active	Morus alba	COMMON MULBERRY	No	Approved	Present	Non-native	Rare			
WHIS	Vascular Plant	Rosales	Rhamnaceae	Active	Ceanothus cordulatus	MT.WHITE THORN, SNOW BUSH	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rhamnaceae	Active	Ceanothus cuneatus	BUCK BRUSH	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Rosales	Rhamnaceae	Active	Ceanothus cuneatus var. cuneatus	buck brush	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Rosales	Rhamnaceae	Active	Ceanothus integerrimus	DEER BRUSH	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Rosales	Rhamnaceae	Active	Ceanothus lemmonii	LEMMON'S CEANOTHUS	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Rosales	Rhamnaceae	Active	Ceanothus pinetorum	kern ceanothus	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rhamnaceae	Active	Ceanothus prostratus	SQUAW CARPET, PINEMAT	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Rosales	Rhamnaceae	Active	Frangula californica	california coffeeberry	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Rosales	Rhamnaceae	Active	Frangula californica ssp. crassifolia	velvet leaf coffeeberry	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rhamnaceae	Active	Frangula californica ssp. tomentella	chaparral coffee berry	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rhamnaceae	Active	Frangula purshiana	cascara sagrada	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Rosales	Rhamnaceae	Active	Frangula rubra	sierra coffeeberry	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rhamnaceae	Active	Rhamnus ilicifolia	HOLLYLEAF REDBERRY	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Rosales	Rhamnaceae	Active	Rhamnus rubra ssp. rubra	Sierra coffeeberry	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Adenostoma fasciculatum	CHAMISE	No	Approved	Present	Native	Abundant			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Amelanchier alnifolia var. pumila	DWARF SERVICE BERRY	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Amelanchier utahensis	SERVICE BERRY	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Aphanes occidentalis	WESTERN LADY'S MANTLE	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Aruncus dioicus var. acuminatus	goat's beard	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Cercocarpus betuloides	MOUNTAIN MAHOGANEY	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Rosales	Rosaceae	Inactive	Cercocarpus betuloides var. betuloides	birch-leaf mountain mahogany	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Crataegus douglasii	DOUGLAS'S HAWTHORNE	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Crataegus gaylussacia	suksdorf's hawthorn	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Drymocallis glandulosa	sticky cinquefoil	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Drymocallis lactea var. austinae	ashland cinquefoil	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Heteromeles arbutifolia	TOYON, CHRISTMAS BERRY	No	Approved	Present	Native	Abundant			

Table B-1
WHIS Species- Vascular Plants
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Holodiscus discolor	CREAM BUSH, OCEAN SPRAY	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Horkelia tridentata	THREE-TOOTHED HORKELIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Physocarpus capitatus	WESTERN NINEBARK	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Potentilla gracilis var. fastigiata	SLENDER CINQUEFOIL	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Poterium sanguisorba	burnet	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Prunus avium	sweet cherry	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Prunus emarginata	BITTER CHERRY	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Prunus subcordata	SIERRA PLUM	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Prunus virginiana var. demissa	CHOKECHERRY	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Rosa californica	CALIFORNIA WILD ROSE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Rosa gymnocarpa	WOOD ROSE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Rosa pinetorum	PINE ROSE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Rosa pisocarpa	Wild Rose, cluster rose	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Rosa spithamea	GROUND ROSE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Rubus armeniacus	Himalayan blackberry	No	Approved	Present	Non-native	Abundant	Management Priority		
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Rubus glaucifolius	RASPBERRY	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Rubus laciniatus	CUT-LEAF BLACKBERRY	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Rubus leucodermis	WESTERN RASPBERRY	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Rubus parviflorus	THIMBLEBERRY	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Rubus ursinus	PACIFIC BLACKBERRY	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Sorbus sitchensis var. grayi	mountain ash	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Rosaceae	Active	Spiraea douglasii	DOUGLAS' SPIREA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Rosales	Urticaceae	Active	Urtica dioica ssp. holosericea	HOARY NETTLE, STINGING NETTLE	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Salviniales	Marsileaceae	Active	Pilularia americana	AMERICAN PILLWORT	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Santalales	Santalaceae	Active	Arceuthobium americanum	AMERICAN DWARF MISTLETOE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Santalales	Santalaceae	Active	Arceuthobium californicum	sugar pine dwarf mistletoe	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Santalales	Santalaceae	Active	Arceuthobium campylopodum	WESTERN DWARF MISTLETOE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Santalales	Santalaceae	Active	Comandra umbellata ssp. californica	BASTARD TOAD FLAX	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Santalales	Santalaceae	Active	Phoradendron juniperinum	incense cedar mistletoe	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Santalales	Santalaceae	Active	Phoradendron serotinum ssp. tomentosum	New Name	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Sapindales	Anacardiaceae	Active	Pistacia chinensis	CHINESE PISTACHE	No	Approved	Present	Non-native	Rare			
WHIS	Vascular Plant	Sapindales	Anacardiaceae	Active	Rhus aromatica	squaw bush	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Sapindales	Anacardiaceae	Active	Rhus ovata	SUGAR BUSH	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Sapindales	Anacardiaceae	Active	Toxicodendron diversilobum	POISON OAK	No	Approved	Present	Native	Abundant			
WHIS	Vascular Plant	Sapindales	Sapindaceae	Active	Acer circinatum	vine maple	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Sapindales	Sapindaceae	Active	Acer glabrum var. glabrum	Rocky Mountain maple	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Sapindales	Sapindaceae	Active	Acer macrophyllum	BIG LEAF MAPLE	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Sapindales	Sapindaceae	Active	Aesculus californica	BUCKEYE, HORSE CHESTNUT	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Sapindales	Simaroubaceae	Active	Ailanthus altissima	TREE OF HEAVEN	No	Approved	Present	Non-native	Common	Management Priority		
WHIS	Vascular Plant	Saxifragales	Altingiaceae	Active	Liquidambar styraciflua	SWEET GUM	No	Approved	Present	Non-native	Uncommon			
WHIS	Vascular Plant	Saxifragales	Crassulaceae	Active	Crassula aquatica	common pigmyweed	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Saxifragales	Crassulaceae	Active	Crassula connata	PYGMY WEED	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Saxifragales	Crassulaceae	Active	Sedum obtusatum	Sierra stonecrop	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Saxifragales	Crassulaceae	Active	Sedum obtusatum ssp. boreale	SIERRA GORMANIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Saxifragales	Crassulaceae	Active	Sedum obtusatum ssp. obtusatum	sierra stonecrop	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Saxifragales	Crassulaceae	Active	Sedum obtusatum ssp. paradisum	canyon creek stonecrop	No	Approved	Present	Native	Rare	Management Priority		
WHIS	Vascular Plant	Saxifragales	Crassulaceae	Active	Sedum oregonense	cream stonecrop	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Saxifragales	Crassulaceae	Active	Sedum spathulifolium	PACIFIC STONECROP	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Saxifragales	Grossulariaceae	Active	Ribes lobbii	GUMMY GOOSEBERRY	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Saxifragales	Grossulariaceae	Active	Ribes nevadense	mountain pink currant	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Saxifragales	Grossulariaceae	Active	Ribes roezlii	SIERRA GOOSEBERRY	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Saxifragales	Grossulariaceae	Active	Ribes viscosissimum	STICKY CURRANT	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Saxifragales	Haloragaceae	Active	Myriophyllum sibiricum	American milfoil	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Saxifragales	Saxifragaceae	Active	Boykinia major	MOUNTAIN BOYKINIA	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Saxifragales	Saxifragaceae	Active	Darmera peltata	UMBRELLA PLANT, INDIAN RHUBARB	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Saxifragales	Saxifragaceae	Active	Lithophragma affine	WOODLAND STAR	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Saxifragales	Saxifragaceae	Active	Lithophragma bolanderi	HILLSTAR	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Saxifragales	Saxifragaceae	Active	Lithophragma campanulatum	WOODLAND STAR	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Saxifragales	Saxifragaceae	Active	Lithophragma heterophyllum	hillside woodland-star	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Saxifragales	Saxifragaceae	Active	Lithophragma parviflorum	PRAIRIE STAR	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Saxifragales	Saxifragaceae	Active	Micranthes californica	california saxifrage	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Saxifragales	Saxifragaceae	Active	Micranthes nidifica	peak saxifrage	No	Approved	Present	Native	Uncommon			

Table B-1
WHIS Species- Vascular Plants
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Vascular Plant	Saxifragales	Saxifragaceae	Active	Tellima grandiflora	FRINGE CUPS	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Solanales	Convolvulaceae	Active	Calystegia occidentalis	WESTERN MORNING GLORY	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Solanales	Convolvulaceae	Active	Calystegia occidentalis ssp. occidentalis	MODOC MORNING GLORY	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Solanales	Convolvulaceae	Active	Convolvulus arvensis	FIELD BINDWEED	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Solanales	Convolvulaceae	Active	Cuscuta cephalanthi	CANYON DODDER	No	Approved	Probably Pres	Native				
WHIS	Vascular Plant	Solanales	Convolvulaceae	Active	Cuscuta occidentalis	san joaquin dodder	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Solanales	Convolvulaceae	Active	Cuscuta subinclusa	canyon dodder	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Solanales	Solanaceae	Active	Datura stramonium	JIMSON WEED	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Solanales	Solanaceae	Active	Nicotiana acuminata var. multiflora	MANY-FLOWERED TOBACCO	No	Approved	Present	Non-native	Unknown			
WHIS	Vascular Plant	Solanales	Solanaceae	Active	Nicotiana quadrivalvis	INDIAN TOBACCO	No	Approved	Present	Native	Uncommon			
WHIS	Vascular Plant	Solanales	Solanaceae	Active	Solanum americanum	SMALL-FLOWERED NIGHTSHADE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Solanales	Solanaceae	Active	Solanum parishii	NIGHTSHADE	No	Approved	Present	Native	Unknown			
WHIS	Vascular Plant	Vitales	Vitaceae	Active	Vitis californica	CALIFORNIA GRAPE	No	Approved	Present	Native	Common			
WHIS	Vascular Plant	Zygophyllales	Zygophyllaceae	Active	Tribulus terrestris	puncture vine	No	Approved	Present	Non-native	Common	Management Priority		

Notes:

1. Reference: NPSpecies - 1.8.2.10174 Acessed January 2018 @ https://irma.nps.gov/NPSpecies/Search/SpeciesList
2. Note: Only species known to be present at WHIS are included

Table B-2
WHIS Species- Mammals
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Mammal	Artiodactyla	Cervidae	Active	Odocoileus hemionus	black-tailed deer, mule deer	No	Approved	Present	Native	Common	Breeder		
WHIS	Mammal	Artiodactyla	Suidae	Active	Sus scrofa	feral pig, pig, wild boar	No	Approved	Present	Non-native	Rare	Breeder		
WHIS	Mammal	Carnivora	Canidae	Active	Canis latrans	coyote	No	Approved	Present	Native	Uncommon	Breeder		SC
WHIS	Mammal	Carnivora	Canidae	Active	Urocyon cinereoargenteus	gray fox	No	Approved	Present	Native	Common	Breeder		
WHIS	Mammal	Carnivora	Canidae	Active	Vulpes vulpes	red fox	No	In Review	Probably Present					
WHIS	Mammal	Carnivora	Felidae	Active	Lynx rufus	bobcat	No	Approved	Present	Native	Common	Breeder		RT
WHIS	Mammal	Carnivora	Felidae	Active	Puma concolor	mountain lion, puma	No	Approved	Present	Native	Common	Breeder		
WHIS	Mammal	Carnivora	Mephitidae	Active	Mephitis mephitis	striped skunk	No	Approved	Present	Native	Common	Breeder		
WHIS	Mammal	Carnivora	Mephitidae	Active	Spilogale putorius	spotted skunk	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Mammal	Carnivora	Mustelidae	Active	Lontra canadensis	river otter	No	Approved	Present	Native	Common	Breeder		RT
WHIS	Mammal	Carnivora	Mustelidae	Active	Martes pennanti	fisher, pacific fisher	No	Approved	Present	Native	Common	Breeder		RT
WHIS	Mammal	Carnivora	Mustelidae	Active	Mustela erminea	ermine	No	In Review	Probably Present					
WHIS	Mammal	Carnivora	Mustelidae	Active	Mustela frenata	long-tailed weasel	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Mammal	Carnivora	Mustelidae	Active	Mustela vison	mink	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Mammal	Carnivora	Mustelidae	Active	Taxidea taxus	badger	No	In Review	Probably Present					SC
WHIS	Mammal	Carnivora	Procyonidae	Active	Bassariscus astutus	ringtail	No	Approved	Present	Native	Common	Breeder		SC
WHIS	Mammal	Carnivora	Procyonidae	Active	Procyon lotor	raccoon	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Mammal	Carnivora	Ursidae	Active	Ursus americanus	black bear	No	Approved	Present	Native	Common	Breeder		
WHIS	Mammal	Chiroptera	Molossidae	Active	Tadarida brasiliensis	Brazilian free-tailed bat, Mexican free-tailed bat	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Mammal	Chiroptera	Vespertilionidae	Active	Antrozous pallidus	pallid bat	No	Approved	Present	Native	Uncommon	Breeder		SC
WHIS	Mammal	Chiroptera	Vespertilionidae	Active	Corynorhinus townsendii	pacific western big-eared bat, townsend's big-eared bat	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Mammal	Chiroptera	Vespertilionidae	Active	Eptesicus fuscus	big brown bat	No	Approved	Present	Native	Common	Breeder		SC
WHIS	Mammal	Chiroptera	Vespertilionidae	Active	Lasionycteris noctivagans	silver-haired bat	No	Approved	Present	Native	Common	Breeder		SC
WHIS	Mammal	Chiroptera	Vespertilionidae	Active	Lasiurus borealis	red bat	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Mammal	Chiroptera	Vespertilionidae	Active	Lasiurus cinereus	hoary bat	No	Approved	Present	Native	Uncommon	Breeder		SU
WHIS	Mammal	Chiroptera	Vespertilionidae	Active	Myotis californicus	California myotis	No	Approved	Present	Native	Common	Breeder		SC
WHIS	Mammal	Chiroptera	Vespertilionidae	Active	Myotis evotis	long-eared myotis	No	Approved	Present	Native	Uncommon	Breeder		SC
WHIS	Mammal	Chiroptera	Vespertilionidae	Active	Myotis lucifugus	little brown bat, little brown myotis	No	In Review	Probably Present					SC
WHIS	Mammal	Chiroptera	Vespertilionidae	Active	Myotis thysanodes	fringed myotis	No	Approved	Present	Native	Uncommon	Breeder		SC
WHIS	Mammal	Chiroptera	Vespertilionidae	Active	Myotis volans	long-legged myotis	No	In Review	Probably Present					SC
WHIS	Mammal	Chiroptera	Vespertilionidae	Active	Myotis yumanensis	Yuma myotis	No	Approved	Present	Native	Common	Resident		SC
WHIS	Mammal	Chiroptera	Vespertilionidae	Active	Parastrellus hesperus	Canyon Bat	No	Approved	Present	Native	Unknown			
WHIS	Mammal	Chiroptera	Vespertilionidae	Active	Plecotus townsendii	Townsend's big-eared bat	No	In Review	Present					
WHIS	Mammal	Didelphimorphia	Didelphidae	Active	Didelphis virginiana	Virginia opossum	No	Approved	Present	Non-native	Uncommon	Breeder		
WHIS	Mammal	Lagomorpha	Leporidae	Active	Lepus californicus	black-tailed hare, black-tailed jack rabbit	No	Approved	Present	Native	Common	Breeder		
WHIS	Mammal	Lagomorpha	Leporidae	Active	Sylvilagus bachmani	brush rabbit	No	Approved	Present	Native	Rare	Breeder		SC
WHIS	Mammal	Rodentia	Castoridae	Active	Castor canadensis	beaver	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Mammal	Rodentia	Cricetidae	Active	Clethrionomys californicus	western red-backed vole	No	Approved	Probably Present	Native		Breeder		
WHIS	Mammal	Rodentia	Cricetidae	Active	Microtus californicus	California vole	No	In Review	Probably Present					
WHIS	Mammal	Rodentia	Cricetidae	Active	Microtus longicaudus	long-tailed vole	No	In Review	Probably Present					
WHIS	Mammal	Rodentia	Cricetidae	Active	Neotoma cinerea	bushy-tailed woodrat	No	In Review	Probably Present					
WHIS	Mammal	Rodentia	Cricetidae	Active	Neotoma fuscipes	dusky-footed woodrat	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Mammal	Rodentia	Cricetidae	Active	Ondatra zibethicus	muskrat	No	In Review	Probably Present					
WHIS	Mammal	Rodentia	Cricetidae	Active	Peromyscus boylii	brush mouse	No	Approved	Present	Native	Common	Breeder		
WHIS	Mammal	Rodentia	Cricetidae	Active	Peromyscus maniculatus	deer mouse	No	Approved	Present	Native	Common	Breeder		
WHIS	Mammal	Rodentia	Cricetidae	Active	Peromyscus truei	pinon mouse, pinyon mouse	No	In Review	Probably Present					
WHIS	Mammal	Rodentia	Cricetidae	Active	Reithrodontomys megalotis	western harvest mouse	No	In Review	Probably Present					
WHIS	Mammal	Rodentia	Erethizontidae	Active	Erethizon dorsatum	porcupine	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Mammal	Rodentia	Geomyidae	Active	Thomomys bottae	Botta's pocket gopher	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Mammal	Rodentia	Heteromyidae	Active	Dipodomys californicus	California kangaroo rat	No	Approved	Probably Present	Native		Resident		
WHIS	Mammal	Rodentia	Muridae	Active	Mus musculus	house mouse	No	Approved	Present	Non-native	Common	Breeder		
WHIS	Mammal	Rodentia	Muridae	Active	Rattus rattus	black rat	No	Approved	Present	Non-native	Uncommon	Breeder		
WHIS	Mammal	Rodentia	Sciuridae	Active	Glaucomys sabrinus	northern flying squirrel	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Mammal	Rodentia	Sciuridae	Active	Sciurus griseus	western gray squirrel	No	Approved	Present	Native	Abundant	Breeder		RT
WHIS	Mammal	Rodentia	Sciuridae	Active	Spermophilus beecheyi	California ground squirrel	No	Approved	Present	Native	Abundant	Breeder		
WHIS	Mammal	Rodentia	Sciuridae	Active	Tamias amoenus	yellow-pine chipmunk	No	In Review	Probably Present					
WHIS	Mammal	Rodentia	Sciuridae	Active	Tamias senex	Allen's chipmunk	No	Approved	Probably Present	Native		Breeder		
WHIS	Mammal	Rodentia	Sciuridae	Active	Tamias sonomae	Sonoma chipmunk	No	In Review	Probably Present					
WHIS	Mammal	Rodentia	Sciuridae	Active	Tamiasciurus douglasii	pine squirrel, Douglas' squirrel	No	Approved	Present	Native	Common	Breeder		
WHIS	Mammal	Soricomorpha	Soricidae	Active	Sorex palustris	northern water shrew, wate shrew	No	In Review	Probably Present					
WHIS	Mammal	Soricomorpha	Soricidae	Active	Sorex trowbridgii	Trowbridge's shrew	No	In Review	Probably Present					
WHIS	Mammal	Soricomorpha	Soricidae	Active	Sorex vagrans	vagrant shrew	No	In Review	Probably Present					
WHIS	Mammal	Soricomorpha	Talpidae	Active	Neurotrichus gibbsii	shrew-mole	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Mammal	Soricomorpha	Talpidae	Active	Scapanus latimanus	broad-footed mole	No	Approved	Present	Native	Common	Breeder		

Notes:
1. Reference: NPSpecies - 1.8.2.10174 Acessed January 2018 @ https://irma.nps.gov/NPSpecies/Search/SpeciesList
2. Note: Only species known to be present at WHIS are included

Table B-3
WHIS Species- Birds
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Bird	Accipitriformes	Accipitridae	Active	Accipiter cooperii	cooper's hawk	No	Approved	Present	Native	Uncommon	Breeder	SC	
WHIS	Bird	Accipitriformes	Accipitridae	Active	Accipiter gentilis	northern goshawk	No	Approved	Present	Native	Occasional	Resident	RT	
WHIS	Bird	Accipitriformes	Accipitridae	Active	Accipiter striatus	sharp-shinned hawk	No	Approved	Present	Native	Uncommon	Resident	SC	
WHIS	Bird	Accipitriformes	Accipitridae	Active	Aquila chrysaetos	golden eagle	No	Approved	Present	Native	Rare	Migratory	SC	
WHIS	Bird	Accipitriformes	Accipitridae	Active	Buteo jamaicensis	red-tailed hawk	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Accipitriformes	Accipitridae	Active	Haliaeetus leucocephalus	bald eagle	No	Approved	Present	Native	Common	Management Priority; Breeder	DM	CA: SE
WHIS	Bird	Accipitriformes	Cathartidae	Active	Cathartes aura	turkey vulture	No	Approved	Present	Native	Abundant	Breeder	SC	
WHIS	Bird	Accipitriformes	Pandionidae	Active	Pandion haliaetus	osprey	No	Approved	Present	Native	Common	Breeder	SC	
WHIS	Bird	Anseriformes	Anatidae	Active	Aix sponsa	wood duck	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Bird	Anseriformes	Anatidae	Active	Anas acuta	northern pintail	No	Approved	Present	Native	Uncommon	Migratory		
WHIS	Bird	Anseriformes	Anatidae	Active	Anas americana	american wigeon	No	Approved	Present	Native	Uncommon	Migratory		
WHIS	Bird	Anseriformes	Anatidae	Active	Anas clypeata	northern shoveler	No	Approved	Present	Native	Uncommon	Migratory		
WHIS	Bird	Anseriformes	Anatidae	Active	Anas crecca	green-winged teal	No	Approved	Present	Native	Uncommon	Migratory		
WHIS	Bird	Anseriformes	Anatidae	Active	Anas cyanoptera	cinnamon teal	No	Approved	Probably Present	Native				
WHIS	Bird	Anseriformes	Anatidae	Active	Anas penelope	Eurasian wigeon	No	Approved	Present	Unknown	Occasional			
WHIS	Bird	Anseriformes	Anatidae	Active	Anas platyrhynchos	mallard	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Anseriformes	Anatidae	Active	Anas strepera	gadwall	No	Approved	Present	Native	Uncommon	Migratory		
WHIS	Bird	Anseriformes	Anatidae	Active	Anser albifrons	greater white-fronted goose	No	Approved	Present	Native	Rare	Migratory		
WHIS	Bird	Anseriformes	Anatidae	Active	Aythya affinis	lesser scaup	No	Approved	Present	Native	Uncommon	Migratory	SC	
WHIS	Bird	Anseriformes	Anatidae	Active	Aythya americana	redhead	No	Approved	Present	Native	Rare	Migratory		
WHIS	Bird	Anseriformes	Anatidae	Active	Aythya collaris	ring-necked duck	No	Approved	Present	Native	Common	Resident		
WHIS	Bird	Anseriformes	Anatidae	Active	Aythya marila	greater scaup	No	Approved	Present	Native	Rare	Migratory		
WHIS	Bird	Anseriformes	Anatidae	Active	Aythya valisineria	canvasback	No	Approved	Present	Native	Uncommon	Migratory		
WHIS	Bird	Anseriformes	Anatidae	Active	Branta canadensis	canada goose	No	Approved	Present	Native	Abundant	Breeder		
WHIS	Bird	Anseriformes	Anatidae	Active	Bucephala albeola	bufflehead	No	Approved	Present	Native	Abundant	Resident		
WHIS	Bird	Anseriformes	Anatidae	Active	Bucephala clangula	common goldeneye	No	Approved	Present	Native	Uncommon	Migratory		
WHIS	Bird	Anseriformes	Anatidae	Active	Bucephala islandica	barrow's goldeneye	No	Approved	Probably Present	Native				
WHIS	Bird	Anseriformes	Anatidae	Active	Chen caerulescens	snow goose	No	Approved	Present	Native	Rare	Migratory		
WHIS	Bird	Anseriformes	Anatidae	Active	Chen rossii	Ross' goose	No	Approved	Probably Present	Native				
WHIS	Bird	Anseriformes	Anatidae	Active	Cygnus columbianus	tundra swan	No	Approved	Present	Native	Rare	Migratory		
WHIS	Bird	Anseriformes	Anatidae	Active	Lophodytes cucullatus	hooded merganser	No	Approved	Present	Native	Common	Resident		
WHIS	Bird	Anseriformes	Anatidae	Active	Mergus merganser	common merganser	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Anseriformes	Anatidae	Active	Mergus serrator	red-breasted merganser	No	Approved	Present	Native	Rare	Migratory		
WHIS	Bird	Anseriformes	Anatidae	Active	Oxyura jamaicensis	ruddy duck	No	Approved	Present	Native	Common	Resident		
WHIS	Bird	Apodiformes	Apodidae	Active	Chaetura vauxi	vaux's swift	No	Approved	Probably Present	Native			SC	
WHIS	Bird	Apodiformes	Trochilidae	Active	Archilochus alexandri	black-chinned hummingbird	No	Approved	Probably Present	Native				
WHIS	Bird	Apodiformes	Trochilidae	Active	Calypte anna	anna's hummingbird	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Apodiformes	Trochilidae	Active	Selasphorus rufus	rufous hummingbird	No	Approved	Present	Native	Uncommon	Breeder	SC	
WHIS	Bird	Apodiformes	Trochilidae	Active	Stellula calliope	calliope hummingbird	No	Approved	Probably Present	Native			SC	
WHIS	Bird	Caprimulgiformes	Caprimulgidae	Active	Chordeiles minor	common nighthawk	No	Approved	Present	Native	Rare	Breeder		
WHIS	Bird	Caprimulgiformes	Caprimulgidae	Active	Phalaenoptilus nuttallii	common poorwill	No	Approved	Present	Native	Rare	Breeder		
WHIS	Bird	Charadriiformes	Charadriidae	Active	Charadrius vociferus	killdeer	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Charadriiformes	Laridae	Active	Larus argentatus	herring gull	No	Approved	Present	Native	Uncommon	Resident		
WHIS	Bird	Charadriiformes	Laridae	Active	Larus californicus	california gull	No	Approved	Present	Native	Common	Resident		
WHIS	Bird	Charadriiformes	Laridae	Active	Larus delawarensis	ring-billed gull	No	Approved	Present	Native	Common	Resident		
WHIS	Bird	Charadriiformes	Laridae	Active	Larus glaucescens	glaucous-winged gull	No	Approved	Present	Native	Rare	Migratory		
WHIS	Bird	Charadriiformes	Laridae	Active	Larus thayeri	thayer's gull	No	Approved	Present	Native	Occasional	Migratory		
WHIS	Bird	Charadriiformes	Laridae	Active	Sterna caspia	caspian tern	No	Approved	Probably Present	Native				
WHIS	Bird	Charadriiformes	Scolopacidae	Active	Actitis macularia	spotted sandpiper	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Bird	Charadriiformes	Scolopacidae	Active	Calidris minutilla	least sandpiper	No	Approved	Probably Present	Native				
WHIS	Bird	Charadriiformes	Scolopacidae	Active	Gallinago gallinago	common snipe	No	Approved	Present	Native	Rare	Migratory		
WHIS	Bird	Columbiformes	Columbidae	Active	Columba fasciata	band-tailed pigeon	No	Approved	Present	Native	Abundant	Management Priority; Breeder		
WHIS	Bird	Columbiformes	Columbidae	Active	Columba livia	domestic pigeon, rock dove	No	Approved	Present	Non-native	Uncommon	Resident		
WHIS	Bird	Columbiformes	Columbidae	Active	Zenaida macroura	mourning dove	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Coraciiformes	Alcedinidae	Active	Ceryle alcyon	belted kingfisher	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Cuculiformes	Cuculidae	Active	Geococcyx californianus	greater roadrunner	No	Approved	Present	Native	Rare	Breeder		
WHIS	Bird	Falconiformes	Falconidae	Active	Falco columbarius	merlin	No	Approved	Present	Native	Rare	Migratory	SC	
WHIS	Bird	Falconiformes	Falconidae	Active	Falco mexicanus	prairie falcon	No	Approved	Probably Present	Native			SC	
WHIS	Bird	Falconiformes	Falconidae	Active	Falco peregrinus	American peregrine falcon, peregrine falcon	No	Approved	Present	Native	Rare	Migratory	SC	
WHIS	Bird	Falconiformes	Falconidae	Active	Falco sparverius	american kestrel	No	Approved	Present	Native	Rare	Resident		
WHIS	Bird	Galliformes	Odontophoridae	Active	Callipepla californica	California quail	No	Approved	Present	Native	Abundant	Breeder		

Table B-3
WHIS Species- Birds
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Bird	Galliformes	Odontophoridae	Active	Oreortyx pictus	mountain quail	No	Approved	Present	Native	Abundant	Breeder	RT	
WHIS	Bird	Galliformes	Phasianidae	Active	Bonasa umbellus	ruffed grouse	No	Approved	Probably Present	Native				
WHIS	Bird	Galliformes	Phasianidae	Active	Dendragapus obscurus	blue grouse	No	Approved	Present	Native	Rare	Breeder		
WHIS	Bird	Galliformes	Phasianidae	Active	Meleagris gallopavo	wild turkey	No	Approved	Present	Non-native	Uncommon	Breeder		
WHIS	Bird	Gaviiformes	Gaviidae	Active	Gavia immer	common loon	No	Approved	Present	Native	Uncommon	Migratory	SC	
WHIS	Bird	Gruiformes	Rallidae	Active	Fulica americana	american coot	No	Approved	Present	Native	Abundant	Resident		
WHIS	Bird	Gruiformes	Rallidae	Active	Porzana carolina	sora	No	Approved	Probably Present	Native				
WHIS	Bird	Gruiformes	Rallidae	Active	Rallus limicola	virginia rail	No	Approved	Probably Present	Native				
WHIS	Bird	Passeriformes	Aegithalidae	Active	Psaltriparus minimus	bushtit	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Aegithalidae	Active	Psaltriparus minimus minimus	bushtit	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Bombycillidae	Active	Bombycilla cedrorum	cedar waxwing	No	Approved	Present	Native	Uncommon	Resident		
WHIS	Bird	Passeriformes	Cardinalidae	Active	Passerina amoena	lazuli bunting	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Cardinalidae	Active	Pheucticus melanocephalus	black-headed grosbeak	No	Approved	Present	Native	Abundant	Breeder		
WHIS	Bird	Passeriformes	Cardinalidae	Active	Piranga ludoviciana	western tanager	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Certhiidae	Active	Certhia americana	brown creeper	No	Approved	Present	Native	Common	Breeder	SC	
WHIS	Bird	Passeriformes	Cinclidae	Active	Cinclus mexicanus	american dipper	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Corvidae	Active	Aphelocoma californica	western scrub jay	No	Approved	Present	Native	Abundant	Breeder		
WHIS	Bird	Passeriformes	Corvidae	Active	Corvus brachyrhynchos	american crow	No	Approved	Present	Native	Uncommon	Resident		
WHIS	Bird	Passeriformes	Corvidae	Active	Corvus corax	common raven	No	Approved	Present	Native	Abundant	Breeder		
WHIS	Bird	Passeriformes	Corvidae	Active	Cyanocitta stelleri	steller's jay	No	Approved	Present	Native	Abundant	Breeder		
WHIS	Bird	Passeriformes	Corvidae	Active	Nucifraga columbiana	clark's nutcracker	No	Approved	Present	Native	Uncommon	Resident		
WHIS	Bird	Passeriformes	Emberizidae	Active	Aimophila ruficeps	Rufous-crowned Sparrow	No	Approved	Present	Unknown	Occasional		SC	
WHIS	Bird	Passeriformes	Emberizidae	Active	Amphispiza belli	sage sparrow	No	Approved	Probably Present	Native			SC	
WHIS	Bird	Passeriformes	Emberizidae	Active	Chondestes grammacus	lark sparrow	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Bird	Passeriformes	Emberizidae	Active	Junco hyemalis	dark-eyed junco	No	Approved	Present	Native	Abundant	Breeder		
WHIS	Bird	Passeriformes	Emberizidae	Active	Melospiza lincolnii	lincoln's sparrow	No	Approved	Present	Native	Uncommon	Resident	SC	
WHIS	Bird	Passeriformes	Emberizidae	Active	Melospiza melodia	song sparrow	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Emberizidae	Active	Passerella iliaca	fox sparrow	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Emberizidae	Active	Pipilo crissalis	brown towhee, California towhee	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Bird	Passeriformes	Emberizidae	Active	Pipilo maculatus	rufous-sided towhee, spotted towhee	No	Approved	Present	Native	Abundant	Breeder		
WHIS	Bird	Passeriformes	Emberizidae	Active	Spizella passerina	chipping sparrow	No	Approved	Present	Native	Uncommon	Resident		
WHIS	Bird	Passeriformes	Emberizidae	Active	Zonotrichia atricapilla	golden-crowned sparrow	No	Approved	Present	Native	Uncommon	Resident		
WHIS	Bird	Passeriformes	Emberizidae	Active	Zonotrichia leucophrys	white-crowned sparrow	No	Approved	Present	Native	Abundant	Resident		
WHIS	Bird	Passeriformes	Fringillidae	Active	Carduelis lawrencei	lawrence's goldfinch	No	Approved	Probably Present	Native			SC	
WHIS	Bird	Passeriformes	Fringillidae	Active	Carduelis pinus	pine siskin	No	Approved	Present	Native	Uncommon	Resident		
WHIS	Bird	Passeriformes	Fringillidae	Active	Carduelis psaltria	lesser goldfinch	No	Approved	Present	Native	Abundant	Breeder		
WHIS	Bird	Passeriformes	Fringillidae	Active	Carduelis tristis	american goldfinch	No	Approved	Present	Native	Common	Resident		
WHIS	Bird	Passeriformes	Fringillidae	Active	Carpodacus cassinii	cassin's finch	No	Approved	Probably Present	Native			SC	
WHIS	Bird	Passeriformes	Fringillidae	Active	Carpodacus mexicanus	house finch	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Fringillidae	Active	Carpodacus purpureus	purple finch	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Fringillidae	Active	Coccothraustes vespertinus	evening grosbeak	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Bird	Passeriformes	Fringillidae	Active	Loxia curvirostra	red crossbill	No	Approved	Present	Native	Rare	Resident	SC	
WHIS	Bird	Passeriformes	Hirundinidae	Active	Hirundo rustica	barn swallow	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Hirundinidae	Active	Petrochelidon pyrrhonota	cliff swallow	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Hirundinidae	Active	Progne subis	purple martin	No	Approved	Probably Present	Native			SC	
WHIS	Bird	Passeriformes	Hirundinidae	Active	Riparia riparia	bank swallow	No	Approved	Present	Native	Occasional	Migratory	SC	CA: ST
WHIS	Bird	Passeriformes	Hirundinidae	Active	Stelgidopteryx serripennis	northern rough-winged swallow	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Hirundinidae	Active	Tachycineta bicolor	tree swallow	No	Approved	Present	Native	Common	Breeder	SC	
WHIS	Bird	Passeriformes	Hirundinidae	Active	Tachycineta thalassina	violet-green swallow	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Bird	Passeriformes	Icteridae	Active	Agelaius phoeniceus	red-winged blackbird	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Icteridae	Active	Euphagus cyanocephalus	brewer's blackbird	No	Approved	Present	Native	Abundant	Breeder		
WHIS	Bird	Passeriformes	Icteridae	Active	Icterus bullockii	Bullock's oriole, northern oriole	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Icteridae	Active	Molothrus ater	brown-headed cowbird	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Icteridae	Active	Sturnella neglecta	western meadowlark	No	Approved	Present	Native	Uncommon	Resident		
WHIS	Bird	Passeriformes	Mimidae	Active	Mimus polyglottos	northern mockingbird	No	Approved	Present	Native	Uncommon	Resident		
WHIS	Bird	Passeriformes	Mimidae	Active	Toxostoma redivivum	california thrasher	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Bird	Passeriformes	Motacillidae	Active	Anthus rubescens	American pipit	No	Approved	Present	Native	Rare	Resident		
WHIS	Bird	Passeriformes	Paridae	Active	Baeolophus inornatus	oak titmouse, plain titmouse	No	Approved	Present	Native	Common	Breeder	SC	
WHIS	Bird	Passeriformes	Paridae	Active	Poecile gambeli	mountain chickadee	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Paridae	Active	Poecile rufescens	chesnut-backed chickadee	No	Approved	Present	Native	Uncommon	Resident		
WHIS	Bird	Passeriformes	Parulidae	Active	Dendroica coronata	Audobon's warbler, yellow-rumped warbler	No	Approved	Present	Native	Common	Breeder		

Table B-3
WHIS Species- Birds
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Bird	Passeriformes	Parulidae	Active	Dendroica coronata auduboni	audubon's warbler	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Parulidae	Active	Dendroica nigrescens	black-throated gray warbler	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Parulidae	Active	Dendroica occidentalis	hermit warbler	No	Approved	Probably Present	Native				
WHIS	Bird	Passeriformes	Parulidae	Active	Dendroica petechia	yellow warbler	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Bird	Passeriformes	Parulidae	Active	Geothlypis trichas	common yellowthroat	No	Approved	Probably Present	Native				
WHIS	Bird	Passeriformes	Parulidae	Active	Icteria virens	yellow-breasted chat	No	Approved	Present	Native	Common	Breeder	SC	
WHIS	Bird	Passeriformes	Parulidae	Active	Oporornis tolmiei	macgillivray's warbler	No	Approved	Present	Native	Common	Breeder	SC	
WHIS	Bird	Passeriformes	Parulidae	Active	Vermivora celata	orange-crowned warbler	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Parulidae	Active	Vermivora ruficapilla	nashville warbler	No	Approved	Present	Native	Common	Breeder	SC	
WHIS	Bird	Passeriformes	Parulidae	Active	Wilsonia pusilla	wilson's warbler	No	Approved	Present	Native	Uncommon	Migratory	SC	
WHIS	Bird	Passeriformes	Passeridae	Active	Passer domesticus	house sparrow	No	Approved	Present	Non-native	Common	Breeder		
WHIS	Bird	Passeriformes	Polioptilidae	Active	Polioptila caerulea	blue-gray gnatcatcher	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Bird	Passeriformes	Regulidae	Active	Regulus calendula	ruby-crowned kinglet	No	Approved	Present	Native	Common	Resident		
WHIS	Bird	Passeriformes	Regulidae	Active	Regulus satrapa	golden-crowned kinglet	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Sittidae	Active	Sitta canadensis	red-breasted nuthatch	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Sittidae	Active	Sitta carolinensis	white-breasted nuthatch	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Sittidae	Active	Sitta pygmaea	pygmy nuthatch	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Bird	Passeriformes	Sturnidae	Active	Sturnus vulgaris	european starling	No	Approved	Present	Non-native	Common	Breeder		
WHIS	Bird	Passeriformes	Sylviidae	Active	Chamaea fasciata	wrentit	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Troglodytidae	Active	Catherpes mexicanus	canyon wren	No	Approved	Present	Native	Rare	Breeder		
WHIS	Bird	Passeriformes	Troglodytidae	Active	Salpinctes obsoletus	rock wren	No	Approved	Probably Present	Native				
WHIS	Bird	Passeriformes	Troglodytidae	Active	Thryomanes bewickii	bewick's wren	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Troglodytidae	Active	Troglodytes aedon	house wren	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Troglodytidae	Active	Troglodytes troglodytes	winter wren	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Turdidae	Active	Catharus guttatus	hermit thrush	No	Approved	Present	Native	Uncommon	Resident		
WHIS	Bird	Passeriformes	Turdidae	Active	Catharus ustulatus	swainson's thrush	No	Approved	Probably Present	Native				
WHIS	Bird	Passeriformes	Turdidae	Active	Ixoreus naevius	varied thrush	No	Approved	Present	Native	Uncommon	Resident		
WHIS	Bird	Passeriformes	Turdidae	Active	Myadestes townsendi	townsend's solitaire	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Bird	Passeriformes	Turdidae	Active	Sialia mexicana	western bluebird	No	Approved	Present	Native	Common	Breeder	SC	
WHIS	Bird	Passeriformes	Turdidae	Active	Turdus migratorius	american robin	No	Approved	Present	Native	Abundant	Breeder		
WHIS	Bird	Passeriformes	Tyrannidae	Active	Contopus cooperi	olive-sided flycatcher	No	Approved	Present	Native	Common	Breeder	SC	
WHIS	Bird	Passeriformes	Tyrannidae	Active	Contopus sordidulus	western wood-pewee	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Tyrannidae	Active	Empidonax difficilis	pacific slope flycatcher, western flycatcher	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Tyrannidae	Active	Empidonax hammondii	Hammond's flycatcher	No	Approved	Probably Present	Native				
WHIS	Bird	Passeriformes	Tyrannidae	Active	Empidonax oberholseri	dusky flycatcher	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Bird	Passeriformes	Tyrannidae	Active	Empidonax traillii	willow flycatcher	No	Approved	Probably Present	Native			SC	CA: SE
WHIS	Bird	Passeriformes	Tyrannidae	Active	Empidonax traillii brewsteri	little willow flycatcher	No	Approved	Probably Present	Native			SC	
WHIS	Bird	Passeriformes	Tyrannidae	Active	Myiarchus cinerascens	ash-throated flycatcher	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Tyrannidae	Active	Sayornis nigricans	black phoebe	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Tyrannidae	Active	Tyrannus verticalis	western kingbird	No	Approved	Probably Present	Native				
WHIS	Bird	Passeriformes	Vireonidae	Active	Vireo cassinii	Cassin's vireo	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Passeriformes	Vireonidae	Active	Vireo gilvus	warbling vireo	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Bird	Passeriformes	Vireonidae	Active	Vireo huttoni	hutton's vireo	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Pelecaniformes	Ardeidae	Active	Ardea herodias	great blue heron	No	Approved	Present	Native	Common	Breeder	SC	
WHIS	Bird	Pelecaniformes	Ardeidae	Active	Butorides striatus	green heron, green-backed heron	No	Approved	Present	Native	Uncommon	Resident		
WHIS	Bird	Pelecaniformes	Ardeidae	Active	Butorides virescens	green heron, green-backed heron	No	Approved	Present	Native	Uncommon	Resident		
WHIS	Bird	Pelecaniformes	Ardeidae	Active	Casmerodius albus	great egret	No	Approved	Present	Native	Rare	Resident		
WHIS	Bird	Pelecaniformes	Pelecanidae	Active	Pelecanus erythrorhynchos	American white pelican	No	Approved	Present	Native	Occasional	Migratory	SC	
WHIS	Bird	Piciformes	Picidae	Active	Colaptes auratus	northern flicker	No	Approved	Present	Native	Abundant	Breeder		
WHIS	Bird	Piciformes	Picidae	Active	Dryocopus pileatus	pileated woodpecker	No	Approved	Present	Native	Rare	Breeder	SC	
WHIS	Bird	Piciformes	Picidae	Active	Melanerpes formicivorus	acorn woodpecker	No	Approved	Present	Native	Abundant	Breeder		
WHIS	Bird	Piciformes	Picidae	Active	Melanerpes lewis	lewis' woodpecker	No	Approved	Present	Native	Occasional	Migratory	SC	
WHIS	Bird	Piciformes	Picidae	Active	Picoides albolarvatus	white-headed woodpecker	No	Approved	Probably Present	Native			SC	
WHIS	Bird	Piciformes	Picidae	Active	Picoides nuttallii	nuttall's woodpecker	No	Approved	Present	Native	Uncommon	Breeder	SC	
WHIS	Bird	Piciformes	Picidae	Active	Picoides pubescens	downy woodpecker	No	Approved	Present	Native	Common	Breeder	SC	
WHIS	Bird	Piciformes	Picidae	Active	Picoides villosus	hairy woodpecker	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Piciformes	Picidae	Active	Sphyrapicus ruber	red-breasted sapsucker	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Bird	Podicipediformes	Podicipedidae	Active	Aechmophorus occidentalis	western grebe	No	Approved	Present	Native	Common	Resident	SC	
WHIS	Bird	Podicipediformes	Podicipedidae	Active	Podiceps auritus	horned grebe	No	Approved	Present	Native	Common	Resident		
WHIS	Bird	Podicipediformes	Podicipedidae	Active	Podiceps grisegena	red-necked grebe	No	Approved	Present	Native	Occasional	Migratory		
WHIS	Bird	Podicipediformes	Podicipedidae	Active	Podiceps nigricollis	eared grebe	No	Approved	Present	Native	Abundant	Resident		

Table B-3
WHIS Species- Birds
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Bird	Podicipediformes	Podicipedidae	Active	Podilymbus podiceps	pied-billed grebe	No	Approved	Present	Native	Abundant	Resident		
WHIS	Bird	Strigiformes	Strigidae	Active	Aegolius acadicus	northern saw-whet owl	No	Approved	Present	Native	Rare	Breeder		
WHIS	Bird	Strigiformes	Strigidae	Active	Bubo virginianus	great horned owl	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Strigiformes	Strigidae	Active	Glaucidium gnoma	northern pygmy-owl	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Strigiformes	Strigidae	Active	Otus flammeolus	flammulated owl	No	Approved	Probably Present	Native			SU	
WHIS	Bird	Strigiformes	Strigidae	Active	Otus kennicottii	western screech-owl	No	Approved	Present	Native	Common	Breeder		
WHIS	Bird	Strigiformes	Strigidae	Active	Strix occidentalis caurina	northern spotted owl	No	Approved	Present	Native	Rare	Management Priority; Breeder	T	
WHIS	Bird	Suliformes	Phalacrocoracidae	Active	Phalacrocorax auritus	double-crested cormorant	No	Approved	Present	Native	Common	Resident	SC	

Notes:

1. Reference: NPSpecies - 1.8.2.10174 Acessed January 2018 @ https://irma.nps.gov/NPSpecies/Search/SpeciesList
2. Note: Only species known to be present at WHIS are included

Table B-4
WHIS Species - Reptiles, Amphibians, and Fish
Coggins Flat Area Placer Mine
Whiskeytown Recreation Area

Park Code	Category	Order	Family	Taxon Record Status	Scientific Name	Common Names	Sens?	Record Status	Occurrence	Nativeness	Abundance	NPS Tags	T&E	State Status
WHIS	Reptile	Squamata	Anguidae	Active	Elgaria coerulea	northern alligator lizard	No	Approved	Present	Native	Common	Breeder		
WHIS	Reptile	Squamata	Anguidae	Active	Elgaria coerulea shastensis	shasta alligator lizard	No	Approved	Present	Native	Common	Breeder		
WHIS	Reptile	Squamata	Anguidae	Active	Elgaria multicarinata	southern alligator lizard	No	Approved	Present	Native	Abundant	Breeder		
WHIS	Reptile	Squamata	Charinidae	Active	Charina bottae	Rubber boa	No	Approved	Probably Present	Native		Breeder		
WHIS	Reptile	Squamata	Colubridae	Active	Coluber constrictor	Racer, yellow racer	No	Approved	Present	Native	Common	Breeder		
WHIS	Reptile	Squamata	Colubridae	Active	Contia tenuis	sharp-tailed snake	No	Approved	Present	Native	Common	Breeder		
WHIS	Reptile	Squamata	Colubridae	Active	Diadophis punctatus	ring-necked snake	No	Approved	Present	Native	Uncommon	Breeder	SC	
WHIS	Reptile	Squamata	Colubridae	Active	Hypsiglena torquata	night snake	No	Approved	Probably Present	Native		Breeder		
WHIS	Reptile	Squamata	Colubridae	Active	Lampropeltis getula	common kingsnake	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Reptile	Squamata	Colubridae	Active	Lampropeltis zonata	california mountain kingsnake	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Reptile	Squamata	Colubridae	Active	Masticophis lateralis	California whipsnake, striped race	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Reptile	Squamata	Colubridae	Active	Pituophis catenifer	bull snake, gopher snake	No	Approved	Present	Native	Common	Breeder		
WHIS	Reptile	Squamata	Colubridae	Active	Pituophis melanoleucus	bull snake, gopher snake	No	Approved	Present	Native	Common	Breeder		
WHIS	Reptile	Squamata	Colubridae	Active	Thamnophis couchii	Couch's garter snake, western aqu	No	Approved	Present	Native	Common	Breeder		
WHIS	Reptile	Squamata	Colubridae	Active	Thamnophis couchii aquaticus	western aquatic giant snake	No	In Review	Present					
WHIS	Reptile	Squamata	Colubridae	Active	Thamnophis elegans	western terrestrial garter snake	No	Approved	Present	Native	Common	Breeder		
WHIS	Reptile	Squamata	Colubridae	Active	Thamnophis sirtalis	common garter snake	No	Approved	Present	Native	Common	Breeder		
WHIS	Reptile	Squamata	Iguanidae	Active	Sceloporus graciosus	sagebrush lizard	No	Approved	Present	Native	Common	Breeder		
WHIS	Reptile	Squamata	Iguanidae	Active	Sceloporus occidentalis	western fence lizard	No	Approved	Present	Native	Abundant	Breeder		
WHIS	Reptile	Squamata	Scincidae	Active	Eumeces skiltonianus	western skink	No	Approved	Present	Native	Common	Breeder		
WHIS	Reptile	Squamata	Teiidae	Active	Cnemidophorus tigris	western whiptail	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Reptile	Squamata	Viperidae	Active	Crotalus viridis	western rattlesnake	No	Approved	Present	Native	Common	Breeder		
WHIS	Reptile	Testudines	Emydidae	Active	Actinemys marmorata	Western Pond Turtle	No	Approved	Present	Native	Common	Breeder	UR	
WHIS	Reptile	Testudines	Emydidae	Active	Trachemys scripta elegans	Red-eared slider	No	Approved	Present	Non-native	Unknown			
WHIS	Amphibian	Anura	Bufonidae	Active	Bufo boreas	western toad	No	Approved	Present	Native	Common	Breeder	SC	
WHIS	Amphibian	Anura	Hylidae	Active	Hyla regilla	pacific tree frog	No	In Review	Present					
WHIS	Amphibian	Anura	Hylidae	Active	Pseudacris regilla	pacific chorus frog, pacific tree fro	No	Approved	Present	Native	Abundant	Breeder		
WHIS	Amphibian	Anura	Leiopelmatidae	Active	Ascaphus truei	Tailed frog	No	Approved	Present	Native	Uncommon	Breeder	SC	
WHIS	Amphibian	Anura	Ranidae	Active	Rana aurora	Red-legged frog	No	In Review	Probably Present					
WHIS	Amphibian	Anura	Ranidae	Active	Rana boylii	foothill yellow-legged frog	No	Approved	Present	Native	Common	Breeder	UR	
WHIS	Amphibian	Anura	Ranidae	Active	Rana catesbeiana	bullfrog	No	Approved	Present	Non-native	Abundant	Breeder		
WHIS	Amphibian	Anura	Scaphiopodidae	Active	Spea hammondii	western spadefoot	No	Approved	Probably Present	Native		Resident	UR	
WHIS	Amphibian	Caudata	Ambystomatidae	Active	Ambystoma macrodactylum	long-toed salamander	No	Approved	Probably Present	Native		Breeder		
WHIS	Amphibian	Caudata	Ambystomatidae	Active	Dicamptodon ensatus	pacific giant salamander	No	Approved	Present	Native	Common	Breeder	RT	
WHIS	Amphibian	Caudata	Plethodontidae	Active	Aneides flavipunctatus	black salamander	No	Approved	Present	Native	Uncommon	Breeder		
WHIS	Amphibian	Caudata	Plethodontidae	Active	Ensatina eschscholtzii	Ensatina	No	Approved	Present	Native	Common	Breeder		
WHIS	Amphibian	Caudata	Plethodontidae	Active	Ensatina eschscholtzii oregon	oregon ensatina	No	Approved	Present	Native	Common	Breeder		
WHIS	Amphibian	Caudata	Salamandridae	Active	Taricha granulosa	rough-skinned newt	No	Approved	Present	Native	Rare	Breeder	SC	

Notes:
1. Reference: NPSpecies - 1.8.2.10174 Acessed January 2018 @ https://irma.nps.gov/NPSpecies/Search/SpeciesList
2. Note: Only species known to be present at WHIS are included

APPENDIX C
FIELD ACTIVITIES DOCUMENTATION

AVATAR ENVIRONMENTAL

DAILY FIELD WORK REPORT

Prepared by: Nicole Hastings-Bethel

Report No: 1 **Project No:** 44017190 **Date:** 8/1/17

Project Name: NPS - Whiskeytown, CA

Location of Work: Coggins Flat Area Placer Mine - Trinity Mountain Road and Clear Creek

Weather: Sunny

Temp.: 105 °F **Min:** 74 **Max:** 113 **Precipitation:** None

Average wind direction and speed: 2mph SSE

Description of Project Activities:	Completed? (Y / N)	Level of Protection Worn
Travel to Site.	Y	Level D
Conduct initial tailgate/safety meeting with Brian Rasmussen, go over entire scope, visit Site.	Y	Level D
Locate and flag first set of locations.	Y	Level D

Personnel On-site

Name	Company	Start Time	Stop Time	Participated in Safety Briefing (Y/N)	Visitor (Y/N); Purpose of Visit
Nicole Hastings-Bethel	Geocon	800	1800	Y	
Julio Esquivel	Geocon	800	1800	Y	
Brian Rasmussen	NPS	1430	1530	Y	Oversight

Safety Briefing

Topics	Information Reviewed (Reference Material Covered or Attach Copy)
Review site Health & Safety Plan	SOP for soil sampling
Slip, Trip, Falls, PPE	Tailgate meeting discussing PPE for the task. Use caution around site: hiking around rocks, through brush, tall grass, and along creek.
Weather	Extremely hot temperatures (>100 °F): plan early start to take advantage of cooler temps earlier in day; wear appropriate clothing, sunscreen, hats, hydration; watch out for each other, take breaks, set up and work in shade, cool down in truck with AC, use portable shade cover if shaded work areas not available, plenty of ice water available.
Wildlife, Biohazard	Be aware of snakes, especially in tall grass, near creek, around downed trees, early morning; poison oak, wear appropriate clothing; general awareness of surroundings; insect repellent; sunscreen.
Traffic	Be aware of traffic along roadside, especially when crossing roadway and near curves in road.

Samples

Samples Collected	Decision Unit	Sample ID	Type	Description

Comments/Issues:

No samples collected.

Planned activities for next work day:

Start on southern portion of Site. CF-SO-13, -14, -15, CF-SD-09 and CF-BG-10 will take considerable effort hiking through brush - plan to collect these locations earlier in the morning before noon.

Nicole Hastings-Bethel

Preparer **Signature**

AVATAR ENVIRONMENTAL

DAILY FIELD WORK REPORT

Prepared by: Nicole Hastings-Bethel

Report No: 2 **Project No:** 44017190 **Date:** 8/2/17

Project Name: NPS - Whiskeytown, CA

Location of Work: Coggins Flat Area Placer Mine - Trinity Mountain Road and Clear Creek

Weather: Sunny

Temp.: 93 °F **Min:** 76 **Max:** 110 **Precipitation:** None

Average wind direction and speed: 3 mph S

Description of Project Activities:	Completed? (Y / N)	Level of Protection Worn
Conduct tailgate/safety meeting with Brian Rasmussen. Rattlesnakes, heat and poison oak primary concer	Y	Level D
Start sampling from southern portion of the Site.	Y	Level D
Locate and flag next set of locations.	Y	Level D

Personnel On-site

Name	Company	Start Time	Stop Time	Participated in Safety Briefing (Y/N)	Visitor (Y/N); Purpose of Visit
Nicole Hastings-Bethel	Geocon	530	1630	Y	
Julio Esquivel	Geocon	530	1630	Y	
Brian Rasmussen	NPS	600	1500	Y	Oversight

Safety Briefing

Topics	Information Reviewed (Reference Material Covered or Attach Copy)
Review site Health & Safety Plan	SOP for soil sampling
Slip, Trip, Falls, PPE	Tailgate meeting discussing PPE for the task. Use caution around site: hiking around rocks, through brush, tall grass, and along creek.
Weather	Extremely hot temperatures (>100 °F): plan early start to take advantage of cooler temps earlier in day; wear appropriate clothing, sunscreen, hats, hydration; watch out for each other, take breaks, set up and work in shade, cool down in truck with AC, use portable shade cover if shaded work areas not available, plenty of ice water available.
Wildlife, Biohazard	Be aware of snakes, especially in tall grass, near creek, around downed trees, early morning; poison oak, wear appropriate clothing; general awareness of surroundings; insect repellent; sunscreen.
Traffic	Be aware of traffic along roadside, especially when crossing roadway and near curves in road.

Samples

Samples Collected	Decision Unit	Sample ID	Type	Description
	Coggins Flat	CF-SO-07	Soil	Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Coarse sandy soil. Area appears to have flooded this past winter. NPS stated first time this channel flooded since 1990's and looked very different than when the initial site visit was conducted. Soil sifted through #40 sieve prior to placement in sample jar. To be analyzed for mercury.
		CF-SO-16	Soil	Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Coarse sandy silt with gravel and cobbles. Soil sifted through #40 sieve prior to placement in sample jar. To be analyzed for mercury.
		CF-SO-08	Soil	Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Coarse sandy soil. Area appears to have flooded this past winter. NPS stated first time this channel flooded since 1990's and looked very different than when the initial site visit was conducted. Soil sifted through #40 sieve prior to placement in sample jar. To be analyzed for mercury.
		CF-SD-03	Sediment	Reddish brown staining observed on bank at this location, NPS identified the staining as evidence of a possible methylation reaction. Collected methyl mercury sample using clean hands/dirty hands technique, and a bulk sample for mercury. Sample too wet to sieve through #40 without significant amounts of water - lab will dry and sieve bulk sample prior to mercury analysis.
		CF-SO-13	Soil	Located as close to mapped location as we could get. Very thick brush, poison oak, and blackberries closer to creek. Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Coarse sandy silt. Soil sifted through #40 sieve prior to placement in sample jar. To be analyzed for mercury.
		CF-SO-14	Soil	Located on tailings pile in thick brush/poison oak. Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Tailings, silt, fractured angular rock. Soil sifted through #40 sieve prior to placement in sample jar. To be analyzed for mercury.
		CF-BG-10	Soil	Moved approximately 100 yards upslope because of observed prospect pits and a water channel/ditch. Prospect pits adj to SE. Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Coarse sandy silt with gravel. Soil sifted through #40 sieve prior to placement in sample jar. To be analyzed for CAM 17 metals.

AVATAR ENVIRONMENTAL

DAILY FIELD WORK REPORT

Prepared by: Nicole Hastings-Bethel

Report No: 2 **Project No:** 44017190 **Date:** 8/2/17

Project Name: NPS - Whiskeytown, CA

Location of Work: Coggins Flat Area Placer Mine - Trinity Mountain Road and Clear Creek

	Coggins Flat	CF-SO-15	Soil	Located in tailings area. Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Coarse sandy silt with gravel and fractured rock. Soil sifted through #40 sieve prior to placement in sample jar. To be analyzed for mercury.
		CF-SD-09	Sediment	Located about 200 ft. downstream of mapped location because of dense vegetation. Visible sediment deposits at new location, also at end of foot trail. Collected methyl mercury sample using clean hands/dirty hands technique, and a bulk sample for mercury. Sample dry enough to sift through #40 sieve prior to placement in sample jar. To be analyzed for mercury.
		CF-SD-10	Sediment	Visible sediment deposits in easily accessible recreation area. Collected methyl mercury sample using clean hands/dirty hands technique, and a bulk sample for mercury. Sample too wet to sieve through #40 - lab will dry and sieve bulk sample prior to mercury analysis.
		CF-ER-01	Equipment Rinsate	Equipment rinsate collected by pouring distilled water through decontaminated sieve into the decontaminated collection tray, then siphoning the water into sample jars. To be analyzed for mercury.
		CF-SO-06	Soil	Located in northern portion of recreation area/apparent parking area. Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Coarse sandy silt with gravel. Soil sifted through #40 sieve prior to placement in sample jar. To be analyzed for mercury.
		CF-BG-06/ CF-BL-04	Soil	Collected on hillside adj to the east of recreation area. Collected 10-pt field composite (approximately 6 oz. per aliquot) from an approximate 5 ft. radius. Coarse sandy silt. Soil sifted through #40 sieve prior to placement in sample jars (blind duplicate also collected at this location). To be analyzed for CAM 17 metals.
		CF-BG-07	Soil	Collected on hillside adj to the east of recreation area (slightly southeast of restroom). Downslope from possible archeological site. Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Coarse sandy silt with gravel. Soil sifted through #40 sieve prior to placement in sample jar. To be analyzed for CAM 17 metals.
		CF-BG-08	Soil	Location relocated approximately 270 ft. northeast because of archeological site. Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Coarse sandy silt. Soil sifted through #40 sieve prior to placement in sample jar. To be analyzed for CAM 17 metals.

Comments/Issues:

Moist to wet samples will not pass through #40 sieve without the use of water which we worry may dilute the sample. Contacted the lab, ok to submit bulk samples in doubled Ziploc bags to be dried and sieved at the lab (will test %Moisture and correct dry weight results).

New 4 oz. glass jars were used as a scoop to collect aliquots for the soil samples.

New, precleaned (EPA protocol B) individually packaged Conbar plastic sampling scoops were used for collecting sediment samples for methyl mercury and mercury samples.

Planned activities for next work day:

Start on northern portion of Site. CF-BD-01, -02, -03, -04 and -05 will take considerable effort hiking through brush - plan to collect these locations first thing. Shade may also not be as readily available later in the afternoon.

Nicole Hastings-Bethel

Preparer **Signature**

AVATAR ENVIRONMENTAL

DAILY FIELD WORK REPORT

Prepared by: Nicole Hastings-Bethel

Report No: 3 **Project No:** 44017190 **Date:** 8/3/17

Project Name: NPS - Whiskeytown, CA
Location of Work: Coggins Flat Area Placer Mine - Trinity Mountain Road and Clear Creek

Weather: Sunny
Temp.: 93 °F **Min:** 74 **Max:** 111 **Precipitation:** None
Average wind direction and speed: 5 mph WSW

Description of Project Activities:	Completed? (Y / N)	Level of Protection Worn
Conduct tailgate/safety meeting with Brian Rasmussen. Rattlesnakes, heat and poison oak primary concer	Y	Level D
Start sampling from northern portion of the Site.	Y	Level D
Collect samples, place on ice, and save sieving for end of day	Y	Level D

Personnel On-site

Name	Company	Start Time	Stop Time	Participated in Safety Briefing (Y/N)	Visitor (Y/N); Purpose of Visit
Nicole Hastings-Bethel	Geocon	530	1730	Y	
Julio Esquivel	Geocon	530	1730	Y	
Brian Rasmussen	NPS	600	1445	Y	Oversight

Safety Briefing

Topics	Information Reviewed (Reference Material Covered or Attach Copy)
Review site Health & Safety Plan	SOP for soil sampling
Slip, Trip, Falls, PPE	Tailgate meeting discussing PPE for the task. Use caution around site: hiking around rocks, through brush, tall grass, and along creek.
Weather	Extremely hot temperatures (>100 °F): plan early start to take advantage of cooler temps earlier in day; wear appropriate clothing, sunscreen, hats, hydration; watch out for each other, take breaks, set up and work in shade, cool down in truck with AC, use portable shade cover if shaded work areas not available, plenty of ice water available.
Wildlife, Biohazard	Be aware of snakes, especially in tall grass, near creek, around downed trees, early morning; poison oak, wear appropriate clothing; general awareness of surroundings; insect repellent; sunscreen.
Traffic	Be aware of traffic along roadside, especially when crossing roadway and near curves in road.

Samples

Samples Collected	Decision Unit	Sample ID	Type	Description
	Coggins Flat	CF-SD-11	Sediment	Area between tailing piles and creek; cannot access creek because of berm covered in blackberry bushes. Area appears to have flooded this past winter with no apparent outlet (evidence of formerly ponded water). Originally collected this sample in place of CF-BD-01, but later found access to the creek closer to that location. Kept this sample because of sediment location between tailings and creek. Collected methyl mercury sample using clean hands/dirty hands technique, and a bulk sample for mercury. Sample dry enough to sift through #40 sieve prior to placement in sample jar. To be analyzed for mercury.
		CF-BD-02	Sediment	Located upstream of mapped location but best access point in area of dense vegetation. Collected methyl mercury sample using clean hands/dirty hands technique, and a bulk sample for mercury. Sample too wet to sieve through #40 - lab will dry and sieve bulk sample prior to mercury analysis.
		CF-BD-03	Sediment	Located upstream of mapped location but east side of creek from CF-BD-02. Wearing layered gloves, one person crossed the stream to collect the methyl mercury sample. The outer glove was removed just prior to opening the sample container and collecting the sample. Bulk sample for mercury also collected. Sample too wet to sieve through #40 - lab will dry and sieve bulk sample prior to mercury analysis.
		CF-BD-01/ CF-BL-05	Sediment	Located access point to creek near CF-BD-01. Blind duplicate CF-BL-05 also collected here. Collected methyl mercury sample using clean hands/dirty hands technique, and a bulk sample for mercury. Sample too wet to sieve through #40 - lab will dry and sieve bulk sample prior to mercury analysis.
		CF-SO-09/ CF-BL-02	Soil	Relocated approximately 75 feet south to find area where there was soil and not just cobbles. Collected 10-pt field composite (approximately 8 oz. per aliquot because of rock and duplicate location) from an approximate 5 ft. radius. Blind duplicate CF-BL-05 also collected here. Tailings with silt and gravel. Soil sifted through #40 sieve prior to placement in sample jars. To be analyzed for CAM 17 metals.
		CF-SO-01/ CF-BL-01	Soil	Collected 10-pt field composite (approximately 8 oz. per aliquot because of coarse sand and duplicate) from an approximate 5 ft. radius. Blind duplicate CF-BL-01 also collected here. Coarse to fine sand with some silt. Soil sifted through #40 sieve prior to placement in sample jar. To be analyzed for CAM 17 metals.
		CF-SO-10	Soil	Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Tailings with silt and gravel. Soil sifted through #40 sieve prior to placement in sample jars. To be analyzed for mercury.
		CF-BD-04	Sediment	Collected methyl mercury sample using clean hands/dirty hands technique, and a bulk sample for mercury. Sample too wet to sieve through #40 - lab will dry and sieve bulk sample prior to mercury analysis.
		CF-BD-05	Sediment	Wearing layered gloves, one person crossed the stream to collect the methyl mercury sample. The outer glove was removed just prior to opening the sample container and collecting the sample. Bulk sample for mercury also collected. Sample too wet to sieve through #40 - lab will dry and sieve bulk sample prior to mercury analysis.
		CF-SD-01	Sediment	Collected methyl mercury sample using clean hands/dirty hands technique, and a bulk sample for mercury. Sample too wet to sieve through #40 - lab will dry and sieve bulk sample prior to mercury analysis.

AVATAR ENVIRONMENTAL

DAILY FIELD WORK REPORT

Prepared by: Nicole Hastings-Bethel

Report No: 3 **Project No:** 44017190 **Date:** 8/3/17

Project Name: NPS - Whiskeytown, CA

Location of Work: Coggins Flat Area Placer Mine - Trinity Mountain Road and Clear Creek

	Coggins Flat	CF-BG-02	Soil	Moved southwest out of road cut and south of former hydraulic mining pathway. Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Coarse sandy silt and gravel. Soil sifted through #40 sieve prior to placement in sample jars. To be analyzed for CAM 17 metals.
		CF-SD-07	Sediment	Collected methyl mercury sample using clean hands/dirty hands technique, and a bulk sample for mercury. Sample too wet to sieve through #40 - lab will dry and sieve bulk sample prior to mercury analysis.
		CF-SD-06	Sediment	Collected methyl mercury sample using clean hands/dirty hands technique, and a bulk sample for mercury. Sample too wet to sieve through #40 - lab will dry and sieve bulk sample prior to mercury analysis.
		CF-SD-05	Sediment	This sample was overlooked in the sampling process. It would have been collected between CF-SD-06 and CF-SD-04, but there is no record in the field log book, photo log, or on the GPS of this sample being collected. This sample will be replaced by the additional sample collected.
		CF-SD-04	Sediment	Collected methyl mercury sample using clean hands/dirty hands technique, and a bulk sample for mercury. High organic content (roots). Sample too wet to sieve through #40 - lab will dry and sieve bulk sample prior to mercury analysis.
		CF-SD-02	Sediment	Wearing layered gloves, one person walked up the stream to collect the methyl mercury sample. The outer glove was removed just prior to opening the sample container and collecting the sample. Collected methyl mercury sample using clean hands/dirty hands technique, and a bulk sample for mercury. Sample too wet to sieve through #40 - lab will dry and sieve bulk sample prior to mercury analysis.
		CF-SO-11	Soil	Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Tailings with silt and gravel. Soil sifted through #40 sieve prior to placement in sample jars. To be analyzed for mercury.
		CF-BG-01	Soil	Moved to what appeared to be an undisturbed location on the west side of Trinity Mountain Road, on the west (uphill) side of the power lines. Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Coarse sandy silt and gravel. Soil sifted through #40 sieve prior to placement in sample jars. To be analyzed for CAM 17 metals.
		CF-BG-02	Soil	Moved to what appeared to be an undisturbed location on the west side of Trinity Mountain Road, on the west (uphill) side of the power lines. Some evidence of possible prospect pits was observed nearby. Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Coarse sandy silt and gravel. Soil sifted through #40 sieve prior to placement in sample jars. To be analyzed for CAM 17 metals.
		CF-SO-02	Soil	Mistakenly collected in road cut. Sample discarded and resampled 8/4/17
		CF-BG-03	Soil	Moved to what appeared to be an undisturbed location on the west side of Trinity Mountain Road, on the west (uphill) side of the power lines. Some evidence of possible prospect pits was observed nearby. Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Coarse sandy silt and gravel. Soil sifted through #40 sieve prior to placement in sample jars. To be analyzed for CAM 17 metals.
		CF-ER-02	Equipment Rinsate	Equipment rinsate collected by pouring distilled water through decontaminated sieve into the decontaminated collection tray, then siphoning the water into sample jars. To be analyzed for CAM 17.

Comments/Issues:

Collected samples and saved sieving (where needed) until the end of the day in a shaded area. For samples requiring sieving, time on COC is post sieving, when placed in final sample container and put in cooler on ice. Brian only stayed on Site while actively collecting samples.

Planned activities for next work day:

Meet at central portion of Site to collect remaining samples.

Nicole Hastings-Bethel

Preparer **Signature**

AVATAR ENVIRONMENTAL

DAILY FIELD WORK REPORT

Prepared by: Nicole Hastings-Bethel

Report No: 4 **Project No:** 44017190 **Date:** 8/4/17

Project Name: NPS - Whiskeytown, CA
Location of Work: Coggins Flat Area Placer Mine - Trinity Mountain Road and Clear Creek

Weather: Sunny
Temp.: 89 °F **Min:** 74 **Max:** 104 **Precipitation:** None
Average wind direction and speed: 4 mph S

Description of Project Activities:	Completed? (Y / N)	Level of Protection Worn
Conduct tailgate/safety meeting with Brian Rasmussen. Rattlesnakes, heat and poison oak primary concer	Y	Level D
Start sampling from central portion of the Site.	Y	Level D
Collect samples, place on ice, and save sieving for end of day	Y	Level D

Personnel On-site

Name	Company	Start Time	Stop Time	Participated in Safety Briefing (Y/N)	Visitor (Y/N); Purpose of Visit
Nicole Hastings-Bethel	Geocon	530	1600	Y	
Julio Esquivel	Geocon	530	1600	Y	
Brian Rasmussen	NPS	600	835	Y	Oversight

Safety Briefing

Topics	Information Reviewed (Reference Material Covered or Attach Copy)
Review site Health & Safety Plan	SOP for soil sampling
Slip, Trip, Falls, PPE	Tailgate meeting discussing PPE for the task. Use caution around site: hiking around rocks, through brush, tall grass, and along creek.
Weather	Extremely hot temperatures (>100 °F): plan early start to take advantage of cooler temps earlier in day; wear appropriate clothing, sunscreen, hats, hydration; watch out for each other, take breaks, set up and work in shade, cool down in truck with AC, use portable shade cover if shaded work areas not available, plenty of ice water available.
Wildlife, Biohazard	Be aware of snakes, especially in tall grass, near creek, around downed trees, early morning; poison oak, wear appropriate clothing; general awareness of surroundings; insect repellent; sunscreen.
Traffic	Be aware of traffic along roadside, especially when crossing roadway and near curves in road.

Samples

Samples Collected	Decision Unit	Sample ID	Type	Description
	Coggins Flat	CF-ER-03	Equipment Rinsate	Equipment rinsate collected by pouring distilled water over newly opened scoop directly into sample jars. Collected adjacent to location CF-SD-08 (very dusty at truck did not want to collect rinsate sample there). To be analyzed for methyl mercury.
		CF-SD-08	Sediment	Moved approximately 50 ft. upstream of mapped location where reddish orange staining was observed on rocks on bank (possible evidence of methylation reaction). Reddish orange staining observed up and downstream of sample location. Collected methyl mercury sample using clean hands/dirty hands technique, and a bulk sample for mercury. Sample too wet to sieve through #40 - lab will dry and sieve bulk sample prior to mercury analysis.
		CF-SO-04	Soil	Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Silt and some gravel; hard pan type material at 3 inches. Soil sifted through #40 sieve prior to placement in sample jars. To be analyzed for mercury.
		CF-SO-03	Soil	Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Silt and some gravel. Soil sifted through #40 sieve prior to placement in sample jars. To be analyzed for mercury.
		CF-SO-02	Soil	Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius adjacent to pullout. Sandy silt and some gravel. Soil sifted through #40 sieve prior to placement in sample jars. To be analyzed for mercury.

AVATAR ENVIRONMENTAL

DAILY FIELD WORK REPORT

Prepared by: Nicole Hastings-Bethel

Report No: 4 **Project No:** 44017190 **Date:** 8/4/17

Project Name: NPS - Whiskeytown, CA

Location of Work: Coggins Flat Area Placer Mine - Trinity Mountain Road and Clear Creek

	Coggins Flat	CF-BG-09	Soil	Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Coarse sandy silt and gravel. Soil sifted through #40 sieve prior to placement in sample jars. To be analyzed for CAM 17 metals.
		CF-SO-12	Soil	Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Coarse to fine sand with some silt. Area appears to have flooded this winter. Soil sifted through #40 sieve prior to placement in sample jars. To be analyzed for mercury. Easy access to creek; reddish brown staining (possible evidence of methylation) observed on rocks adjacent to creek near this location.
		CF-SO-05	Soil	Collected 10-pt field composite (approximately 8 oz. per aliquot because of rocks) from an approximate 5 ft. radius. Silt and gravel. Soil sifted through #40 sieve prior to placement in sample jars. To be analyzed for mercury.
		CF-BG-05	Soil	Collected 10-pt field composite (approximately 4 oz. per aliquot) from an approximate 5 ft. radius. Tailings sandy silt and gravel, no clear undisturbed areas to relocate. Soil sifted through #40 sieve prior to placement in sample jars. To be analyzed for mercury.
		CF-ER-04A	Equipment Rinsate	Equipment rinsate collected by pouring distilled water over newly opened scoop directly into sample jars. Collected in recreation area where we were set up but had not started to sieve mercury/CAM 17 soil samples). Collected rinsate sample here because most likely to be neutral location. Previous rinsate sample collected in an area where potential evidence of methylation was observed. Sample to be analyzed for methyl mercury.
		CF-ER-04B	Equipment Rinsate	Equipment rinsate collected by pouring distilled water through decontaminated sieve into the decontaminated collection tray, then siphoning the water into sample jars. To be analyzed for CAM 17.
		CF-ER-05	Equipment Rinsate	Equipment rinsate collected by pouring distilled water through decontaminated sieve into the decontaminated collection tray, then siphoning the water into sample jars. To be analyzed for CAM 17.

Comments/Issues:

Collected samples and saved sieving (where needed) until the end of the day in a shaded area. For samples requiring sieving, time on COC is post sieving, when placed in final sample container and put in cooler on ice. Brian only stayed on Site while actively collecting samples.

Geocon left Site at 1030 to travel back to Sacramento, ship samples, etc.

Planned activities for next work day:

No further fieldwork required

Nicole Hastings-Bethel

Preparer **Signature**

Rite in the Rain®

ALL-WEATHER

FIELD

№ 351FX

MADE IN TACOMA
— SINCE 1916 —
Rite in the Rain®
= DEFYING MOTHER NATURE =

Name Nicole Hastings + ~~Ford~~ ~~Deming~~ Julio Esquivel

Address 3160 Gold Valley Dr #800
Rancho Cordova 95742

Phone 916 852 9118

Project EE/CA Sampling
Coggins Flat Area Placer
Mine - Whiskeytown
Nat. Rec. Area.

~~December 2016~~
August 2017

MADE USA · RITE GREEN · Archival paper

RiteintheRain.com

CONTENTS

PAGE	REFERENCE	DATE

8/1/17

800 - Arrive office start loading truck, go over scope w/ PM Tim Berger one last time. Question about sieving methyl mercury samples — TB research do not sieve methyl mercury samples + avoid all contact w/ metal — check w/ Envirotech for plastic or teflon scoops will pickup on way to site

1100 Leave ~~site~~ office to Envirotech then Whiskey Town Lake HQ

1430 Arrive HQ go over scope + Health and Safety w/ Brian Rasmussen — heat #1 concern as well as rattlesnakes (esp. near creek), stinging insects, ticks possibly carry Lime Disease, poison oak, slips, trips + falls

1500 Brian leads us through various potential staging areas of site. Access in many areas will be challenging. Keep away

from western private parcel unless NPS is present — may need to relocate some samples if unsafe.

1530 Brian leaves site — OK for Geocon to flag/mark locations just stay off private land. Brian in office till 430 if we have questions otherwise meet at 6am in RFC area west of Bridge

Geocon flag southern samples accessible from RFC Area

1715 Geocon leave site, pick up supplies, head to hotel

1800 Offload truck at hotel end work day

8/1/17

8/2/17

525 Leave hotel, ice
605 Arrive at site H&S set up for sampling. Brian R w/ NPS already onsite
650 Start sampling CF-SO-07
~~780~~ ~~Start sampling~~ not enough material after run through sieve go back collect 10 samples from same location
700 Collect CF-SO-07 (sieved)
725 Start sample CF-SO-16
748 Collect CF-SO-16
~~800~~ 800 Set up to collect CF-SO-08 + CF-SD-03
810 Collect CF-SO-08 in ziplock
820 Collect methyl mercury CF-SD-03 reddish brown matial on bank where sample collected possible evidence of methylation collect methyl mercury sample at location, collect sediment sample for mercury in ziplock to process at truck
840 Sieving ~~CF-SO08~~ not enough

material — go back collect another 10pt set from same locations
850 Julio sieving CF-SO-08 start sieving CF-SD-03 sediment mercury sample, wet material Try using distilled water (spray bottle) to help push material through sieve — possible to use this method but worried we might be using finer sediment call Tim Berger Tim to check w/ lab to see if we collect bulk samples if they can sieve at lab — also to check on containers Zip locks or overnight larger sample bottles
930 Keep sediment sample collected from 1/4 of CF-SD-03 sample
940 move into REC area set up to collect CF-SO-13, -14, -15 CF-BG-10 + CF-SD-09 (little in locations)
10-11 finish CF-SO-13

1045 locate SO-14 on tailings pile lots brush/ poison oak
1055 Collect SO-14 in zip lock bag
1115 collect BG-10 background ziploc location move ~ 100' yds up slope prospect pits observed adj to southeast ~~east~~ of water ditch
1130 Collect SO-15 in ziploc
1140 collect SD-09 sediment sample methyl mercury at location grab bulk sediment sample - Sample location moved ~ 200 ft downstream because of dense vegetation
1200 Return to truck cool down
1215 Sieve samples
1225 CF-SO-13
1235 CF-SO-14
1245 CF-BG-10
1255 CF-SO-15 (dry material able to sieve) sieve
1310 CF-SD-09 methyl mercury
collect mercury in ziploc, sieve

at truck - ~~dry enough to sieve~~ not dry enough to sieve put bulk sample double bagged on ice
1345 Collect equipment blank for mercury CF-ER-01
1350 Collect sample CF-SO-06
1355 Locate CF-BG-06 collect Blind Dup CF-BL-04 at this location as well
1415 CF-BG-06
1420 CF-BL-04 (blind dup BG-06)
1430 Go collect CF-BG-07. NH sieve BG-07 Julio + Brian go to grab CF-BG-08
1450 Collect (sieved) CF-BG-07
1500 Julio + Brian return w/ samples. Brian leaves site no more sampling to day
1510 collect CF-BG-08 (sieved)
1515 pack up truck drive to find staging for northernmost location
1600 Leave site
1630 ~~End~~ Arrive hotel end work day

8/2/17

Rite in the Rain

8/3/17

530 Pack truck leave hotel

600 Arrive site set up + H&S

645 walk to northernmost locations heavy brush thick blackberries btw flood channel and creek — impenetrable, however evidence of ponding ~~water~~ in channel decide good location to collect sediment sample CF-BD-01, though not adj to creek (in flood channel no apparent outlet btw tailings piles + creek)

715 collect above described CF-BD-01* methyl mercury + bulk mercury

730 collect CF-BD-02 upstream of location on map, best/only access point — bulk sample wet no sieve

745 CF-BD-03 collected across stream ~~from~~ BD-02 both samples methyl mercury + bulk mercury — wet no sieve

810 Find another creek access point closer to CF-BD-01

815 collect sample + Dup label

* renamed CF-SD-11

810 *CF-BL-05 @15 ##

sample CF-BD-01, change sediment sample collected at 715 to CF-SD-11 * No sieve

840 collect CF-SO-09 — relocated about 75' south to find ore w/ soil

840 Return to vehicle CF-BG-01 is in tailings discuss alt. locations w/ Tim, Brian NPS suggests county park north of site but reconissance shows further from site than thought + evidence of tailings in undisturbed areas.

Evidence of mining west of road (hydraulic mining, but not as obvious further south — will collect/relocate CF-BG-01 to that area

925 Collect bulk sample for CF-SO-01

930 Collect bulk sample for CF-SO-10 move over too much rock

1010 Collect CF-BD-04 methyl mercury + bulk - wet cannot sieve

Rite in the Rain

1025 Collect CF-BD-05 methy mercury and bulk mercury - wet cannot sieve

1100 HAK 8/31/17 Collect CF-BD-01 SD methyl mercury and bulk mercury - wet cannot sieve

1120 CF-BG-02 mining road observed collected sample ~20 yds uphill from road bulk sample collected

1210 collect CF-SD-07 methyl mercury and bulk sample - wet no sieve

1220 collect CF-SD-06 methyl mercury and bulk sample - wet no sieve

1240 Collect CF-SD-04 methyl mercury and bulk sample - wet no sieve

1300 lots of organics collected extra soil

1300 Collect CF-SD-02 methyl mercury and bulk sample - wet no sieve

1325 Collect CF-SO-11 bulk sample relocated slightly because of significant amounts of rock little soil

1345 collect BG-01 relocated south and west side of road

1355 CF-BG-04 is right on tailings pile move west side of road some evidence of prospect pits, location appeared relatively undisturbed

1425 collect CF-SO-02 bulk sample

1435 Collect CF-BG-03 bulk sample

1445 Brian leaves site Tobacon sieve samples

1500 Sieve/collect CF-SD-11 402 (added sample see note 715)

1505 Sieve/collect CF-SO-09

1510 + Dup CF-BL-02 802

1515 Sieve collect CF-SO-01 +

1520 Dup CF-BL-01 802

1525 Sieve CF-SO-10 402

1535 Sieve CF-BG-02 802

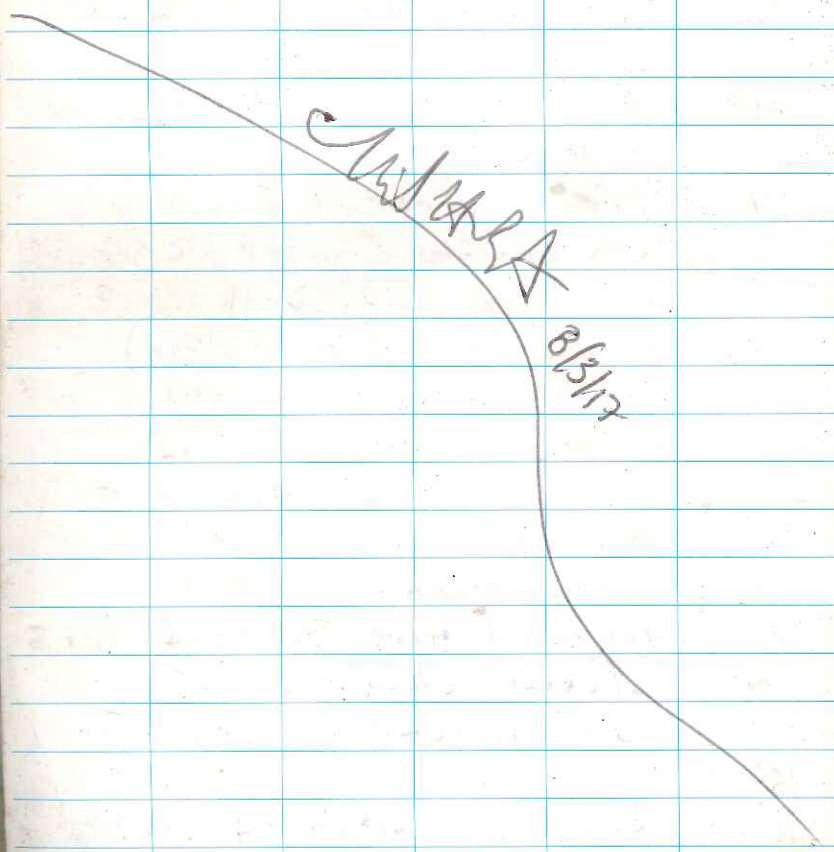
1545 Collect Equipment Blank CF-ER-02 for CAM 17

1555 Start Collect CF-SO-11 402

1600 Sieve + collect CF-BG-01 802

Rite in the Rain

1610 sieve/collect CF-BG-04 808
1625 sieve/collect CF-SO-02 407
1635 sieve/collect CF-BG-03 807
1640 Clean up site
1700 Leave site
1730 unload truck end work day



8/4/17

530 pack up truck, get ike go to site
600 arrive onsite, NPS onsite H&S, lots of dust in this area do not process just stage for collection
645 collect equipment bank near creek distilled water run over new pre-packaged scoop CF-ER-03
650 Collect methyl mercury + bulk sample CF-SD-08 - moved ~50' upstream to area where orange staining was observed possible methylation reaction evidence minor staining observed on rocks up and downstream
700 collect CF-SO-04 hand pan type material at -3"
710 CF-SO-03 bulk sample
730 ~~Relocate~~ Resample CF-SO-02 mistakenly collected in a road cut yesterday
745 CF-BG-09 collect bulk sample
755 ~~CF-SO-13~~ collect bulk sample
CF-SO-12 ~~HA~~ 8/8/17

Easy access to creek from this location, minor staining on rocks around creek, possible methylation (sediment sample not collected, just observation soil sample collected in apparent flood channel ~50' away

810 collect CF-SO-Ø5 bulk bags of rock

825 Collect CF-BG-Ø5 bulk, evidence of tailings ~~around~~ around sample location, no good place to relocate

835 All done collecting samples Brian leaves site we go to REC area to sieve samples

850 Collect Equipment Blank for mercury CF-ER-04A and

855 Equipment Blank for methyl mercury CF-ER-04B
CF-ER-04A collected through decon'd sieves
CF-ER-04B collected over

a newly opened plastic scoop w/ distilled water before any sieving has occured (most neutral place on site to collect blank)

~~CF-SO~~

900 CF-SO-Ø4 sieved and collected 4oz

910 CF-SO-Ø3 sieved and collected

925 CF-SO-Ø2 sieved and collected 4oz 4oz

930 CF-BG-Ø9 sieved and collected 8oz

940 ~~CF-SO-13~~ CF-SO-12 sieved and collected 4oz

950 CF-SO-Ø5 sieved and collected 4oz

955 CF-BG-Ø5 sieved and collected 8oz

1005 CF-ER-05 equipment blank through sieves CAM17

1010 Pack up

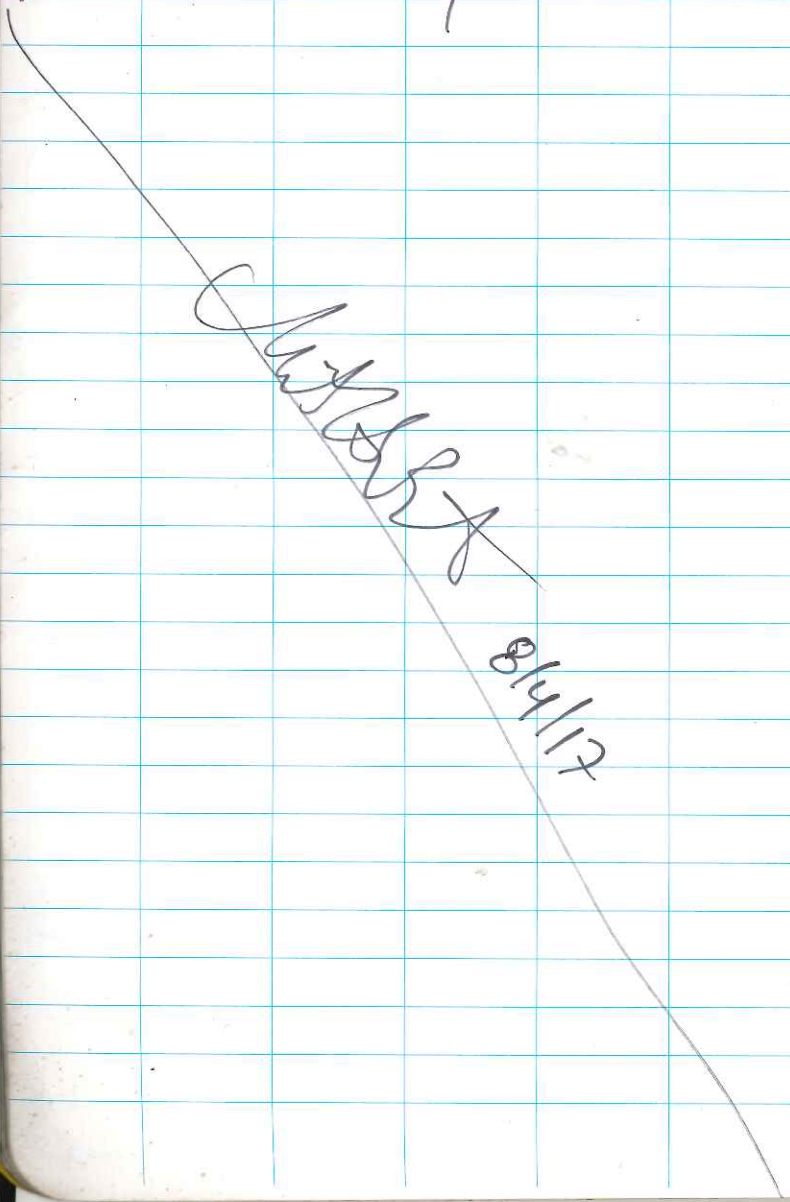
1030 Leave site

1345 Arrive office, prep samples for shipment — lab is going to dry + sieve wet samples we weren't able to sieve ~~prior to~~

1500 ~~Sat~~ Drop 3 coolers at FedEx for Sat Delivery to Test American

Rite in the Rain

1600 End work day



8/4/17

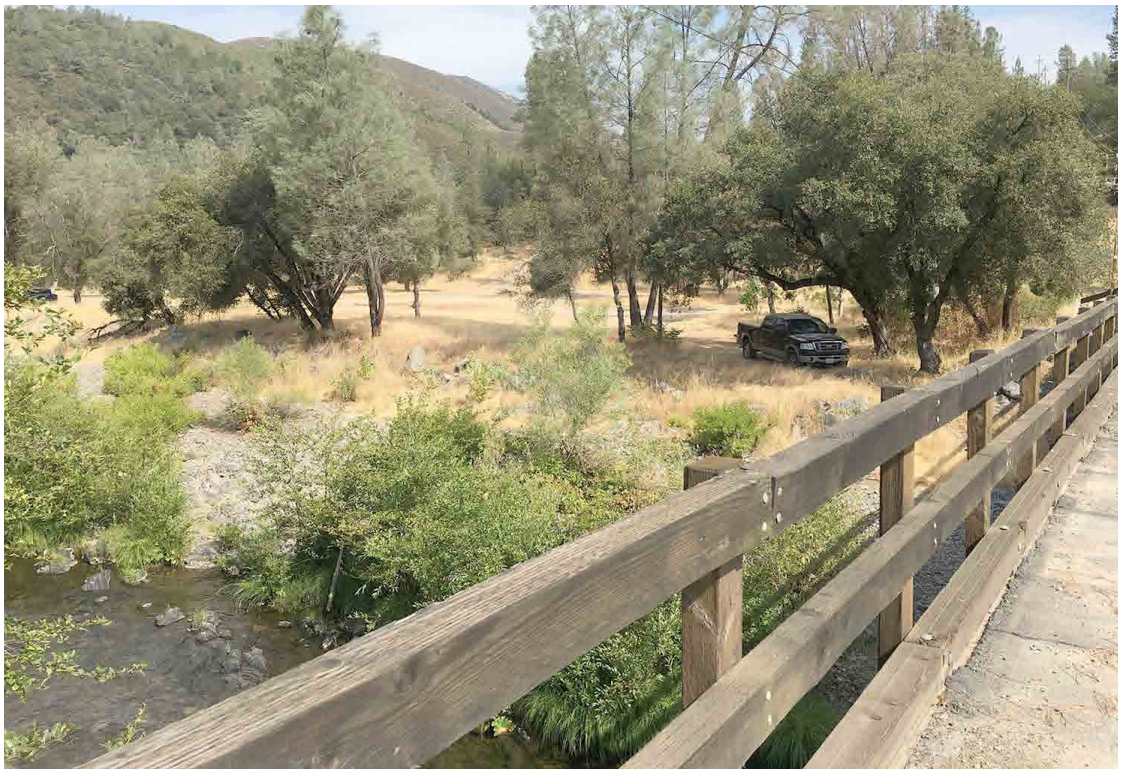


Photo No. 1 Clear Creek Picnic Area

Photo No. 2 Sediment Sample Location CF-SD-01

PHOTOS NO. 1 & 2

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 3 Sediment Sample Location CF-SD-02

Photo No. 4 Sediment Sample Location CF-SD-03, possible methylation reaction visible

PHOTOS NO. 3 & 4

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 5 Sediment Sample Location CF-SD-04

Photo No. 6 Sediment Sample Location CF-SD-06

PHOTOS NO. 5 & 6

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 7 Sediment Sample Location CF-SD-07 (photo by Brian Rasmussen)

Photo No. 8 Sediment Sample Location CF-SD-08, possible methylation reaction visible

PHOTOS NO. 7 & 8

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 9 Sediment Sample Location CF-SD-09

Photo No. 10 Sediment Sample Location CF-SD-10

PHOTOS NO. 9 & 10

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

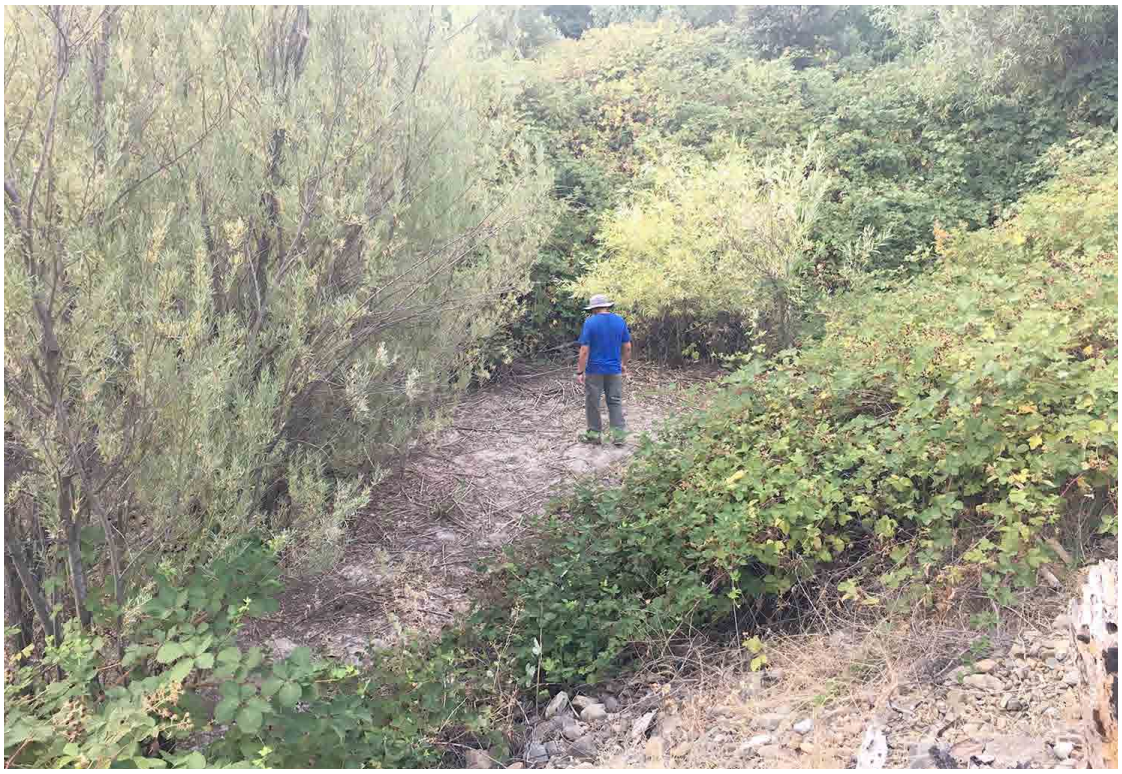


Photo No. 11 Sediment Sample Location CF-SD-11, and added location in flood channel between tailing piles and Clear Creek

Photo No. 12 Background Sediment Sample Location CF-BD-01 and Blind Duplicate Location CF-BL-05

PHOTOS NO. 11 & 12

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 13 Background Sediment Sample Location CF-BD-02

Photo No. 14 Background Sediment Sample Location CF-BD-03

PHOTOS NO. 13 & 14

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 15 Background Sediment Sample Location CF-BD-04

Photo No. 16 Background Sediment Sample Location CF-BD-05

PHOTOS NO. 15 & 16

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 17 Soil Sample Location CF-SO-01 and Blind Duplicate Location CF-BL-01 (photo by Brian Rasmussen)

Photo No. 18 Soil Sample Location CF-SO-02

PHOTOS NO. 17 & 18

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area
Shasta County, California
September 2017

Photo No. 19 Soil Sample Location CF-SO-03

Photo No. 20 Soil Sample Location CF-SO-04

PHOTOS NO. 19 & 20

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 21 Soil Sample Location CF-SO-05

Photo No. 22 Soil Sample Location CF-SO-06

PHOTOS NO. 21 & 22

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 23 Soil Sample Location CF-SO-07

Photo No. 24 Soil Sample Location CF-SO-08

PHOTOS NO. 23 & 24

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 25 Background Soil Sample Location CF-SO-09 and Blind Duplicate Location CF-BL-02

Photo No. 26 Soil Sample Location CF-SO-10 (photo by Brian Rasmussen)

PHOTOS NO. 25 & 26

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area
Shasta County, California
September 2017

Photo No. 27 Soil Sample Location CF-SO-11 (photo by Brian Rasmussen)

Photo No. 28 Soil Sample Location CF-SO-12

PHOTOS NO. 27 & 28

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 29 Soil Sample Location CF-SO-13

Photo No. 30 Soil Sample Location CF-SO-14

PHOTOS NO. 29 & 30

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 31 Soil Sample Location CF-SO-15

Photo No. 32 Soil Sample Location CF-SO-16

PHOTOS NO. 31 & 32

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 33 Background Soil Sample Location CF-BG-01

Photo No. 34 Background Soil Sample Location CF-BG-02 (photo by Brian Rasmussen)

PHOTOS NO. 33 & 34

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 35 Background Soil Sample Location CF-BG-03

Photo No. 36 Background Soil Sample Location CF-BG-04

PHOTOS NO. 35 & 36

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 37 Background Soil Sample Location CF-BG-05

Photo No. 38 Background Soil Sample Location CF-BG-06 and Blind Duplicate Location CF-BL-04

PHOTOS NO. 37 & 38

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 39 Background Soil Sample Location CF-BG-07

Photo No. 40 Background Soil Sample Location CF-BG-08 (photo by Brian Rasmussen)

PHOTOS NO. 39 & 40

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 41 Background Soil Sample Location CF-BG-09

Photo No. 42 Background Soil Sample Location CF-BG-10

PHOTOS NO. 41 & 42

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

Photo No. 43 Equipment blank sample collection

PHOTO NO. 43

AVATAR ENVIRONMENTAL

Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shasta County, California

September 2017

APPENDIX D

LABORATORY AND VALIDATA DATA PACKAGES

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Irvine
17461 Derian Ave
Suite 100
Irvine, CA 92614-5817
Tel: (949)261-1022

TestAmerica Job ID: 440-189680-1
Client Project/Site: National Park Service - Whiskeytown, CA

For:
Avatar Environmental LLC
107 S Church Street
West Chester, Pennsylvania 19382

Attn: Kristina Early

Authorized for release by:
8/29/2017 9:12:49 AM

Lena Davidkova, Project Manager II
(949)261-1022
lena.davidkova@testamericainc.com

Table of Contents

Sample Summary

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-189680-1	CF-SO-07	Solid	08/02/17 07:00	08/05/17 10:40
440-189680-2	CF-SO-16	Solid	08/02/17 07:48	08/05/17 10:40
440-189680-3	CF-SD-03	Solid	08/02/17 08:20	08/05/17 10:40
440-189680-4	CF-SO-08	Solid	08/02/17 09:10	08/05/17 10:40
440-189680-5	CF-SD-09	Solid	08/02/17 11:40	08/05/17 10:40
440-189680-6	CF-SO-13	Solid	08/02/17 12:15	08/05/17 10:40
440-189680-7	CF-SO-14	Solid	08/02/17 12:25	08/05/17 10:40
440-189680-8	CF-BG-10	Solid	08/02/17 12:35	08/05/17 10:40
440-189680-9	CF-SO-15	Solid	08/02/17 12:45	08/05/17 10:40
440-189680-10	CF-SD-09	Solid	08/02/17 12:55	08/05/17 10:40
440-189680-11	CF-SD-10	Solid	08/02/17 13:10	08/05/17 10:40
440-189680-12	CF-ER-01	Water	08/02/17 13:45	08/05/17 10:40
440-189680-13	CF-SO-06	Solid	08/02/17 13:50	08/05/17 10:40
440-189680-14	CF-BG-06	Solid	08/02/17 14:15	08/05/17 10:40
440-189680-15	CF-BL-04	Solid	08/02/17 14:20	08/05/17 10:40
440-189680-16	CF-BG-07	Solid	08/02/17 14:50	08/05/17 10:40
440-189680-17	CF-BG-08	Solid	08/02/17 15:10	08/05/17 10:40
440-189680-18	CF-SD-11	Solid	08/03/17 07:15	08/05/17 10:40
440-189680-19	CF-BD-02	Solid	08/03/17 07:30	08/05/17 10:40
440-189680-20	CF-BD-03	Solid	08/03/17 07:45	08/05/17 10:40
440-189680-21	CF-BD-01	Solid	08/03/17 08:10	08/05/17 10:40
440-189680-22	CF-BL-05	Solid	08/03/17 08:15	08/05/17 10:40
440-189680-23	CF-BD-04	Solid	08/03/17 10:10	08/05/17 10:40
440-189680-24	CF-BD-05	Solid	08/03/17 10:25	08/05/17 10:40
440-189680-25	CF-SD-01	Solid	08/03/17 11:00	08/05/17 10:40
440-189680-26	CF-SD-07	Solid	08/03/17 12:10	08/05/17 10:40
440-189680-27	CF-SD-06	Solid	08/03/17 12:20	08/05/17 10:40
440-189680-28	CF-SD-04	Solid	08/03/17 12:40	08/05/17 10:40
440-189680-29	CF-SD-02	Solid	08/03/17 13:00	08/05/17 10:40
440-189680-30	CF-SD-11	Solid	08/03/17 15:00	08/05/17 10:40
440-189680-31	CF-SO-09	Solid	08/03/17 15:05	08/05/17 10:40
440-189680-32	CF-BL-02	Solid	08/03/17 15:10	08/05/17 10:40
440-189680-33	CF-SO-01	Solid	08/03/17 15:15	08/05/17 10:40
440-189680-34	CF-BL-01	Solid	08/03/17 15:20	08/05/17 10:40
440-189680-35	CF-SO-10	Solid	08/03/17 15:25	08/05/17 10:40
440-189680-36	CF-BG-02	Solid	08/03/17 15:35	08/05/17 10:40
440-189680-37	CF-ER-02	Water	08/03/17 15:45	08/05/17 10:40
440-189680-38	CF-SO-11	Solid	08/03/17 15:55	08/05/17 10:40
440-189680-39	CF-BG-01	Solid	08/03/17 16:00	08/05/17 10:40
440-189680-40	CF-BG-04	Solid	08/03/17 16:10	08/05/17 10:40
440-189680-41	CF-BG-03	Solid	08/03/17 16:35	08/05/17 10:40
440-189680-42	CF-ER-03	Water	08/04/17 06:45	08/05/17 10:40
440-189680-43	CF-SD-08	Solid	08/04/17 06:50	08/05/17 10:40
440-189680-44	CF-ER-04A	Water	08/04/17 08:50	08/05/17 10:40
440-189680-45	CF-ER-04B	Water	08/04/17 08:55	08/05/17 10:40
440-189680-46	CF-SO-04	Solid	08/04/17 09:00	08/05/17 10:40
440-189680-47	CF-SO-03	Solid	08/04/17 09:10	08/05/17 10:40
440-189680-48	CF-SO-02	Solid	08/04/17 09:25	08/05/17 10:40
440-189680-49	CF-BG-09	Solid	08/04/17 09:30	08/05/17 10:40
440-189680-50	CF-SO-12	Solid	08/04/17 09:40	08/05/17 10:40
440-189680-51	CF-SO-05	Solid	08/04/17 09:50	08/05/17 10:40
440-189680-52	CF-BG-05	Solid	08/04/17 09:55	08/05/17 10:40
440-189680-53	CF-ER-05	Water	08/04/17 10:05	08/05/17 10:40

Sample Summary

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-189680-55	EB1	Water	08/05/17 00:01	08/05/17 10:40
440-189680-56	EB2	Water	08/05/17 00:01	08/05/17 10:40

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Job ID: 440-189680-1

Laboratory: TestAmerica Irvine

Narrative

Job Narrative
440-189680-1

Comments
Samples checked on the COC were dried in the lab and sieved with sieve #40 prior analysis. This procedure was applied only on samples used to analyze for EPA7471A-Mercury test. Spread sheet with drying conditions was provided
%Moisture test was done in TA-Irvine in association with methods 6010B and 7471A and results were reported as analyte Percent Moisture
%Moisture test was done in TA-Canton in association with method 1630-Methyl Mercury and results were reported as analyte Fine Moisture

Receipt
The samples were received on 8/5/2017 10:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 16.7º C.

GC Semi VOA
Method(s) 1630: The opening CCB had poor surrogate recoveries. The CCB and MB are prepared at the same time and are identical. The MB is analyzed immediately after the CCB. The MB shows that the prep and analytical processes are free from contamination. Surrogate recoveries for all other QC and client samples met recovery criteria, indicating that the problem was isolated to the CCB. No further corrective action was taken.

(CCB 240-291010/25)

Method(s) 1630: The following samples were diluted due to the nature of the sample matrix: (240-83447-A-17-D) and (240-83447-C-17-B DU). Elevated reporting limits (RLs) are provided.

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

Metals
Method(s) 6010B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 440-422409 and analytical batch 440-422577 were outside control limits for Antimony. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 7470A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 440-421693 and analytical batch 440-423141 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 7471A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 440-423112 and analytical batch 440-423270 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 6010B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 440-422535 and analytical batch 440-422971 were outside control limits for Nickel, Antimony and Zinc. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 6010B: The post digestion spike % recovery for Silver associated with batch 440-422971 was outside of control limits.

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.

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

Client Sample ID: CF-SO-07

Lab Sample ID: 440-189680-1
Date Collected: 08/02/17 07:00
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 99.0

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.089		0.021	0.012	mg/Kg	☼	08/09/17 16:52	08/10/17 20:46	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	1		0.1	0.1	%			08/15/17 18:02	1

Client Sample ID: CF-SO-16

Lab Sample ID: 440-189680-2
Date Collected: 08/02/17 07:48
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 99.2

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.087		0.020	0.012	mg/Kg	☼	08/09/17 16:59	08/14/17 20:59	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	0.8		0.1	0.1	%			08/15/17 18:02	1

Client Sample ID: CF-SD-03

Lab Sample ID: 440-189680-3
Date Collected: 08/02/17 08:20
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 80.1

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	0.13		0.12	0.036	ug/Kg	☼	08/09/17 10:30	08/10/17 13:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*85*		*13 - 133*	*08/09/17 10:30*	*08/10/17 13:44*	*1*

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.11		0.025	0.015	mg/Kg	☼	08/14/17 11:36	08/15/17 02:43	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fine Moisture	19.9		0.1	0.1	%			08/11/17 13:36	1
Percent Moisture	21.2		0.1	0.1	%			08/15/17 18:02	1

Client Sample ID: CF-SO-08

Lab Sample ID: 440-189680-4
Date Collected: 08/02/17 09:10
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 94.7

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.058		0.021	0.013	mg/Kg	☼	08/09/17 22:26	08/10/17 18:04	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	5.3		0.1	0.1	%			08/15/17 18:02	1

Client Sample ID: CF-SD-09

Lab Sample ID: 440-189680-5
Date Collected: 08/02/17 11:40
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 99.1

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	0.067	J	0.10	0.030	ug/Kg	☼	08/09/17 10:30	08/10/17 14:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*80*		*13 - 133*	*08/09/17 10:30*	*08/10/17 14:50*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fine Moisture	0.9		0.1	0.1	%			08/11/17 13:36	1

Client Sample ID: CF-SO-13

Lab Sample ID: 440-189680-6
Date Collected: 08/02/17 12:15
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 92.4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.13		0.022	0.013	mg/Kg	☼	08/09/17 22:26	08/10/17 18:13	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	7.6		0.1	0.1	%			08/15/17 18:02	1

Client Sample ID: CF-SO-14

Lab Sample ID: 440-189680-7
Date Collected: 08/02/17 12:25
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 90.4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12		0.022	0.013	mg/Kg	☼	08/09/17 16:52	08/10/17 20:32	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	9.6		0.1	0.1	%			08/15/17 18:02	1

Client Sample ID: CF-BG-10

Lab Sample ID: 440-189680-8
Date Collected: 08/02/17 12:35
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 97.4

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND	F1	10	5.2	mg/Kg	☼	08/10/17 15:26	08/12/17 17:25	5
Arsenic	14		3.1	1.5	mg/Kg	☼	08/10/17 15:26	08/12/17 17:25	5
Barium	270		1.5	0.77	mg/Kg	☼	08/10/17 15:26	08/12/17 17:25	5
Beryllium	0.62		0.52	0.26	mg/Kg	☼	08/10/17 15:26	08/12/17 17:25	5
Cadmium	0.36	J	0.52	0.26	mg/Kg	☼	08/10/17 15:26	08/12/17 17:25	5
Chromium	45		1.0	0.52	mg/Kg	☼	08/10/17 15:26	08/12/17 17:25	5
Cobalt	12		1.0	0.52	mg/Kg	☼	08/10/17 15:26	08/12/17 17:25	5
Copper	38		2.1	1.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:25	5
Lead	18		2.1	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:25	5
Molybdenum	2.2		2.1	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:25	5
Nickel	29	F1	2.1	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:25	5
Selenium	2.1	J	3.1	1.8	mg/Kg	☼	08/10/17 15:26	08/12/17 17:25	5

Client Sample ID: CF-BG-10

Lab Sample ID: 440-189680-8
Date Collected: 08/02/17 12:35
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 97.4

Method: 6010B - Metals (ICP) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thallium	ND		10	5.2	mg/Kg	☼	08/10/17 15:26	08/12/17 17:25	5
Vanadium	**65**		1.0	0.52	mg/Kg	☼	08/10/17 15:26	08/12/17 17:25	5
Zinc	**110**	**F1**	5.2	2.6	mg/Kg	☼	08/10/17 15:26	08/12/17 17:25	5
Silver	ND		1.5	0.77	mg/Kg	☼	08/10/17 15:26	08/12/17 17:25	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.041**		0.021	0.012	mg/Kg	☼	08/09/17 22:26	08/10/17 18:07	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**2.6**		0.1	0.1	%			08/17/17 19:24	1

Client Sample ID: CF-SO-15

Lab Sample ID: 440-189680-9
Date Collected: 08/02/17 12:45
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 95.7

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.057**		0.021	0.013	mg/Kg	☼	08/09/17 22:26	08/10/17 18:10	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**4.3**		0.1	0.1	%			08/15/17 18:02	1

Client Sample ID: CF-SD-09

Lab Sample ID: 440-189680-10
Date Collected: 08/02/17 12:55
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 95.7

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.10**		0.020	0.012	mg/Kg	☼	08/09/17 16:52	08/10/17 20:36	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**4.3**		0.1	0.1	%			08/15/17 18:02	1

Client Sample ID: CF-SD-10

Lab Sample ID: 440-189680-11
Date Collected: 08/02/17 13:10
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 93.9

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	**0.058**	**J**	0.10	0.031	ug/Kg	☼	08/09/17 10:30	08/10/17 15:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*76*		*13 - 133*	*08/09/17 10:30*	*08/10/17 15:12*	*1*

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.040**		0.021	0.013	mg/Kg	☼	08/14/17 11:36	08/15/17 02:45	1

Client Sample ID: CF-SD-10

Lab Sample ID: 440-189680-11
Date Collected: 08/02/17 13:10
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 93.9

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fine Moisture	6.1		0.1	0.1	%			08/11/17 13:36	1
Percent Moisture	6.2		0.1	0.1	%			08/15/17 18:02	1

Client Sample ID: CF-ER-01

Lab Sample ID: 440-189680-12
Date Collected: 08/02/17 13:45
Matrix: Water
Date Received: 08/05/17 10:40

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010	0.0060	mg/L		08/10/17 08:38	08/10/17 18:36	1
Arsenic	ND		0.010	0.0089	mg/L		08/10/17 08:38	08/10/17 18:36	1
Barium	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:36	1
Beryllium	ND		0.0020	0.0010	mg/L		08/10/17 08:38	08/10/17 18:36	1
Cadmium	ND		0.0050	0.0025	mg/L		08/10/17 08:38	08/10/17 18:36	1
Chromium	ND		0.0050	0.0025	mg/L		08/10/17 08:38	08/10/17 18:36	1
Cobalt	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:36	1
Copper	0.011		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:36	1
Lead	0.0086		0.0050	0.0038	mg/L		08/10/17 08:38	08/10/17 18:36	1
Molybdenum	ND		0.020	0.010	mg/L		08/10/17 08:38	08/10/17 18:36	1
Nickel	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:36	1
Selenium	ND		0.010	0.0087	mg/L		08/10/17 08:38	08/10/17 18:36	1
Thallium	ND		0.010	0.0080	mg/L		08/10/17 08:38	08/10/17 18:36	1
Vanadium	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:36	1
Zinc	0.014	J	0.020	0.012	mg/L		08/10/17 08:38	08/10/17 18:36	1
Silver	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:36	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		08/07/17 11:51	08/07/17 17:59	1

Client Sample ID: CF-SO-06

Lab Sample ID: 440-189680-13
Date Collected: 08/02/17 13:50
Matrix: Solid
Date Received: 08/05/17 10:40

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	0.6		0.1	0.1	%			08/08/17 18:38	1

Client Sample ID: CF-SO-06

Lab Sample ID: 440-189680-13
Date Collected: 08/02/17 13:50
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 99.4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.19		0.020	0.012	mg/Kg	☼	08/09/17 16:52	08/10/17 20:02	1

Client Sample ID: CF-BG-06

Lab Sample ID: 440-189680-14
Date Collected: 08/02/17 14:15
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 98.8

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	5.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:34	5
Arsenic	**16**		3.0	1.5	mg/Kg	☼	08/10/17 15:26	08/12/17 17:34	5
Barium	**300**		1.5	0.76	mg/Kg	☼	08/10/17 15:26	08/12/17 17:34	5
Beryllium	**0.72**		0.51	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 17:34	5
Cadmium	**0.72**		0.51	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 17:34	5
Chromium	**44**		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 17:34	5
Cobalt	**17**		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 17:34	5
Copper	**51**		2.0	1.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:34	5
Lead	**24**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:34	5
Molybdenum	**2.1**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:34	5
Nickel	**37**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:34	5
Selenium	ND		3.0	1.7	mg/Kg	☼	08/10/17 15:26	08/12/17 17:34	5
Thallium	ND		10	5.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:34	5
Vanadium	**70**		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 17:34	5
Zinc	**140**		5.1	2.5	mg/Kg	☼	08/10/17 15:26	08/12/17 17:34	5
Silver	ND		1.5	0.76	mg/Kg	☼	08/10/17 15:26	08/12/17 17:34	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.069**		0.020	0.012	mg/Kg	☼	08/09/17 16:52	08/10/17 20:22	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**1.2**		0.1	0.1	%			08/08/17 18:38	1

Client Sample ID: CF-BL-04

Lab Sample ID: 440-189680-15
Date Collected: 08/02/17 14:20
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 98.8

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	5.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:36	5
Arsenic	**13**		3.0	1.5	mg/Kg	☼	08/10/17 15:26	08/12/17 17:36	5
Barium	**250**		1.5	0.75	mg/Kg	☼	08/10/17 15:26	08/12/17 17:36	5
Beryllium	**0.61**		0.50	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 17:36	5
Cadmium	**0.56**		0.50	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 17:36	5
Chromium	**36**		1.0	0.50	mg/Kg	☼	08/10/17 15:26	08/12/17 17:36	5
Cobalt	**14**		1.0	0.50	mg/Kg	☼	08/10/17 15:26	08/12/17 17:36	5
Copper	**41**		2.0	1.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:36	5
Lead	**19**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:36	5
Molybdenum	**1.7**	**J**	2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:36	5
Nickel	**30**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:36	5
Selenium	ND		3.0	1.7	mg/Kg	☼	08/10/17 15:26	08/12/17 17:36	5
Thallium	ND		10	5.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:36	5
Vanadium	**57**		1.0	0.50	mg/Kg	☼	08/10/17 15:26	08/12/17 17:36	5
Zinc	**120**		5.0	2.5	mg/Kg	☼	08/10/17 15:26	08/12/17 17:36	5
Silver	ND		1.5	0.75	mg/Kg	☼	08/10/17 15:26	08/12/17 17:36	5

Client Sample ID: CF-BL-04

Lab Sample ID: 440-189680-15
Date Collected: 08/02/17 14:20
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 98.8

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.068**		0.021	0.012	mg/Kg	☼	08/09/17 16:52	08/10/17 21:13	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**1.2**		0.1	0.1	%			08/08/17 18:38	1

Client Sample ID: CF-BG-07

Lab Sample ID: 440-189680-16
Date Collected: 08/02/17 14:50
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 95.3

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	5.2	mg/Kg	☼	08/10/17 15:26	08/12/17 17:37	5
Arsenic	**28**		3.1	1.6	mg/Kg	☼	08/10/17 15:26	08/12/17 17:37	5
Barium	**3000**		1.6	0.78	mg/Kg	☼	08/10/17 15:26	08/12/17 17:37	5
Beryllium	**0.27**	**J**	0.52	0.26	mg/Kg	☼	08/10/17 15:26	08/12/17 17:37	5
Cadmium	**6.5**		0.52	0.26	mg/Kg	☼	08/10/17 15:26	08/12/17 17:37	5
Chromium	**19**		1.0	0.52	mg/Kg	☼	08/10/17 15:26	08/12/17 17:37	5
Cobalt	**26**		1.0	0.52	mg/Kg	☼	08/10/17 15:26	08/12/17 17:37	5
Copper	**71**		2.1	1.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:37	5
Lead	**23**		2.1	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:37	5
Molybdenum	**11**		2.1	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:37	5
Nickel	**54**		2.1	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:37	5
Selenium	**4.1**		3.1	1.8	mg/Kg	☼	08/10/17 15:26	08/12/17 17:37	5
Thallium	ND		10	5.2	mg/Kg	☼	08/10/17 15:26	08/12/17 17:37	5
Vanadium	**67**		1.0	0.52	mg/Kg	☼	08/10/17 15:26	08/12/17 17:37	5
Zinc	**490**		5.2	2.6	mg/Kg	☼	08/10/17 15:26	08/12/17 17:37	5
Silver	ND		1.6	0.78	mg/Kg	☼	08/10/17 15:26	08/12/17 17:37	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.20**		0.021	0.013	mg/Kg	☼	08/09/17 16:52	08/10/17 20:05	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**4.7**		0.1	0.1	%			08/08/17 18:38	1

Client Sample ID: CF-BG-08

Lab Sample ID: 440-189680-17
Date Collected: 08/02/17 15:10
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 94.8

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		11	5.3	mg/Kg	☼	08/10/17 15:26	08/12/17 17:54	5
Arsenic	**26**		3.2	1.6	mg/Kg	☼	08/10/17 15:26	08/12/17 17:54	5
Barium	**140**		1.6	0.79	mg/Kg	☼	08/10/17 15:26	08/12/17 17:54	5
Beryllium	**0.54**		0.53	0.26	mg/Kg	☼	08/10/17 15:26	08/12/17 17:54	5
Cadmium	**0.94**		0.53	0.26	mg/Kg	☼	08/10/17 15:26	08/12/17 17:54	5
Chromium	**46**		1.1	0.53	mg/Kg	☼	08/10/17 15:26	08/12/17 17:54	5
Cobalt	**15**		1.1	0.53	mg/Kg	☼	08/10/17 15:26	08/12/17 17:54	5
Copper	**43**		2.1	1.2	mg/Kg	☼	08/10/17 15:26	08/12/17 17:54	5

Client Sample ID: CF-BG-08

Lab Sample ID: 440-189680-17
Date Collected: 08/02/17 15:10
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 94.8

Method: 6010B - Metals (ICP) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	25		2.1	1.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:54	5
Molybdenum	1.8	J	2.1	1.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:54	5
Nickel	40		2.1	1.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:54	5
Selenium	ND		3.2	1.8	mg/Kg	☼	08/10/17 15:26	08/12/17 17:54	5
Thallium	ND		11	5.3	mg/Kg	☼	08/10/17 15:26	08/12/17 17:54	5
Vanadium	65		1.1	0.53	mg/Kg	☼	08/10/17 15:26	08/12/17 17:54	5
Zinc	160		5.3	2.6	mg/Kg	☼	08/10/17 15:26	08/12/17 17:54	5
Silver	ND		1.6	0.79	mg/Kg	☼	08/10/17 15:26	08/12/17 17:54	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	1.4		0.021	0.013	mg/Kg	☼	08/09/17 16:52	08/10/17 20:19	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	5.2		0.1	0.1	%			08/08/17 18:38	1

Client Sample ID: CF-SD-11

Lab Sample ID: 440-189680-18
Date Collected: 08/03/17 07:15
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 96.2

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	6.4		0.51	0.15	ug/Kg	☼	08/09/17 10:30	08/09/17 22:16	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*65*		*13 - 133*	*08/09/17 10:30*	*08/09/17 22:16*	*5*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fine Moisture	3.8		0.1	0.1	%			08/11/17 13:36	1

Client Sample ID: CF-BD-02

Lab Sample ID: 440-189680-19
Date Collected: 08/03/17 07:30
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 72.9

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	0.23		0.13	0.040	ug/Kg	☼	08/09/17 10:30	08/10/17 15:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*83*		*13 - 133*	*08/09/17 10:30*	*08/10/17 15:34*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fine Moisture	27.1		0.1	0.1	%			08/11/17 13:36	1
Percent Moisture	25.7		0.1	0.1	%			08/08/17 18:38	1

Client Sample ID: CF-BD-02
Lab Sample ID: 440-189680-19
Date Collected: 08/03/17 07:30
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 74.3

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.066		0.026	0.016	mg/Kg	☼	08/14/17 11:36	08/15/17 02:53	1

Client Sample ID: CF-BD-03
Lab Sample ID: 440-189680-20
Date Collected: 08/03/17 07:45
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 58.6

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	3.6		0.17	0.050	ug/Kg	☼	08/09/17 10:30	08/10/17 15:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*88*		*13 - 133*	*08/09/17 10:30*	*08/10/17 15:56*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fine Moisture	41.4		0.1	0.1	%			08/11/17 13:36	1
Percent Moisture	32.5		0.1	0.1	%			08/08/17 18:23	1

Client Sample ID: CF-BD-03
Lab Sample ID: 440-189680-20
Date Collected: 08/03/17 07:45
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 67.5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.083		0.029	0.017	mg/Kg	☼	08/14/17 11:36	08/15/17 02:56	1

Client Sample ID: CF-BD-01
Lab Sample ID: 440-189680-21
Date Collected: 08/03/17 08:10
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 75.7

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	0.34		0.13	0.040	ug/Kg	☼	08/09/17 10:30	08/10/17 16:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*86*		*13 - 133*	*08/09/17 10:30*	*08/10/17 16:18*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fine Moisture	24.3		0.1	0.1	%			08/11/17 13:36	1
Percent Moisture	13.5		0.1	0.1	%			08/08/17 18:23	1

Client Sample ID: CF-BD-01
Lab Sample ID: 440-189680-21
Date Collected: 08/03/17 08:10
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 86.5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.095		0.023	0.014	mg/Kg	☼	08/14/17 11:36	08/15/17 02:59	1

Client Sample ID: CF-BL-05
Lab Sample ID: 440-189680-22
Date Collected: 08/03/17 08:15
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 72.6

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	ND		0.13	0.040	ug/Kg	☼	08/09/17 10:30	08/10/17 16:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*73*		*13 - 133*	*08/09/17 10:30*	*08/10/17 16:40*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fine Moisture	27.4		0.1	0.1	%			08/11/17 13:36	1
Percent Moisture	24.2		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-BL-05
Lab Sample ID: 440-189680-22
Date Collected: 08/03/17 08:15
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 75.8

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.097		0.026	0.016	mg/Kg	☼	08/14/17 11:36	08/15/17 03:02	1

Client Sample ID: CF-BD-04
Lab Sample ID: 440-189680-23
Date Collected: 08/03/17 10:10
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 70.8

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	1.0		0.14	0.041	ug/Kg	☼	08/09/17 10:30	08/10/17 17:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*83*		*13 - 133*	*08/09/17 10:30*	*08/10/17 17:02*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fine Moisture	29.2		0.1	0.1	%			08/11/17 13:36	1
Percent Moisture	28.1		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-BD-04
Lab Sample ID: 440-189680-23
Date Collected: 08/03/17 10:10
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 71.9

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.081		0.027	0.016	mg/Kg	☼	08/14/17 11:36	08/15/17 03:04	1

Client Sample ID: CF-BD-05
Lab Sample ID: 440-189680-24
Date Collected: 08/03/17 10:25
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 85.0

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.057		0.024	0.014	mg/Kg	☼	08/14/17 11:36	08/15/17 03:07	1

Client Sample ID: CF-BD-05

Lab Sample ID: 440-189680-24
Date Collected: 08/03/17 10:25
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 88.2

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	0.054	J	0.11	0.033	ug/Kg	☼	08/09/17 10:30	08/10/17 17:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*77*		*13 - 133*	*08/09/17 10:30*	*08/10/17 17:24*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fine Moisture	11.8		0.1	0.1	%			08/11/17 13:36	1
Percent Moisture	15.0		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-SD-01

Lab Sample ID: 440-189680-25
Date Collected: 08/03/17 11:00
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 88.0

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.066		0.023	0.014	mg/Kg	☼	08/14/17 11:36	08/15/17 03:10	1

Client Sample ID: CF-SD-01

Lab Sample ID: 440-189680-25
Date Collected: 08/03/17 11:00
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 89.8

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	0.10	J	0.11	0.033	ug/Kg	☼	08/09/17 10:30	08/10/17 18:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*78*		*13 - 133*	*08/09/17 10:30*	*08/10/17 18:30*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fine Moisture	10.2		0.1	0.1	%			08/11/17 13:36	1
Percent Moisture	12.0		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-SD-07

Lab Sample ID: 440-189680-26
Date Collected: 08/03/17 12:10
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 72.9

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.092		0.027	0.016	mg/Kg	☼	08/14/17 11:36	08/15/17 03:13	1

Client Sample ID: CF-SD-07

Lab Sample ID: 440-189680-26
Date Collected: 08/03/17 12:10
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 80.8

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	0.95		0.12	0.036	ug/Kg	☼	08/09/17 10:30	08/10/17 18:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*80*		*13 - 133*	*08/09/17 10:30*	*08/10/17 18:52*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fine Moisture	19.2		0.1	0.1	%			08/11/17 13:36	1
Percent Moisture	27.1		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-SD-06
Date Collected: 08/03/17 12:20
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-27
Matrix: Solid
Percent Solids: 52.9

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	4.2		0.19	0.056	ug/Kg	☼	08/09/17 10:30	08/10/17 19:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*77*		*13 - 133*	*08/09/17 10:30*	*08/10/17 19:14*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fine Moisture	47.1		0.1	0.1	%			08/11/17 13:36	1
Percent Moisture	30.9		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-SD-06
Date Collected: 08/03/17 12:20
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-27
Matrix: Solid
Percent Solids: 69.1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.11		0.029	0.017	mg/Kg	☼	08/14/17 11:36	08/15/17 03:15	1

Client Sample ID: CF-SD-04
Date Collected: 08/03/17 12:40
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-28
Matrix: Solid
Percent Solids: 53.8

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	4.5		0.18	0.055	ug/Kg	☼	08/09/17 10:30	08/10/17 19:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*76*		*13 - 133*	*08/09/17 10:30*	*08/10/17 19:36*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fine Moisture	46.1		0.1	0.1	%			08/11/17 13:36	1
Percent Moisture	19.6		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-SD-04
Date Collected: 08/03/17 12:40
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-28
Matrix: Solid
Percent Solids: 80.4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.13		0.025	0.015	mg/Kg	☼	08/14/17 11:36	08/15/17 03:18	1

Client Sample ID: CF-SD-02
Lab Sample ID: 440-189680-29
Date Collected: 08/03/17 13:00
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 61.6

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	0.57		0.16	0.049	ug/Kg	☼	08/09/17 10:30	08/10/17 19:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*71*		*13 - 133*	*08/09/17 10:30*	*08/10/17 19:58*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fine Moisture	38.4		0.1	0.1	%			08/11/17 13:36	1
Percent Moisture	26.6		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-SD-02
Lab Sample ID: 440-189680-29
Date Collected: 08/03/17 13:00
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 73.4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.059		0.027	0.016	mg/Kg	☼	08/14/17 11:41	08/15/17 03:42	1

Client Sample ID: CF-SD-11
Lab Sample ID: 440-189680-30
Date Collected: 08/03/17 15:00
Matrix: Solid
Date Received: 08/05/17 10:40

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.6		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-SD-11
Lab Sample ID: 440-189680-30
Date Collected: 08/03/17 15:00
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 95.4

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.37		0.021	0.012	mg/Kg	☼	08/09/17 16:52	08/10/17 21:07	1

Client Sample ID: CF-SO-09
Lab Sample ID: 440-189680-31
Date Collected: 08/03/17 15:05
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 97.9

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	5.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:56	5
Arsenic	15		3.1	1.5	mg/Kg	☼	08/10/17 15:26	08/12/17 17:56	5
Barium	58		1.5	0.77	mg/Kg	☼	08/10/17 15:26	08/12/17 17:56	5
Beryllium	ND		0.51	0.26	mg/Kg	☼	08/10/17 15:26	08/12/17 17:56	5
Cadmium	ND		0.51	0.26	mg/Kg	☼	08/10/17 15:26	08/12/17 17:56	5
Chromium	9.5		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 17:56	5
Cobalt	6.2		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 17:56	5
Copper	28		2.0	1.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:56	5
Lead	5.9		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:56	5
Molybdenum	ND		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:56	5
Nickel	6.2		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:56	5

Client Sample ID: CF-SO-09

Lab Sample ID: 440-189680-31
Date Collected: 08/03/17 15:05
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 97.9

Method: 6010B - Metals (ICP) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	ND		3.1	1.7	mg/Kg	☼	08/10/17 15:26	08/12/17 17:56	5
Thallium	ND		10	5.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:56	5
Vanadium	**16**		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 17:56	5
Zinc	**77**		5.1	2.6	mg/Kg	☼	08/10/17 15:26	08/12/17 17:56	5
Silver	ND		1.5	0.77	mg/Kg	☼	08/10/17 15:26	08/12/17 17:56	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.025**		0.020	0.012	mg/Kg	☼	08/09/17 16:52	08/10/17 20:29	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**2.1**		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-BL-02

Lab Sample ID: 440-189680-32
Date Collected: 08/03/17 15:10
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 98.0

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	5.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:58	5
Arsenic	**17**		3.1	1.5	mg/Kg	☼	08/10/17 15:26	08/12/17 17:58	5
Barium	**69**		1.5	0.77	mg/Kg	☼	08/10/17 15:26	08/12/17 17:58	5
Beryllium	ND		0.51	0.26	mg/Kg	☼	08/10/17 15:26	08/12/17 17:58	5
Cadmium	ND		0.51	0.26	mg/Kg	☼	08/10/17 15:26	08/12/17 17:58	5
Chromium	**11**		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 17:58	5
Cobalt	**7.3**		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 17:58	5
Copper	**33**		2.0	1.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:58	5
Lead	**6.9**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:58	5
Molybdenum	ND		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:58	5
Nickel	**7.2**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:58	5
Selenium	ND		3.1	1.7	mg/Kg	☼	08/10/17 15:26	08/12/17 17:58	5
Thallium	ND		10	5.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:58	5
Vanadium	**18**		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 17:58	5
Zinc	**91**		5.1	2.6	mg/Kg	☼	08/10/17 15:26	08/12/17 17:58	5
Silver	ND		1.5	0.77	mg/Kg	☼	08/10/17 15:26	08/12/17 17:58	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.027**		0.020	0.012	mg/Kg	☼	08/09/17 16:52	08/10/17 20:39	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**2.0**		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-SO-01

Lab Sample ID: 440-189680-33
Date Collected: 08/03/17 15:15
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 98.9

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	5.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:59	5
Arsenic	**58**		3.0	1.5	mg/Kg	☼	08/10/17 15:26	08/12/17 17:59	5
Barium	**170**		1.5	0.76	mg/Kg	☼	08/10/17 15:26	08/12/17 17:59	5
Beryllium	**0.60**		0.51	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 17:59	5
Cadmium	**1.3**		0.51	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 17:59	5
Chromium	**59**		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 17:59	5
Cobalt	**20**		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 17:59	5
Copper	**56**		2.0	1.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:59	5
Lead	**19**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:59	5
Molybdenum	**1.8**	**J**	2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:59	5
Nickel	**60**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 17:59	5
Selenium	ND		3.0	1.7	mg/Kg	☼	08/10/17 15:26	08/12/17 17:59	5
Thallium	ND		10	5.1	mg/Kg	☼	08/10/17 15:26	08/12/17 17:59	5
Vanadium	**74**		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 17:59	5
Zinc	**220**		5.1	2.5	mg/Kg	☼	08/10/17 15:26	08/12/17 17:59	5
Silver	ND		1.5	0.76	mg/Kg	☼	08/10/17 15:26	08/12/17 17:59	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.079**		0.021	0.012	mg/Kg	☼	08/09/17 16:59	08/14/17 20:51	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**1.1**		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-BL-01

Lab Sample ID: 440-189680-34
Date Collected: 08/03/17 15:20
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 98.9

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	5.1	mg/Kg	☼	08/10/17 15:26	08/12/17 18:01	5
Arsenic	**50**		3.0	1.5	mg/Kg	☼	08/10/17 15:26	08/12/17 18:01	5
Barium	**140**		1.5	0.76	mg/Kg	☼	08/10/17 15:26	08/12/17 18:01	5
Beryllium	**0.52**		0.51	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 18:01	5
Cadmium	**1.1**		0.51	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 18:01	5
Chromium	**50**		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 18:01	5
Cobalt	**16**		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 18:01	5
Copper	**49**		2.0	1.1	mg/Kg	☼	08/10/17 15:26	08/12/17 18:01	5
Lead	**16**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:01	5
Molybdenum	**1.6**	**J**	2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:01	5
Nickel	**51**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:01	5
Selenium	**2.8**	**J**	3.0	1.7	mg/Kg	☼	08/10/17 15:26	08/12/17 18:01	5
Thallium	ND		10	5.1	mg/Kg	☼	08/10/17 15:26	08/12/17 18:01	5
Vanadium	**64**		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 18:01	5
Zinc	**190**		5.1	2.5	mg/Kg	☼	08/10/17 15:26	08/12/17 18:01	5
Silver	ND		1.5	0.76	mg/Kg	☼	08/10/17 15:26	08/12/17 18:01	5

Client Sample ID: CF-BL-01

Lab Sample ID: 440-189680-34
Date Collected: 08/03/17 15:20
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 98.9

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.17		0.020	0.012	mg/Kg	☼	08/09/17 16:52	08/10/17 19:58	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	1.1		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-SO-10

Lab Sample ID: 440-189680-35
Date Collected: 08/03/17 15:25
Matrix: Solid
Date Received: 08/05/17 10:40

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	1.5		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-SO-10

Lab Sample ID: 440-189680-35
Date Collected: 08/03/17 15:25
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 98.5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12		0.020	0.012	mg/Kg	☼	08/09/17 16:52	08/10/17 21:03	1

Client Sample ID: CF-BG-02

Lab Sample ID: 440-189680-36
Date Collected: 08/03/17 15:35
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 96.4

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	5.2	mg/Kg	☼	08/10/17 15:26	08/12/17 18:03	5
Arsenic	20		3.1	1.6	mg/Kg	☼	08/10/17 15:26	08/12/17 18:03	5
Barium	600		1.6	0.78	mg/Kg	☼	08/10/17 15:26	08/12/17 18:03	5
Beryllium	0.54		0.52	0.26	mg/Kg	☼	08/10/17 15:26	08/12/17 18:03	5
Cadmium	0.68		0.52	0.26	mg/Kg	☼	08/10/17 15:26	08/12/17 18:03	5
Chromium	24		1.0	0.52	mg/Kg	☼	08/10/17 15:26	08/12/17 18:03	5
Cobalt	13		1.0	0.52	mg/Kg	☼	08/10/17 15:26	08/12/17 18:03	5
Copper	61		2.1	1.1	mg/Kg	☼	08/10/17 15:26	08/12/17 18:03	5
Lead	21		2.1	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:03	5
Molybdenum	1.9	J	2.1	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:03	5
Nickel	27		2.1	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:03	5
Selenium	ND		3.1	1.8	mg/Kg	☼	08/10/17 15:26	08/12/17 18:03	5
Thallium	ND		10	5.2	mg/Kg	☼	08/10/17 15:26	08/12/17 18:03	5
Vanadium	51		1.0	0.52	mg/Kg	☼	08/10/17 15:26	08/12/17 18:03	5
Zinc	130		5.2	2.6	mg/Kg	☼	08/10/17 15:26	08/12/17 18:03	5
Silver	ND		1.6	0.78	mg/Kg	☼	08/10/17 15:26	08/12/17 18:03	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.038		0.021	0.012	mg/Kg	☼	08/09/17 16:59	08/14/17 21:15	1

Client Sample ID: CF-BG-02

Lab Sample ID: 440-189680-36
Date Collected: 08/03/17 15:35
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 96.4

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.6		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-ER-02

Lab Sample ID: 440-189680-37
Date Collected: 08/03/17 15:45
Matrix: Water
Date Received: 08/05/17 10:40

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010	0.0060	mg/L		08/10/17 08:38	08/10/17 18:39	1
Arsenic	ND		0.010	0.0089	mg/L		08/10/17 08:38	08/10/17 18:39	1
Barium	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:39	1
Beryllium	ND		0.0020	0.0010	mg/L		08/10/17 08:38	08/10/17 18:39	1
Cadmium	ND		0.0050	0.0025	mg/L		08/10/17 08:38	08/10/17 18:39	1
Chromium	ND		0.0050	0.0025	mg/L		08/10/17 08:38	08/10/17 18:39	1
Cobalt	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:39	1
Copper	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:39	1
Lead	ND		0.0050	0.0038	mg/L		08/10/17 08:38	08/10/17 18:39	1
Molybdenum	ND		0.020	0.010	mg/L		08/10/17 08:38	08/10/17 18:39	1
Nickel	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:39	1
Selenium	ND		0.010	0.0087	mg/L		08/10/17 08:38	08/10/17 18:39	1
Thallium	ND		0.010	0.0080	mg/L		08/10/17 08:38	08/10/17 18:39	1
Vanadium	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:39	1
Zinc	ND		0.020	0.012	mg/L		08/10/17 08:38	08/10/17 18:39	1
Silver	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:39	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		08/07/17 11:51	08/07/17 18:02	1

Client Sample ID: CF-SO-11

Lab Sample ID: 440-189680-38
Date Collected: 08/03/17 15:55
Matrix: Solid
Date Received: 08/05/17 10:40

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.2		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-SO-11

Lab Sample ID: 440-189680-38
Date Collected: 08/03/17 15:55
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 95.8

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.10		0.021	0.013	mg/Kg	☼	08/09/17 16:59	08/14/17 21:02	1

Client Sample ID: CF-BG-01

Lab Sample ID: 440-189680-39
Date Collected: 08/03/17 16:00
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 98.3

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	5.1	mg/Kg	☼	08/10/17 15:26	08/12/17 18:05	5
Arsenic	**13**		3.1	1.5	mg/Kg	☼	08/10/17 15:26	08/12/17 18:05	5
Barium	**290**		1.5	0.76	mg/Kg	☼	08/10/17 15:26	08/12/17 18:05	5
Beryllium	**1.0**		0.51	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 18:05	5
Cadmium	**0.66**		0.51	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 18:05	5
Chromium	**32**		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 18:05	5
Cobalt	**22**		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 18:05	5
Copper	**69**		2.0	1.1	mg/Kg	☼	08/10/17 15:26	08/12/17 18:05	5
Lead	**38**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:05	5
Molybdenum	**2.6**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:05	5
Nickel	**38**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:05	5
Selenium	ND		3.1	1.7	mg/Kg	☼	08/10/17 15:26	08/12/17 18:05	5
Thallium	ND		10	5.1	mg/Kg	☼	08/10/17 15:26	08/12/17 18:05	5
Vanadium	**50**		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 18:05	5
Zinc	**120**		5.1	2.5	mg/Kg	☼	08/10/17 15:26	08/12/17 18:05	5
Silver	ND		1.5	0.76	mg/Kg	☼	08/10/17 15:26	08/12/17 18:05	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.061**		0.020	0.012	mg/Kg	☼	08/09/17 16:59	08/14/17 21:07	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**1.7**		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-BG-04

Lab Sample ID: 440-189680-40
Date Collected: 08/03/17 16:10
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 99.1

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	5.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:06	5
Arsenic	**9.1**		3.0	1.5	mg/Kg	☼	08/10/17 15:26	08/12/17 18:06	5
Barium	**240**		1.5	0.76	mg/Kg	☼	08/10/17 15:26	08/12/17 18:06	5
Beryllium	**0.84**		0.50	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 18:06	5
Cadmium	ND		0.50	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 18:06	5
Chromium	**210**		1.0	0.50	mg/Kg	☼	08/10/17 15:26	08/12/17 18:06	5
Cobalt	**16**		1.0	0.50	mg/Kg	☼	08/10/17 15:26	08/12/17 18:06	5
Copper	**37**		2.0	1.1	mg/Kg	☼	08/10/17 15:26	08/12/17 18:06	5
Lead	**17**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:06	5
Molybdenum	**3.0**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:06	5
Nickel	**40**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:06	5
Selenium	ND		3.0	1.7	mg/Kg	☼	08/10/17 15:26	08/12/17 18:06	5
Thallium	ND		10	5.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:06	5
Vanadium	**83**		1.0	0.50	mg/Kg	☼	08/10/17 15:26	08/12/17 18:06	5
Zinc	**70**		5.0	2.5	mg/Kg	☼	08/10/17 15:26	08/12/17 18:06	5
Silver	ND		1.5	0.76	mg/Kg	☼	08/10/17 15:26	08/12/17 18:06	5

Client Sample ID: CF-BG-04

Lab Sample ID: 440-189680-40
Date Collected: 08/03/17 16:10
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 99.1

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.078**		0.020	0.012	mg/Kg	☼	08/09/17 16:52	08/10/17 19:45	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**0.9**		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-BG-03

Lab Sample ID: 440-189680-41
Date Collected: 08/03/17 16:35
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 98.6

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	5.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:08	5
Arsenic	**30**		3.0	1.5	mg/Kg	☼	08/10/17 15:26	08/12/17 18:08	5
Barium	**180**		1.5	0.76	mg/Kg	☼	08/10/17 15:26	08/12/17 18:08	5
Beryllium	**0.55**		0.50	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 18:08	5
Cadmium	**1.6**		0.50	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 18:08	5
Chromium	**44**		1.0	0.50	mg/Kg	☼	08/10/17 15:26	08/12/17 18:08	5
Cobalt	**17**		1.0	0.50	mg/Kg	☼	08/10/17 15:26	08/12/17 18:08	5
Copper	**54**		2.0	1.1	mg/Kg	☼	08/10/17 15:26	08/12/17 18:08	5
Lead	**21**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:08	5
Molybdenum	**1.3**	**J**	2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:08	5
Nickel	**49**		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:08	5
Selenium	ND		3.0	1.7	mg/Kg	☼	08/10/17 15:26	08/12/17 18:08	5
Thallium	ND		10	5.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:08	5
Vanadium	**59**		1.0	0.50	mg/Kg	☼	08/10/17 15:26	08/12/17 18:08	5
Zinc	**190**		5.0	2.5	mg/Kg	☼	08/10/17 15:26	08/12/17 18:08	5
Silver	ND		1.5	0.76	mg/Kg	☼	08/10/17 15:26	08/12/17 18:08	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	**0.26**		0.020	0.012	mg/Kg	☼	08/09/17 16:52	08/10/17 20:09	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**1.4**		0.1	0.1	%			08/08/17 18:38	1

Client Sample ID: CF-ER-03

Lab Sample ID: 440-189680-42
Date Collected: 08/04/17 06:45
Matrix: Water
Date Received: 08/05/17 10:40

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	ND		0.050	0.019	ng/L		08/11/17 10:55	08/12/17 05:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*73*		*36 - 133*	*08/11/17 10:55*	*08/12/17 05:22*	*1*

Client Sample ID: CF-SD-08

Lab Sample ID: 440-189680-43
Date Collected: 08/04/17 06:50
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 93.1

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	0.29		0.11	0.032	ug/Kg	☼	08/09/17 10:30	08/10/17 20:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*75*		*13 - 133*	*08/09/17 10:30*	*08/10/17 20:20*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Fine Moisture	6.9		0.1	0.1	%			08/11/17 14:15	1
Percent Moisture	3.0		0.1	0.1	%			08/08/17 18:23	1

Client Sample ID: CF-SD-08

Lab Sample ID: 440-189680-43
Date Collected: 08/04/17 06:50
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 97.0

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.051		0.020	0.012	mg/Kg	☼	08/14/17 11:41	08/15/17 03:50	1

Client Sample ID: CF-ER-04A

Lab Sample ID: 440-189680-44
Date Collected: 08/04/17 08:50
Matrix: Water
Date Received: 08/05/17 10:40

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010	0.0060	mg/L		08/10/17 08:38	08/10/17 18:41	1
Arsenic	ND		0.010	0.0089	mg/L		08/10/17 08:38	08/10/17 18:41	1
Barium	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:41	1
Beryllium	ND		0.0020	0.0010	mg/L		08/10/17 08:38	08/10/17 18:41	1
Cadmium	ND		0.0050	0.0025	mg/L		08/10/17 08:38	08/10/17 18:41	1
Chromium	ND		0.0050	0.0025	mg/L		08/10/17 08:38	08/10/17 18:41	1
Cobalt	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:41	1
Copper	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:41	1
Lead	ND		0.0050	0.0038	mg/L		08/10/17 08:38	08/10/17 18:41	1
Molybdenum	ND		0.020	0.010	mg/L		08/10/17 08:38	08/10/17 18:41	1
Nickel	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:41	1
Selenium	ND		0.010	0.0087	mg/L		08/10/17 08:38	08/10/17 18:41	1
Thallium	ND		0.010	0.0080	mg/L		08/10/17 08:38	08/10/17 18:41	1
Vanadium	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:41	1
Zinc	ND		0.020	0.012	mg/L		08/10/17 08:38	08/10/17 18:41	1
Silver	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:41	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		08/07/17 11:51	08/07/17 18:05	1

Client Sample ID: CF-ER-04B
Lab Sample ID: 440-189680-45
Date Collected: 08/04/17 08:55
Matrix: Water
Date Received: 08/05/17 10:40

Method: 1630 - Methyl Mercury (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	ND		0.050	0.019	ng/L		08/11/17 10:55	08/12/17 05:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*69*		*36 - 133*	*08/11/17 10:55*	*08/12/17 05:44*	*1*

Client Sample ID: CF-SO-04
Lab Sample ID: 440-189680-46
Date Collected: 08/04/17 09:00
Matrix: Solid
Date Received: 08/05/17 10:40

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	1.7		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-SO-04
Lab Sample ID: 440-189680-46
Date Collected: 08/04/17 09:00
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 98.3

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.13		0.020	0.012	mg/Kg	☼	08/09/17 16:52	08/10/17 21:00	1

Client Sample ID: CF-SO-03
Lab Sample ID: 440-189680-47
Date Collected: 08/04/17 09:10
Matrix: Solid
Date Received: 08/05/17 10:40

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.5		0.1	0.1	%			08/08/17 18:23	1

Client Sample ID: CF-SO-03
Lab Sample ID: 440-189680-47
Date Collected: 08/04/17 09:10
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 96.5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.13		0.021	0.012	mg/Kg	☼	08/09/17 16:52	08/10/17 20:43	1

Client Sample ID: CF-SO-02
Lab Sample ID: 440-189680-48
Date Collected: 08/04/17 09:25
Matrix: Solid
Date Received: 08/05/17 10:40

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	1.5		0.1	0.1	%			08/08/17 17:37	1

Client Sample ID: CF-SO-02

Lab Sample ID: 440-189680-48
Date Collected: 08/04/17 09:25
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 98.5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.096		0.020	0.012	mg/Kg	☼	08/09/17 16:52	08/10/17 21:10	1

Client Sample ID: CF-BG-09

Lab Sample ID: 440-189680-49
Date Collected: 08/04/17 09:30
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 98.5

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	5.1	mg/Kg	☼	08/10/17 15:26	08/12/17 18:10	5
Arsenic	37		3.0	1.5	mg/Kg	☼	08/10/17 15:26	08/12/17 18:10	5
Barium	180		1.5	0.76	mg/Kg	☼	08/10/17 15:26	08/12/17 18:10	5
Beryllium	0.55		0.51	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 18:10	5
Cadmium	1.4		0.51	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 18:10	5
Chromium	44		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 18:10	5
Cobalt	18		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 18:10	5
Copper	51		2.0	1.1	mg/Kg	☼	08/10/17 15:26	08/12/17 18:10	5
Lead	24		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:10	5
Molybdenum	1.3	J	2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:10	5
Nickel	50		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:10	5
Selenium	ND		3.0	1.7	mg/Kg	☼	08/10/17 15:26	08/12/17 18:10	5
Thallium	ND		10	5.1	mg/Kg	☼	08/10/17 15:26	08/12/17 18:10	5
Vanadium	56		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 18:10	5
Zinc	180		5.1	2.5	mg/Kg	☼	08/10/17 15:26	08/12/17 18:10	5
Silver	ND		1.5	0.76	mg/Kg	☼	08/10/17 15:26	08/12/17 18:10	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.19		0.020	0.012	mg/Kg	☼	08/09/17 16:52	08/10/17 20:49	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	1.5		0.1	0.1	%			08/08/17 18:23	1

Client Sample ID: CF-SO-12

Lab Sample ID: 440-189680-50
Date Collected: 08/04/17 09:40
Matrix: Solid
Date Received: 08/05/17 10:40

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	1.1		0.1	0.1	%			08/08/17 18:23	1

Client Sample ID: CF-SO-12

Lab Sample ID: 440-189680-50
Date Collected: 08/04/17 09:40
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 98.9

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.051		0.020	0.012	mg/Kg	☼	08/09/17 22:26	08/10/17 17:59	1

Client Sample ID: CF-SO-05
Date Collected: 08/04/17 09:50
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-51
Matrix: Solid

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	1.7		0.1	0.1	%			08/08/17 18:23	1

Client Sample ID: CF-SO-05
Date Collected: 08/04/17 09:50
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-51
Matrix: Solid
Percent Solids: 98.3

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.089		0.021	0.012	mg/Kg	☼	08/09/17 16:59	08/14/17 21:05	1

Client Sample ID: CF-BG-05
Date Collected: 08/04/17 09:55
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-52
Matrix: Solid
Percent Solids: 99.3

Method: 6010B - Metals (ICP)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	5.1	mg/Kg	☼	08/10/17 15:26	08/12/17 18:34	5
Arsenic	ND		3.0	1.5	mg/Kg	☼	08/10/17 15:26	08/12/17 18:34	5
Barium	9.5		1.5	0.76	mg/Kg	☼	08/10/17 15:26	08/12/17 18:34	5
Beryllium	ND		0.51	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 18:34	5
Cadmium	ND		0.51	0.25	mg/Kg	☼	08/10/17 15:26	08/12/17 18:34	5
Chromium	ND		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 18:34	5
Cobalt	ND		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 18:34	5
Copper	14		2.0	1.1	mg/Kg	☼	08/10/17 15:26	08/12/17 18:34	5
Lead	ND		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:34	5
Molybdenum	ND		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:34	5
Nickel	ND		2.0	1.0	mg/Kg	☼	08/10/17 15:26	08/12/17 18:34	5
Selenium	ND		3.0	1.7	mg/Kg	☼	08/10/17 15:26	08/12/17 18:34	5
Thallium	ND		10	5.1	mg/Kg	☼	08/10/17 15:26	08/12/17 18:34	5
Vanadium	ND		1.0	0.51	mg/Kg	☼	08/10/17 15:26	08/12/17 18:34	5
Zinc	16		5.1	2.5	mg/Kg	☼	08/10/17 15:26	08/12/17 18:34	5
Silver	ND		1.5	0.76	mg/Kg	☼	08/10/17 15:26	08/12/17 18:34	5

Method: 7471A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.12		0.020	0.012	mg/Kg	☼	08/09/17 16:52	08/10/17 19:55	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	0.7		0.1	0.1	%			08/08/17 18:23	1

Client Sample ID: CF-ER-05
Date Collected: 08/04/17 10:05
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-53
Matrix: Water

Method: 6010B - Metals (ICP) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010	0.0060	mg/L		08/10/17 08:38	08/10/17 18:43	1
Arsenic	ND		0.010	0.0089	mg/L		08/10/17 08:38	08/10/17 18:43	1
Barium	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:43	1
Beryllium	ND		0.0020	0.0010	mg/L		08/10/17 08:38	08/10/17 18:43	1

Client Sample ID: CF-ER-05

Lab Sample ID: 440-189680-53
Date Collected: 08/04/17 10:05
Matrix: Water
Date Received: 08/05/17 10:40

Method: 6010B - Metals (ICP) - Total Recoverable (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0050	0.0025	mg/L		08/10/17 08:38	08/10/17 18:43	1
Chromium	ND		0.0050	0.0025	mg/L		08/10/17 08:38	08/10/17 18:43	1
Cobalt	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:43	1
Copper	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:43	1
Lead	ND		0.0050	0.0038	mg/L		08/10/17 08:38	08/10/17 18:43	1
Molybdenum	ND		0.020	0.010	mg/L		08/10/17 08:38	08/10/17 18:43	1
Nickel	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:43	1
Selenium	ND		0.010	0.0087	mg/L		08/10/17 08:38	08/10/17 18:43	1
Thallium	ND		0.010	0.0080	mg/L		08/10/17 08:38	08/10/17 18:43	1
Vanadium	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:43	1
Zinc	ND		0.020	0.012	mg/L		08/10/17 08:38	08/10/17 18:43	1
Silver	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 18:43	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		08/07/17 11:51	08/07/17 18:07	1

Client Sample ID: EB1

Lab Sample ID: 440-189680-55
Date Collected: 08/05/17 00:01
Matrix: Water
Date Received: 08/05/17 10:40

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		08/16/17 13:42	08/16/17 21:54	1

Client Sample ID: EB2

Lab Sample ID: 440-189680-56
Date Collected: 08/05/17 00:01
Matrix: Water
Date Received: 08/05/17 10:40

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		08/14/17 12:10	08/14/17 22:47	1

Method Summary

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Method	Method Description	Protocol	Laboratory
1630	Methyl Mercury (GC)	EPA	TAL CAN
6010B	Metals (ICP)	SW846	TAL IRV
7470A	Mercury (CVAA)	SW846	TAL IRV
7471A	Mercury (CVAA)	SW846	TAL IRV
Moisture	Percent Moisture	EPA	TAL IRV
Moisture	Percent Moisture	EPA	TAL CAN

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 CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Client Sample ID: CF-SO-07 — **Lab Sample ID: 440-189680-1**
Date Collected: 08/02/17 07:00 — **Matrix: Solid**
Date Received: 08/05/17 10:40

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			423502	08/15/17 18:02	EC1	TAL IRV

Client Sample ID: CF-SO-07 — **Lab Sample ID: 440-189680-1**
Date Collected: 08/02/17 07:00 — **Matrix: Solid**
Date Received: 08/05/17 10:40 — **Percent Solids: 99.0**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.49 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 20:46	DB	TAL IRV

Client Sample ID: CF-SO-16 — **Lab Sample ID: 440-189680-2**
Date Collected: 08/02/17 07:48 — **Matrix: Solid**
Date Received: 08/05/17 10:40

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			423502	08/15/17 18:02	EC1	TAL IRV

Client Sample ID: CF-SO-16 — **Lab Sample ID: 440-189680-2**
Date Collected: 08/02/17 07:48 — **Matrix: Solid**
Date Received: 08/05/17 10:40 — **Percent Solids: 99.2**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.50 g	50 mL	422302	08/09/17 16:59	DB	TAL IRV
Total/NA	Analysis	7471A		1			423263	08/14/17 20:59	DB	TAL IRV

Client Sample ID: CF-SD-03 — **Lab Sample ID: 440-189680-3**
Date Collected: 08/02/17 08:20 — **Matrix: Solid**
Date Received: 08/05/17 10:40

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			423502	08/15/17 18:02	EC1	TAL IRV
Total/NA	Analysis	Moisture		1			290877	08/11/17 13:36	PW	TAL CAN

Client Sample ID: CF-SD-03 — **Lab Sample ID: 440-189680-3**
Date Collected: 08/02/17 08:20 — **Matrix: Solid**
Date Received: 08/05/17 10:40 — **Percent Solids: 80.1**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1630			1.0302 g	10 mL	290489	08/09/17 10:30	SEM	TAL CAN
Total/NA	Analysis	1630		1	4.2 mL	39 mL	290646	08/10/17 13:44	RES	TAL CAN
Total/NA	Prep	7471A			0.49 g	50 mL	423112	08/14/17 11:36	DB	TAL IRV
Total/NA	Analysis	7471A		1			423270	08/15/17 02:43	DB	TAL IRV

Lab Chronicle

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Client Sample ID: CF-SO-08
Date Collected: 08/02/17 09:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-4
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			423502	08/15/17 18:02	EC1	TAL IRV

Client Sample ID: CF-SO-08
Date Collected: 08/02/17 09:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-4
Matrix: Solid
Percent Solids: 94.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.50 g	50 mL	422340	08/09/17 22:26	DB	TAL IRV
Total/NA	Analysis	7471A		1			422610	08/10/17 18:04	DB	TAL IRV

Client Sample ID: CF-SD-09
Date Collected: 08/02/17 11:40
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-5
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			290877	08/11/17 13:36	PW	TAL CAN

Client Sample ID: CF-SD-09
Date Collected: 08/02/17 11:40
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-5
Matrix: Solid
Percent Solids: 99.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1630			1.0001 g	10 mL	290489	08/09/17 10:30	SEM	TAL CAN
Total/NA	Analysis	1630		1	4.2 mL	39 mL	290646	08/10/17 14:50	RES	TAL CAN

Client Sample ID: CF-SO-13
Date Collected: 08/02/17 12:15
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-6
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			423502	08/15/17 18:02	EC1	TAL IRV

Client Sample ID: CF-SO-13
Date Collected: 08/02/17 12:15
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-6
Matrix: Solid
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	7471A			0.50 g	50 mL	422340	08/09/17 22:26	DB	TAL IRV
Total/NA	Analysis	7471A		1			422610	08/10/17 18:13	DB	TAL IRV

Lab Chronicle

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Client Sample ID: CF-SO-14
Date Collected: 08/02/17 12:25
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-7
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			423502	08/15/17 18:02	EC1	TAL IRV

Client Sample ID: CF-SO-14
Date Collected: 08/02/17 12:25
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-7
Matrix: Solid
Percent Solids: 90.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.50 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 20:32	DB	TAL IRV

Client Sample ID: CF-BG-10
Date Collected: 08/02/17 12:35
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-8
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			424071	08/17/17 19:24	EC1	TAL IRV

Client Sample ID: CF-BG-10
Date Collected: 08/02/17 12:35
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-8
Matrix: Solid
Percent Solids: 97.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.99 g	50 mL	422535	08/10/17 15:26	DT	TAL IRV
Total/NA	Analysis	6010B		5			422971	08/12/17 17:25	VS	TAL IRV
Total/NA	Prep	7471A			0.50 g	50 mL	422340	08/09/17 22:26	DB	TAL IRV
Total/NA	Analysis	7471A		1			422610	08/10/17 18:07	DB	TAL IRV

Client Sample ID: CF-SO-15
Date Collected: 08/02/17 12:45
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-9
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			423502	08/15/17 18:02	EC1	TAL IRV

Client Sample ID: CF-SO-15
Date Collected: 08/02/17 12:45
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-9
Matrix: Solid
Percent Solids: 95.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.50 g	50 mL	422340	08/09/17 22:26	DB	TAL IRV
Total/NA	Analysis	7471A		1			422610	08/10/17 18:10	DB	TAL IRV

Client Sample ID: CF-SD-09
Date Collected: 08/02/17 12:55
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-10
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			423502	08/15/17 18:02	EC1	TAL IRV

Client Sample ID: CF-SD-09
Date Collected: 08/02/17 12:55
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-10
Matrix: Solid
Percent Solids: 95.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.51 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 20:36	DB	TAL IRV

Client Sample ID: CF-SD-10
Date Collected: 08/02/17 13:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-11
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			423502	08/15/17 18:02	EC1	TAL IRV
Total/NA	Analysis	Moisture		1			290877	08/11/17 13:36	PW	TAL CAN

Client Sample ID: CF-SD-10
Date Collected: 08/02/17 13:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-11
Matrix: Solid
Percent Solids: 93.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1630			1.0324 g	10 mL	290489	08/09/17 10:30	SEM	TAL CAN
Total/NA	Analysis	1630		1	4.2 mL	39 mL	290646	08/10/17 15:12	RES	TAL CAN
Total/NA	Prep	7471A			0.50 g	50 mL	423112	08/14/17 11:36	DB	TAL IRV
Total/NA	Analysis	7471A		1			423270	08/15/17 02:45	DB	TAL IRV

Client Sample ID: CF-ER-01
Date Collected: 08/02/17 13:45
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-12
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			25 mL	25 mL	422409	08/10/17 08:38	Q1N	TAL IRV
Total Recoverable	Analysis	6010B		1			422577	08/10/17 18:36	B1H	TAL IRV
Total/NA	Prep	7470A			20 mL	20 mL	421693	08/07/17 11:51	DB	TAL IRV
Total/NA	Analysis	7470A		1			423141	08/07/17 17:59	DB	TAL IRV

Client Sample ID: CF-SO-06
Date Collected: 08/02/17 13:50
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-13
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			422059	08/08/17 18:38	EC1	TAL IRV

Client Sample ID: CF-SO-06
Date Collected: 08/02/17 13:50
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-13
Matrix: Solid
Percent Solids: 99.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.51 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 20:02	DB	TAL IRV

Client Sample ID: CF-BG-06
Date Collected: 08/02/17 14:15
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-14
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			422059	08/08/17 18:38	EC1	TAL IRV

Client Sample ID: CF-BG-06
Date Collected: 08/02/17 14:15
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-14
Matrix: Solid
Percent Solids: 98.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			2.00 g	50 mL	422535	08/10/17 15:26	DT	TAL IRV
Total/NA	Analysis	6010B		5			422971	08/12/17 17:34	VS	TAL IRV
Total/NA	Prep	7471A			0.50 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 20:22	DB	TAL IRV

Client Sample ID: CF-BL-04
Date Collected: 08/02/17 14:20
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-15
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			422059	08/08/17 18:38	EC1	TAL IRV

Client Sample ID: CF-BL-04
Date Collected: 08/02/17 14:20
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-15
Matrix: Solid
Percent Solids: 98.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			2.03 g	50 mL	422535	08/10/17 15:26	DT	TAL IRV
Total/NA	Analysis	6010B		5			422971	08/12/17 17:36	VS	TAL IRV
Total/NA	Prep	7471A			0.49 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV

Client Sample ID: CF-BL-04
Date Collected: 08/02/17 14:20
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-15
Matrix: Solid
Percent Solids: 98.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	7471A		1			422611	08/10/17 21:13	DB	TAL IRV

Client Sample ID: CF-BG-07
Date Collected: 08/02/17 14:50
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-16
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			422059	08/08/17 18:38	EC1	TAL IRV

Client Sample ID: CF-BG-07
Date Collected: 08/02/17 14:50
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-16
Matrix: Solid
Percent Solids: 95.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			2.02 g	50 mL	422535	08/10/17 15:26	DT	TAL IRV
Total/NA	Analysis	6010B		5			422971	08/12/17 17:37	VS	TAL IRV
Total/NA	Prep	7471A			0.49 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 20:05	DB	TAL IRV

Client Sample ID: CF-BG-08
Date Collected: 08/02/17 15:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-17
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			422059	08/08/17 18:38	EC1	TAL IRV

Client Sample ID: CF-BG-08
Date Collected: 08/02/17 15:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-17
Matrix: Solid
Percent Solids: 94.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			2.01 g	50 mL	422535	08/10/17 15:26	DT	TAL IRV
Total/NA	Analysis	6010B		5			422971	08/12/17 17:54	VS	TAL IRV
Total/NA	Prep	7471A			0.50 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 20:19	DB	TAL IRV

Client Sample ID: CF-SD-11
Date Collected: 08/03/17 07:15
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-18
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			290877	08/11/17 13:36	PW	TAL CAN

Lab Chronicle

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Client Sample ID: CF-SD-11
Date Collected: 08/03/17 07:15
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-18
Matrix: Solid
Percent Solids: 96.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1630			1.0210 g	10 mL	290489	08/09/17 10:30	SEM	TAL CAN
Total/NA	Analysis	1630		5	4.2 mL	39 mL	290529	08/09/17 22:16	RES	TAL CAN

Client Sample ID: CF-BD-02
Date Collected: 08/03/17 07:30
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-19
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			422059	08/08/17 18:38	EC1	TAL IRV
Total/NA	Analysis	Moisture		1			290877	08/11/17 13:36	PW	TAL CAN

Client Sample ID: CF-BD-02
Date Collected: 08/03/17 07:30
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-19
Matrix: Solid
Percent Solids: 72.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1630			1.0387 g	10 mL	290489	08/09/17 10:30	SEM	TAL CAN
Total/NA	Analysis	1630		1	4.2 mL	39 mL	290646	08/10/17 15:34	RES	TAL CAN

Client Sample ID: CF-BD-02
Date Collected: 08/03/17 07:30
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-19
Matrix: Solid
Percent Solids: 74.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.51 g	50 mL	423112	08/14/17 11:36	DB	TAL IRV
Total/NA	Analysis	7471A		1			423270	08/15/17 02:53	DB	TAL IRV

Client Sample ID: CF-BD-03
Date Collected: 08/03/17 07:45
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-20
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			422059	08/08/17 18:23	EC1	TAL IRV
Total/NA	Analysis	Moisture		1			290877	08/11/17 13:36	PW	TAL CAN

Client Sample ID: CF-BD-03
Date Collected: 08/03/17 07:45
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-20
Matrix: Solid
Percent Solids: 58.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1630			1.0288 g	10 mL	290489	08/09/17 10:30	SEM	TAL CAN
Total/NA	Analysis	1630		1	4.2 mL	39 mL	290646	08/10/17 15:56	RES	TAL CAN

Lab Chronicle

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Client Sample ID: CF-BD-03
Date Collected: 08/03/17 07:45
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-20
Matrix: Solid
Percent Solids: 67.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.51 g	50 mL	423112	08/14/17 11:36	DB	TAL IRV
Total/NA	Analysis	7471A		1			423270	08/15/17 02:56	DB	TAL IRV

Client Sample ID: CF-BD-01
Date Collected: 08/03/17 08:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-21
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			422059	08/08/17 18:23	EC1	TAL IRV
Total/NA	Analysis	Moisture		1			290877	08/11/17 13:36	PW	TAL CAN

Client Sample ID: CF-BD-01
Date Collected: 08/03/17 08:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-21
Matrix: Solid
Percent Solids: 75.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1630			1.0029 g	10 mL	290489	08/09/17 10:30	SEM	TAL CAN
Total/NA	Analysis	1630		1	4.2 mL	39 mL	290646	08/10/17 16:18	RES	TAL CAN

Client Sample ID: CF-BD-01
Date Collected: 08/03/17 08:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-21
Matrix: Solid
Percent Solids: 86.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.51 g	50 mL	423112	08/14/17 11:36	DB	TAL IRV
Total/NA	Analysis	7471A		1			423270	08/15/17 02:59	DB	TAL IRV

Client Sample ID: CF-BL-05
Date Collected: 08/03/17 08:15
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-22
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			422047	08/08/17 17:37	EC1	TAL IRV
Total/NA	Analysis	Moisture		1			290877	08/11/17 13:36	PW	TAL CAN

Client Sample ID: CF-BL-05
Date Collected: 08/03/17 08:15
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-22
Matrix: Solid
Percent Solids: 72.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1630			1.0272 g	10 mL	290489	08/09/17 10:30	SEM	TAL CAN
Total/NA	Analysis	1630		1	4.2 mL	39 mL	290646	08/10/17 16:40	RES	TAL CAN

Lab Chronicle

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Client Sample ID: CF-BL-05
Date Collected: 08/03/17 08:15
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-22
Matrix: Solid
Percent Solids: 75.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.51 g	50 mL	423112	08/14/17 11:36	DB	TAL IRV
Total/NA	Analysis	7471A		1			423270	08/15/17 03:02	DB	TAL IRV

Client Sample ID: CF-BD-04
Date Collected: 08/03/17 10:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-23
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			422047	08/08/17 17:37	EC1	TAL IRV
Total/NA	Analysis	Moisture		1			290877	08/11/17 13:36	PW	TAL CAN

Client Sample ID: CF-BD-04
Date Collected: 08/03/17 10:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-23
Matrix: Solid
Percent Solids: 70.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1630			1.0371 g	10 mL	290489	08/09/17 10:30	SEM	TAL CAN
Total/NA	Analysis	1630		1	4.2 mL	39 mL	290646	08/10/17 17:02	RES	TAL CAN

Client Sample ID: CF-BD-04
Date Collected: 08/03/17 10:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-23
Matrix: Solid
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	7471A			0.51 g	50 mL	423112	08/14/17 11:36	DB	TAL IRV
Total/NA	Analysis	7471A		1			423270	08/15/17 03:04	DB	TAL IRV

Client Sample ID: CF-BD-05
Date Collected: 08/03/17 10:25
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-24
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			422047	08/08/17 17:37	EC1	TAL IRV
Total/NA	Analysis	Moisture		1			290877	08/11/17 13:36	PW	TAL CAN

Client Sample ID: CF-BD-05
Date Collected: 08/03/17 10:25
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-24
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	7471A			0.50 g	50 mL	423112	08/14/17 11:36	DB	TAL IRV
Total/NA	Analysis	7471A		1			423270	08/15/17 03:07	DB	TAL IRV

Lab Chronicle

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Client Sample ID: CF-BD-05
Date Collected: 08/03/17 10:25
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-24
Matrix: Solid
Percent Solids: 88.2

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1630			1.0180 g	10 mL	290489	08/09/17 10:30	SEM	TAL CAN
Total/NA	Analysis	1630		1	4.2 mL	39 mL	290646	08/10/17 17:24	RES	TAL CAN

Client Sample ID: CF-SD-01
Date Collected: 08/03/17 11:00
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-25
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			422047	08/08/17 17:37	EC1	TAL IRV
Total/NA	Analysis	Moisture		1			290877	08/11/17 13:36	PW	TAL CAN

Client Sample ID: CF-SD-01
Date Collected: 08/03/17 11:00
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-25
Matrix: Solid
Percent Solids: 88.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.49 g	50 mL	423112	08/14/17 11:36	DB	TAL IRV
Total/NA	Analysis	7471A		1			423270	08/15/17 03:10	DB	TAL IRV

Client Sample ID: CF-SD-01
Date Collected: 08/03/17 11:00
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-25
Matrix: Solid
Percent Solids: 89.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1630			1.0023 g	10 mL	290489	08/09/17 10:30	SEM	TAL CAN
Total/NA	Analysis	1630		1	4.2 mL	39 mL	290646	08/10/17 18:30	RES	TAL CAN

Client Sample ID: CF-SD-07
Date Collected: 08/03/17 12:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-26
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			422047	08/08/17 17:37	EC1	TAL IRV
Total/NA	Analysis	Moisture		1			290877	08/11/17 13:36	PW	TAL CAN

Client Sample ID: CF-SD-07
Date Collected: 08/03/17 12:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-26
Matrix: Solid
Percent Solids: 72.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.50 g	50 mL	423112	08/14/17 11:36	DB	TAL IRV
Total/NA	Analysis	7471A		1			423270	08/15/17 03:13	DB	TAL IRV

Lab Chronicle

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Client Sample ID: CF-SD-07
Date Collected: 08/03/17 12:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-26
Matrix: Solid
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	1630			1.0226 g	10 mL	290489	08/09/17 10:30	SEM	TAL CAN
Total/NA	Analysis	1630		1	4.2 mL	39 mL	290646	08/10/17 18:52	RES	TAL CAN

Client Sample ID: CF-SD-06
Date Collected: 08/03/17 12:20
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-27
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			422047	08/08/17 17:37	EC1	TAL IRV
Total/NA	Analysis	Moisture		1			290877	08/11/17 13:36	PW	TAL CAN

Client Sample ID: CF-SD-06
Date Collected: 08/03/17 12:20
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-27
Matrix: Solid
Percent Solids: 52.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1630			1.0208 g	10 mL	290489	08/09/17 10:30	SEM	TAL CAN
Total/NA	Analysis	1630		1	4.2 mL	39 mL	290646	08/10/17 19:14	RES	TAL CAN

Client Sample ID: CF-SD-06
Date Collected: 08/03/17 12:20
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-27
Matrix: Solid
Percent Solids: 69.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.50 g	50 mL	423112	08/14/17 11:36	DB	TAL IRV
Total/NA	Analysis	7471A		1			423270	08/15/17 03:15	DB	TAL IRV

Client Sample ID: CF-SD-04
Date Collected: 08/03/17 12:40
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-28
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			422047	08/08/17 17:37	EC1	TAL IRV
Total/NA	Analysis	Moisture		1			290877	08/11/17 13:36	PW	TAL CAN

Client Sample ID: CF-SD-04
Date Collected: 08/03/17 12:40
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-28
Matrix: Solid
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	1630			1.0145 g	10 mL	290489	08/09/17 10:30	SEM	TAL CAN
Total/NA	Analysis	1630		1	4.2 mL	39 mL	290646	08/10/17 19:36	RES	TAL CAN

Client Sample ID: CF-SD-04
Date Collected: 08/03/17 12:40
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-28
Matrix: Solid
Percent Solids: 80.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.50 g	50 mL	423112	08/14/17 11:36	DB	TAL IRV
Total/NA	Analysis	7471A		1			423270	08/15/17 03:18	DB	TAL IRV

Client Sample ID: CF-SD-02
Date Collected: 08/03/17 13:00
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-29
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			422047	08/08/17 17:37	EC1	TAL IRV
Total/NA	Analysis	Moisture		1			290877	08/11/17 13:36	PW	TAL CAN

Client Sample ID: CF-SD-02
Date Collected: 08/03/17 13:00
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-29
Matrix: Solid
Percent Solids: 61.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1630			1.0001 g	10 mL	290489	08/09/17 10:30	SEM	TAL CAN
Total/NA	Analysis	1630		1	4.2 mL	39 mL	290646	08/10/17 19:58	RES	TAL CAN

Client Sample ID: CF-SD-02
Date Collected: 08/03/17 13:00
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-29
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	7471A			0.50 g	50 mL	423115	08/14/17 11:41	DB	TAL IRV
Total/NA	Analysis	7471A		1			423273	08/15/17 03:42	DB	TAL IRV

Client Sample ID: CF-SD-11
Date Collected: 08/03/17 15:00
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-30
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			422047	08/08/17 17:37	EC1	TAL IRV

Client Sample ID: CF-SD-11
Date Collected: 08/03/17 15:00
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-30
Matrix: Solid
Percent Solids: 95.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.51 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 21:07	DB	TAL IRV

Client Sample ID: CF-SO-09
Date Collected: 08/03/17 15:05
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-31
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			422047	08/08/17 17:37	EC1	TAL IRV

Client Sample ID: CF-SO-09
Date Collected: 08/03/17 15:05
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-31
Matrix: Solid
Percent Solids: 97.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			2.00 g	50 mL	422535	08/10/17 15:26	DT	TAL IRV
Total/NA	Analysis	6010B		5			422971	08/12/17 17:56	VS	TAL IRV
Total/NA	Prep	7471A			0.51 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 20:29	DB	TAL IRV

Client Sample ID: CF-BL-02
Date Collected: 08/03/17 15:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-32
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			422047	08/08/17 17:37	EC1	TAL IRV

Client Sample ID: CF-BL-02
Date Collected: 08/03/17 15:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-32
Matrix: Solid
Percent Solids: 98.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			2.00 g	50 mL	422535	08/10/17 15:26	DT	TAL IRV
Total/NA	Analysis	6010B		5			422971	08/12/17 17:58	VS	TAL IRV
Total/NA	Prep	7471A			0.50 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 20:39	DB	TAL IRV

Client Sample ID: CF-SO-01
Date Collected: 08/03/17 15:15
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-33
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			422047	08/08/17 17:37	EC1	TAL IRV

Client Sample ID: CF-SO-01
Date Collected: 08/03/17 15:15
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-33
Matrix: Solid
Percent Solids: 98.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.99 g	50 mL	422535	08/10/17 15:26	DT	TAL IRV

Lab Chronicle

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Client Sample ID: CF-SO-01
Date Collected: 08/03/17 15:15
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-33
Matrix: Solid
Percent Solids: 98.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	6010B		5			422971	08/12/17 17:59	VS	TAL IRV
Total/NA	Prep	7471A			0.49 g	50 mL	422302	08/09/17 16:59	DB	TAL IRV
Total/NA	Analysis	7471A		1			423263	08/14/17 20:51	DB	TAL IRV

Client Sample ID: CF-BL-01
Date Collected: 08/03/17 15:20
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-34
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			422047	08/08/17 17:37	EC1	TAL IRV

Client Sample ID: CF-BL-01
Date Collected: 08/03/17 15:20
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-34
Matrix: Solid
Percent Solids: 98.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.99 g	50 mL	422535	08/10/17 15:26	DT	TAL IRV
Total/NA	Analysis	6010B		5			422971	08/12/17 18:01	VS	TAL IRV
Total/NA	Prep	7471A			0.51 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 19:58	DB	TAL IRV

Client Sample ID: CF-SO-10
Date Collected: 08/03/17 15:25
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-35
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			422047	08/08/17 17:37	EC1	TAL IRV

Client Sample ID: CF-SO-10
Date Collected: 08/03/17 15:25
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-35
Matrix: Solid
Percent Solids: 98.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.51 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 21:03	DB	TAL IRV

Client Sample ID: CF-BG-02
Date Collected: 08/03/17 15:35
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-36
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			422047	08/08/17 17:37	EC1	TAL IRV

Lab Chronicle

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Client Sample ID: CF-BG-02
Date Collected: 08/03/17 15:35
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-36
Matrix: Solid
Percent Solids: 96.4

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.99 g	50 mL	422535	08/10/17 15:26	DT	TAL IRV
Total/NA	Analysis	6010B		5			422971	08/12/17 18:03	VS	TAL IRV
Total/NA	Prep	7471A			0.50 g	50 mL	422302	08/09/17 16:59	DB	TAL IRV
Total/NA	Analysis	7471A		1			423263	08/14/17 21:15	DB	TAL IRV

Client Sample ID: CF-ER-02
Date Collected: 08/03/17 15:45
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-37
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			25 mL	25 mL	422409	08/10/17 08:38	Q1N	TAL IRV
Total Recoverable	Analysis	6010B		1			422577	08/10/17 18:39	B1H	TAL IRV
Total/NA	Prep	7470A			20 mL	20 mL	421693	08/07/17 11:51	DB	TAL IRV
Total/NA	Analysis	7470A		1			423141	08/07/17 18:02	DB	TAL IRV

Client Sample ID: CF-SO-11
Date Collected: 08/03/17 15:55
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-38
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			422047	08/08/17 17:37	EC1	TAL IRV

Client Sample ID: CF-SO-11
Date Collected: 08/03/17 15:55
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-38
Matrix: Solid
Percent Solids: 95.8

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.50 g	50 mL	422302	08/09/17 16:59	DB	TAL IRV
Total/NA	Analysis	7471A		1			423263	08/14/17 21:02	DB	TAL IRV

Client Sample ID: CF-BG-01
Date Collected: 08/03/17 16:00
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-39
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			422047	08/08/17 17:37	EC1	TAL IRV

Lab Chronicle

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Client Sample ID: CF-BG-01
Date Collected: 08/03/17 16:00
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-39
Matrix: Solid
Percent Solids: 98.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			2.00 g	50 mL	422535	08/10/17 15:26	DT	TAL IRV
Total/NA	Analysis	6010B		5			422971	08/12/17 18:05	VS	TAL IRV
Total/NA	Prep	7471A			0.50 g	50 mL	422302	08/09/17 16:59	DB	TAL IRV
Total/NA	Analysis	7471A		1			423263	08/14/17 21:07	DB	TAL IRV

Client Sample ID: CF-BG-04
Date Collected: 08/03/17 16:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-40
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			422047	08/08/17 17:37	EC1	TAL IRV

Client Sample ID: CF-BG-04
Date Collected: 08/03/17 16:10
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-40
Matrix: Solid
Percent Solids: 99.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			2.00 g	50 mL	422535	08/10/17 15:26	DT	TAL IRV
Total/NA	Analysis	6010B		5			422971	08/12/17 18:06	VS	TAL IRV
Total/NA	Prep	7471A			0.51 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 19:45	DB	TAL IRV

Client Sample ID: CF-BG-03
Date Collected: 08/03/17 16:35
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-41
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			422059	08/08/17 18:38	EC1	TAL IRV

Client Sample ID: CF-BG-03
Date Collected: 08/03/17 16:35
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-41
Matrix: Solid
Percent Solids: 98.6

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			2.01 g	50 mL	422535	08/10/17 15:26	DT	TAL IRV
Total/NA	Analysis	6010B		5			422971	08/12/17 18:08	VS	TAL IRV
Total/NA	Prep	7471A			0.50 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 20:09	DB	TAL IRV

Lab Chronicle

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Client Sample ID: CF-ER-03
Date Collected: 08/04/17 06:45
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-42
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	1630			39 mL	39 mL	290831	08/11/17 10:55	SEM	TAL CAN
Total/NA	Analysis	1630		1	39 mL	39 mL	291010	08/12/17 05:22	RES	TAL CAN

Client Sample ID: CF-SD-08
Date Collected: 08/04/17 06:50
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-43
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			422059	08/08/17 18:23	EC1	TAL IRV
Total/NA	Analysis	Moisture		1			290877	08/11/17 14:15	PW	TAL CAN

Client Sample ID: CF-SD-08
Date Collected: 08/04/17 06:50
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-43
Matrix: Solid
Percent Solids: 93.1

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1630			1.0028 g	10 mL	290489	08/09/17 10:30	SEM	TAL CAN
Total/NA	Analysis	1630		1	4.2 mL	39 mL	290646	08/10/17 20:20	RES	TAL CAN

Client Sample ID: CF-SD-08
Date Collected: 08/04/17 06:50
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-43
Matrix: Solid
Percent Solids: 97.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.51 g	50 mL	423115	08/14/17 11:41	DB	TAL IRV
Total/NA	Analysis	7471A		1			423273	08/15/17 03:50	DB	TAL IRV

Client Sample ID: CF-ER-04A
Date Collected: 08/04/17 08:50
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-44
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			25 mL	25 mL	422409	08/10/17 08:38	Q1N	TAL IRV
Total Recoverable	Analysis	6010B		1			422577	08/10/17 18:41	B1H	TAL IRV
Total/NA	Prep	7470A			20 mL	20 mL	421693	08/07/17 11:51	DB	TAL IRV
Total/NA	Analysis	7470A		1			423141	08/07/17 18:05	DB	TAL IRV

Client Sample ID: CF-ER-04B
Lab Sample ID: 440-189680-45
Date Collected: 08/04/17 08:55
Matrix: Water
Date Received: 08/05/17 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	1630			39 mL	39 mL	290831	08/11/17 10:55	SEM	TAL CAN
Total/NA	Analysis	1630		1	39 mL	39 mL	291010	08/12/17 05:44	RES	TAL CAN

Client Sample ID: CF-SO-04
Lab Sample ID: 440-189680-46
Date Collected: 08/04/17 09:00
Matrix: Solid
Date Received: 08/05/17 10:40

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			422047	08/08/17 17:37	EC1	TAL IRV

Client Sample ID: CF-SO-04
Lab Sample ID: 440-189680-46
Date Collected: 08/04/17 09:00
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 98.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.51 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 21:00	DB	TAL IRV

Client Sample ID: CF-SO-03
Lab Sample ID: 440-189680-47
Date Collected: 08/04/17 09:10
Matrix: Solid
Date Received: 08/05/17 10:40

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			422059	08/08/17 18:23	EC1	TAL IRV

Client Sample ID: CF-SO-03
Lab Sample ID: 440-189680-47
Date Collected: 08/04/17 09:10
Matrix: Solid
Date Received: 08/05/17 10:40
Percent Solids: 96.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.50 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 20:43	DB	TAL IRV

Client Sample ID: CF-SO-02
Lab Sample ID: 440-189680-48
Date Collected: 08/04/17 09:25
Matrix: Solid
Date Received: 08/05/17 10:40

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			422047	08/08/17 17:37	EC1	TAL IRV

Lab Chronicle

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Client Sample ID: CF-SO-02
Date Collected: 08/04/17 09:25
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-48
Matrix: Solid
Percent Solids: 98.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.51 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 21:10	DB	TAL IRV

Client Sample ID: CF-BG-09
Date Collected: 08/04/17 09:30
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-49
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			422059	08/08/17 18:23	EC1	TAL IRV

Client Sample ID: CF-BG-09
Date Collected: 08/04/17 09:30
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-49
Matrix: Solid
Percent Solids: 98.5

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			2.00 g	50 mL	422535	08/10/17 15:26	DT	TAL IRV
Total/NA	Analysis	6010B		5			422971	08/12/17 18:10	VS	TAL IRV
Total/NA	Prep	7471A			0.51 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 20:49	DB	TAL IRV

Client Sample ID: CF-SO-12
Date Collected: 08/04/17 09:40
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-50
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			422059	08/08/17 18:23	EC1	TAL IRV

Client Sample ID: CF-SO-12
Date Collected: 08/04/17 09:40
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-50
Matrix: Solid
Percent Solids: 98.9

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.51 g	50 mL	422340	08/09/17 22:26	DB	TAL IRV
Total/NA	Analysis	7471A		1			422610	08/10/17 17:59	DB	TAL IRV

Client Sample ID: CF-SO-05
Date Collected: 08/04/17 09:50
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-51
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			422059	08/08/17 18:23	EC1	TAL IRV

Lab Chronicle

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Client Sample ID: CF-SO-05
Date Collected: 08/04/17 09:50
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-51
Matrix: Solid
Percent Solids: 98.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7471A			0.49 g	50 mL	422302	08/09/17 16:59	DB	TAL IRV
Total/NA	Analysis	7471A		1			423263	08/14/17 21:05	DB	TAL IRV

Client Sample ID: CF-BG-05
Date Collected: 08/04/17 09:55
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-52
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			422059	08/08/17 18:23	EC1	TAL IRV

Client Sample ID: CF-BG-05
Date Collected: 08/04/17 09:55
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-52
Matrix: Solid
Percent Solids: 99.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			1.99 g	50 mL	422535	08/10/17 15:26	DT	TAL IRV
Total/NA	Analysis	6010B		5			422971	08/12/17 18:34	VS	TAL IRV
Total/NA	Prep	7471A			0.50 g	50 mL	422299	08/09/17 16:52	DB	TAL IRV
Total/NA	Analysis	7471A		1			422611	08/10/17 19:55	DB	TAL IRV

Client Sample ID: CF-ER-05
Date Collected: 08/04/17 10:05
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-53
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			25 mL	25 mL	422409	08/10/17 08:38	Q1N	TAL IRV
Total Recoverable	Analysis	6010B		1			422577	08/10/17 18:43	B1H	TAL IRV
Total/NA	Prep	7470A			20 mL	20 mL	421693	08/07/17 11:51	DB	TAL IRV
Total/NA	Analysis	7470A		1			423141	08/07/17 18:07	DB	TAL IRV

Client Sample ID: EB1
Date Collected: 08/05/17 00:01
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-55
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	7470A			20 mL	20 mL	423705	08/16/17 13:42	DB	TAL IRV
Total/NA	Analysis	7470A		1			423816	08/16/17 21:54	DB	TAL IRV

Lab Chronicle

Client: Avatar Environmental LLC
Project/Site: National Park Service - Whiskeytown, CA

TestAmerica Job ID: 440-189680-1

Client Sample ID: EB2
Date Collected: 08/05/17 00:01
Date Received: 08/05/17 10:40

Lab Sample ID: 440-189680-56
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	7470A			20 mL	20 mL	423126	08/14/17 12:10	DB	TAL IRV
Total/NA	Analysis	7470A		1			423275	08/14/17 22:47	DB	TAL IRV

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Method: 1630 - Methyl Mercury (GC)

Lab Sample ID: MB 240-290489/1-A
Matrix: Solid
Analysis Batch: 290529

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 290489

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	ND		0.10	0.030	ug/Kg		08/09/17 10:29	08/09/17 19:21	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*95*		*13 - 133*	*08/09/17 10:29*	*08/09/17 19:21*	*1*

Lab Sample ID: LCS 240-290489/2-A
Matrix: Solid
Analysis Batch: 290529

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 290489

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Methyl Mercury			1.00	0.986		ug/Kg		99	44 - 133		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
n-Propyl Mercury Chloride	*90*		*13 - 133*

Lab Sample ID: 440-189680-3 MS
Matrix: Solid
Analysis Batch: 290646

Client Sample ID: CF-SD-03
Prep Type: Total/NA
Prep Batch: 290489

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Methyl Mercury	0.13		1.20	1.40		ug/Kg	☼	106	10 - 168		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
n-Propyl Mercury Chloride	*84*		*13 - 133*

Lab Sample ID: 440-189680-3 MSD
Matrix: Solid
Analysis Batch: 290646

Client Sample ID: CF-SD-03
Prep Type: Total/NA
Prep Batch: 290489

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methyl Mercury	0.13		1.19	1.43		ug/Kg	☼	109	10 - 168	2	40

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
n-Propyl Mercury Chloride	*83*		*13 - 133*

Lab Sample ID: 440-189680-24 MS
Matrix: Solid
Analysis Batch: 290646

Client Sample ID: CF-BD-05
Prep Type: Total/NA
Prep Batch: 290489

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Methyl Mercury	0.054	J	1.11	1.17		ug/Kg	☼	100	10 - 168		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
n-Propyl Mercury Chloride	*78*		*13 - 133*

Method: 1630 - Methyl Mercury (GC) (Continued)

Lab Sample ID: 440-189680-24 MSD
Matrix: Solid
Analysis Batch: 290646

Client Sample ID: CF-BD-05
Prep Type: Total/NA
Prep Batch: 290489

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Methyl Mercury	0.054	J	1.13	1.20		ug/Kg	☼	101	10 - 168	3	40

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
n-Propyl Mercury Chloride	*79*		*13 - 133*

Lab Sample ID: MB 240-290831/1-A
Matrix: Water
Analysis Batch: 291010

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 290831

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Methyl Mercury	ND		0.050	0.019	ng/L		08/11/17 10:54	08/11/17 22:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
n-Propyl Mercury Chloride	*91*		*36 - 133*	*08/11/17 10:54*	*08/11/17 22:04*	*1*

Lab Sample ID: LCS 240-290831/2-A
Matrix: Water
Analysis Batch: 291010

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 290831

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Methyl Mercury			0.500	0.566		ng/L		113	67 - 138		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
n-Propyl Mercury Chloride	*87*		*36 - 133*

Method: 6010B - Metals (ICP)

Lab Sample ID: MB 440-422535/1-A ^5
Matrix: Solid
Analysis Batch: 422971

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 422535

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		10	5.0	mg/Kg		08/10/17 15:26	08/12/17 17:20	5
Arsenic	ND		3.0	1.5	mg/Kg		08/10/17 15:26	08/12/17 17:20	5
Barium	ND		1.5	0.75	mg/Kg		08/10/17 15:26	08/12/17 17:20	5
Beryllium	ND		0.50	0.25	mg/Kg		08/10/17 15:26	08/12/17 17:20	5
Cadmium	ND		0.50	0.25	mg/Kg		08/10/17 15:26	08/12/17 17:20	5
Chromium	ND		1.0	0.50	mg/Kg		08/10/17 15:26	08/12/17 17:20	5
Cobalt	ND		1.0	0.50	mg/Kg		08/10/17 15:26	08/12/17 17:20	5
Copper	ND		2.0	1.1	mg/Kg		08/10/17 15:26	08/12/17 17:20	5
Lead	ND		2.0	1.0	mg/Kg		08/10/17 15:26	08/12/17 17:20	5
Molybdenum	ND		2.0	1.0	mg/Kg		08/10/17 15:26	08/12/17 17:20	5
Nickel	ND		2.0	1.0	mg/Kg		08/10/17 15:26	08/12/17 17:20	5
Selenium	ND		3.0	1.7	mg/Kg		08/10/17 15:26	08/12/17 17:20	5
Thallium	ND		10	5.0	mg/Kg		08/10/17 15:26	08/12/17 17:20	5
Vanadium	ND		1.0	0.50	mg/Kg		08/10/17 15:26	08/12/17 17:20	5
Zinc	ND		5.0	2.5	mg/Kg		08/10/17 15:26	08/12/17 17:20	5

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: MB 440-422535/1-A ^5
Matrix: Solid
Analysis Batch: 422971

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 422535

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silver	ND		1.5	0.75	mg/Kg		08/10/17 15:26	08/12/17 17:20	5

Lab Sample ID: LCS 440-422535/2-A ^5
Matrix: Solid
Analysis Batch: 422971

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 422535

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	50.5	53.1		mg/Kg		105	80 - 120
Arsenic	50.5	50.6		mg/Kg		100	80 - 120
Barium	50.5	51.3		mg/Kg		102	80 - 120
Beryllium	50.5	48.9		mg/Kg		97	80 - 120
Cadmium	50.5	51.2		mg/Kg		101	80 - 120
Chromium	50.5	53.5		mg/Kg		106	80 - 120
Cobalt	50.5	51.9		mg/Kg		103	80 - 120
Copper	50.5	51.7		mg/Kg		102	80 - 120
Lead	50.5	51.6		mg/Kg		102	80 - 120
Molybdenum	50.5	53.5		mg/Kg		106	80 - 120
Nickel	50.5	51.3		mg/Kg		102	80 - 120
Selenium	50.5	47.7		mg/Kg		95	80 - 120
Thallium	50.5	52.6		mg/Kg		104	80 - 120
Vanadium	50.5	51.1		mg/Kg		101	80 - 120
Zinc	50.5	52.2		mg/Kg		103	80 - 120
Silver	25.3	24.9		mg/Kg		98	80 - 120

Lab Sample ID: 440-189680-8 MS
Matrix: Solid
Analysis Batch: 422971

Client Sample ID: CF-BG-10
Prep Type: Total/NA
Prep Batch: 422535

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	ND	F1	50.8	19.2	F1	mg/Kg	☼	38	75 - 125
Arsenic	14		50.8	59.3		mg/Kg	☼	90	75 - 125
Barium	270		50.8	390	4	mg/Kg	☼	242	75 - 125
Beryllium	0.62		50.8	46.1		mg/Kg	☼	89	75 - 125
Cadmium	0.36	J	50.8	45.3		mg/Kg	☼	88	75 - 125
Chromium	45		50.8	94.1		mg/Kg	☼	97	75 - 125
Cobalt	12		50.8	60.0		mg/Kg	☼	93	75 - 125
Copper	38		50.8	100		mg/Kg	☼	122	75 - 125
Lead	18		50.8	63.8		mg/Kg	☼	90	75 - 125
Molybdenum	2.2		50.8	48.6		mg/Kg	☼	91	75 - 125
Nickel	29	F1	50.8	90.9		mg/Kg	☼	122	75 - 125
Selenium	2.1	J	50.8	43.2		mg/Kg	☼	81	75 - 125
Thallium	ND		50.8	46.9		mg/Kg	☼	92	75 - 125
Vanadium	65		50.8	126		mg/Kg	☼	119	75 - 125
Zinc	110	F1	50.8	185	F1	mg/Kg	☼	156	75 - 125
Silver	ND		25.4	22.4		mg/Kg	☼	88	75 - 125

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: 440-189680-8 MSD
Matrix: Solid
Analysis Batch: 422971

Client Sample ID: CF-BG-10
Prep Type: Total/NA
Prep Batch: 422535

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	ND	F1	51.3	21.0	F1	mg/Kg	☼	41	75 - 125	9	20
Arsenic	14		51.3	62.0		mg/Kg	☼	94	75 - 125	5	20
Barium	270		51.3	399	4	mg/Kg	☼	258	75 - 125	2	20
Beryllium	0.62		51.3	47.5		mg/Kg	☼	91	75 - 125	3	20
Cadmium	0.36	J	51.3	46.2		mg/Kg	☼	89	75 - 125	2	20
Chromium	45		51.3	97.5		mg/Kg	☼	103	75 - 125	4	20
Cobalt	12		51.3	62.7		mg/Kg	☼	98	75 - 125	4	20
Copper	38		51.3	102		mg/Kg	☼	125	75 - 125	2	20
Lead	18		51.3	67.5		mg/Kg	☼	96	75 - 125	6	20
Molybdenum	2.2		51.3	50.9		mg/Kg	☼	95	75 - 125	5	20
Nickel	29	F1	51.3	94.3	F1	mg/Kg	☼	127	75 - 125	4	20
Selenium	2.1	J	51.3	46.1		mg/Kg	☼	86	75 - 125	7	20
Thallium	ND		51.3	48.1		mg/Kg	☼	94	75 - 125	3	20
Vanadium	65		51.3	127		mg/Kg	☼	122	75 - 125	2	20
Zinc	110	F1	51.3	188	F1	mg/Kg	☼	160	75 - 125	1	20
Silver	ND		25.7	23.1		mg/Kg	☼	90	75 - 125	3	20

Lab Sample ID: MB 440-422409/1-A
Matrix: Water
Analysis Batch: 422577

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 422409

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.010	0.0060	mg/L		08/10/17 08:38	08/10/17 17:53	1
Arsenic	ND		0.010	0.0089	mg/L		08/10/17 08:38	08/10/17 17:53	1
Barium	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 17:53	1
Beryllium	ND		0.0020	0.0010	mg/L		08/10/17 08:38	08/10/17 17:53	1
Cadmium	ND		0.0050	0.0025	mg/L		08/10/17 08:38	08/10/17 17:53	1
Chromium	ND		0.0050	0.0025	mg/L		08/10/17 08:38	08/10/17 17:53	1
Cobalt	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 17:53	1
Copper	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 17:53	1
Lead	ND		0.0050	0.0038	mg/L		08/10/17 08:38	08/10/17 17:53	1
Molybdenum	ND		0.020	0.010	mg/L		08/10/17 08:38	08/10/17 17:53	1
Nickel	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 17:53	1
Selenium	ND		0.010	0.0087	mg/L		08/10/17 08:38	08/10/17 17:53	1
Thallium	ND		0.010	0.0080	mg/L		08/10/17 08:38	08/10/17 17:53	1
Vanadium	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 17:53	1
Zinc	ND		0.020	0.012	mg/L		08/10/17 08:38	08/10/17 17:53	1
Silver	ND		0.010	0.0050	mg/L		08/10/17 08:38	08/10/17 17:53	1

Lab Sample ID: LCS 440-422409/2-A
Matrix: Water
Analysis Batch: 422577

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 422409

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	1.00	0.986		mg/L		99	80 - 120
Arsenic	1.00	1.01		mg/L		101	80 - 120
Barium	1.00	1.01		mg/L		101	80 - 120
Beryllium	1.00	0.993		mg/L		99	80 - 120

Method: 6010B - Metals (ICP) (Continued)

Lab Sample ID: LCS 440-422409/2-A
Matrix: Water
Analysis Batch: 422577

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 422409

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cadmium	1.00	1.01		mg/L		101	80 - 120
Chromium	1.00	1.00		mg/L		100	80 - 120
Cobalt	1.00	1.01		mg/L		101	80 - 120
Copper	1.00	0.998		mg/L		100	80 - 120
Lead	1.00	1.01		mg/L		101	80 - 120
Molybdenum	1.00	1.00		mg/L		100	80 - 120
Nickel	1.00	1.01		mg/L		101	80 - 120
Selenium	1.00	0.975		mg/L		97	80 - 120
Thallium	1.00	0.998		mg/L		100	80 - 120
Vanadium	1.00	0.996		mg/L		100	80 - 120
Zinc	1.00	1.01		mg/L		101	80 - 120
Silver	0.500	0.492		mg/L		98	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 440-421693/1-A
Matrix: Water
Analysis Batch: 423141

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 421693

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		08/07/17 11:51	08/07/17 17:22	1

Lab Sample ID: LCS 440-421693/2-A
Matrix: Water
Analysis Batch: 423141

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 421693

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00800	0.00741		mg/L		93	80 - 120

Lab Sample ID: MB 440-423126/1-A
Matrix: Water
Analysis Batch: 423275

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 423126

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		08/14/17 12:10	08/14/17 22:09	1

Lab Sample ID: LCS 440-423126/2-A
Matrix: Water
Analysis Batch: 423275

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 423126

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00800	0.00783		mg/L		98	80 - 120

Lab Sample ID: MB 440-423705/1-A
Matrix: Water
Analysis Batch: 423816

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 423705

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.00010	mg/L		08/16/17 13:42	08/16/17 21:30	1

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 440-423705/2-A
Matrix: Water
Analysis Batch: 423816

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 423705

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00800	0.00771		mg/L		96	80 - 120

Method: 7471A - Mercury (CVAA)

Lab Sample ID: MB 440-422299/1-A
Matrix: Solid
Analysis Batch: 422611

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 422299

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.020	0.012	mg/Kg		08/09/17 16:52	08/10/17 19:38	1

Lab Sample ID: LCS 440-422299/2-A
Matrix: Solid
Analysis Batch: 422611

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 422299

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.800	0.872		mg/Kg		109	80 - 120

Lab Sample ID: 440-189680-40 MS
Matrix: Solid
Analysis Batch: 422611

Client Sample ID: CF-BG-04
Prep Type: Total/NA
Prep Batch: 422299

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.078		0.807	0.897		mg/Kg	☼	102	70 - 130

Lab Sample ID: 440-189680-40 MSD
Matrix: Solid
Analysis Batch: 422611

Client Sample ID: CF-BG-04
Prep Type: Total/NA
Prep Batch: 422299

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.078		0.824	0.872		mg/Kg	☼	96	70 - 130	3	20

Lab Sample ID: MB 440-422302/1-A
Matrix: Solid
Analysis Batch: 423263

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 422302

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.020	0.012	mg/Kg		08/09/17 16:59	08/14/17 20:46	1

Lab Sample ID: LCS 440-422302/2-A
Matrix: Solid
Analysis Batch: 423263

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 422302

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.800	0.766		mg/Kg		96	80 - 120

Method: 7471A - Mercury (CVAA) (Continued)

Lab Sample ID: 440-189680-33 MS
Matrix: Solid
Analysis Batch: 423263

Client Sample ID: CF-SO-01
Prep Type: Total/NA
Prep Batch: 422302

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.079		0.809	0.762		mg/Kg	☼	84	70 - 130

Lab Sample ID: 440-189680-33 MSD
Matrix: Solid
Analysis Batch: 423263

Client Sample ID: CF-SO-01
Prep Type: Total/NA
Prep Batch: 422302

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.079		0.825	0.720		mg/Kg	☼	78	70 - 130	6	20

Lab Sample ID: MB 440-422340/1-A
Matrix: Solid
Analysis Batch: 422610

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 422340

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.020	0.012	mg/Kg		08/09/17 22:26	08/10/17 17:51	1

Lab Sample ID: LCS 440-422340/2-A
Matrix: Solid
Analysis Batch: 422610

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 422340

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.800	0.804		mg/Kg		101	80 - 120

Lab Sample ID: 440-189680-50 MS
Matrix: Solid
Analysis Batch: 422610

Client Sample ID: CF-SO-12
Prep Type: Total/NA
Prep Batch: 422340

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.051		0.809	0.758		mg/Kg	☼	87	70 - 130

Lab Sample ID: 440-189680-50 MSD
Matrix: Solid
Analysis Batch: 422610

Client Sample ID: CF-SO-12
Prep Type: Total/NA
Prep Batch: 422340

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	0.051		0.809	0.822		mg/Kg	☼	95	70 - 130	8	20

Lab Sample ID: MB 440-423112/1-A
Matrix: Solid
Analysis Batch: 423270

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 423112

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.020	0.012	mg/Kg		08/14/17 11:36	08/15/17 02:05	1

Lab Sample ID: LCS 440-423112/2-A
Matrix: Solid
Analysis Batch: 423270

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 423112

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.816	0.817		mg/Kg		100	80 - 120

Lab Sample ID: MB 440-423115/1-A
Matrix: Solid
Analysis Batch: 423273

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 423115

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.020	0.012	mg/Kg		08/14/17 11:41	08/15/17 03:26	1

Lab Sample ID: LCS 440-423115/2-A
Matrix: Solid
Analysis Batch: 423273

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 423115

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Mercury			0.816	0.828		mg/Kg		101	80 - 120		

Method: Moisture - Percent Moisture

Lab Sample ID: 440-189680-21 DU
Matrix: Solid
Analysis Batch: 290877

Client Sample ID: CF-BD-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Fine Moisture	24.3			26.2		%				7	20

Lab Sample ID: 440-189680-43 DU
Matrix: Solid
Analysis Batch: 290877

Client Sample ID: CF-SD-08
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Fine Moisture	6.9			5.5	F3	%				21	20

Lab Sample ID: 440-189680-22 DU
Matrix: Solid
Analysis Batch: 422047

Client Sample ID: CF-BL-05
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Moisture	24.2			22.6		%				7	20

GC Semi VOA

Prep Batch: 290489

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-3	CF-SD-03	Total/NA	Solid	1630	
440-189680-5	CF-SD-09	Total/NA	Solid	1630	
440-189680-11	CF-SD-10	Total/NA	Solid	1630	
440-189680-18	CF-SD-11	Total/NA	Solid	1630	
440-189680-19	CF-BD-02	Total/NA	Solid	1630	
440-189680-20	CF-BD-03	Total/NA	Solid	1630	
440-189680-21	CF-BD-01	Total/NA	Solid	1630	
440-189680-22	CF-BL-05	Total/NA	Solid	1630	
440-189680-23	CF-BD-04	Total/NA	Solid	1630	
440-189680-24	CF-BD-05	Total/NA	Solid	1630	
440-189680-25	CF-SD-01	Total/NA	Solid	1630	
440-189680-26	CF-SD-07	Total/NA	Solid	1630	
440-189680-27	CF-SD-06	Total/NA	Solid	1630	
440-189680-28	CF-SD-04	Total/NA	Solid	1630	
440-189680-29	CF-SD-02	Total/NA	Solid	1630	
440-189680-43	CF-SD-08	Total/NA	Solid	1630	
MB 240-290489/1-A	Method Blank	Total/NA	Solid	1630	
LCS 240-290489/2-A	Lab Control Sample	Total/NA	Solid	1630	
440-189680-3 MS	CF-SD-03	Total/NA	Solid	1630	
440-189680-3 MSD	CF-SD-03	Total/NA	Solid	1630	
440-189680-24 MS	CF-BD-05	Total/NA	Solid	1630	
440-189680-24 MSD	CF-BD-05	Total/NA	Solid	1630	

Analysis Batch: 290529

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-18	CF-SD-11	Total/NA	Solid	1630	290489
MB 240-290489/1-A	Method Blank	Total/NA	Solid	1630	290489
LCS 240-290489/2-A	Lab Control Sample	Total/NA	Solid	1630	290489

Analysis Batch: 290646

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-3	CF-SD-03	Total/NA	Solid	1630	290489
440-189680-5	CF-SD-09	Total/NA	Solid	1630	290489
440-189680-11	CF-SD-10	Total/NA	Solid	1630	290489
440-189680-19	CF-BD-02	Total/NA	Solid	1630	290489
440-189680-20	CF-BD-03	Total/NA	Solid	1630	290489
440-189680-21	CF-BD-01	Total/NA	Solid	1630	290489
440-189680-22	CF-BL-05	Total/NA	Solid	1630	290489
440-189680-23	CF-BD-04	Total/NA	Solid	1630	290489
440-189680-24	CF-BD-05	Total/NA	Solid	1630	290489
440-189680-25	CF-SD-01	Total/NA	Solid	1630	290489
440-189680-26	CF-SD-07	Total/NA	Solid	1630	290489
440-189680-27	CF-SD-06	Total/NA	Solid	1630	290489
440-189680-28	CF-SD-04	Total/NA	Solid	1630	290489
440-189680-29	CF-SD-02	Total/NA	Solid	1630	290489
440-189680-43	CF-SD-08	Total/NA	Solid	1630	290489
440-189680-3 MS	CF-SD-03	Total/NA	Solid	1630	290489
440-189680-3 MSD	CF-SD-03	Total/NA	Solid	1630	290489
440-189680-24 MS	CF-BD-05	Total/NA	Solid	1630	290489
440-189680-24 MSD	CF-BD-05	Total/NA	Solid	1630	290489

GC Semi VOA (Continued)

Prep Batch: 290831

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-42	CF-ER-03	Total/NA	Water	1630	
440-189680-45	CF-ER-04B	Total/NA	Water	1630	
MB 240-290831/1-A	Method Blank	Total/NA	Water	1630	
LCS 240-290831/2-A	Lab Control Sample	Total/NA	Water	1630	

Analysis Batch: 291010

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-42	CF-ER-03	Total/NA	Water	1630	290831
440-189680-45	CF-ER-04B	Total/NA	Water	1630	290831
MB 240-290831/1-A	Method Blank	Total/NA	Water	1630	290831
LCS 240-290831/2-A	Lab Control Sample	Total/NA	Water	1630	290831

Metals

Prep Batch: 421693

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-12	CF-ER-01	Total/NA	Water	7470A	
440-189680-37	CF-ER-02	Total/NA	Water	7470A	
440-189680-44	CF-ER-04A	Total/NA	Water	7470A	
440-189680-53	CF-ER-05	Total/NA	Water	7470A	
MB 440-421693/1-A	Method Blank	Total/NA	Water	7470A	
LCS 440-421693/2-A	Lab Control Sample	Total/NA	Water	7470A	

Prep Batch: 422299

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-1	CF-SO-07	Total/NA	Solid	7471A	
440-189680-7	CF-SO-14	Total/NA	Solid	7471A	
440-189680-10	CF-SD-09	Total/NA	Solid	7471A	
440-189680-13	CF-SO-06	Total/NA	Solid	7471A	
440-189680-14	CF-BG-06	Total/NA	Solid	7471A	
440-189680-15	CF-BL-04	Total/NA	Solid	7471A	
440-189680-16	CF-BG-07	Total/NA	Solid	7471A	
440-189680-17	CF-BG-08	Total/NA	Solid	7471A	
440-189680-30	CF-SD-11	Total/NA	Solid	7471A	
440-189680-31	CF-SO-09	Total/NA	Solid	7471A	
440-189680-32	CF-BL-02	Total/NA	Solid	7471A	
440-189680-34	CF-BL-01	Total/NA	Solid	7471A	
440-189680-35	CF-SO-10	Total/NA	Solid	7471A	
440-189680-40	CF-BG-04	Total/NA	Solid	7471A	
440-189680-41	CF-BG-03	Total/NA	Solid	7471A	
440-189680-46	CF-SO-04	Total/NA	Solid	7471A	
440-189680-47	CF-SO-03	Total/NA	Solid	7471A	
440-189680-48	CF-SO-02	Total/NA	Solid	7471A	
440-189680-49	CF-BG-09	Total/NA	Solid	7471A	
440-189680-52	CF-BG-05	Total/NA	Solid	7471A	
MB 440-422299/1-A	Method Blank	Total/NA	Solid	7471A	
LCS 440-422299/2-A	Lab Control Sample	Total/NA	Solid	7471A	
440-189680-40 MS	CF-BG-04	Total/NA	Solid	7471A	
440-189680-40 MSD	CF-BG-04	Total/NA	Solid	7471A	

Metals (Continued)

Prep Batch: 422302

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-2	CF-SO-16	Total/NA	Solid	7471A	
440-189680-33	CF-SO-01	Total/NA	Solid	7471A	
440-189680-36	CF-BG-02	Total/NA	Solid	7471A	
440-189680-38	CF-SO-11	Total/NA	Solid	7471A	
440-189680-39	CF-BG-01	Total/NA	Solid	7471A	
440-189680-51	CF-SO-05	Total/NA	Solid	7471A	
MB 440-422302/1-A	Method Blank	Total/NA	Solid	7471A	
LCS 440-422302/2-A	Lab Control Sample	Total/NA	Solid	7471A	
440-189680-33 MS	CF-SO-01	Total/NA	Solid	7471A	
440-189680-33 MSD	CF-SO-01	Total/NA	Solid	7471A	

Prep Batch: 422340

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-4	CF-SO-08	Total/NA	Solid	7471A	
440-189680-6	CF-SO-13	Total/NA	Solid	7471A	
440-189680-8	CF-BG-10	Total/NA	Solid	7471A	
440-189680-9	CF-SO-15	Total/NA	Solid	7471A	
440-189680-50	CF-SO-12	Total/NA	Solid	7471A	
MB 440-422340/1-A	Method Blank	Total/NA	Solid	7471A	
LCS 440-422340/2-A	Lab Control Sample	Total/NA	Solid	7471A	
440-189680-50 MS	CF-SO-12	Total/NA	Solid	7471A	
440-189680-50 MSD	CF-SO-12	Total/NA	Solid	7471A	

Prep Batch: 422409

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-12	CF-ER-01	Total Recoverable	Water	3005A	
440-189680-37	CF-ER-02	Total Recoverable	Water	3005A	
440-189680-44	CF-ER-04A	Total Recoverable	Water	3005A	
440-189680-53	CF-ER-05	Total Recoverable	Water	3005A	
MB 440-422409/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 440-422409/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 422535

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-8	CF-BG-10	Total/NA	Solid	3050B	
440-189680-14	CF-BG-06	Total/NA	Solid	3050B	
440-189680-15	CF-BL-04	Total/NA	Solid	3050B	
440-189680-16	CF-BG-07	Total/NA	Solid	3050B	
440-189680-17	CF-BG-08	Total/NA	Solid	3050B	
440-189680-31	CF-SO-09	Total/NA	Solid	3050B	
440-189680-32	CF-BL-02	Total/NA	Solid	3050B	
440-189680-33	CF-SO-01	Total/NA	Solid	3050B	
440-189680-34	CF-BL-01	Total/NA	Solid	3050B	
440-189680-36	CF-BG-02	Total/NA	Solid	3050B	
440-189680-39	CF-BG-01	Total/NA	Solid	3050B	
440-189680-40	CF-BG-04	Total/NA	Solid	3050B	
440-189680-41	CF-BG-03	Total/NA	Solid	3050B	
440-189680-49	CF-BG-09	Total/NA	Solid	3050B	
440-189680-52	CF-BG-05	Total/NA	Solid	3050B	
MB 440-422535/1-A ^5	Method Blank	Total/NA	Solid	3050B	
LCS 440-422535/2-A ^5	Lab Control Sample	Total/NA	Solid	3050B	

Metals (Continued)

Prep Batch: 422535 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-8 MS	CF-BG-10	Total/NA	Solid	3050B	
440-189680-8 MSD	CF-BG-10	Total/NA	Solid	3050B	

Analysis Batch: 422577

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-12	CF-ER-01	Total Recoverable	Water	6010B	422409
440-189680-37	CF-ER-02	Total Recoverable	Water	6010B	422409
440-189680-44	CF-ER-04A	Total Recoverable	Water	6010B	422409
440-189680-53	CF-ER-05	Total Recoverable	Water	6010B	422409
MB 440-422409/1-A	Method Blank	Total Recoverable	Water	6010B	422409
LCS 440-422409/2-A	Lab Control Sample	Total Recoverable	Water	6010B	422409

Analysis Batch: 422610

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-4	CF-SO-08	Total/NA	Solid	7471A	422340
440-189680-6	CF-SO-13	Total/NA	Solid	7471A	422340
440-189680-8	CF-BG-10	Total/NA	Solid	7471A	422340
440-189680-9	CF-SO-15	Total/NA	Solid	7471A	422340
440-189680-50	CF-SO-12	Total/NA	Solid	7471A	422340
MB 440-422340/1-A	Method Blank	Total/NA	Solid	7471A	422340
LCS 440-422340/2-A	Lab Control Sample	Total/NA	Solid	7471A	422340
440-189680-50 MS	CF-SO-12	Total/NA	Solid	7471A	422340
440-189680-50 MSD	CF-SO-12	Total/NA	Solid	7471A	422340

Analysis Batch: 422611

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-1	CF-SO-07	Total/NA	Solid	7471A	422299
440-189680-7	CF-SO-14	Total/NA	Solid	7471A	422299
440-189680-10	CF-SD-09	Total/NA	Solid	7471A	422299
440-189680-13	CF-SO-06	Total/NA	Solid	7471A	422299
440-189680-14	CF-BG-06	Total/NA	Solid	7471A	422299
440-189680-15	CF-BL-04	Total/NA	Solid	7471A	422299
440-189680-16	CF-BG-07	Total/NA	Solid	7471A	422299
440-189680-17	CF-BG-08	Total/NA	Solid	7471A	422299
440-189680-30	CF-SD-11	Total/NA	Solid	7471A	422299
440-189680-31	CF-SO-09	Total/NA	Solid	7471A	422299
440-189680-32	CF-BL-02	Total/NA	Solid	7471A	422299
440-189680-34	CF-BL-01	Total/NA	Solid	7471A	422299
440-189680-35	CF-SO-10	Total/NA	Solid	7471A	422299
440-189680-40	CF-BG-04	Total/NA	Solid	7471A	422299
440-189680-41	CF-BG-03	Total/NA	Solid	7471A	422299
440-189680-46	CF-SO-04	Total/NA	Solid	7471A	422299
440-189680-47	CF-SO-03	Total/NA	Solid	7471A	422299
440-189680-48	CF-SO-02	Total/NA	Solid	7471A	422299
440-189680-49	CF-BG-09	Total/NA	Solid	7471A	422299
440-189680-52	CF-BG-05	Total/NA	Solid	7471A	422299
MB 440-422299/1-A	Method Blank	Total/NA	Solid	7471A	422299
LCS 440-422299/2-A	Lab Control Sample	Total/NA	Solid	7471A	422299
440-189680-40 MS	CF-BG-04	Total/NA	Solid	7471A	422299
440-189680-40 MSD	CF-BG-04	Total/NA	Solid	7471A	422299

Metals (Continued)

Analysis Batch: 422971

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-8	CF-BG-10	Total/NA	Solid	6010B	422535
440-189680-14	CF-BG-06	Total/NA	Solid	6010B	422535
440-189680-15	CF-BL-04	Total/NA	Solid	6010B	422535
440-189680-16	CF-BG-07	Total/NA	Solid	6010B	422535
440-189680-17	CF-BG-08	Total/NA	Solid	6010B	422535
440-189680-31	CF-SO-09	Total/NA	Solid	6010B	422535
440-189680-32	CF-BL-02	Total/NA	Solid	6010B	422535
440-189680-33	CF-SO-01	Total/NA	Solid	6010B	422535
440-189680-34	CF-BL-01	Total/NA	Solid	6010B	422535
440-189680-36	CF-BG-02	Total/NA	Solid	6010B	422535
440-189680-39	CF-BG-01	Total/NA	Solid	6010B	422535
440-189680-40	CF-BG-04	Total/NA	Solid	6010B	422535
440-189680-41	CF-BG-03	Total/NA	Solid	6010B	422535
440-189680-49	CF-BG-09	Total/NA	Solid	6010B	422535
440-189680-52	CF-BG-05	Total/NA	Solid	6010B	422535
MB 440-422535/1-A ^5	Method Blank	Total/NA	Solid	6010B	422535
LCS 440-422535/2-A ^5	Lab Control Sample	Total/NA	Solid	6010B	422535
440-189680-8 MS	CF-BG-10	Total/NA	Solid	6010B	422535
440-189680-8 MSD	CF-BG-10	Total/NA	Solid	6010B	422535

Prep Batch: 423112

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-3	CF-SD-03	Total/NA	Solid	7471A	
440-189680-11	CF-SD-10	Total/NA	Solid	7471A	
440-189680-19	CF-BD-02	Total/NA	Solid	7471A	
440-189680-20	CF-BD-03	Total/NA	Solid	7471A	
440-189680-21	CF-BD-01	Total/NA	Solid	7471A	
440-189680-22	CF-BL-05	Total/NA	Solid	7471A	
440-189680-23	CF-BD-04	Total/NA	Solid	7471A	
440-189680-24	CF-BD-05	Total/NA	Solid	7471A	
440-189680-25	CF-SD-01	Total/NA	Solid	7471A	
440-189680-26	CF-SD-07	Total/NA	Solid	7471A	
440-189680-27	CF-SD-06	Total/NA	Solid	7471A	
440-189680-28	CF-SD-04	Total/NA	Solid	7471A	
MB 440-423112/1-A	Method Blank	Total/NA	Solid	7471A	
LCS 440-423112/2-A	Lab Control Sample	Total/NA	Solid	7471A	

Prep Batch: 423115

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-29	CF-SD-02	Total/NA	Solid	7471A	
440-189680-43	CF-SD-08	Total/NA	Solid	7471A	
MB 440-423115/1-A	Method Blank	Total/NA	Solid	7471A	
LCS 440-423115/2-A	Lab Control Sample	Total/NA	Solid	7471A	

Prep Batch: 423126

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-56	EB2	Total/NA	Water	7470A	
MB 440-423126/1-A	Method Blank	Total/NA	Water	7470A	
LCS 440-423126/2-A	Lab Control Sample	Total/NA	Water	7470A	

Metals (Continued)

Analysis Batch: 423141

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-12	CF-ER-01	Total/NA	Water	7470A	421693
440-189680-37	CF-ER-02	Total/NA	Water	7470A	421693
440-189680-44	CF-ER-04A	Total/NA	Water	7470A	421693
440-189680-53	CF-ER-05	Total/NA	Water	7470A	421693
MB 440-421693/1-A	Method Blank	Total/NA	Water	7470A	421693
LCS 440-421693/2-A	Lab Control Sample	Total/NA	Water	7470A	421693

Analysis Batch: 423263

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-2	CF-SO-16	Total/NA	Solid	7471A	422302
440-189680-33	CF-SO-01	Total/NA	Solid	7471A	422302
440-189680-36	CF-BG-02	Total/NA	Solid	7471A	422302
440-189680-38	CF-SO-11	Total/NA	Solid	7471A	422302
440-189680-39	CF-BG-01	Total/NA	Solid	7471A	422302
440-189680-51	CF-SO-05	Total/NA	Solid	7471A	422302
MB 440-422302/1-A	Method Blank	Total/NA	Solid	7471A	422302
LCS 440-422302/2-A	Lab Control Sample	Total/NA	Solid	7471A	422302
440-189680-33 MS	CF-SO-01	Total/NA	Solid	7471A	422302
440-189680-33 MSD	CF-SO-01	Total/NA	Solid	7471A	422302

Analysis Batch: 423270

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-3	CF-SD-03	Total/NA	Solid	7471A	423112
440-189680-11	CF-SD-10	Total/NA	Solid	7471A	423112
440-189680-19	CF-BD-02	Total/NA	Solid	7471A	423112
440-189680-20	CF-BD-03	Total/NA	Solid	7471A	423112
440-189680-21	CF-BD-01	Total/NA	Solid	7471A	423112
440-189680-22	CF-BL-05	Total/NA	Solid	7471A	423112
440-189680-23	CF-BD-04	Total/NA	Solid	7471A	423112
440-189680-24	CF-BD-05	Total/NA	Solid	7471A	423112
440-189680-25	CF-SD-01	Total/NA	Solid	7471A	423112
440-189680-26	CF-SD-07	Total/NA	Solid	7471A	423112
440-189680-27	CF-SD-06	Total/NA	Solid	7471A	423112
440-189680-28	CF-SD-04	Total/NA	Solid	7471A	423112
MB 440-423112/1-A	Method Blank	Total/NA	Solid	7471A	423112
LCS 440-423112/2-A	Lab Control Sample	Total/NA	Solid	7471A	423112

Analysis Batch: 423273

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-29	CF-SD-02	Total/NA	Solid	7471A	423115
440-189680-43	CF-SD-08	Total/NA	Solid	7471A	423115
MB 440-423115/1-A	Method Blank	Total/NA	Solid	7471A	423115
LCS 440-423115/2-A	Lab Control Sample	Total/NA	Solid	7471A	423115

Analysis Batch: 423275

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-56	EB2	Total/NA	Water	7470A	423126
MB 440-423126/1-A	Method Blank	Total/NA	Water	7470A	423126
LCS 440-423126/2-A	Lab Control Sample	Total/NA	Water	7470A	423126

Metals (Continued)

Prep Batch: 423705

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-55	EB1	Total/NA	Water	7470A	
MB 440-423705/1-A	Method Blank	Total/NA	Water	7470A	
LCS 440-423705/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 423816

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-55	EB1	Total/NA	Water	7470A	423705
MB 440-423705/1-A	Method Blank	Total/NA	Water	7470A	423705
LCS 440-423705/2-A	Lab Control Sample	Total/NA	Water	7470A	423705

General Chemistry

Analysis Batch: 290877

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-3	CF-SD-03	Total/NA	Solid	Moisture	
440-189680-5	CF-SD-09	Total/NA	Solid	Moisture	
440-189680-11	CF-SD-10	Total/NA	Solid	Moisture	
440-189680-18	CF-SD-11	Total/NA	Solid	Moisture	
440-189680-19	CF-BD-02	Total/NA	Solid	Moisture	
440-189680-20	CF-BD-03	Total/NA	Solid	Moisture	
440-189680-21	CF-BD-01	Total/NA	Solid	Moisture	
440-189680-22	CF-BL-05	Total/NA	Solid	Moisture	
440-189680-23	CF-BD-04	Total/NA	Solid	Moisture	
440-189680-24	CF-BD-05	Total/NA	Solid	Moisture	
440-189680-25	CF-SD-01	Total/NA	Solid	Moisture	
440-189680-26	CF-SD-07	Total/NA	Solid	Moisture	
440-189680-27	CF-SD-06	Total/NA	Solid	Moisture	
440-189680-28	CF-SD-04	Total/NA	Solid	Moisture	
440-189680-29	CF-SD-02	Total/NA	Solid	Moisture	
440-189680-43	CF-SD-08	Total/NA	Solid	Moisture	
440-189680-21 DU	CF-BD-01	Total/NA	Solid	Moisture	
440-189680-43 DU	CF-SD-08	Total/NA	Solid	Moisture	

Analysis Batch: 422047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-22	CF-BL-05	Total/NA	Solid	Moisture	
440-189680-23	CF-BD-04	Total/NA	Solid	Moisture	
440-189680-24	CF-BD-05	Total/NA	Solid	Moisture	
440-189680-25	CF-SD-01	Total/NA	Solid	Moisture	
440-189680-26	CF-SD-07	Total/NA	Solid	Moisture	
440-189680-27	CF-SD-06	Total/NA	Solid	Moisture	
440-189680-28	CF-SD-04	Total/NA	Solid	Moisture	
440-189680-29	CF-SD-02	Total/NA	Solid	Moisture	
440-189680-30	CF-SD-11	Total/NA	Solid	Moisture	
440-189680-31	CF-SO-09	Total/NA	Solid	Moisture	
440-189680-32	CF-BL-02	Total/NA	Solid	Moisture	
440-189680-33	CF-SO-01	Total/NA	Solid	Moisture	
440-189680-34	CF-BL-01	Total/NA	Solid	Moisture	
440-189680-35	CF-SO-10	Total/NA	Solid	Moisture	
440-189680-36	CF-BG-02	Total/NA	Solid	Moisture	

General Chemistry (Continued)

Analysis Batch: 422047 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-38	CF-SO-11	Total/NA	Solid	Moisture	
440-189680-39	CF-BG-01	Total/NA	Solid	Moisture	
440-189680-40	CF-BG-04	Total/NA	Solid	Moisture	
440-189680-46	CF-SO-04	Total/NA	Solid	Moisture	
440-189680-48	CF-SO-02	Total/NA	Solid	Moisture	
440-189680-22 DU	CF-BL-05	Total/NA	Solid	Moisture	

Analysis Batch: 422059

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-13	CF-SO-06	Total/NA	Solid	Moisture	
440-189680-14	CF-BG-06	Total/NA	Solid	Moisture	
440-189680-15	CF-BL-04	Total/NA	Solid	Moisture	
440-189680-16	CF-BG-07	Total/NA	Solid	Moisture	
440-189680-17	CF-BG-08	Total/NA	Solid	Moisture	
440-189680-19	CF-BD-02	Total/NA	Solid	Moisture	
440-189680-20	CF-BD-03	Total/NA	Solid	Moisture	
440-189680-21	CF-BD-01	Total/NA	Solid	Moisture	
440-189680-41	CF-BG-03	Total/NA	Solid	Moisture	
440-189680-43	CF-SD-08	Total/NA	Solid	Moisture	
440-189680-47	CF-SO-03	Total/NA	Solid	Moisture	
440-189680-49	CF-BG-09	Total/NA	Solid	Moisture	
440-189680-50	CF-SO-12	Total/NA	Solid	Moisture	
440-189680-51	CF-SO-05	Total/NA	Solid	Moisture	
440-189680-52	CF-BG-05	Total/NA	Solid	Moisture	

Analysis Batch: 423502

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-1	CF-SO-07	Total/NA	Solid	Moisture	
440-189680-2	CF-SO-16	Total/NA	Solid	Moisture	
440-189680-3	CF-SD-03	Total/NA	Solid	Moisture	
440-189680-4	CF-SO-08	Total/NA	Solid	Moisture	
440-189680-6	CF-SO-13	Total/NA	Solid	Moisture	
440-189680-7	CF-SO-14	Total/NA	Solid	Moisture	
440-189680-9	CF-SO-15	Total/NA	Solid	Moisture	
440-189680-10	CF-SD-09	Total/NA	Solid	Moisture	
440-189680-11	CF-SD-10	Total/NA	Solid	Moisture	

Analysis Batch: 424071

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-189680-8	CF-BG-10	Total/NA	Solid	Moisture	

Qualifiers

GC Semi VOA

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.
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.

General Chemistry

Qualifier	Qualifier Description
F3	Duplicate RPD exceeds the control limit

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	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
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 (Radiochemistry)
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)

Accreditation/Certification Summary

Client: Avatar Environmental LLC
TestAmerica Job ID: 440-189680-1
Project/Site: National Park Service - Whiskeytown, CA

Laboratory: TestAmerica Irvine

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	CA01531	06-30-18 *
Arizona	State Program	9	AZ0671	10-14-17
California	LA Cty Sanitation Districts	9	10256	06-30-18
California	State Program	9	CA ELAP 2706	06-30-18
Guam	State Program	9	Cert. No. 17-003R	01-23-18
Hawaii	State Program	9	N/A	01-29-18
Kansas	NELAP Secondary AB	7	E-10420	07-31-17 *
Nevada	State Program	9	CA015312018-1	07-31-18 *
New Mexico	State Program	6	N/A	01-29-18 *
Northern Mariana Islands	State Program	9	MP0002	01-29-17 *
Oregon	NELAP	10	4028	01-29-18
USDA	Federal		P330-15-00184	07-08-18
Washington	State Program	10	C900	09-03-17 *

Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-18
Connecticut	State Program	1	PH-0590	12-31-17 *
Florida	NELAP	4	E87225	06-30-18
Illinois	NELAP	5	200004	07-31-18
Kansas	NELAP	7	E-10336	01-31-18 *
Kentucky (UST)	State Program	4	58	02-23-18
Kentucky (WW)	State Program	4	98016	12-31-17 *
Minnesota	NELAP	5	039-999-348	12-31-17 *
Minnesota (Petrofund)	State Program	1	3506	07-31-17 *
Nevada	State Program	9	OH-000482008A	07-31-18
New Jersey	NELAP	2	OH001	06-30-18
New York	NELAP	2	10975	03-31-18
Ohio VAP	State Program	5	CL0024	09-14-17 *
Oregon	NELAP	10	4062	02-23-18
Pennsylvania	NELAP	3	68-00340	08-31-17 *
Texas	NELAP	6	T104704517-15-5	08-31-17 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-17 *
Washington	State Program	10	C971	01-12-18 *
West Virginia DEP	State Program	3	210	12-31-17 *
Wisconsin	State Program	5	999518190	08-31-17 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Job 189680

Jar#	Sample Description:	Lab ID	Sample Date & Sampling Time:	Time in oven	Start Temp	Weight of Sample+Jar	Weight of empty jar	Weight of Sieved Sample	Weight of non sieved (total weight -Jar-Sieved)	comments
				8/11/2017						
1	CF-SD-03	440-189680-3	8/2/2017 8:20	19:42	103	319.22	186.51	65.93	66.78	
2	CF-SD-10	440-189680-11	8/2/2017 13:30	19:42	103	349.26	177.36	32.81	139.09	
3	CF-BD-02	440-189680-19	8/3/2017 7:30	19:42	103	305.8	185.08	76.72	44	
4	CF-BD-03	440-189680-20	8/3/2017 7:45	19:42	103	305.79	177.17	67.16	61.46	
5	CF-BD-01	440-189680-21	8/3/2017 8:10	19:42	103	340.69	178.7	53.75	108.24	
6	CF-BL-05	440-189680-22	8/3/2017 8:15	19:42	103	345	177.57	59.71	107.72	
7	CF-BD-04	440-189680-23	8/3/2017 10:10	19:42	103	319.11	178.51	58.37	82.23	
8	CF-BD-05	440-189680-24	8/3/2017 10:25	19:42	103	314.71	185.05	18.11	111.55	
9	CF-BD-01	440-189680-25	8/3/2017 11:00	19:42	103	385.07	184.75	21.13	179.19	
10	CF-BD-07	440-189680-26	8/3/2017 12:10	19:42	103	297.54	177.51	53.02	67.01	
11	CF-SD-06	440-189680-27	8/3/2017 12:20	19:42	103	294.2	177.81	73.83	42.56	
12	CF-SD-04	440-189680-28	8/3/2017 12:40	19:42	103	399.17	188.82	114.24	96.11	
13	CF-SD-02	440-189680-29	8/3/2017 13:00	19:42	103	272.09	184.97	84.21	2.91	
14	CF-SD-08	440-189680-43	8/4/2017 6:50	19:42	103	343.51	185.16	142.03	16.32	

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

440-189680 Chain of Custody

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Nicole Hastings-Bethel	Lab PM: Davidkova, Lena	COC No: 440-125638-22573.5
Client Contact: Kristina Early	Phone: 805-801-4998	E-Mail: lena.davidkova@testamericainc.com	Page: Page ~~5 of 8~~ 1 of 7
Company: Avatar Environmental LLC			Job #:
Address: 107 S Church Street	Due Date Requested:		
City: West Chester	TAT Requested (days):		
State, Zip: PA, 19382			
Phone:	PO #: Purchase Order Requested		
Email: kearly@avatarenviro.com	WO #:		
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190		
Site:	SSOW#:		

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 7471A CAM 17 Mercury	7471A - Local Method	1630 - Local Method methyl mercury	6010B, 7470A CAM 17	1630 - methyl mercury	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	A		
CF-SO-07	8-2-17	700	C	Solid				X				1	
CF-SO-16		748	C	Solid				X				1	
CF-SD-03		820	G	Solid				X	X			2	sieve bulk sample #40
CF-SO-08		910	C	Solid				X				1	
CF-SD-09		1140	G	Solid					X			1	
CF-SO-13		1215	C	Solid				X				1	
CF-SO-14		1225	C	Solid				X				1	
CF-BG-10		1235	C	Solid			X	X				1	4 oz sample jar
CF-SO-15		1245	C	Solid				X				1	
CF-SD-09		1255	G	Solid				X				1	
CF-SD-10		1310	G	Solid				X	X			2	sieve bulk sample #40

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

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

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:		Date:		Time:		Method of Shipment:	
Relinquished by:		Date/Time: 8/4/17 1500	Company Geocon	Received by: FedEx		Date/Time: 8/4/17 1500	Company
Relinquished by:		Date/Time:	Company	Received by:		Date/Time: 8/5/17 10:40	Company TAI
Relinquished by:		Date/Time:	Company	Received by:		Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 16.4/16.7 IR85 No ice

7653 3170 4350

8/29/2017

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: M. Hastings-Bethel	Lab PM: Davidkova, Lena	Carrier Tracking No(s):	COC No. 440-125638-22573.5
Client Contact: Kristina Early	Phone: 805-801-4998	E-Mail: lena.davidkova@testamericainc.com		Page: Page 2 of 7
Company: Avatar Environmental LLC				Job #:
Address: 107 S Church Street	Due Date Requested:			
City: West Chester	TAT Requested (days):			
State, Zip: PA, 19382				
Phone:	PO #: Purchase Order Requested			
Email: kearly@avatarenviro.com	WO #:			
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
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=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 7471A	7471A - Local Method	1630 - Local Method	6010B, 7470A	1630 -	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	A		
CF-ER-Ø1	8.2.17	1345	G	~~Soil~~ Water	N					X		2	
CF-SO-Ø6		1350	C	Solid				X				1	
CF-BG-Ø6		1415	C	Solid			X					1	
CF-BL-Ø4		1420	C	Solid			X					1	
CF-BG-Ø7		1450	C	Solid			X					1	
CF-BG-Ø8		1510	C	Solid			X					1	
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									

8/2/17

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

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

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	8/4/17 1500	Geocon	FedEx	8/4/17 1500	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
				8/5/17 10:40	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.: # 7453170 47 57

Cooler Temperature(s) °C and Other Remarks: 16.4/16.7 IR85 No ice

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: N. Hastings-Bethel	Lab PM: Davidkova, Lena	Carrier Tracking No(s):	COC No: 440-125638-22573.5
Client Contact: Kristina Early	Phone: 805.801.4998	E-Mail: lena.davidkova@testamericainc.com		Page: Page ~~5 of 8~~ 3 of 7
Company: Avatar Environmental LLC				Job #:

Address: 107 S Church Street	Due Date Requested:	Analysis Requested	Preservation Codes:
City: West Chester	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, 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, Z - other (specify)
State, Zip: PA, 19382			
Phone:	PO #: Purchase Order Requested		Other:
Email: kearly@avatarenviro.com	WO #:		
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190		
Site:	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 7471A	7471A - Local Method	1630 - Local Method	6010B, 7470A	1630 -	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	A		
CF-SD-11	8.3.17	715	G	Solid			~~X~~	~~X~~	X			1	
CF-BD-02		730	G	Solid				X	X			2	Sieve bulk Sample
CF-BD-03		745	G	Solid				X	X			2	#40
CF-BD-01		810	G	Solid				X	X			2	
CF-BL-05		815	G	Solid				X	X			2	
~~CF-SD-04~~ CF-BD-04		1010	G	Solid				X	X			2	
CF-BD-05		1025	G	Solid				X	X			2	
CF-BD-01		1100	G	Solid				X	X			2	
CF-BD-07		1210	G	Solid				X	X			2	
CF-SD-06		1220	G	Solid				X	X			2	
CF-SD-04		1240	G	Solid				X	X			2	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

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

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	8/4/17 1500	Ecocon	Fedex	8/4/17 1500	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
				8/5/17 10:40	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
	# 7453 3170 4750	16.4 / 16.7 IR 85 No ice

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: N. Hastings-Bethel	Lab PM: Davidkova, Lena	Carrier Tracking No(s):	COC No: 440-125638-22573.5
Client Contact: Kristina Early	Phone: 805.801.4998	E-Mail: lena.davidkova@testamericainc.com		Page: Page ~~5 of 8~~ 4 of 7
Company: Avatar Environmental LLC				Job #:
Address: 107 S Church Street	Due Date Requested:			
City: West Chester	TAT Requested (days):			
State, Zip: PA, 19382				
Phone:	PO #: Purchase Order Requested			
Email: kearly@avatarenviro.com	WO #:			
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
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=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 7471A	7471A - Local Method	1630 - Local Method	6010B, 7470A	1630 -	Total Number of containers	Special Instructions/Note:
Preservation Code:							N	N	N	D	A		
CF-SD-02	8.3.17	1300	G	Solid				X	X			2	Sieve bulk sample #40
CF-SD-11		1500	C	Solid				X				1	
CF-SD-09		1505	C	Solid			X					1	
CF-BL-02		1510	C	Solid			X					1	
CF-SD-01		1515	C	Solid			X					1	
CF-BL-01		1520	C	Solid			X					1	
CF-SD-10		1525	C	Solid				X				1	
CF-BG-02		1535	C	Solid			X					1	
CF-ER-02		1545	G	~~Solid~~ Water	N					X		2	
CF-SD-11		1555	C	Solid				X				1	
CF-BG-01		1600	C	Solid			X					1	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

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

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		8/4/17 1500	Geocon	FedEx	8/4/17 1500	
2					8/5/17 10:40	TAT
3						

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.: # 7453 3170 4750

Cooler Temperature(s) °C and Other Remarks: (CS) 16.4/16.7 IR85

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Nicole Hastings-Bethel	Lab PM: Davidkova, Lena	Carrier Tracking No(s):	COC No: 440-125638-22573.5
Client Contact: Kristina Early	Phone: 805-801-4998	E-Mail: lena.davidkova@testamericainc.com		Page: Page ~~6 of 6~~ 5 of 7
Company: Avatar Environmental LLC				Job #:
Address: 107 S Church Street	Due Date Requested:			
City: West Chester	TAT Requested (days):			
State, Zip: PA, 19382				
Phone:	PO #: Purchase Order Requested			
Email: kearly@avatarenviro.com	WO #:			
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
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=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 7471A	7471A - Local Method	1630 - Local Method	6010B, 7470A	1630 -	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	A		
CF-BG-04	8.3.17	~~Hold~~	C	Solid			X					1	
~~CF-SO-02~~	↓	~~1025~~	C	Solid				X				1	~~WA~~
CF-BG-03	↓	1635	C	Solid			X					1	
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									

Client Left 8/3/17

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

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

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Client	8/4/17 1500	Client	Fedex	8/4/17 1500	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
				8/5/17 10:40	TAI
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 16.4/16.7 IR 85 No ice

76537 317; 6745

8/29/2017

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: N. Hastings - Bethel	Lab PM: Davidkova, Lena	Carrier Tracking No(s):	COC No: 440-125638-22573.5
Client Contact: Kristina Early	Phone: 805-801-4998	E-Mail: lena.davidkova@testamericainc.com		Page: ~~Page 5 of 8~~ 6 of 7
Company: Avatar Environmental LLC				Job #:

Address: 107 S Church Street	Due Date Requested:	
City: West Chester	TAT Requested (days):	
State, Zip: PA, 19382		
Phone:	PO #: Purchase Order Requested	
Email: kearly@avatarenviro.com	WO #:	
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190	
Site:	SSOW#:	

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
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=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 7471A	7471A - Local Method	1630 - Local Method	6010B, 7470A	1630 -	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	A		
CF-ER-Ø3	8.4.17	645	G	~~Solid~~ Water	N						X	3	
CF-SD-Ø8		650	G	Solid				X	X			2	sieve bulk sample #40
CF-ER-Ø4A		850	G	~~Solid~~ Water	N					X		2	
CF-ER-Ø4B		855	G	~~Solid~~ Water	N						X	3	
CF-SO-Ø4		900	C	Solid				X				1	
CF-SO-Ø3		910	C	Solid				X				1	
CF-SO-Ø2		925	C	Solid				X				1	
CF-BG-Ø9		930	C	Solid			X					1	
CF-SO-13		940	C	Solid				X				1	
CF-SO-Ø5		950	C	Solid				X				1	
CF-BG-Ø5	↓	955	C	Solid			X					1	

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

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

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	8/4/17 1500	Geocon	FedEx	8/4/17 1500	
2				[signature]	8/5/17 10:40	TAT
3						

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 16.4/16.7 IR85 No ice

76 59 2170 4753

8/29/2017

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: N. Hastings-Bethel	Lab PM: Davidkova, Lena	Carrier Tracking No(s):	COC No: 440-125638-22573.5
Client Contact: Kristina Early	Phone: 805-801-4998	E-Mail: lena.davidkova@testamericainc.com		Page: Page ~~6 of 6~~ 7 of 7
Company: Avatar Environmental LLC				Job #:
Address: 107 S Church Street	Due Date Requested:			
City: West Chester	TAT Requested (days):			
State, Zip: PA, 19382				
Phone:	PO #: Purchase Order Requested			
Email: kearly@avatarenviro.com	WO #:			
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190			
Site:	SSOW#:			

Analysis Requested

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 - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 7471A	7471A - Local Method	1630 - Local Method	6010B, 7470A	1630 -	Total Number of containers	Special Instructions/Note:
Preservation Code:							N	N	N	D	A		
CF-ER-05	8-4-17	1005	G	~~Solid~~ W	N					X		2	
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									

8/4/17

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

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

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1		8/4/17 1500	Beacon	Fedex	8/4/17 1500	
2					8/5/17 10:40	TAI
3						

Custody Seals Intact: △ Yes △ No

Custody Seal No.: # 3457 3170 4750

Cooler Temperature(s) °C and Other Remarks: 16.4 / 16.7 IR8J 40 Ice

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

440-189680 Chain of Custody

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Nicole Hastings-Bethel	Lab PM: Davidkova, Lena	COC No: 440-125638-22573.5
Client Contact: Kristina Early	Phone: 805-801-4998	E-Mail: lena.davidkova@testamericainc.com	Page: Page ~~5 of 8~~ 1 of 7
Company: Avatar Environmental LLC			Job #:
Address: 107 S Church Street	Due Date Requested:		
City: West Chester	TAT Requested (days):		
State, Zip: PA, 19382			
Phone:	PO #: Purchase Order Requested		
Email: kearly@avatarenviro.com	WO #:		
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
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=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 7471A CAM 17 Mercury	7471A - Local Method	1630 - Local Method methylmercury	6010B, 7470A CAM 17	1630 - methylmercury	Total Number of containers	Special Instructions/Note:
Preservation Code:							N	N	N	D	A		
CF-SO-07	8-2-17	700	C	Solid				X				1	
CF-SO-16		748	C	Solid				X				1	
CF-SD-03		820	G	Solid				X	X			2	Sieve bulk sample #40
CF-SO-08		910	C	Solid				X				1	
CF-SD-09		1140	G	Solid					X			1	
CF-SO-13		1215	C	Solid				X				1	
CF-SO-14		1225	C	Solid				X				1	
CF-BG-10		1235	C	Solid			X	X				1	4 oz sample jar
CF-SO-15		1245	C	Solid				X				1	
CF-SD-09		1255	G	Solid				X				1	
CF-SD-10	↓	1310	G	Solid				X	X			2	Sieve bulk sample #40

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

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

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time	Company		Date/Time	Company
Relinquished by:	8/4/17 1500	Geocon	Received by: FedEx	8/4/17 1500	
Relinquished by:	Date/Time:	Company	Received by:	8/5/17 10:40	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 16.4/16.7 IR85 No ice

7653 3170 4350

8/29/2017

Page 77 of 89

8/5/17

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: M. Hastings-Bethel ~~HK~~	Lab PM: Davidkova, Lena	Carrier Tracking No(s)	COC No: 440-125638-22573.5
Client Contact: Kristina Early	Phone: 805-801-4998	E-Mail: lena.davidkova@testamericainc.com		Page: ~~Page 5 of 8~~ 2 of 7
Company: Avatar Environmental LLC				Job #:
Address: 107 S Church Street	Due Date Requested:			
City: West Chester	TAT Requested (days):			
State, Zip: PA, 19382				
Phone:	PO #: Purchase Order Requested			
Email: kearly@avatarenviro.com	WO #:			
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
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=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 7471A	7471A - Local Method	1630 - Local Method	6010B, 7470A	1630 -	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	A		
CF-ER-01	8.2.17	1345	G	~~Solid~~ Water	N					X		2	
CF-SO-06		1350	C	Solid				X				1	
CF-BG-06		1415	C	Solid			X					1	
CF-BL-04		1420	C	Solid			X					1	
CF-BG-07		1450	C	Solid			X					1	
CF-BG-08		1510	C	Solid			X					1	
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									

8/2/17

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

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

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	8/4/17 1500	Geocon	FedEx	8/4/17 1500	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
				8/5/17 10:40	TAI
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.: # 7165 2171 4751

Cooler Temperature(s) °C and Other Remarks: (CS) 16.4/16.7 IR85 No ice

LB 8/5/17

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: N. Hastings-Bethel	Lab PM: Davidkova, Lena	Carrier Tracking No(s):	COC No: 440-125638-22573.5
Client Contact: Kristina Early	Phone: 805.801.4998	E-Mail: lena.davidkova@testamericainc.com		Page: Page ~~5 of 6~~ 3 of 7
Company: Avatar Environmental LLC		Analysis Requested		Job #:
Address: 107 S Church Street	Due Date Requested:			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 - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
City: West Chester	TAT Requested (days):			
State, Zip: PA, 19382				
Phone:	PO #: Purchase Order Requested			
Email: kearly@avatarenviro.com	WO #:			Other:
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 7471A	7471A - Local Method	1630 - Local Method	6010B, 7470A	1630 -	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	A		
CF-SD-11	8.3.17	715	G	Solid				X	X			1	
CF-BD-02		730	G	Solid				X	X			2	Sieve bulk Sample
CF-BD-03		745	G	Solid				X	X			2	#40
CF-BD-01		810	G	Solid				X	X			2	
CF-BL-05		815	G	Solid				X	X			2	
~~CF-SD-09~~ CF-BD-04		1010	G	Solid				X	X			2	
CF-BD-05		1025	G	Solid				X	X			2	
CF-BD-01		1100	G	Solid				X	X			2	
CF-BD-07		1210	G	Solid				X	X			2	
CF-SD-06		1220	G	Solid				X	X			2	
CF-SD-04		1240	G	Solid				X	X			2	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

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

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
		8/4/17 1500	Ecocon	Fedex	8/4/17 1500	
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
					8/5/17 10:40	TAT
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ☐ Yes ☐ No
Custody Seal No.: 7662 3171 4750

Cooler Temperature(s) °C and Other Remarks: 16.4 / 16.7 IR 85 (CS) Notice

8/4/17 LB

Page 79 of 89

8/29/2017

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: N. Hastings-Bethel	Lab PM: Davidkova, Lena	Carrier Tracking No(s):	COC No: 440-125638-22573.5
Client Contact: Kristina Early	Phone: 805.801.4998	E-Mail: lena.davidkova@testamericainc.com		Page: Page ~~5 of 8~~ 4 of 7
Company: Avatar Environmental LLC		Analysis Requested		Job #:
Address: 107 S Church Street	Due Date Requested:			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 - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
City: West Chester	TAT Requested (days):			
State, Zip: PA, 19382				
Phone:	PO #: Purchase Order Requested			Other:
Email: kearly@avatarenviro.com	WO #:			
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 7471A	7471A - Local Method	1630 - Local Method	6010B, 7470A	1630 -	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	N	N	D	A	X	
CF-SD-02	8.3.17	1300	G	Solid				X	X			2	Sieve bulk sample #40
CF-SD-11		1500	C	Solid				X				1	
CF-SD-09		1505	C	Solid			X					1	
CF-BL-02		1510	C	Solid			X					1	
BF-SD-01		1515	C	Solid			X					1	
CF-BL-01		1520	C	Solid			X					1	
CF-SD-10		1525	C	Solid				X				1	
CF-BG-02		1535	C	Solid			X					1	
CF-ER-02		1545	G	~~Solid~~ Water	N					X		2	
CF-SD-11		1555	C	Solid				X				1	
CF-BG-01		1600	C	Solid			X					1	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

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

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	8/4/17 1500	Geocon	FedEx	8/4/17 1500	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
			[signature]	8/5/17 10:40	TAJ
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: △ Yes △ No
Custody Seal No.: # 7653 3170 6750

Cooler Temperature(s) °C and Other Remarks: 16.4/16.7 IR85 (CS) No IR

8/5/17 LD

8/29/2017

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Nicole Hastings-Bethel	Lab PM: Davidkova, Lena	Carrier Tracking No(s):	COC No: 440-125638-22573.5
Client Contact: Kristina Early	Phone: 805-801-4998	E-Mail: lena.davidkova@testamericainc.com		Page: Page ~~5 of 6~~ 5 of 7
Company: Avatar Environmental LLC				Job #:
Address: 107 S Church Street	Due Date Requested:			
City: West Chester	TAT Requested (days):			
State, Zip: PA, 19382				
Phone:	PO #: Purchase Order Requested			
Email: kearly@avatarenviro.com	WO #:			
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
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=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 7471A	7471A - Local Method	1630 - Local Method	6010B, 7470A	1630 -	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	A		
CF-BG-04	8.3.17	~~1610~~	C	Solid			X					1	
~~CF-SG-02~~	↓	~~1625~~	C	Solid				X				1	WA
CF-BG-03	↓	1635	C	Solid			X					1	
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									

Kristina 8/3/17

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

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

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Kristina	8/4/17 1500	Geolon	Fedex	8/4/17 1500	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
				8/5/17 10:40	TA7
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
		16.4/16.7 IR 85 No ice (CS)

8/5/17 LB

8/29/2017

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: N. Hastings - Bethel	Lab PM: Davidkova, Lena	Carrier Tracking No(s):	COC No: 440-125638-22573.5
Client Contact: Kristina Early	Phone: 805-801-4998	E-Mail: lena.davidkova@testamericainc.com		Page: Page ~~5 of 8~~ 6 of 7
Company: Avatar Environmental LLC				Job #:

Address: 107 S Church Street	Due Date Requested:	Analysis Requested	Preservation Codes:
City: West Chester	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, 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, Z - other (specify)
State, Zip: PA, 19382			
Phone:	PO #: Purchase Order Requested		Other:
Email: kearly@avatarenviro.com	WO #:		
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190		
Site:	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 7471A	7471A - Local Method	1630 - Local Method	6010B, 7470A	1630 -	Total Number of containers	Special Instructions/Note:
Preservation Code:							N	N	N	D	A		
CF-ER-Ø3	8.4.17	645	G	~~Solid~~ Water	N						X	3	
CF-SD-Ø8		650	G	Solid				X	X			2	sieve bulk sample #40
CF-ER-Ø4A		850	G	~~Solid~~ Water	N					X		2	
CF-ER-Ø4B		855	G	~~Solid~~ Water	N						X	3	
CF-SO-Ø4		900	C	Solid				X				1	
CF-SO-Ø3		910	C	Solid				X				1	
CF-SO-Ø2		925	C	Solid				X				1	
CF-BG-Ø9		930	C	Solid			X					1	
CF-SO-13		940	C	Solid				X				1	
CF-SO-Ø5		950	C	Solid				X				1	
CF-BG-Ø5	↓	955	C	Solid			X					1	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

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

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	8/4/17 1500	Geocon	FedEx	8/4/17 1500	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
				8/5/17 10:40	TAT
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 16.4/16.7 IR85 No ice (CS)

8/15/17 CB

Page 82 of 89

8/29/2017

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: N. Hastings - Bethel	Lab PM: Davidkova, Lena	Carrier Tracking No(s):	COC No: 440-125638-22573.5
Client Contact: Kristina Early	Phone: 805-801-4998	E-Mail: lena.davidkova@testamericainc.com		Page: Page ~~6 of 6~~ 7 of 7
Company: Avatar Environmental LLC				Job #:
Address: 107 S Church Street	Due Date Requested:			
City: West Chester	TAT Requested (days):			
State, Zip: PA, 19382				
Phone:	PO #: Purchase Order Requested			
Email: kearly@avatarenviro.com	WO #:			
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
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=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 7471A	7471A - Local Method	1630 - Local Method	6010B, 7470A	1630 -	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	A		
CF-ER-05	8-4-17	1005	G	~~Solid~~ W	N					X		2	
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									
				Solid									

8/4/17

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

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

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	8/4/17 1500	Beacon	fedex	8/4/17 1500	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
				8/5/17 10:40	TAI
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
	# 16422170 4797	16.4 / 16.7 IR8J 140 ICE

8/5/17 CB

8/29/2017

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

Client Information	Sampler: N. Hastings-Bethel	Lab PM: Davidkova, Lena	Carrier Tracking No(s):
Client Contact: Kristina Early	Phone: 805.801.4998	E-Mail: lena.davidkova@testamericainc.com	
Company: Avatar Environmental LLC			
Address: 107 S Church Street	Due Date Requested:		
City: West Chester	TAT Requested (days):		
State, Zip: PA, 19382			
Phone:	PO #: Purchase Order Requested		
Email: kearly@avatarenviro.com	WO #:		
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190		
Site:	SSOW#:		

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 7471A	7471A - Local Method	1630 - Local Method	6010B, 7470A	1630 -
Preservation Code:							N	N	N	D	A
CF-SD-11	8.3.17	715	G	Solid				X	X		
CF-BD-02		730	G	Solid				X	X		
CF-BD-03		745	G	Solid				X	X		
CF-BD-01		810	G	Solid				X	X		
CF-BL-05		815	G	Solid				X	X		
~~CF-SD-09~~ CF-BD-04		1010	G	Solid				X	X		
CF-BD-05		1025	G	Solid				X	X		
~~CF-BD-01~~ CF-SD-01		1100	G	Solid				X	X		
~~CF-BD-07~~ CF-SD-07		1210	G	Solid				X	X		
CF-SD-06		1220	G	Solid				X	X		
CF-SD-04		1240	G	Solid				X	X		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are
☐ Return To Client ☐ Disposal By Lab

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

Client Information	Sampler: N. Hastings - Bethel	Lab PM: Davidkova, Lena	Carrier Tracking No(s):
Client Contact: Kristina Early	Phone: 805-801.4998	E-Mail: lena.davidkova@testamericainc.com	
Company: Avatar Environmental LLC			
Address: 107 S Church Street	Due Date Requested:		
City: West Chester	TAT Requested (days):		
State, Zip: PA, 19382			
Phone:	PO #: Purchase Order Requested		
Email: kearly@avatarenviro.com	WO #:		
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190		
Site:	SSOW#:		

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010B, 7471A	7471A - Local Method	1630 - Local Method	6010B, 7470A	1630 -
			Preservation Code:				N	N	N	D	A
CF-ER-Ø3	8.4.17	645	G	~~Solid~~ Water	N						X
CF-SD-Ø8		650	G	Solid				X	X		
CF-ER-Ø4A		850	G	~~Solid~~ Water	N					X	
CF-ER-Ø4B		855	G	~~Solid~~ Water	N						X
CF-SO-Ø4		900	C	Solid				X			
CF-SO-Ø3		910	C	Solid				X			
CF-SO-Ø2		925	C	Solid				X			
CF-BG-Ø9		930	C	Solid			X				
~~CF-SO-13~~ CF-SO-12		940	C	Solid				X			
CF-SO-Ø5		950	C	Solid				X			
CF-BG-Ø5		955	C	Solid			X				

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are r
☐ Return To Client ☐ Disposal By Lab ☐

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by:	Date/Time:	Company	Received by: Date/Time:

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Davidkova, Lena	Carrier Tracking No(s):	COC No: 440-113625.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: lena.davidkova@testamericainc.com	State of Origin: California	Page: Page 1 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 440-189680-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 8/14/2017			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	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 Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	1630/1630_P_USGS	1630/1630_Prep_W Methyl Mercury (GC)	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
CF-SD-03 (440-189680-3)	8/2/17	08:20 Pacific		Solid			X		1	
CF-SD-09 (440-189680-5)	8/2/17	11:40 Pacific		Solid			X		1	
CF-SD-10 (440-189680-11)	8/2/17	13:10 Pacific		Solid			X		1	
CF-SD-11 (440-189680-18)	8/3/17	07:15 Pacific		Solid			X		1	
CF-BD-02 (440-189680-19)	8/3/17	07:30 Pacific		Solid			X		1	
CF-BD-03 (440-189680-20)	8/3/17	07:45 Pacific		Solid			X		1	
CF-BD-01 (440-189680-21)	8/3/17	08:10 Pacific		Solid			X		1	
CF-BL-05 (440-189680-22)	8/3/17	08:15 Pacific		Solid			X		1	
CF-BD-04 (440-189680-23)	8/3/17	10:10 Pacific		Solid			X		1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
				8/8/17 920	TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Davidkova, Lena	Carrier Tracking No(s):	COC No: 440-113625.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: lena.davidkova@testamericainc.com	State of Origin: California	Page: Page 2 of 2
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 440-189680-1
Address: 4101 Shuffel Street NW, ,	Due Date Requested: 8/14/2017			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: National Park Service - Whiskeytown, CA	Project #: 44017190			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	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 Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	1630/1630_P_USGS	1630/1630_Prep_W Methyl Mercury (GC)	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
CF-BD-05 (440-189680-24)	8/3/17	10:25 Pacific		Solid			X		1	
CF-BD-01 (440-189680-25)	8/3/17	11:00 Pacific		Solid			X		1	
CF-BD-07 (440-189680-26)	8/3/17	12:10 Pacific		Solid			X		1	
CF-SD-06 (440-189680-27)	8/3/17	12:20 Pacific		Solid			X		1	
CF-SD-04 (440-189680-28)	8/3/17	12:40 Pacific		Solid			X		1	
CF-SD-02 (440-189680-29)	8/3/17	13:00 Pacific		Solid			X		1	
CF-ER-03 (440-189680-42)	8/4/17	06:45 Pacific		Water				X	3	
CF-SD-08 (440-189680-43)	8/4/17	06:50 Pacific		Solid			X		1	
CF-ER-04B (440-189680-45)	8/4/17	08:55 Pacific		Water				X	3	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	JuBaruh	8/3/17 17:00	TAI		8/4/17 920	TA
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** _____

Canton Facility

Client TA Irvine Site Name _____ Cooler unpacked by:

Cooler Received on 8/8/17 Opened on 8/8/17

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # _____ Foam Box Client Cooler Box Other _____

Packing material used: Bubble Wrap Foam Plastic Bag None Other _____

COOLANT: Wet Ice Blue Ice Dry Ice Water None

☐ See Multiple Cooler Form

1. Cooler temperature upon receipt
   IR GUN# IR-8 (CF -0.4 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
   IR GUN #36 (CF +0°C) Observed Cooler Temp. 2.1 °C Corrected Cooler Temp. 2.1 °C
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No

If yes, Questions 11-15 have been checked at the originating laboratory.

11. Were sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC697954
12. Were VOAs on the COC? Yes No
13. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No NA
14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No
15. Was a LL Hg or Me Hg trip blank present? _____ Yes No

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

16. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

17. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.

Sample(s) _____ were received in a broken container.

Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

18. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

Ref: SOP NC-SC-0005, Sample Receiving

\\tacorp\corp\QA\QA_Facilities\Canton-QA\Document-Management\Work-Instruction\Word Version Work Instructions\WI-NC-099-052317 Cooler Receipt Form.doc djl

Login Sample Receipt Checklist

Client: Avatar Environmental LLC

Job Number: 440-189680-1

Login Number: 189680
List Number: 1
Creator: Garcia, Veronica G

List Source: TestAmerica Irvine

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	Not Present
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.	False	Refer to Job Narrative for details.
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	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.	True	
Residual Chlorine Checked.	N/A	

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

Avatar Environmental, LLC
107 South Church St.
Westchester, PA 19382
ATTN: Ms. Sue Herbert

September 26, 2017

SUBJECT: NPS Whiskeytown, Data Validation

Dear Ms. Herbert,

Enclosed is the final validation report for the fraction listed below. This SDG was received on September 6, 2017. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #39411:

SDG #	Fraction
440-189680-1	Metals & Methyl Mercury

The data validation was performed under Level II guidelines. The analyses were validated using the following documents, as applicable to each method:

- Final Engineering Evaluation/Cost Analysis Sampling and Analysis Plan, Coggins Flat Area Placer Mine, Whiskeytown National Recreation Area, Shasta County, California, June 2017
- USEPA, Contract Laboratory Program National Functional Guidelines, for Inorganic Superfund Methods Data Review, January 2017
- EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; update IV, February 2007; update V, July 2014

Please feel free to contact us if you have any questions.

Sincerely,

Shauna McKellar
Project Manager/Chemist

89 pages-em

Attachment 1

Level II EDD

LDC #39411 (Avatar- West Chester, PA / NPS Wiskeytown)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Metals (6010B /7000)		Hg (7470A /7471A)		Methyl Hg (1630)																													
Matrix: Water/Soil				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	440-189680-1	09/06/17	09/27/17	4	15	3	30	1	16																												
Total	T/SM			4	15	3	30	1	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69

Shaded cells indicate Level IV validation (all other cells are Level II validation). These sample counts do not include MS, MSD, or DUP's.

V:\LOGIN\Avatar\NPS Whiskeytown\39411ST.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NPS Whiskeytown

LDC Report Date: September 26, 2017

Parameters: Metals & Methyl Mercury

Validation Level: Level II

Laboratory: TestAmerica, Inc.

Sample Delivery Group (SDG): 440-189680-1

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
CF-SO-07	440-189680-1	Soil	08/02/17
CF-SO-16	440-189680-2	Soil	08/02/17
CF-SD-03	440-189680-3	Soil	08/02/17
CF-SO-08	440-189680-4	Soil	08/02/17
CF-SD-09	440-189680-5	Soil	08/02/17
CF-SO-13	440-189680-6	Soil	08/02/17
CF-SO-14	440-189680-7	Soil	08/02/17
CF-BG-10	440-189680-8	Soil	08/02/17
CF-SO-15	440-189680-9	Soil	08/02/17
CF-SD-09	440-189680-10	Soil	08/02/17
CF-SD-10	440-189680-11	Soil	08/02/17
CF-ER-01	440-189680-12	Water	08/02/17
CF-SO-06	440-189680-13	Soil	08/02/17
CF-BG-06	440-189680-14	Soil	08/02/17
CF-BL-04	440-189680-15	Soil	08/02/17
CF-BG-07	440-189680-16	Soil	08/02/17
CF-BG-08	440-189680-17	Soil	08/02/17
CF-SD-11	440-189680-18	Soil	08/03/17
CF-BD-02	440-189680-19	Soil	08/03/17
CF-BD-03	440-189680-20	Soil	08/03/17
CF-BD-01	440-189680-21	Soil	08/03/17
CF-BL-05	440-189680-22	Soil	08/03/17
CF-BD-04	440-189680-23	Soil	08/03/17
CF-BD-05	440-189680-24	Soil	08/03/17
CF-SD-01	440-189680-25	Soil	08/03/17
CF-SD-07	440-189680-26	Soil	08/03/17
CF-SD-06	440-189680-27	Soil	08/03/17

Sample Identification	Laboratory Sample Identification	Matrix	Collection Date
CF-SD-04	440-189680-28	Soil	08/03/17
CF-SD-02	440-189680-29	Soil	08/03/17
CF-SD-11	440-189680-30	Soil	08/03/17
CF-SO-09	440-189680-31	Soil	08/03/17
CF-BL-02	440-189680-32	Soil	08/03/17
CF-SO-01	440-189680-33	Soil	08/03/17
CF-BL-01	440-189680-34	Soil	08/03/17
CF-SO-10	440-189680-35	Soil	08/03/17
CF-BG-02	440-189680-36	Soil	08/03/17
CF-ER-02	440-189680-37	Water	08/03/17
CF-SO-11	440-189680-38	Soil	08/03/17
CF-BG-01	440-189680-39	Soil	08/03/17
CF-BG-04	440-189680-40	Soil	08/03/17
CF-BG-03	440-189680-41	Soil	08/03/17
CF-ER-03	440-189680-42	Water	08/04/17
CF-SD-08	440-189680-43	Soil	08/04/17
CF-ER-04A	440-189680-44	Water	08/04/17
CF-ER-04B	440-189680-45	Water	08/04/17
CF-SO-04	440-189680-46	Soil	08/04/17
CF-SO-03	440-189680-47	Soil	08/04/17
CF-SO-02	440-189680-48	Soil	08/04/17
CF-BG-09	440-189680-49	Soil	08/04/17
CF-SO-12	440-189680-50	Soil	08/04/17
CF-SO-05	440-189680-51	Soil	08/04/17
CF-BG-05	440-189680-52	Soil	08/04/17
CF-ER-05	440-189680-53	Water	08/04/17
EB1	440-189680-55	Water	08/05/17
EB2	440-189680-56	Water	08/05/17
CF-SD-03MS	440-189680-3MS	Soil	08/02/17
CF-SD-03MSD	440-189680-3MSD	Soil	08/02/17
CF-BG-10MS	440-189680-8MS	Soil	08/02/17
CF-BG-10MSD	440-189680-8MSD	Soil	08/02/17
CF-BD-05MS	440-189680-24MS	Soil	08/03/17
CF-BD-05MSD	440-189680-24MSD	Soil	08/03/17
CF-SO-01MS	440-189680-33MS	Soil	08/03/17
CF-SO-01MSD	440-189680-33MSD	Soil	08/03/17
CF-BG-04MS	440-189680-40MS	Soil	08/03/17
CF-BG-04MSD	440-189680-40MSD	Soil	08/03/17
CF-SO-12MS	440-189680-50MS	Soil	08/04/17
CF-SO-12MSD	440-189680-50MSD	Soil	08/04/17

Introduction

This Data Validation Report (DVR) presents data validation findings and results for the associated samples listed on the cover page. Data validation was performed in accordance with the Final Engineering Evaluation/Cost Analysis Sampling and Analysis Plan, Coggins Flat Area Placer Mine, Whiskeytown National Recreation Area, Shasta County, California (June 2017) and a modified outline of the USEPA National Functional Guidelines (NFG) for Inorganic Superfund Methods Data Review (January 2017). Where specific guidance was not available, the data has been evaluated in a conservative manner consistent with industry standards using professional experience.

The analyses were performed by the following methods:

Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Cobalt, Copper, Lead, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium, Zinc by Environmental Protection Agency (EPA) SW 846 Method 6010B
Mercury by EPA SW 846 Methods 7470A/7471A
Methyl Mercury by EPA Method 1630

All sample results were subjected to Level II data validation, which comprises an evaluation of quality control (QC) summary results.

The following are definitions of the data qualifiers utilized during data validation:

J (Estimated): The compound or analyte was analyzed for and positively identified by the laboratory; however the reported concentration is estimated due to non-conformances discovered during data validation.

U (Non-detected): The compound or analyte was analyzed for and positively identified by the laboratory; however the compound or analyte should be considered non-detected at the reported concentration due to the presence of contaminants detected in the associated blank(s).

UJ (Non-detected estimated): The compound or analyte was reported as not detected by the laboratory; however the reported quantitation/detection limit is estimated due to non-conformances discovered during data validation.

R (Rejected): The sample results were rejected due to gross non-conformances discovered during data validation. Data qualified as rejected is not usable.

NA (Not Applicable): The non-conformance discovered during data validation demonstrates a high bias, while the affected compound or analyte in the associated sample(s) was reported as not detected by the laboratory and did not warrant the qualification of the data.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

I. Sample Receipt and Technical Holding Times

All samples were received in good condition.

All technical holding time requirements were met.

II. Instrument Calibration

Instrument calibration data were not reviewed for Level II validation.

III. ICP Interference Check Sample Analysis

Interference check sample (ICS) analysis data were not reviewed for Level II validation.

IV. Laboratory Blanks

Laboratory blanks were analyzed as required by the methods. No contaminants were found in the laboratory blanks.

V. Field Blanks

Samples EB1 and EB2 were identified as laboratory equipment rinsates. No contaminants were found.

Samples CF-ER-01, CF-ER-02, CF-ER-03, CF-ER-04A, CF-ER-04B, AND CF-ER-05 were identified as equipment rinsates. No contaminants were found with the following exceptions:

Blank ID	Collection Date	Analyte	Concentration	Associated Samples
CF-ER-01	08/02/17	Copper Lead Zinc	0.011 mg/L 0.0086 mg/L 0.014 mg/L	CF-BG-10

Sample concentrations were compared to concentrations detected in the field blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated field blanks.

VI. Surrogates

Surrogates were added to all samples as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) sample analysis was performed on an associated project sample. Percent recoveries (%R) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	Flag	A or P
CF-BG-10MS/MSD (CF-BG-10)	Antimony	38 (75-125)	41 (75-125)	UJ (all non-detects)	A
CF-BG-10MS/MSD (CF-BG-10)	Zinc Nickel	156 (75-125) -	160 (75-125) 127 (75-125)	J (all detects) J (all detects)	A

For CF-BG-10MS/MSD, no data were qualified for Barium percent recoveries (%R) outside the QC limits since the parent sample results were greater than 4X the spike concentration.

Relative percent differences (RPD) were within QC limits.

VIII. Duplicate Sample Analysis

The laboratory has indicated that there were no duplicate (DUP) analyses specified for the samples in this SDG, and therefore duplicate analyses were not performed for this SDG.

IX. Serial Dilution

Serial dilution was not performed for this SDG.

X. Laboratory Control Samples

Laboratory control samples (LCS) were analyzed as required by the methods. Percent recoveries (%R) were within QC limits.

XI. Field Duplicates

Samples CF-BG-06 and CF-BL-04, samples CF-BD-01 and CF-BL-05, samples CF-SO-09 and CF-BL-02, and samples CF-SO-01 and CF-BL-01 were identified as field duplicates. No results were detected in any of the samples with the following exceptions:

Analyte	Concentration (mg/Kg)		RPD
	CF-BG-06	CF-BL-04	
Arsenic	16	13	21
Barium	300	250	18
Beryllium	0.72	0.61	17
Cadmium	0.72	0.56	25

Analyte	Concentration (mg/Kg)		RPD
	CF-BG-06	CF-BL-04	
Chromium	44	36	20
Cobalt	17	14	19
Copper	51	41	22
Lead	24	19	23
Molybdenum	2.1	1.7	21
Mercury	0.069	0.068	1
Nickel	37	30	21
Vanadium	70	57	20
Zinc	140	120	15

Analyte	Concentration		RPD
	CF-BD-01	CF-BL-05	
Mercury	0.094 mg/Kg	0.097 mg/Kg	3
Methyl mercury	0.34 ug/Kg	0.040U ug/Kg	Not calculable

Analyte	Concentration (mg/Kg)		RPD
	CF-SO-09	CF-BL-02	
Arsenic	15	17	13
Barium	58	69	17
Chromium	9.5	11	15
Cobalt	6.2	7.3	16
Copper	28	33	16
Lead	5.9	6.9	16

Analyte	Concentration (mg/Kg)		RPD
	CF-SO-09	CF-BL-02	
Mercury	0.025	0.027	8
Nickel	6.2	7.2	15
Vanadium	16	18	12
Zinc	77	91	17

Analyte	Concentration (mg/Kg)		RPD
	CF-SO-01	CF-BL-01	
Arsenic	58	50	15
Barium	170	140	19
Beryllium	0.60	0.52	14
Cadmium	1.3	1.1	17
Chromium	59	50	17
Cobalt	20	16	22
Copper	56	49	13
Lead	19	16	17
Molybdenum	1.8	1.6	12
Mercury	0.079	0.17	73
Nickel	60	51	16
Selenium	1.7U	2.8	Not calculable
Vanadium	74	64	14
Zinc	220	190	15

XII. Sample Result Verification

Raw data were not reviewed for Level II validation.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the methods. No results were rejected in this SDG.

Due to MS/MSD %R, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the data validation all other results are considered valid and usable for all purposes.

NPS Whiskeytown
Metals & Methyl Mercury - Data Qualification Summary - SDG 440-189680-1

Sample	Analyte	Flag	A or P	Reason
CF-BG-10	Antimony	UJ (all non-detects)	A	Matrix spike/Matrix spike duplicate (%R)
CF-BG-10	Zinc Nickel	J (all detects) J (all detects)	A	Matrix spike/Matrix spike duplicate (%R)

NPS Whiskeytown
Metals & Methyl Mercury - Laboratory Blank Data Qualification Summary - SDG 440-189680-1

No Sample Data Qualified in this SDG

NPS Whiskeytown
Metals & Methyl Mercury - Field Blank Data Qualification Summary - SDG 440-189680-1

No Sample Data Qualified in this SDG

LDC #: 39411A4b

SDG #: 440-189680-1

Laboratory: Test America, Inc~~TA~~

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 9/11/17

Page: 1 of 3

Reviewer: a

2nd Reviewer: je

METHOD: Metals & Methyl Mercury (EPA SW 846 Method 6010B/7470A/7471A/EPA Method 1630)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Instrument Calibration	N	
III.	ICP Interference Check Sample (ICS) Analysis	N	
IV.	Laboratory Blanks	A	
V.	Field Blanks	SW	ER= 12*,37*,42*,44*,45* LabER= 54**,55**
VI.	Matrix Spike/Matrix Spike Duplicates	SW	
VII.	Duplicate sample analysis	N	
VIII.	Serial Dilution	N	
IX.	Laboratory control samples	A	LCS
X.	Field Duplicates	SW	(14,15) (21,22) (31,32) (33,34)
XI.	Sample Result Verification	N	
XII	Overall Assessment of Data	A	

Surrogate Recovery A

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; *ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	CF-SO-07	440-189680-1	Soil	08/02/17
2	CF-SO-16	440-189680-2	Soil	08/02/17
3	CF-SD-03	440-189680-3	Soil	08/02/17
4	CF-SO-08	440-189680-4	Soil	08/02/17
5	CF-SD-09	440-189680-5	Soil	08/02/17
6	CF-SO-13	440-189680-6	Soil	08/02/17
7	CF-SO-14	440-189680-7	Soil	08/02/17
8	CF-BG-10	440-189680-8	Soil	08/02/17
9	CF-SO-15	440-189680-9	Soil	08/02/17
10	CF-SD-09	440-189680-10	Soil	08/02/17
11	CF-SD-10	440-189680-11	Soil	08/02/17
12	CF-ER-01	440-189680-12	Water	08/02/17
13	CF-SO-06	440-189680-13	Soil	08/02/17
14	CF-BG-06	440-189680-14	Soil	08/02/17
15	CF-BL-04	440-189680-15	Soil	08/02/17
16	CF-BG-07	440-189680-16	Soil	08/02/17
17	CF-BG-08	440-189680-17	Soil	08/02/17

**LabER= Laboratory Equipment Rinsate

LDC #: 39411A4b

SDG #: 440-189680-1

Laboratory: Test America, IncTA

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 9/11/17

Reviewer: [illegible]

2nd Reviewer: JB

METHOD: Metals & Methyl Mercury (EPA SW 846 Method 6010B/7470A/7471A/EPA Method 1630)

	Client ID	Lab ID	Matrix	Date
18	CF-SD-11	440-189680-18	Soil	08/03/17
19	CF-BD-02	440-189680-19	Soil	08/03/17
20	CF-BD-03	440-189680-20	Soil	08/03/17
21	CF-BD-01	440-189680-21	Soil	08/03/17
22	CF-BL-05	440-189680-22	Soil	08/03/17
23	CF-BD-04	440-189680-23	Soil	08/03/17
24	CF-BD-05	440-189680-24	Soil	08/03/17
25	CF-SD-01	440-189680-25	Soil	08/03/17
26	CF-SD-07	440-189680-26	Soil	08/03/17
27	CF-SD-06	440-189680-27	Soil	08/03/17
28	CF-SD-04	440-189680-28	Soil	08/03/17
29	CF-SD-02	440-189680-29	Soil	08/03/17
30	CF-SD-11	440-189680-30	Soil	08/03/17
31	CF-SO-09	440-189680-31	Soil	08/03/17
32	CF-BL-02	440-189680-32	Soil	08/03/17
33	CF-SO-01	440-189680-33	Soil	08/03/17
34	CF-BL-01	440-189680-34	Soil	08/03/17
35	CF-SO-10	440-189680-35	Soil	08/03/17
36	CF-BG-02	440-189680-36	Soil	08/03/17
37	CF-ER-02	440-189680-37	Water	08/03/17
38	CF-SO-11	440-189680-38	Soil	08/03/17
39	CF-BG-01	440-189680-39	Soil	08/03/17
40	CF-BG-04	440-189680-40	Soil	08/03/17
41	CF-BG-03	440-189680-41	Soil	08/03/17
42	CF-ER-03	440-189680-42	Water	08/04/17
43	CF-SD-08	440-189680-43	Soil	08/04/17
44	CF-ER-04A	440-189680-44	Water	08/04/17
45	CF-ER-04B	440-189680-45	Water	08/04/17
46	CF-SO-04	440-189680-46	Soil	08/04/17
47	CF-SO-03	440-189680-47	Soil	08/04/17
48	CF-SO-02	440-189680-48	Soil	08/04/17
49	CF-BG-09	440-189680-49	Soil	08/04/17
50	CF-SO-12	440-189680-50	Soil	08/04/17
51	CF-SO-05	440-189680-51	Soil	08/04/17
52	CF-BG-05	440-189680-52	Soil	08/04/17

LDC #: 39411A4b

SDG #: 440-189680-1

Laboratory: Test America, IncTA

VALIDATION COMPLETENESS WORKSHEET

Level II

Date: 9/11/17

Reviewer: C

2nd Reviewer: JS

METHOD: Metals & Methyl Mercury (EPA SW 846 Method 6010B/7470A/7471A/EPA Method 1630)

	Client ID	Lab ID	Matrix	Date
53	CF-ER-05	440-189680-53	Water	08/04/17
54	EB1	440-189680-55	Water	08/05/17
55	EB2	440-189680-56	Water	08/05/17
56	CF-SD-03MS	440-189680-3MS	Soil	08/02/17
57	CF-SD-03MSD	440-189680-3MSD	Soil	08/02/17
58	CF-BG-10MS	440-189680-8MS	Soil	08/02/17
59	CF-BG-10MSD	440-189680-8MSD	Soil	08/02/17
60	CF-BD-05MS	440-189680-24MS	Soil	08/03/17
61	CF-BD-05MSD	440-189680-24MSD	Soil	08/03/17
62	CF-SO-01MS	440-189680-33MS	Soil	08/03/17
63	CF-SO-01MSD	440-189680-33MSD	Soil	08/03/17
64	CF-BG-04MS	440-189680-40MS	Soil	08/03/17
65	CF-BG-04MSD	440-189680-40MSD	Soil	08/03/17
66	CF-SO-12MS	440-189680-50MS	Soil	08/04/17
67	CF-SO-12MSD	440-189680-50MSD	Soil	08/04/17
68				
69				
70				
71				
72				

Notes:

LDC #: 39411A4b

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: CR
2nd reviewer: JS

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1,2,4,6,	7,9,10,	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, [✓ Hg], Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
13,20,30,	35,	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
38,46-48,	50,51,	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
54,55		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
3,11,19,21,	22-29,	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, [✓ Hg], Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, [✓ MeHg]
43		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
5,18,20,	~~22~~,42,	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, [✓ MeHg]
45		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
8,12,14-	17,31-	Al, [✓ Sb, As, Ba, Be, Cd], Ca, [✓ Cr, Co, Cu], Fe, [✓ Pb], Mg, Mn, [✓ Hg], [✓ Ni], K, [✓ Se], [✓ Ag], Na, [✓ Tl, V, Zn, Mo], B, Sn, Ti, ___ ___
34,36,37,	39-41,	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
44,49,52	,53	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
QC: 56,57		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, [✓ MeHg]
58,59		Al, [✓ Sb, As, Ba, Be, Cd], Ca, [✓ Cr, Co, Cu], Fe, [✓ Pb], Mg, Mn, Hg, [✓ Ni], K, [✓ Se, Ag], Na, [✓ Tl, V, Zn, Mo], B, Sn, Ti, ___ ___
60,61		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, [✓ MeHg]
62,63		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, [✓ Hg], Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
64,65		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, [✓ Hg], Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
66,67		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, [✓ Hg], Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Analysis Method
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti,

Comments: Mercury by CVAA if performed

LDC #: 39411A4b

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW846 6010B/7000)

Blank units: mg/L **Associated sample units:** mg/Kg
Sampling date: 8/2/17
Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: 8

Analyte	Blank ID	Sample Identification										
	12	Action Limit	No qualifiers (>5x)									
Cu	0.011	0.055										
Pb	0.0086	0.043										
Zn	0.014	0.07										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 39411A46

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: CL
2nd Reviewer: VB

METHOD: Trace metals (EPA SW 846 Method 6010B/6020A/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of 75-125? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	58/59		Sb	38	41		8	J (all det.) / A (MD)
			Zn	156	160		↓	J (all det.) / A (MD)
			Ni		127		↓	↓

Comments: 58/59: Ba 74%

LDC#: 39411A4b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: OR
2nd Reviewer: JB

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (mg/Kg)		RPD
	14	15	
Arsenic	16	13	21
Barium	300	250	18
Beryllium	0.72	0.61	17
Cadmium	0.72	0.56	25
Chromium	44	36	20
Cobalt	17	14	19
Copper	51	41	22
Lead	24	19	23
Molybdenum	2.1	1.7	21
Mercury	0.069	0.068	1
Nickel	37	30	21
Vanadium	70	57	20
Zinc	140	120	15

V:\FIELD DUPLICATES\Field Duplicates\FD_inorganic\2017\39411A4b.wpd

Analyte	Concentration (mg/Kg)		RPD
	21	22	
Mercury	0.094	0.097	3
Methyl Mercury (ug/Kg)	0.34	0.040U	NC

VALIDATION FINDINGS WORKSHEET
Field Duplicates

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (mg/Kg)		RPD
	31	32	
Arsenic	15	17	13
Barium	58	69	17
Chromium	9.5	11	15
Cobalt	6.2	7.3	16
Copper	28	33	16
Lead	5.9	6.9	16
Mercury	0.025	0.027	8
Nickel	6.2	7.2	15
Vanadium	16	18	12
Zinc	77	91	17

Analyte	Concentration (mg/Kg)		RPD
	33	34	
Arsenic	58	50	15
Barium	170	140	19
Beryllium	0.60	0.52	14
Cadmium	1.3	1.1	17
Chromium	59	50	17
Cobalt	20	16	22
Copper	56	49	13

LDC#: 39411A4b

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Reviewer: CA
2nd Reviewer: VS

METHOD: Metals (EPA Method 6010B/7000)

Analyte	Concentration (mg/Kg)		RPD
	33	34	
Lead	19	16	17
Molybdenum	1.8	1.6	12
Mercury	0.079	0.17	73
Nickel	60	51	16
Selenium	1.7U	2.8	NC
Vanadium	74	64	14
Zinc	220	190	15

APPENDIX E
PROUCL OUTPUTS

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Background Statistics for Data Sets with Non-Detects

User Selected Options

Date/Time of Computation	ProUCL 5.12/12/2018 2:16:39 PM
From File	ProUCL Input_a.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Different or Future K Observations	1
Number of Bootstrap Operations	2000

Antimony

General Statistics

Total Number of Observations	11	Number of Missing Observations	0
Number of Distinct Observations	4		
Number of Detects	0	Number of Non-Detects	11
Number of Distinct Detects	0	Number of Distinct Non-Detects	4
Minimum Detect	N/A	Minimum Non-Detect	5
Maximum Detect	N/A	Maximum Non-Detect	5.3
Variance Detected	N/A	Percent Non-Detects	100%
Mean Detected	N/A	SD Detected	N/A
Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Antimony was not processed!

Arsenic

General Statistics

Total Number of Observations	11	Number of Missing Observations	0
Number of Distinct Observations	10		
Number of Detects	10	Number of Non-Detects	1
Number of Distinct Detects	9	Number of Distinct Non-Detects	1
Minimum Detect	9.1	Minimum Non-Detect	1.5
Maximum Detect	37	Maximum Non-Detect	1.5
Variance Detected	83.79	Percent Non-Detects	9.091%
Mean Detected	20.61	SD Detected	9.154
Mean of Detected Logged Data	2.935	SD of Detected Logged Data	0.454

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.815	d2max (for USL)	2.234

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.927	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.193	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	18.87	KM SD	9.937
95% UTL95% Coverage	46.84	95% KM UPL (t)	37.68
90% KM Percentile (z)	31.61	95% KM Percentile (z)	35.22
99% KM Percentile (z)	41.99	95% KM USL	41.07

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	18.8	SD	10.55
95% UTL95% Coverage	48.5	95% UPL (t)	38.77
90% Percentile (z)	32.32	95% Percentile (z)	36.15
99% Percentile (z)	43.34	95% USL	42.37

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.331	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.729	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.168	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.267	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	5.657	k star (bias corrected MLE)	4.027
Theta hat (MLE)	3.643	Theta star (bias corrected MLE)	5.118

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

nu hat (MLE)	113.1	nu star (bias corrected)	80.53
MLE Mean (bias corrected)	20.61		
MLE Sd (bias corrected)	10.27	95% Percentile of Chisquare (2kstar)	15.58

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	3.092	Mean	19.02
Maximum	37	Median	16
SD	10.16	CV	0.534
k hat (MLE)	3.018	k star (bias corrected MLE)	2.255
Theta hat (MLE)	6.302	Theta star (bias corrected MLE)	8.432
nu hat (MLE)	66.39	nu star (bias corrected)	49.62
MLE Mean (bias corrected)	19.02	MLE Sd (bias corrected)	12.66
95% Percentile of Chisquare (2kstar)	10.31	90% Percentile	35.97
95% Percentile	43.45	99% Percentile	59.92

The following statistics are computed using Gamma ROS Statistics on Imputed Data
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	67.93	74.18	95% Approx. Gamma UPL	46.17	48.34
95% Gamma USL	53.56	56.94			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	18.87	SD (KM)	9.937
Variance (KM)	98.73	SE of Mean (KM)	3.158
k hat (KM)	3.607	k star (KM)	2.684
nu hat (KM)	79.36	nu star (KM)	59.05
theta hat (KM)	5.232	theta star (KM)	7.031
80% gamma percentile (KM)	27.28	90% gamma percentile (KM)	34.31
95% gamma percentile (KM)	40.91	99% gamma percentile (KM)	55.3

The following statistics are computed using gamma distribution and KM estimates
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	72.37	81.81	95% Approx. Gamma UPL	48.1	51.52
95% KM Gamma Percentile	42.65	45.05	95% Gamma USL	56.31	61.52

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.952	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.162	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	19.3	Mean in Log Scale	2.833
SD in Original Scale	9.714	SD in Log Scale	0.546
95% UTL95% Coverage	79.18	95% BCA UTL95% Coverage	37
95% Bootstrap (%) UTL95% Coverage	37	95% UPL (t)	47.84
90% Percentile (z)	34.25	95% Percentile (z)	41.77
99% Percentile (z)	60.62	95% USL	57.64

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	2.705	95% KM UTL (Lognormal)95% Coverage	156.9
KM SD of Logged Data	0.835	95% KM UPL (Lognormal)	72.66
95% KM Percentile Lognormal (z)	59.06	95% KM USL (Lognormal)	96.59

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	18.8	Mean in Log Scale	2.642
SD in Original Scale	10.55	SD in Log Scale	1.063
95% UTL95% Coverage	279.7	95% UPL (t)	105
90% Percentile (z)	54.81	95% Percentile (z)	80.65
99% Percentile (z)	166.4	95% USL	150.8

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	11	95% UTL with95% Coverage	37
Approx, f used to compute achieved CC	0.579	Approximate Actual Confidence Coefficient achieved by UTL	0.431
Approximate Sample Size needed to achieve specified CC	59	95% UPL	37
95% USL	37	95% KM Chebyshev UPL	64.11

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Barium

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
Minimum	9.5	First Quartile	180
Second Largest	600	Median	250
Maximum	3000	Third Quartile	295
Mean	496.3	SD	842.7
Coefficient of Variation	1.698	Skewness	3.147
Mean of logged Data	5.451	SD of logged Data	1.349

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.815	d2max (for USL)	2.234

Normal GOF Test

Shapiro Wilk Test Statistic	0.494	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.41	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	2869	90% Percentile (z)	1576
95% UPL (t)	2092	95% Percentile (z)	1882
95% USL	2379	99% Percentile (z)	2457

Gamma GOF Test

A-D Test Statistic	1.136	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.761	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.326	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.265	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.786	k star (bias corrected MLE)	0.632
Theta hat (MLE)	631.3	Theta star (bias corrected MLE)	784.8
nu hat (MLE)	17.3	nu star (bias corrected)	13.91
MLE Mean (bias corrected)	496.3	MLE Sd (bias corrected)	624.1

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	1879	90% Percentile	1276
95% Hawkins Wixley (HW) Approx. Gamma UPL	1945	95% Percentile	1752
95% WH Approx. Gamma UTL with 95% Coverage	3432	99% Percentile	2900
95% HW Approx. Gamma UTL with 95% Coverage	3850		
95% WH USL	2381	95% HW USL	2538

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.835	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.85	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.262	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.251	Data Not Lognormal at 5% Significance Level

Data Not Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	10380	90% Percentile (z)	1312
95% UPL (t)	2993	95% Percentile (z)	2142
95% USL	4740	99% Percentile (z)	5370

Nonparametric Distribution Free Background Statistics
Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	11	95% UTL with 95% Coverage	3000
Approx, f used to compute achieved CC	0.579	Approximate Actual Confidence Coefficient achieved by UTL	0.431
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	3000	95% BCA Bootstrap UTL with 95% Coverage	3000
95% UPL	3000	90% Percentile	600
90% Chebyshev UPL	3137	95% Percentile	1800
95% Chebyshev UPL	4333	99% Percentile	2760

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

95% USL 3000

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Beryllium

General Statistics

Total Number of Observations	11	Number of Missing Observations	0
Number of Distinct Observations	9		
Number of Detects	10	Number of Non-Detects	1
Number of Distinct Detects	8	Number of Distinct Non-Detects	1
Minimum Detect	0.27	Minimum Non-Detect	0.25
Maximum Detect	1	Maximum Non-Detect	0.25
Variance Detected	0.0386	Percent Non-Detects	9.091%
Mean Detected	0.624	SD Detected	0.197
Mean of Detected Logged Data	-0.521	SD of Detected Logged Data	0.347

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.815	d2max (for USL)	2.234

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.925	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.235	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.59	KM SD	0.208
95% UTL95% Coverage	1.175	95% KM UPL (t)	0.983
90% KM Percentile (z)	0.856	95% KM Percentile (z)	0.932
99% KM Percentile (z)	1.073	95% KM USL	1.054

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.579	SD	0.24
95% UTL95% Coverage	1.253	95% UPL (t)	1.032
90% Percentile (z)	0.886	95% Percentile (z)	0.973
99% Percentile (z)	1.136	95% USL	1.114

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.523	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.265	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.267	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	10.23	k star (bias corrected MLE)	7.23
Theta hat (MLE)	0.061	Theta star (bias corrected MLE)	0.0863
nu hat (MLE)	204.7	nu star (bias corrected)	144.6
MLE Mean (bias corrected)	0.624		
MLE Sd (bias corrected)	0.232	95% Percentile of Chisquare (2kstar)	24.29

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.236	Mean	0.589
Maximum	1	Median	0.55
SD	0.22	CV	0.374
k hat (MLE)	6.803	k star (bias corrected MLE)	5.008
Theta hat (MLE)	0.0865	Theta star (bias corrected MLE)	0.118
nu hat (MLE)	149.7	nu star (bias corrected)	110.2
MLE Mean (bias corrected)	0.589	MLE Sd (bias corrected)	0.263
95% Percentile of Chisquare (2kstar)	18.33	90% Percentile	0.941
95% Percentile	1.077	99% Percentile	1.366

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

WH	HW	WH	HW

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

95% Approx. Gamma UTL with 95% Coverage	1.485	1.549	95% Approx. Gamma UPL	1.116	1.14
95% Gamma USL	1.244	1.28			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.59	SD (KM)	0.208
Variance (KM)	0.0432	SE of Mean (KM)	0.066
k hat (KM)	8.061	k star (KM)	5.923
nu hat (KM)	177.3	nu star (KM)	130.3
theta hat (KM)	0.0732	theta star (KM)	0.0996
80% gamma percentile (KM)	0.778	90% gamma percentile (KM)	0.914
95% gamma percentile (KM)	1.037	99% gamma percentile (KM)	1.294

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	1.41	1.463	95% Approx. Gamma UPL	1.076	1.095
95% KM Gamma Percentile	0.996	1.009	95% Gamma USL	1.192	1.222

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.882	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.292	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Data Not Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.592	Mean in Log Scale	-0.592
SD in Original Scale	0.215	SD in Log Scale	0.405
95% UTL95% Coverage	1.729	95% BCA UTL95% Coverage	1
95% Bootstrap (%) UTL95% Coverage	1	95% UPL (t)	1.19
90% Percentile (z)	0.929	95% Percentile (z)	1.076
99% Percentile (z)	1.419	95% USL	1.366

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-0.6	95% KM UTL (Lognormal)95% Coverage	1.694
KM SD of Logged Data	0.4	95% KM UPL (Lognormal)	1.171
95% KM Percentile Lognormal (z)	1.06	95% KM USL (Lognormal)	1.342

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.579	Mean in Log Scale	-0.663
SD in Original Scale	0.24	SD in Log Scale	0.574
95% UTL95% Coverage	2.59	95% UPL (t)	1.526
90% Percentile (z)	1.075	95% Percentile (z)	1.324
99% Percentile (z)	1.957	95% USL	1.856

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	11	95% UTL with95% Coverage	1
Approx, f used to compute achieved CC	0.579	Approximate Actual Confidence Coefficient achieved by UTL	0.431
Approximate Sample Size needed to achieve specified CC	59	95% UPL	1
95% USL	1	95% KM Chebyshev UPL	1.536

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Cadmium

General Statistics

Total Number of Observations	11	Number of Missing Observations	0
Number of Distinct Observations	10		
Number of Detects	9	Number of Non-Detects	2
Number of Distinct Detects	9	Number of Distinct Non-Detects	1
Minimum Detect	0.36	Minimum Non-Detect	0.25
Maximum Detect	6.5	Maximum Non-Detect	0.25
Variance Detected	3.688	Percent Non-Detects	18.18%
Mean Detected	1.491	SD Detected	1.92
Mean of Detected Logged Data	-0.0127	SD of Detected Logged Data	0.84

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.815	d2max (for USL)	2.234

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.576	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.366	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.274	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	1.265	KM SD	1.706
95% UTL95% Coverage	6.068	95% KM UPL (t)	4.495
90% KM Percentile (z)	3.452	95% KM Percentile (z)	4.072
99% KM Percentile (z)	5.235	95% KM USL	5.077

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	1.243	SD	1.804
95% UTL95% Coverage	6.322	95% UPL (t)	4.658
90% Percentile (z)	3.555	95% Percentile (z)	4.211
99% Percentile (z)	5.44	95% USL	5.273

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.929	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.737	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.246	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.285	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.355	k star (bias corrected MLE)	0.978
Theta hat (MLE)	1.1	Theta star (bias corrected MLE)	1.525
nu hat (MLE)	24.39	nu star (bias corrected)	17.6
MLE Mean (bias corrected)	1.491		
MLE Sd (bias corrected)	1.508	95% Percentile of Chisquare (2kstar)	5.904

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	1.222
Maximum	6.5	Median	0.68
SD	1.819	CV	1.489
k hat (MLE)	0.591	k star (bias corrected MLE)	0.49
Theta hat (MLE)	2.068	Theta star (bias corrected MLE)	2.492
nu hat (MLE)	13	nu star (bias corrected)	10.79
MLE Mean (bias corrected)	1.222	MLE Sd (bias corrected)	1.745
95% Percentile of Chisquare (2kstar)	3.793	90% Percentile	3.319
95% Percentile	4.726	99% Percentile	8.194

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	10.04	12.93	95% Approx. Gamma UPL	5.275	6.028
95% Gamma USL	6.801	8.132			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.265	SD (KM)	1.706
Variance (KM)	2.911	SE of Mean (KM)	0.546
k hat (KM)	0.55	k star (KM)	0.461
nu hat (KM)	12.1	nu star (KM)	10.13
theta hat (KM)	2.301	theta star (KM)	2.747
80% gamma percentile (KM)	2.069	90% gamma percentile (KM)	3.481
95% gamma percentile (KM)	5.005	99% gamma percentile (KM)	8.781

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	6.795	7.137	95% Approx. Gamma UPL	4.009	3.999
95% KM Gamma Percentile	3.418	3.369	95% Gamma USL	4.927	5.003

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.875	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.202	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.274	Detected Data appear Lognormal at 5% Significance Level	

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	1.246	Mean in Log Scale	-0.369
SD in Original Scale	1.802	SD in Log Scale	1.097
95% UTL95% Coverage	15.17	95% BCA UTL95% Coverage	6.5
95% Bootstrap (%) UTL95% Coverage	6.5	95% UPL (t)	5.516
90% Percentile (z)	2.82	95% Percentile (z)	4.202
99% Percentile (z)	8.874	95% USL	8.018

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-0.262	95% KM UTL (Lognormal)95% Coverage	9.452
KM SD of Logged Data	0.891	95% KM UPL (Lognormal)	4.156
95% KM Percentile Lognormal (z)	3.331	95% KM USL (Lognormal)	5.631

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	1.243	Mean in Log Scale	-0.389
SD in Original Scale	1.804	SD in Log Scale	1.124
95% UTL95% Coverage	16.06	95% UPL (t)	5.696
90% Percentile (z)	2.864	95% Percentile (z)	4.309
99% Percentile (z)	9.27	95% USL	8.355

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	11	95% UTL with95% Coverage	6.5
Approx, f used to compute achieved CC	0.579	Approximate Actual Confidence Coefficient achieved by UTL	0.431
Approximate Sample Size needed to achieve specified CC	59	95% UPL	6.5
95% USL	6.5	95% KM Chebyshev UPL	9.033

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Chromium

General Statistics

Total Number of Observations	11	Number of Missing Observations	0
Number of Distinct Observations	9		
Number of Detects	10	Number of Non-Detects	1
Number of Distinct Detects	8	Number of Distinct Non-Detects	1
Minimum Detect	19	Minimum Non-Detect	0.51
Maximum Detect	210	Maximum Non-Detect	0.51
Variance Detected	3079	Percent Non-Detects	9.091%
Mean Detected	54.4	SD Detected	55.49
Mean of Detected Logged Data	3.751	SD of Detected Logged Data	0.637

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.815	d2max (for USL)	2.234

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.525	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.46	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	49.5	KM SD	52.53
95% UTL95% Coverage	197.4	95% KM UPL (t)	148.9
90% KM Percentile (z)	116.8	95% KM Percentile (z)	135.9
99% KM Percentile (z)	171.7	95% KM USL	166.8

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	49.48	SD	55.12
95% UTL95% Coverage	204.6	95% UPL (t)	153.8
90% Percentile (z)	120.1	95% Percentile (z)	140.1
99% Percentile (z)	177.7	95% USL	172.6

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.403	**Anderson-Darling GOF Test**	

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

5% A-D Critical Value	0.735	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.404	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.27	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.187	k star (bias corrected MLE)	1.598
Theta hat (MLE)	24.87	Theta star (bias corrected MLE)	34.05
nu hat (MLE)	43.74	nu star (bias corrected)	31.95
MLE Mean (bias corrected)	54.4		
MLE Sd (bias corrected)	43.04	95% Percentile of Chisquare (2kstar)	8.151

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	49.46
Maximum	210	Median	44
SD	55.14	CV	1.115
k hat (MLE)	0.668	k star (bias corrected MLE)	0.547
Theta hat (MLE)	73.99	Theta star (bias corrected MLE)	90.46
nu hat (MLE)	14.71	nu star (bias corrected)	12.03
MLE Mean (bias corrected)	49.46	MLE Sd (bias corrected)	66.88
95% Percentile of Chisquare (2kstar)	4.068	90% Percentile	131.3
95% Percentile	184	99% Percentile	312.6

The following statistics are computed using Gamma ROS Statistics on Imputed Data
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	339.6	475.6	95% Approx. Gamma UPL	191.2	236.1
95% Gamma USL	239.6	310.3			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	49.5	SD (KM)	52.53
Variance (KM)	2759	SE of Mean (KM)	16.69
k hat (KM)	0.888	k star (KM)	0.706
nu hat (KM)	19.54	nu star (KM)	15.54
theta hat (KM)	55.74	theta star (KM)	70.07
80% gamma percentile (KM)	81.34	90% gamma percentile (KM)	124
95% gamma percentile (KM)	167.9	99% gamma percentile (KM)	272.8

The following statistics are computed using gamma distribution and KM estimates
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	275.8	331.3	95% Approx. Gamma UPL	163.2	180.2
95% KM Gamma Percentile	139.2	150.4	95% Gamma USL	200.3	228.2

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.783	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.351	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Data Not Lognormal at 5% Significance Level	

Data Not Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	50.43	Mean in Log Scale	3.626
SD in Original Scale	54.26	SD in Log Scale	0.732
95% UTL95% Coverage	295	95% BCA UTL95% Coverage	210
95% Bootstrap (%) UTL95% Coverage	210	95% UPL (t)	150.2
90% Percentile (z)	95.99	95% Percentile (z)	125.2
99% Percentile (z)	206.3	95% USL	192.8

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	3.348	95% KM UTL (Lognormal)95% Coverage	1449
KM SD of Logged Data	1.396	95% KM UPL (Lognormal)	400
95% KM Percentile Lognormal (z)	282.8	95% KM USL (Lognormal)	643.7

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	49.48	Mean in Log Scale	3.285
SD in Original Scale	55.12	SD in Log Scale	1.657
95% UTL95% Coverage	2835	95% UPL (t)	615.3
90% Percentile (z)	223.4	95% Percentile (z)	407.8
99% Percentile (z)	1261	95% USL	1082

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Nonparametric Distribution Free Background Statistics
Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	11	95% UTL with95% Coverage	210
Approx, f used to compute achieved CC	0.579	Approximate Actual Confidence Coefficient achieved by UTL	0.431
Approximate Sample Size needed to achieve specified CC	59	95% UPL	210
95% USL	210	95% KM Chebyshev UPL	288.7

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Cobalt

General Statistics

Total Number of Observations	11	Number of Missing Observations	0
Number of Distinct Observations	10		
Number of Detects	10	Number of Non-Detects	1
Number of Distinct Detects	9	Number of Distinct Non-Detects	1
Minimum Detect	12	Minimum Non-Detect	0.51
Maximum Detect	26	Maximum Non-Detect	0.51
Variance Detected	18	Percent Non-Detects	9.091%
Mean Detected	17	SD Detected	4.243
Mean of Detected Logged Data	2.808	SD of Detected Logged Data	0.234

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.815	d2max (for USL)	2.234

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.909	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.207	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	15.5	KM SD	6.099
95% UTL95% Coverage	32.67	95% KM UPL (t)	27.05
90% KM Percentile (z)	23.32	95% KM Percentile (z)	25.53
99% KM Percentile (z)	29.69	95% KM USL	29.13

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	15.48	SD	6.457
95% UTL95% Coverage	33.65	95% UPL (t)	27.7
90% Percentile (z)	23.75	95% Percentile (z)	26.1
99% Percentile (z)	30.5	95% USL	29.9

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.292	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.17	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.266	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	19.65	k star (bias corrected MLE)	13.82
Theta hat (MLE)	0.865	Theta star (bias corrected MLE)	1.23
nu hat (MLE)	392.9	nu star (bias corrected)	276.4
MLE Mean (bias corrected)	17		
MLE Sd (bias corrected)	4.573	95% Percentile of Chisquare (2kstar)	40.9

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	7.968	Mean	16.18
Maximum	26	Median	16
SD	4.86	CV	0.3
k hat (MLE)	11.87	k star (bias corrected MLE)	8.693
Theta hat (MLE)	1.363	Theta star (bias corrected MLE)	1.861

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

nu hat (MLE)	261.1	nu star (bias corrected)	191.2
MLE Mean (bias corrected)	16.18	MLE Sd (bias corrected)	5.487
95% Percentile of Chisquare (2kstar)	28.08	90% Percentile	23.49
95% Percentile	26.13	99% Percentile	31.59

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	33.63	34.4	95% Approx. Gamma UPL	26.77	27.04
95% Gamma USL	29.18	29.6			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	15.5	SD (KM)	6.099
Variance (KM)	37.2	SE of Mean (KM)	1.938
k hat (KM)	6.459	k star (KM)	4.758
nu hat (KM)	142.1	nu star (KM)	104.7
theta hat (KM)	2.4	theta star (KM)	3.258
80% gamma percentile (KM)	20.95	90% gamma percentile (KM)	25.02
95% gamma percentile (KM)	28.73	99% gamma percentile (KM)	36.6

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	59.81	72.03	95% Approx. Gamma UPL	39.82	44.72
95% KM Gamma Percentile	35.33	38.93	95% Gamma USL	46.59	53.69

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.959	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.162	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	16.3	Mean in Log Scale	2.755
SD in Original Scale	4.644	SD in Log Scale	0.282
95% UTL95% Coverage	34.79	95% BCA UTL95% Coverage	26
95% Bootstrap (%) UTL95% Coverage	26	95% UPL (t)	26.82
90% Percentile (z)	22.57	95% Percentile (z)	25.01
99% Percentile (z)	30.31	95% USL	29.53

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	2.491	95% KM UTL (Lognormal)95% Coverage	215
KM SD of Logged Data	1.023	95% KM UPL (Lognormal)	83.72
95% KM Percentile Lognormal (z)	64.95	95% KM USL (Lognormal)	118.6

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	15.48	Mean in Log Scale	2.428
SD in Original Scale	6.457	SD in Log Scale	1.278
95% UTL95% Coverage	413.9	95% UPL (t)	127.4
90% Percentile (z)	58.32	95% Percentile (z)	92.78
99% Percentile (z)	221.7	95% USL	197

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	11	95% UTL with95% Coverage	26
Approx, f used to compute achieved CC	0.579	Approximate Actual Confidence Coefficient achieved by UTL	0.431
Approximate Sample Size needed to achieve specified CC	59	95% UPL	26
95% USL	26	95% KM Chebyshev UPL	43.27

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Copper

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
Minimum	14	First Quartile	39.5
Second Largest	69	Median	51
Maximum	71	Third Quartile	57.5
Mean	48.18	SD	16.26

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Coefficient of Variation	0.337	Skewness	-0.559
Mean of logged Data	3.802	SD of logged Data	0.446

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.815	d2max (for USL)	2.234

Normal GOF Test

Shapiro Wilk Test Statistic	0.951	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.155	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	93.95	90% Percentile (z)	69.02
95% UPL (t)	78.96	95% Percentile (z)	74.93
95% USL	84.5	99% Percentile (z)	86.01

Gamma GOF Test

A-D Test Statistic	0.502	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.731	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.203	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.256	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	7.019	k star (bias corrected MLE)	5.165
Theta hat (MLE)	6.865	Theta star (bias corrected MLE)	9.328
nu hat (MLE)	154.4	nu star (bias corrected)	113.6
MLE Mean (bias corrected)	48.18	MLE Sd (bias corrected)	21.2

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	90.52	90% Percentile	76.56
95% Hawkins Wixley (HW) Approx. Gamma UPL	93.11	95% Percentile	87.5
95% WH Approx. Gamma UTL with 95% Coverage	119.9	99% Percentile	110.6
95% HW Approx. Gamma UTL with 95% Coverage	126.3		
95% WH USL	100.7	95% HW USL	104.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.816	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.85	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.243	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.251	Data appear Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	157.2	90% Percentile (z)	79.32
95% UPL (t)	104.2	95% Percentile (z)	93.27
95% USL	121.3	99% Percentile (z)	126.4

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	11	95% UTL with 95% Coverage	71
Approx, f used to compute achieved CC	0.579	Approximate Actual Confidence Coefficient achieved by UTL	0.431
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	71	95% BCA Bootstrap UTL with 95% Coverage	71
95% UPL	71	90% Percentile	69
90% Chebyshev UPL	99.13	95% Percentile	70
95% Chebyshev UPL	122.2	99% Percentile	70.8
95% USL	71		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Lead

General Statistics

Total Number of Observations	11	Number of Missing Observations	0
Number of Distinct Observations	9		
Number of Detects	10	Number of Non-Detects	1
Number of Distinct Detects	8	Number of Distinct Non-Detects	1

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Minimum Detect	17	Minimum Non-Detect	1
Maximum Detect	38	Maximum Non-Detect	1
Variance Detected	35.11	Percent Non-Detects	9.091%
Mean Detected	23	SD Detected	5.925
Mean of Detected Logged Data	3.111	SD of Detected Logged Data	0.226

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.815	d2max (for USL)	2.234

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.797	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.268	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	21	KM SD	8.29
95% UTL95% Coverage	44.34	95% KM UPL (t)	36.69
90% KM Percentile (z)	31.62	95% KM Percentile (z)	34.64
99% KM Percentile (z)	40.29	95% KM USL	39.52

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	20.95	SD	8.81
95% UTL95% Coverage	45.76	95% UPL (t)	37.63
90% Percentile (z)	32.25	95% Percentile (z)	35.45
99% Percentile (z)	41.45	95% USL	40.64

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.551	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.225	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.266	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	20.18	k star (bias corrected MLE)	14.19
Theta hat (MLE)	1.14	Theta star (bias corrected MLE)	1.621
nu hat (MLE)	403.6	nu star (bias corrected)	283.9
MLE Mean (bias corrected)	23		
MLE Sd (bias corrected)	6.105	95% Percentile of Chisquare (2kstar)	41.81

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	11.25	Mean	21.93
Maximum	38	Median	21
SD	6.644	CV	0.303
k hat (MLE)	12.62	k star (bias corrected MLE)	9.236
Theta hat (MLE)	1.738	Theta star (bias corrected MLE)	2.375
nu hat (MLE)	277.6	nu star (bias corrected)	203.2
MLE Mean (bias corrected)	21.93	MLE Sd (bias corrected)	7.217
95% Percentile of Chisquare (2kstar)	29.47	90% Percentile	31.54
95% Percentile	34.99	99% Percentile	42.1

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	44.71	45.55	95% Approx. Gamma UPL	35.79	36.06
95% Gamma USL	38.94	39.38			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	21	SD (KM)	8.29
Variance (KM)	68.73	SE of Mean (KM)	2.635
k hat (KM)	6.417	k star (KM)	4.727
nu hat (KM)	141.2	nu star (KM)	104
theta hat (KM)	3.273	theta star (KM)	4.442
80% gamma percentile (KM)	28.41	90% gamma percentile (KM)	33.94
95% gamma percentile (KM)	38.99	99% gamma percentile (KM)	49.69

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

95% Approx. Gamma UTL with 95% Coverage	76.51	90.02	95% Approx. Gamma UPL	51.75	57.2
95% KM Gamma Percentile	46.15	50.16	95% Gamma USL	60.16	68.05

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.888	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.216	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	22.11	Mean in Log Scale	3.062
SD in Original Scale	6.35	SD in Log Scale	0.268
95% UTL95% Coverage	45.41	95% BCA UTL95% Coverage	38
95% Bootstrap (%) UTL95% Coverage	38	95% UPL (t)	35.48
90% Percentile (z)	30.12	95% Percentile (z)	33.2
99% Percentile (z)	39.84	95% USL	38.87

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	2.828	95% KM UTL (Lognormal)95% Coverage	223.6
KM SD of Logged Data	0.917	95% KM UPL (Lognormal)	96
95% KM Percentile Lognormal (z)	76.45	95% KM USL (Lognormal)	131.2

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	20.95	Mean in Log Scale	2.765
SD in Original Scale	8.81	SD in Log Scale	1.167
95% UTL95% Coverage	423.8	95% UPL (t)	144.5
90% Percentile (z)	70.81	95% Percentile (z)	108.2
99% Percentile (z)	239.6	95% USL	215.1

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	11	95% UTL with95% Coverage	38
Approx, f used to compute achieved CC	0.579	Approximate Actual Confidence Coefficient achieved by UTL	0.431
Approximate Sample Size needed to achieve specified CC	59	95% UPL	38
95% USL	38	95% KM Chebyshev UPL	58.74

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Mercury

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
Minimum	0.038	First Quartile	0.0645
Second Largest	0.26	Median	0.078
Maximum	1.4	Third Quartile	0.195
Mean	0.23	SD	0.395
Coefficient of Variation	1.721	Skewness	3.115
Mean of logged Data	-2.143	SD of logged Data	1.042

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.815	d2max (for USL)	2.234

Normal GOF Test

Shapiro Wilk Test Statistic	0.505	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.378	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.251	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	1.342	90% Percentile (z)	0.736
95% UPL (t)	0.977	95% Percentile (z)	0.879
95% USL	1.112	99% Percentile (z)	1.149

Gamma GOF Test

A-D Test Statistic	1.097	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.757	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.228	**Kolmogorov-Smirnov Gamma GOF Test**

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

5% K-S Critical Value	0.264	Detected data appear Gamma Distributed at 5% Significance Level

Detected data follow Appr. Gamma Distribution at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.874	k star (bias corrected MLE)	0.696
Theta hat (MLE)	0.263	Theta star (bias corrected MLE)	0.33
nu hat (MLE)	19.22	nu star (bias corrected)	15.31
MLE Mean (bias corrected)	0.23	MLE Sd (bias corrected)	0.275

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.835	90% Percentile	0.577
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.826	95% Percentile	0.783
95% WH Approx. Gamma UTL with 95% Coverage	1.507	99% Percentile	1.275
95% HW Approx. Gamma UTL with 95% Coverage	1.59		
95% WH USL	1.053	95% HW USL	1.066

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.878	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.85	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.198	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.251	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	2.2	90% Percentile (z)	0.446
95% UPL (t)	0.842	95% Percentile (z)	0.65
95% USL	1.201	99% Percentile (z)	1.323

Nonparametric Distribution Free Background Statistics
Data appear Approximate Gamma Distribution at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	11	95% UTL with 95% Coverage	1.4
Approx, f used to compute achieved CC	0.579	Approximate Actual Confidence Coefficient achieved by UTL	0.431
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	1.4	95% BCA Bootstrap UTL with 95% Coverage	1.4
95% UPL	1.4	90% Percentile	0.26
90% Chebyshev UPL	1.467	95% Percentile	0.83
95% Chebyshev UPL	2.028	99% Percentile	1.286
95% USL	1.4		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Molybdenum

General Statistics

Total Number of Observations	11	Number of Missing Observations	0
Number of Distinct Observations	10		
Number of Detects	10	Number of Non-Detects	1
Number of Distinct Detects	9	Number of Distinct Non-Detects	1
Minimum Detect	1.3	Minimum Non-Detect	1
Maximum Detect	11	Maximum Non-Detect	1
Variance Detected	8.401	Percent Non-Detects	9.091%
Mean Detected	2.89	SD Detected	2.898
Mean of Detected Logged Data	0.827	SD of Detected Logged Data	0.613

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.815	d2max (for USL)	2.234

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.538	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.385	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	2.718	KM SD	2.677
95% UTL95% Coverage	10.26	95% KM UPL (t)	7.787
90% KM Percentile (z)	6.149	95% KM Percentile (z)	7.122
99% KM Percentile (z)	8.947	95% KM USL	8.699

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	2.673	SD	2.843
95% UTL95% Coverage	10.67	95% UPL (t)	8.054
90% Percentile (z)	6.316	95% Percentile (z)	7.348
99% Percentile (z)	9.286	95% USL	9.023

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.3	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.735	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.29	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.269	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.285	k star (bias corrected MLE)	1.666
Theta hat (MLE)	1.265	Theta star (bias corrected MLE)	1.735
nu hat (MLE)	45.7	nu star (bias corrected)	33.32
MLE Mean (bias corrected)	2.89		
MLE Sd (bias corrected)	2.239	95% Percentile of Chisquare (2kstar)	8.383

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	0.01	Mean	2.628
Maximum	11	Median	1.9
SD	2.884	CV	1.097
k hat (MLE)	0.92	k star (bias corrected MLE)	0.73
Theta hat (MLE)	2.855	Theta star (bias corrected MLE)	3.6
nu hat (MLE)	20.25	nu star (bias corrected)	16.06
MLE Mean (bias corrected)	2.628	MLE Sd (bias corrected)	3.076
95% Percentile of Chisquare (2kstar)	4.895	90% Percentile	6.532
95% Percentile	8.811	99% Percentile	14.23

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	16.42	20.9	95% Approx. Gamma UPL	9.477	10.91
95% Gamma USL	11.75	14.05			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	2.718	SD (KM)	2.677
Variance (KM)	7.169	SE of Mean (KM)	0.851
k hat (KM)	1.031	k star (KM)	0.81
nu hat (KM)	22.67	nu star (KM)	17.82
theta hat (KM)	2.637	theta star (KM)	3.355
80% gamma percentile (KM)	4.439	90% gamma percentile (KM)	6.589
95% gamma percentile (KM)	8.778	99% gamma percentile (KM)	13.94

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	10.57	10.73	95% Approx. Gamma UPL	6.928	6.84
95% KM Gamma Percentile	6.115	6.004	95% Gamma USL	8.157	8.126

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.776	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.229	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Approximate Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	2.681	Mean in Log Scale	0.704
SD in Original Scale	2.835	SD in Log Scale	0.709
95% UTL95% Coverage	14.89	95% BCA UTL95% Coverage	11
95% Bootstrap (%) UTL95% Coverage	11	95% UPL (t)	7.745
90% Percentile (z)	5.02	95% Percentile (z)	6.495
99% Percentile (z)	10.53	95% USL	9.864

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	0.752	95% KM UTL (Lognormal)95% Coverage	11.59
KM SD of Logged Data	0.603	95% KM UPL (Lognormal)	6.645
95% KM Percentile Lognormal (z)	5.721	95% KM USL (Lognormal)	8.162

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	2.673	Mean in Log Scale	0.689
SD in Original Scale	2.843	SD in Log Scale	0.741
95% UTL95% Coverage	16.01	95% UPL (t)	8.088
90% Percentile (z)	5.143	95% Percentile (z)	6.73
99% Percentile (z)	11.15	95% USL	10.41

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	11	95% UTL with95% Coverage	11
Approx, f used to compute achieved CC	0.579	Approximate Actual Confidence Coefficient achieved by UTL	0.431
Approximate Sample Size needed to achieve specified CC	59	95% UPL	11
95% USL	11	95% KM Chebyshev UPL	14.91

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Nickel

General Statistics

Total Number of Observations	11	Number of Missing Observations	0
Number of Distinct Observations	10		
Number of Detects	10	Number of Non-Detects	1
Number of Distinct Detects	9	Number of Distinct Non-Detects	1
Minimum Detect	27	Minimum Non-Detect	1
Maximum Detect	54	Maximum Non-Detect	1
Variance Detected	86.27	Percent Non-Detects	9.091%
Mean Detected	39.4	SD Detected	9.288
Mean of Detected Logged Data	3.648	SD of Detected Logged Data	0.239

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.815	d2max (for USL)	2.234

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.933	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Normal at 5% Significance Level	
Lilliefors Test Statistic	0.174	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	35.91	KM SD	13.87
95% UTL95% Coverage	74.96	95% KM UPL (t)	62.17
90% KM Percentile (z)	53.69	95% KM Percentile (z)	58.73
99% KM Percentile (z)	68.18	95% KM USL	66.9

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	35.86	SD	14.67
95% UTL95% Coverage	77.16	95% UPL (t)	63.63
90% Percentile (z)	54.66	95% Percentile (z)	59.99
99% Percentile (z)	69.99	95% USL	68.63

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.335	**Anderson-Darling GOF Test**	
5% A-D Critical Value	0.725	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.161	**Kolmogorov-Smirnov GOF**	
5% K-S Critical Value	0.266	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	19.83	k star (bias corrected MLE)	13.95
Theta hat (MLE)	1.987	Theta star (bias corrected MLE)	2.825
nu hat (MLE)	396.6	nu star (bias corrected)	279
MLE Mean (bias corrected)	39.4		
MLE Sd (bias corrected)	10.55	95% Percentile of Chisquare (2kstar)	41.21

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	19.43	Mean	37.58
Maximum	54	Median	38
SD	10.67	CV	0.284
k hat (MLE)	12.6	k star (bias corrected MLE)	9.225
Theta hat (MLE)	2.983	Theta star (bias corrected MLE)	4.074
nu hat (MLE)	277.2	nu star (bias corrected)	203
MLE Mean (bias corrected)	37.58	MLE Sd (bias corrected)	12.37
95% Percentile of Chisquare (2kstar)	29.44	90% Percentile	54.06
95% Percentile	59.98	99% Percentile	72.17

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	76.73	78.5	95% Approx. Gamma UPL	61.4	62.05
95% Gamma USL	66.8	67.8			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	35.91	SD (KM)	13.87
Variance (KM)	192.4	SE of Mean (KM)	4.409
k hat (KM)	6.7	k star (KM)	4.934
nu hat (KM)	147.4	nu star (KM)	108.5
theta hat (KM)	5.359	theta star (KM)	7.278
80% gamma percentile (KM)	48.34	90% gamma percentile (KM)	57.55
95% gamma percentile (KM)	65.96	99% gamma percentile (KM)	83.72

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	141.7	172.5	95% Approx. Gamma UPL	93.78	106.1
95% KM Gamma Percentile	83.05	92.08	95% Gamma USL	110	127.9

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.936	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.149	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	37.77	Mean in Log Scale	3.595
SD in Original Scale	10.35	SD in Log Scale	0.287
95% UTL95% Coverage	81.72	95% BCA UTL95% Coverage	54
95% Bootstrap (%) UTL95% Coverage	54	95% UPL (t)	62.72
90% Percentile (z)	52.62	95% Percentile (z)	58.41
99% Percentile (z)	71.03	95% USL	69.17

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	3.317	95% KM UTL (Lognormal)95% Coverage	561.8
KM SD of Logged Data	1.071	95% KM UPL (Lognormal)	209.3
95% KM Percentile Lognormal (z)	160.5	95% KM USL (Lognormal)	301.5

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	35.86	Mean in Log Scale	3.254
SD in Original Scale	14.67	SD in Log Scale	1.328
95% UTL95% Coverage	1089	95% UPL (t)	320.1
90% Percentile (z)	142.1	95% Percentile (z)	230.2
99% Percentile (z)	569.2	95% USL	503.4

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	11	95% UTL with95% Coverage	54
Approx, f used to compute achieved CC	0.579	Approximate Actual Confidence Coefficient achieved by UTL	0.431
Approximate Sample Size needed to achieve specified CC	59	95% UPL	54
95% USL	54	95% KM Chebyshev UPL	99.07

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Selenium

General Statistics

Total Number of Observations	11	Number of Missing Observations	0
Number of Distinct Observations	4		
Number of Detects	2	Number of Non-Detects	9
Number of Distinct Detects	2	Number of Distinct Non-Detects	2
Minimum Detect	2.1	Minimum Non-Detect	1.7
Maximum Detect	4.1	Maximum Non-Detect	1.8
Variance Detected	2	Percent Non-Detects	81.82%
Mean Detected	3.1	SD Detected	1.414
Mean of Detected Logged Data	1.076	SD of Detected Logged Data	0.473

Warning: Data set has only 2 Detected Values.
This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.815	d2max (for USL)	2.234

Normal GOF Test on Detects Only
Not Enough Data to Perform GOF Test

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	1.955	KM SD	0.688
95% UTL95% Coverage	3.891	95% KM UPL (t)	3.257
90% KM Percentile (z)	2.836	95% KM Percentile (z)	3.086
99% KM Percentile (z)	3.555	95% KM USL	3.492

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	1.268	SD	1.01
95% UTL95% Coverage	4.112	95% UPL (t)	3.181
90% Percentile (z)	2.563	95% Percentile (z)	2.93
99% Percentile (z)	3.618	95% USL	3.525

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only
Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	9.264	k star (bias corrected MLE)	N/A
Theta hat (MLE)	0.335	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	37.06	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2kstar)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	1.955	SD (KM)	0.688
Variance (KM)	0.473	SE of Mean (KM)	0.293
k hat (KM)	8.07	k star (KM)	5.93
nu hat (KM)	177.5	nu star (KM)	130.5
theta hat (KM)	0.242	theta star (KM)	0.33
80% gamma percentile (KM)	2.579	90% gamma percentile (KM)	3.028
95% gamma percentile (KM)	3.434	99% gamma percentile (KM)	4.286

The following statistics are computed using gamma distribution and KM estimates
Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	3.857	3.853	95% Approx. Gamma UPL	3.114	3.095
95% KM Gamma Percentile	2.931	2.912	95% Gamma USL	3.376	3.361

Lognormal GOF Test on Detected Observations Only
Not Enough Data to Perform GOF Test

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	0.77	Mean in Log Scale	-1.266
SD in Original Scale	1.252	SD in Log Scale	1.486
95% UTL95% Coverage	18.46	95% BCA UTL95% Coverage	4.1
95% Bootstrap (%) UTL95% Coverage	4.1	95% UPL (t)	4.693
90% Percentile (z)	1.892	95% Percentile (z)	3.246
99% Percentile (z)	8.933	95% USL	7.787

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	0.63	95% KM UTL (Lognormal)95% Coverage	3.841
KM SD of Logged Data	0.254	95% KM UPL (Lognormal)	3.038

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

95% KM Percentile Lognormal (z)	2.852	95% KM USL (Lognormal)	3.313

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	1.268	Mean in Log Scale	0.0731
SD in Original Scale	1.01	SD in Log Scale	0.519
95% UTL95% Coverage	4.632	95% UPL (t)	2.872
90% Percentile (z)	2.091	95% Percentile (z)	2.525
99% Percentile (z)	3.595	95% USL	3.427

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics
Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	11	95% UTL with95% Coverage	4.1
Approx, f used to compute achieved CC	0.579	Approximate Actual Confidence Coefficient achieved by UTL	0.431
Approximate Sample Size needed to achieve specified CC	59	95% UPL	4.1
95% USL	4.1	95% KM Chebyshev UPL	5.087

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Silver

General Statistics

Total Number of Observations	11	Number of Missing Observations	0
Number of Distinct Observations	5		
Number of Detects	0	Number of Non-Detects	11
Number of Distinct Detects	0	Number of Distinct Non-Detects	5
Minimum Detect	N/A	Minimum Non-Detect	0.75
Maximum Detect	N/A	Maximum Non-Detect	0.79
Variance Detected	N/A	Percent Non-Detects	100%
Mean Detected	N/A	SD Detected	N/A
Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Silver was not processed!

Thallium

General Statistics

Total Number of Observations	11	Number of Missing Observations	0
Number of Distinct Observations	4		
Number of Detects	0	Number of Non-Detects	11
Number of Distinct Detects	0	Number of Distinct Non-Detects	4
Minimum Detect	N/A	Minimum Non-Detect	5
Maximum Detect	N/A	Maximum Non-Detect	5.3
Variance Detected	N/A	Percent Non-Detects	100%
Mean Detected	N/A	SD Detected	N/A
Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Thallium was not processed!

Vanadium

General Statistics

Total Number of Observations	11	Number of Missing Observations	0
Number of Distinct Observations	10		
Number of Detects	10	Number of Non-Detects	1
Number of Distinct Detects	9	Number of Distinct Non-Detects	1
Minimum Detect	50	Minimum Non-Detect	0.51
Maximum Detect	83	Maximum Non-Detect	0.51
Variance Detected	98.01	Percent Non-Detects	9.091%
Mean Detected	62.3	SD Detected	9.9

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Mean of Detected Logged Data	4.121	SD of Detected Logged Data	0.154

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.815	d2max (for USL)	2.234

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.938	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.131	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	56.68	KM SD	19.89
95% UTL95% Coverage	112.7	95% KM UPL (t)	94.34
90% KM Percentile (z)	82.18	95% KM Percentile (z)	89.4
99% KM Percentile (z)	103	95% KM USL	101.1

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	56.66	SD	20.93
95% UTL95% Coverage	115.6	95% UPL (t)	96.29
90% Percentile (z)	83.49	95% Percentile (z)	91.09
99% Percentile (z)	105.4	95% USL	103.4

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.244	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.724	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.133	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.266	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	46.03	k star (bias corrected MLE)	32.29
Theta hat (MLE)	1.354	Theta star (bias corrected MLE)	1.93
nu hat (MLE)	920.6	nu star (bias corrected)	645.7
MLE Mean (bias corrected)	62.3		
MLE Sd (bias corrected)	10.96	95% Percentile of Chisquare (2kstar)	84.33

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	40.09	Mean	60.28
Maximum	83	Median	59
SD	11.54	CV	0.191
k hat (MLE)	29.5	k star (bias corrected MLE)	21.52
Theta hat (MLE)	2.043	Theta star (bias corrected MLE)	2.802
nu hat (MLE)	649	nu star (bias corrected)	473.3
MLE Mean (bias corrected)	60.28	MLE Sd (bias corrected)	13
95% Percentile of Chisquare (2kstar)	59.34	90% Percentile	77.42
95% Percentile	83.13	99% Percentile	94.56

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	98.4	99.36	95% Approx. Gamma UPL	84.26	84.61
95% Gamma USL	89.32	89.86			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	56.68	SD (KM)	19.89
Variance (KM)	395.7	SE of Mean (KM)	6.322
k hat (KM)	8.119	k star (KM)	5.965
nu hat (KM)	178.6	nu star (KM)	131.2
theta hat (KM)	6.981	theta star (KM)	9.502
80% gamma percentile (KM)	74.74	90% gamma percentile (KM)	87.71
95% gamma percentile (KM)	99.45	99% gamma percentile (KM)	124.1

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	247	321.6	95% Approx. Gamma UPL	159.3	189
95% KM Gamma Percentile	139.9	161.7	95% Gamma USL	188.8	232

Lognormal GOF Test on Detected Observations Only

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Shapiro Wilk Test Statistic	0.96	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Detected Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.135	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Detected Data appear Lognormal at 5% Significance Level	

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	60.47	Mean in Log Scale	4.087
SD in Original Scale	11.18	SD in Log Scale	0.186
95% UTL95% Coverage	100.4	95% BCA UTL95% Coverage	83
95% Bootstrap (%) UTL95% Coverage	83	95% UPL (t)	84.62
90% Percentile (z)	75.54	95% Percentile (z)	80.81
99% Percentile (z)	91.71	95% USL	90.15

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	3.685	95% KM UTL (Lognormal)95% Coverage	1968
KM SD of Logged Data	1.385	95% KM UPL (Lognormal)	548.8
95% KM Percentile Lognormal (z)	389.1	95% KM USL (Lognormal)	880

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	56.66	Mean in Log Scale	3.622
SD in Original Scale	20.93	SD in Log Scale	1.661
95% UTL95% Coverage	4016	95% UPL (t)	868.3
90% Percentile (z)	314.5	95% Percentile (z)	575
99% Percentile (z)	1783	95% USL	1530

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	11	95% UTL with95% Coverage	83
Approx, f used to compute achieved CC	0.579	Approximate Actual Confidence Coefficient achieved by UTL	0.431
Approximate Sample Size needed to achieve specified CC	59	95% UPL	83
95% USL	83	95% KM Chebyshev UPL	147.2

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Zinc

General Statistics

Total Number of Observations	11	Number of Distinct Observations	10
Minimum	16	First Quartile	115
Second Largest	190	Median	130
Maximum	490	Third Quartile	170
Mean	156.9	SD	120.8
Coefficient of Variation	0.77	Skewness	2.31
Mean of logged Data	4.801	SD of logged Data	0.826

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.815	d2max (for USL)	2.234

Normal GOF Test

Shapiro Wilk Test Statistic	0.738	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.301	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.251	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	497	90% Percentile (z)	311.7
95% UPL (t)	385.6	95% Percentile (z)	355.6
95% USL	426.8	99% Percentile (z)	437.9

Gamma GOF Test

A-D Test Statistic	0.663	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.738	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.219	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.258	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

k hat (MLE)	2.118	k star (bias corrected MLE)	1.601
Theta hat (MLE)	74.09	Theta star (bias corrected MLE)	98.01
nu hat (MLE)	46.59	nu star (bias corrected)	35.22
MLE Mean (bias corrected)	156.9	MLE Sd (bias corrected)	124

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	427.9	90% Percentile	321.8
95% Hawkins Wixley (HW) Approx. Gamma UPL	448.6	95% Percentile	400
95% WH Approx. Gamma UTL with 95% Coverage	661.8	99% Percentile	575.7
95% HW Approx. Gamma UTL with 95% Coverage	729		
95% WH USL	506.5	95% HW USL	540.5

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.852	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.85	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.27	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.251	Data Not Lognormal at 5% Significance Level

Data appear Approximate Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	1245	90% Percentile (z)	350.7
95% UPL (t)	581.2	95% Percentile (z)	473.5
95% USL	770.3	99% Percentile (z)	831.4

Nonparametric Distribution Free Background Statistics
Data appear Gamma Distributed at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	11	95% UTL with 95% Coverage	490
Approx, f used to compute achieved CC	0.579	Approximate Actual Confidence Coefficient achieved by UTL	0.431
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	490	95% BCA Bootstrap UTL with 95% Coverage	490
95% UPL	490	90% Percentile	190
90% Chebyshev UPL	535.4	95% Percentile	340
95% Chebyshev UPL	706.9	99% Percentile	460
95% USL	490		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Mercury_SD

General Statistics

Total Number of Observations	6	Number of Distinct Observations	6
Minimum	0.057	First Quartile	0.0698
Second Largest	0.095	Median	0.082
Maximum	0.097	Third Quartile	0.092
Mean	0.0798	SD	0.0158
Coefficient of Variation	0.198	Skewness	-0.454
Mean of logged Data	-2.545	SD of logged Data	0.209

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test

Shapiro Wilk Test Statistic	0.928	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.788	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.196	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.325	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	0.138	90% Percentile (z)	0.1
95% UPL (t)	0.114	95% Percentile (z)	0.106
95% USL	0.109	99% Percentile (z)	0.117

Gamma GOF Test

A-D Test Statistic	0.328	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.697	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.222	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.332	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Gamma Statistics

k hat (MLE)	28.72	k star (bias corrected MLE)	14.47
Theta hat (MLE)	0.00278	Theta star (bias corrected MLE)	0.00552
nu hat (MLE)	344.6	nu star (bias corrected)	173.7
MLE Mean (bias corrected)	0.0798	MLE Sd (bias corrected)	0.021

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	0.12	90% Percentile	0.108
95% Hawkins Wixley (HW) Approx. Gamma UPL	0.121	95% Percentile	0.117
95% WH Approx. Gamma UTL with 95% Coverage	0.156	99% Percentile	0.137
95% HW Approx. Gamma UTL with 95% Coverage	0.159		
95% WH USL	0.112	95% HW USL	0.113

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.914	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.788	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.228	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.325	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Background Statistics assuming Lognormal Distribution

95% UTL with 95% Coverage	0.17	90% Percentile (z)	0.103
95% UPL (t)	0.124	95% Percentile (z)	0.111
95% USL	0.115	99% Percentile (z)	0.127

Nonparametric Distribution Free Background Statistics
Data appear Normal at 5% Significance Level

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	6	95% UTL with 95% Coverage	0.097
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by UTL	0.265
		Approximate Sample Size needed to achieve specified CC	59
95% Percentile Bootstrap UTL with 95% Coverage	0.097	95% BCA Bootstrap UTL with 95% Coverage	0.097
95% UPL	0.097	90% Percentile	0.096
90% Chebyshev UPL	0.131	95% Percentile	0.0965
95% Chebyshev UPL	0.154	99% Percentile	0.0969
95% USL	0.097		

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

MethylMercury

General Statistics

Total Number of Observations	6	Number of Missing Observations	0
Number of Distinct Observations	6		
Number of Detects	5	Number of Non-Detects	1
Number of Distinct Detects	5	Number of Distinct Non-Detects	1
Minimum Detect	5.4000E-5	Minimum Non-Detect	0.04
Maximum Detect	0.0036	Maximum Non-Detect	0.04
Variance Detected	2.1683E-6	Percent Non-Detects	16.67%
Mean Detected	0.00104	SD Detected	0.00147
Mean of Detected Logged Data	-7.745	SD of Detected Logged Data	1.579

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	3.708	d2max (for USL)	1.822

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.745	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.762	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.312	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.00104	KM SD	0.00132
95% UTL95% Coverage	0.00593	95% KM UPL (t)	0.00391
90% KM Percentile (z)	0.00273	95% KM Percentile (z)	0.00321
99% KM Percentile (z)	0.00411	95% KM USL	0.00344

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.0042	SD	0.00785
95% UTL95% Coverage	0.0333	95% UPL (t)	0.0213

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

90% Percentile (z)	0.0143	95% Percentile (z)	0.0171
99% Percentile (z)	0.0225	95% USL	0.0185

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.27	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.701	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.239	**Kolmogorov-Smirnov GOF**
5% K-S Critical Value	0.368	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	0.688	k star (bias corrected MLE)	0.408
Theta hat (MLE)	0.00152	Theta star (bias corrected MLE)	0.00256
nu hat (MLE)	6.876	nu star (bias corrected)	4.084
MLE Mean (bias corrected)	0.00104		
MLE Sd (bias corrected)	0.00163	95% Percentile of Chisquare (2kstar)	3.369

Gamma ROS Statistics using Imputed Non-Detects

GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs
GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)
For such situations, GROS method may yield incorrect values of UCLs and BTVs
This is especially true when the sample size is small.
For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates

Minimum	5.4000E-5	Mean	0.00254
Maximum	0.01	Median	6.7000E-4
SD	0.00389	CV	1.532
k hat (MLE)	0.509	k star (bias corrected MLE)	0.366
Theta hat (MLE)	0.00499	Theta star (bias corrected MLE)	0.00694
nu hat (MLE)	6.105	nu star (bias corrected)	4.386
MLE Mean (bias corrected)	0.00254	MLE Sd (bias corrected)	0.0042
95% Percentile of Chisquare (2kstar)	3.133	90% Percentile	0.00728
95% Percentile	0.0109	99% Percentile	0.02

The following statistics are computed using Gamma ROS Statistics on Imputed Data

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	0.0441	0.062	95% Approx. Gamma UPL	0.0159	0.0182
95% Gamma USL	0.0118	0.0129			

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.00104	SD (KM)	0.00132
Variance (KM)	1.7347E-6	SE of Mean (KM)	6.5854E-4
k hat (KM)	0.629	k star (KM)	0.426
nu hat (KM)	7.551	nu star (KM)	5.109
theta hat (KM)	0.00166	theta star (KM)	0.00245
80% gamma percentile (KM)	0.0017	90% gamma percentile (KM)	0.00292
95% gamma percentile (KM)	0.00425	99% gamma percentile (KM)	0.00757

The following statistics are computed using gamma distribution and KM estimates

Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods

	WH	HW		WH	HW
95% Approx. Gamma UTL with 95% Coverage	0.0125	0.0159	95% Approx. Gamma UPL	0.005	0.00546
95% KM Gamma Percentile	0.00336	0.00348	95% Gamma USL	0.00386	0.00407

Lognormal GOF Test on Detected Observations Only

Shapiro Wilk Test Statistic	0.992	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.762	Detected Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.161	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.343	Detected Data appear Lognormal at 5% Significance Level

Detected Data appear Lognormal at 5% Significance Level

Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects

Mean in Original Scale	9.4282E-4	Mean in Log Scale	-7.745
SD in Original Scale	0.00134	SD in Log Scale	1.413
95% UTL95% Coverage	0.0815	95% BCA UTL95% Coverage	0.0036
95% Bootstrap (%) UTL95% Coverage	0.0036	95% UPL (t)	0.00937
90% Percentile (z)	0.00265	95% Percentile (z)	0.00442
99% Percentile (z)	0.0116	95% USL	0.00568

Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution

KM Mean of Logged Data	-7.745	95% KM UTL (Lognormal)95% Coverage	0.0815
KM SD of Logged Data	1.413	95% KM UPL (Lognormal)	0.00937
95% KM Percentile Lognormal (z)	0.00442	95% KM USL (Lognormal)	0.00568

Background DL/2 Statistics Assuming Lognormal Distribution

Mean in Original Scale	0.0042	Mean in Log Scale	-7.106

Table E-1
ProUCL Output - BTVs
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

SD in Original Scale	0.00785	SD in Log Scale	2.108
95% UTL95% Coverage	2.036	95% UPL (t)	0.0806
90% Percentile (z)	0.0122	95% Percentile (z)	0.0263
99% Percentile (z)	0.111	95% USL	0.0382

DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.

Nonparametric Distribution Free Background Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)

Order of Statistic, r	6	95% UTL with95% Coverage	0.04
Approx, f used to compute achieved CC	0.316	Approximate Actual Confidence Coefficient achieved by UTL	0.265
Approximate Sample Size needed to achieve specified CC	59	95% UPL	0.04
95% USL	0.04	95% KM Chebyshev UPL	0.00725

Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.
Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers
and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data
represents a background data set and when many onsite observations need to be compared with the BTV.

Table E-2
Ecological SRE - ProUCL Output - Sediment
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.12/20/2018 3:16:09 PM
From File	Sed_ProUCL Input.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Mercury_Sed

General Statistics

Total Number of Observations	10	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	0.04	Mean	0.113
Maximum	0.37	Median	0.096
SD	0.095	Std. Error of Mean	0.03
Coefficient of Variation	0.842	Skewness	2.611

Normal GOF Test

Shapiro Wilk Test Statistic	0.662	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.328	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.168	95% Adjusted-CLT UCL (Chen-1995)	0.189
		95% Modified-t UCL (Johnson-1978)	0.172

Gamma GOF Test

A-D Test Statistic	0.644	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.734	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.233	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.269	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.582	k star (bias corrected MLE)	1.874
Theta hat (MLE)	0.0437	Theta star (bias corrected MLE)	0.0602
nu hat (MLE)	51.65	nu star (bias corrected)	37.49
MLE Mean (bias corrected)	0.113	MLE Sd (bias corrected)	0.0824
		Approximate Chi Square Value (0.05)	24.47
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	22.66

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	0.173	95% Adjusted Gamma UCL (use when n<50)	0.187

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.915	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.188	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-3.219	Mean of logged Data	-2.388
Maximum of Logged Data	-0.994	SD of logged Data	0.622

Assuming Lognormal Distribution

95% H-UCL	0.183	90% Chebyshev (MVUE) UCL	0.175
95% Chebyshev (MVUE) UCL	0.205	97.5% Chebyshev (MVUE) UCL	0.246
99% Chebyshev (MVUE) UCL	0.327		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	0.162	95% Jackknife UCL	0.168
95% Standard Bootstrap UCL	0.16	95% Bootstrap-t UCL	0.245

Table E-2
Ecological SRE - ProUCL Output - Sediment
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

95% Hall's Bootstrap UCL	0.369	95% Percentile Bootstrap UCL	0.164
95% BCA Bootstrap UCL	0.193		
90% Chebyshev(Mean, Sd) UCL	0.203	95% Chebyshev(Mean, Sd) UCL	0.244
97.5% Chebyshev(Mean, Sd) UCL	0.3	99% Chebyshev(Mean, Sd) UCL	0.412

Suggested UCL to Use

95% Adjusted Gamma UCL	0.187

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.111/30/2018 12:51:52 PM
From File	Sed_MeHg_ProUCL_Input.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Methyl_mercury

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	5.8000E-5	Mean	0.00173
Maximum	0.0064	Median	4.3000E-4
SD	0.00237	Std. Error of Mean	7.4824E-4
Coefficient of Variation	1.37	Skewness	1.216

Normal GOF Test

Shapiro Wilk Test Statistic	0.736	**Shapiro Wilk GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.329	**Lilliefors GOF Test**	
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.0031	95% Adjusted-CLT UCL (Chen-1995)	0.00326
		95% Modified-t UCL (Johnson-1978)	0.00315

Gamma GOF Test

A-D Test Statistic	0.634	**Anderson-Darling Gamma GOF Test**	
5% A-D Critical Value	0.776	Detected data appear Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.189	**Kolmogorov-Smirnov Gamma GOF Test**	
5% K-S Critical Value	0.281	Detected data appear Gamma Distributed at 5% Significance Level	

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.51	k star (bias corrected MLE)	0.424
Theta hat (MLE)	0.00338	Theta star (bias corrected MLE)	0.00407
nu hat (MLE)	10.2	nu star (bias corrected)	8.477
MLE Mean (bias corrected)	0.00173	MLE Sd (bias corrected)	0.00265
		Approximate Chi Square Value (0.05)	3.014
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	2.477

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	0.00486	95% Adjusted Gamma UCL (use when n<50)	0.00591

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.896	**Shapiro Wilk Lognormal GOF Test**	
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.18	**Lilliefors Lognormal GOF Test**	
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level	

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-9.755	Mean of logged Data	-7.603

Table E-2

Ecological SRE - ProUCL Output - Sediment

Coggins Flat Area Placer Mine

Whiskeytown National Recreation Area

Maximum of Logged Data	-5.051	SD of logged Data	1.816

Assuming Lognormal Distribution

95% H-UCL	0.0519	90% Chebyshev (MVUE) UCL	0.00526
95% Chebyshev (MVUE) UCL	0.00679	97.5% Chebyshev (MVUE) UCL	0.00892
99% Chebyshev (MVUE) UCL	0.0131		

Nonparametric Distribution Free UCL Statistics

Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	0.00296	95% Jackknife UCL	0.0031
95% Standard Bootstrap UCL	0.00287	95% Bootstrap-t UCL	0.00367
95% Hall's Bootstrap UCL	0.00261	95% Percentile Bootstrap UCL	0.00305
95% BCA Bootstrap UCL	0.00318		
90% Chebyshev(Mean, Sd) UCL	0.00397	95% Chebyshev(Mean, Sd) UCL	0.00499
97.5% Chebyshev(Mean, Sd) UCL	0.0064	99% Chebyshev(Mean, Sd) UCL	0.00917

Suggested UCL to Use

95% Adjusted Gamma UCL	0.00591

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.

Recommendations are based upon data size, data distribution, and skewness.

These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).

However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Table E-2
Ecological SRE - ProUCL Output - Sediment
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	ProUCL 5.12/20/2018 3:16:09 PM
From File	Sed_ProUCL Input.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Mercury_Sed

General Statistics

Total Number of Observations	10	Number of Distinct Observations	9
		Number of Missing Observations	0
Minimum	0.04	Mean	0.113
Maximum	0.37	Median	0.096
SD	0.095	Std. Error of Mean	0.03
Coefficient of Variation	0.842	Skewness	2.611

Normal GOF Test

Shapiro Wilk Test Statistic	0.662	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.328	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.262	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.168	95% Adjusted-CLT UCL (Chen-1995)	0.189
		95% Modified-t UCL (Johnson-1978)	0.172

Gamma GOF Test

A-D Test Statistic	0.644	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.734	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.233	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.269	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	2.582	k star (bias corrected MLE)	1.874
Theta hat (MLE)	0.0437	Theta star (bias corrected MLE)	0.0602
nu hat (MLE)	51.65	nu star (bias corrected)	37.49
MLE Mean (bias corrected)	0.113	MLE Sd (bias corrected)	0.0824
		Approximate Chi Square Value (0.05)	24.47
Adjusted Level of Significance	0.0267	Adjusted Chi Square Value	22.66

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	0.173	95% Adjusted Gamma UCL (use when n<50)	0.187

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.915	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.842	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.188	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.262	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	-3.219	Mean of logged Data	-2.388
Maximum of Logged Data	-0.994	SD of logged Data	0.622

Assuming Lognormal Distribution

95% H-UCL	0.183	90% Chebyshev (MVUE) UCL	0.175
95% Chebyshev (MVUE) UCL	0.205	97.5% Chebyshev (MVUE) UCL	0.246
99% Chebyshev (MVUE) UCL	0.327		

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	0.162	95% Jackknife UCL	0.168
95% Standard Bootstrap UCL	0.16	95% Bootstrap-t UCL	0.245
95% Hall's Bootstrap UCL	0.369	95% Percentile Bootstrap UCL	0.164
95% BCA Bootstrap UCL	0.193		
90% Chebyshev(Mean, Sd) UCL	0.203	95% Chebyshev(Mean, Sd) UCL	0.244
97.5% Chebyshev(Mean, Sd) UCL	0.3	99% Chebyshev(Mean, Sd) UCL	0.412

Table E-2
Ecological SRE - ProUCL Output - Sediment
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Suggested UCL to Use

95% Adjusted Gamma UCL	0.187

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

APPENDIX F
RSL OUTPUTS

Table F-1

Outdoor Worker Equation Inputs for Soil

Variable	Outdoor Worker Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	10.2152
A (VF Dispersion Constant)	11.911	10.2152
A (VF Dispersion Constant - Mass Limit)	11.911	10.2152
B (PEF Dispersion Constant)	18.7762	19.2654
B (VF Dispersion Constant)	18.4385	19.2654
B (VF Dispersion Constant - Mass Limit)	18.4385	19.2654
$City_{PEF}$ (Climate Zone) Selection	Default	Fresno, CA (2)
$City_{VF}$ (Climate Zone) Selection	Default	Fresno, CA (2)
C (PEF Dispersion Constant)	216.108	220.0604
C (VF Dispersion Constant)	209.7845	220.0604
C (VF Dispersion Constant - Mass Limit)	209.7845	220.0604
foc (fraction organic carbon in soil) g/g	0.006	0.006
F(x) (function dependent on U_m/U_t) unitless	0.194	0.000319
n (total soil porosity) L_{pore}/L_{soil}	0.43396	0.43396
p_b (dry soil bulk density) g/cm^3	1.5	1.5
p_b (dry soil bulk density) g/cm^3	1.5	1.5
PEF (particulate emission factor) m^3/kg	1359344438	2.42699E+12
p_s (soil particle density) g/cm^3	2.65	2.65
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	62.42916722
Q/C_{vol} (g/m^2-s per kg/m^3)	68.18	62.42916722
Q/C_{vol} (g/m^2-s per kg/m^3)	68.18	62.42916722
A_s (PEF acres)	0.5	0.5
A_s (VF acres)	0.5	0.5
A_s (VF mass-limit acres)	0.5	0.5
AF_{ow} (skin adherence factor - outdoor worker) mg/cm^2	0.12	0.12
AT_{ow} (averaging time - outdoor worker)	365	365
BW_{ow} (body weight - outdoor worker)	80	80
ED_{ow} (exposure duration - outdoor worker) yr	25	25
EF_{ow} (exposure frequency - outdoor worker) day/yr	225	52
ET_{ow} (exposure time - outdoor worker) hr	8	8
THQ (target hazard quotient) unitless	0.1	0.1
IR_{ow} (soil ingestion rate - outdoor worker) mg/day	100	100
LT (lifetime) yr	70	70
SA_{ow} (surface area - outdoor worker) cm^2/day	3527	3527
TR (target cancer risk) unitless	0.000001	0.000001
T_w (groundwater temperature) Celsius	25	25
$Theta_a$ (air-filled soil porosity) L_{air}/L_{soil}	0.28396	0.28396
$Theta_w$ (water-filled soil porosity) L_{water}/L_{soil}	0.15	0.15
T (exposure interval) s	819936000	819936000
T (exposure interval) yr	26	26
U_m (mean annual wind speed) m/s	4.69	2.86
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5
VF_{ml} (volitization factor - mass-limit) m^3/kg		0

Table F-2

Outdoor Worker Risk for Soil

Chemical	SF_o $(mg/kg\text{-}day)^{-1}$	SF_o Ref	IUR $(ug/m^3)^{-1}$	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m^3)	RfC Ref	GIABS	ABS	RBA	Particulate Emission Factor (m^3/kg)	Concentration (mg/kg)	Ingestion Risk	Dermal Risk	Inhalation Risk	Carcinogenic Risk	Ingestion HQ	Dermal HQ	Inhalation HQ	Noncarcinogenic HI
Antimony	-		-		0.0004	I	-		0.15	-	1	2.43E+12	5.3	-	-	-	-	0.00236	-	-	0.00236
Arsenic	1.5	I	0.0043	I	0.0003	I	0.000015	C	1	0.03	0.6	2.43E+12	58	0.00000332	0.000000703	1.74E-12	0.00000402	0.0207	0.00437	7.57E-08	0.025
Thallium	-		-		0.00001	X	-		1	-	1	2.43E+12	5.3	-	-	-	-	0.0944	-	-	0.0944
**Total Risk/HI*	-		-		-		-		-	-	-	-	-	*0.00000332*	*0.000000703*	*1.74E-12*	*0.00000402*	*0.117*	*0.00437*	*7.57E-08*	*0.122*

Table F-3

Recreator Equation Inputs for Soil

Variable	Recreator Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	10.2152
A (VF Dispersion Constant)	11.911	10.2152
A (VF Dispersion Constant - Mass Limit)	11.911	10.2152
B (PEF Dispersion Constant)	18.7762	19.2654
B (VF Dispersion Constant)	18.4385	19.2654
B (VF Dispersion Constant - Mass Limit)	18.4385	19.2654
$City_{PEF}$ (Climate Zone) Selection	Default	Fresno, CA (2)
$City_{VF}$ (Climate Zone) Selection	Default	Fresno, CA (2)
C (PEF Dispersion Constant)	216.108	220.0604
C (VF Dispersion Constant)	209.7845	220.0604
C (VF Dispersion Constant - Mass Limit)	209.7845	220.0604
foc (fraction organic carbon in soil) g/g	0.006	0.006
F(x) (function dependent on U_m/U_t) unitless	0.194	0.000319
n (total soil porosity) L_{pore}/L_{soil}	0.43396	0.43396
p_b (dry soil bulk density) g/cm^3	1.5	1.5
p_b (dry soil bulk density) g/cm^3	1.5	1.5
PEF (particulate emission factor) m^3/kg	1359344438	2.42699E+12
p_s (soil particle density) g/cm^3	2.65	2.65
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	62.42916722
Q/C_{vol} (g/m^2-s per kg/m^3)	68.18	62.42916722
Q/C_{vol} (g/m^2-s per kg/m^3)	68.18	62.42916722
A_s (PEF acres)	0.5	0.5
A_s (VF acres)	0.5	0.5
A_s (VF mass-limit acres)	0.5	0.5
AF_{0-2} (skin adherence factor) mg/cm^2	0.2	0.2
AF_{2-6} (skin adherence factor) mg/cm^2	0.2	0.2
AF_{6-16} (skin adherence factor) mg/cm^2	0.07	0.07
AF_{16-30} (skin adherence factor) mg/cm^2	0.07	0.07
AF_{rec-a} (skin adherence factor - adult) mg/cm^2	0.07	0.07
AF_{rec-c} (skin adherence factor - child) mg/cm^2	0.2	0.2
AT_{rec} (averaging time)	365	365
BW_{0-2} (body weight) kg	15	15
BW_{2-6} (body weight) kg	15	15
BW_{6-16} (body weight) kg	80	80
BW_{16-30} (body weight) kg	80	80
BW_{rec-a} (body weight - adult) kg	80	80
BW_{rec-c} (body weight - child) kg	15	15
ED_{rec} (exposure duration - recreator) years	26	26
ED_{0-2} (exposure duration) year	2	2
ED_{2-6} (exposure duration) year	4	4
ED_{6-16} (exposure duration) year	10	10
ED_{16-30} (exposure duration) year	10	10
ED_{rec-c} (exposure duration - child) years	6	6
EF_{rec} (exposure frequency) days/year	.	12
EF_{0-2} (exposure frequency) days/year	.	12
EF_{2-6} (exposure frequency) days/year	.	12
EF_{6-16} (exposure frequency) days/year	.	12
EF_{16-30} (exposure frequency) days/year	.	12
EF_{rec-a} (exposure frequency - adult) days/year	.	12
EF_{rec-c} (exposure frequency - child) days/year	.	12
ET_{rec} (exposure time - recreator) hours/day	.	8
ET_{0-2} (exposure time) hours/day	.	8
ET_{2-6} (exposure time) hours/day	.	8
ET_{6-16} (exposure time) hours/day	.	8
ET_{16-30} (exposure time) hours/day	.	8

Table F-3

Recreator Equation Inputs for Soil

Variable	Recreator Soil Default Value	Form-input Value
ET_{rec-a} (adult exposure time) hours/day	.	8
ET_{rec-c} (child exposure time) hours/day	.	8
THQ (target hazard quotient) unitless	0.1	0.1
IRS_{0-2} (soil intake rate) mg/day	200	200
IRS_{2-6} (soil intake rate) mg/day	200	200
IRS_{6-16} (soil intake rate) mg/day	100	100
IRS_{16-30} (soil intake rate) mg/day	100	100
IRS_{rec-a} (soil intake rate - adult) mg/day	100	100
IRS_{rec-c} (soil intake rate - child) mg/day	200	200
LT (lifetime - recreator) years	70	70
SA_{0-2} (skin surface area) cm^2/day	2373	2373
SA_{2-6} (skin surface area) cm^2/day	2373	2373
SA_{6-16} (skin surface area) cm^2/day	6032	6032
SA_{16-30} (skin surface area) cm^2/day	6032	6032
SA_{rec-a} (skin surface area - adult) cm^2/day	6032	6032
SA_{rec-c} (skin surface area - child) cm^2/day	2373	2373
TR (target risk) unitless	0.000001	0.000001
T_w (groundwater temperature) Celsius	25	25
$Theta_a$ (air-filled soil porosity) L_{air}/L_{soil}	0.28396	0.28396
$Theta_w$ (water-filled soil porosity) L_{water}/L_{soil}	0.15	0.15
T (exposure interval) s	819936000	819936000
T (exposure interval) yr	26	26
U_m (mean annual wind speed) m/s	4.69	2.86
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5
VF_{ml} (volitization factor - mass-limit) m^3/kg	.	0

Table F-4

Recreator Risk for Soil

Chemical	SF_o $(mg/kg\text{-}day)^{-1}$	SF_o Ref	IUR $(ug/m^3)^{-1}$	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m^3)	RfC Ref	GIABS	ABS	RBA	Particulate Emission Factor (m^3/kg)	Concentration (mg/kg)	Ingestion Risk	Dermal Risk	Inhalation Risk	Carcinogenic Risk	Ingestion Child HQ	Dermal Child HQ	Inhalation Child HQ
Antimony	-		-		0.0004	I	-		0.15	-	1	2.43E+12	5.3	-	-	-	-	0.00581	-	-
Arsenic	1.5	I	0.0043	I	0.0003	I	0.000015	C	1	0.03	0.6	2.43E+12	58	0.00000257	0.000000362	4.18E-13	0.00000294	0.0508	0.00603	1.75E-08
Thallium	-		-		0.00001	X	-		1	-	1	2.43E+12	5.3	-	-	-	-	0.232	-	-
**Total Risk/HI*	-		-		-		-		-	-	-	-	-	*0.00000257*	*0.000000362*	*4.18E-13*	*0.00000294*	*0.289*	*0.00603*	*1.75E-08*

Table F-4

Recreator Risk for Soil

Chemical	Noncarcinogenic Child HI	Ingestion Adult HQ	Dermal Adult HQ	Inhalation Adult HQ	Noncarcinogenic Adult HI
Antimony	0.00581	0.000545	-	-	0.000545
Arsenic	0.0569	0.00477	0.00101	1.75E-08	0.00577
Thallium	0.232	0.0218	-	-	0.0218
**Total Risk/HI*	*0.295*	*0.0271*	*0.00101*	*1.75E-08*	*0.0281*

Table F-5

Resident Equation Inputs for Soil

Variable	Resident Soil Default Value	Form-input Value
A (PEF Dispersion Constant)	16.2302	10.2152
A (VF Dispersion Constant)	11.911	10.2152
A (VF Dispersion Constant - Mass Limit)	11.911	10.2152
B (PEF Dispersion Constant)	18.7762	19.2654
B (VF Dispersion Constant)	18.4385	19.2654
B (VF Dispersion Constant - Mass Limit)	18.4385	19.2654
$City_{PEF}$ (Climate Zone) Selection	Default	Fresno, CA (2)
$City_{VF}$ (Climate Zone) Selection	Default	Fresno, CA (2)
C (PEF Dispersion Constant)	216.108	220.0604
C (VF Dispersion Constant)	209.7845	220.0604
C (VF Dispersion Constant - Mass Limit)	209.7845	220.0604
foc (fraction organic carbon in soil) g/g	0.006	0.006
F(x) (function dependent on U_m/U_t) unitless	0.194	0.000319
n (total soil porosity) L_{pore}/L_{soil}	0.43396	0.43396
p_b (dry soil bulk density) g/cm^3	1.5	1.5
p_b (dry soil bulk density - mass limit) g/cm^3	1.5	1.5
PEF (particulate emission factor) m^3/kg	1359344438	2.42699E+12
p_s (soil particle density) g/cm^3	2.65	2.65
Q/C_{wind} (g/m^2-s per kg/m^3)	93.77	62.42916722
Q/C_{vol} (g/m^2-s per kg/m^3)	68.18	62.42916722
Q/C_{vol} (g/m^2-s per kg/m^3)	68.18	62.42916722
A_s (PEF acres)	0.5	0.5
A_s (VF acres)	0.5	0.5
A_s (VF mass-limit acres)	0.5	0.5
AF_{res-a} (skin adherence factor - adult) mg/cm^2	0.07	0.07
AF_{res-c} (skin adherence factor - child) mg/cm^2	0.2	0.2
AT_{res} (averaging time - resident carcinogenic)	365	365
BW_{res-a} (body weight - adult) kg	80	80
BW_{res-c} (body weight - child) kg	15	15
$DFS_{res-adj}$ (age-adjusted soil dermal factor) mg/kg	103390	103390
$DFSM_{res-adj}$ (mutagenic age-adjusted soil dermal factor) mg/kg	428260	428260
ED_{res} (exposure duration) years	26	26
ED_{res-a} (exposure duration - adult) years	20	20
ED_{res-c} (exposure duration - child) years	6	6
EF_{res} (exposure frequency) days/year	350	350
EF_{res-a} (exposure frequency - adult) days/year	350	350
EF_{res-c} (exposure frequency - child) days/year	350	350
ET_{res} (exposure time) hours/day	24	24
ET_{res-a} (adult exposure time) hours/day	24	24
ET_{res-c} (child exposure time) hours/day	24	24
THQ (target hazard quotient) unitless	0.1	0.1

Table F-5

Resident Equation Inputs for Soil

Variable	Resident Soil Default Value	Form-input Value
$IFS_{res\text{-}adj}$ (age-adjusted soil ingestion factor) mg/kg	36750	36750
$IRS_{res\text{-}a}$ (soil intake rate - adult) mg/day	100	100
$IRS_{res\text{-}c}$ (soil intake rate - child) mg/day	200	200
LT (lifetime) years	70	70
$SA_{res\text{-}a}$ (skin surface area - adult) cm^2/day	6032	6032
$SA_{res\text{-}c}$ (skin surface area - child) cm^2/day	2373	2373
TR (target risk) unitless	0.000001	0.000001
T_w (groundwater temperature) Celsius	25	25
$Theta_a$ (air-filled soil porosity) L_{air}/L_{soil}	0.28396	0.28396
$Theta_w$ (water-filled soil porosity) L_{water}/L_{soil}	0.15	0.15
T (exposure interval) s	819936000	819936000
T (exposure interval) yr	26	26
U_m (mean annual wind speed) m/s	4.69	2.86
U_t (equivalent threshold value)	11.32	11.32
V (fraction of vegetative cover) unitless	0.5	0.5
VF_{ml} (volitization factor - mass limit) m^3/kg	.	0

Table F-6

Resident Risk for Soil

Chemical	SF_o $(mg/kg\text{-}day)^{-1}$	SF_o Ref	IUR $(ug/m^3)^{-1}$	IUR Ref	RfD (mg/kg-day)	RfD Ref	RfC (mg/m^3)	RfC Ref	GIABS	ABS	RBA	Particulate Emission Factor (m^3/kg)	Volatilization Factor (m^3/kg)	Concentration (mg/kg)	Ingestion Risk	Dermal Risk	Inhalation Risk	Carcinogenic Risk
Antimony	-		-		0.0004	I	-		0.15	-	1	2.43E+12	-	5.3	-	-	-	-
Arsenic	1.5	I	0.0043	I	0.0003	I	0.000015	C	1	0.03	0.6	2.43E+12	-	58	0.0000751	0.0000106	3.66E-11	0.0000856
Thallium	-		-		0.00001	X	-		1	-	1	2.43E+12	-	5.3	-	-	-	-
**Total Risk/HI*	-		-		-		-		-	-	-	-	-	-	*0.0000751*	*0.0000106*	*3.66E-11*	*0.0000856*

Table F-6

Resident Risk for Soil

Chemical	Ingestion Child HQ	Dermal Child HQ	Inhalation Child HQ	Noncarcinogenic Child HI	Ingestion Adult HQ	Dermal Adult HQ	Inhalation Adult HQ	Noncarcinogenic Adult HI
Antimony	0.169	-	-	0.169	0.0159	-	-	0.0159
Arsenic	1.48	0.176	0.00000153	1.66	0.139	0.0294	0.00000153	0.168
Thallium	6.78	-	-	6.78	0.635	-	-	0.635
**Total Risk/HI*	*8.43*	*0.176*	*0.00000153*	*8.6*	*0.79*	*0.0294*	*0.00000153*	*0.82*

APPENDIX G
ECOLOGICAL PRGS

Table G-1
Plant and Aquatic Invertebrate PRGs
Engineering Evaluation/Cost Analysis
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

COPEC	Receptor	ESL[a] (mg/kg)		PRG[b] (mg/kg)
		No Effect	Low Effect	
Arsenic	Soil Invertebrate	6.8	68	22

[a]Los Alamos National Laboratory (LANL) ECORISK Database Release 4.1.
[b]Geometric mean of the no effect and low effect concentrations.

APPENDIX H
RAIS PRG OUTPUTS

Table H-1
RAIS PRG Resident Equation Inputs for Soil

Variable	Value
THQ (target hazard quotient) unitless	1
TR (target risk) unitless	0.000001
LT (lifetime) years	70
ET_{res} (exposure time) hours/day	24
$ET_{res\text{-}c}$ (child exposure time) hours/day	24
$ET_{res\text{-}a}$ (adult exposure time) hours/day	24
$ET_{0\text{-}2}$ (mutagenic exposure time) hours/day	24
$ET_{2\text{-}6}$ (mutagenic exposure time) hours/day	24
$ET_{6\text{-}16}$ (mutagenic exposure time) hours/day	24
$ET_{16\text{-}26}$ (mutagenic exposure time) hours/day	24
ED_{res} (exposure duration) years	26
$ED_{res\text{-}c}$ (exposure duration - child) years	6
$ED_{res\text{-}a}$ (exposure duration - adult) years	20
$ED_{0\text{-}2}$ (mutagenic exposure duration) years	2
$ED_{2\text{-}6}$ (mutagenic exposure duration) years	4
$ED_{6\text{-}16}$ (mutagenic exposure duration) years	10
$ED_{16\text{-}26}$ (mutagenic exposure duration) years	10
$BW_{res\text{-}c}$ (body weight - child) kg	15
$BW_{res\text{-}a}$ (body weight - adult) kg	80
$BW_{0\text{-}2}$ (mutagenic body weight) kg	15
$BW_{2\text{-}6}$ (mutagenic body weight) kg	15
$BW_{6\text{-}16}$ (mutagenic body weight) kg	80
$BW_{16\text{-}26}$ (mutagenic body weight) kg	80
$SA_{res\text{-}c}$ (skin surface area - child) cm^2/day	2373
$SA_{res\text{-}a}$ (skin surface area - adult) cm^2/day	6032
$SA_{0\text{-}2}$ (mutagenic skin surface area) cm^2/day	2373
$SA_{2\text{-}6}$ (mutagenic skin surface area) cm^2/day	2373
$SA_{6\text{-}16}$ (mutagenic skin surface area) cm^2/day	6032
$SA_{16\text{-}26}$ (mutagenic skin surface area) cm^2/day	6032
EF_{res} (exposure frequency) days/year	350
$EF_{res\text{-}c}$ (exposure frequency - child) days/year	350
$EF_{res\text{-}a}$ (exposure frequency - adult) days/year	350
$EF_{0\text{-}2}$ (mutagenic exposure frequency) days/year	350
$EF_{2\text{-}6}$ (mutagenic exposure frequency) days/year	350
$EF_{6\text{-}16}$ (mutagenic exposure frequency) days/year	350
$EF_{16\text{-}26}$ (mutagenic exposure frequency) days/year	350
$IFS_{res\text{-}adj}$ (age-adjusted soil ingestion factor) mg/kg	36750
$IFSM_{res\text{-}adj}$ (mutagenic age-adjusted soil ingestion factor) mg/kg	166833.3
$IRS_{res\text{-}c}$ (soil intake rate - child) mg/day	200
$IRS_{res\text{-}a}$ (soil intake rate - adult) mg/day	100
$IRS_{0\text{-}2}$ (mutagenic soil intake rate) mg/day	200
$IRS_{2\text{-}6}$ (mutagenic soil intake rate) mg/day	200
$IRS_{6\text{-}16}$ (mutagenic soil intake rate) mg/day	100
$IRS_{16\text{-}26}$ (mutagenic soil intake rate) mg/day	100
$AF_{res\text{-}a}$ (skin adherence factor - adult) mg/cm^2	0.07
$AF_{res\text{-}c}$ (skin adherence factor - child) mg/cm^2	0.2
$AF_{0\text{-}2}$ (mutagenic skin adherence factor) mg/cm^2	0.2
$AF_{2\text{-}6}$ (mutagenic skin adherence factor) mg/cm^2	0.2
$AF_{6\text{-}16}$ (mutagenic skin adherence factor) mg/cm^2	0.07
$AF_{16\text{-}26}$ (mutagenic skin adherence factor) mg/cm^2	0.07
$DFS_{res\text{-}adj}$ (age-adjusted soil dermal factor) mg/kg	103390
$DFSM_{res\text{-}adj}$ (mutagenic age-adjusted soil dermal factor) mg/kg	428260
AT_{res} (averaging time - resident carcinogenic)	365
$City_{PEF}$ (Climate Zone) Selection	San Francisco, CA (2)
A_s (PEF acres)	0.5

Table H-1
RAIS PRG Resident Equation Inputs for Soil

Variable	Value
Q/C_{wind} (g/m^2-s per kg/m^3)	88.42690368
PEF (particulate emission factor) m^3/kg	11146233405
A (PEF Dispersion Constant)	13.8139
B (PEF Dispersion Constant)	20.1624
C (PEF Dispersion Constant)	234.2869
V (fraction of vegetative cover) unitless	0.5
U_m (mean annual wind speed) m/s	3.89
U_t (equivalent threshold value)	11.32
F(x) (function dependent on U_m/U_t) unitless	0.0391
$City_{VF}$ (Climate Zone) Selection	San Francisco, CA (2)
A_s (VF acres)	0.5
Q/C_{vol} (g/m^2-s per kg/m^3)	88.42690368
foc (fraction organic carbon in soil) g/g	0.006
p_b (dry soil bulk density) g/cm^3	1.5
p_s (soil particle density) g/cm^3	2.65
n (total soil porosity) L_{pore}/L_{soil}	0.43396
θ_a (air-filled soil porosity) L_{air}/L_{soil}	0.28396
θ_w (water-filled soil porosity) L_{water}/L_{soil}	0.15
T (exposure interval) s	819936000
A (VF Dispersion Constant)	13.8139
B (VF Dispersion Constant)	20.1624
C (VF Dispersion Constant)	234.2869
$City_{VF\ mass\text{-}loading}$ (Climate Zone) Selection	San Francisco, CA (2)
VF_{ml} (volitization factor - mass limit) m^3/kg	0
Q/C_{vol} (g/m^2-s per kg/m^3)	88.42690368
A_s (VF mass-limit acres)	0.5
T (exposure interval) yr	26
p_b (dry soil bulk density - mass limit) g/cm^3	1.5
A (VF Dispersion Constant - Mass Limit)	13.8139
B (VF Dispersion Constant - Mass Limit)	20.1624
C (VF Dispersion Constant - Mass Limit)	234.2869
T_w (groundwater temperature) Celsius	25

Table H-2
RAIS Resident Risk for Soil

Chemical	CAS Number	Mutagen?	VOC ?	RfD (mg/kg-day)	RfD Reference	RfC (mg/m3)	RfC Reference	Ingestion SF (mg/kg-day)-1	SFO Reference	Inhalation Unit Risk (µg/m3)-1	IUR Reference	ABS_{derm}	ABS_{gi}	Volatilization Factor (m^3/kg)
Antimony (metallic)	7440360	No	No	0.0004	USER	0.0003	USER	-		-		-	0.15	-
Arsenic, Inorganic	7440382	No	No	0.0003	USER	1.5E-05	USER	1.5	USER	0.0043	USER	0.03	1	-
Barium	7440393	No	No	0.2	USER	0.0005	USER	-		-		-	0.07	-
Beryllium and compounds	7440417	No	No	0.002	USER	0.00002	USER	-		0.0024	USER	-	0.007	-
Cadmium (Diet)	7440439	No	No	0.001	USER	0.00001	USER	-		0.0018	USER	0.001	0.025	-
Chromium(III), Insoluble Salts	16065831	No	No	1.5	USER	-		-		-		-	0.013	-
Chromium(VI)	18540299	Yes	No	0.003	USER	0.0001	USER	0.5	USER	0.084	USER	-	0.025	-
Cobalt	7440484	No	No	0.0003	USER	6E-06	USER	-		0.009	USER	-	1	-
Copper	7440508	No	No	0.04	USER	-		-		-		-	1	-
Lead and Compounds	7439921	No	No	-		-		0.0085	USER	0.000012	USER	-	1	-
Mercury (elemental)	7439976	No	Yes	0.00016	USER	0.0003	USER	-		-		-	1	45000
Methyl Mercury	22967926	No	No	0.0001	USER	-		-		-		-	1	-
Molybdenum	7439987	No	No	0.005	USER	0.0004	USER	-		-		-	1	-
Nickel Soluble Salts	7440020	No	No	0.02	USER	0.00009	USER	-		0.00026	USER	-	0.04	-
Selenium	7782492	No	No	0.005	USER	0.02	USER	-		-		-	1	-
Silver	7440224	No	No	0.005	USER	-		-		-		-	0.04	-
Thallium (Soluble Salts)	7440280	No	No	0.00001	USER	-		-		-		-	1	-
Vanadium and Compounds	7440622	No	No	0.00504	USER	0.0001	USER	-		-		-	0.026	-
Zinc and Compounds	7440666	No	No	0.3	USER	-		-		-		-	1	-

Table H-2
RAIS Resident Risk for Soil

Chemical	CAS Number	Particulate Emission Factor (m^3/kg)	Ingestion PRG TR=1.0E-6 (mg/kg)	Inhalation PRG TR=1.0E-6 (mg/kg)	Dermal PRG TR=1.0E-6 (mg/kg)	Carcinogenic PRG TR=1.0E-6 (mg/kg)	Child Ingestion PRG HQ=1.0 (mg/kg)	Child Inhalation PRG HQ=1.0 (mg/kg)	Child Dermal PRG HQ=1.0 (mg/kg)	Noncarcinogenic Child PRG HI=1.0 (mg/kg)	Adult Ingestion PRG HQ=1.0 (mg/kg)	Adult Inhalation PRG HQ=1.0 (mg/kg)	Adult Dermal PRG HQ=1.0 (mg/kg)
Antimony (metallic)	7440360	11100000000	-	-	-	-	31.3	3490000	-	31.3	334	3490000	-
Arsenic, Inorganic	7440382	11100000000	0.772	7280	5.49	0.677	39.1	174000	330	35	417	174000	1980
Barium	7440393	11100000000	-	-	-	-	15600	5810000	-	15600	167000	5810000	-
Beryllium and compounds	7440417	11100000000	-	13000	-	13000	156	232000	-	156	1670	232000	-
Cadmium (Diet)	7440439	11100000000	-	17400	-	17400	78.2	116000	824	71.4	834	116000	4940
Chromium(III), Insoluble Salts	16065831	11100000000	-	-	-	-	117000	-	-	117000	1250000	-	-
Chromium(VI)	18540299	11100000000	0.306	135	-	0.306	235	1160000	-	235	2500	1160000	-
Cobalt	7440484	11100000000	-	3480	-	3480	23.5	69700	-	23.5	250	69700	-
Copper	7440508	11100000000	-	-	-	-	3130	-	-	3130	33400	-	-
Lead and Compounds	7439921	11100000000	81.8	2610000	-	81.8	-	-	-	-	-	-	-
Mercury (elemental)	7439976	11100000000	-	-	-	-	12.5	14.1	-	6.62	133	14.1	-
Methyl Mercury	22967926	11100000000	-	-	-	-	7.82	-	-	7.82	83.4	-	-
Molybdenum	7439987	11100000000	-	-	-	-	391	4650000	-	391	4170	4650000	-
Nickel Soluble Salts	7440020	11100000000	-	120000	-	120000	1560	1050000	-	1560	16700	1050000	-
Selenium	7782492	11100000000	-	-	-	-	391	232000000	-	391	4170	232000000	-
Silver	7440224	11100000000	-	-	-	-	391	-	-	391	4170	-	-
Thallium (Soluble Salts)	7440280	11100000000	-	-	-	-	0.782	-	-	0.782	8.34	-	-
Vanadium and Compounds	7440622	11100000000	-	-	-	-	394	1160000	-	394	4200	1160000	-
Zinc and Compounds	7440666	11100000000	-	-	-	-	23500	-	-	23500	250000	-	-

Table H-2
RAIS Resident Risk for Soil

Chemical	CAS Number	Noncarcinogenic Adult PRG HI=1.0 (mg/kg)	Adjusted Ingestion PRG HQ=1.0 (mg/kg)	Adjusted Inhalation PRG HQ=1.0 (mg/kg)	Adjusted Dermal PRG HQ=1.0 (mg/kg)	Noncarcinogenic Adjusted PRG HI=1.0 (mg/kg)	Final PRG (mg/kg)
Antimony (metallic)	7440360	334	103	3490000	-	103	103
Arsenic, Inorganic	7440382	344	129	174000	918	113	0.677
Barium	7440393	162000	51600	5810000	-	51200	51200
Beryllium and compounds	7440417	1660	516	232000	-	515	515
Cadmium (Diet)	7440439	709	258	116000	2290	232	232
Chromium(III), Insoluble Salts	16065831	1250000	387000	-	-	387000	387000
Chromium(VI)	18540299	2500	775	1160000	-	774	0.306
Cobalt	7440484	249	77.5	69700	-	77.4	77.4
Copper	7440508	33400	10300	-	-	10300	10300
Lead and Compounds	7439921	-	-	-	-	-	81.8
Mercury (elemental)	7439976	12.7	41.3	14.1	-	10.5	10.5
Methyl Mercury	22967926	83.4	25.8	-	-	25.8	25.8
Molybdenum	7439987	4170	1290	4650000	-	1290	1290
Nickel Soluble Salts	7440020	16400	5160	1050000	-	5140	5140
Selenium	7782492	4170	1290	232000000	-	1290	1290
Silver	7440224	4170	1290	-	-	1290	1290
Thallium (Soluble Salts)	7440280	8.34	2.58	-	-	2.58	2.58
Vanadium and Compounds	7440622	4190	1300	1160000	-	1300	1300
Zinc and Compounds	7440666	250000	77500	-	-	77500	77500

Table H-3
RAIS PRG Outdoor Worker Equation Inputs for Soil

Variable	Value
THQ (target hazard quotient) unitless	1
AT_{ow} (averaging time - outdoor worker)	365
EF_{ow} (exposure frequency - outdoor worker) day/yr	52
ED_{ow} (exposure duration - outdoor worker) yr	25
ET_{ow} (exposure time - outdoor worker) hr	8
LT (lifetime) yr	70
BW_{ow} (body weight - outdoor worker)	80
IR_{ow} (soil ingestion rate - outdoor worker) mg/day	100
SA_{ow} (surface area - outdoor worker) cm^2/day	3527
AF_{ow} (skin adherence factor - outdoor worker) mg/cm^2	0.12
TR (target cancer risk) unitless	0.000001
$City_{PEF}$ (Climate Zone) Selection	San Francisco, CA (2)
A_s (PEF acres)	0.5
Q/C_{wind} (g/m^2-s per kg/m^3)	88.42690368
PEF (particulate emission factor) m^3/kg	11146233405
A (PEF Dispersion Constant)	13.8139
B (PEF Dispersion Constant)	20.1624
C (PEF Dispersion Constant)	234.2869
V (fraction of vegetative cover) unitles	0.5
U_m (mean annual wind speed) m/s	3.89
U_t (equivalent threshold value)	11.32
F(x) (function dependent on U_m/U_t) unitless	0.0391
$City_{VF}$ (Climate Zone) Selection	San Francisco, CA (2)
A_s (VF acres)	0.5
Q/C_{vol} (g/m^2-s per kg/m^3)	88.42690368
foc (fraction organic carbon in soil) g/g	0.006
p_b (dry soil bulk density) g/cm^3	1.5
p_s (soil particle density) g/cm^3	2.65
n (total soil porosity) L_{pore}/L_{soil}	0.43396
θ_a (air-filled soil porosity) L_{air}/L_{soil}	0.28396
θ_w (water-filled soil porosity) L_{water}/L_{soil}	0.15
T (exposure interval) s	819936000
A (VF Dispersion Constant)	13.8139
B (VF Dispersion Constant)	20.1624
C (VF Dispersion Constant)	234.2869
$City_{VF\ mass\text{-}loading}$ (Climate Zone) Selection	San Francisco, CA (2)
VF_{ml} (volitization factor - mass limit) m^3/kg	0
Q/C_{vol} (g/m^2-s per kg/m^3)	88.42690368
A_s (VF mass-limit acres)	0.5
T (exposure interval) y	26
p_b (dry soil bulk density - mass limit) g/cm^3	1.5
A (VF Dispersion Constant - Mass Limit	13.8139
B (VF Dispersion Constant - Mass Limit	20.1624
C (VF Dispersion Constant - Mass Limit	234.2869
T_w (groundwater temperature) Celsius	25

Output generated 18SEP2018:13:34:07

Table H-5
Recreator Equation Inputs for Soil/Sediment

Variable	Value
ED_{rec} (exposure duration - recreator) years	26
$ED_{rec\text{-}c}$ (exposure duration - child) years	6
$BW_{rec\text{-}a}$ (body weight - adult) kg	80
$BW_{rec\text{-}c}$ (body weight - child) kg	15
$SA_{rec\text{-}a}$ (skin surface area - adult) cm^2/day	6032
$SA_{rec\text{-}c}$ (skin surface area - child) cm^2/day	2373
THQ (target hazard quotient) unitless	1
TR (target risk) unitless	0.000001
LT (lifetime - recreator) years	70
$IRS_{rec\text{-}a}$ (soil intake rate - adult) mg/day	100
$IRS_{rec\text{-}c}$ (soil intake rate - child) mg/day	200
$AF_{rec\text{-}a}$ (skin adherence factor - adult) mg/cm^2	0.07
$AF_{rec\text{-}c}$ (skin adherence factor - child) mg/cm^2	0.2
$IFS_{rec\text{-}adj}$ (age-adjusted soil ingestion factor) mg/kg	1260
$DFS_{rec\text{-}adj}$ (age-adjusted soil dermal factor) mg/kg	3544.8
$IFSM_{rec\text{-}adj}$ (mutagenic age-adjusted soil ingestion factor) mg/kg	5720
$DFSM_{rec\text{-}adj}$ (mutagenic age-adjusted soil dermal factor) mg/kg	14683.2
$AF_{0\text{-}2}$ (skin adherence factor) mg/cm^2	0.2
$AF_{2\text{-}6}$ (skin adherence factor) mg/cm^2	0.2
$AF_{6\text{-}16}$ (skin adherence factor) mg/cm^2	0.07
$AF_{16\text{-}30}$ (skin adherence factor) mg/cm^2	0.07
$BW_{0\text{-}2}$ (body weight) kg	15
$BW_{2\text{-}6}$ (body weight) kg	15
$BW_{6\text{-}16}$ (body weight) kg	80
$BW_{16\text{-}30}$ (body weight) kg	80
$ED_{0\text{-}2}$ (exposure duration) year	2
$ED_{2\text{-}6}$ (exposure duration) year	4
$ED_{6\text{-}16}$ (exposure duration) year	10
$ED_{16\text{-}30}$ (exposure duration) year	10
EF_{rec} (exposure frequency) days/year	12
$EF_{rec\text{-}c}$ (exposure frequency - child) days/year	12
$EF_{rec\text{-}a}$ (exposure frequency - adult) days/year	12
$EF_{0\text{-}2}$ (exposure frequency) days/year	12
$EF_{2\text{-}6}$ (exposure frequency) days/year	12
$EF_{6\text{-}16}$ (exposure frequency) days/year	12
$EF_{16\text{-}30}$ (exposure frequency) days/year	12
ET_{rec} (exposure time - recreator) hours/day	8
$ET_{rec\text{-}c}$ (child exposure time) hours/day	8
$ET_{rec\text{-}a}$ (adult exposure time) hours/day	8
$ET_{0\text{-}2}$ (exposure time) hours/day	8
$ET_{2\text{-}6}$ (exposure time) hours/day	8
$ET_{6\text{-}16}$ (exposure time) hours/day	8
$ET_{16\text{-}30}$ (exposure time) hours/day	8
$IRS_{0\text{-}2}$ (soil intake rate) mg/day	200
$IRS_{2\text{-}6}$ (soil intake rate) mg/day	200
$IRS_{6\text{-}16}$ (soil intake rate) mg/day	100
$IRS_{16\text{-}30}$ (soil intake rate) mg/day	100

Table H-5
Recreator Equation Inputs for Soil/Sediment

Variable	Value
SA_{0-2} (skin surface area) cm^2/day	2373
SA_{2-6} (skin surface area) cm^2/day	2373
SA_{6-16} (skin surface area) cm^2/day	6032
SA_{16-30} (skin surface area) cm^2/day	6032
AT_{rec} (averaging time)	365
$City_{PEF}$ (Climate Zone) Selection	San Francisco, CA (2)
A_s (PEF acres)	0.5
Q/C_{wind} (g/m^2-s per kg/m^3)	88.42690368
PEF (particulate emission factor) m^3/kg	11146233405
A (PEF Dispersion Constant)	13.8139
B (PEF Dispersion Constant)	20.1624
C (PEF Dispersion Constant)	234.2869
V (fraction of vegetative cover) unitles	0.5
U_m (mean annual wind speed) m/s	3.89
U_t (equivalent threshold value)	11.32
F(x) (function dependent on U_m/U_t) unitless	0.0391
$City_{VF}$ (Climate Zone) Selection	San Francisco, CA (2)
A_s (VF acres)	0.5
Q/C_{vol} (g/m^2-s per kg/m^3)	88.42690368
foc (fraction organic carbon in soil) g/g	0.006
p_b (dry soil bulk density) g/cm^3	1.5
p_s (soil particle density) g/cm^3	2.65
n (total soil porosity) L_{pore}/L_{soil}	0.43396
θ_a (air-filled soil porosity) L_{air}/L_{soil}	0.28396
θ_w (water-filled soil porosity) L_{water}/L_{soil}	0.15
T (exposure interval) s	819936000
A (VF Dispersion Constant)	13.8139
B (VF Dispersion Constant)	20.1624
C (VF Dispersion Constant)	234.2869
$City_{VF\ mass\text{-}loading}$ (Climate Zone) Selection	San Francisco, CA (2)
VF_{ml} (volitization factor - mass limit) m^3/kg	0
Q/C_{vol} (g/m^2-s per kg/m^3)	88.42690368
A_s (VF mass-limit acres)	0.5
T (exposure interval) y	26
p_b (dry soil bulk density - mass limit) g/cm^3	1.5
A (VF Dispersion Constant - Mass Limit	13.8139
B (VF Dispersion Constant - Mass Limit	20.1624
C (VF Dispersion Constant - Mass Limit	234.2869
T_w (groundwater temperature) Celsius	25

Table H-6
Recreator Risk for Soil/Sediment

Chemical	CAS Number	Mutagen?	VOC?	RfD (mg/kg-day)	RfD Reference	RfC (mg/m3)	RfC Reference	Ingestion SF (mg/kg-day)-1	SFO Reference	Inhalation Unit Risk (µg/m3)-1	IUR Reference	ABS_{derm}	ABS_{gi}
Antimony (metallic)	7440360	No	No	0.0004	USER	0.0003	USER	-		-		-	0.15
Arsenic, Inorganic	7440382	No	No	0.0003	USER	0.000015	USER	1.5	USER	0.0043	USER	0.03	1
Barium	7440393	No	No	0.2	USER	0.0005	USER	-		-		-	0.07
Beryllium and compounds	7440417	No	No	0.002	USER	0.00002	USER	-		0.0024	USER	-	0.007
Cadmium (Diet)	7440439	No	No	0.001	USER	0.00001	USER	-		0.0018	USER	0.001	0.025
Chromium(III), Insoluble Salts	16065831	No	No	1.5	USER	-		-		-		-	0.013
Chromium(VI)	18540299	Yes	No	0.003	USER	0.0001	USER	0.5	USER	0.084	USER	-	0.025
Chromium, Total	7440473	No	No	-		-		-		-		-	0.013
Cobalt	7440484	No	No	0.0003	USER	0.000006	USER	-		0.009	USER	-	1
Copper	7440508	No	No	0.04	USER	-		-		-		-	1
Lead and Compounds	7439921	No	No	-		-		0.0085	USER	0.000012	USER	-	1
Mercury (elemental)	7439976	No	Yes	0.00016	USER	0.0003	USER	-		-		-	1
Methyl Mercury	22967926	No	No	0.0001	USER	-		-		-		-	1
Molybdenum	7439987	No	No	0.005	USER	0.0004	USER	-		-		-	1
Nickel Soluble Salts	7440020	No	No	0.02	USER	0.00009	USER	-		0.00026	USER	-	0.04
Selenium	7782492	No	No	0.005	USER	0.02	USER	-		-		-	1
Silver	7440224	No	No	0.005	USER	-		-		-		-	0.04
Thallium (Soluble Salts)	7440280	No	No	0.00001	USER	-		-		-		-	1
Vanadium and Compounds	7440622	No	No	0.00504	USER	0.0001	USER	-		-		-	0.026
Zinc and Compounds	7440666	No	No	0.3	USER	-		-		-		-	1

Table H-6
Recreator Risk for Soil/Sediment

Chemical	CAS Number	Volatilization Factor (m^3/kg)	Particulate Emission Factor (m^3/kg)	Ingestion PRG TR=1.0E-6 (mg/kg)	Inhalation PRG TR=1.0E-6 (mg/kg)	Dermal PRG TR=1.0E-6 (mg/kg)	Carcinogenic PRG TR=1.0E-6 (mg/kg)	Child Ingestion PRG HQ=1 (mg/kg)	Child Inhalation PRG HQ=1 (mg/kg)	Child Dermal PRG HQ=1 (mg/kg)	Noncarcinogenic Child PRG HI=1 (mg/kg)
Antimony (metallic)	7440360	-	1.11E+10	-	-	-	-	913	305000000	-	912
Arsenic, Inorganic	7440382	-	1.11E+10	22.5	637000	160	19.8	1140	15300000	9610	1020
Barium	7440393	-	1.11E+10	-	-	-	-	456000	509000000	-	456000
Beryllium and compounds	7440417	-	1.11E+10	-	1140000	-	1140000	4560	20300000	-	4560
Cadmium (Diet)	7440439	-	1.11E+10	-	1520000	-	1520000	2280	10200000	24000	2080
Chromium(III), Insoluble Salts	16065831	-	1.11E+10	-	-	-	-	3420000	-	-	3420000
Chromium(VI)	18540299	-	1.11E+10	8.93	11800	-	8.93	6840	102000000	-	6840
Chromium, Total	7440473	-	1.11E+10	-	-	-	-	-	-	-	-
Cobalt	7440484	-	1.11E+10	-	304000	-	304000	684	6100000	-	684
Copper	7440508	-	1.11E+10	-	-	-	-	91300	-	-	91300
Lead and Compounds	7439921	-	1.11E+10	2390	228000000	-	2390	-	-	-	-
Mercury (elemental)	7439976	45000	1.11E+10	-	-	-	-	365	1230	-	282
Methyl Mercury	22967926	-	1.11E+10	-	-	-	-	228	-	-	228
Molybdenum	7439987	-	1.11E+10	-	-	-	-	11400	407000000	-	11400
Nickel Soluble Salts	7440020	-	1.11E+10	-	10500000	-	10500000	45600	91500000	-	45600
Selenium	7782492	-	1.11E+10	-	-	-	-	11400	20300000000	-	11400
Silver	7440224	-	1.11E+10	-	-	-	-	11400	-	-	11400
Thallium (Soluble Salts)	7440280	-	1.11E+10	-	-	-	-	22.8	-	-	22.8
Vanadium and Compounds	7440622	-	1.11E+10	-	-	-	-	11500	102000000	-	11500
Zinc and Compounds	7440666	-	1.11E+10	-	-	-	-	684000	-	-	684000

Table H-6
Recreator Risk for Soil/Sediment

Chemical	CAS Number	Adult Ingestion PRG HQ=1 (mg/kg)	Adult Inhalation PRG HQ=1 (mg/kg)	Adult Dermal PRG HQ=1 (mg/kg)	Noncarcinogenic Adult PRG HI=1 (mg/kg)	Adjusted Ingestion PRG HQ=1 (mg/kg)	Adjusted Inhalation PRG HQ=1 (mg/kg)	Adjusted Dermal PRG HQ=1 (mg/kg)	Noncarcinogenic Adjusted PRG HI=1 (mg/kg)	Final PRG (mg/kg)
Antimony (metallic)	7440360	9730	305000000	-	9730	3010	305000000	-	3010	3010
Arsenic, Inorganic	7440382	12200	15300000	57600	10000	3770	15300000	26800	3300	19.8
Barium	7440393	4870000	509000000	-	4820000	1510000	509000000	-	1500000	1500000
Beryllium and compounds	7440417	48700	20300000	-	48600	15100	20300000	-	15100	15100
Cadmium (Diet)	7440439	24300	10200000	144000	20800	7530	10200000	66900	6770	6770
Chromium(III), Insoluble Salts	16065831	36500000	-	-	36500000	11300000	-	-	11300000	11300000
Chromium(VI)	18540299	73000	102000000	-	72900	22600	102000000	-	22600	8.93
Chromium, Total	7440473	-	-	-	-	-	-	-	-	0
Cobalt	7440484	7300	6100000	-	7290	2260	6100000	-	2260	2260
Copper	7440508	973000	-	-	973000	301000	-	-	301000	301000
Lead and Compounds	7439921	-	-	-	-	-	-	-	-	2390
Mercury (elemental)	7439976	3890	1230	-	936	1210	1230	-	609	609
Methyl Mercury	22967926	2430	-	-	2430	753	-	-	753	753
Molybdenum	7439987	122000	407000000	-	122000	37700	407000000	-	37700	37700
Nickel Soluble Salts	7440020	487000	91500000	-	484000	151000	91500000	-	150000	150000
Selenium	7782492	122000	20300000000	-	122000	37700	20300000000	-	37700	37700
Silver	7440224	122000	-	-	122000	37700	-	-	37700	37700
Thallium (Soluble Salts)	7440280	243	-	-	243	75.3	-	-	75.3	75.3
Vanadium and Compounds	7440622	123000	102000000	-	122000	38000	102000000	-	37900	37900
Zinc and Compounds	7440666	7300000	-	-	7300000	2260000	-	-	2260000	2260000

APPENDIX I
GENERIC ECOLOGICAL PRGS

Table I-1
Food Ingestion Rates
Engineering Evaluation/Cost Analysis
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

$$FIR\,(kg\ ww/kg\ BW\text{-}day) = \frac{FMR}{\sum_{i=1}^{n}(AE_i \times GE_i \times P_i)}$$

Parameter	Definition	Value		Reference
FIR	Body weight normalized field ingestion rate (kg WW/kg BW-day equals g WW/g BW-day)	American Robin	0.66	Calculated
		Deer Mouse	0.51	
FMR	Field metabolic rate (kcal/g BW-day)	Species-specific		Table I-2
AE_i	Assimilation efficiency of the i^{th} food item (unitless)	Species- and food item-specific		Table I-3
GE_i	Gross energy of the i^{th} food item (kcal/g)	Food item-specific		Table I-4
P_i	Proportion of diet comprised of the ith food item (unitless)	1		Professional judgment

Table I-2
Calculation of Field Metabolic Rates*
Engineering Evaluation/Cost Analysis
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

$$FMR\ (kcal/g\ BW\text{-}day) = a \times BW^{b} \times \frac{1\,kcal}{4.1876\,kJ} \div BW$$

Target Receptor	Allometric Equation Basis	a	b	Body Weight (g)	Body Weight Reference	FMR (kcal/g BW-day)
American Robin	Birds - Passerines	10.4	0.68	77	Sample and Suter, 1994	0.62
Deer Mouse	Mammals - Insectivores	6.98	0.622	16.2	Cal/Ecotox, 1999	0.58

*From Nagy et al., 1999.

Table I-3
Assimilation Efficiency (AE) and Gross Energy (GE) of Anticipated Prey Items
Engineering Evaluation/Cost Analysis
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Predator/Prey Item	Assimilation Efficiency (unitless)	Basis of Value	Gross Energy (kcal/g WW)	Basis of Value
Birds/Soil Invertebrates	0.72	Birds – terrestrial insects	1.3	Mean of earthworms, grasshoppers/crickets, and beetles
Mammals/Soil Invertebrates	0.87	Small mammals – Insects	1.3	Mean of earthworms, grasshoppers/crickets, and beetles

*Source: EPA, 1993.

Table I-4
Receptor-specific Life History Exposure Parameters
Engineering Evaluation/Cost Analysis
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

	Parameter						
Receptor	FIR[a] (kg WW/kg BW-day)	Fraction Moisture in Diet[b]	FIR[c] (kg DW/kg BW-day)	SIR (fraction of FIR DW)	SIR Source	SIR[d] (kg DW/kg BW-day)	FT[e] (unitless)
American Robin	0.66	0.84	0.11	0.10	American woodcock value; Beyer et al., 1994	0.010	1
Deer Mouse	0.51	0.84	0.082	0.020	white-footed mouse value; Beyer et al., 1994	0.0016	1

Definitions:
FIR = Food Ingestion Rate.
SIR = Soil Ingestion Rate.
FT = Fraction of Foraging Time at the Site.

[a]Table J-1.
[b]Moisture in diet as follows:

Dietary Item	Fraction Moisture	Source
Soil Invertebrates	0.84	EPA, 2007a

[c]FIR DW calculated as FIR WW * (1-Fraction Moisture in Diet)
[d]SIR on body weight basis calculated as FIR DW times fraction SIR.
[e]Professional judgment based on home and foraging ranges and available nearby habitats.

Table I-5
Chemical-specific BCFs and Concentration Estimation Values
Engineering Evaluation/Cost Analysis
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

	Measured Soil Invertebrate BCF (mg COPC/kg dry tissue)/ (mg COPC/kg dry soil)		Regression Equation (mg/kg dry tissue)		
COPEC	Value	Source	B0	B1	Source
Antimony	1.0	EPA, 2007			
Arsenic			-1.421	0.71	EPA, 2007
Barium	0.091	EPA, 2007			
Beryllium	0.045	EPA, 2007			
Cadmium			2.114	0.80	EPA, 2007
Chromium	0.31	EPA, 2007; trivalent chromium			
Cobalt	0.12	EPA, 2007			
Copper	0.52	EPA, 2007			
Lead			-0.218	0.81	EPA, 2007
Mercury	0.20	EPA, 1999			
Molybdenum	0.60	Arithmetic mean of inorganics (see accompanying text).			
Nickel	0.12	EPA, 1999			
Selenium			-0.075	0.73	EPA, 2007
Silver	2.05	EPA, 2007			
Thallium	0.60	EPA, 1999			
Vanadium	0.042	EPA, 2007			
Zinc	3.4	EPA, 1999			

Table I-6
Avian Toxicity Reference Values (TRVs)
Engineering Evaluation/Cost Analysis
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Analyte	Test Species	Study Duration	Effect	Dose (mg/kg-day)		TRV (mg/kg-day)		Toxicity Value Form or Surrogate	Initial Value Source
				NOAEL	LOAEL	NOAEL	LOAEL		
Antimony									
Arsenic	Chicken	chronic	reproduction	2.24		2.24	11.2		EPA, 2005
Barium	1-day old chick	subchronic	mortality	208.26	416.53	20.826	41.653		Sample et al., 1996
Beryllium									
Cadmium	Multiple	multiple	reproduction and growth	1.47		1.47	7.35		EPA, 2005
Chromium	multiple	chronic	reproduction and growth	2.66		2.66	13.3	chromium III	EPA, 2008
Cobalt	Multiple	multiple	growth and mortality	7.61		7.61	38.05		EPA, 2005
Copper	Chicken	chronic	reproduction	4.05	12.1	4.05	12.1		EPA, 2007
Lead	Chicken	chronic	reproduction	1.63	3.26	1.63	3.26	lead acetate	EPA, 2005
Mercury	Japanese quail	chronic	reproduction	0.45		0.45	0.9		Sample et al., 1996
Molybdenum	Chicken	chronic	reproduction		35	7	35	Sodium molybdate	Sample et al., 1996
Nickel	Multiple	multiple	reproduction and growth	6.71		6.71	33.55	mean of NOAELs; Eco SSL	EPA, 2007
Selenium	Mallard	chronic	reproduction	0.4	0.8	0.4	0.8	Selinomethionine	Sample et al., 1996
Silver						2.02	20.2		EPA Region IV, 2013
Thallium	Starling	acute	mortality		35	0.35	1.75	LC50	EPA, 1999
Vanadium	Mallard	chronic	ity, body weight, blood che	11.38		11.38	56.9		Sample et al., 1996
Zinc	Multiple	multiple	growth and reproduction	66.1		66.1	330.5		EPA, 2007

LOAEL = Lowest observable adverse effect level.
mg/kg-day = Milligrams per kilogram per day.
NOAEL = No observable adverse effect level.
TRV = Toxicity reference value.

Table I-7
Mammalian Toxicity Reference Values (TRVs)
Engineering Evaluation/Cost Analysis
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

Analyte	Test Species	Study Duration	Effect	Dose (mg/kg-day)		TRV (mg/kg-day)		Toxicity Value Form or Surrogate	Initial Value Source
				NOAEL	LOAEL	NOAEL	LOAEL		
Antimony	Rat	chronic	reproduction	0.059	0.59	0.059	0.59	Highest bounded NOAEL below lowest bounded LOAEL; Eco SSL TRV	EPA, 2005
Arsenic	Dog	chronic	growth	1.0	1.7	1.0	1.7		EPA, 2005
Barium	Rat	chronic	growth and survival	61	121	61	121	Reproduction, growth, or survival study with lowest bounded LOAEL	EPA, 2005b
Beryllium	Rat	chronic	mortality	0.53		0.53	2.7	Lowest NOAEL for reproduction, growth, and survival; Eco SSL TRV	EPA, 2005
Cadmium	Rat	chronic	growth	0.77	7.7	0.77	7.7		EPA, 2005
Chromium	multiple	multiple	reproduction and growth	2.4		2.4	12	Geomean of NOAELs; Chromium III	EPA, 2008
Cobalt	Multiple	multiple	reproduction and growth	7.3		7.3	37	Geomean of NOAELs; Eco SSL TRV	EPA, 2005
Copper	Mouse	subchronic	mortality	34	101	3.4	10		EPA, 2007
Lead	Rat	chronic	growth	4.7	8.9	4.7	8.9		EPA, 2005
Mercury	Mink	chronic	reproduction	1.0		1.0	5.1	mercuric chloride	Sample et al., 1996
Molybdenum	Mouse	chronic	reproduction	0.26		0.26	1.3		Sample et al., 1996
Nickel	Mouse	chronic	reproduction	1.7	3.4	1.7	3.4	Highest bounded NOAEL below the lowest bounded LOAEL; Eco SSL TRV	EPA, 2007
Selenium	Mouse	chronic	reproduction	0.072	0.15	0.072	0.15	Highest bounded NOAEL lower than the lowest bounded LOAEL; Eco SSL TRV	EPA, 2007
Silver	Rat	chronic	growth		80	16	80	Lowest rodent LOAEL	EPA, 2006
Thallium	Rat	chronic	reproduction		0.74	0.15	0.74		Sample et al., 1996
Vanadium	Mouse	chronic	growth, reproduction, and survival	4.2	8.3	4.2	8.3	Highest bounded NOAEL lower than lowest bounded LOAEL; Eco SSL TRV	EPA, 2005
Zinc	Rat	chronic	reproduction	181	452	181	452		EPA, 2007

LOAEL = Lowest observable adverse effect level.
mg/kg-day = Milligrams per kilogram per day.
NOAEL = No observable adverse effect level.
TRV = Toxicity reference value.

Table I-8
Avian PRGs
Engineering Evaluation/Cost Analysis
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

COPEC	NOAEL-Based PRG (mg/kg DW)	LOAEL-Based PRG (mg/kg DW)
	American Robin - Soil	
Antimony	NA	NA
Arsenic	161	932
Barium	1062	2124
Beryllium	NA	NA
Cadmium	1.9	14
Chromium	63	314
Cobalt	333	1663
Copper	63	188
Lead	31	72
Mercury	14	29
Molybdenum	95	477
Nickel	296	1480
Selenium	5.8	14
Silver	8.9	89
Thallium	4.8	24
Vanadium	788	3942
Zinc	182	909

LOAEL = Lowest adverse effect level.
mg/kg DW = Milligrams per kilogram dry weight.
NOAEL = No adverse effect level.
PRG = Preliminary remediation goal.

Table I-9
Mammal PRGs
Engineering Evaluation/Cost Analysis
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

COPEC	NOAEL-Based PRG (mg/kg DW)	LOAEL-Based PRG (mg/kg DW)
	Deer Mouse - Soil	
Antimony	0.71	7.1
Arsenic	192	350
Barium	6746	13359
Beryllium	100	502
Cadmium	1.2	21
Chromium	90	451
Cobalt	633	3163
Copper	77	231
Lead	186	406
Mercury	56	281
Molybdenum	5.1	26
Nickel	149	298
Selenium	0.91	2.4
Silver	95	476
Thallium	2.9	15
Vanadium	822	1643
Zinc	658	1644

LOAEL = Lowest adverse effect level.
mg/kg DW = Milligrams per kilogram dry weight.
NOAEL = No adverse effect level.
PRG = Preliminary remediation goal.

Table I-10
Terrestrial Plant and Soil Invertebrate PRGs
Engineering Evaluation/Cost Analysis
Coggins Flat Area Placer Mine
Whiskeytown National Recreation Area

COPEC	Terrestrial Plant ESL[a] (mg/kg)		Soil Invertebrate ESL[a] (mg/kg)	
	No Effect	Low Effect	No Effect	Low Effect
Antimony	11	58	78	780
Arsenic	18	91	6.8	68
Barium	110	260	330	3200
Beryllium	2.5	25	40	400
Cadmium	32	160	140	760
Chromium	0.35	4	0.34	3.4
Cobalt	13	130	NA	NA
Copper	70	490	80	530
Lead	120	570	1700	8400
Mercury (inorganic)	34	64	0.05	0.5
Molybdenum	NA	NA	NA	NA
Nickel	38	270	280	1300
Selenium	0.52	3	4.1	41
Silver	560	2800	NA	NA
Thallium	0.05	0.5	NA	NA
Vanadium	60	80	NA	NA
Zinc	160	810	120	930

[a]Los Alamos National Laboratory (LANL) ECORISK Database Release 4.1.
[b]Geometric mean of the no effect and low effect concentrations.

APPENDIX J
COST ESTIMATES

Table J-1 - Alternative 2 Cost Estimate

Labor and Specialized Equipment	Description	Units	Cost rate	Labor Hours	Labor	Materials	Equipment	Subs	Other	Task Cost
Task 1: Project Management, Preparation and Engineering										
Construction Project Manager	hour	0	$ 115.00	50	$ -					
Sr. Project Manager/Geologist	hour	32	$ 155.00	30	$ 4,960.00					
Project Geologist	hour	40	$ 125.00	30	$ 5,000.00					
Draftsman	hour	8	$ 85.00	12	$ 680.00					
Clerical	hour	8	$ 75.00	8	$ 600.00					
RAW Plan	lump	0.5	$ 4,000.00		$ 2,000.00					
Health & Safety Plan	lump	1	$ 750.00		$ 750.00					
Closure Report	lump	0.75	$ 5,000.00		$ 3,750.00					
Task 1 Subtotal Cost Code				**130**	**$ 17,740.00**	**$ -**	**$ -**	**$ -**	**$ -**	**$ 17,740.00**
Task 2: Mobilization and Demobilization Equipment and Personnel										
Equipment Operator/Project Mgr.	hour	0	$ 115.00	0	$ -					
Equipment Operator	hour	20	$ 105.00	32	$ 2,100.00					
Laborer	hour	16	$ 95.00	16	$ 1,520.00					
Project Geologist	hour	16	$ 125.00	32	$ 2,000.00					
Equipment Trucks	day	4	$ 250.00		$ 1,000.00					
Per Diem and Lodging (All)	day	24	$ 143.00		$ 3,432.00					
JD-310 Backhoe Mob/Demob	roundtrip(RT)	0.5	$ 1,000.00				$ 500.00			
JD-644 Loader Mob/Demob	RT	0	$ 1,000.00				$ -			
Motor Grader Unit Mob/Demob	RT	0	$ 1,000.00				$ -			
Fuel Surcharge/Environmental Fee	each	1	$ 35.00				$ 35.00			
Portable Sanitation Facilities	month	0.2	$ 400.00				$ 80.00			
500-gallon Water Wagon Mob/Demob	RT	0.2	$ 250.00				$ 50.00			
Rocket Launcher Oper. to Deliver Bins	RT	0	$ 880.00					$ -		
Haz Waste Bin Rentals (2-each)	day	1	$ 18.00					$ 18.00		
PPE - Misc. Equip., BMP & Supplies	Estimate	0.5	$ 500.00			$ 250.00				
									$ -	
Task 2 subtotal Cost Code				**80**	**$ 10,052.00**	**$ 250.00**	**$ 665.00**	**$ 18.00**	**$ -**	**$ 10,985.00**
Task 3: Equipment, Labor and Materials for Soil Excavation, Stockpiling, Loading and Removal										
JD-310 Backhoe	Day	1	$ 500.00				$ 500.00			
JD-644 Loader	week	0	$ 2,500.00				$ -			
Motor Grader	week	0	$ 4,500.00				$ -			
500-gal Water Wagon	week	0.2	$ 1,200.00				$ 240.00			
Diesel Fuel (Mobile Service)	gallon	0	$ 5.00						$ -	
Equipment Operator/Project Mgr.	hour	0	$ 115.00	300	$ -					
Equipment Operator	hour	4	$ 105.00	300	$ 420.00					
Equipment Operator OT Multiplier	hour	0	$ 35.00		$ -					
Laborer/Traffic Control	hour	4	$ 95.00	300	$ 380.00					
Laborer/Traffic Control OT Multiplier	hour	0	$ 25.00		$ -					
10-CY Dump Trucks Operated to Shuttle	Load	0	$ 810.00					$ -		
Equipment Trucks	day	1	$ 125.00		$ 125.00					
Task 4: Class I & II Non-Hazardous Soil Transportation (1-Load) and Disposal (Approx. 4 CY or 6 tons) to Waste Management's Anderson Landfill, Anderson, CA										
Class II Non Haz Disposal Std. Gate Rate	Est/ton	0	$ 35.00					$ -		
Transportation to Class II per load	Est/load	0	$ 810.00					$ -		
Class I Haz Disposal Std. Rate Metals	Est/ton	6	$ 40.00					$ 240.00		
Transportation to Class I per load	Est/load	1	$ 810.00					$ 810.00		
Non-Haz Disposal Manifest Fee	Est.	0	$ 10.00					$ -		
Task 5: Waste Profiling/Analysis and Confirmation Soil Sampling										
Project Geologist	hour	8	$ 125.00	50	$ 1,000.00					
Waste Profile Fee	lump	1	$ 500.00					$ 500.00		
Waste Profile Sample Analysis (24-hr)	Estimate	1	$ 924.00						$ 924.00	
WET Test (Arsenic)	Estimate	1	$ 56.00						$ 56.00	
Confirmation Soil Sample Analysis (24-hr)	Estimate	4	$ 112.00						$ 448.00	
Disposal Project Management	hour	4	$ 125.00	10	$ 500.00					
Task 6: Miscellaneous Cost Estimates										
Restoration	Est	1	$ 1,500.00						$ 1,500.00	
Miscellaneous Materials	Est.	0.5	$ 500.00			$ 250.00				
BMPs and Erosion Control	Est.	0.5	$ 500.00					$ 250.00		
Incidentals/Mileage/Vehicles	Est.	0.5	$ 500.00		$ 250.00					
Task 3,4,5,6 TOTAL Cost Code				**960**	**$ 2,675.00**	**$ 250.00**	**$ 740.00**	**$ 1,800.00**	**$ 2,928.00**	**$ 8,393.00**
	PROJECT TOTALS			**1,170**	**$ 30,467.00**	**$ 500.00**	**$ 1,405.00**	**$ 1,818.00**	**$ 2,928.00**	**$ 37,118.00**
					Labor	Materials	Equipment	Subs	Other	Task Cost
								Contingency @	0.00%	**$ -**
									TOTAL	**$ 37,118.00**

Note: Scope and cost are subject to change as determined by the project engineers evaluation and review of the preliminary scope of work.
Cost are not solicited or competively bid at these rates. Using general gate rates and general state and federal prevailing wage rates for transportation, labor, equipment and materials

ASSUMPTIONS:

Assumes that this is a union, state or federal prevailing wage project including transportation.
Owner will identify, de-activate, cap and/or relocate all underground utilities within project limits. Unrestricted site access
Excavation limits are free of all underground active and inactive utilities
No Replacement or Repairs to Existing Building Structures, Concrete Footings and Roadways, Storm Drainage, Asphalt Highway Surfaces, and Underground and Aboveground Utilities and Anomalies.
Does not include De-Watering, Shoring or Relocating of any Utilities, Light Poles, Water Lines, Electrical and Gas Service, Permanent Fencing, etc.
Does not include Import and compaction of any Clean Quarry Fill Materials.
Erosion control is estimated and actual cost may vary based on specifications being provided to contractor later by owner