

Engineering Evaluation/Cost Analysis Report

ALDER CAMP ROAD FIRING RANGE
REDWOOD NATIONAL PARK
ORICK, CALIFORNIA



June 9, 2015

Prepared for:



**U.S. DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
Pacific West Regional Office
333 Bush Street, Suite 500
San Francisco, California 94104**

Prepared by:

Patriot Technical Consultants, Inc.
Richland, Washington, under P.O. No. P14PX03671



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This document has been prepared in accordance with accepted scientific and engineering practices and procedures and the Patriot Technical Consultants, Inc. Quality Assurance Program.

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ACRONYMS, ABBREVIATIONS AND UNITS OF MEASURE

AOC	Area of Contamination
ARAR	Applicable or Relevant and Appropriate Requirement
Ba	Barium
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
COPC	Contaminant of Potential Concern
Cu	Copper
DOI	Department of Interior
DU	Decision Unit
Eco-SSL	Ecological Soil Screening Levels
EE/CA	Engineering Evaluation/Cost Analysis
EPA	Environmental Protection Agency
ESL	Ecological Screening Level
EPC	Exposure Point Concentration
FRTR	Federal Remediation Technologies Roundtable
HQ	Hazard Quotient
ITRC	Interstate Technology and Regulatory Council
LDR	Land Disposal Restricted
mg/kg	milligrams per kilogram
mm	millimeter
NCP	National Oil Pollution and Hazardous Substances Contingency Plan (also known as National Contingency Plan)
NTCRA	Non-Time Critical Removal Action
NPS	National Park Service
PA	Preliminary Assessment
Pb	Lead
RAO	Removal Action Objective
RCRA	Resource Conservation and Recovery Act
Sb	Antimony
SI	Site Inspection
SRE	Streamlined Risk Evaluation
UC	University of California
UCL	Upper Confidence Limit
TBC	To Be Considered
TCLP	Toxicity Characteristic Leaching Procedure
WET	Wet Extraction Test

EXECUTIVE SUMMARY

Patriot Technical Consultants, Inc. has prepared this Engineering Evaluation/Cost Analysis Report for the National Park Service for the Alder Camp Road Firing Range, also referred to as the Site. The National Park Service has managed the Redwood National Park since 1968 and the Site was already an established firing range at that time. The National Park Service currently plans to discontinue use of the Site as a firing range and will allow the Site to revegetate naturally after cleanup is completed.

The National Park Service has determined that use of its removal action authority under the Comprehensive Environmental Response, Compensation, and Liabilities Act is appropriate for this Site. The following preliminary removal action objectives were developed to reduce the risk to human health and the environment at the Site:

- Reduce exposure of human and ecological receptors to contaminants of potential concern to acceptable levels; and,
- Do not dispose of solid waste containing hazardous materials in a National Park unit.

This Engineering Evaluation/Cost Analysis is based on a screening level risk assessment in which established values for human health and ecological risk for certain contaminants are compared to actual values of the same contaminants found in the surface and near-surface soil at the Site. These contaminants consist of antimony, barium, copper and lead. Preliminary cleanup levels that are protective of both human health and the environment were developed and used in an evaluation of removal action alternatives to attain the removal action objectives. The following removal action alternatives were evaluated in the Engineering Evaluation/Cost Analysis:

Alternative 1. No Action.

Alternative 2. Excavation and off-site disposal.

Each alternative was analyzed for effectiveness, implementability, and cost. A comparative analysis of all the alternatives was then conducted and the recommended removal action alternative was selected. This detailed comparative analysis led to the recommendation that Alternative 2 be selected as the preferred remedy for the Site because it would:

- Achieve the removal action objectives;
- Meet the applicable or relevant and appropriate requirements; and,
- Be the most cost-effective alternative that achieves removal action objectives and complies with applicable or relevant and appropriate requirements.

This EE/CA Report is available for review and public comment. Public comments are considered in development of an Action Memorandum which finalizes removal action objectives, establishes final cleanup levels and specifies the cleanup action to be taken.

1.0 INTRODUCTION

Patriot Technical Consultants, Inc. (Patriot) was retained by the National Park Service (NPS) to conduct an Engineering Evaluation/Cost Analysis (EE/CA) of the Alder Camp Road Firing Range (Site). This work was conducted under purchase order #P14PX03671 and in accordance with the EE/CA Work Plan for the Site ([Patriot, 2014](#)). This EE/CA was prepared following the U.S. Environmental Protection Agency (EPA), 1993 guidance, *Conducting Non-Time-Critical Removal Actions Under CERCLA* ([EPA, 1993](#)).

A Preliminary Assessment (PA) for the Site was completed in 2011 ([Versar, 2011](#)), in accord with the Comprehensive Environmental Response, Compensation, and Liabilities Act (CERCLA). The PA included a recommendation that a Site Inspection (SI) be performed in accordance with CERCLA protocols. The NPS has determined that the use of removal action authority 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, as presented in the Approval Memorandum ([NPS, 2014](#)).

1.1 Regulatory Framework

The President of the United States is authorized to act whenever there is a release or substantial threat of a release of a hazardous substance into the environment, consistent with the National Contingency Plan (NCP), to remove or arrange for the removal of such hazardous substance or take any other response action, including appropriate investigations, deemed necessary to protect public health or welfare or the environment. This authority is contained in Sections 104(a)(1) and (b)(1) of CERCLA, 42 U.S.C. §§ 9604(a)(1) and (b)(1), under which a non-time critical removal action (NTCRA) is performed.

This response authority has been delegated to the Secretary of the Department of the Interior (DOI) pursuant to Executive Order 12580, 52 Fed. Reg. 2923 (1987), and further delegated to the NPS by Department of Interior Departmental Manual, Part 207 Limited Delegations, Chapter 7 CERCLA Implementation ([DOI, 2001](#)), with respect to property under the jurisdiction, custody, or control of the NPS. Therefore, the NPS has the authority to perform a NTCRA at the Site.

The EPA has classified removal actions into three types: emergency, time-critical, and non-time critical. The classification is based on the type of situation, the urgency to take action, the threat of release or potential release, and the period of time in which the action must be initiated ([EPA, 1993](#)). A NTCRA was selected for this Site because no immediate threat is posed to human health or the environment from onsite contaminants. The NTCRA can start later than six months after the determination that a response is necessary. Section 300.415(b)(4)(i) of the NCP requires that an EE/CA is prepared for all NTCRAs to evaluate removal action alternatives.

1.2 Purpose of the EE/CA

The purpose of the EE/CA is to develop and analyze removal action alternatives in accordance with CERCLA and the NCP and to recommend a removal action alternative that is protective of human health and the environment and complies with federal and state applicable or relevant and appropriate requirements (ARARs). This EE/CA has been completed in accordance with EPA guidance ([EPA, 1993](#)) in order to:

1. Satisfy the environmental review requirements for removal actions;
2. Satisfy administrative record requirements for documentation of removal action selection; and,
3. Provide a framework for evaluating and selecting alternative technologies.

The EE/CA identifies the objectives of a removal action and analyzes the effectiveness, implementability, and cost of various alternatives that may satisfy these objectives.

2.0 SITE CHARACTERIZATION

2.1 Site Description and Background

The Site is located in Redwood National and State Parks in Northern California. Redwood National Park is one of four park units managed jointly as Redwood National and State Parks by the National Park Service and the California Department of Parks and Recreation. The Site is entirely within national park lands. The three state park units within Redwood National and State Parks are not part of this EE/CA. The NPS has managed the Redwood National Park since 1968 and a firing range was physically present at the Site at that time, according to NPS personnel. The Site is located approximately 19 miles north of the town of Orick, off of Highway 101. The Site coordinates are 41.51275° north (latitude) and -124.07571° west (longitude). The Site is located in an area of second growth forest. The range is a flat grassy area surrounded by alder, Sitka spruce, salmonberry, evergreen huckleberry, salal and sword fern. The general location of the Site is shown on a map in Figure 1. A Site photograph is provided in Figure 2. Additional photographs of the Site, taken during the initial Site visit in September 2014 and during soil sampling in December 2014 are included in Appendix A to this report. Figure 3 is the drawing that shows key features of the Site and the soil sampling locations used to characterize the extent of contamination at the Site as part of this EE/CA.

Access to the Site is via an unimproved road that ties into Alder Camp Road. The dirt entrance road is approximately 0.1-mile from Alder Camp Road and terminates at the firing range. The road is closed to the general public and can only be accessed with NPS personnel escort. NPS still uses (with only lead free ammunition) the Site as a firing range to maintain handgun use permits and does not intend to open up the area to public access.

The firing range, used since at least 1968, has a line of 12 targets located at the northern end of the Site. The targets consist of old pieces of conveyor belts. The target line is positioned in front of a natural embankment that is known to contain bullets fired at the targets over the years. Several NPS park rangers have historically used the Site twice per year for permit qualifying. The Site was also used occasionally by personnel from California State Parks, the Bureau of Land Management (BLM), and Tribal Police. The NPS will not continue to use the Site as a firing range.

The NPS transitioned to “green” ammunition in 2008, but lead ammunition was still used for specific qualifications. Other agencies which utilized the range had not transitioned to “green” ammunition and would typically use lead ammunition. The NPS curtailed the use of lead ammunition in 2012 and also eliminated access to non-NPS users, thereby excluding the use of any leaded ammunition at the Site. All permit qualifiers are directed to pick up and remove spent shell casings, according to NPS personnel; however, casings were observed sporadically spread on the ground at the Site.

Above-ground plastic piping can be observed at several locations at the Site. The piping provides fixed base supports for posts attached to barricades. NPS personnel position themselves behind these barricades during qualifying for a handgun permit.

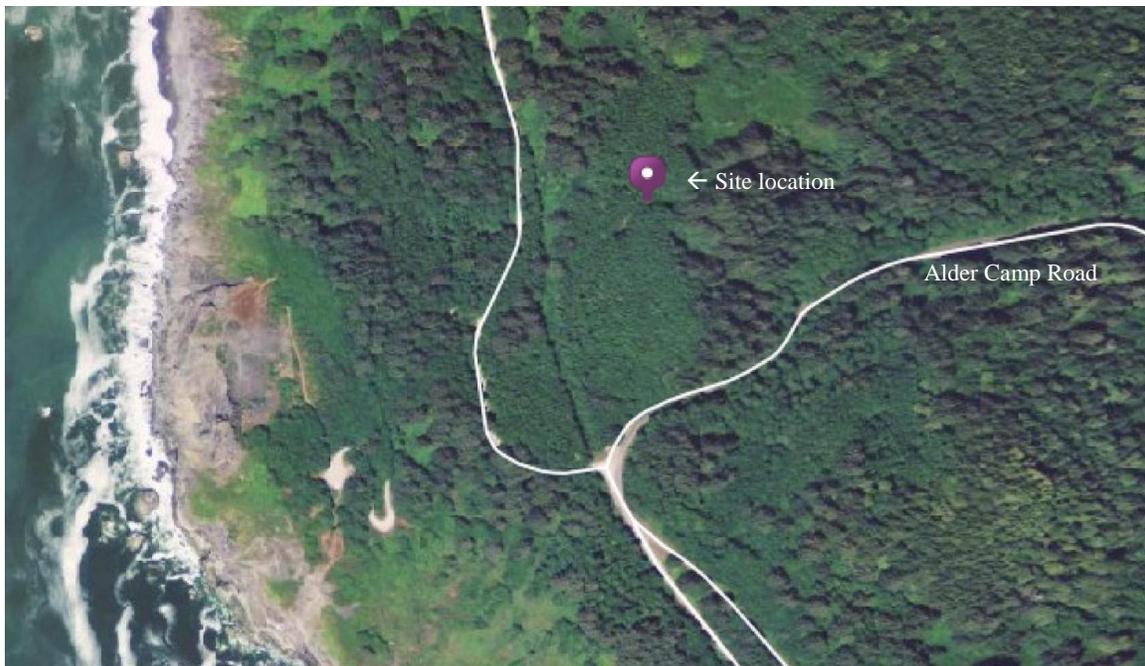
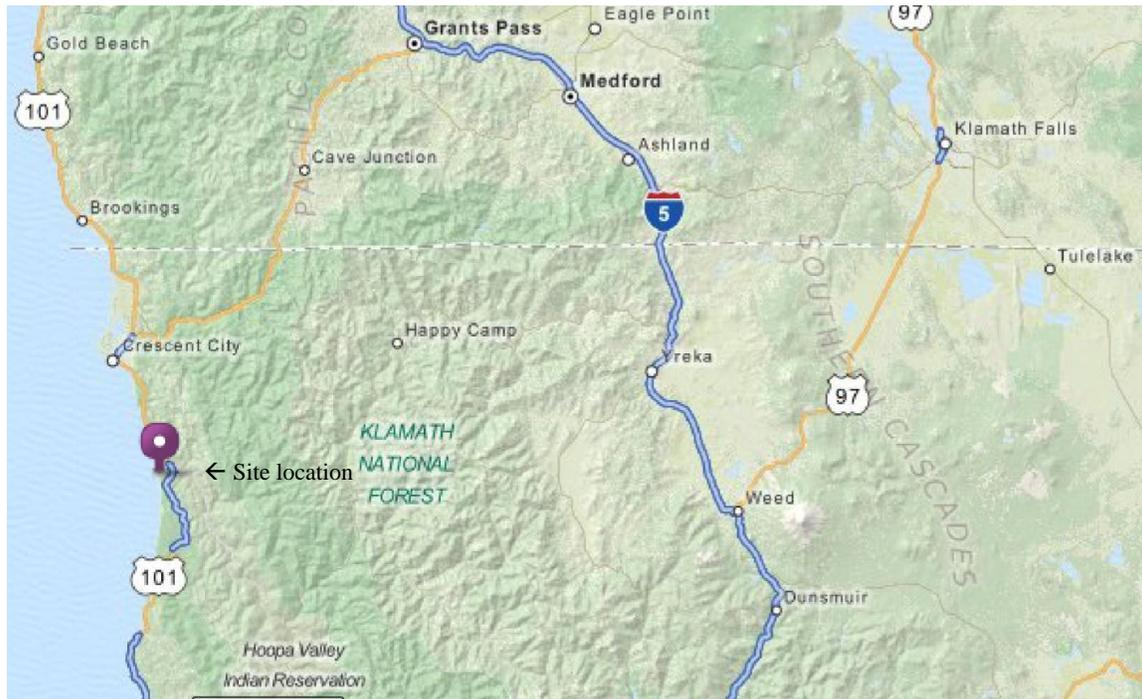


Figure 1. Site Location Maps



Figure 2. View from the Long Firing Range Area

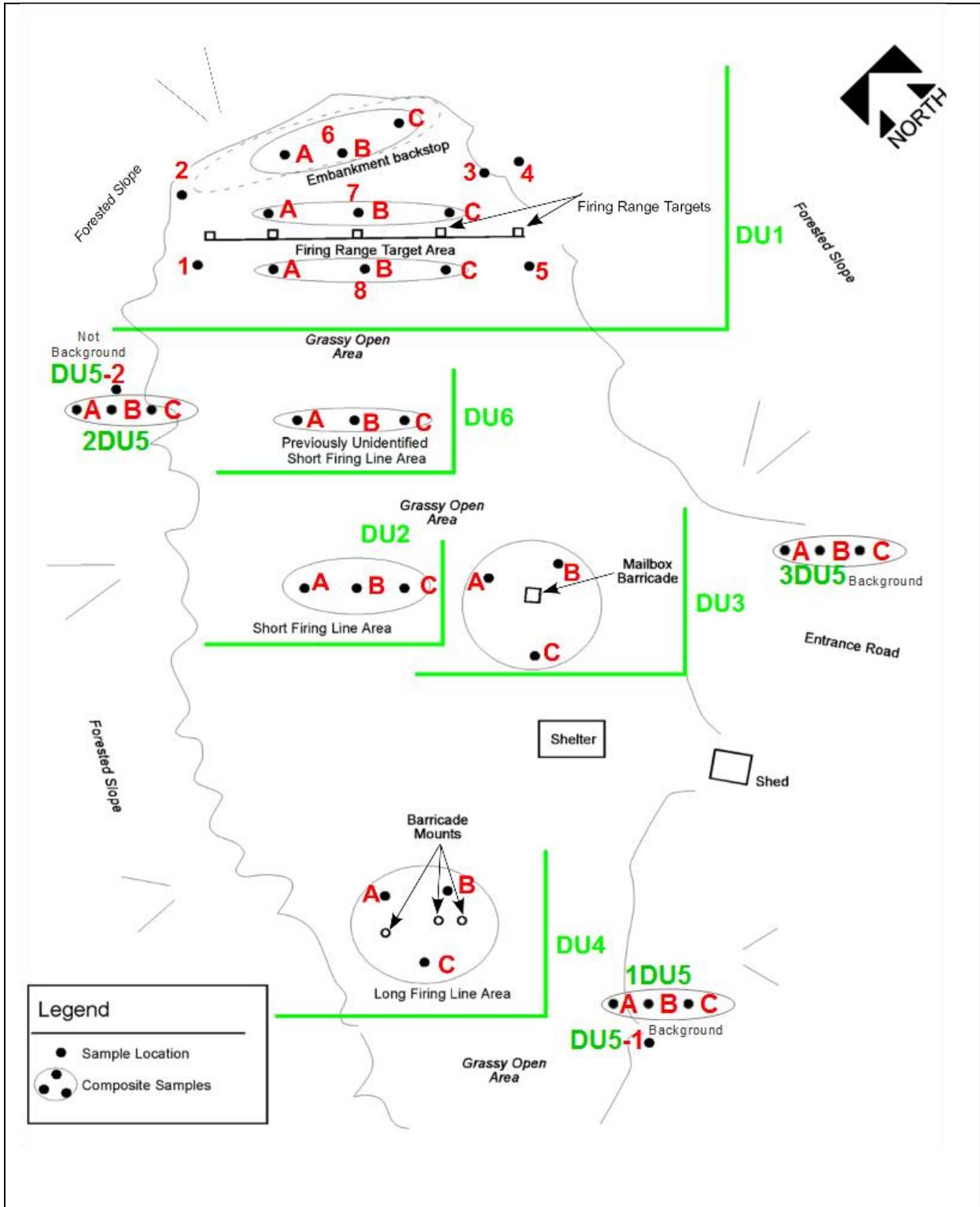


Figure 3. Site Layout Map

A shed, picnic table and old mailbox are located on the eastern side of the range. The shed is used to store portable barricades and the mailbox itself is used as a barricade.

A CERCLA Preliminary Assessment (PA) was completed in February 2011 ([Versar, 2011](#)). The targets at the firing range consist of a line of 12 targets located at the northern end of the Site. There is no barrier behind the targets to catch stray bullets; therefore, bullets are likely present in the area behind and beneath the target line. Bullet casings have been observed on the soil surface at the Site. A release of lead to the soil is likely due to use of lead bullets for over four decades, based on guidelines set by the Interstate Technology and Regulatory Council (ITRC), *Technical/Regulatory Guidelines; Characterization and Remediation of Soils at Closed Small Arms Firing Ranges* ([ITRC, 2003](#)).

Contaminant exposure of persons not engaged in firing range activities at the Site is limited because visitors are not allowed access to the Site. There is no plan to open up the area to the public. There are no sensitive receptors within the Site, nor have any off-site transport mechanisms been identified. The Site is not known to have habitat to support endangered or threatened species.

The presence of localized elevated lead concentrations in soil within the Site is considered likely, based on the observations of the Site and review of available information regarding the past and present use of the Site. The extent to which lead or other heavy metals associated with firing range activities may have migrated within the soil and potentially to underlying groundwater, has not yet been determined. Elevated concentrations of lead in ground water and surface water in not considered likely, due to the Site's location in relation to existing water bodies. The mobility, fate, bioavailability and toxicity of lead-based ammunition in firing ranges has been studied at other sites as discussed in [EPA, 2003](#).

The Site is subject to a Removal Site Evaluation (40 Code of Federal Regulation [CFR] 300.410(b)) as part of a CERCLA cleanup evaluation. The Removal Site Evaluation includes a removal PA and, if warranted, a SI. A Site reconnaissance with NPS personnel was conducted on September 30, 2010 ([Versar, 2010](#)), and the PA was completed in 2011 ([Versar, 2011](#)). The PA was based on readily available information (without analytical information on the Site soils) and generally identified the source and nature of the release, evaluated the magnitude of the threat, assessed the threat to public health, and determined if more information was needed to characterize the release. This PA addressed the potential environmental pathways and environmental hazards, including the exposure pathways of groundwater, surface water, soil, and air. The PA included a recommendation that an SI be performed.

The PA included an EPA hazard ranking system scoring package for the Site. The score for the Site was 6.3, well below the threshold of 28.5 that is required for listing on EPA's National Priority List. An Approval Memorandum was issued by the NPS ([NPS, 2014](#)) to document that the Site meets the NCP criteria for initiating a non-time critical removal action. The NPS has determined that the use of removal action authority at the Site 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. The NPS has elected not to perform an SI, but rather to move directly to an EE/CA. The EE/CA is a process through which the NPS, as the lead agency, can take to support a final decision regarding a removal action at the Site and satisfies

the following objectives:

- Maintain compliance with CERCLA;
- Identify ARARs (Appendix B);
- Document information including cost; and,
- Document Site contaminant data (Appendix C).

A Categorical Exclusion was reached for the conduct of a CERCLA Response at the Site, in accordance with the National Environmental Policy Act (NEPA) responsibilities ([NPS, 2011](#)). The Categorical Exclusion documented a determination that no mitigation actions were necessary for a SI. The Categorical Exclusion referred to additional actions to be implemented if future Site cleanup and remediation were to involve more extensive ground disturbance. Cleanup at the Site has a much greater potential to affect previously undocumented archeological or historic resources and a cleanup project will be subject to Section 106 of the National Historic Preservation Act.

The NPS performed an assessment of Site investigation activities, titled “Assessment of Action Having an Effect on Cultural Resources” in 2011 ([NPS, 2011](#)). This included a survey to identify cultural resources. This NEPA document noted that there are no known cultural resources to be impacted, but there is the potential to affect presently unidentified cultural resources. The Yurok Tribe has indicated that “no sensitivity for this area is known, however the Tribe is concerned about lead in the environment and would like to know the results of the investigation.”

2.2 Previous Removal Actions

No contaminant removal actions have occurred at the Site. There are no constructed barriers behind the targets to catch stray bullets; therefore, bullets are known to have passed through the targets and to have entered the native soil behind and near the target line. All permit qualifiers are supposed to pick up and remove spent shell casings and it is likely that casings have been picked up and removed over the years; however, numerous bullet casings were observed on the soil surface at the Site in the areas where weapons have been fired.

2.3 Source, Nature, and Extent of Contamination

This section presents the results of Site characterization activities conducted as part of this EE/CA.

2.3.1 Site Sampling Description

The Site was divided into the following decision units (DU):

DU1	Firing range target area	DU2	Short firing line area
DU3	Mailbox barricade area	DU4	Long firing line area
DU5	Background and one site northwest of the target area	DU6	Previously unidentified firing line area.

Contaminants of potential concern (COPC) generally comprise the hazardous substances, pollutants, and contaminants that are investigated during the risk assessment. Contaminants of concern (COC) are the hazardous substances, pollutants, and contaminants that, at the end of the risk assessment, are found to be the risk drivers or those that may actually pose unacceptable human or ecological risks ([EPA, 2002b](#)). The COCs typically drive the need for a cleanup action ([EPA, 1999](#)).

The COPCs within DU1 are antimony, copper and lead. The COPCs for DU2, DU3, DU4, and DU6 are antimony, barium, copper and lead. COPCs are included in the sampling plan for the Site. The resulting data is evaluated in the streamlined risk evaluation.

Samples of soil were taken on December 3 and 4, 2014, as part of the EE/CA field activities. The sampling locations are shown on Figure 3. Additional background sampling was conducted on February 17, 2015 at three sites, two of which were sampled in December 2014. The February 17, 2015 samples consisted of three increments at each of the three sites. These three increments were measured at the lab as both discrete samples and composites samples. Samples were collected at both 0-6 inch and 6-12 inch depths.

The February samples and site locations are identified in the figures and tables with a site identification containing “DU51” versus the prior December background samples which contained “DU5-1.” The soil sampling location labeled DU5-2 and 2DU5 in Figure 3 and Figure 4 was reasonably close to the target zone and had the potential to be contaminated from site activities. Data from this sampling location was not used in the assessment of local background metal concentration.

The December 3 and 4, 2014 surface and near-surface soil was sampled in accordance with the NPS approved Sampling and Analysis Plan ([Versar, 2014](#)) and the EE/CA Work Plan ([Patriot, 2014](#)), as follows:

1. Sample locations were selected from each of the six DUs. One of the DUs (DU5) was established to collect background soil samples (i.e., areas that are unlikely to have been impacted by the firing range activities at the Site).
2. Samples were collected from surface (0-3” or 0-6” below ground surface [bgs]) or near-surface (6-12” bgs) soils using a slide hammer and steel sleeves. This method resulted in sample cores that were 2” wide. Soil was deposited onto a large steel (cookie) sheet before being put into jars. The steel sleeves and sheet were decontaminated between samples using a brush, liquinox water mixture, distilled water and paper towels.
3. Samples were placed in a clean sample jar, labeled, and placed on ice in a cooler for delivery to the contract laboratory. Sub-samples were collected separately and sent to the laboratory where they were combined into composite samples for analysis.
4. Soil samples were sieved at the laboratory using a #10 (2 millimeter [mm]) sieve, and the soil that passed through the sieve was measured for metals contamination. The sieving was repeated using a #40 (0.5 mm) sieve. Separate analyses for total metals were conducted on all surface soil samples that had been run through a #10 sieve and a #40 sieve.

5. Near-surface (6” to 12” bgs) samples were collected and retained at the lab for analysis based on contamination levels measured in surface soil. A select set of these samples from locations with high surface contamination were sieved at the laboratory using a #40 sieve and measured for metals contamination.
6. A select set of surface samples were measured for metals using the California Title 22 Wet Extraction Test (WET), based on the results of analysis of metals in surface soil.

Sampling activities during December 3 and 4, 2014 were recorded in the field logbook and chain of custody forms (Appendix C). The February 17, 2015 sampling event and the subsequent laboratory analyses were performed in accordance with the same field sampling and analytical procedures that were used for the December 3 and 4, 2014 samples. Samples were collected in accordance with the Sampling and Analysis Plan ([Versar, 2014](#)) and the EE/CA Work Plan ([Patriot, 2014](#)).

2.3.2 Analytical Data

Soil samples collected from the firing range target area were analyzed for antimony, copper and lead. Background soil samples and samples collected from the short firing line area, mailbox barricade area and the long firing line area were analyzed for antimony, barium, copper and lead. Soil samples, as discussed in Section 2.3.1, collected on December 3 and 4, 2014 were delivered to an accredited analytical laboratory on December 6, 2014. Laboratory analyses were completed on January 7, 2015. Background soil samples collected on February 17, 2015 were delivered to the same accredited analytical laboratory on February 26, 2015. Laboratory analyses were completed on March 5, 2015. All laboratory data were subject to an independent quality assurance review to ensure they were suitable for inclusion in this EE/CA Report.

A summary of the analytical data, using EPA Method 6010 for total metal for antimony (Sb), barium (Ba), copper (Cu) and lead (Pb) using a #40 (2 mm) sieve are shown on Figure 4. Summary Data for Soil Samples, #40 Sieve, by Decision Unit.. Analytical results for these soil samples are summarized in Table 1 through Table 7. Samples collected on December 3 and 4, 2014 were also analyzed after using a #10 (0.4 mm) sieve. The laboratory analytical results, including the quality assurance review, are contained in Appendix C.

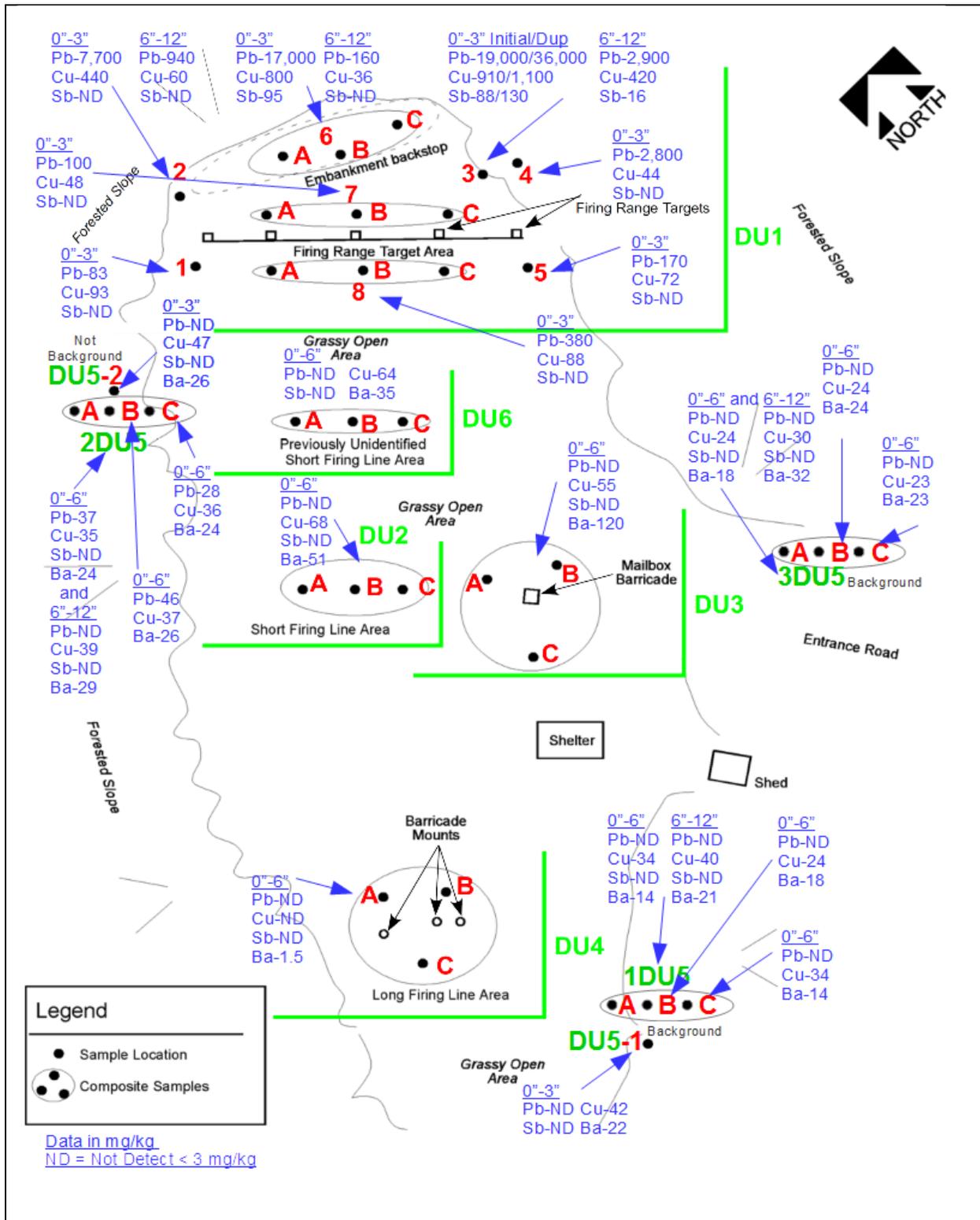


Figure 4. Summary Data for Soil Samples, #40 Sieve, by Decision Unit.

**Table 1. Decision Unit 1 Laboratory Data
Target Area and Backstop, Near-Surface Soil**

Sample ID	Antimony (mg/kg)		Copper (mg/kg)		Lead (mg/kg)	
	Result	RL	Result	RL	Result	RL
RNP-AC-DU1-2_D	ND	3.0	60	1.0	940	3.0
RNP-AC-DU1-2_D	ND	3.0	60	1.0	940	3.0
RNP-AC-DU1-3_D	16	3.0	420	1.0	2,900	3.0
RNP-AC-DU1-6Comp_D	ND	3.0	36	1.0	160	3.0

Samples collected from 6-12” depth

Comp = Composite of three sub-samples within immediate area

ND = Not Detected at or above the Reporting Limit (RL)

mg/kg = milligrams per kilogram

**Table 2. Decision Unit 1 Laboratory Data
Target Area and Backstop, Surface Soil**

Sample ID	Antimony (mg/kg)		Copper (mg/kg)		Lead (mg/kg)	
	Result	RL	Result	RL	Result	RL
RNP-AC-DU1-1	ND	3	93	1	83	3
RNP-AC-DU1-2	ND	3	440	1	7,700	30
RNP-AC-DU1-3	88	3	910	1	19,000	30
RNP-AC-DU1-3 Dup	130	3	1100	1	36,000	30
RNP-AC-DU1-4	ND	3	44	1	2,800	3
RNP-AC-DU1-5	ND	3	72	1	170	3
RNP-AC-DU1-6 Comp	95	3	800	1	17,000	30
RNP-AC-DU1-7 Comp	ND	3	48	1	100	3
RNP-AC-DU1-8 Comp	ND	3	88	1	380	3

**Table 2. Decision Unit 1 Laboratory Data
Target Area and Backstop, Surface Soil**

California Title 22 Wet Extraction Test (values expressed in mg/l)						
Sample ID	Antimony (mg/l)		Copper (mg/l)		Lead (mg/l)	
	Result	RL	Result	RL	Result	RL
RNP-AC-DU1-2	4.8	0.1	19	0.1	490	0.1
RNP-AC-DU1-4	13	0.1	7	0.1	1,200	0.1
RNP-AC-DU1-8 Comp	1.1	0.1	49	0.1	110	0.1

Samples collected from 0-3” depth
 Comp = Composite of three sub-samples within immediate area
 Dup = Duplicate
 ND = Not Detected at or above the Reporting Limit (RL)
 mg/kg = milligrams per kilogram
 mg/l = milligrams per liter

**Table 3. Decision Unit 2 Laboratory Data
Short Firing Line, Surface Soil**

Sample ID	Antimony (mg/kg)		Barium (mg/kg)		Copper (mg/kg)		Lead (mg/kg)	
	Result	RL	Result	RL	Result	RL	Result	RL
RNP-AC-DU2-1 Comp	ND	3	51	1	68	1	ND	3

Comp = Composite of three sub-samples within immediate area
 ND = Not Detected at or above the Reporting Limit (RL)
 Samples collected from 0-6” depth
 mg/kg = milligrams per kilogram

**Table 4. Decision Unit 3 Laboratory Data
Mailbox Barricade, Surface Soil**

Sample ID	Antimony (mg/kg)		Barium (mg/kg)		Copper (mg/kg)		Lead (mg/kg)	
	Result	RL	Result	RL	Result	RL	Result	RL
RNP-AC-DU3-1 Comp	ND	3	120	1	55	1	ND	3

Samples collected from 0-6” depth
 Comp = Composite of three sub-samples within immediate area
 ND = Not Detected at or above the Reporting Limit (RL)
 mg/kg = milligrams per kilogram

**Table 5. Decision Unit 4 Laboratory Data
Long Firing Line, Surface Soil**

Sample ID	Antimony (mg/kg)		Barium (mg/kg)		Copper (mg/kg)		Lead (mg/kg)	
	Result	RL	Result	RL	Result	RL	Result	RL
RNP-AC-DU4-1 Comp	ND	3	1.5	1	ND	1	ND	3

Samples collected from 0-6" depth

Comp = Composite of three sub-samples within immediate area

ND = Not Detected at or above the Reporting Limit (RL)

mg/kg = milligrams per kilogram

**Table 6. Decision Unit 5 Laboratory Data
Background, Surface and Near-Surface Soil**

Sample ID	Depth	Antimony (mg/kg)		Barium (mg/kg)		Copper (mg/kg)		Lead (mg/kg)	
		Result	RL	Result	RL	Result	RL	Result	RL
RNP-AC-DU5-1	0-3"	ND	3	22	1	42	1	ND	3
1DU51A comp	0-6"	ND	3	14	1	34	1	ND	3
1DU52A	0-6"	--	--	14	1	27	1	ND	3
1DU53A	0-6"	--	--	15	1	32	1	ND	3
3DU51A comp	0-6"	ND	3	18	1	24	1	ND	3
3DU52A	0-6"	--	--	24	1	24	1	ND	3
3DU53A	0-6"	--	--	23	1	23	1	ND	3
1DU51B comp	6"-12"	ND	3	21	1	40	1	ND	3
3DU51B comp	6"-12"	ND	3	32	1	30	1	ND	3

Comp = Composite of three sub-samples within immediate area

ND = Not Detected at or above the Reporting Limit (RL)

mg/kg = milligrams per kilogram

**Table 7. Decision Unit 6 Laboratory Data
Previously Unidentified Firing Line, Surface Soil**

Sample ID	Antimony (mg/kg)		Barium (mg/kg)		Copper (mg/kg)		Lead (mg/kg)	
	Result	RL	Result	RL	Result	RL	Result	RL
RNP-AC-DU6-1 Comp	ND	3	35	1	68	1	ND	3

Samples collected from 0-6” depth Comp = Composite of three sub-samples within immediate area
 ND = Not Detected at or above the Reporting Limit (RL)
 mg/kg = milligrams per kilogram

2.3.3 Extent and Volume of Contaminated Soils

Use history of the Site supported identification of the different DUs and the initial estimate of their surface extent. Field observation during soil sampling, soil sample analytical laboratory data (including sampling at different depths), and comparison with screening levels provides the basis for estimated volumes of soil (Table 8) that exceed the screening levels.

Table 8. Estimated Volume of Soil Exceeding Screening Levels.

Location	Size of Impacted Area (square meters)	Average Depth (meters)	Estimated Volume (cubic meters)	Estimated Weight at 1.6 US tons/cubic meter (US tons)
DU1 20% with more bullets	180	1.5	270	432
DU1 80% with fewer bullets	720	0.5	360	576
DU2, DU3, DU4, 2DU5, DU6	3,000	0.1	300	480
Total	3,900	N/A	930	1,488

2.4 Streamlined Risk Evaluation

This section summarizes the streamlined risk evaluation (SRE) of potential risks to human health and the environment from exposure to antimony, barium, copper and lead at the Site. Potential risks were evaluated for exposure to soil contamination resulting from use of the firing range. The SRE was used to qualitatively evaluate rather than quantify potential risks to determine if a removal action is warranted and to develop appropriate preliminary cleanup levels and removal

action alternatives to reduce risk. The potential risks to human and ecological receptors from exposure to these metals were evaluated by comparing Site concentrations with appropriate screening levels.

2.4.1 Human Health and Ecological Screening Levels

Screening levels were obtained from published sources presented in Table 9. The NPS protocol (NPS, 2014) was used to determine which published sources containing ecological screening levels were used to identify COPCs and which ecological screening level sources were used in the SRE. Ecological screening levels (Eco-SSL) from four sources, four ecological receptor groups (plants, invertebrates, mammals and birds) and four contaminants are presented in Table 9.

Table 9. Human and Ecological Screening Levels.

Human or Ecological Receptor	Initial Screening Levels for COPCs			
	Antimony (mg/kg)	Barium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)
Eco-SSL-Plants	--	--	70	120
ORNL-Plants	5	500	100	50
LANL-Plants	0.05	110	70	120
Eco-SSL-Invertebrates	78	330	80	1,700
ORNL- Invertebrates	--	--	50	500
LANL- Invertebrates ESL	78	330	80	1,700
Eco-SSL-Mammals	0.27	2,000	49	56
LANL ESL: Mammals	0.26	1,300	38	72
Sample et al screening: Mammals	0.248	20	55.7	29.3
Eco-SSL: Birds	--	--	28	11
LANL-ESL: Birds	--	820	15	14
Sample et al screening: Birds	--	17.2	38.9	0.94
COPEC screening: Plants + Invertebrates	0.05	110	50	50
COPEC screening: Mammals + Birds	0.248	17.2	15	0.94
Screening Eco risk assessment: Plants	5	500	70	120
Screening Eco risk assessment: Invertebrates	78	330	80	1700
Screening Eco risk assessment: Mammals	0.27	2,000	49	56
Screening Eco risk assessment: Birds	--	820	28	11

Table 9. Human and Ecological Screening Levels.

Human or Ecological Receptor	Initial Screening Levels for COPECs			
	Antimony (mg/kg)	Barium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)
Human Health residential soil	31	15,000	3,100	400
Site Background Location 1	ND < 3	22	42	ND < 3
Site Background Location 3	ND < 3	32	30	ND < 3
California background, Kearney 1996 – (average/geometric mean)	1.11 / 1.03	509 / 468	28.7 / 24	48.5 / 44.6

Human health based on EPA Regional Screening Levels for residential soil, using a hazard quotient (HQ) = 1.0. These four metals are not considered carcinogenic.

Eco-SSL = Ecological Soil Screening Level

ORNL = Oak Ridge National Laboratory

LANL = Los Alamos National Laboratory

mg/kg = milligrams per kilogram.

COPEC = Contaminant of Potential Ecological Concern

2.4.2 Site Risk Based on Screening Levels

A conservative estimate of the chemical concentration in each decision unit, termed the exposure point concentration (EPC), was determined for each of the decision units. The EPC is based on the Site data and is used in the risk assessment. A streamlined risk evaluation is intended to be a conservative estimate of risk to human health or the environment. The decision units have a small number of sample data; some decision units have only a single measurement of the concentration of each metal. The highest measured concentration within a decision unit is used as the EPC for this risk evaluation.

Risk is quantified in terms of a hazard quotient (HQ). A HQ is the ratio of the EPC to the screening risk assessment level, as shown in Table 9. The HQ for each contaminant in each DU for each receptor group is shown in Table 10. For example, in DU1 the risk of antimony to plants is calculated as follows: The EPC is 95 mg/kg and the screening level shown in Table 9 is 5 mg/kg. $HQ = EPC / \text{screening level}$. In this case, $HQ = 95 \text{ mg/kg} / 5 \text{ mg/kg}$. Therefore, $HQ = 19$ for antimony to plants in DU1. A HQ of 1.0 or greater indicates potential ecological or human health risk to the receptors shown in Table 10 that should be addressed in the cleanup decision.

Table 10. Decision Unit Exposure Point Concentration and Hazard Quotient.

Decision Unit and Metal	EPC (mg/kg)	Plant HQ	Invertebrate HQ	Mammal HQ	Bird HQ	Human HQ
DU1 Antimony	95	19	1.2	352	NA	3.1
DU1 Copper	910	13	11	19	32	0.3
DU1 Lead	19,000	158	11	339	1,727	48
DU2 Antimony	ND	--	--	--	NA	--
DU2 Barium	51	0.1	0.2	0.0	0.1	0.0
DU2 Copper	68	1.0	0.9	1.4	2.4	0.0
DU2 Lead	ND	--	--	--	--	--
DU3 Antimony	ND	--	--	--	--	--
DU3 Barium	120	0.2	0.4	0.1	0.1	0.0
DU3 Copper	55	0.8	0.7	1.1	2.0	0.0
DU3 Lead	ND	--	--	--	--	--
DU4 Antimony	ND	--	--	--	NA	--
DU4 Barium	1.5	0.0	0.0	0.0	0.0	0.0
DU4 Copper	ND	--	--	--	--	--
DU4 Lead	ND	--	--	--	--	--
2DU5 Antimony	ND	--	--	--	--	--
2DU5 Barium	29	0.1	0.1	0.0	0.0	0.0
2DU5 Copper	47	0.7	0.6	1.0	1.7	0.0
2DU5 Lead	46	0.4	0.0	0.8	4.3	0.1
DU6 Antimony	ND	--	--	--	--	--
DU6 Barium	35	0.1	0.1	0.0	0.0	0.0
DU6 Copper	68	1.0	0.9	1.4	2.4	0.0
DU6 Lead	ND	--	--	--	--	--

EPC = Exposure Point Concentration based on #40 sieve results
 HQ = 1.0 or greater (**indicated in bold type**) indicates potential risk
 mg/kg = milligrams per kilogram

2.4.3 Preliminary Cleanup Levels for Ecological Protection

Antimony, copper and lead in DU1 pose a potential risk to ecological receptors and both antimony and lead pose a potential human health risk. Antimony in DU2 poses a potential risk to mammals. Copper in DU2, DU3, 2DU5 and DU6 poses a potential ecological risk. Lead in 2DU5 poses a potential ecological risk.

Antimony, barium, copper, and lead were all COPCs at the Site at the beginning of this EE/CA and therefore were included in the soil analyses and streamlined risk evaluation. Barium does not pose a risk to human health or the environment at the Site, based on results of the sampling and streamlined risk evaluation. Barium, therefore, is not a COC at the Site and cleanup levels are not required for barium. Antimony, copper and lead each pose a risk, so are COCs at the Site and preliminary cleanup levels are presented in this EECA Report.

Regulatory standards and risk-based screening levels, along with Site use considerations, were used to develop the preliminary cleanup levels. The preliminary cleanup levels for the Site are based on reducing risks to acceptable levels for humans and environmental receptors that could potentially use the Site.

EPA guidance and policy do not recommend that cleanup levels be established at concentrations less than background, even if the background concentration exceeds an ARAR or risk-based screening level ([EPA 2002a](#) and [2002b](#)); however, regulatory standards and risk-based screening levels must be considered in the development of cleanup levels. The list of ARARs evaluated for this EE/CA is included in Appendix B to this report. The NPS guidance was used as part of the process to identify ARARs ([NPS, 2014](#)).

DU1 is significantly more contaminated than other areas and poses the greatest risk. During cleanup confirmatory sampling from DU1 will be performed to verify attainment of the cleanup levels. This will ensure that residual contamination measurements in DU1 are not dismissed as part of a larger set of measurements inclusive of other areas. Data from the remaining areas of the site will be combined into a single closeout unit. The decision units at the Site are very small relative to an area associated with communities or populations of ecological receptors to be protected. The entire Site is also small relative to the area utilized by wildlife species that could enter the Site. The fraction of exposure to receptors from contamination at the Site verses exposure from off-site sources should be considered when the ecological receptor utilizes an area significantly larger than the Site ([EPA, 2001](#)). This is one of the reasons ecological screening levels should not be used as default cleanup levels.

Cleanup levels should not be set below background. Two background samples were collected from DU5 at the Site. DU5 contains an additional site that is too close to the target area to be considered as representing background. A statewide assessment of background by the University of California ([UC, 1996](#)) provides average and geometric mean estimates of background for the COCs at this Site. Contaminant concentrations are often based on the 95 percent upper confidence limit (UCL) of the mean ([ITRC, 2008](#); [EPA, 2013](#)). A 95 percent UCL of the mean is not available in the statewide study. Data from the two Site background samples taken under this EE/CA were used to calculate a site-specific mean value with 95 percent confidence ([EPA, 2013](#)) for copper. Analytical results of background samples for antimony and lead are below the

laboratory reporting limit of 3 mg/kg, so a 95% UCL is not available for these contaminants.

Some of the ecological screening levels in the NPS Protocol ([NPS, 2014](#)) for these three contaminants are below background levels. The NPS Protocol repeatedly states that these risk screening levels should not be used as default cleanup levels. EPA guidance for eco risk screening also states it is not appropriate to use risk screening levels as cleanup levels, and that cleanup levels should not be set below background. Two background sample locations were sampled at the Site.

Soil from the various firing lines at the Site has been analyzed for the subject metals. These soil samples may be a combination of natural background and any contamination from firing range activities. These soil data, therefore, do not appropriately represent background, but they do help identify an upper bound on local background. Background concentrations for antimony, barium, copper and lead measured at the site are presented Table 6.

A cleanup level for barium is not included because it is not a COC. It was an initial COPC because it has been present at some other small arms firing ranges. It was included in the analyte list for Site characterization. Barium does not pose a human health or ecological risk at the Site, based on measured soil concentrations and the streamlined risk evaluation.

The preliminary cleanup levels for this EE/CA report have been determined to be protective at the Site for both human health and the environment. The preliminary cleanup levels are shown in Table 11.

Table 11. Preliminary Cleanup Levels

Contaminant of Concern	Preliminary Cleanup Level	Basis for Preliminary Cleanup Level
Antimony	3 mg/kg	<p>Measured Site background values (see Table 6) are all lower than the laboratory RL of 3 mg/kg.</p> <p>Therefore, the preliminary cleanup level is set at the RL.</p>
Copper	34 mg/kg	<p>Measured Site background values (see Table 6) range from 23 mg/kg to 42 mg/kg. The most stringent ecological screening level for copper is 15 mg/kg, based on the ecological screening level for mammals plus birds (see Table 9). The 95 percent UCL of the background data is calculated as follows:</p> <p>UCL at 95% = mean + t (0.05, sample size [9]-1) x standard deviation/square root of sample size.</p> <p>UCL at 95% = 30.22 + 1.86 x 5.7/square root of 9.</p> <p>UCL at 95% = 33.73 mg/kg [round to 34 mg/kg].</p> <p>Therefore, the preliminary cleanup level is set at 34 mg/kg.</p>

Table 11. Preliminary Cleanup Levels

Contaminant of Concern	Preliminary Cleanup Level	Basis for Preliminary Cleanup Level
Lead	11 mg/kg	<p>Measured Site background values (see Table 6) are all lower than the laboratory RL of 3 mg/kg. The most stringent ecological screening level for lead is 11 mg/kg, based on the ecological screening level for birds (see Table 9).</p> <p>Therefore, the preliminary cleanup level is set at 11 mg/kg.</p>

mg/kg = milligrams per kilogram
 RL = Reporting Limit
 UCL = Upper Confidence Limit

Final cleanup levels will be established by the NPS following public comment and will be stated in the Action Memorandum for this EE/CA.

2.4.4 Preliminary Cleanup Levels for Human Health Protection

The preliminary cleanup levels for all COCs for protection of the environment are more stringent than would be needed for protection of human health and, therefore, drive the preliminary cleanup levels for all COCs at the Site. The screening levels for both ecological receptors and human health are shown in Table 9.

Antimony: The human health screening level for antimony in residential soil is 31 mg/kg. The preliminary cleanup level for antimony at the Site, based on ecological risk, is set at 3 mg/kg, which is the laboratory reporting limit. The antimony preliminary cleanup level for ecological receptors is approximately 10 times more stringent than the human health screening level.

Copper: The human health screening level for copper in residential soil is 3,100 mg/kg. The Site background values for copper range from 23 mg/kg to 42 mg/kg, as shown in Table 6. The preliminary cleanup level for copper at the Site, based on the 95 percent UCL for the Site background concentration, is set at 34 mg/kg (see Table 11). The copper preliminary cleanup level for ecological receptors is approximately 91 times more stringent than the human health screening level.

Lead: The human health screening level for lead in residential soil is 400 mg/kg. Lead was not detected in the background soil samples, with a laboratory reporting limit of 3 mg/kg. The preliminary cleanup level for lead at the Site is set at 11 mg/kg, which is the ecological screening level for birds. The lead preliminary cleanup level for ecological receptors is approximately 36 times more stringent than the human health screening level.

3.0 REMOVAL ACTION OBJECTIVES

3.1 Statutory Limits on Removal Actions.

Authority for responding to releases or threat of releases from an impacted site is addressed in Section 104(a) of CERCLA, 42 U.S.C. §9604(a). Section 104 of CERCLA and Section 300.415 of the NCP specifically address non time-critical removal actions. Section 104(c)(1) of CERCLA generally restricts the timing of removal actions funded with Superfund monies to one year and the cost to \$2 million; however, CERCLA does not impose these limitations on a removal action funded by a federal agency at a federal facility with dedicated monies appropriated to that agency for that purpose apart from Superfund. Therefore, no statutory limits apply to a removal action at the Site.

3.2 Determination of Removal Action Scope

The scope of this removal action is to remove antimony, copper and lead impacts from historic firing range activities at the DUs to comply with preliminary removal action objectives for the Site.

3.3 Purpose and Preliminary Removal Action Objectives

The purpose of this EE/CA is to develop and analyze removal action alternatives in accordance with CERCLA and to recommend a removal action alternative that is protective of human health and the environment and compliant with ARARs. The removal action alternative will be selected by NPS, the lead federal agency for this EE/CA, and will be stated in an Action Memorandum following the public comment period on this EE/CA Report.

The preliminary removal action objectives (RAO) for the Site and the generalized removal schedule are presented below. The RAOs for the Site may be altered after this EE/CA Report is submitted if additional information becomes available from stakeholders or other interested parties that requires reevaluation of the RAOs. The Action Memorandum will define the final RAOs to reflect any alterations and refinements.

The following preliminary RAOs were developed for the Site:

- Reduce exposure of human and ecological receptors to contaminants of potential concern to acceptable levels; and,
- Do not dispose of solid waste containing hazardous waste in a National Park unit.

3.4 Determination of Removal Schedule and Planned Remedial Activities

The schedule for removal activities will be determined by NPS within a reasonable time frame that ensures adequate protection of public health and the environment. The removal action is planned to be fully protective of human health and the environment and comply with ARARs such that no subsequent remedial actions are necessary.

4.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

CERCLA removal actions must, to the extent practicable considering the exigencies of the situation, attain applicable or relevant and appropriate requirements (ARARs) under federal environmental or state environmental or facility siting laws at the completion or during the implementation of the removal action, or both depending on the nature of the requirements [CERCLA Section 121(d) and NCP Section 300.415(j)]. The urgency of the situation and the scope of the removal action to be conducted may be considered in determining whether compliance with ARARs is practicable.

ARARs consist of cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws (40 CFR § 300.5). These requirements are either “applicable” or “relevant and appropriate”. Applicable requirements are defined by NCP Section 300.5 as those requirements “that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site.” Applicable requirements are laws and regulations that would be enforceable at a particular site even if there was no CERCLA response action taking place. Relevant and appropriate requirements are defined as those requirements “that, while not ‘applicable’ to a hazardous substance, pollutant, contaminant, remedial action location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their uses is well suited to the particular site. A requirement must be determined to be both relevant and appropriate to be considered an ARAR”. (EPA, 1988). State standards and requirements that are promulgated, substantive, consistently applied, identified in a timely manner, and are more stringent than federal requirements may be applicable or relevant and appropriate [40 CFR § 300.400(g)(4)].

Provisions of generally relevant federal and state statutes and regulations determined to be procedural or non-environmental, including permit requirements, are not considered ARARs. Non-promulgated advisories or guidance issued by federal or state governments are not legally binding and do not have the status of ARARs. Such requirements, however, may be useful and are “to be considered” (TBC) for guiding decisions regarding cleanup goals or methodologies when regulatory standards are not available.

EPA has developed three categories of ARARs to assist in the identification of site requirements:

1. Chemical-specific;
2. Location-specific; and,
3. Action-specific.

EPA guidance recognizes that some requirements do not fall neatly into this classification. However, the definitions summarized below provide a general guideline for each category.

- Chemical-Specific ARARs are usually health- or risk-based numerical values or methodologies that, when applied to site-specific conditions, result in the establishment of numeric values (such as cleanup levels). These values establish the acceptable amount or concentration of a chemical that may be found in or discharged to the ambient environment.
- Location-Specific ARARs are restrictions placed on the concentrations of hazardous substances or the conduct of activities solely because they occur in special locations. Location-specific ARARs relate to the geographical or physical position of the site (such as the presence of wetlands, sensitive species, flood plains, etc.).
- Action-Specific ARARs are activity-based requirements or limitations on actions taken with respect to hazardous substances.

The NPS, as lead federal agency for this CERCLA action, has primary responsibility for identifying federal ARARs. EPA guidance recommends that the lead federal agency consult with the state when identifying state ARARs ([EPA, 1988](#)).

The federal and state ARARs discussed in this EE/CA represent a preliminary analysis of ARARs. Other federal and state advisories, criteria, or guidance may, as appropriate, be considered in formulating the removal action. Appendix B presents the ARARs and other requirements or TBCs identified for this project.

5.0 IDENTIFICATION AND ANALYSIS OF REMOVAL ACTION ALTERNATIVES

5.1 Description of Alternatives

This section presents potential removal action alternatives considered for use at the Site. EPA guidance ([EPA, 1993](#)) for non-time-critical removal actions states that a few relevant and viable removal alternatives should be chosen for evaluation and comparison. Three removal alternatives are evaluated and compared in this EE/CA. The three alternatives are evaluated for effectiveness, implementability and cost. The evaluation and comparison process follows EPA guidance for NTCRAs.

The following removal action alternatives were evaluated in the EE/CA:

Alternative 1. No Action;

Alternative 2. Excavation and off-site disposal.

Potential removal action alternatives were limited to those which would address antimony, copper and lead contamination in soils, since the scope of work for this project was to address soil contamination. No evaluation was conducted for removal action alternatives that directly address surface water or groundwater contamination. Risk to groundwater and surface water is believed to be low and, therefore, is outside the scope of this removal action ([Versar, 2011](#)). Any removal action activities for contaminated soil at the Site will further protect both surface water and groundwater by removing or controlling the primary contaminant source.

5.1.1 Alternative 1. No Action

No action would be taken at the Site, including no restrictions on current or future land-use scenarios. The human and ecological risks due to contamination would be unabated. Consideration of the No Action alternative is required by the NCP.

5.1.2 Alternative 2. Excavation and Off-site Disposal

Alternative 2 consists of the following elements:

1. Contaminated soil, defined as soil exceeding the preliminary cleanup levels, would be excavated and placed in one or more temporary staging piles. Incremental sub-samples would be gathered during excavation for subsequent analysis to determine the level of contamination in each staging pile.
2. In-process characterization using soil sampling and analysis or x-ray fluorescence would be used as needed to determine if additional excavation is needed within each decision unit to meet the cleanup level.
3. Soil that requires treatment to meet disposal requirements would be treated.
4. Incremental sub-samples that represent the staging pile(s) would be combined and

measured for antimony, copper and lead to designate the waste, determine if treatment is necessary, and for use in selecting an appropriate off-site disposal facility.

5. Soil for off-site disposal would be packaged and labeled to meet transportation requirements.
6. Soil for off-site disposal would be transported to an off-site disposal facility.
7. Surface topography appropriate for post-cleanup use determined by the NPS would be established.
8. Temporary institutional controls would be used to protect workers and the public from exposure to contamination and industrial hazards. Institutional controls apply at the contaminated waste Site, adjacent areas used for handling waste, and other areas where industrial hazards may be present such as heavy equipment use areas.
9. Dust control at the Site during excavation to meet metals and dust abatement controls for air emissions.

5.2 Criteria for Analysis of Alternatives

The analysis of removal action alternatives is qualitative in nature and is based on the following three evaluation criteria as recommended by [EPA \(1993\)](#): effectiveness, implementability, and cost. The following subsections describe each criterion.

5.2.1 Effectiveness

Alternatives are evaluated for effectiveness based on the criteria listed below.

- Overall Protection of Human Health and the Environment: Assesses the ability of the alternative to be protective of human health and the environment under present and future land use conditions.
- Compliance with ARARs: Determines if implementation of the alternative would comply with all chemical-, action-, and location-specific ARARs.
- Long-Term Effectiveness: Addresses the magnitude of residual risk remaining at the conclusion of removal activities, and addresses the adequacy and reliability of controls established by a removal action alternative to maintain reliable protection of human health and the environment over time.
- Short-Term Effectiveness: Addresses the effects of an alternative during the construction and implementation phase until RAOs are achieved; includes consideration of the time for the remedy to achieve protectiveness and the potential to create adverse impacts on human health and the environment during construction and implementation of the remedy.
- Reduction of Toxicity, Mobility, or Volume through Treatment: Determines if implementation of the alternative would reduce contaminant toxicity (such as reduction of metals toxicity), contaminant mobility, or actual volume of hazardous substances.

5.2.2 Implementability

Alternatives are evaluated for implementability based on the criteria below.

- **Technical Feasibility:** Evaluates constructability and operational considerations as well as demonstrated performance and useful life.
- **Administrative Feasibility:** Evaluates activities such as statutory limits, permitting requirements, easements and rights-of-way, and impacts on adjoining property.
- **Availability of Services and Materials:** Evaluates the availability of qualified contractors to provide the necessary services, materials, and equipment (with the preferred technologies being those that are commercially developed and readily available or innovative technologies that have been field-tested with documented results); also evaluates the availability of licensed disposal facilities.
- **State Acceptance:** Considers the concurrence of the State of California with the proposed alternative.
- **Community Acceptance:** Considers the community's acceptance of the proposed alternative.

5.2.3 Cost

Technologies were evaluated based on costs. Alternatives with lower costs were preferred if the effectiveness and implementability criteria were judged to be similar. The cost estimates were prepared to aid in the evaluation of alternatives using currently available information. These costs are order-of-magnitude estimates, with an intended accuracy of +50 to -30 percent ([EPA, 2000](#)). These costs are not construction bid costs, nor are they final project costs, but are based on best professional judgment (including experience on recent similar projects and actual vendor quotes, as appropriate).

5.3 Analysis of Alternatives

The individual alternatives are evaluated for effectiveness, implementability and cost in this section. These alternatives are compared with each other in Section 5.4.

5.3.1 Alternative 1 – No Action

The evaluation of Alternative 1, in terms of effectiveness, implementability, and cost, is shown below. This alternative would not include any future restrictions regarding potential human or ecological exposure to contaminants at the Site.

5.3.1.1 Effectiveness

The effectiveness of Alternative 1 is evaluated using the following criteria:

1. **Overall Protection of Public Health and the Environment:** The firing range areas would remain as they currently exist with no efforts to minimize contaminant migration or

exposure under this alternative. No efforts would be made to reduce any potential risks to human health or the environment. The identified risks would continue if no action is taken.

2. Compliance with ARARs: Alternative 1 does not comply with ARARs.
3. Long-Term Effectiveness and Permanence: Alternative 1 does not provide long-term effectiveness or a permanent remedy for contaminated soils. This alternative does not manage the risks to human health and the environment.
4. Reduction of Toxicity, Mobility, or Volume through Treatment: Alternative 1 does not include treatment and thus does not reduce the toxicity, mobility or volume of contamination at the Site.
5. Short-Term Effectiveness: Alternative 1 has poor short-term effectiveness because risk from Site contaminated is not reduced. The length of time until protection is achieved is indefinite under this alternative.

5.3.1.2 Implementability

The implementability of Alternative 1 is evaluated using the following criteria:

- Technical Feasibility;
- Administrative Feasibility;
- Availability of Services and Materials, and,
- State and Community Acceptance.

No technical or administrative feasibility concerns are associated with this alternative because no action is being taken. No services or materials are required. State and community acceptance is unknown, but the alternative is likely to be determined unacceptable based on the exceedances of screening criteria protective of ecological receptors.

5.3.1.3 Cost

There is no cost for Alternative 1, as no removal action would be taken.

5.3.2 Alternative 2 – Excavation and Off-Site Disposal

The evaluation of Alternative 2, in terms of effectiveness, implementability, and cost, is shown below. This alternative supports unrestricted use and unrestricted exposure regarding potential human or ecological exposure to contaminants at the Site upon completion of the removal action.

5.3.2.1 Effectiveness

The effectiveness of Alternative 2 is evaluated using the following criteria:

1. Overall Protection of Public Health and the Environment: Removal to an off-site facility would provide a high level of protection to human health and the environment as all contaminated materials would be removed to attain the preliminary cleanup levels.

2. Compliance with ARARs: Alternative 2 is compliant with ARARs and removes all material that exceeds preliminary cleanup levels.
3. Long-Term Effectiveness and Permanence: Alternative 2 provides a high level of long-term effectiveness and is a permanent remedy for the soils. This alternative reduces risks to human health and the environment to acceptable levels
4. Reduction of Toxicity, Mobility or Volume through Treatment: Reduction in the mobility of the contaminants would be achieved through treatment, if necessary, to meet disposal facility requirements.
5. Short-Term Effectiveness: This removal action alternative would be completed in a relatively short period of time, estimated at six months, and no permanent facilities would be required. A small increase in short-term risk to human health would be encountered during the excavation and transport phase of this work due to the truck trips required. Impacts associated with construction activities are considered short-term, and should not significantly impact human health. Short-term air quality impacts to the immediate environment may occur during excavation of contaminated soils. Control of fugitive dusts may be required at the Site and at off-site areas used to obtain clean backfill.

5.3.2.2 Implementability

The implementability of Alternative 2 is evaluated using the following criteria:

1. Technical Feasibility: Alternative 2 is a technically feasible remedy. This remedy has been implemented with consistent success at numerous similar sites, including NPS sites. The alternative would require technical oversight to ensure complete removal of soils exceeding preliminary cleanup levels and contracts with firms licensed to perform hazardous waste removal.

Contaminants in DU1 exceed the preliminary cleanup levels. DUs 2, 3, 4, and 6 are nearby and could be used by the heavy equipment required for the excavation. Soil from DU1 could be placed in a staging pile in these nearby areas during the excavation process. The surface soil (estimated to be 0.1 meters in depth) could be removed from the area bounded by DU2, DU3, DU4 and DU6 to minimize any cross contamination from the staging pile or equipment used to excavate the more contaminated DU1 soil.
2. Administrative Feasibility: Implementation of Alternative 2 requires coordination with administrators and regulatory agencies for on-site excavation, treatment and packaging and off-site transport and disposal.
3. Availability of Services and Materials: Services and materials for Alternative 2 are readily available.
4. State and Community Acceptance: Alternative 2 is commonly used at sites of this type. State and community acceptance of the remedy is considered highly likely. Final state and community acceptance will be determined following public comment.

5.3.2.3 Cost

The cost basis estimate requires assumptions. The two most significant are the size of the removal action (such as ground surface area, depth of contamination and volumes of waste) and contamination levels (principally if it is hazardous waste that needs treatment or not). Costs are categorized as direct or indirect.

The area of DU1 that will be excavated as guided by in-process sampling and analysis is estimated to be 30 meters wide (southeast to northwest) and 30 meters long (southwest to northeast – target area to backstop). Contamination is assumed to extend down to 0.3 meters below ground surface in 80 percent of DU1 in areas with the least bullet impacts. Contamination is assumed to extend 1.0 meter bgs in 20 percent of DU1 containing the backstop area with the most bullet impacts. It is assumed that 0.5 meters from 80 percent and 1.5 meters from 20 percent of DU1 will be excavated due to sloughing and mixing of higher surface contamination with deeper soil during excavation. The total volume of waste would be 630 cubic meters, based on these assumptions. The actual area and depth will be as necessary to attain the cleanup levels.

Cost for excavation/removal, transportation and disposal at a permitted facility, but exclusive of treatment which may be necessary, considers information from the Federal Remediation Technologies Roundtable ([FRTR, 2014](#)). Waste disposal cost is based on \$142.24 per ton at the transfer station in Crescent City, CA run by the Solid Waste Management Authority (personal contact by Larry Gadbois of Patriot Technical Consultants Inc. to Ted Ward at the transfer station, December 18, 2014). Cost is rounded to \$150 per US ton, and waste soil is assumed to weigh 1.6 US tons per cubic meter.

DU1 is bounded by three sides by forest and the backstop hill so equipment and waste generated during the excavation is assumed to enter and exit from the southwest toward the other DUs. The open space containing DU2, DU3, DU4, and DU6 are assumed to be used for equipment handling and two staging piles for exhumed contaminated soil. DU1, DU2, DU3, DU4, and DU6 are part of the Area of Contamination (AOC) subject to the requirements of Alternative 2 including excavation and closeout confirmatory sampling to meet cleanup levels.

The AOC exclusive of DU1 that will be excavated is assumed to be 30 meters wide (southeast to northwest) and 100 meters long. In consideration of cross contamination within the AOC containing the staging pile and heavy equipment activity, the AOC exclusive of DU1 is assumed to be contaminated to an average depth of 0.1 meter. The volume of waste from the AOC exclusive of DU1 is assumed to be 300 cubic meters.

The excavated soil will be placed into two staging piles. The cost estimate assumes subsamples will be collected such that the composite sample for each staging pile represents the entire staging pile. Samples are necessary for use in waste designation, and identification of treatment requirements. This cost estimate assumes the soil within each staging pile will not designate as hazardous waste and therefore will not require treatment prior to off-site disposal. Analysis of the composite samples will be run in triplicate for total metals, EPA's toxicity characteristic leaching procedure, and the WET.

The cost estimate assumes the DU1 target backstop soil, which is the most contaminated, will be segregated into its own staging pile. The excavated soil will likely not require treatment prior to off-

site disposal; however, if treatment is required, treatment would add a cost of about \$200 per cubic yard (EPA, 2009), and would increase the volume and weight of the waste by approximately 50 percent. The cost of treatment is not included in this EE/CA cost estimate. EE/CA cost estimates are required to be within a range of +50 percent to -30% of the actual cost (EPA, 2000).

Table 12 presents a breakdown of the estimated costs for Alternative 2.

Table 12. Alternative 2 Cost Estimate Basis

Task	Quantity	Unit	Unit Cost	Total Cost
Direct Costs				
Site mobilization and demobilization	1	each	\$3,000	\$3,000
Clearing and Grubbing (primarily in DU1)	600	m2	5	\$3,000
Excavation, temporary on-site management and transport to off-site disposal facility.	930	m3	\$500	\$465,000
Off-site disposal (nonhazardous)	930	m3	\$240	\$223,200
X-ray fluorescence rental fee	2	weeks	\$1,200	\$2,400
Laboratory analysis of staging pile samples	2	each	\$2,100	\$4,200
Site completion sample analysis at lab	30	each	\$150	\$4,500
Site restoration after contaminant removal	3,900	m2	\$2	\$7,800
Total Direct Costs				\$713,100
Indirect Costs				
Design including work plan				\$30,000
Project oversight				\$25,000
Health and Safety Plan				\$4,000
On-site environmental oversight				\$15,000
On-site sampler	1	month	\$5,000	\$5,000
Contingency (15% of direct cost)				\$106,965
Health and safety (3% of direct cost)				\$21,390
Total Indirect Costs				\$207,355
Total Cost (Direct plus Indirect)				\$920,455
Total Cost (+50% to -30%)				\$1,380,683 to \$644,319

Sampling of ground surface soil is conducted after excavation. The cost estimate assumes three composite (30 increment) samples would be collected from each of DU1, DU2, DU3, DU4 and DU4 and from the whole AOC resulting in 18 samples for use to demonstrate attainment of the

cleanup levels. Six of the 18 are would also be used for QA/QC. A field blank would be used for each of the five DUs, plus whole AOC. These 30 samples would be analyzed at a lab for the three COCs in a total metals analysis. The cost estimate assumes that Site restoration, including re-contouring, would use soil from the immediate vicinity.

Present value cost estimates were not calculated using the real discount rate published in Appendix C of the Office of Management and Budget (OMB) Circular No. A-94 ([OMB, 2013](#)), because this alternative is expected to take less than six months to complete. Cost estimates are expected to be within +50% to -30% of actual costs as described in EPA guidance for remedial actions. ([EPA, 2000](#)).

5.4 Comparative Evaluation of Alternatives

Table 13 summarizes the removal action alternatives and compares effectiveness, implementability and cost of each alternative. Costs estimated are based on previously determined soil volumes and contaminant concentrations.

Table 13. Comparative Evaluation

Evaluation Factors	Alternative 1 No Action Alternative	Alternative 2 Excavation and Off-site Disposal
Effectiveness		
Overall Protection of Human Health and the Environment	No	Yes
Compliance with ARARs	No	Yes
Long-Term Effectiveness and Permanence	No	Yes
Reduction of Toxicity, Mobility, or Volume Through Treatment	No	Yes
Short-Term Effectiveness	No	Yes
Implementability		
Technical Feasibility	Yes	Yes

Table 13. Comparative Evaluation

Evaluation Factors	Alternative 1 No Action Alternative	Alternative 2 Excavation and Off-site Disposal
Administrative Feasibility	Yes	Yes
Availability of Services and Materials	Yes	Yes
State and Community Acceptance	To Be Determined	To Be Determined
Cost		
Estimated Costs (+50%, -30%)	\$0	\$920,455
Compliance with ARARs	No	Yes

6.0 RECOMMENDED REMOVAL ACTION ALTERNATIVE

This section presents the recommended removal action alternative that best satisfies the evaluation criteria described in Section 5.2. The NPS reviewed each of the removal action alternatives in detail and recommends Alternative 2, as described in Section 5.3.2. This is the alternative that includes excavation of contaminated soils that exceed the preliminary cleanup levels provided in Section 2.4, followed by off-site disposal. The excavation and off-site disposal is relatively easy to implement, provides protection to human health and the environment, complies with ARARs, and is cost-effective.

7.0 REFERENCES

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APPENDIX A

PHOTOGRAPHIC DOCUMENTATION

This section of the Appendix contains a series of photographs taken during the soil sampling event on December 3 and 4, 2014. A short description of each photograph is included.

Photograph # 1	
View: Facing southwest	
Description: View of firing range from behind the target area.	

Photograph # 2	
View: Facing west	
Description: View of the embankment backstop behind target area.	

Photograph # 3

View:

Facing east

Description:

View of fence that held targets.



Photograph # 4

View:

Facing north

Description:

View of the firing range target area, previously unidentified firing line area and mailbox barricade.



Photograph # 5	
View: Facing northeast	
Description: View from the long firing line area.	

Photograph # 6	
View: Facing south	
Description: Access road to Site.	

APPENDIX B

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

The ARARs are identified for the on-site response actions in this appendix, per CERCLA Section 121(d)(2)(A)(ii). The substantive elements of a standard, requirement, criteria or limitation are part of the ARAR; however, administrative or process elements are not part of the ARAR. Independent of ARARs, on-site activities also must comply with requirements of non-environmental laws such as Occupational Safety and Health Act. Off-site activities are subject to compliance with both the substantive and administrative elements of laws and regulations, including laws and regulations not listed as ARARs for the on-site response. This would include laws and regulations such as waste management and disposal requirements at an off-site disposal facility and U.S. Department of Transportation requirements for off-site transport of waste.

Standard, Requirement, Criteria or Limitation	Citation	Requirement Description	Potential ARAR or TBC
NPS Organic Act of 1916.	16 USC §1, <i>et seq.</i> 36 CFR Part 1 General Authorities Act, <i>et seq.</i> 16 U.S.C § 1a-1	NPS mandate to ensure the non-impairment of national park resources for the enjoyment of future generations and the non-derogation of national park values and purposes. The Organic Act directs the National Park Service “to promote and regulate the use of . . . national parks . . . by such means and measures as conform to the fundamental purpose of the said parks . . . which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.” The General Authorities Act, Section 1a-1, further provides that “the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established.”	Applicable
An Act to Establish a Redwood National Park in the State of California, 1968. Redwoods National Park Expansion Act, 1978.	Public Law. No. 90-545 Public Law No. 95-250 16 USC Chapter 1, subchapter VII: Redwood National Park, <i>et seq.</i>	Preserve significant examples of the primeval coastal redwood forests and the streams and seashores with which they are associated for purposes of public inspiration, enjoyment, and scientific study.	Applicable

Standard, Requirement, Criteria or Limitation	Citation	Requirement Description	Potential ARAR or TBC
NPS policy on implementation of the non-impairment mandate	2006 NPS Management Policies, Section 1.4	<p>NPS MP §1.4.5: “The impairment that is prohibited . . . is an impact that . . . would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. Whether an impact meets this definition depends on the particular resources and values that would be affected; the severity, duration, and timing of the impact, the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts. . . . An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is: necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; or key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or identified in the park’s general management plan or other relevant NPS planning documents as being of significance. . . . An impact would be less likely to constitute an impairment if it is an unavoidable result of an action necessary to preserve or restore the integrity of park resources or values and it cannot be further mitigated.”</p> <p>NPS MP §1.4.3: “The fundamental purpose of all parks also includes providing for the enjoyment of park resources and values by the people of the United States. The enjoyment that is contemplated by the statute is broad; it is the enjoyment of all the people of the United States and includes enjoyment both by people who visit parks and by those who appreciate them from afar. It also includes deriving benefit (including scientific knowledge) and inspiration from parks”</p> <p>NPS MP §1.4.6 describes the ‘park resources and values’ subject to non-impairment. NPS MP §1.4.7 provides that “before approving a proposed action that could lead to an impairment of park resources and values, an NPS decision-maker must consider the impacts of the proposed action and determine, in writing, that the activity will not lead to an impairment of park resources and values. If there would be an impairment, the action must not be approved.”</p>	TBC

Standard, Requirement, Criteria or Limitation	Citation	Requirement Description	Potential ARAR or TBC
Solid Waste Disposal Sites in Units of the National Park System	16 USC 4601-22(c) <i>et seq.</i> NPS implementing regulations, 36 CFR Part 6	The federal statute 16 USC 4601-22(c) prohibits operation of any solid waste disposal site that was not in operation on September 1, 1984, except for sites used only for disposal of wastes generated within the park unit, so long as such site will not degrade any natural or cultural resources of the park unit. The NPS regulations implementing 16 USC 4601-22(c) are codified at 36 CFR Part 6. Among other things, the regulations prohibit the operation of any solid waste disposal site, except as specifically provided for in the regulations. 36 CFR § 6.4 specifies 12 conditions that must be met before a new solid waste disposal site may be authorized in a National Park, including the condition that there will be no disposal at the site of solid waste containing hazardous waste.	TBC
NPS restrictions of public use and recreation activities to protect national park resources	36 CFR Part 2: Resource Protection, Public Use and Recreation 36 CFR Part 7: Special Regulations, Areas of the National Park System	The NPS 36 CFR Part 2 regulations prohibit specific public use and recreational activities in national parks in order to protect park resources. For example, 36 CFR 2.1(a) prohibits “(1) Possessing, destroying, injuring, defacing, removing, digging, or disturbing from its natural state: (i) . . . wildlife or fish. . . (ii) Plants or the parts or products thereof. . . [or] (2) Introducing . . . plants . . . into a park area ecosystem.” Section 2.2(a)(2) prohibits “feeding, touching, teasing, frightening or intentional disturbing of wildlife nesting, breeding or other activities.” Section 2.14(a) prohibits “(1) Disposing of refuse in other than refuse receptacles. . . (6) Polluting or contaminating park area waters or water courses.” The NPS 36 CFR Part 7 regulations are Park-specific public use and recreational rules.	TBC
NPS restrictions of commercial and private operations in national parks, including the prohibition of nuisances	Part 5: Commercial and Private Operations 36 CFR Part 5 generally 36 CFR §5.13 (nuisances)	The NPS 36 CFR Part 5 regulations regulate commercial use of national parks and the resources therein (e.g., commercial notices, advertisements, photography, business operations). 36 CFR §5.13 prohibits the creation or maintenance of a nuisance upon federal or private lands within a park area.	TBC

Standard, Requirement, Criteria or Limitation	Citation	Requirement Description	Potential ARAR or TBC
Redwood National Park. General Management Plan	http://www.nps.gov/redw/parkmgmt/planning.htm	A 2000 joint federal-state plan is to provide a clearly defined, coordinated direction for resource preservation and visitor use and a basic foundation for decision making and managing these four parks for the next 15 to 20 years. The NPS will emphasize the protection of the parks’ resources and values and will also provide a variety of opportunities for visitors to enjoy the parks’ natural and cultural resources.	TBC
NPS Policies for Restoration of Natural Systems	2006 MP §4.1.5 http://www.nps.gov/policy/MP2006.pdf	Section 4.1.5 provides: “The Service will reestablish natural functions and processes in parks unless otherwise directed by Congress. Landscapes disturbed by natural phenomena, such as landslides, earthquakes, floods, hurricanes, tornadoes, and fires, will be allowed to recover naturally unless manipulation is necessary to protect other park resources, developments, or employee and public safety. Impacts on natural systems resulting from human disturbances include the introduction of exotic species; the contamination of air, water, and soil; changes to hydrologic patterns and sediment transport; the acceleration of erosion and sedimentation; and the disruption of natural processes. The Service will seek to return such disturbed areas to the natural conditions and processes characteristic of the ecological zone in which the damaged resources are situated. The Service will use the best available technology, within available resources, to restore the biological and physical components of these systems, accelerating both their recovery and the recovery of the landscape and biological community structure and function.”	TBC
NPS Policies for Managing Wildlife and Plant Resources	2006 MP §4.4.1 http://www.nps.gov/policy/MP2006.pdf	Section 4.4.1 provides that the NPS “...will maintain as parts of the natural ecosystems of parks all plants and animals native to park ecosystems...” by “...preserving and restoring the natural abundances, diversities, dynamics, distributions, habitats, and behaviors of native plant and animal populations and the communities and ecosystems in which they occur; restoring native plant and animal populations in parks when they have been extirpated by past human-caused actions; and minimizing human impacts on native plants, animals, populations, communities, and ecosystems, and the processes that sustain them.”	TBC

Standard, Requirement, Criteria or Limitation	Citation	Requirement Description	Potential ARAR or TBC
NPS Policies for Managing Species of Special Concern	2006 MP §4.4.2.3 http://www.nps.gov/policy/M2006.pdf	Section 4.4.2.3 requires that the NPS "...inventory, monitor, and manage state and locally listed species in a manner similar to its treatment of federally listed species to the greatest extent possible." The NPS is also required to "...inventory other native species that are of special management concern to parks (such as rare, declining, sensitive, or unique species and their habitats) and manage them to maintain their natural distribution and abundance."	TBC
NPS Policies for Importation of Soil During Site Restoration	2006 MP §4.8.2.4 http://www.nps.gov/policy/M2006.pdf	Section 4.8.2.4 allows importation of off-site soil or soil amendments to restore damaged sites. It provides that "off-site soil normally will be salvaged soil, not soil removed from pristine sites, unless the use of pristine site soil can be achieved without causing any overall ecosystem impairment. Before using any off-site materials, parks must develop a prescription and select the materials that will be needed to restore the physical, chemical, and biological characteristics of original native soils without introducing exotic species."	TBC
NPS Policies for Managing Cultural Resources	2006 MP §5f http://www.nps.gov/policy/M2006.pdf	Section 5f addresses research on cultural resources and traditional associated peoples; planning to ensure that management processes "integrate information about cultural resources and provide for consultation and collaboration with outside entities;" and preservation, protection, and the making available for public understanding of cultural resources.	TBC
NPS Employee Guidance for Managing Cultural Resources	NPS Director's Order (DO) #28: Cultural Resource Management NPS-28: Cultural Resource Management Guideline	Director's Order #28 provides that: "[t]he NPS will protect and manage cultural resources in its custody through effective research, planning, and stewardship and in accordance with the policies and principles contained in the NPS Management Policies' (Section 3.1) and requires that the NPS comply with the Secretary of the Interior's Standards and Guidelines for Archeology [stet] and Historic Preservation (Section 3.2). "NPS-28: Cultural Resource Management Guideline" addresses park cultural resource management programs, compliance with Section 106 of the National Historic Preservation Act, and issues related to archaeological resources, cultural landscapes, structures, museum objects, and ethnographic resources. "Cultural resources" are defined as "the material evidence of past human activities" (NPS-28, Introduction).	TBC

Standard, Requirement, Criteria or Limitation	Citation	Requirement Description	Potential ARAR or TBC
NPS Employee Guidance for Managing Wilderness	NPS Director’s Order #41: Wilderness Stewardship Reference Manual-41	Director’s Order #41 and the related RM-41 offer comprehensive guidance to NPS employees responsible for managing, conserving, and protecting wilderness character and resources found in park units.	TBC
NPS Employee Guidance for Managing Natural Resources	Reference Manual #77 http://www.nature.nps.gov/rm77	RM-77 offers comprehensive guidance to NPS employees responsible for managing, conserving, and protecting the natural resources found in park units. It addresses management of natural resources (including air; disturbed land; endangered, threatened and rare species; geologic resources; vegetation; etc.), resource uses, and planning (e.g., emergency management, and environmental compliance).	TBC
Resource Conservation and Recovery Act (RCRA) 40 USC §7601 Identification and Listing of Hazardous Waste	40 CFR Part 261	Defines those solids wastes which are subject to regulation as hazardous wastes.	Applicable
RCRA 40 USC §7601 Standards Applicable to Generators of Hazardous Waste	40 CFR Part 262	Defines hazardous waste identification requirements, manifest, and pre-transport requirements.	Applicable
RCRA 40 USC §7601. Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR Part 264	Restricts the temporary storage of hazardous waste without triggering Land Disposal Restrictions (LDR) or Minimum Technological Requirements. There is a two year limit and the waste piles must be designated by appropriate agencies. Specifies design and operating standards of containers and tanks used to store hazardous waste.	Applicable
RCRA 40 USC §7601. Land Disposal Restrictions	40 CFR Part 268	LDRs place specific restrictions (concentration or treatment) on RCRA hazardous wastes prior to their placement in a land disposal unit. Relevant and appropriate LDR requirements will be met if any material accumulations are treated ex situ.	Applicable
Fugitive Dust Emissions	40 CFR Part 50.6	Establishes standards for PM-10.	Applicable

Standard, Requirement, Criteria or Limitation	Citation	Requirement Description	Potential ARAR or TBC
“National Emission Standards for Hazardous Air Pollutants”	40 CFR 61 Subparts A,C,E,H,I,M,Q,V	Emission standards and activity requirements for hazardous air pollutants including emission control requirements.	Relevant and Appropriate
National Historic Preservation Act of 1966.	16 USC §470; 36 CFR Part 800 40 CFR 6.301(b)	Requires Federal Agencies to take into account the effect of any Federally assisted undertaking or licensing on any property with historic, architectural, archeological, or cultural value that is included in or eligible for inclusion in the National Register of Historic Places. Section 106 (16 USC § 470f) Requires the head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. The head of any such Federal agency shall afford the Advisory Council on Historic Preservation established under Title II of this Act a reasonable opportunity to comment with regard to such undertaking.	Applicable
Archeological and Historic Preservation Act	16 USC §469 40 CFR 6.301(c)	Establishes procedures to provide for preservation of significant scientific, prehistoric, historic, and archeological data that might be destroyed through alteration of terrain as a result of a Federal construction project or a Federally licensed activity or program.	Applicable
Native American Graves Protection and Repatriation Act1	25 USC §3001 <i>et seq.</i> and 43 CFR 10	Establishes federal agency responsibility for discovery, protection and appropriate disposition of human remains, associated and unassociated funerary objects, sacred objects and items of cultural patrimony.	Relevant and Appropriate
Endangered Species Act of 1973	16 USC §§1531-1543; 40 CFR 6.302 (h); 50 CFR Part 402	Activities may not jeopardize the continued existence of any threatened or endangered species or destroy or adversely modify a critical habitat.	Applicable
Migratory Bird Treaty Act of 1972	16 USC § 703-712 50 CFR Parts 10 and 21	Protects almost all species of native migratory birds in the United States from unregulated “take.” The prerequisite is the presence of migratory birds.	Relevant and Appropriate

Standard, Requirement, Criteria or Limitation	Citation	Requirement Description	Potential ARAR or TBC
California Endangered Species Act	Fish and Game Code §§2051 <i>et seq.</i> and §2080	The statute sections provide a declaration of policy and definitions. Section 2080 provides that no person shall take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission determines to be an endangered species or a threatened species, or attempt any of those acts.	Relevant and Appropriate
California Health and Safety Code, Division 20	Title 22, California Code of Regulation, Division 4.5	The statute and regulations provide for identification of hazardous waste in §§66261. If a material is a hazardous waste, Division 4.5 provisions further regulate hazardous waste generators, transporters, and treatment, storage, and disposal facilities.	Applicable
North Coast Unified Air Quality Management District1	Rule 104 Prohibitions	Prohibits discharge of hazardous materials to through fugitive dust, and adopts the NESHAP. The prerequisite is disturbance of contaminated soil. This non-promulgated rule prohibits the discharge of material that causes injury, detriment, or nuisance to the public. It prohibits unnecessary amounts of particulate matter from becoming airborne and requires that reasonable precautions be taken to prevent particulate matter from becoming airborne.	TBC
EPA Region 9 Regional Screening Levels for Chemical Contaminants at Superfund Sites	Non-promulgated guidance developed by the EPA Superfund Program. http://www.epa.gov/region9/superfund/prg/	Provides non-regulatory screening criteria for the protection of human health.	TBC
NPS Protocol for the Selection and use of Ecological Screening Values for Non-Radiological Analytes	NPS Contaminated Sites Program, Environmental Compliance and Response Branch. Revision 1, January 2014	Provides guidance from the NPS for selecting ecological screening values.	TBC
EPA Eco-SSLs	Non-promulgated guidance developed by EPA Office of Solid Waste and Emergency Response Directive 9285.7	Provides non-regulatory screening criteria for the protection of ecological receptors.	TBC

Standard, Requirement, Criteria or Limitation	Citation	Requirement Description	Potential ARAR or TBC
Los Alamos National Lab ECORISK Database	LANL. 2012. ECORISK Database (Release 3.1), LA-UR-12-24548, Los Alamos National Laboratory, Los Alamos, New Mexico, October http://www.lanl.gov/community-environment/environmentalstewardship/protection/ecorisk-assessment.php	Provides non regulatory screening criteria for the protection of ecological receptors.	TBC
Sample et al Toxicological Benchmarks for Wildlife	Sample, B.E., D.M. Opresko, G.W. Suter II. 1996. Toxicological Benchmarks for Wildlife: 1996 Revision. Oak Ridge National Laboratory. Document ES/ER/TM-86/R3. June 1996. http://www.esd.ornl.gov/programs/ecorisk/documents/tm86r3.pdf	Provides non regulatory screening criteria for the protection of ecological receptors.	TBC

Standard, Requirement, Criteria or Limitation	Citation	Requirement Description	Potential ARAR or TBC
Oak Ridge National Lab Toxicological Benchmarks	<p>Efroymson, R.A., M.E. Will, G.W. Suter II, and A.C. Wooten. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. ORNL publication. ES/ER/TM-85/R3, November 1997. http://www.esd.ornl.gov/programs/ecorisk/documents/tm85r3.pdf</p> <p>Efroymson, R.A., M.E. Will and G.W. Suter II. 1997. Toxicological Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision ORNL publication ES/ER/TM-126/R2, November 1997 http://www.esd.ornl.gov/programs/ecorisk/documents/tm126r21.pdf</p>	Provides non regulatory screening criteria for the protection of ecological receptors.	TBC

APPENDIX C

SOIL SAMPLING AND ANALYSIS INFORMATION

This appendix contains the following information related to soil sampling and analysis:

- C1 – Sampling Locations and Geographic Information System Coordinates
- C2 – Field Sampling Log Book
- C3 – Laboratory Analytical Results, Laboratory Quality Control, and Chain of Custody
- C4 – Independent Quality Control of Laboratory Analyses

C1 – Sampling Locations and Geographic Information System Coordinates

Table 14 shows the geographic information system (GIS) coordinates for each soil sample and the decision unit from which each sample was taken. Coordinates shown represent the central part of the sampling area in cases where individual samples were composited into a single sample. The datum is D_WGS_1984. Accuracy is plus or minus 10 feet.

Table 14. Global Positioning System Coordinates for Soil Samples

Location ID	Latitude	Longitude
DU1 1	41.51269	-124.07555
DU1 2	41.51251	-124.07583
DU1 3	41.51245	-124.07578
DU1 4	41.51234	-124.07615
DU1 5-1	41.51220	-124.07602
DU1 5-2	41.51276	-124.07583
DU1 5-3	41.51233	-124.07569
DU1-6	41.51258	-124.07573

Figure 5 on the following page shows the layout of the Site and the actual sampling locations.

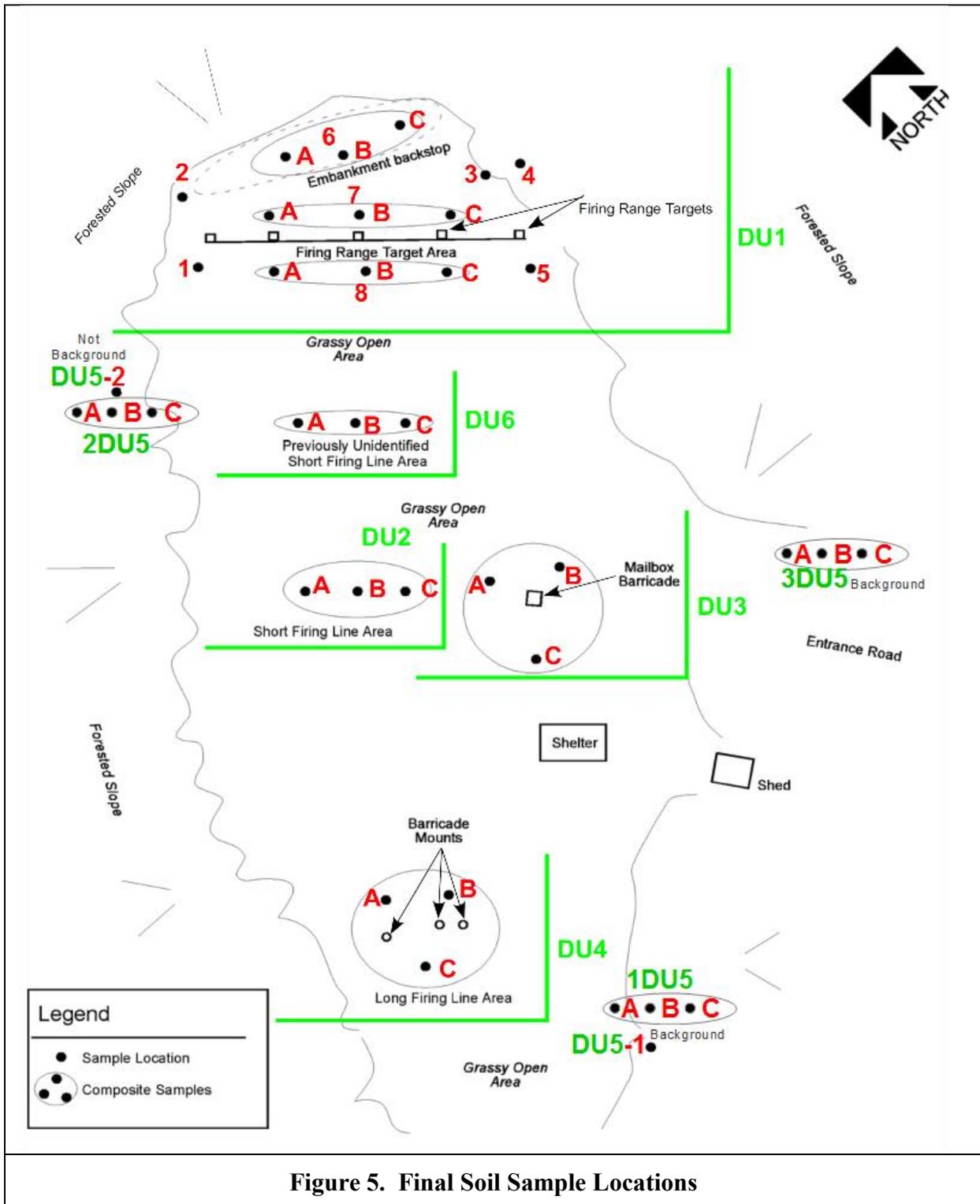


Figure 5. Final Soil Sample Locations

C2 – Field Sampling Log Book

A field log book was created during field sampling on December 3-4, 2014 to supplement the other information that was collected and recorded. The field log book is provided in this section of Appendix C.

*C3 – Laboratory Analytical Results, Laboratory Quality Control,
and Chain of Custody*

Laboratory analytical reports for all soil samples taken at the Site as part of this EE/CA are provided in this section of the Appendix. This section includes the laboratory quality assurance and quality control information provided by the laboratory, as well as sample chain of custody documentation.

The four laboratory reports are included in the following order:

1. The lab report dated December 15, 2014 provides results for metals analysis of surface (0” to 3” or 0” to 6” depth) samples after processing the samples with a #10 (2 mm) sieve. Discrete and composite (three increment) samples were analyzed. Samples were collected on December 3-4, 2014.
2. The lab report dated January 7, 2015 provides results for metals analysis of one composite and two discrete samples from near surface (6” to 12” depth) after processing the samples with a #40 (0.4 mm) sieve. The January 7, 2015 lab report also provides results from the wet extraction test for one composite and two discrete samples from the surface (0” to 3” depth) after processing the samples with a #40 sieve. Samples were collected on December 3-4, 2014.

There are two lab reports dated January 30, 2015.

3. The first January 30, 2015 lab report provides results from a rerun of the wet extraction test samples reported in the January 7, 2015 report. These samples were processed with a #40 sieve prior to analyses.
4. The second January 30, 2015 report provides results for metal analysis of surface (0” to 3” or 0” to 6” depth) soil samples after processing the samples with a #40 sieve. Discrete and composite (three increment) samples were analyzed. Samples were collected on December 3-4, 2014.
5. The lab report dated March 12, 2015 provides composite (three increment) sample results from surface (0” to 6” depth) and near-surface (6” to 12” depth) after processing the samples with a #40 sieve. The samples were collected on February 17, 2015.
6. The lab report dated March 25, 2015 provides discrete sample results from the surface (0” to 6” depth) after processing the samples with a #40 sieve. The samples were collected on February 17, 2015.

Field sampling equipment was washed and rinsed between sample collections. The water generated from that activity was collected and a sample was sent to the lab for analysis to support an appropriate disposal decision. The results of the analyses of rinse water are included in the second January 30, 2015 lab report.



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15 December 2014

Tim Berger
Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks, CA 95628
RE: NPS - Alder Camp

Enclosed are the results of analyses for samples received by the laboratory on 12/06/14 10:35. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Daniel Chavez
Project Manager



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 949.297.5027 Fax

Versar -- Fair Oaks
 5330 Primrose Dr. #147
 Fair Oaks CA, 95628

Project: NPS - Alder Camp
 Project Number: 112036.0004.001
 Project Manager: Tim Berger

Reported:
 12/15/14 16:43

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
RNP-AC-DU1-1	T142518-01	Soil	12/04/14 12:44	12/06/14 10:35
RNP-AC-DU1-2	T142518-03	Soil	12/04/14 13:49	12/06/14 10:35
RNP-AC-DU1-3	T142518-05	Soil	12/04/14 12:16	12/06/14 10:35
RNP-AC-DU1-3DUP	T142518-06	Soil	12/04/14 12:16	12/06/14 10:35
RNP-AC-DU1-4	T142518-08	Soil	12/04/14 14:07	12/06/14 10:35
RNP-AC-DU1-5	T142518-10	Soil	12/04/14 13:02	12/06/14 10:35
RNP-AC-DU1-6-COMP	T142518-12	Soil	12/04/14 00:00	12/06/14 10:35
RNP-AC-DU1-7-COMP	T142518-19	Soil	12/04/14 00:00	12/06/14 10:35
RNP-AC-DU1-8-COMP	T142518-26	Soil	12/04/14 00:00	12/06/14 10:35
RNP-AC-DU2-1-COMP	T142518-33	Soil	12/03/14 00:00	12/06/14 10:35
RNP-AC-DU3-1-COMP	T142518-37	Soil	12/03/14 00:00	12/06/14 10:35
RNP-AC-DU4-1-COMP	T142518-41	Soil	12/03/14 00:00	12/06/14 10:35
RNP-AC-DU5-1	T142518-45	Soil	12/03/14 10:08	12/06/14 10:35
RNP-AC-DU5-2	T142518-47	Soil	12/03/14 10:30	12/06/14 10:35
RNP-AC-DU6-1-COMP	T142518-49	Soil	12/03/14 00:00	12/06/14 10:35
RNP-AC-QCEB	T142518-53	Water	12/04/14 14:27	12/06/14 10:35

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Daniel Chavez, Project Manager

Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
12/15/14 16:43

Sample ID: RNP-AC-DU1-4

Laboratory ID: T142518-08

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Lead	10000	30		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU1-5

Laboratory ID: T142518-10

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Copper	61	1.0		mg/kg	EPA 6010B	
Lead	75	3.0		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU1-6-COMP

Laboratory ID: T142518-12

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Antimony	23	3.0		mg/kg	EPA 6010B	
Copper	470	1.0		mg/kg	EPA 6010B	
Lead	9800	30		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU1-7-COMP

Laboratory ID: T142518-19

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Antimony	3.6	3.0		mg/kg	EPA 6010B	
Copper	42	1.0		mg/kg	EPA 6010B	
Lead	120	3.0		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU1-8-COMP

Laboratory ID: T142518-26

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Antimony	5.6	3.0		mg/kg	EPA 6010B	
Copper	120	1.0		mg/kg	EPA 6010B	
Lead	360	3.0		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU2-1-COMP

Laboratory ID: T142518-33

Analyte	Result	Reporting		Units	Method	Notes
		Limit				

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Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
12/15/14 16:43

Sample ID: RNP-AC-DU2-1-COMP

Laboratory ID: T142518-33

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Antimony	3.0	3.0	mg/kg	EPA 6010B	
Barium	38	1.0	mg/kg	EPA 6010B	
Copper	57	1.0	mg/kg	EPA 6010B	
Lead	16	3.0	mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU3-1-COMP

Laboratory ID: T142518-37

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Barium	76	1.0	mg/kg	EPA 6010B	
Copper	55	1.0	mg/kg	EPA 6010B	
Lead	21	3.0	mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU4-1-COMP

Laboratory ID: T142518-41

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Antimony	3.1	3.0	mg/kg	EPA 6010B	
Barium	20	1.0	mg/kg	EPA 6010B	
Copper	49	1.0	mg/kg	EPA 6010B	
Lead	11	3.0	mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU5-1

Laboratory ID: T142518-45

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Barium	69	1.0	mg/kg	EPA 6010B	
Copper	40	1.0	mg/kg	EPA 6010B	
Lead	25	3.0	mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU5-2

Laboratory ID: T142518-47

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Barium	15	1.0	mg/kg	EPA 6010B	
Copper	46	1.0	mg/kg	EPA 6010B	
Lead	20	3.0	mg/kg	EPA 6010B	

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Sample ID: RNP-AC-DU6-1-COMP **Laboratory ID:** T142518-49

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Antimony	4.7	3.0		mg/kg	EPA 6010B	
Barium	29	1.0		mg/kg	EPA 6010B	
Copper	59	1.0		mg/kg	EPA 6010B	
Lead	15	3.0		mg/kg	EPA 6010B	

Sample ID: RNP-AC-QCEB **Laboratory ID:** T142518-53

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Lead	80	50		ug/l	EPA 6010B	

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RNP-AC-DU1-1
T142518-01 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Antimony	ND	3.0	mg/kg	1	4120911	12/09/14	12/10/14	EPA 6010B	
Copper	64	1.0	"	"	"	"	"	"	
Lead	57	3.0	"	"	"	"	"	"	

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RNP-AC-DU1-2
T142518-03 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	21	3.0	mg/kg	1	4120911	12/09/14	12/10/14	EPA 6010B	
Copper	690	1.0	"	"	"	"	"	"	
Lead	7000	30	"	10	"	"	12/11/14	"	

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RNP-AC-DU1-3
T142518-05 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	160	3.0	mg/kg	1	4120911	12/09/14	12/10/14	EPA 6010B	
Copper	880	1.0	"	"	"	"	"	"	
Lead	20000	30	"	10	"	"	12/11/14	"	

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RNP-AC-DU1-3DUP
T142518-06 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	150	3.0	mg/kg	1	4120911	12/09/14	12/10/14	EPA 6010B	
Copper	970	1.0	"	"	"	"	"	"	
Lead	30000	30	"	10	"	"	12/11/14	"	

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RNP-AC-DU1-4
T142518-08 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	250	3.0	mg/kg	1	4120911	12/09/14	12/10/14	EPA 6010B	
Copper	52	1.0	"	"	"	"	"	"	
Lead	10000	30	"	10	"	"	12/11/14	"	

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RNP-AC-DU1-5
T142518-10 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	3.0	mg/kg	1	4120911	12/09/14	12/10/14	EPA 6010B	
Copper	61	1.0	"	"	"	"	12/10/14	"	
Lead	75	3.0	"	"	"	"	12/10/14	"	

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**RNP-AC-DU1-6-COMP
 T142518-12 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	23	3.0	mg/kg	1	4120911	12/09/14	12/10/14	EPA 6010B	
Copper	470	1.0	"	"	"	"	"	"	
Lead	9800	30	"	10	"	"	12/11/14	"	

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**RNP-AC-DU1-7-COMP
 T142518-19 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	3.6	3.0	mg/kg	1	4120911	12/09/14	12/10/14	EPA 6010B	
Copper	42	1.0	"	"	"	"	"	"	
Lead	120	3.0	"	"	"	"	"	"	

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**RNP-AC-DU1-8-COMP
 T142518-26 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	5.6	3.0	mg/kg	1	4120911	12/09/14	12/10/14	EPA 6010B	
Copper	120	1.0	"	"	"	"	"	"	
Lead	360	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.

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Daniel Chavez, Project Manager



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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 12/15/14 16:43
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**RNP-AC-DU2-1-COMP
 T142518-33 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	3.0	3.0	mg/kg	1	4120911	12/09/14	12/10/14	EPA 6010B	
Barium	38	1.0	"	"	"	"	"	"	
Copper	57	1.0	"	"	"	"	"	"	
Lead	16	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 12/15/14 16:43
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RNP-AC-DU3-1-COMP
T142518-37 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Antimony	ND	3.0	mg/kg	1	4120911	12/09/14	12/10/14	EPA 6010B	
Barium	76	1.0	"	"	"	"	"	"	
Copper	55	1.0	"	"	"	"	"	"	
Lead	21	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Daniel Chavez, Project Manager



25712 Commercentre Drive
 Lake Forest, California 92630
 949.297.5020 Phone
 949.297.5027 Fax

Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 12/15/14 16:43
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RNP-AC-DU4-1-COMP
T142518-41 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	3.1	3.0	mg/kg	1	4120911	12/09/14	12/10/14	EPA 6010B	
Barium	20	1.0	"	"	"	"	"	"	
Copper	49	1.0	"	"	"	"	"	"	
Lead	11	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.

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Daniel Chavez, Project Manager



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 949.297.5027 Fax

Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 12/15/14 16:43
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RNP-AC-DU5-1
T142518-45 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Antimony	ND	3.0	mg/kg	1	4120911	12/09/14	12/10/14	EPA 6010B	
Barium	69	1.0	"	"	"	"	"	"	
Copper	40	1.0	"	"	"	"	"	"	
Lead	25	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.

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Daniel Chavez, Project Manager



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 949.297.5020 Phone
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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 12/15/14 16:43
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RNP-AC-DU5-2
T142518-47 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Antimony	ND	3.0	mg/kg	1	4120911	12/09/14	12/10/14	EPA 6010B	
Barium	15	1.0	"	"	"	"	"	"	
Copper	46	1.0	"	"	"	"	"	"	
Lead	20	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.

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Daniel Chavez, Project Manager



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 Lake Forest, California 92630
 949.297.5020 Phone
 949.297.5027 Fax

Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 12/15/14 16:43
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**RNP-AC-DU6-1-COMP
 T142518-49 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	4.7	3.0	mg/kg	1	4120911	12/09/14	12/10/14	EPA 6010B	
Barium	29	1.0	"	"	"	"	"	"	
Copper	59	1.0	"	"	"	"	"	"	
Lead	15	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.

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Daniel Chavez, Project Manager



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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 12/15/14 16:43
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RNP-AC-QCEB
T142518-53 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	50	ug/l	1	4120913	12/09/14	12/09/14	EPA 6010B	
Barium	ND	50	"	"	"	"	"	"	
Copper	ND	50	"	"	"	"	"	"	
Lead	80	50	"	"	"	"	"	"	

SunStar Laboratories, Inc.

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Daniel Chavez, Project Manager



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Versar -- Fair Oaks
 5330 Primrose Dr. #147
 Fair Oaks CA, 95628

Project: NPS - Alder Camp
 Project Number: 112036.0004.001
 Project Manager: Tim Berger

Reported:
 12/15/14 16:43

Metals by EPA 6010B - Quality Control
SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 4120911 - EPA 3051

Blank (4120911-BLK1)

Prepared: 12/09/14 Analyzed: 12/10/14

Antimony	ND	3.0	mg/kg							
Barium	ND	1.0	"							
Copper	ND	1.0	"							
Lead	ND	3.0	"							

LCS (4120911-BS1)

Prepared: 12/09/14 Analyzed: 12/10/14

Barium	107	1.0	mg/kg	100		107	75-125			
Lead	109	3.0	"	100		109	75-125			

Matrix Spike (4120911-MS1)

Source: T142518-01

Prepared: 12/09/14 Analyzed: 12/10/14

Barium	129	1.0	mg/kg	100	43.0	86.2	75-125			
Lead	137	3.0	"	100	57.1	79.9	75-125			

Matrix Spike Dup (4120911-MSD1)

Source: T142518-01

Prepared: 12/09/14 Analyzed: 12/10/14

Barium	144	1.0	mg/kg	100	43.0	101	75-125	11.0	20	
Lead	148	3.0	"	100	57.1	90.7	75-125	7.59	20	

Batch 4120913 - EPA 3010A

Blank (4120913-BLK1)

Prepared & Analyzed: 12/09/14

Antimony	ND	50	ug/l							
Barium	ND	50	"							
Copper	ND	50	"							
Lead	ND	50	"							

LCS (4120913-BS1)

Prepared & Analyzed: 12/09/14

Barium	515	50	ug/l	500		103	75-125			
Lead	516	50	"	500		103	75-125			

SunStar Laboratories, Inc.

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Daniel Chavez, Project Manager



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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 12/15/14 16:43
--	---	------------------------------------

Metals by EPA 6010B - Quality Control
SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch 4120913 - EPA 3010A

LCS Dup (4120913-BSD1)				Prepared & Analyzed: 12/09/14						
Barium	487	50	ug/l	500		97.4	75-125	5.65	20	
Lead	489	50	"	500		97.7	75-125	5.35	20	

SunStar Laboratories, Inc.

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Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
12/15/14 16:43

Notes and Definitions

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

SunStar Laboratories, Inc.

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Daniel Chavez, Project Manager

Chain of Custody Record

SunStar Laboratories, Inc.
 25712 Commerce Centre Dr
 Lake Forest, CA 92630
 949-297-5020

Client: Versar, Inc.
 Address: 5330 Primrose Dr #147, Fair Oaks, CA 95628
 Phone: 916-863-9360 ~~925-801-4488~~ Fax: _____
 Project Manager: Tim Berger

Date: 12/14/14 Page: 1 Of 4
 Project Name: NPS - Alder Camp
 Collector: Nicole Haslings-Bethel Client Project #: 112036.0004.001
 Batch #: 742518 EDF #: _____

Sample ID	Date Sampled	Time	Sample Type	Container Type	Analysis Parameters						Laboratory ID #	Comments/Preservative	Total # of containers		
					8260	8260 + OXY	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)				8015M Ext./Carbon Chain	6010/7000 Title 22 Metals
RNP-AC-DU1-1	12/14/14	1244	soil	802 jar									01	HOLD	1
RNP-AC-DU1-1 D		1246	soil	802 jar									02	HOLD	1
RNP-AC-DU1-2		1349	soil	802 jar									03	HOLD	1
RNP-AC-DU1-2 D		1351	soil	802 jar									04	HOLD	1
RNP-AC-DU1-3		1216	soil	802 jar									05	Duplicate	1
RNP-AC-DU1-3DUP		1220	soil	802 jar									06	HOLD	1
RNP-AC-DU1-3 D		1407	soil	802 jar									07	HOLD	1
RNP-AC-DU1-4		1409	soil	802 jar									08	HOLD	1
RNP-AC-DU1-4 D		1302	soil	802 jar									09	HOLD	1
RNP-AC-DU1-5		1304	soil	802 jar									10	HOLD	1
RNP-AC-DU1-5 D			soil	802 jar									11	HOLD	1
RNP-AC-DU1-6-COMP													12	Composite DU1- 6A, 6B & 6C	0
RNP-AC-DU1-6A		1045	soil	802 jar									13	RNP-AC-DU1-6-COMP	1
RNP-AC-DU1-6B		1126	soil	802 jar									14	RNP-AC-DU1-6-COMP	1
RNP-AC-DU1-6C		1140	soil	802 jar									15	RNP-AC-DU1-6-COMP	1
Relinquished by: (signature) <u>[Signature]</u> Date / Time <u>12/15/14 1358</u>			Received by: (signature) <u>[Signature]</u> Date / Time <u>12/15/14 1358</u>			Chain of Custody seals <u>[Seals]</u>			Total # of containers <u>[Total]</u>			Notes			
Relinquished by: (signature) <u>[Signature]</u> Date / Time <u>12-6-14 10:35</u>			Received by: (signature) <u>[Signature]</u> Date / Time <u>12-6-14 10:35</u>			Received good condition/cold			Turn around time: <u>STD</u>			All samples need to be individually sieved using #40 sieve and lead particles counted before composite and analysis.			

Sample disposal instructions: Disposal @ \$2.00 each

Return to client

Pickup

Chain of Custody Record

SunStar Laboratories, Inc.
 25712 Commercentre Dr
 Lake Forest, CA 92630
 949-297-5020

Client: Versar, Inc.
 Address: 5330 Primrose Dr #147, Fair Oaks, CA 95628
 Phone: 916-863-9360 Fax: _____
 Project Manager: Tim Berger

Date: 12/14/14 Page: 2 Of 4
 Project Name: NPS - Alder Camp
 Collector: Nicole Hastings-Bethel Client Project #: 112036.0004.001
 Batch #: 7142518 EDF #: _____

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals	6010 Sb, Cu & Pb	6010 Sb, Cu, Pb & Ba	Laboratory ID #	Comments/Preservative	Total # of containers	
RNP-AC-DU1-6A D	12/14/14	1047	soil	8oz Jar												16	HOLD	1	
RNP-AC-DU1-6B D		1128	soil	8oz Jar												17	HOLD	1	
RNP-AC-DU1-6C D		1142	soil	8oz Jar												18	HOLD	1	
RNP-AC-DU1-7-COMP																19	Composite DU1- 7A, 7B & 7C	0	
RNP-AC-DU1-7A	12/14/14	940	soil	8oz Jar												20	RNP-AC-DU1-7-COMP	1	
RNP-AC-DU1-7B		955	soil	8oz Jar												21	RNP-AC-DU1-7-COMP	1	
RNP-AC-DU1-7C		1015	soil	8oz Jar												22	RNP-AC-DU1-7-COMP	1	
RNP-AC-DU1-7A D		942	soil	8oz Jar												23	HOLD	1	
RNP-AC-DU1-7B D		957	soil	8oz Jar												24	HOLD	1	
RNP-AC-DU1-7C D		1017	soil	8oz Jar												25	HOLD	1	
RNP-AC-DU1-8-COMP																26	Composite DU1- 8A, 8B & 8C	0	
RNP-AC-DU1-8A	12/13/14	1300	soil	8oz Jar												27	RNP-AC-DU1-8-COMP	1	
RNP-AC-DU1-8B		1304	soil	8oz Jar												28	RNP-AC-DU1-8-COMP	1	
RNP-AC-DU1-8C		1308	soil	8oz Jar												29	RNP-AC-DU1-8-COMP	1	
RNP-AC-DU1-8A D		1302	soil	8oz Jar												30	HOLD	1	
Reinquinshed by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Received by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Chain of Custody seals <u>X/N/N/A</u>			Seals Intact <u>Y/N/N/A</u>			Total # of containers	
Reinquinshed by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Received by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Chain of Custody seals <u>X/N/N/A</u>			Seals Intact <u>Y/N/N/A</u>			Total # of containers	
Reinquinshed by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Received by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Chain of Custody seals <u>X/N/N/A</u>			Seals Intact <u>Y/N/N/A</u>			Total # of containers	

Sample disposal instructions: Disposal @ \$2.00 each _____ Return to client _____ Pickup _____

Turn around time: STD

Chain of Custody Record

SunStar Laboratories, Inc.
 25712 Commercentre Dr
 Lake Forest, CA 92630
 949-297-5020

Client: Versar, Inc.
 Address: 5330 Primrose Dr #147, Fair Oaks, CA 95628
 Phone: 916-863-9360 Fax: _____
 Project Manager: Tim Berger

Date: 12/14/14 Page: 3 Of 4
 Project Name: NPS - Alder Camp
 Collector: Nicole Hastings-Bethel Client Project #: 112036.0004.001
 Batch #: 712518 EDF #: _____

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals	6010 Sb, Cu & Pb	6010 Sb, Cu, Pb & Ba	Laboratory ID #	Comments/Preservative	Total # of containers
RNP-AC-DU1-8B D	12/31/14	1306	soil	8oz Jar												31	HOLD	1
RNP-AC-DU1-8C D		1310	soil	8oz Jar												32	HOLD	1
RNP-AC-DU2-1-COMP																33	Composite DU2-1A, 1B & 1C	0
RNP-AC-DU2-1A	12/31/14	1128	soil	8oz Jar												34	RNP-AC-DU2-1-COMP	1
RNP-AC-DU2-1B		1130	soil	8oz Jar												35	RNP-AC-DU2-1-COMP	1
RNP-AC-DU2-1C		1132	soil	8oz Jar												36	RNP-AC-DU2-1-COMP	1
RNP-AC-DU3-1-COMP																37	Composite DU3-1A, 1B & 1C	0
RNP-AC-DU3-1A	12/31/14	1049	soil	8oz Jar												38	RNP-AC-DU3-1-COMP	1
RNP-AC-DU3-1B		1051	soil	8oz Jar												39	RNP-AC-DU3-1-COMP	1
RNP-AC-DU3-1C		1052	soil	8oz Jar												40	RNP-AC-DU3-1-COMP	1
RNP-AC-DU4-1-COMP																41	Composite DU4-1A, 1B & 1C	0
RNP-AC-DU4-1A	12/31/14	1106	soil	8oz Jar												42	RNP-AC-DU4-1-COMP	1
RNP-AC-DU4-1B		1108	soil	8oz Jar												43	RNP-AC-DU4-1-COMP	1
RNP-AC-DU4-1C		1110	soil	8oz Jar												44	RNP-AC-DU4-1-COMP	1
RNP-AC-DU5-1		1006	soil	8oz Jar												45		1
Relinquished by: (signature) <i>[Signature]</i>			Date / Time			Received by: (signature) <i>[Signature]</i>			Date / Time			Total # of containers			Notes			
Relinquished by: (signature) <i>[Signature]</i>			Date / Time			Received by: (signature) <i>[Signature]</i>			Date / Time			Chain of Custody seals: <i>[Signature]</i> Seals intact: <i>[Signature]</i>			Received good condition/cold			
Relinquished by: (signature) <i>[Signature]</i>			Date / Time			Received by: (signature) <i>[Signature]</i>			Date / Time			Turn around time: <i>STD</i>						

Sample disposal instructions: Disposal @ \$2.00 each

Return to client

Pickup

Chain of Custody Record

SunStar Laboratories, Inc.
 25712 Commerce Centre Dr
 Lake Forest, CA 92630
 949-297-5020

Client: Versar, Inc. Date: 12/14/14 Page: 4 Of 4
 Address: 5330 Primrose Dr #147, Fair Oaks, CA 95628 Project Name: NPS - Alder Camp
 Phone: 916-863-9360 Fax: 742518 Collector: Nicole Hastings-Bethel Client Project #: 112036.0004.001
 Project Manager: Tim Berger Batch #: 742518 EDF #:

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals	6010 Sb, Cu & Pb	6010 Sb, Cu, Pb & Ba	Laboratory ID #	Comments/Preservative	Total # of containers																											
RNP-AC-DU5-1_D	12/3/14	1010	soil	8oz Jar												46	HOLD	1																											
RNP-AC-DU5-2		1030	soil	8oz Jar												47	HOLD	1																											
RNP-AC-DU5-2_D		1032	soil	8oz Jar												48	HOLD	1																											
RNP-AC-DU6-1-COMP																49	Composite DU6-1A, 1B & 1C	0																											
RNP-AC-DU6-1A	12/3/14	1148	soil	8oz Jar												50	RNP-AC-DU6-1-COMP	1																											
RNP-AC-DU6-1B		1150	soil	8oz Jar												51	RNP-AC-DU6-1-COMP	1																											
RNP-AC-DU6-1C		1152	soil	8oz Jar												52	RNP-AC-DU6-1-COMP	1																											
RNP-AC-QCEB	12/4/14	1427	water	poly												53		1																											
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">Relinquished by: (signature)</td> <td style="width: 15%;">Date / Time</td> <td style="width: 15%;">Received by: (signature)</td> <td style="width: 15%;">Date / Time</td> <td style="width: 15%;">Total # of containers</td> <td style="width: 15%;">Chain of Custody seals</td> <td style="width: 15%;">Seals intact?</td> <td style="width: 15%;">Received good condition/cold</td> <td style="width: 15%;">Notes</td> </tr> <tr> <td><i>[Signature]</i></td> <td>12/5/14 1358</td> <td><i>[Signature]</i></td> <td>12/5/14 1358</td> <td></td> <td>NN/NA</td> <td>Y/NN/NA</td> <td></td> <td></td> </tr> <tr> <td><i>[Signature]</i></td> <td>12/6/14 10:35</td> <td><i>[Signature]</i></td> <td>12/6/14 10:35</td> <td></td> <td>NN/NA</td> <td>Y/NN/NA</td> <td></td> <td></td> </tr> </table>																			Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time	Total # of containers	Chain of Custody seals	Seals intact?	Received good condition/cold	Notes	<i>[Signature]</i>	12/5/14 1358	<i>[Signature]</i>	12/5/14 1358		NN/NA	Y/NN/NA			<i>[Signature]</i>	12/6/14 10:35	<i>[Signature]</i>	12/6/14 10:35		NN/NA	Y/NN/NA		
Relinquished by: (signature)	Date / Time	Received by: (signature)	Date / Time	Total # of containers	Chain of Custody seals	Seals intact?	Received good condition/cold	Notes																																					
<i>[Signature]</i>	12/5/14 1358	<i>[Signature]</i>	12/5/14 1358		NN/NA	Y/NN/NA																																							
<i>[Signature]</i>	12/6/14 10:35	<i>[Signature]</i>	12/6/14 10:35		NN/NA	Y/NN/NA																																							

Sample disposal instructions: Disposal @ \$2.00 each _____ Return to client _____ Pickup _____

Turn around time: STD

1.0

SAMPLE RECEIVING REVIEW SHEET

BATCH # T142518

Client Name: VERDAR - FAIR OAKS

Project: NPS - ALDER CAMP

Received by: SUNNY

Date/Time Received: 12-6-14 / 10:35

Delivered by: Client SunStar Courier GSO FedEx Other _____

Total number of coolers received 1 Temp criteria = 6°C > 0°C (no frozen containers)

Temperature: cooler #1 1.2 °C +/- the CF (- 0.2°C) = 1.0 °C corrected temperature

cooler #2 _____ °C +/- the CF (- 0.2°C) = _____ °C corrected temperature

cooler #3 _____ °C +/- the CF (- 0.2°C) = _____ °C corrected temperature

Samples outside temp. but received on ice, w/in 6 hours of final sampling. Yes No* N/A

Custody Seals Intact on Cooler/Sample Yes No* N/A

Sample Containers Intact Yes No*

Sample labels match COC ID's Yes No*

Total number of containers received match COC Yes No*

Proper containers received for analyses requested on COC Yes No*

Proper preservative indicated on COC/containers for analyses requested Yes No* N/A

Complete shipment received in good condition with correct temperatures, containers, labels, volumes preservatives and within method specified holding times. Yes No*

* Complete Non-Conformance Receiving Sheet if checked Cooler/Sample Review - Initials and date SL 12-7-14

Comments:



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

07 January 2015

Tim Berger
Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks, CA 95628
RE: NPS - Alder Camp

Enclosed are the results of analyses for samples received by the laboratory on 12/06/14 10:35. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Daniel Chavez
Project Manager



25712 Commercentre Drive
 Lake Forest, California 92630
 949.297.5020 Phone
 949.297.5027 Fax

Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/07/15 16:26
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ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
RNP-AC-DU1-2	T142518-03	Soil	12/04/14 13:49	12/06/14 10:35
RNP-AC-DU1-2_D	T142518-04	Soil	12/04/14 13:51	12/06/14 10:35
RNP-AC-DU1-3_D	T142518-07	Soil	12/04/14 12:20	12/06/14 10:35
RNP-AC-DU1-4	T142518-08	Soil	12/04/14 14:07	12/06/14 10:35
RNP-AC-DU1-8-COMP	T142518-26	Soil	12/04/14 00:00	12/06/14 10:35
RNP-AC-DU1-6-COMP_D	T142518-54	Soil	12/04/14 00:00	12/06/14 10:35

SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Daniel Chavez, Project Manager

Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
01/07/15 16:26

DETECTIONS SUMMARY

Sample ID: RNP-AC-DU1-2

Laboratory ID: T142518-03

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Antimony	4.5	0.10	mg/l	STLC Waste Extractio	
Copper	37	0.10	mg/l	STLC Waste Extractio	
Lead	850	0.10	mg/l	STLC Waste Extractio	

Sample ID: RNP-AC-DU1-2_D

Laboratory ID: T142518-04

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Copper	60	1.0	mg/kg	EPA 6010B	
Lead	940	3.0	mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU1-3_D

Laboratory ID: T142518-07

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Antimony	16	3.0	mg/kg	EPA 6010B	
Copper	420	1.0	mg/kg	EPA 6010B	
Lead	2900	3.0	mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU1-4

Laboratory ID: T142518-08

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Antimony	2.6	0.10	mg/l	STLC Waste Extractio	
Copper	3.2	0.10	mg/l	STLC Waste Extractio	
Lead	240	0.10	mg/l	STLC Waste Extractio	

Sample ID: RNP-AC-DU1-8-COMP

Laboratory ID: T142518-26

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Antimony	1.6	0.10	mg/l	STLC Waste Extractio	
Copper	1.6	0.10	mg/l	STLC Waste Extractio	

SunStar Laboratories, Inc.



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Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
01/07/15 16:26

Sample ID: RNP-AC-DU1-8-COMP

Laboratory ID: T142518-26

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Lead	240	0.10		mg/l	STLC Waste Extractio	

Sample ID: RNP-AC-DU1-6-COMP_D

Laboratory ID: T142518-54

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Copper	36	1.0		mg/kg	EPA 6010B	
Lead	160	3.0		mg/kg	EPA 6010B	

SunStar Laboratories, Inc.



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Daniel Chavez, Project Manager



25712 Commercentre Drive
 Lake Forest, California 92630
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 949.297.5027 Fax

Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/07/15 16:26
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RNP-AC-DU1-2
T142518-03 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

STLC Metals by 6000/7000 Series Methods

Copper	37	0.10	mg/l	1	4123031	12/30/14	01/02/15	STLC Waste Extraction Test	
Antimony	4.5	0.10	"	"	"	"	"	"	
Lead	850	0.10	"	"	"	"	"	"	

SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Daniel Chavez, Project Manager

Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/07/15 16:26
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RNP-AC-DU1-2_D
T142518-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Antimony	ND	3.0	mg/kg	1	4123111	12/31/14	12/31/14	EPA 6010B	
Copper	60	1.0	"	"	"	"	"	"	
Lead	940	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.



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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/07/15 16:26
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RNP-AC-DU1-3_D
T142518-07 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Antimony	16	3.0	mg/kg	1	4123111	12/31/14	12/31/14	EPA 6010B	
Copper	420	1.0	"	"	"	"	"	"	
Lead	2900	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.

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Daniel Chavez, Project Manager



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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/07/15 16:26
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RNP-AC-DU1-4
T142518-08 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

STLC Metals by 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Copper	3.2	0.10	mg/l	1	4123031	12/30/14	01/02/15	STLC Waste Extraction Test	
Antimony	2.6	0.10	"	"	"	"	"	"	
Lead	240	0.10	"	"	"	"	"	"	

SunStar Laboratories, Inc.

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Daniel Chavez, Project Manager



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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/07/15 16:26
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**RNP-AC-DU1-8-COMP
 T142518-26 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

STLC Metals by 6000/7000 Series Methods

Antimony	1.6	0.10	mg/l	1	4123031	12/30/14	01/02/15	STLC Waste Extraction Test	
Copper	1.6	0.10	"	"	"	"	"	"	
Lead	240	0.10	"	"	"	"	"	"	

SunStar Laboratories, Inc.

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/07/15 16:26
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RNP-AC-DU1-6-COMP_D
T142518-54 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	3.0	mg/kg	1	4123111	12/31/14	12/31/14	EPA 6010B	
Copper	36	1.0	"	"	"	"	"	"	
Lead	160	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.

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Daniel Chavez, Project Manager



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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/07/15 16:26
--	---	------------------------------------

Metals by EPA 6010B - Quality Control
SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4123111 - EPA 3051

Blank (4123111-BLK1)

Prepared & Analyzed: 12/31/14

Antimony	ND	3.0	mg/kg							
Copper	ND	1.0	"							
Lead	ND	3.0	"							

LCS (4123111-BS1)

Prepared & Analyzed: 12/31/14

Lead	118	3.0	mg/kg	100		118	75-125			
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LCS Dup (4123111-BSD1)

Prepared & Analyzed: 12/31/14

Lead	99.8	3.0	mg/kg	100		99.8	75-125	16.5	20	
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SunStar Laboratories, Inc.

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Daniel Chavez, Project Manager

Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
01/07/15 16:26

STLC Metals by 6000/7000 Series Methods - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4123031 - STLC Metals

Blank (4123031-BLK1)

Prepared: 12/30/14 Analyzed: 01/02/15

Antimony	ND	0.10	mg/l							
Copper	ND	0.10	"							
Lead	ND	0.10	"							

LCS (4123031-BS1)

Prepared: 12/30/14 Analyzed: 01/02/15

Antimony	12.1	0.10	mg/l	10.0		121	75-125			
Copper	11.6	0.10	"	10.0		116	75-125			
Lead	12.2	0.10	"	10.0		122	75-125			

Matrix Spike (4123031-MS1)

Source: T142688-01

Prepared: 12/30/14 Analyzed: 01/02/15

Copper	11.5	0.10	mg/l	10.0	0.501	110	75-125			
Antimony	12.2	0.10	"	10.0	ND	122	75-125			
Lead	15.2	0.10	"	10.0	4.76	105	75-125			

Matrix Spike Dup (4123031-MSD1)

Source: T142688-01

Prepared: 12/30/14 Analyzed: 01/02/15

Antimony	11.6	0.10	mg/l	10.0	ND	116	75-125	4.26	30	
Copper	11.0	0.10	"	10.0	0.501	105	75-125	3.62	30	
Lead	14.7	0.10	"	10.0	4.76	99.6	75-125	3.45	30	

SunStar Laboratories, Inc.



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Daniel Chavez, Project Manager



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Lake Forest, California 92630
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Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
01/07/15 16:26

Notes and Definitions

- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

SunStar Laboratories, Inc.

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Daniel Chavez, Project Manager

Chain of Custody Record

SunStar Laboratories, Inc.
 25712 Commerce Centre Dr
 Lake Forest, CA 92630
 949-297-5020

Client: Versar, Inc.
 Address: 5330 Primrose Dr #147, Fair Oaks, CA 95628
 Phone: 916-863-9360 ~~925-801-4488~~ Fax: _____
 Project Manager: Tim Berger

Date: 12/14/14 Page: 1 Of 4
 Project Name: NPS - Alder Camp
 Collector: Nicole Haslings-Bethel Client Project #: 112036.0004.001
 Batch #: 742518 EDF #: _____

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals	6010 Sb, Cu & Pb	6010 Sb, Cu, Pb & Ba	Laboratory ID #	Comments/Preservative	Total # of containers
RNP-AC-DU1-1	12/4/14	1244	soil	8oz jar										X		01		1
RNP-AC-DU1-1 D		1246	soil	8oz jar										X		02	HOLD	1
RNP-AC-DU1-2		1349	soil	8oz jar										X		03	HOLD	1
RNP-AC-DU1-2 D		1351	soil	8oz jar										X		04	HOLD	1
RNP-AC-DU1-3		1216	soil	8oz jar										X		05	Duplicate	1
RNP-AC-DU1-3DUP		1220	soil	8oz jar										X		06	HOLD	1
RNP-AC-DU1-3 D		1407	soil	8oz jar										X		07	HOLD	1
RNP-AC-DU1-4		1409	soil	8oz jar										X		08	HOLD	1
RNP-AC-DU1-4 D		1302	soil	8oz jar										X		09	HOLD	1
RNP-AC-DU1-5		1304	soil	8oz jar										X		10	HOLD	1
RNP-AC-DU1-5 D			soil	8oz jar										X		11	HOLD	1
RNP-AC-DU1-6-COMP			soil	8oz jar										X		12	Composite DU1- 6A, 6B & 6C	0
RNP-AC-DU1-6A		1045	soil	8oz jar										X		13	RNP-AC-DU1-6-COMP	1
RNP-AC-DU1-6B		1126	soil	8oz jar										X		14	RNP-AC-DU1-6-COMP	1
RNP-AC-DU1-6C		1140	soil	8oz jar										X		15	RNP-AC-DU1-6-COMP	1
Relinquished by: (signature) <u>[Signature]</u> Date / Time <u>12/15/14 1358</u>			Received by: (signature) <u>[Signature]</u> Date / Time <u>12/15 1358</u>			Chain of Custody seals <u>[Seals]</u>			Total # of containers <u>[Total]</u>			Notes All samples need to be individually sieved using #40 sieve and lead particles counted before composite and analysis.						
Relinquished by: (signature) <u>[Signature]</u> Date / Time <u>12-6/14 10:35</u>			Received by: (signature) <u>[Signature]</u> Date / Time <u>12-6/14 10:35</u>			Turn around time: <u>STD</u>			Received good condition/cold <u>[Condition]</u>			Laboratory ID # <u>[ID]</u>						

Sample disposal instructions: Disposal @ \$2.00 each

Return to client

Pickup

Chain of Custody Record

SunStar Laboratories, Inc.
 25712 Commercentre Dr
 Lake Forest, CA 92630
 949-297-5020

Client: Versar, Inc.
 Address: 5330 Primrose Dr #147, Fair Oaks, CA 95628
 Phone: 916-863-9360 Fax: _____
 Project Manager: Tim Berger

Date: 12/14/14 Page: 2 Of 4
 Project Name: NPS - Alder Camp
 Collector: Nicole Hastings-Bethel Client Project #: 112036.0004.001
 Batch #: 7142518 EDF #: _____

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals	6010 Sb, Cu & Pb	6010 Sb, Cu, Pb & Ba	Laboratory ID #	Comments/Preservative	Total # of containers	
RNP-AC-DU1-6A D	12/14/14	1047	soil	8oz Jar												16	HOLD	1	
RNP-AC-DU1-6B D		1128	soil	8oz Jar												17	HOLD	1	
RNP-AC-DU1-6C D		1142	soil	8oz Jar												18	HOLD	1	
RNP-AC-DU1-7-COMP																19	Composite DU1- 7A, 7B & 7C	0	
RNP-AC-DU1-7A	12/14/14	940	soil	8oz Jar												20	RNP-AC-DU1-7-COMP	1	
RNP-AC-DU1-7B		955	soil	8oz Jar												21	RNP-AC-DU1-7-COMP	1	
RNP-AC-DU1-7C		1015	soil	8oz Jar												22	RNP-AC-DU1-7-COMP	1	
RNP-AC-DU1-7A D		942	soil	8oz Jar												23	HOLD	1	
RNP-AC-DU1-7B D		957	soil	8oz Jar												24	HOLD	1	
RNP-AC-DU1-7C D		1017	soil	8oz Jar												25	HOLD	1	
RNP-AC-DU1-8-COMP																26	Composite DU1- 8A, 8B & 8C	0	
RNP-AC-DU1-8A	12/13/14	1300	soil	8oz Jar												27	RNP-AC-DU1-8-COMP	1	
RNP-AC-DU1-8B		1304	soil	8oz Jar												28	RNP-AC-DU1-8-COMP	1	
RNP-AC-DU1-8C		1308	soil	8oz Jar												29	RNP-AC-DU1-8-COMP	1	
RNP-AC-DU1-8A D		1302	soil	8oz Jar												30	HOLD	1	
Reinquinshed by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Received by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Chain of Custody seals <u>X/N/N/A</u>			Seals Intact <u>Y/N/N/A</u>			Total # of containers	
Reinquinshed by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Received by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Chain of Custody seals <u>X/N/N/A</u>			Seals Intact <u>Y/N/N/A</u>			Total # of containers	
Reinquinshed by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Received by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Chain of Custody seals <u>X/N/N/A</u>			Seals Intact <u>Y/N/N/A</u>			Total # of containers	

Sample disposal instructions: Disposal @ \$2.00 each _____ Return to client _____ Pickup _____

Turn around time: STD

Chain of Custody Record

SunStar Laboratories, Inc.
 25712 Commercentre Dr
 Lake Forest, CA 92630
 949-297-5020

Client: Versar, Inc. Date: 12/14/14 Page: 3 Of 4
 Address: 5330 Primrose Dr #147, Fair Oaks, CA 95628 Project Name: NPS - Alder Camp
 Phone: 916-863-9360 Fax: Collector: Nicole Hastings-Bethel Client Project #: 112036.0004.001
 Project Manager: Tim Berger Batch #: 712518 EDF #:

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals	6010 Sb, Cu & Pb	6010 Sb, Cu, Pb & Ba	Laboratory ID #	Comments/Preservative	Total # of containers	
RNP-AC-DU1-8B D	12/31/14	1306	soil	8oz Jar												31	HOLD	1	
RNP-AC-DU1-8C D		1310	soil	8oz Jar												32	HOLD	1	
RNP-AC-DU2-1-COMP																33	Composite DU2-1A, 1B & 1C	0	
RNP-AC-DU2-1A	12/31/14	1128	soil	8oz Jar												34	RNP-AC-DU2-1-COMP	1	
RNP-AC-DU2-1B		1130	soil	8oz Jar												35	RNP-AC-DU2-1-COMP	1	
RNP-AC-DU2-1C		1132	soil	8oz Jar												36	RNP-AC-DU2-1-COMP	1	
RNP-AC-DU3-1-COMP																37	Composite DU3-1A, 1B & 1C	0	
RNP-AC-DU3-1A	12/31/14	1049	soil	8oz Jar												38	RNP-AC-DU3-1-COMP	1	
RNP-AC-DU3-1B		1051	soil	8oz Jar												39	RNP-AC-DU3-1-COMP	1	
RNP-AC-DU3-1C		1052	soil	8oz Jar												40	RNP-AC-DU3-1-COMP	1	
RNP-AC-DU4-1-COMP																41	Composite DU4-1A, 1B & 1C	0	
RNP-AC-DU4-1A	12/31/14	1106	soil	8oz Jar												42	RNP-AC-DU4-1-COMP	1	
RNP-AC-DU4-1B		1108	soil	8oz Jar												43	RNP-AC-DU4-1-COMP	1	
RNP-AC-DU4-1C		1110	soil	8oz Jar												44	RNP-AC-DU4-1-COMP	1	
RNP-AC-DU5-1		1006	soil	8oz Jar												45		1	
Relinquished by: (signature) <i>[Signature]</i> Date / Time <u>12/15/14 1358</u>			Received by: (signature) <i>[Signature]</i> Date / Time <u>12/15/14 1358</u>			Total # of containers													
Relinquished by: (signature) <i>[Signature]</i> Date / Time <u>12-6-14 10:35</u>			Received by: (signature) <i>[Signature]</i> Date / Time <u>12-6-14 10:35</u>			Chain of Custody seals: <u>N/A</u> Seals intact? <u>Y/N/A</u>													
Relinquished by: (signature) <i>[Signature]</i> Date / Time <u>12-6-14 10:35</u>			Received by: (signature) <i>[Signature]</i> Date / Time <u>12-6-14 10:35</u>			Received good condition/cold <u>L-O</u>													

Sample disposal instructions: Disposal @ \$2.00 each _____ Return to client _____ Pickup _____

Turn around time: STD

SAMPLE RECEIVING REVIEW SHEET

BATCH # T142518

Client Name: VERDAR - FAIR OAKS

Project: NPS - ALDER CAMP

Received by: SUNNY

Date/Time Received: 12-6-14 / 10:35

Delivered by: Client SunStar Courier GSO FedEx Other _____

Total number of coolers received 1

Temp criteria = 6°C > 0°C (no frozen containers)

Temperature: cooler #1 1.2 °C +/- the CF (-0.2°C) = 1.0 °C corrected temperature

cooler #2 _____ °C +/- the CF (-0.2°C) = _____ °C corrected temperature

cooler #3 _____ °C +/- the CF (-0.2°C) = _____ °C corrected temperature

Samples outside temp. but received on ice, w/in 6 hours of final sampling. Yes No* N/A

Custody Seals Intact on Cooler/Sample Yes No* N/A

Sample Containers Intact Yes No*

Sample labels match COC ID's Yes No*

Total number of containers received match COC Yes No*

Proper containers received for analyses requested on COC Yes No*

Proper preservative indicated on COC/containers for analyses requested Yes No* N/A

Complete shipment received in good condition with correct temperatures, containers, labels, volumes preservatives and within method specified holding times. Yes No*

* Complete Non-Conformance Receiving Sheet if checked

Cooler/Sample Review - Initials and date SL 12-7-14

Comments:

From: [Hastings, Nicole](#)
To: dchavez@sunstarlabs.com;
CC: [Berger, Tim](#); [Bill Hannell](#); [Kleinecke, Lawrence](#);
Subject: RE: Final Report for NPS-Alder Camp (T142518)
Date: Tuesday, December 30, 2014 12:10:14 PM
Attachments: [Scan.pdf](#)

Dan,

We have additional analysis that needs to be conducted on the samples collected under COC T142518, on a standard turnaround time. I have attached a revised COC, but for clarities sake, here is the narrative of what we need:

RNP-AC-DU1-2, RNP-AC-DU1-4 and RNP-AC-DU1-8-COMP (these samples should already be sieved using the #40 sieve) need to additionally be run for metals using the CA Title 22 Waste Extraction Test (WET).

RNP-AC-DU1-2_D, RNP-AC-DU1-3_D will be removed from hold, sieved using #40 sieve, lead particles left in sieve counted and weighed, and sample analyzed for Sb, Cu, Pb 6010 method.

RNP-AC-DU1-6A_D, RNP-AC-DU1-6B_D and RNP-AC-DU1-6C_D will be removed from hold, sieved using #40 sieve, lead particles left in sieve counted and weighed, then composited into one sample ID: RNP-AC-DU-6-COMP_D, and analyzed for Sb, Cu, Pb 6010 method.

Please let me know if you have any questions or need clarity on any of the analysis being requested.

Thanks and Happy New Year!

Nicole Hastings-Bethel
Environmental Scientist



Direct Line: 916.863.9360
Mobile: 805.801.4998

From: Dan Chavez [mailto:dchavez@sunstarlabs.com]
Sent: Friday, December 19, 2014 9:39 AM
To: Hastings, Nicole
Cc: Berger, Tim; Bill Hannell
Subject: Final Report for NPS-Alder Camp (T142518)

Hi Nicole,

Here is the final report for the project referenced in the subject line. These samples were all sieved with the #40 sieve. I have also attached a log with the particle count for each sample.

Please don't hesitate to contact me if you have any questions or need any further tests run.

Thank you,

Daniel Chavez - Sr. Project Manager

SunStar Laboratories, Inc.
25712 Commercentre Drive, Lake Forest, CA 92630
Office: 949-297-5020
Cell: 562-900-7466
Email: dchavez@sunstarlabs.com

<<...>> <<...>>

SunStar Laboratories, Inc.
 25712 Commerce Centre Dr
 Lake Forest, CA 92630
 949-297-5020

Chain of Custody Record

Client: Versar, Inc.
 Address: 5330 Primrose Dr #147, Fair Oaks, CA 95628
 Phone: 916-863-9360 Fax: 916-863-4478
 Project Manager: Tim Berger

Date: 12/14/14
 Project Name: NPS - Alder Camp
 Collector: Nicole Hastings-Belhel
 Batch #: 712518
 Client Project #: 112036.0004.001
 Page: 1 of 4
 EDF #:

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270	6021 BTEX	6015M (gasoline)	6015M (diesel)	6015M ExL/Carbon Chain	6010/7000 Title 22 Metals	6010 Sb, Cu & Pb	6010 Sb, Cu, Pb & Ba	Laboratory ID #	Comments/Preservative	Total # of containers		
RNP-AC-DU1-1	12/14/14	12:44	soil	Boz Jar										X		61		1		
RNP-AC-DU1-1 D		12:46	soil	Boz Jar										X		62	HOLD	1		
RNP-AC-DU1-2		13:49	soil	Boz Jar										X		63		1		
RNP-AC-DU1-2 D		13:51	soil	Boz Jar										X		64	HOLD Remove HOLD tag	1		
RNP-AC-DU1-3		12:16	soil	Boz Jar										X		65		1		
RNP-AC-DU1-3DUP		12:20	soil	Boz Jar										X		66	Duplicate	1		
RNP-AC-DU1-3 D		14:07	soil	Boz Jar										X		67	HOLD Remove HOLD tag	1		
RNP-AC-DU1-4		14:09	soil	Boz Jar										X		68		1		
RNP-AC-DU1-4 D		13:02	soil	Boz Jar										X		69	HOLD	1		
RNP-AC-DU1-5		13:04	soil	Boz Jar										X		70		1		
RNP-AC-DU1-5 D			soil	Boz Jar										X		71	HOLD	1		
RNP-AC-DU1-6-COMP		10:45	soil	Boz Jar										X		72	Composite DU1-6A, 6B & 6C	0		
RNP-AC-DU1-6A		11:26	soil	Boz Jar										X		73	RNP-AC-DU1-6-COMP	1		
RNP-AC-DU1-6B		11:26	soil	Boz Jar										X		74	RNP-AC-DU1-6-COMP	1		
RNP-AC-DU1-6C		11:40	soil	Boz Jar										X		75	RNP-AC-DU1-6-COMP	1		
Received by: (signature) <i>[Signature]</i>			Received by: (signature) <i>[Signature]</i>			Received by: (signature) <i>[Signature]</i>			Received by: (signature) <i>[Signature]</i>			Received by: (signature) <i>[Signature]</i>			Received by: (signature) <i>[Signature]</i>			Received by: (signature) <i>[Signature]</i>		
Date / Time: 12/15/14 13:56			Date / Time: 12/15/14 13:56			Date / Time: 12/15/14 13:56			Date / Time: 12/15/14 13:56			Date / Time: 12/15/14 13:56			Date / Time: 12/15/14 13:56			Date / Time: 12/15/14 13:56		
Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>		
Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35		
Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>		
Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35		
Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>			Relinquished by: (signature) <i>[Signature]</i>		
Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35			Date / Time: 12/6/14 10:35		

Chart of Custody seals: *[initials]*
 Seals Intact: *[initials]*
 Received good condition: *[initials]*
 Total # of containers: *[initials]*
 Turn around time: *STD*

Notes:
 All samples need to be individually sieved using #40 sieve and lead particles counted before composite and analysis.

Sample disposal instructions: Disposal @ \$2.00 each
 Return to client
 Pickup

Chain of Custody Record

SunStar Laboratories, Inc.
 25712 Commerce Centre Dr
 Lake Forest, CA 92630
 949-297-5020

Client: Versar, Inc.
 Address: 5330 Plimrose Dr #147, Fair Oaks, CA 95628
 Phone: 916-863-9360 Fax: _____
 Project Manager: Tim Berger

Date: 12/14/14 Page: 2 Of 4
 Project Name: NPS - Alder Camp
 Collector: Nicole Hastings-Bethel Client Project #: 112036.0004.001
 Batch #: 12/25/8 EDF #: _____

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	8010/7000 Title 22 Metals	8010 Sb, Cu & Pb	8010 Sb, Cu, Pb & Ba	Laboratory ID #	Comments/Preservative	Total # of containers		
RNP-AC-DU1-8A D	12/14/14	1047	soil	8oz Jar										X		16	HOLD Composite	1		
RNP-AC-DU1-8B D		1128	soil	8oz Jar										X		17	HOLD RNP-AC-DU1-6-COMP-D	1		
RNP-AC-DU1-6C D		1142	soil	8oz Jar												18	HOLD	1		
RNP-AC-DU1-7-COMP																19	Composite DU1-7A, 7B & 7C	0		
RNP-AC-DU1-7A	12/14/14	940	soil	8oz Jar												20	RNP-AC-DU1-7-COMP	1		
RNP-AC-DU1-7B		955	soil	8oz Jar												21	RNP-AC-DU1-7-COMP	1		
RNP-AC-DU1-7C		1015	soil	8oz Jar												22	RNP-AC-DU1-7-COMP	1		
RNP-AC-DU1-7A D		942	soil	8oz Jar												23	HOLD	1		
RNP-AC-DU1-7B D		957	soil	8oz Jar												24	HOLD	1		
RNP-AC-DU1-7C D		1017	soil	8oz Jar												25	HOLD	1		
RNP-AC-DU1-8-COMP														X		26	Composite DU1-8A, 8B & 8C	0		
RNP-AC-DU1-8A	12/13/14	1300	soil	8oz Jar												27	RNP-AC-DU1-8-COMP	1		
RNP-AC-DU1-8B		1304	soil	8oz Jar												28	RNP-AC-DU1-8-COMP	1		
RNP-AC-DU1-8C		1308	soil	8oz Jar												29	RNP-AC-DU1-8-COMP	1		
RNP-AC-DU1-8A D		1302	soil	8oz Jar												30	HOLD	1		
Relinquished by: (signature) <u>[Signature]</u> Date / Time <u>12/15/14 1358</u>			Received by: (signature) <u>[Signature]</u> Date / Time <u>12/15/1358</u>			Chain of Custody seal <u>XXXXNA</u>			Seals intact <u>XXXXNA</u>			Received good condition/cold <u>1.0</u>			Total # of containers			Notes		
Relinquished by: (signature) <u>[Signature]</u> Date / Time <u>12/6/14 10:35</u>			Received by: (signature) <u>[Signature]</u> Date / Time <u>12/6/14 10:35</u>			Turn around time: <u>518</u>														

Sample disposal instructions: Disposal @ \$2.00 each _____ Return to client _____ Prepair _____



25712 Commercentre Drive
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949.297.5020 Phone
949.297.5027 Fax

30 January 2015

Tim Berger
Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks, CA 95628
RE: NPS - Alder Camp

Enclosed are the results of analyses for samples received by the laboratory on 12/06/14 10:35. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Daniel Chavez
Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
01/30/15 10:23

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
RNP-AC-DU1-2	T142518-03	Soil	12/04/14 13:49	12/06/14 10:35
RNP-AC-DU1-4	T142518-08	Soil	12/04/14 14:07	12/06/14 10:35
RNP-AC-DU1-8-COMP	T142518-26	Soil	12/04/14 00:00	12/06/14 10:35

SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Daniel Chavez, Project Manager

Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
01/30/15 10:23

DETECTIONS SUMMARY

Sample ID: RNP-AC-DU1-2

Laboratory ID: T142518-03RE2

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Antimony	4.8	0.10	mg/l	STLC Waste Extraction I	
Copper	19	0.10	mg/l	STLC Waste Extraction I	
Lead	490	0.10	mg/l	STLC Waste Extraction I	

Sample ID: RNP-AC-DU1-4

Laboratory ID: T142518-08RE2

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Antimony	13	0.10	mg/l	STLC Waste Extraction I	
Copper	7.0	0.10	mg/l	STLC Waste Extraction I	
Lead	1200	0.50	mg/l	STLC Waste Extraction I	

Sample ID: RNP-AC-DU1-8-COMP

Laboratory ID: T142518-26RE2

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Antimony	1.1	0.10	mg/l	STLC Waste Extraction I	
Copper	49	0.10	mg/l	STLC Waste Extraction I	
Lead	110	0.10	mg/l	STLC Waste Extraction I	

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 10:23
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RNP-AC-DU1-2
T142518-03RE2 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

STLC Metals by 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Copper	19	0.10	mg/l	1	5012304	01/23/15	01/26/15	STLC Waste Extraction Test	
Antimony	4.8	0.10	"	"	"	"	"	"	
Lead	490	0.10	"	"	"	"	"	"	

SunStar Laboratories, Inc.

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Daniel Chavez, Project Manager



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 Lake Forest, California 92630
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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 10:23
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RNP-AC-DU1-4
T142518-08RE2 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

STLC Metals by 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Copper	7.0	0.10	mg/l	1	5012304	01/23/15	01/26/15	STLC Waste Extraction Test	
Antimony	13	0.10	"	"	"	"	"	"	
Lead	1200	0.50	"	5	"	"	"	"	

SunStar Laboratories, Inc.

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Daniel Chavez, Project Manager



25712 Commercentre Drive
 Lake Forest, California 92630
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 949.297.5027 Fax

Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 10:23
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RNP-AC-DU1-8-COMP
T142518-26RE2 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

STLC Metals by 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Copper	49	0.10	mg/l	1	5012721	01/27/15	01/29/15	STLC Waste Extraction Test	
Antimony	1.1	0.10	"	"	"	"	"	"	
Lead	110	0.10	"	"	"	"	"	"	

SunStar Laboratories, Inc.

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Daniel Chavez, Project Manager



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 949.297.5027 Fax

Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 10:23
--	---	-----------------------------

STLC Metals by 6000/7000 Series Methods - Quality Control
SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5012304 - STLC Metals

Blank (5012304-BLK1) Prepared: 01/23/15 Analyzed: 01/26/15

Antimony	ND	0.10	mg/l							
Copper	ND	0.10	"							
Lead	ND	0.10	"							

LCS (5012304-BS1) Prepared: 01/23/15 Analyzed: 01/26/15

Antimony	9.68	0.10	mg/l	10.0		96.8	75-125			
Copper	10.1	0.10	"	10.0		101	75-125			
Lead	10.0	0.10	"	10.0		100	75-125			

Matrix Spike (5012304-MS1) Source: T142551-02RE1 Prepared: 01/23/15 Analyzed: 01/26/15

Copper	10.9	0.10	mg/l	10.0	0.00	109	75-125			
Antimony	9.82	0.10	"	10.0	0.00	98.2	75-125			
Lead	18.6	0.10	"	10.0	8.07	105	75-125			

Matrix Spike Dup (5012304-MSD1) Source: T142551-02RE1 Prepared: 01/23/15 Analyzed: 01/26/15

Antimony	9.18	0.10	mg/l	10.0	0.00	91.8	75-125	6.74	30	
Copper	9.88	0.10	"	10.0	0.00	98.8	75-125	9.63	30	
Lead	17.7	0.10	"	10.0	8.07	96.6	75-125	4.54	30	

Batch 5012721 - STLC Metals

Blank (5012721-BLK1) Prepared: 01/27/15 Analyzed: 01/29/15

Copper	ND	0.10	mg/l							
Antimony	ND	0.10	"							
Lead	ND	0.10	"							

LCS (5012721-BS1) Prepared: 01/27/15 Analyzed: 01/29/15

Antimony	10.3	0.10	mg/l	10.0		103	75-125			
Copper	10.4	0.10	"	10.0		104	75-125			
Lead	10.8	0.10	"	10.0		108	75-125			

SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Daniel Chavez, Project Manager



25712 Commercentre Drive
 Lake Forest, California 92630
 949.297.5020 Phone
 949.297.5027 Fax

Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 10:23
--	---	-----------------------------

STLC Metals by 6000/7000 Series Methods - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5012721 - STLC Metals

Matrix Spike (5012721-MS1)		Source: T142518-26RE1		Prepared: 01/27/15		Analyzed: 01/29/15				
Antimony	10.8	0.10	mg/l	10.0	1.10	96.6	75-125			
Copper	58.3	0.10	"	10.0	49.3	90.4	75-125			
Lead	121	0.10	"	10.0	113	77.4	75-125			
Matrix Spike Dup (5012721-MSD1)		Source: T142518-26RE1		Prepared: 01/27/15		Analyzed: 01/29/15				
Antimony	11.0	0.10	mg/l	10.0	1.10	98.6	75-125	1.84	30	
Copper	61.9	0.10	"	10.0	49.3	126	75-125	5.99	30	QM-05
Lead	128	0.10	"	10.0	113	148	75-125	5.69	30	QM-05

SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Daniel Chavez, Project Manager



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Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
01/30/15 10:23

Notes and Definitions

- QM-05 The spike recovery was outside acceptance limits for the MS and/or MSD due to possible matrix interference. The LCS was within acceptance criteria. The data is acceptable as no negative impact on data is expected.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Daniel Chavez, Project Manager

Chain of Custody Record

SunStar Laboratories, Inc.
 25712 Commerce Centre Dr
 Lake Forest, CA 92630
 949-297-5020

Client: Versar, Inc.
 Address: 5330 Primrose Dr #147, Fair Oaks, CA 95628
 Phone: 916-863-9360 ~~925-801-4488~~ Fax: _____
 Project Manager: Tim Berger

Date: 12/14/14 Page: 1 Of 4
 Project Name: NPS - Alder Camp
 Collector: Nicole Haslings-Bethel Client Project #: 112036.0004.001
 Batch #: 742518 EDF #: _____

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals	6010 Sb, Cu & Pb	6010 Sb, Cu, Pb & Ba	Laboratory ID #	Comments/Preservative	Total # of containers
RNP-AC-DU1-1	12/14/14	1244	soil	8oz jar										X		01		1
RNP-AC-DU1-1 D		1246	soil	8oz jar										X		02	HOLD	1
RNP-AC-DU1-2		1349	soil	8oz jar										X		03	HOLD	1
RNP-AC-DU1-2 D		1351	soil	8oz jar										X		04	HOLD	1
RNP-AC-DU1-3		1216	soil	8oz jar										X		05	Duplicate	1
RNP-AC-DU1-3DUP		1220	soil	8oz jar										X		06	HOLD	1
RNP-AC-DU1-3 D		1407	soil	8oz jar										X		07	HOLD	1
RNP-AC-DU1-4		1409	soil	8oz jar										X		08	HOLD	1
RNP-AC-DU1-4 D		1302	soil	8oz jar										X		09	HOLD	1
RNP-AC-DU1-5		1304	soil	8oz jar										X		10	HOLD	1
RNP-AC-DU1-5 D		1045	soil	8oz jar										X		11	Composite DU1- 6A, 6B & 6C	0
RNP-AC-DU1-6-COMP		1045	soil	8oz jar										X		12	RNP-AC-DU1-6-COMP	1
RNP-AC-DU1-6A		1126	soil	8oz jar										X		13	RNP-AC-DU1-6-COMP	1
RNP-AC-DU1-6B		1140	soil	8oz jar										X		14	RNP-AC-DU1-6-COMP	1
RNP-AC-DU1-6C		1140	soil	8oz jar										X		15	RNP-AC-DU1-6-COMP	1
Relinquished by: (signature) <u>[Signature]</u> Date / Time <u>12/15/14 1358</u>			Received by: (signature) <u>[Signature]</u> Date / Time <u>12/15/14 1358</u>			Chain of Custody seals <u>[Seals]</u>			Total # of containers <u>15</u>			Notes All samples need to be individually sieved using #40 sieve and lead particles counted before composite and analysis.						
Relinquished by: (signature) <u>[Signature]</u> Date / Time <u>12-6-14 10:35</u>			Received by: (signature) <u>[Signature]</u> Date / Time <u>12-6-14 10:35</u>			Turn around time: <u>STD</u>			Received good condition/cold									

Sample disposal instructions: Disposal @ \$2.00 each

Return to client

Pickup

Chain of Custody Record

SunStar Laboratories, Inc.
 25712 Commercentre Dr
 Lake Forest, CA 92630
 949-297-5020

Client: Versar, Inc.
 Address: 5330 Primrose Dr #147, Fair Oaks, CA 95628
 Phone: 916-863-9360 Fax: _____
 Project Manager: Tim Berger

Date: 12/14/14 Page: 2 Of 4
 Project Name: NPS - Alder Camp
 Collector: Nicole Hastings-Bethel Client Project #: 112036.0004.001
 Batch #: 7142518 EDF #: _____

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals	6010 Sb, Cu & Pb	6010 Sb, Cu, Pb & Ba	Laboratory ID #	Comments/Preservative	Total # of containers	
RNP-AC-DU1-6A D	12/14/14	1047	soil	8oz Jar												16	HOLD	1	
RNP-AC-DU1-6B D		1128	soil	8oz Jar												17	HOLD	1	
RNP-AC-DU1-6C D		1142	soil	8oz Jar												18	HOLD	1	
RNP-AC-DU1-7-COMP																19	Composite DU1- 7A, 7B & 7C	0	
RNP-AC-DU1-7A	12/14/14	940	soil	8oz Jar												20	RNP-AC-DU1-7-COMP	1	
RNP-AC-DU1-7B		955	soil	8oz Jar												21	RNP-AC-DU1-7-COMP	1	
RNP-AC-DU1-7C		1015	soil	8oz Jar												22	RNP-AC-DU1-7-COMP	1	
RNP-AC-DU1-7A D		942	soil	8oz Jar												23	HOLD	1	
RNP-AC-DU1-7B D		957	soil	8oz Jar												24	HOLD	1	
RNP-AC-DU1-7C D		1017	soil	8oz Jar												25	HOLD	1	
RNP-AC-DU1-8-COMP																26	Composite DU1- 8A, 8B & 8C	0	
RNP-AC-DU1-8A	12/13/14	1300	soil	8oz Jar												27	RNP-AC-DU1-8-COMP	1	
RNP-AC-DU1-8B		1304	soil	8oz Jar												28	RNP-AC-DU1-8-COMP	1	
RNP-AC-DU1-8C		1308	soil	8oz Jar												29	RNP-AC-DU1-8-COMP	1	
RNP-AC-DU1-8A D		1302	soil	8oz Jar												30	HOLD	1	
Reinquinshed by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Received by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Chain of Custody seals <u>X/N/N/A</u>			Seals Intact <u>Y/N/N/A</u>			Total # of containers	
Reinquinshed by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Received by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Chain of Custody seals <u>X/N/N/A</u>			Seals Intact <u>Y/N/N/A</u>			Total # of containers	
Reinquinshed by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Received by: (signature) <u>[Signature]</u>			Date / Time	12/15/14	1358	Chain of Custody seals <u>X/N/N/A</u>			Seals Intact <u>Y/N/N/A</u>			Total # of containers	

Sample disposal instructions: Disposal @ \$2.00 each _____ Return to client _____ Pickup _____

Turn around time: STD

Chain of Custody Record

SunStar Laboratories, Inc.
 25712 Commercentre Dr
 Lake Forest, CA 92630
 949-297-5020

Client: Versar, Inc.
 Address: 5330 Primrose Dr #147, Fair Oaks, CA 95628
 Phone: 916-863-9360 Fax: _____
 Project Manager: Tim Berger

Date: 12/14/14 Page: 3 Of 4
 Project Name: NPS - Alder Camp
 Collector: Nicole Hastings-Bethel Client Project #: 112036.0004.001
 Batch #: 712518 EDF #: _____

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals	6010 Sb, Cu & Pb	6010 Sb, Cu, Pb & Ba	Laboratory ID #	Comments/Preservative	Total # of containers		
RNP-AC-DU1-8B D	12/31/14	1306	soil	8oz Jar												31	HOLD	1		
RNP-AC-DU1-8C D		1310	soil	8oz Jar												32	HOLD	1		
RNP-AC-DU2-1-COMP																33	Composite DU2-1A, 1B & 1C	0		
RNP-AC-DU2-1A	12/31/14	1128	soil	8oz Jar												34	RNP-AC-DU2-1-COMP	1		
RNP-AC-DU2-1B		1130	soil	8oz Jar												35	RNP-AC-DU2-1-COMP	1		
RNP-AC-DU2-1C		1132	soil	8oz Jar												36	RNP-AC-DU2-1-COMP	1		
RNP-AC-DU3-1-COMP																37	Composite DU3-1A, 1B & 1C	0		
RNP-AC-DU3-1A	12/31/14	1049	soil	8oz Jar												38	RNP-AC-DU3-1-COMP	1		
RNP-AC-DU3-1B		1051	soil	8oz Jar												39	RNP-AC-DU3-1-COMP	1		
RNP-AC-DU3-1C		1052	soil	8oz Jar												40	RNP-AC-DU3-1-COMP	1		
RNP-AC-DU4-1-COMP																41	Composite DU4-1A, 1B & 1C	0		
RNP-AC-DU4-1A	12/31/14	1106	soil	8oz Jar												42	RNP-AC-DU4-1-COMP	1		
RNP-AC-DU4-1B		1108	soil	8oz Jar												43	RNP-AC-DU4-1-COMP	1		
RNP-AC-DU4-1C		1110	soil	8oz Jar												44	RNP-AC-DU4-1-COMP	1		
RNP-AC-DU5-1		1006	soil	8oz Jar												45		1		
Relinquished by: (signature) <i>[Signature]</i>			Date / Time			Received by: (signature) <i>[Signature]</i>			Date / Time			Total # of containers			Chain of Custody seals: <i>[Signature]</i> Seals intact? <i>[Signature]</i>			Notes		
Relinquished by: (signature) <i>[Signature]</i>			Date / Time			Received by: (signature) <i>[Signature]</i>			Date / Time			Total # of containers			Chain of Custody seals: <i>[Signature]</i> Seals intact? <i>[Signature]</i>			Notes		
Relinquished by: (signature) <i>[Signature]</i>			Date / Time			Received by: (signature) <i>[Signature]</i>			Date / Time			Total # of containers			Chain of Custody seals: <i>[Signature]</i> Seals intact? <i>[Signature]</i>			Notes		

Sample disposal instructions: Disposal @ \$2.00 each _____ Return to client _____ Pickup _____

Turn around time: STD

SAMPLE RECEIVING REVIEW SHEET

BATCH # T142518

Client Name: VERDAR - FAIR OAKS

Project: NPS - ALDER CAMP

Received by: SUNNY

Date/Time Received: 12-6-14 / 10:35

Delivered by: Client SunStar Courier GSO FedEx Other _____

Total number of coolers received 1

Temp criteria = 6°C > 0°C (no frozen containers)

Temperature: cooler #1 1.2 °C +/- the CF (- 0.2°C) = 1.0 °C corrected temperature

cooler #2 _____ °C +/- the CF (- 0.2°C) = _____ °C corrected temperature

cooler #3 _____ °C +/- the CF (- 0.2°C) = _____ °C corrected temperature

Samples outside temp. but received on ice, w/in 6 hours of final sampling. Yes No* N/A

Custody Seals Intact on Cooler/Sample Yes No* N/A

Sample Containers Intact Yes No*

Sample labels match COC ID's Yes No*

Total number of containers received match COC Yes No*

Proper containers received for analyses requested on COC Yes No*

Proper preservative indicated on COC/containers for analyses requested Yes No* N/A

Complete shipment received in good condition with correct temperatures, containers, labels, volumes preservatives and within method specified holding times. Yes No*

* Complete Non-Conformance Receiving Sheet if checked

Cooler/Sample Review - Initials and date SL 12-7-14

Comments:



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

30 January 2015

Tim Berger
Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks, CA 95628
RE: NPS - Alder Camp

Enclosed are the results of analyses for samples received by the laboratory on 12/06/14 10:35. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Daniel Chavez
Project Manager



25712 Commercentre Drive
 Lake Forest, California 92630
 949.297.5020 Phone
 949.297.5027 Fax

Versar -- Fair Oaks
 5330 Primrose Dr. #147
 Fair Oaks CA, 95628

Project: NPS - Alder Camp
 Project Number: 112036.0004.001
 Project Manager: Tim Berger

Reported:
 01/30/15 15:56

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
RNP-AC-DU1-1	T142518-01	Soil	12/04/14 12:44	12/06/14 10:35
RNP-AC-DU1-2	T142518-03	Soil	12/04/14 13:49	12/06/14 10:35
RNP-AC-DU1-2_D	T142518-04	Soil	12/04/14 13:51	12/06/14 10:35
RNP-AC-DU1-3	T142518-05	Soil	12/04/14 12:16	12/06/14 10:35
RNP-AC-DU1-3DUP	T142518-06	Soil	12/04/14 12:16	12/06/14 10:35
RNP-AC-DU1-3_D	T142518-07	Soil	12/04/14 12:20	12/06/14 10:35
RNP-AC-DU1-4	T142518-08	Soil	12/04/14 14:07	12/06/14 10:35
RNP-AC-DU1-5	T142518-10	Soil	12/04/14 13:02	12/06/14 10:35
RNP-AC-DU1-6-COMP	T142518-12	Soil	12/04/14 00:00	12/06/14 10:35
RNP-AC-DU1-7-COMP	T142518-19	Soil	12/04/14 00:00	12/06/14 10:35
RNP-AC-DU1-8-COMP	T142518-26	Soil	12/04/14 00:00	12/06/14 10:35
RNP-AC-DU2-1-COMP	T142518-33	Soil	12/03/14 00:00	12/06/14 10:35
RNP-AC-DU3-1-COMP	T142518-37	Soil	12/03/14 00:00	12/06/14 10:35
RNP-AC-DU4-1-COMP	T142518-41	Soil	12/03/14 00:00	12/06/14 10:35
RNP-AC-DU5-1	T142518-45	Soil	12/03/14 10:08	12/06/14 10:35
RNP-AC-DU5-2	T142518-47	Soil	12/03/14 10:30	12/06/14 10:35
RNP-AC-DU6-1-COMP	T142518-49	Soil	12/03/14 00:00	12/06/14 10:35
RNP-AC-QCEB	T142518-53	Water	12/04/14 14:27	12/06/14 10:35
RNP-AC-DU1-6-COMP_D	T142518-54	Soil	12/04/14 00:00	12/06/14 10:35

SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Daniel Chavez, Project Manager

Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
01/30/15 15:56

DETECTIONS SUMMARY

Sample ID: RNP-AC-DU1-1 **Laboratory ID:** T142518-01

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Copper	93	1.0		mg/kg	EPA 6010B	
Lead	83	3.0		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU1-2 **Laboratory ID:** T142518-03

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Copper	440	1.0		mg/kg	EPA 6010B	
Lead	7700	30		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU1-2_D **Laboratory ID:** T142518-04

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Copper	60	1.0		mg/kg	EPA 6010B	
Lead	940	3.0		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU1-3 **Laboratory ID:** T142518-05

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Antimony	88	3.0		mg/kg	EPA 6010B	
Copper	910	1.0		mg/kg	EPA 6010B	
Lead	19000	30		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU1-3DUP **Laboratory ID:** T142518-06

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Antimony	130	3.0		mg/kg	EPA 6010B	
Copper	1100	1.0		mg/kg	EPA 6010B	
Lead	36000	30		mg/kg	EPA 6010B	

SunStar Laboratories, Inc.



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Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
01/30/15 15:56

Sample ID: RNP-AC-DU1-3_D **Laboratory ID:** T142518-07

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Antimony	16	3.0		mg/kg	EPA 6010B	
Copper	420	1.0		mg/kg	EPA 6010B	
Lead	2900	3.0		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU1-4 **Laboratory ID:** T142518-08

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Copper	44	1.0		mg/kg	EPA 6010B	
Lead	2800	3.0		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU1-5 **Laboratory ID:** T142518-10

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Copper	72	1.0		mg/kg	EPA 6010B	
Lead	170	3.0		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU1-6-COMP **Laboratory ID:** T142518-12

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Antimony	95	3.0		mg/kg	EPA 6010B	
Copper	800	1.0		mg/kg	EPA 6010B	
Lead	17000	30		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU1-7-COMP **Laboratory ID:** T142518-19

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Copper	48	1.0		mg/kg	EPA 6010B	
Lead	100	3.0		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU1-8-COMP **Laboratory ID:** T142518-26

Analyte	Result	Reporting		Units	Method	Notes
		Limit				

SunStar Laboratories, Inc.



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Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
01/30/15 15:56

Sample ID: RNP-AC-DU1-8-COMP

Laboratory ID: T142518-26

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Copper	88	1.0		mg/kg	EPA 6010B	
Lead	380	3.0		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU2-1-COMP

Laboratory ID: T142518-33

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Barium	51	1.0		mg/kg	EPA 6010B	
Copper	68	1.0		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU3-1-COMP

Laboratory ID: T142518-37

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Barium	120	1.0		mg/kg	EPA 6010B	
Copper	55	1.0		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU4-1-COMP

Laboratory ID: T142518-41

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Barium	1.5	1.0		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU5-1

Laboratory ID: T142518-45

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Barium	22	1.0		mg/kg	EPA 6010B	
Copper	42	1.0		mg/kg	EPA 6010B	

Sample ID: RNP-AC-DU5-2

Laboratory ID: T142518-47

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Barium	26	1.0		mg/kg	EPA 6010B	
Copper	47	1.0		mg/kg	EPA 6010B	

SunStar Laboratories, Inc.



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Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
01/30/15 15:56

Sample ID: RNP-AC-DU6-1-COMP

Laboratory ID: T142518-49

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Barium	35	1.0		mg/kg	EPA 6010B	
Copper	64	1.0		mg/kg	EPA 6010B	

Sample ID: RNP-AC-QCEB

Laboratory ID: T142518-53

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Lead	80	50		ug/l	EPA 6010B	

Sample ID: RNP-AC-DU1-6-COMP_D

Laboratory ID: T142518-54

Analyte	Result	Reporting		Units	Method	Notes
		Limit				
Copper	36	1.0		mg/kg	EPA 6010B	
Lead	160	3.0		mg/kg	EPA 6010B	

SunStar Laboratories, Inc.



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Daniel Chavez, Project Manager



25712 Commercentre Drive
 Lake Forest, California 92630
 949.297.5020 Phone
 949.297.5027 Fax

Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU1-1
T142518-01 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Antimony	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Copper	93	1.0	"	"	"	"	"	"	
Lead	83	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Daniel Chavez, Project Manager



25712 Commercentre Drive
 Lake Forest, California 92630
 949.297.5020 Phone
 949.297.5027 Fax

Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU1-2
T142518-03 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
---------	--------	-----------------	-------	----------	-------	----------	----------	--------	-------

SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Copper	440	1.0	"	"	"	"	"	"	
Lead	7700	30	"	10	"	"	12/18/14	"	

SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Daniel Chavez, Project Manager



25712 Commercentre Drive
 Lake Forest, California 92630
 949.297.5020 Phone
 949.297.5027 Fax

Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU1-2_D
T142518-04 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	3.0	mg/kg	1	4123111	12/31/14	12/31/14	EPA 6010B	
Copper	60	1.0	"	"	"	"	"	"	
Lead	940	3.0	"	"	"	"	"	"	

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Daniel Chavez, Project Manager



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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU1-3
T142518-05 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	88	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Copper	910	1.0	"	"	"	"	"	"	
Lead	19000	30	"	10	"	"	12/18/14	"	

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU1-3DUP
T142518-06 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	130	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Copper	1100	1.0	"	"	"	"	12/18/14	"	
Lead	36000	30	"	10	"	"	12/18/14	"	

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU1-3_D
T142518-07 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	16	3.0	mg/kg	1	4123111	12/31/14	12/31/14	EPA 6010B	
Copper	420	1.0	"	"	"	"	"	"	
Lead	2900	3.0	"	"	"	"	"	"	

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU1-4
T142518-08 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Antimony	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Copper	44	1.0	"	"	"	"	"	"	
Lead	2800	3.0	"	"	"	"	"	"	

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU1-5
T142518-10 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Copper	72	1.0	"	"	"	"	"	"	
Lead	170	3.0	"	"	"	"	"	"	

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU1-6-COMP
T142518-12 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	95	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Copper	800	1.0	"	"	"	"	"	"	
Lead	17000	30	"	10	"	"	12/18/14	"	

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU1-7-COMP
T142518-19 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Copper	48	1.0	"	"	"	"	12/18/14	"	
Lead	100	3.0	"	"	"	"	12/18/14	"	

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU1-8-COMP
T142518-26 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Copper	88	1.0	"	"	"	"	"	"	
Lead	380	3.0	"	"	"	"	"	"	

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Daniel Chavez, Project Manager



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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU2-1-COMP
T142518-33 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Barium	51	1.0	"	"	"	"	"	"	
Copper	68	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU3-1-COMP
T142518-37 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Barium	120	1.0	"	"	"	"	"	"	
Copper	55	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU4-1-COMP
T142518-41 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Barium	1.5	1.0	"	"	"	"	"	"	
Copper	ND	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU5-1
T142518-45 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Antimony	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Barium	22	1.0	"	"	"	"	"	"	
Copper	42	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU5-2
T142518-47 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Antimony	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Barium	26	1.0	"	"	"	"	"	"	
Copper	47	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU6-1-COMP
T142518-49 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Antimony	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Barium	35	1.0	"	"	"	"	"	"	
Copper	64	1.0	"	"	"	"	"	"	
Lead	ND	3.0	"	"	"	"	"	"	

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-QCEB
T142518-53 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	50	ug/l	1	4120913	12/09/14	12/09/14	EPA 6010B	
Barium	ND	50	"	"	"	"	"	"	
Copper	ND	50	"	"	"	"	"	"	
Lead	80	50	"	"	"	"	"	"	

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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RNP-AC-DU1-6-COMP_D
T142518-54 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	3.0	mg/kg	1	4123111	12/31/14	12/31/14	EPA 6010B	
Copper	36	1.0	"	"	"	"	"	"	
Lead	160	3.0	"	"	"	"	"	"	

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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Metals by EPA 6010B - Quality Control
SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4120913 - EPA 3010A

Blank (4120913-BLK1)			Prepared & Analyzed: 12/09/14							
Antimony	ND	50	ug/l							
Barium	ND	50	"							
Copper	ND	50	"							
Lead	ND	50	"							

LCS (4120913-BS1)			Prepared & Analyzed: 12/09/14							
Antimony	512	50	ug/l	500		102	75-125			
Barium	515	50	"	500		103	75-125			
Copper	516	50	"	500		103	75-125			
Lead	516	50	"	500		103	75-125			

LCS Dup (4120913-BSD1)			Prepared & Analyzed: 12/09/14							
Antimony	494	50	ug/l	500		98.8	75-125	3.58	20	
Barium	487	50	"	500		97.4	75-125	5.59	20	
Copper	490	50	"	500		98.0	75-125	5.17	20	
Lead	489	50	"	500		97.8	75-125	5.37	20	

Batch 4121802 - EPA 3051

Blank (4121802-BLK1)			Prepared & Analyzed: 12/18/14							
Antimony	ND	3.0	mg/kg							
Barium	ND	1.0	"							
Copper	ND	1.0	"							
Lead	ND	3.0	"							

LCS (4121802-BS1)			Prepared & Analyzed: 12/18/14							
Antimony	101	3.0	mg/kg	100		101				
Barium	107	1.0	"	100		107	75-125			
Copper	107	1.0	"	100		107	75-125			
Lead	106	3.0	"	100		106	75-125			

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/30/15 15:56
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Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 4121802 - EPA 3051

LCS Dup (4121802-BSD1) Prepared & Analyzed: 12/18/14										
Antimony	111	3.0	mg/kg	100		111	75-125	9.83	20	
Barium	115	1.0	"	100		115	75-125	7.73	20	
Copper	117	1.0	"	100		117	75-125	8.40	20	
Lead	114	3.0	"	100		114	75-125	7.19	20	

Batch 4123111 - EPA 3051

Blank (4123111-BLK1) Prepared & Analyzed: 12/31/14										
Antimony	ND	3.0	mg/kg							
Copper	ND	1.0	"							
Lead	ND	3.0	"							

LCS (4123111-BS1) Prepared & Analyzed: 12/31/14										
Antimony	116	3.0	mg/kg	100		116	75-125			
Copper	122	1.0	"	100		122	75-125			
Lead	118	3.0	"	100		118	75-125			

LCS Dup (4123111-BSD1) Prepared & Analyzed: 12/31/14										
Antimony	98.6	3.0	mg/kg	100		98.6	75-125	16.2	20	
Copper	104	1.0	"	100		104	75-125	15.9	20	
Lead	99.8	3.0	"	100		99.8	75-125	16.5	20	

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Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
01/30/15 15:56

Notes and Definitions

DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference

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12 March 2015

Joe Seney

Redwood National Park

121200 Highway 101

Orick, CA 95555

RE: Alder Camp Firing Range EE/CA

Enclosed are the results of analyses for samples received by the laboratory on 02/26/15 11:20. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Daniel Chavez For Katherine RunningCrane
Project Manager



25712 Commercentre Drive
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Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/12/15 12:04

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
1DU51A	T150430-01	Soil	02/17/15 10:00	02/26/15 11:20
1DU51B	T150430-04	Soil	02/17/15 10:00	02/26/15 11:20
2DU51A	T150430-07	Soil	02/17/15 11:00	02/26/15 11:20
2DU51B	T150430-10	Soil	02/17/15 11:00	02/26/15 11:20
3DU51A	T150430-13	Soil	02/17/15 12:00	02/26/15 11:20
3DU51B	T150430-16	Soil	02/17/15 12:00	02/26/15 11:20

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Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/12/15 12:04

DETECTIONS SUMMARY

Sample ID: 1DU51A **Laboratory ID:** T150430-01

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Barium	14	1.0	mg/kg	EPA 6010B	
Copper	34	1.0	mg/kg	EPA 6010B	

Sample ID: 1DU51B **Laboratory ID:** T150430-04

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Barium	21	1.0	mg/kg	EPA 6010B	
Copper	40	1.0	mg/kg	EPA 6010B	

Sample ID: 2DU51A **Laboratory ID:** T150430-07

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Barium	24	1.0	mg/kg	EPA 6010B	
Copper	35	1.0	mg/kg	EPA 6010B	
Lead	37	3.0	mg/kg	EPA 6010B	

Sample ID: 2DU51B **Laboratory ID:** T150430-10

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Barium	29	1.0	mg/kg	EPA 6010B	
Copper	39	1.0	mg/kg	EPA 6010B	

Sample ID: 3DU51A **Laboratory ID:** T150430-13

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Barium	18	1.0	mg/kg	EPA 6010B	
Copper	24	1.0	mg/kg	EPA 6010B	

SunStar Laboratories, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/12/15 12:04

Sample ID: 3DU51B

Laboratory ID: T150430-16

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Barium	32	1.0	mg/kg	EPA 6010B	
Copper	30	1.0	mg/kg	EPA 6010B	

Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/12/15 12:04

1DU51A
T150430-01(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	0.014	3.0	mg/kg	1	5022615	02/26/15	03/03/15	EPA 6010B	
Barium	14	0.0034	1.0	"	"	"	"	"	"	
Copper	34	0.0015	1.0	"	"	"	"	"	"	
Lead	ND	0.0097	3.0	"	"	"	"	"	"	



Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/12/15 12:04

1DU51B
T150430-04(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	0.014	3.0	mg/kg	1	5022615	02/26/15	03/03/15	EPA 6010B	
Barium	21	0.0034	1.0	"	"	"	"	"	"	
Copper	40	0.0015	1.0	"	"	"	"	"	"	
Lead	ND	0.0097	3.0	"	"	"	"	"	"	



Redwood National Park 121200 Highway 101 Orick CA, 95555	Project: Alder Camp Firing Range EE/CA Project Number: 001 Project Manager: Joe Seney	Reported: 03/12/15 12:04
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2DU51A
T150430-07(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	0.014	3.0	mg/kg	1	5022615	02/26/15	03/03/15	EPA 6010B	
Barium	24	0.0034	1.0	"	"	"	"	"	"	
Copper	35	0.0015	1.0	"	"	"	"	"	"	
Lead	37	0.0097	3.0	"	"	"	"	"	"	





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 949.297.5020 Phone
 949.297.5027 Fax

Redwood National Park 121200 Highway 101 Orick CA, 95555	Project: Alder Camp Firing Range EE/CA Project Number: 001 Project Manager: Joe Seney	Reported: 03/12/15 12:04
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2DU51B
T150430-10(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	0.014	3.0	mg/kg	1	5022615	02/26/15	03/03/15	EPA 6010B	
Barium	29	0.0034	1.0	"	"	"	"	"	"	
Copper	39	0.0015	1.0	"	"	"	"	"	"	
Lead	ND	0.0097	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.

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Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/12/15 12:04

3DU51A
T150430-13(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	0.014	3.0	mg/kg	1	5022615	02/26/15	03/03/15	EPA 6010B	
Barium	18	0.0034	1.0	"	"	"	"	"	"	
Copper	24	0.0015	1.0	"	"	"	"	"	"	
Lead	ND	0.0097	3.0	"	"	"	"	"	"	



Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/12/15 12:04

3DU51B

T150430-16(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	0.014	3.0	mg/kg	1	5022615	02/26/15	03/03/15	EPA 6010B	
Barium	32	0.0034	1.0	"	"	"	"	"	"	
Copper	30	0.0015	1.0	"	"	"	"	"	"	
Lead	ND	0.0097	3.0	"	"	"	"	"	"	

Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/12/15 12:04

Metals by EPA 6010B - Quality Control

SunStar Laboratories, Inc.

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5022615 - EPA 3051

Blank (5022615-BLK1)

Prepared: 02/26/15 Analyzed: 03/03/15

Antimony	ND	0.014	3.0	mg/kg							
Barium	ND	0.0034	1.0	"							
Copper	ND	0.0015	1.0	"							
Lead	ND	0.0097	3.0	"							

LCS (5022615-BS1)

Prepared: 02/26/15 Analyzed: 03/03/15

Antimony	113	0.014	3.0	mg/kg	100		113	75-125			
Barium	115	0.0034	1.0	"	100		115	75-125			
Copper	116	0.0015	1.0	"	100		116	75-125			
Lead	125	0.0097	3.0	"	100		125	75-125			

Matrix Spike (5022615-MS1)

Source: T150430-01

Prepared: 02/26/15 Analyzed: 03/03/15

Antimony	33.6	0.014	3.0	mg/kg	100	ND	33.6	75-125			QM-05
Barium	106	0.0034	1.0	"	100	13.8	92.2	75-125			
Copper	132	0.0015	1.0	"	100	34.3	97.9	75-125			
Lead	113	0.0097	3.0	"	100	ND	113	75-125			

Matrix Spike Dup (5022615-MSD1)

Source: T150430-01

Prepared: 02/26/15 Analyzed: 03/03/15

Antimony	34.2	0.014	3.0	mg/kg	100	ND	34.2	75-125	1.77	20	QM-05
Barium	109	0.0034	1.0	"	100	13.8	95.4	75-125	2.99	20	
Copper	138	0.0015	1.0	"	100	34.3	103	75-125	4.15	20	
Lead	119	0.0097	3.0	"	100	ND	119	75-125	5.91	20	



Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/12/15 12:04

Notes and Definitions

- QM-05 The spike recovery was outside acceptance limits for the MS and/or MSD due to possible matrix interference. The LCS was within acceptance criteria. The data is acceptable as no negative impact on data is expected.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

T150430

Client: Redwood National Park (RNP)
 Address: 121200 Highway 101 Orick, CA 95555
 Phone: (707) 465-7704 Fax: _____
 Project Manager: Joe Sany

Date: Feb 17, 2015 Page: 2 of 2
 Project Name: Alber Camp Firing Range EE/CA
 Collector: Joe Sany Client Project #: 001
 Batch #: 001 EDF #: 001

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals	6020 ICP-MS Metals	EPA Method #	Laboratory ID #	Comments/Preservative	Total # of containers	
30U51B 16	2/17/15	10:00	core	glass														1	
30U52B 17																			
30U53B 18																			
1DU51A 01		10:00																	
1DU52A 02		10:00																	
1DU53A 03		10:00																	
1DU51B 04		10:00																	
1DU52B 05		10:00																	
1DU53B 06		10:00																	
2DU51A 07		11:00																	
2DU52A 08		11:00																	
2DU53A 09		11:00																	
2DU51B 10		11:00																	
2DU52B 11		11:00																	
2DU53B 12		11:00																	
3DU51A 13		12:00																	
3DU52A 14		12:00																	
3DU53A 15		12:00																	
Relinquished by: (signature)			Received by: (signature)			Date / Time			Date / Time			Total # of containers			Notes				
<i>[Signature]</i>			<i>[Signature]</i>			2/23/15 10:30am						18			same test for all samples!				
Relinquished by: (signature)			Received by: (signature)			Date / Time			Date / Time			Chain of Custody seals Y/N/A			Seals intact? Y/N/A				
<i>[Signature]</i>			<i>[Signature]</i>			2/26/15 11:20						18			18				
Relinquished by: (signature)			Received by: (signature)			Date / Time			Date / Time			Received good condition/cold			Turn around time: 20.0				
<i>[Signature]</i>			<i>[Signature]</i>			2/26/15 11:20						1			20.0				

Sample disposal instructions: Disposal @ \$2.00 each _____ Return to client _____ Pickup _____

COC 140752

SAMPLE RECEIVING REVIEW SHEET

BATCH # 7150480

Client Name: REDWOOD NAT. PARK

Project: ALDER CAMP FIRING RANGE

Received by: SUNNY

Date/Time Received: 2-26-15 / 11:20

Delivered by: Client SunStar Courier GSO FedEx Other _____

Total number of coolers received 1

Temp criteria = 6°C > 0°C (no frozen containers)

Temperature: cooler #1 20.2 °C +/- the CF (-0.2°C) = 20.0 °C corrected temperature

cooler #2 _____ °C +/- the CF (-0.2°C) = _____ °C corrected temperature

cooler #3 _____ °C +/- the CF (-0.2°C) = _____ °C corrected temperature

Samples outside temp. but received on ice, w/in 6 hours of final sampling. Yes No* N/A

Custody Seals Intact on Cooler/Sample Yes No* N/A

Sample Containers Intact Yes No*

Sample labels match COC ID's Yes No*

Total number of containers received match COC Yes No*

Proper containers received for analyses requested on COC Yes No*

Proper preservative indicated on COC/containers for analyses requested Yes No* N/A

Complete shipment received in good condition with correct temperatures, containers, labels, volumes preservatives and within method specified holding times. Yes No*

* Complete Non-Conformance Receiving Sheet if checked

Cooler/Sample Review - Initials and date SL 2-26-15

Comments:



25712 Commercentre Drive
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25 March 2015

Joe Seney

Redwood National Park

121200 Highway 101

Orick, CA 95555

RE: Alder Camp Firing Range EE/CA

Enclosed are the results of analyses for samples received by the laboratory on 02/26/15 11:20. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Daniel Chavez For Katherine RunningCrane
Project Manager



25712 Commercentre Drive
Lake Forest, California 92630
949.297.5020 Phone
949.297.5027 Fax

Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/25/15 16:37

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
1DU52A	T150430-02	Soil	02/17/15 10:00	02/26/15 11:20
1DU53A	T150430-03	Soil	02/17/15 10:00	02/26/15 11:20
2DU52A	T150430-08	Soil	02/17/15 11:00	02/26/15 11:20
2DU53A	T150430-09	Soil	02/17/15 11:00	02/26/15 11:20
3DU52A	T150430-14	Soil	02/17/15 12:00	02/26/15 11:20
3DU53A	T150430-15	Soil	02/17/15 12:00	02/26/15 11:20

SunStar Laboratories, Inc.

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Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/25/15 16:37

DETECTIONS SUMMARY

Sample ID: 1DU52A

Laboratory ID: T150430-02

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Barium	14	1.0	mg/kg	EPA 6010B	
Copper	27	1.0	mg/kg	EPA 6010B	

Sample ID: 1DU53A

Laboratory ID: T150430-03

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Barium	15	1.0	mg/kg	EPA 6010B	
Copper	32	1.0	mg/kg	EPA 6010B	

Sample ID: 2DU52A

Laboratory ID: T150430-08

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Barium	26	1.0	mg/kg	EPA 6010B	
Copper	37	1.0	mg/kg	EPA 6010B	
Lead	46	3.0	mg/kg	EPA 6010B	

Sample ID: 2DU53A

Laboratory ID: T150430-09

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Barium	24	1.0	mg/kg	EPA 6010B	
Copper	36	1.0	mg/kg	EPA 6010B	
Lead	28	3.0	mg/kg	EPA 6010B	

Sample ID: 3DU52A

Laboratory ID: T150430-14

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Barium	24	1.0	mg/kg	EPA 6010B	

SunStar Laboratories, Inc.

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Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/25/15 16:37

Sample ID: 3DU52A

Laboratory ID: T150430-14

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Copper	24	1.0	mg/kg	EPA 6010B	

Sample ID: 3DU53A

Laboratory ID: T150430-15

Analyte	Reporting		Units	Method	Notes
	Result	Limit			
Barium	23	1.0	mg/kg	EPA 6010B	
Copper	23	1.0	mg/kg	EPA 6010B	

Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/25/15 16:37

1DU52A

T150430-02(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	0.014	3.0	mg/kg	1	5031221	03/12/15	03/13/15	EPA 6010B	
Barium	14	0.0034	1.0	"	"	"	"	"	"	"
Copper	27	0.0015	1.0	"	"	"	"	"	"	"
Lead	ND	0.0097	3.0	"	"	"	"	"	"	"



Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/25/15 16:37

1DU53A

T150430-03(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	0.014	3.0	mg/kg	1	5031221	03/12/15	03/13/15	EPA 6010B	
Barium	15	0.0034	1.0	"	"	"	"	"	"	
Copper	32	0.0015	1.0	"	"	"	"	"	"	
Lead	ND	0.0097	3.0	"	"	"	"	"	"	



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Redwood National Park
 121200 Highway 101
 Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
 Project Number: 001
 Project Manager: Joe Seney

Reported:
 03/25/15 16:37

2DU52A

T150430-08(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	0.014	3.0	mg/kg	1	5031221	03/12/15	03/13/15	EPA 6010B	
Barium	26	0.0034	1.0	"	"	"	"	"	"	
Copper	37	0.0015	1.0	"	"	"	"	"	"	
Lead	46	0.0097	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.

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Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/25/15 16:37

2DU53A
T150430-09(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	0.014	3.0	mg/kg	1	5031221	03/12/15	03/13/15	EPA 6010B	
Barium	24	0.0034	1.0	"	"	"	"	"	"	
Copper	36	0.0015	1.0	"	"	"	"	"	"	
Lead	28	0.0097	3.0	"	"	"	"	"	"	

Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/25/15 16:37

3DU52A

T150430-14(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	0.014	3.0	mg/kg	1	5031221	03/12/15	03/13/15	EPA 6010B	
Barium	24	0.0034	1.0	"	"	"	"	"	"	
Copper	24	0.0015	1.0	"	"	"	"	"	"	
Lead	ND	0.0097	3.0	"	"	"	"	"	"	



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Redwood National Park
 121200 Highway 101
 Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
 Project Number: 001
 Project Manager: Joe Seney

Reported:
 03/25/15 16:37

3DU53A

T150430-15(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	ND	0.014	3.0	mg/kg	1	5031221	03/12/15	03/13/15	EPA 6010B	
Barium	23	0.0034	1.0	"	"	"	"	"	"	
Copper	23	0.0015	1.0	"	"	"	"	"	"	
Lead	ND	0.0097	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.

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 Lake Forest, California 92630
 949.297.5020 Phone
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Redwood National Park
 121200 Highway 101
 Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
 Project Number: 001
 Project Manager: Joe Seney

Reported:
 03/25/15 16:37

Metals by EPA 6010B - Quality Control
SunStar Laboratories, Inc.

Analyte	Result	MDL	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5031221 - EPA 3051

Blank (5031221-BLK1)

Prepared: 03/12/15 Analyzed: 03/13/15

Antimony	ND	0.014	3.0	mg/kg							
Barium	ND	0.0034	1.0	"							
Copper	ND	0.0015	1.0	"							
Lead	ND	0.0097	3.0	"							

LCS (5031221-BS1)

Prepared: 03/12/15 Analyzed: 03/13/15

Antimony	101	0.014	3.0	mg/kg	100		101	75-125		20	
Barium	104	0.0034	1.0	"	100		104	75-125			
Copper	104	0.0015	1.0	"	100		104	75-125		20	
Lead	102	0.0097	3.0	"	100		102	75-125			

Matrix Spike (5031221-MS1)

Source: T150430-02

Prepared: 03/12/15 Analyzed: 03/13/15

Antimony	27.6	0.014	3.0	mg/kg	100	ND	27.6	75-125		20	QM-05
Barium	113	0.0034	1.0	"	100	13.8	99.1	75-125			
Copper	136	0.0015	1.0	"	100	27.4	109	75-125		20	
Lead	111	0.0097	3.0	"	100	ND	111	75-125			

Matrix Spike Dup (5031221-MSD1)

Source: T150430-02

Prepared: 03/12/15 Analyzed: 03/13/15

Antimony	25.6	0.014	3.0	mg/kg	100	ND	25.6	75-125	7.52	20	QM-05
Barium	99.8	0.0034	1.0	"	100	13.8	86.0	75-125	12.3	20	
Copper	121	0.0015	1.0	"	100	27.4	93.2	75-125	12.1	20	
Lead	91.8	0.0097	3.0	"	100	ND	91.8	75-125	19.4	20	

SunStar Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/25/15 16:37

Notes and Definitions

- QM-05 The spike recovery was outside acceptance limits for the MS and/or MSD due to possible matrix interference. The LCS was within acceptance criteria. The data is acceptable as no negative impact on data is expected.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference

T150430

Client: Redwood National Park (RNP)
 Address: 121200 Highway 101 Orick, CA 95555
 Phone: (707) 465-7704 Fax: _____
 Project Manager: Joe Sany

Date: Feb 17, 2015 Page: 2 of 2
 Project Name: Alber Camp Firing Range EE/CA
 Collector: Joe Sany Client Project #: 001
 Batch #: 001 EDF #: 001

Sample ID	Date Sampled	Time	Sample Type	Container Type	8260	8260 + OXY	8260 BTEX, OXY only	8270	8021 BTEX	8015M (gasoline)	8015M (diesel)	8015M Ext./Carbon Chain	6010/7000 Title 22 Metals	6020 ICP-MS Metals	EPA Method #	Laboratory ID #	Comments/Preservative	Total # of containers																																																																																																																																																																																																																																										
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Relinquished by: (signature) <u>[Signature]</u>			Received by: (signature) <u>[Signature]</u>			Date / Time			Date / Time			Chain of Custody seals Y/N/A			Seals intact? Y/N/A																																																																																																																																																																																																																																													
Relinquished by: (signature) <u>[Signature]</u>			Received by: (signature) <u>[Signature]</u>			Date / Time			Date / Time			Received good condition/cold			Turn around time: <u>20.0</u>																																																																																																																																																																																																																																													

Sample disposal instructions: Disposal @ \$2.00 each _____ Return to client _____ Pickup _____

COC 140752

SAMPLE RECEIVING REVIEW SHEET

BATCH # 7150480

Client Name: REDWOOD NAT. PARK

Project: ALDER CAMP FIRING RANGE

Received by: SUNNY

Date/Time Received: 2-26-15 / 11:20

Delivered by: Client SunStar Courier GSO FedEx Other _____

Total number of coolers received 1

Temp criteria = 6°C > 0°C (no frozen containers)

Temperature: cooler #1 20.2 °C +/- the CF (-0.2°C) = 20.0 °C corrected temperature

cooler #2 _____ °C +/- the CF (-0.2°C) = _____ °C corrected temperature

cooler #3 _____ °C +/- the CF (-0.2°C) = _____ °C corrected temperature

Samples outside temp. but received on ice, w/in 6 hours of final sampling. Yes No* N/A

Custody Seals Intact on Cooler/Sample Yes No* N/A

Sample Containers Intact Yes No*

Sample labels match COC ID's Yes No*

Total number of containers received match COC Yes No*

Proper containers received for analyses requested on COC Yes No*

Proper preservative indicated on COC/containers for analyses requested Yes No* N/A

Complete shipment received in good condition with correct temperatures, containers, labels, volumes preservatives and within method specified holding times. Yes No*

* Complete Non-Conformance Receiving Sheet if checked

Cooler/Sample Review - Initials and date SL 2-26-15

Comments:

C4 – Independent Quality Control of Laboratory Analyses.

Laboratory data reports were submitted to an independent subcontractor for data validation to support quality control. The independent reviewer issued its data validation findings in three separate reports, as listed below and included in this appendix. The independent reviewer's reports included only those laboratory data sheets for which they had added handwritten qualifiers.

The dates of laboratory reports were:

- December 19, 2014 and January 7, 2015. The laboratory re-issued its data report on January 30, 2015, to include some additional information to support the data validation process. The data validation of the December 19, 2014 laboratory report is included in the appendix. The enhanced laboratory report, issued on January 30, 2015, is included in Appendix C3.
- March 5, 2015. The laboratory re-issued its data report on March 12, 2015, to include some additional information to support the data validation process. The data validation of the March 5, 2015 laboratory report is included in the appendix. The enhanced laboratory report, issued on March 12, 2015, is included in Appendix C3.
- March 25, 2015. The data validation of the March 25, 2015 laboratory report is included in the appendix. The full laboratory report issued on March 25, 2015 is included in Appendix C3.



DATA VALIDATION REPORT

National Parks Service – Alder Camp

SAMPLE DELIVERY GROUP: T142518f

Prepared by

MEC^x
12269 East Vassar Drive
Aurora, CO 80014

I. INTRODUCTION

Task Order Title: National Parks Service – Alder Camp
 Contract Task Order: 1488.000D.00 001
 Sample Delivery Group: T142518f
 Project Manager: P. Day
 Matrix: Soil
 QC Level: Data review
 No. of Samples: 19
 No. of Reanalyses/Dilutions: 0
 Laboratory: SunStar Laboratories, Inc.

Table 1. Sample Identification

Sample Name	Lab Sample Name	Matrix	Collection	Method
RNP-AC-DU1-1	T142518-01	Soil	12/4/2014; 1244	6010B
RNP-AC-DU1-2	T142518-03 T142518-03RE2	Soil	12/4/2014; 1349	6010B STLC WET
RNP-AC-DU1-2_D	T142518-04	Soil	12/04/2014; 1351	6010B
RNP-AC-DU1-3	T142518-05	Soil	12/4/2014; 1216	6010B
RNP-AC-DU1-3DUP	T142518-06	Soil	12/4/2014; 1216	6010B
RNP-AC-DU1-3_D	T142518-07	Soil	12/04/2014; 1220	6010B
RNP-AC-DU1-4	T142518-08 T142518-08RE2	Soil	12/4/2014; 1407	6010B STLC WET
RNP-AC-DU1-5	T142518-10	Soil	12/4/2014; 1302	6010B
RNP-AC-DU1-6-COMP	T142518-12	Soil	12/4/2014	6010B
RNP-AC-DU1-7-COMP	T142518-19	Soil	12/4/2014	6010B
RNP-AC-DU1-8-COMP	T142518-26 T142518-26RE2	Soil	12/3/2014	6010B STLC WET
RNP-AC-DU2-1-COMP	T142518-33	Soil	12/3/2014	6010B
RNP-AC-DU3-1-COMP	T142518-37	Soil	12/3/2014	6010B
RNP-AC-DU4-1-COMP	T142518-41	Soil	12/3/2014	6010B
RNP-AC-DU5-1	T142518-45	Soil	12/3/2014; 1008	6010B
RNP-AC-DU5-2	T142518-47	Soil	12/3/2014; 1030	6010B
RNP-AC-DU6-1-COMP	T142518-49	Soil	12/3/2014	6010B
RNP-AC-QCEB	T142518-53	Water	12/4/2014; 1427	6010B
RNP-AC-DU1-6-COMP_D	T142518-54	Soil	12/04/2014	6010B

II. Sample Management

The samples were received within the temperature limits of 6°C but above

On page 4 of the COC, it appears the laboratory used white-out to correct the laboratory ID of sample RNP-AC-DU6-1B. The correction was not initialed or dated.

As per the project QAPjP, the STLC wet extraction test samples were prepared using a #40 sieve; however, in the original preparation, the laboratory used only a small amount of the available sample. The laboratory was requested to re-prepare the samples using the full sample volume. Both sets of results were reported. It was the reviewer's professional opinion that the reanalyses, which utilized a larger sample volume, were likely more representative of the samples than the original results. Additionally, the original analyses were associated with high laboratory control sample (LCS) recoveries for antimony and lead. The LCS recoveries associated with the reanalyses were acceptable and a site sample was designated for matrix spike/matrix spike duplicate analyses, allowing for some assessment of the sample matrix on the site sample results. For these reasons, the reviewer chose to reject, "R," the original STLC wet extraction analysis results with a reason flag of "D," in favor of the reanalyses.

Data Qualifier Reference Table

Qualifier	Organics	Inorganics
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. The associated value is the quantitation limit or the estimated detection limit for dioxins or PCB congeners.	The material was analyzed for, but was not detected above the level of the associated value. The associated value is either the sample quantitation limit or the sample detection limit. The associated value is the sample detection limit or the quantitation limit for perchlorate only.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample, and may have a potential positive bias.	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample, and may have a potential positive bias.
J-	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample, and may have a potential negative bias.	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample, and may have a potential negative bias.
UU	The analyte was not deemed above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.	The material was analyzed for, but was not detected. The associated value is an estimate and may be inaccurate or imprecise.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.

Qualifier	Organics	Inorganics
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.	Not applicable.
R	The data are unusable. The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.	The data are unusable. The sample results are rejected due to serious deficiencies in the ability to analyze the sample and to meet quality control criteria. The presence or absence of the analyte cannot be verified.

Qualification Code Reference Table

Qualifier	Organics	Inorganics
H	Holding times were exceeded.	Holding times were exceeded.
S	Surrogate recovery was outside QC limits.	The sequence or number of standards used for the calibration was incorrect
C	Calibration %RSD or %D was noncompliant.	Correlation coefficient is <0.995.
R	Calibration RRF was <0.05.	%R for calibration is not within control limits.
B	Presumed contamination as indicated by the preparation (method) blank results.	Presumed contamination as indicated by the preparation (method) or calibration blank results.
L	Laboratory Blank Spike/Blank Spike Duplicate %R was not within control limits.	Laboratory Control Sample %R was not within control limits.
L1	LCS/LCSD RPD was outside control limits.	LSC/LSCD RPD was outside control limits.
Q	MS/MSD recovery was poor.	MS recovery was poor.
Q1	MS/MSD RPD was outside control limits.	MS/MSD RPD was outside control limits.
E	Not applicable.	Duplicates showed poor agreement.
I	Internal standard performance was unsatisfactory.	ICP ICS results were unsatisfactory.
A	Not applicable.	ICP Serial Dilution %D were not within control limits.
M	Tuning (BFB or DFTPP) was noncompliant.	ICPMS tune was not compliant.
T	Presumed contamination as indicated by the trip blank results.	Not applicable.
+	False positive – reported compound was not present.	Not applicable.
-	False negative – compound was present but not reported.	Not applicable.
F	Presumed contamination as indicated by the FB or ER results.	Presumed contamination as indicated by the FB or ER results.
\$	Reported result or other information was incorrect.	Reported result or other information was incorrect.
?	TIC identity or reported retention time has been changed.	Not applicable.

Qualifier	Organics	Inorganics
D	The analysis with this flag should not be used because another more technically sound analysis is available.	The analysis with this flag should not be used because another more technically sound analysis is available.
P	Instrument performance for pesticides was poor.	Post Digestion Spike recovery was not within control limits.
DNQ	The reported result is above the method detection limit but is less than the reporting limit.	The reported result is above the method detection limit but is less than the reporting limit.
*II, *III	Unusual problems found with the data that have been described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Unusual problems found with the data that have been described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.

III. Method Analyses

A. EPA METHODS 6010B and STLC Wet Extraction—Select Metals

Reviewed By: P. Meeks

Date Reviewed: January 26, 2015

The samples listed in Table 1 for these analyses were reviewed based on the guidelines outlined in the *Quality Assurance Project Plan, National Park Service Engineering Estimate/Cost Analysis for Redwood National Park Alder Creek Road Firing Range (2014)*, *Sampling and Analysis Plan, Firing Range Engineering Evaluation/Cost Analysis, Redwood National Park Alder Camp Road, Orick, California (2014)*, *EPA Method 6010B, California Title 22 Wet Extraction Test*, and the *National Functional Guidelines for Superfund Inorganic Data Review (2014)*.

- Holding Times: The analytical holding time, six months, was met.
- Calibration: No initial or continuing calibration data was provided by the laboratory. The data were not assessed against these criteria.
- Blanks: Blanks were assessed as per the National Functional Guidelines. There were no detects in the method blanks. The laboratory did not provide continuing calibration blank results; therefore, the data were not assessed against this criterion.
- Interference Check Samples (ICSA/B): The laboratory did not provide results for the ICSA or ICSAB. The data were not assessed against these criteria.
- Laboratory Control Samples (LCS) : The original wet extraction test LCS recoveries for antimony and lead exceeded the control limits at 121% and 122%, however, as these results were not retained (see Sample Management), no qualifications were applied. Copper was recovered at 122% in the soil LCS associated with samples RNP-AC-DU1-2_D, RNP-AC-DU1-3_D, and RNP-AC-DU1-6-COMP_D; however, as the LCSD recovery was acceptable, no qualifications were applied. The remaining recoveries and all relative percent differences (RPDs) were within the method control limits of 80-120% and $\leq 20\%$, respectively.
- Laboratory Duplicates: No laboratory duplicate analyses were performed on a sample in this SDG.
- Matrix Spike/Matrix Spike Duplicate (MS/MSD): MS/MSD analyses were performed on sample RNP-AC-8-COMP for the wet extraction test reanalysis. Results for copper and lead were not assessed as the native concentration exceeded the spike amount by more than 4x, as the amount added to the sample was considered to be too small to be accurately measured. Soil method accuracy and precision and wet extraction test accuracy and precision for copper and lead were evaluated based on LCS/LCSD results.

- Serial Dilution: No serial dilution analyses were performed on a sample in this SDG.
- Sample Result Verification: In order to report the analyte within the linear range of the calibration, lead in samples RNP-AC-DU1-2, RNP-AC-DU1-3, RNP-AC-DU1-3DUP, and RNP-AC-DU1-6-COMP was reported from 10x dilutions in samples. Reported nondetects are valid to the reporting limits.
- Field QC Samples: Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site samples. Following are findings associated with field QC samples:
 - Field Blanks and Equipment Rinsates: This SDG had no identified field blank. Sample RNP-AC-QCEB was the equipment blank associated with the site samples. Lead was detected in this sample at 80 µg/L; however, as the laboratory did not provide information regarding the sample and water amounts used in sample preparation; the reviewer could not make a direct comparison of the equipment blank result to the sample results. However, based on the aqueous (50 µg/L) and soil (3.0 mg/Kg) reporting limits, it was the reviewer's professional opinion that the equipment blank result was roughly equivalent to 4.8 mg/Kg. As all site sample detects for lead were more than 10x this result, no qualifications were applied.
 - Field Duplicates: Samples RNP-AC-DU1-3 and RNP-QC-DU1-3DUP were identified as field duplicate samples. The lead RPD was 62%; therefore, lead detected in RNP-AC-DU1-3 and RNP-QC-DU1-3DUP was qualified as estimated, "J/," with an associated reason flag of "*III." The RPDs for antimony and copper were within the reasonable control limit of 50%.

Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
12/19/14 09:34

RNP-AC-DU1-1
T142518-01 (Soil)

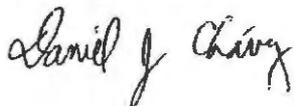
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	U	ND	3.0 mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Copper	93	1.0	"	"	"	"	"	"	
Lead	83	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.



Daniel Chavez, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 12/19/14 09:34
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**RNP-AC-DU1-2
T142518-03 (Soil)**

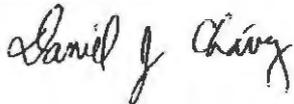
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	U ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Copper	440	1.0	"	"	"	"	"	"	
Lead	7700	30	"	10	"	"	12/18/14	"	

SunStar Laboratories, Inc.



Daniel Chavez, Project Manager

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/07/15 16:26
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RNP-AC-DU1-2
T142518-03 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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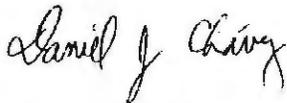
SunStar Laboratories, Inc.

STLC Metals by 6000/7000 Series Methods

Copper	R/D	37	0.10	mg/l	1	4123031	12/30/14	01/02/15	STLC Waste Extraction Test
Antimony	R/D J+L	4.5	0.10	"	"	"	"	"	"
Lead	R/D J+L	850	0.10	"	"	"	"	"	"

3M 2/2/15

SunStar Laboratories, Inc.



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Daniel Chavez, Project Manager

Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/29/15 16:04
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RNP-AC-DU1-2
T142518-03RE2 (Soil)

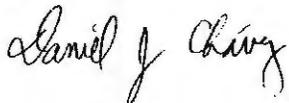
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

STLC Metals by 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Copper	19	0.10	mg/l	1	5012304	01/23/15	01/26/15	STLC Waste Extraction Test	
Antimony	4.8	0.10	"	"	"	"	"	"	
Lead	490	0.10	"	"	"	"	"	"	

SunStar Laboratories, Inc.



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Daniel Chavez, Project Manager

Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
01/07/15 16:26

RNP-AC-DU1-2_D
T142518-04 (Soil)

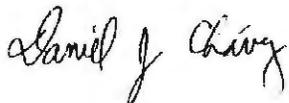
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	U ND	3.0	mg/kg	1	4123111	12/31/14	12/31/14	EPA 6010B	
Copper	60	1.0	"	"	"	"	"	"	
Lead	940	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.



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Daniel Chavez, Project Manager

Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
12/19/14 09:34

**RNP-AC-DU1-3
T142518-05 (Soil)**

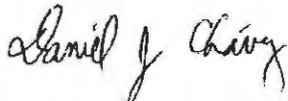
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	88	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Copper	910	1.0	"	"	"	"	"	"	
Lead	J/III 19000	30	"	10	"	"	12/18/14	"	

SunStar Laboratories, Inc.



Daniel Chavez, Project Manager

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Versar -- Fair Oaks
 5330 Primrose Dr. #147
 Fair Oaks CA, 95628

Project: NPS - Alder Camp
 Project Number: 112036.0004.001
 Project Manager: Tim Berger

Reported:
 12/19/14 09:34

RNP-AC-DU1-3DUP
T142518-06 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	130	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Copper	1100	1.0	"	"	"	"	12/18/14	"	
Lead	J/III 36000	30	"	10	"	"	12/18/14	"	

SunStar Laboratories, Inc.

Daniel J. Chavez

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Daniel Chavez, Project Manager

Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
01/07/15 16:26

RNP-AC-DU1-3_D
T142518-07 (Soil)

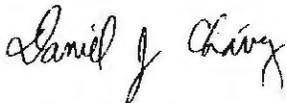
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	16	3.0	mg/kg	1	4123111	12/31/14	12/31/14	EPA 6010B	
Copper	420	1.0	"	"	"	"	"	"	
Lead	2900	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.



Daniel Chavez, Project Manager

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Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
12/19/14 09:34

**RNP-AC-DU1-4
T142518-08 (Soil)**

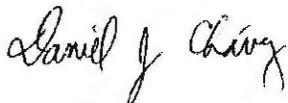
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	U	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B
Copper		44	1.0	"	"	"	"	"	"
Lead		2800	3.0	"	"	"	"	"	"

SunStar Laboratories, Inc.



Daniel Chavez, Project Manager

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Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/07/15 16:26
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**RNP-AC-DU1-4
T142518-08 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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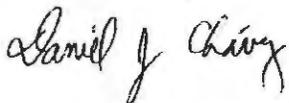
SunStar Laboratories, Inc.

STLC Metals by 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Copper	R/D	3.2	0.10	mg/l	1	4123031	12/30/14	01/02/15	STLC Waste Extraction Test
Antimony	R/D J+L	2.6	0.10	"	"	"	"	"	"
Lead	R/D J+L	240	0.10	"	"	"	"	"	"

RM 2/2/15

SunStar Laboratories, Inc.



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Daniel Chavez, Project Manager

Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 01/29/15 16:04
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RNP-AC-DU1-4
T142518-08RE2 (Soil)

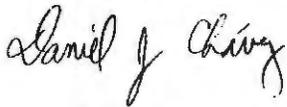
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

STLC Metals by 6000/7000 Series Methods

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Copper	7.0	0.10	mg/l	1	5012304	01/23/15	01/26/15	STLC Waste Extraction Test	"
Antimony	13	0.10	"	"	"	"	"	"	"
Lead	1200	0.50	"	5	"	"	"	"	"

SunStar Laboratories, Inc.



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Daniel Chavez, Project Manager

Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
12/19/14 09:34

RNP-AC-DU1-5
T142518-10 (Soil)

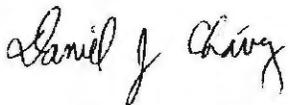
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	U	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B
Copper		72	1.0	"	"	"	"	"	"
Lead		170	3.0	"	"	"	"	"	"

SunStar Laboratories, Inc.



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Daniel Chavez, Project Manager

Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
12/19/14 09:34

RNP-AC-DU1-6-COMP
T142518-12 (Soil)

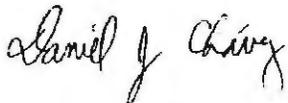
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	95	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Copper	800	1.0	"	"	"	"	"	"	
Lead	17000	30	"	10	"	"	12/18/14	"	

SunStar Laboratories, Inc.



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Daniel Chavez, Project Manager

Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 12/19/14 09:34
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RNP-AC-DU1-7-COMP
T142518-19 (Soil)

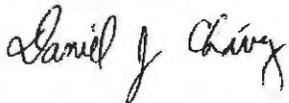
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	U ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Copper	48	1.0	"	"	"	"	12/18/14	"	
Lead	100	3.0	"	"	"	"	12/18/14	"	

SunStar Laboratories, Inc.



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Daniel Chavez, Project Manager

Versar -- Fair Oaks 5330 Primrose Dr. #147 Fair Oaks CA, 95628	Project: NPS - Alder Camp Project Number: 112036.0004.001 Project Manager: Tim Berger	Reported: 12/19/14 09:34
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RNP-AC-DU1-8-COMP
T142518-26 (Soil)

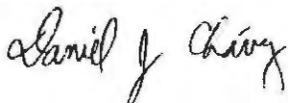
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Antimony	U ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B	
Copper	88	1.0	"	"	"	"	"	"	
Lead	380	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.



Daniel Chavez, Project Manager

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Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
01/07/15 16:26

RNP-AC-DU1-8-COMP
T142518-26 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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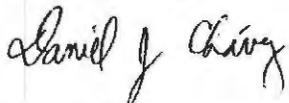
SunStar Laboratories, Inc.

STLC Metals by 6000/7000 Series Methods

Antimony	R/D	J+L	1.6	0.10	mg/l	1	4123031	12/30/14	01/02/15	STLC Waste Extraction Test
Copper	R/D	J+L	1.6	0.10	"	"	"	"	"	"
Lead	R/D	J+L	240	0.10	"	"	"	"	"	"

3m 2/2/15

SunStar Laboratories, Inc.



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Daniel Chavez, Project Manager

Versar -- Fair Oaks
 5330 Primrose Dr. #147
 Fair Oaks CA, 95628

Project: NPS - Alder Camp
 Project Number: 112036.0004.001
 Project Manager: Tim Berger

Reported:
 01/29/15 16:04

RNP-AC-DU1-8-COMP
T142518-26RE2 (Soil)

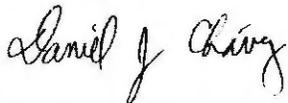
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

STLC Metals by 6000/7000 Series Methods

Copper	49	0.10	mg/l	1	5012721	01/27/15	01/29/15	STLC Waste Extraction Test	
Antimony	1.1	0.10	"	"	"	"	"	"	
Lead	110	0.10	"	"	"	"	"	"	

SunStar Laboratories, Inc.



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Daniel Chavez, Project Manager

Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
12/19/14 09:34

RNP-AC-DU2-1-COMP
T142518-33 (Soil)

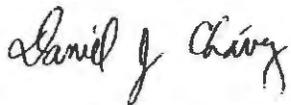
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	U	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B
Barium		51	1.0	"	"	"	"	"	"
Copper		68	1.0	"	"	"	"	"	"
Lead	U	ND	3.0	"	"	"	"	"	"

SunStar Laboratories, Inc.



Daniel Chavez, Project Manager

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Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
12/19/14 09:34

RNP-AC-DU3-1-COMP
T142518-37 (Soil)

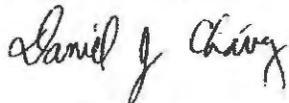
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	U	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B
Barium		120	1.0	"	"	"	"	"	"
Copper		55	1.0	"	"	"	"	"	"
Lead	U	ND	3.0	"	"	"	"	"	"

SunStar Laboratories, Inc.



Daniel Chavez, Project Manager

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Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
12/19/14 09:34

RNP-AC-DU4-1-COMP
T142518-41 (Soil)

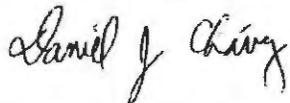
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	U	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B
Barium		1.5	1.0	"	"	"	"	"	"
Copper	U	ND	1.0	"	"	"	"	"	"
Lead	U	ND	3.0	"	"	"	"	"	"

SunStar Laboratories, Inc.



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Daniel Chavez, Project Manager

Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
12/19/14 09:34

RNP-AC-DU5-1
T142518-45 (Soil)

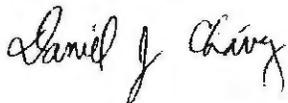
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	U	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B
Barium		22	1.0	"	"	"	"	"	"
Copper		42	1.0	"	"	"	"	"	"
Lead	U	ND	3.0	"	"	"	"	"	"

SunStar Laboratories, Inc.



Daniel Chavez, Project Manager

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Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
12/19/14 09:34

RNP-AC-DU5-2
T142518-47 (Soil)

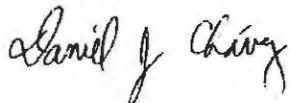
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	U	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B
Barium		26	1.0	"	"	"	"	"	"
Copper		47	1.0	"	"	"	"	"	"
Lead	U	ND	3.0	"	"	"	"	"	"

SunStar Laboratories, Inc.



Daniel Chavez, Project Manager

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Versar -- Fair Oaks
 5330 Primrose Dr. #147
 Fair Oaks CA, 95628

Project: NPS - Alder Camp
 Project Number: 112036.0004.001
 Project Manager: Tim Berger

Reported:
 12/19/14 09:34

RNP-AC-DU6-1-COMP
T142518-49 (Soil)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	U	ND	3.0	mg/kg	1	4121802	12/18/14	12/18/14	EPA 6010B
Barium		35	1.0	"	"	"	"	"	"
Copper		64	1.0	"	"	"	"	"	"
Lead	U	ND	3.0	"	"	"	"	"	"

SunStar Laboratories, Inc.

Daniel J. Chavez

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Daniel Chavez, Project Manager

Versar -- Fair Oaks
 5330 Primrose Dr. #147
 Fair Oaks CA, 95628

Project: NPS - Alder Camp
 Project Number: 112036.0004.001
 Project Manager: Tim Berger

Reported:
 12/19/14 09:34

RNP-AC-QCEB
T142518-53 (Water)

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	U	ND	50	ug/l	1	4120913	12/09/14	12/09/14	EPA 6010B
Barium	U	ND	50	"	"	"	"	"	"
Copper	U	ND	50	"	"	"	"	"	"
Lead		80	50	"	"	"	"	"	"

SunStar Laboratories, Inc.

Daniel J. Chavez

Daniel Chavez, Project Manager

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Versar -- Fair Oaks
5330 Primrose Dr. #147
Fair Oaks CA, 95628

Project: NPS - Alder Camp
Project Number: 112036.0004.001
Project Manager: Tim Berger

Reported:
01/07/15 16:26

RNP-AC-DU1-6-COMP_D
T142518-54 (Soil)

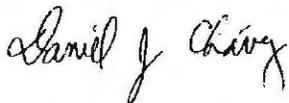
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	U ND	3.0	mg/kg	1	4123111	12/31/14	12/31/14	EPA 6010B	
Copper	36	1.0	"	"	"	"	"	"	
Lead	160	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.



Daniel Chavez, Project Manager

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DATA VALIDATION REPORT

National Parks Service – Alder Camp Firing Range EE/CA

SAMPLE DELIVERY GROUP: T150430f

Prepared by

MEC^x
12269 East Vassar Drive
Aurora, CO 80014

I. INTRODUCTION

Task Order Title: NPS – Alder Camp Firing Range EE/CA
Contract Task Order: 1488.000D.00 001
Sample Delivery Group: T150430f
Project Manager: P. Day
Matrix: Soil
QC Level: Data review
No. of Samples: 6
No. of Reanalyses/Dilutions: 0
Laboratory: SunStar Laboratories, Inc.

Table 1. Sample Identification

<i>Sample Name</i>	<i>Lab Sample Name</i>	<i>Matrix</i>	<i>Collection</i>	<i>Method</i>
1DU51A	T150430-01	Soil	2/17/2015; 1000	6010B
1DU51B	T150430-04	Soil	2/17/2015; 1000	6010B
2DU51A	T150430-07	Soil	2/17/2015; 1100	6010B
2DU51B	T150430-10	Soil	2/17/2015; 1100	6010B
3DU51A	T150430-13	Soil	2/17/2015; 1200	6010B
3DU51B	T150430-16	Soil	2/17/2015; 1200	6010B

II. Sample Management

The samples were received at ambient temperature nine days after collection. Due to the nonvolatile nature of the analytes, no qualifications were required. According to the laboratory sample receipt log for this sample delivery group (SDG), the samples were received intact. The chain-of-custody (COC) was appropriately signed and dated by field and laboratory personnel. Custody seals were intact upon receipt at the laboratory.

In addition to the six samples listed in the table above, twelve other samples were listed on the COC for metals analysis. No sample collection date was listed for four samples (including 3DU51A) and no sample time or date was listed for three samples (including 3DU51A and 3DU51B). Per electronic correspondence from J. Seney of the National Parks Service, it appears the reported samples were composites of three locations; thus accounting for the additional twelve samples.

One correction to a sample identifier was made by obliterating the original entry and one correction was properly made by lining-out the original entry. Neither correction was initialed or dated.

Data Qualifier Reference Table

Qualifier	Organic	Inorganic
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For dioxins or PCB congeners, the associated value is the quantitation limit or the estimated detection limit.	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For perchlorate, the associated value is the sample detection limit or the quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.	Not applicable.
T-I	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents an approximate concentration. The tentative identification represents a compound with a Chemical Abstract Service (CAS) number and fit greater than 80%.	Not applicable

Qualifier	Organic	Inorganic
T-II	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents an approximate concentration. The tentative identification represents a class of compound, and is not of sufficient identification quality to represent a specific compound.	Not applicable
T-III	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents an approximate concentration. The tentative identification represents an unknown compound.	Not applicable
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.

Reason Code Reference Table

Reason Code	Organic	Inorganic
H	Holding time was exceeded.	Holding time was exceeded.
S	Surrogate recovery was outside control limits.	Not applicable.
C	Calibration percent relative standard deviation (%RSD) or percent deviation (%D) were noncompliant, or coefficient of determination (r^2) was <0.990.	Correlation coefficient (r) was <0.995.
R	Calibration relative response factor (RRF) was <0.05.	Percent recovery (%R) for calibration was outside control limits.
B	The analyte was detected in an associated blank as well as in the sample.	The analyte was detected in an associated blank as well as in the sample.
L	Laboratory control sample (LCS) or /LCS duplicate (LCSD) %R was outside the control limits.	LCS or LCSD %R was outside the control limits.
L1	LCS/LCSD relative percent difference (RPD) was outside the control limit.	LCS/LCSD RPD was outside the control limit.
Q	Matrix spike/matrix spike duplicate (MS/MSD) %R was outside control limits.	MS or MSD %R was outside the control limit.
Q1	MS/MSD RPD was outside the control limit.	MS/MSD RPD was outside the control limit.
E	Result was reported as an estimated maximum possible concentration (EMPC).	Laboratory duplicate RPD was outside the control limit.
I	Internal standard recovery was outside control limits.	Inductively coupled plasma (ICP) interference check standard (ICSA/ICSAB) result was outside control limits.
I1	Not applicable.	ICP mass spectrometer (ICPMS) internal standard recovery was outside control limits.
A	Not applicable.	Serial dilution %D was outside control limits.
M	Tuning (BFB or DFTPP) was not compliant.	ICPMS tune was not compliant.
T	The analyte was detected in an associated trip blank as well as in the sample.	Not applicable.

Reason Code	Organic	Inorganic
+	False positive – reported compound was not present.	False positive – reported compound was not present.
-	False negative – compound was present but not reported.	False negative – compound was present but not reported.
F	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.
F1	Field duplicate RPD was outside the control limit.	Field duplicate RPD was outside the control limit.
\$	The reviewer corrected the reported result and/or other information.	The reviewer corrected the reported result and/or other information.
D	The analysis was not used because another more technically sound analysis was available.	The analysis was not used because another more technically sound analysis was available.
P	Instrument performance not compliant.	Post digestion spike recovery was outside of control limits.
*II, *III	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.

III. Method Analyses

A. EPA METHOD 6010B—Select Metals

Reviewed By: P. Meeks

Date Reviewed: March 11, 2015

The samples listed in Table 1 for this analysis were reviewed based on the guidelines outlined in the *Quality Assurance Project Plan, National Park Service Engineering Estimate/Cost Analysis for Redwood National Park Alder Creek Road Firing Range (2014)*, *Sampling and Analysis Plan, Firing Range Engineering Evaluation/Cost Analysis, Redwood National Park Alder Camp Road, Orick, California (2014)*, *EPA Method 6010B*, and the *National Functional Guidelines for Superfund Inorganic Data Review (2014)*.

- Holding Times: The analytical holding time, six months, was met.
- Calibration: No initial or continuing calibration data was provided by the laboratory. The data were not assessed against these criteria.
- Blanks: The method blank was assessed as per the National Functional Guidelines. There were no detects in the method blank. The laboratory did not provide continuing calibration blank results; therefore, the data were not assessed against this criterion.
- Interference Check Samples (ICSA/B): The laboratory did not provide results for the ICSA or ICSAB. The data were not assessed against these criteria.
- Laboratory Control Samples (LCS): The recoveries were within the laboratory control limits of 75-125%.
- Laboratory Duplicates: No laboratory duplicate analyses were performed on a sample in this SDG.
- Matrix Spike/Matrix Spike Duplicate (MS/MSD): MS/MSD analyses were performed on sample 1DU51A. Both antimony recoveries were below the control limit at 30.9% and 31.5%; therefore, antimony in the samples, all nondetects, was qualified as estimated (UJ). The remaining recoveries and all RPDs were within the method control limits of 75-125% and $\leq 20\%$, respectively.
- Serial Dilution: No serial dilution analyses were performed on a sample in this SDG.
- Sample Result Verification: Reported nondetects are valid to the reporting limits.
- Field QC Samples: Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site samples.

Following are findings associated with field QC samples:

- Field Blanks and Equipment Rinsates: This SDG had no identified field blank or equipment blank.
- Field Duplicates: There were no field duplicate samples identified in this SDG.

Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/05/15 12:00

1DU51A
T150430-01 (Soil)

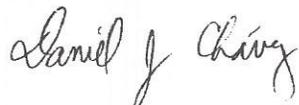
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	UJ/Q	ND	3.0	mg/kg	1	5022615	02/26/15	03/03/15	EPA 6010B
Barium		14	1.0	"	"	"	"	"	"
Copper		34	1.0	"	"	"	"	"	"
Lead	U	ND	3.0	"	"	"	"	"	"

SunStar Laboratories, Inc.



Daniel Chavez For Katherine RunningCrane, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/05/15 12:00

1DU51B
T150430-04 (Soil)

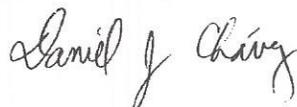
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	US/Q	ND	3.0	mg/kg	1	5022615	02/26/15	03/03/15	EPA 6010B
Barium		21	1.0	"	"	"	"	"	"
Copper		40	1.0	"	"	"	"	"	"
Lead	U	ND	3.0	"	"	"	"	"	"

SunStar Laboratories, Inc.



Daniel Chavez For Katherine RunningCrane, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/05/15 12:00

**2DU51A
T150430-07 (Soil)**

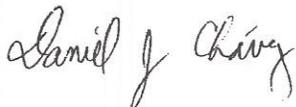
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	UT/Q	ND	3.0	mg/kg	1	5022615	02/26/15	03/03/15	EPA 6010B
Barium	24	1.0	"	"	"	"	"	"	"
Copper	35	1.0	"	"	"	"	"	"	"
Lead	37	3.0	"	"	"	"	"	"	"

SunStar Laboratories, Inc.



Daniel Chavez For Katherine RunningCrane, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Redwood National Park 121200 Highway 101 Orick CA, 95555	Project: Alder Camp Firing Range EE/CA Project Number: 001 Project Manager: Joe Seney	Reported: 03/05/15 12:00
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2DU51B
T150430-10 (Soil)

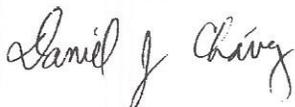
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	US/Q ND	3.0	mg/kg	1	5022615	02/26/15	03/03/15	EPA 6010B	
Barium	29	1.0	"	"	"	"	"	"	
Copper	39	1.0	"	"	"	"	"	"	
Lead	U ND	3.0	"	"	"	"	"	"	

SunStar Laboratories, Inc.



Daniel Chavez For Katherine RunningCrane, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Redwood National Park
121200 Highway 101
Orick CA, 95555

Project: Alder Camp Firing Range EE/CA
Project Number: 001
Project Manager: Joe Seney

Reported:
03/05/15 12:00

3DU51A
T150430-13 (Soil)

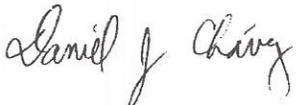
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	UT/Q	ND	3.0	mg/kg	1	5022615	02/26/15	03/03/15	EPA 6010B
Barium		18	1.0	"	"	"	"	"	"
Copper		24	1.0	"	"	"	"	"	"
Lead	U	ND	3.0	"	"	"	"	"	"

SunStar Laboratories, Inc.



The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Daniel Chavez For Katherine RunningCrane, Project Manager

Redwood National Park 121200 Highway 101 Orick CA, 95555	Project: Alder Camp Firing Range EE/CA Project Number: 001 Project Manager: Joe Seney	Reported: 03/05/15 12:00
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3DU51B
T150430-16 (Soil)

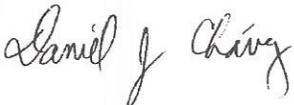
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	UJ/Q	ND	3.0	mg/kg	1	5022615	02/26/15	03/03/15	EPA 6010B
Barium		32	1.0	"	"	"	"	"	"
Copper		30	1.0	"	"	"	"	"	"
Lead	U	ND	3.0	"	"	"	"	"	"

SunStar Laboratories, Inc.



Daniel Chavez For Katherine RunningCrane, Project Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



DATA VALIDATION REPORT

National Parks Service – Alder Camp Firing Range EE/CA

SAMPLE DELIVERY GROUP: T150430f_a

Prepared by

MEC^x
12269 East Vassar Drive
Aurora, CO 80014

I. INTRODUCTION

Task Order Title: NPS – Alder Camp Firing Range EE/CA
Contract Task Order: 1488.000D.00 001
Sample Delivery Group: T150430f_a
Project Manager: P. Day
Matrix: Soil
QC Level: Data review
No. of Samples: 6
No. of Reanalyses/Dilutions: 0
Laboratory: SunStar Laboratories, Inc.

Table 1. Sample Identification

Sample Name	Lab Sample Name	Matrix	Collection	Method
1DU52A	T150430-02	Soil	2/17/2015; 1000	6010B
1DU53A	T150430-03	Soil	2/17/2015; 1000	6010B
2DU52A	T150430-08	Soil	2/17/2015; 1100	6010B
2DU53A	T150430-09	Soil	2/17/2015; 1100	6010B
3DU52A	T150430-14	Soil	2/17/2015; 1200	6010B
3DU53A	T150430-15	Soil	2/17/2015; 1200	6010B

II. Sample Management

The samples were received at ambient temperature nine days after collection. Due to the nonvolatile nature of the analytes, no qualifications were required. According to the laboratory sample receipt log for this sample delivery group (SDG), the samples were received intact. The chain-of-custody (COC) was appropriately signed and dated by field and laboratory personnel. Custody seals were intact upon receipt at the laboratory.

In addition to the six samples listed in the table above and six samples validated in a previous report, six other samples were listed on the COC. No sample collection date was listed for four of the eighteen samples and no sample time or date was listed for three of the eighteen samples. One correction to a sample identifier was made by obliterating the original entry. The correction was neither initialed nor dated. Per electronic correspondence from J. Seney of the National Parks Service, it appears the reported samples were composites of three locations; thus accounting for the additional six samples.

Data Qualifier Reference Table

Qualifier	Organic	Inorganic
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For dioxins or PCB congeners, the associated value is the quantitation limit or the estimated detection limit.	The analyte was analyzed for, but was not detected above the reported sample quantitation limit. For perchlorate, the associated value is the sample detection limit or the quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.	The result is an estimated quantity, but the result may be biased low.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may inaccurate or imprecise.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."	Not applicable.
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.	Not applicable.
T-I	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents an approximate concentration. The tentative identification represents a compound with a Chemical Abstract Service (CAS) number and fit greater than 80%.	Not applicable

Qualifier	Organic	Inorganic
T-II	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents an approximate concentration. The tentative identification represents a class of compound, and is not of sufficient identification quality to represent a specific compound.	Not applicable
T-III	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents an approximate concentration. The tentative identification represents an unknown compound.	Not applicable
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.	The data are unusable. The sample results are rejected due to serious deficiencies in meeting quality control criteria. The analyte may or may not be present in the sample.

Reason Code Reference Table

Reason Code	Organic	Inorganic
H	Holding time was exceeded.	Holding time was exceeded.
S	Surrogate recovery was outside control limits.	Not applicable.
C	Calibration percent relative standard deviation (%RSD) or percent deviation (%D) were noncompliant, or coefficient of determination (r^2) was <0.990.	Correlation coefficient (r) was <0.995.
R	Calibration relative response factor (RRF) was <0.05.	Percent recovery (%R) for calibration was outside control limits.
B	The analyte was detected in an associated blank as well as in the sample.	The analyte was detected in an associated blank as well as in the sample.
L	Laboratory control sample (LCS) or /LCS duplicate (LCSD) %R was outside the control limits.	LCS or LCSD %R was outside the control limits.
L1	LCS/LCSD relative percent difference (RPD) was outside the control limit.	LCS/LCSD RPD was outside the control limit.
Q	Matrix spike/matrix spike duplicate (MS/MSD) %R was outside control limits.	MS or MSD %R was outside the control limit.
Q1	MS/MSD RPD was outside the control limit.	MS/MSD RPD was outside the control limit.
E	Result was reported as an estimated maximum possible concentration (EMPC).	Laboratory duplicate RPD was outside the control limit.
I	Internal standard recovery was outside control limits.	Inductively coupled plasma (ICP) interference check standard (ICSA/ICSAB) result was outside control limits.
I1	Not applicable.	ICP mass spectrometer (ICPMS) internal standard recovery was outside control limits.
A	Not applicable.	Serial dilution %D was outside control limits.
M	Tuning (BFB or DFTPP) was not compliant.	ICPMS tune was not compliant.
T	The analyte was detected in an associated trip blank as well as in the sample.	Not applicable.

Reason Code	Organic	Inorganic
+	False positive – reported compound was not present.	False positive – reported compound was not present.
-	False negative – compound was present but not reported.	False negative – compound was present but not reported.
F	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.	The analyte was detected in an associated field blank (FB) or equipment blank (EB) as well as in the sample.
F1	Field duplicate RPD was outside the control limit.	Field duplicate RPD was outside the control limit.
\$	The reviewer corrected the reported result and/or other information.	The reviewer corrected the reported result and/or other information.
D	The analysis was not used because another more technically sound analysis was available.	The analysis was not used because another more technically sound analysis was available.
P	Instrument performance not compliant.	Post digestion spike recovery was outside of control limits.
*II, *III	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.	Other problems identified in the data are described in Section II, "Sample Management," or Section III, "Method Analyses." The number following the asterisk (*) will indicate the report section where a description of the problem can be found.

III. Method Analyses

A. EPA METHOD 6010B—Select Metals

Reviewed By: P. Meeks

Date Reviewed: April 21, 2015

The samples listed in Table 1 for this analysis were reviewed based on the guidelines outlined in the *Quality Assurance Project Plan, National Park Service Engineering Estimate/Cost Analysis for Redwood National Park Alder Creek Road Firing Range (2014)*, *Sampling and Analysis Plan, Firing Range Engineering Evaluation/Cost Analysis, Redwood National Park Alder Camp Road, Orick, California (2014)*, *EPA Method 6010B*, and the *National Functional Guidelines for Superfund Inorganic Data Review (2014)*.

- Holding Times: The analytical holding time, six months, was met.
- Calibration: No initial or continuing calibration data was provided by the laboratory. The data were not assessed against these criteria.
- Blanks: The method blank was assessed as per the National Functional Guidelines. There were no detects in the method blank. The laboratory did not provide continuing calibration blank results; therefore, the data were not assessed against this criterion.
- Interference Check Samples (ICSA/B): The laboratory did not provide results for the ICSA or ICSAB. The data were not assessed against these criteria.
- Laboratory Control Samples (LCS): The recoveries were within the laboratory control limits of 75-125%.
- Laboratory Duplicates: No laboratory duplicate analyses were performed on a sample in this SDG.
- Matrix Spike/Matrix Spike Duplicate (MS/MSD): MS/MSD analyses were performed on sample 1DU52A. The antimony recoveries were below 30% at 27.6% and 25.6%; therefore, nondetected antimony in the associated samples - 1DU52A, 1DU53A, 2DU52A, 2DU53A, 3DU52A, and 3DU53A - was rejected (R). The remaining recoveries and all RPDs were within the method control limits of 75-125% and $\leq 20\%$, respectively.
- Serial Dilution: No serial dilution analyses were performed on a sample in this SDG.
- Sample Result Verification: Nondetects are valid to the reporting limits.
- Field QC Samples: Field QC samples were evaluated, and if necessary, qualified based on method blanks and other laboratory QC results affecting the usability of the field QC data. Any remaining detects were used to evaluate the associated site samples.

Following are findings associated with field QC samples:

- Field Blanks and Equipment Rinsates: This SDG had no identified field blank or equipment blank.
- Field Duplicates: There were no field duplicate samples identified in this SDG.

Redwood National Park 121200 Highway 101 Orick CA, 95555	Project: Alder Camp Firing Range EE/CA Project Number: 001 Project Manager: Joe Seney	Reported: 03/25/15 16:37
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1DU52A
T150430-02(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Rev Qual/Reason

SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	R/Q	ND	0.014	3.0	mg/kg	1	5031221	03/12/15	03/13/15	EPA 6010B
Barium		14	0.0034	1.0	"	"	"	"	"	"
Copper		27	0.0015	1.0	"	"	"	"	"	"
Lead	U	ND	0.0097	3.0	"	"	"	"	"	"

Daniel J. Chang

Redwood National Park 121200 Highway 101 Orick CA, 95555	Project: Alder Camp Firing Range EE/CA Project Number: 001 Project Manager: Joe Seney	Reported: 03/25/15 16:37
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1DU53A
T150430-03(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Rev Qual / Reason

SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony R/Q	ND	0.014	3.0	mg/kg	1	5031221	03/12/15	03/13/15	EPA 6010B	
Barium	15	0.0034	1.0	"	"	"	"	"	"	
Copper	32	0.0015	1.0	"	"	"	"	"	"	
Lead U	ND	0.0097	3.0	"	"	"	"	"	"	



Redwood National Park 121200 Highway 101 Orick CA, 95555	Project: Alder Camp Firing Range EE/CA Project Number: 001 Project Manager: Joe Seney	Reported: 03/25/15 16:37
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2DU52A
T150430-08(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Rev Qual / Reason

SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	R/Q	ND	0.014	3.0	mg/kg	1	5031221	03/12/15	03/13/15	EPA 6010B
Barium		26	0.0034	1.0	"	"	"	"	"	"
Copper		37	0.0015	1.0	"	"	"	"	"	"
Lead		46	0.0097	3.0	"	"	"	"	"	"



Redwood National Park 121200 Highway 101 Orick CA, 95555	Project: Alder Camp Firing Range EE/CA Project Number: 001 Project Manager: Joe Seney	Reported: 03/25/15 16:37
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2DU53A
T150430-09(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Rev Qual / Reason

SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	R/Q	ND	0.014	3.0	mg/kg	1	5031221	03/12/15	03/13/15	EPA 6010B
Barium		24	0.0034	1.0	"	"	"	"	"	"
Copper		36	0.0015	1.0	"	"	"	"	"	"
Lead		28	0.0097	3.0	"	"	"	"	"	"



Redwood National Park 121200 Highway 101 Orick CA, 95555	Project: Alder Camp Firing Range EE/CA Project Number: 001 Project Manager: Joe Seney	Reported: 03/25/15 16:37
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3DU52A
T150430-14(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Rev Qual / Reason

SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	R/Q	ND	0.014	3.0	mg/kg	1	5031221	03/12/15	03/13/15	EPA 6010B
Barium		24	0.0034	1.0	"	"	"	"	"	"
Copper		24	0.0015	1.0	"	"	"	"	"	"
Lead	U	ND	0.0097	3.0	"	"	"	"	"	"



Redwood National Park 121200 Highway 101 Orick CA, 95555	Project: Alder Camp Firing Range EE/CA Project Number: 001 Project Manager: Joe Seney	Reported: 03/25/15 16:37
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3DU53A
T150430-15(Soil)

Analyte	Result	MDL	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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Rev Qual / Reason

SunStar Laboratories, Inc.

Metals by EPA 6010B

Antimony	B/Q	ND	0.014	3.0	mg/kg	1	5031221	03/12/15	03/13/15	EPA 6010B
Barium		23	0.0034	1.0	"	"	"	"	"	"
Copper		23	0.0015	1.0	"	"	"	"	"	"
Lead	u	ND	0.0097	3.0	"	"	"	"	"	"

SunStar Laboratories, Inc.

Daniel J. Chavez

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.