



IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE

LASSEN VOLCANIC NATIONAL PARK

Post Office Box 100
Mineral, CA 96063-0100

L7615 (LAVO)

Memorandum

To: Martha Lee, Acting Director, Pacific West Region

From: James Richardson, Superintendent, Lassen Volcanic National Park

Through: Stephen J. Mitchell, PE, Operations/Environmental Programs Branch Chief,
Pacific West Region

Subject: Approval for CERCLA Non-Time-Critical Removal Action at the Former
Firing Range, Lassen Volcanic National Park

1.0 PURPOSE AND AUTHORITY

The purpose of this Action Memorandum (AM) is to request approval of and document the basis for the proposed non-time-critical removal action (NTCRA) described herein for the Former Firing Range (Site) located approximately 1,500 feet west of the western boundary of Lassen Volcanic National Park on Federal lands managed by the Hat Creek Ranger District, Lassen National Forest, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, (CERCLA), 42 U.S.C. §§ 9601 *et seq.* The President has delegated response authority under CERCLA Section 104 to the Secretary of the United States Department of the Interior (DOI) by Executive Order 12580, 52 Fed. Reg. 2923 (1987), as amended by Executive Order 13016, 61 Fed. Reg. 45871 (1996), to respond to the release or substantial threat of release of hazardous substances on or from land under the jurisdiction, custody, or control of DOI. The National Park Service (NPS) Pacific West Regional Director, through further delegations, has CERCLA Section 104 response authority for the Site. If this action is approved, on-Site work is anticipated to start in June or July 2018.

2.0 SITE CONDITIONS AND BACKGROUND

The following sections provide the Site description (2.1), previous and current actions to date (2.2), and State and local authority's role and actions to date (2.3). The Site description includes the removal Site evaluation, physical location, site characteristics, and the potential release of hazardous contaminants.

2.1 Site Description

The Site is located approximately 1,500 feet (ft) west of the western boundary of Lassen Volcanic National Park, on Federal lands managed by the Hat Creek Ranger District, Lassen National Forest (Figure 1). The Site was operated under conditions of a Special Use Permit from the Forest Service from 1974 to 2002 (ENPLAN, 2013) and has been closed since 2002. Prior to 1974, the property consisted of undeveloped land. No prior uses of the firing range are known. During the period of use, the entrance to the firing range was gated and closed to the public. The firing range was used solely by National Park Service Rangers, Fish and Game Wardens, and Forest Service Law Enforcement Officers. During use of the range, lead bullets accumulated in the backstop berm and were not removed from the Site, many of which are still visible on the surface of the backstop berm.

2.1.1 Removal Site Evaluation

A removal action is appropriate for this site to address the contamination of soil due to the Site firing range use. The contaminant of potential concern (COPC) at this Site is lead. Although additional contaminants such as antimony and copper typically correspond to firing range remnants as well, lead is of primary concern due to the large quantity of lead bullet remains at the Site surface.

A previous Preliminary Assessment (PA) determined roughly 10,000 rounds of lead ammunition were used during Site operation. Due to the substantial amounts of estimated contamination and noticeable bullets on the Site, the PA recommended a Site Inspection be conducted.

In November 2015, Resource Environmental Management Consultants, Inc. (REMC) performed a Site Inspection (SI) to further investigate the extent of lead contamination. Incremental sampling methodology (ISM) was utilized for sample collection. Two decision units (DU) were identified in areas of expected or noted contamination at the Site. One ISM surface soil sample (0-2 inches) was collected from DU-1, comprising the firing line area soils, with one replicate ISM sample collected from the same location. Another ISM surface soil sample (0-2 inches) was collected from the backstop berm soil (DU-2), with one replicate from the same location. In addition to these two DUs, one ISM sample was collected outside of the site boundaries (DU-3) for background comparison. Figure 2 presents the location for each DU. All samples were analyzed for lead and those samples with values higher than 50 mg/kg were

analyzed for soluble lead using Soluble Threshold Limit Concentration (STLC) and Synthetic Precipitation Leaching Procedure (SPLP).

The sampling process during the SI determined that lead concentrations in soils at the Site exceeded background concentrations and human health and ecological screening values by large margins. The analysis of the samples also classified a portion of the Site's soils as hazardous waste per Title 22 of the California Code of Regulations (CCR). Further human health and ecological risk assessment of the SI data during the Engineering Evaluation/ Cost Analysis (EE/CA) confirmed that Site lead concentrations posed an unacceptable risk to human and ecological receptors.

The extent to which lead associated with the firing range may have migrated is not thoroughly understood; however, lead impacts to groundwater and surface water are not considered highly likely due to the lack of water bodies near the Site.

2.1.2 Physical Location

The Site is located in Lassen Volcanic National Park, Shasta County, California approximately one-quarter mile southwest of the Manzanita Lake Housing Compound, and is accessed via a dirt road originating at the Manzanita Lake Housing Compound. The firing range is in the northeast quarter of Section 13, Township 31 North, Range 3 East, Mount Diablo Base and Meridian. The geographic coordinates are 40° 32' 17.52" North latitude and -121° 35' 1.32" West longitude. The elevation of the property is approximately 5,680 feet above sea level.

The Site is relatively flat, with an earthen berm that was used as a backstop located on the southern end. The backstop berm measures approximately 65 feet long, 8 feet wide and 6 feet high. A small out building is located approximately 50 feet west of the backstop berm. Additional features at the Site include a row of 11 treated 6"x 6" wood posts set into the ground, a second row of 13 untreated 6"x 6" wood posts set into the ground and connected by approximately 50 feet of cable used to hold targets, two pieces of galvanized pipe set into the ground, and sixteen 6"x 6" by 2-foot-long concrete blocks used to mark shooting places. The Site has minimal vegetation and has some gravel cover.

2.1.3 Site Characteristics

The Site was in operation as a pistol range between 1974 to 2002, through a Special Use permit between the Forest Service and the National Park Service. The permit expired in 2002 and the Site has remained unused from approximately 2003 to the present. No prior uses of the firing range are known. During the period of use, the entrance to the firing range was gated and closed to the public. The Site was used solely by National Park Service Rangers, Fish and Game Wardens, and Forest Service Law Enforcement Officers.

2.1.4 Release or Substantial Threat of Release into the Environment of a Hazardous Substance, or Pollutant or Contaminant

Lead is considered a persistent, bio-accumulative and toxic (PBT) hazardous substance that has the potential to cause adverse impacts to human health and the environment. Lead was detected in all samples and concentrations at the Site ranged from 16.1-4,570 mg/kg (Table 1). Two samples contained lead concentrations greater than 50 mg/kg and were subjected to solubility testing via the STLC procedure. STLC results are presented in Table 1 and indicate the backstop berm soils would be classified as hazardous waste per Title 22 of the California Code of Regulations. Since two samples exceeded STLC regulatory limits (>5 mg/L), these samples were also subjected to solubility testing via the SPLP. SPLP results for both samples were non-detect at a reporting limit of 0.01 mg/L, indicating lead present in the backstop berm soils is non-soluble under normal weathering conditions (REMC, 2016).

Table 2 summarizes Federal and State human health and ecological screening values, the Site data and the screening exceedances. In making comparisons between Site data and screening values, it is important to note that screening values are 1) intended to identify contaminants of potential concern (COPCs) and 2) are based on specific exposure assumptions that may or may not be appropriate for a Site. For example, residential screening levels assume full-time residential exposure at the Site for 24 hours per day and ecological screening values are based on the assumption that an ecological receptor is also exposed 24 hours per day at the Site. Once COPCs are identified, it is then important to consider how and when potential receptors may be exposed to Site contamination.

The background sampling showed that lead was found adjacent to the Site; however, in lower concentrations than the areas of concern. Therefore, the background sampling validates the assumption that lead contamination is due to the Site's former uses.

Human Health SRE

Based on the review of the current and potential land and water uses and the results of previous investigations, a Human Health Streamlined Risk Evaluation (SRE) was conducted. The exposure route evaluated for potential current and future human receptors included direct contact (ingestion and dermal absorption) with surface soils. Potential current and future receptors included Site workers (NPS and Forest Service staff and subcontractors) and recreational visitors.

A COPC screening process was conducted to identify which, if any, DUs had lead concentrations in the surface soil that could pose a potential risk to human receptors. The COPC screening process included a comparison of lead concentrations to the minimum of the USEPA *Residential and Industrial Regional Screening Levels* (RSLs, USEPA, 2016), California Department of Toxic Substances Control *Residential and Industrial Screening Levels* (DTSC-SLs, DTSC, 2016), and CalEPA Office of Environmental Health Hazard Assessment (OEHHA) *Residential and Industrial Human Health Screening Levels*

(CHHSLs, CalEPA, 2010). Based on this comparison, lead was determined to be a Site COPC for human health within DU-2.

Site Workers

In order to address potential lead exposure to Site workers, lead concentrations were compared against the USEPA Industrial Soil RSL and the California Water Board (CWB) Construction Worker ESL to develop noncancer Hazard Quotient (HQs). The Site Worker resulted in HQs of 3.2 and 16 based on the USEPA Industrial Soil RSL and the CWB Construction Worker ESL, respectively. Both HQs exceeded the USEPA noncancer benchmark of 1.0, indicating that adverse health effects are likely to occur.

In order to address exposure to lead to the fetus of an exposed Site worker, the USEPA Adult Lead Model (ALM) (USEPA, 2009) was run. The ALM estimates fetal blood lead concentrations in women exposed to lead-contaminated soil in non-residential scenarios and estimates the probability that blood lead levels will exceed 10µg/dL. USEPA's risk reduction goal for lead is that individuals exposed would have no more than a 5% probability of exceeding the level of concern of 10µg/dL. The ALM estimated that the blood lead concentration among fetuses born to women Site workers exposed to soil at the Site would be 22.4 µg/dL, which is higher than the USEPA established level of concern of 10µg/dL. The probability that the fetal blood lead concentration exceeds 10µg/dL was 39.11% for pregnant Site workers exposed to soil. USEPA's target probability is 5 percent or less. Therefore, the results of the ALM indicated that adverse effects are anticipated for fetuses of pregnant workers exposed to lead in surface soil at the Site.

Recreational Visitors

In order to address child recreational visitor exposure to lead in soil at the Site, the USEPA Integrated Exposure Uptake Biokinetic (IEUBK) model was evaluated (USEPA, 1994c and 2007). The IEUBK Model estimates blood levels of lead in children (under 7 years of age). The model results estimated that the blood lead concentration among child recreational visitors exposed to soil at the Site would be 3.026 µg/dL. This estimate is less than EPA's established level of concern of 10 µg/dL. The probability that the child's blood lead concentration exceeds 10µg/dL was 0.549%, which is less than EPA's target probability of 5% or less.

The USEPA ALM was also used to characterize blood lead levels to the fetus of an exposed adult recreational visitor. The ALM estimated that the blood lead concentration among fetuses born to adult recreational visitors exposed to soil at the Site would be 4.4 µg/dL, which is less than USEPA's level of concern of 10µg/dL. The probability that the fetal blood lead concentration exceeded 10µg/dL was 0.12% for pregnant recreational visitors exposed to soil, which is less than USEPA's target probability of 5% or less. Therefore, exposure to lead in Site soil to adult and child recreational visitors would likely not result in adverse health effects.

Human Health Preliminary Remediation Goal

The ALM was also used to calculate a human health preliminary remediation goal (PRG) based on exposure to lead to the fetus of an exposed adult Site worker and/or child recreational visitor. Because the exposure assumptions were more conservative, the Site worker, rather than the pregnant adult or child recreational visitor, was used for the PRG calculation. The lead PRG for the fetus of a pregnant Site worker was determined to be 981 mg/kg.

Ecological SRE

The ecological SRE documents the potential exposure and risks to ecological receptors exposed to soil contamination within the Site.

Multiple tropic levels were evaluated in this SRE. Communities evaluated in the SRE included vascular plants, soil invertebrates, invertivorous birds, and invertivorous mammals. Surface soil concentrations were compared to soil-based Ecological Screening Values (ESVs) in order to identify contaminants of potential ecological concern (COPECs). ESVs for the COPEC screening were obtained from the *NPS Protocol for the Selection and Use of Ecological Screening Values for Non-Radiological Analytes* (2016). For the COPEC screening of plants and soil invertebrates, the minimum ESV of plant and soil invertebrate was used. Similarly, for the birds and mammals, the lower of the two ESVs was used. Based on these comparisons, lead was determined to be a Site COPEC in DUs 1 and 2.

The HQ calculated in the ecological SRE reflects the magnitude by which a sample concentration or dose exceeded or was less than the ESV. In general, if an HQ exceeds 1, the potential for the exposure to elicit an adverse effect is possible. As part of the HQ determination for mammal and avian species, an area use factor (AUF) was developed based on the surrogate bird and mammal species selected for the Site. The AUF is defined as the ratio of the site area to the receptor's home range and is the probability that a receptor will be exposed to contamination throughout its home range. Home ranges for the surrogate bird (American robin, *Turdus migratorius*; HR=2) and the surrogate mammal (Ornate shrew, *Sorex ornatus*; HR=1) were obtained from the Wildlife Exposure Factors Handbook (USEPA, 1993b) and Cal/Ecotox, 1999.

Based on the results of the risk evaluation, the plant community at the Former Firing Range was determined to be at risk of phytotoxic effects from exposure to lead at DU-2 (HQ=21). The soil invertebrate community also resulted in a risk for lead exposure at DU-2 with an HQ slightly greater than 1 (HQ=1.5).

The avian community and mammalian community resulted in risk for lead at DU-2 (HQ=36 and HQ=46, respectively).

Ecological Preliminary Remediation Goals

Site-specific ecological soil PRGs were developed using avian and mammalian receptor dietary exposure modeling using both NOAEL- and LOAEL-based TRVs. Ecological PRGs were modeled for invertivorous avian and mammalian species that are expected to potentially forage on or near the Site. Ecological PRGs ranged from 113 – 598 mg/kg. The

more conservative PRGs were Avian based PRGs which were calculated as 265 mg/kg (NOAEL-based) and 598 mg/kg (LOAEL-based). The mammalian PRGs were slightly more conservative with a NOAEL-based PRG of 113 mg/kg and a LOAEL-based PRG of 245 mg/kg.

Site Preliminary Remediation Goal

The overall site remediation goal will be the following:

Chemical	Remediation Goal (mg/kg)	Basis for Remediation Goal
Lead	113	Protection of Mammals

This soil remediation goal is based on the lowest calculated PRG. PRGs for DU-2 were calculated for both human health and ecological receptors. Human health PRGs were based on lead exposure to the fetus of an exposed pregnant adult Site worker and/or child recreational visitor. The calculated lead PRG for the fetus of a pregnant Site worker was determined to be 981 mg/kg.

Ecological PRGs were calculated for both birds and mammals. Calculated site-specific ecological PRGs considered to be “no effect” values ranged from 113 mg/kg for mammals to 265 mg/kg for birds.

2.1.5 National Priorities List (NPL) Status

The Former Firing Range Site is not listed or proposed for listing on the NPL.

2.2 Previous and Current Actions to Date

Other than the site investigations, there have been no government or private actions undertaken on Site. This NTCRA will be the only removal action to be undertaken at this Site.

2.3 State and Local Authorities Role and Actions to Date

The NPS is the lead agency for this Site. No State or local actions have been performed at the Site to date.

3.0 THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT AND STATUTORY AND REGULATORY AUTHORITIES

As a direct result of the past use, the Site contains lead contaminated surface soils. During use of the range, lead bullets accumulated in the backstop berm and were not removed from the Site. Some bullets are still visible on the surface of the backstop berm. The materials found on the Site include bullet shells, casings and debris.

The location of the Site DUs is illustrated in Figure 2. Lead at DU-2 is the soil COPC for human health, and lead at DU-1 and DU-2 is the soil COPC for ecological receptors. In addition, the backstop berm soils (DU-2) are classified as hazardous waste per Title 22 of the California Code of Regulations; demonstrating the Site contains unacceptable risks to both human and ecological receptors.

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) is the implementing regulation for CERCLA, and 40 C.F.R. Section 300.415(b)(2) sets forth the factors the NPS shall consider to determine whether a removal action is appropriate. Those factors applicable to this NTCRA include the following:

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

There is potential exposure to individuals who travel on or near the Site due to the high levels of lead contamination found in surface soil. For example, Site workers or the public could be exposed to hazardous lead concentrations in soil. Plants, soil invertebrates, birds and mammals who utilize this area could also be exposed to hazardous lead concentrations in soil.

- **High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface that may migrate.**

Site contamination is largely concentrated in surface soil (0-3 inches) and has the potential to migrate. The Site is located in a porous geologic area which allows for possible infiltration of rain water into the below permeable rock units. Although groundwater depths in the area range from 100 to 150 ft below ground surface (bgs), leaching concerns remain due to the high concentration of lead contamination at the surface.

Migration of lead contaminants to surface water would likely only occur over a long time span due to the area's permeable geology. The nearest surface water, Manzanita Creek, is 750 ft south and 230 feet higher in elevation than the Site. Manzanita Creek is the drinking water source of all residents in the area. In addition, Manzanita Lake, an impoundment of Manzanita Creek, is known to support the threatened rainbow trout which allows for the possibility of rainbow trout presence in Manzanita Creek during the winter and spring seasons when water is present.

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

This Site receives an average of 42.5 inches of rainfall annually and roughly 190 inches of snowfall. From mid-October to early June much of the park is covered with snow. Such high levels of snowfall account for large amounts of snow melt, which in turn cause increased migration possibilities. Excavation should be

conducted during summer or early fall when precipitation is low and snowmelt has ended, reducing unwanted migration of contaminants.

4.0 ENDANGERMENT DETERMINATION

An actual release or substantial threat of release of hazardous substances at the Site, if not addressed by implementing the response action selected in this action memorandum, poses a threat to public health and the environment. This NTCRA is necessary in order to abate, prevent, mitigate or eliminate the threat posed by the release or substantial threat of release of these substances. Migration of contamination to surrounding areas is of concern. The removal of debris and contaminated soil from the Site is expected to mitigate, if not eliminate, threats to human health and the environment associated with the COPCs at this Site.

5.0 PROPOSED ACTIONS AND ESTIMATED COSTS

Due to the small size of the Site (0.31 acres), the area planned for debris and soil removal will be delineated based on the distribution of debris and soil contaminant concentrations exceeding the PRG (113 mg/kg).

As part of the NTCRA, NPS will excavate near-surface soils (0-4 inches) and debris contaminated with lead. The contractor will be required to remove the contaminated soil from the Site and transport the material to an approved disposal facility(s). While the material has not yet been fully characterized for disposal, the identified concentrations of lead at the Site meet the criteria for non-RCRA (California) and RCRA hazardous waste. The lead-containing material will likely be required to be disposed of in a RCRA Class I landfill unless solubility (TCLP) testing confirms it is not hazardous. The nearest cost-effective RCRA Class I Landfill is the US Ecology Landfill in Beatty, Nevada. This landfill is also equipped to stabilize the lead to reduce its leachability before interment.

After completion of the NTCRA, soil confirmation sampling will be conducted to ensure that the Site soil concentrations are at or below the remediation goals. NPS will complete the NTCRA by restoring the natural contours of the Site and monitoring Site re-vegetation to ensure that, over time, appropriate native vegetation associations and densities on-Site reflect pre-NTCRA conditions.

Work is planned to be initiated in June or July 2019 after snowmelt but prior to the next wet season to reduce the potential risk of contamination migrating off-Site. Overall construction, materials transport, and disposal is estimated to take approximately 1-2 weeks of on-Site work, and is planned to occur between June and October 2019. If at any point in time the NPS believes that the net environmental impacts of achieving

the remediation goals outweigh the net environmental benefits, the remediation goals may be revised to reflect background or other defensible criteria.

5.1 Description of Proposed Action

Removal of Impacted Soil and Debris

The estimated total volume of material assessed in this removal action is 115 cubic yards (cy), based on the areas and depths of the two impacted areas, DU-1 and DU-2, reported in the 2016 SI. The estimated volume of site material exceeding the STLC for lead is 13 cy – comprising the shallow soil cover of decision unit, DU-2. As described in Section 3 of the EE/CA, there is the potential for the SI findings to have included dilution of lead concentrations identified in DU-1. Supplemental site investigation may be warranted to prevent potentially elevated concentrations of lead to remain in shallow soil in portions of DU-1. Supplemental investigation could comprise the extension of DU-2 confirmation sampling into the southern DU-1 area, and spot cleanup as required to meet the PRG.

Excavated soil and debris will be placed in 20 cy bins for transport off-Site to a landfill licensed to accept the waste. The contaminated soil and debris bins will be placed in trucks for ground transport to an approved disposal site. Site restoration will be limited to grading at the time of soil removal. Appropriate erosion control measures will be implemented to minimize erosion from exposed soils.

NPS will collect confirmatory samples to verify that soils remaining after the removal action are at or below the PRG. Materials will be disposed of in an approved, USEPA-compliant landfill licensed to accept the material based on designation and classification of the contaminated materials. Removed material will be managed in accordance with all applicable federal, state, and local requirements.

Risks to Human Health and the Environment Associated with the Work

A small increase in short-term risk to human health and the environment may be encountered during the excavation and transport phase of this work. Work will be conducted in accordance with OSHA health and safety protocols for working with hazardous substances. Impacts associated with construction activities are considered short term, and should not significantly impact human health or the environment.

Short-term air quality impacts to the immediate vicinity may occur during removal of debris and contaminated soils. Control of fugitive dusts may be required on-Site and will be conducted by wetting soils as required. Additional NTCRA activities that could cause the spread of contamination within or from the contaminated zone will need to be mitigated, including excavation activities, transport of materials on the dirt access road, and other removal work activities.

All materials removed from the Site will be transported in covered trucks and/or containers from the site to the selected disposal facility. The Site will remain closed to public access throughout implementation of the NTCRA.

5.2 Contribution to Remedial Performance

In evaluating the appropriateness of a NTCRA, the NPS must consider whether the removal action would contribute to the efficient performance of any anticipated long-term remedial action with respect to the release concerned [NCP § 300.41 5(d)], as well as the availability of other appropriate federal or state response mechanisms to respond to the release of hazardous substances [NCP § 300.415(b)(2)(vii)]. This NTCRA will entail excavation and disposal of contaminated soil located at the Former Firing Range, thereby minimizing risks to human health and the environment and mitigating, if not eliminating, the source of the contamination (determined based on post-removal confirmation sampling). Future response actions at the Site are not expected based upon available information.

5.3 Applicable or Relevant and Appropriate Requirements

In the context of a NTCRA, site activities are subject to all applicable federal, state, and local laws and regulations, and all on-site project activities must attain ARARs under federal and state environmental laws and facility siting laws that the NPS determines to be practicable considering the exigencies of the situation (CERCLA Section 121(d); NCP Section 300.4150)).

In order to determine whether a particular ARAR is applicable under the exigencies of the situation, the NPS has considered the scope of the response action to be conducted, the urgency of the situation, and other appropriate factors (40 C.F.R. § 300.4150)). The NPS has identified the federal and state ARARs set forth below for this NTCRA and that additional federal and state ARARs may be identified and added to project requirements.

1. The NTCRA must be conducted in compliance with the NPS Organic Act of 1916 (codified at 16 U.S.C. §§ 1-3), which requires management of units of the National Park System so as to leave them "unimpaired" for future generations. *See* the implementing regulations (36 CFR Parts 1-79), and in particular, *see* 36 CFR Part 2 regarding preservation of natural, cultural, and archeological resources.
2. Treatment, storage, and disposal of waste and excavated soils must comply with all applicable state and federal laws, including applicable provisions in the Resource Conservation and Recovery Act (42 U.S.C. §§ 7401-7642; 40 CFR §§ 264 and 265), Hazardous Waste Regulations (California Code of Regulations (CCR) Title 22), and provisions governing solid waste disposal in National Parks (codified at 16 U.S.C. §§ 4601-22(c) *et seq.*) and related implementing regulations (codified at 36 CFR Part 6). This project must comply with CERCLA Section 121(d)(3) ("off-site rule"), which requires that hazardous substances, pollutants, and contaminants that must be transferred off-site as a result of CERCLA response activities must be managed at a facility operating in compliance with federal and state laws. The

NCP's "off-site rule" implementing regulations (40 CFR § 300.440) define facility acceptability and create procedures for obtaining and reviewing acceptability determinations.

3. Regulations describing monitoring and assessment of all areas where waste has been discharged to the land, including a determination of the spatial distribution and concentration of each constituent (CCR Title 23, Sections 2550.7 and 2550.9; and CCR Title 27, Sections 20415 and 20425).
4. Laws and regulations protecting threatened and endangered species present at the Site, including the Endangered Species Act (e.g., 16 U.S.C. §§ 1531-1544, 50 CFR Part 402).
5. The NTCRA is required to avoid, minimize, or mitigate impacts to historic sites or structures and must be conducted in compliance with the National Historic Preservation Act (16 U.S.C. § 470f; 36 CFR Parts 60, 63, and 800), the Archeological Resources Protection Act (43 CFR Part 7), the American Indian Religious Freedom Act (42 U.S.C. § 1996), the Native American Graves Protection and Repatriation Act (43 CFR Part 10), and Executive Order 13007.

Additionally, the following are other factors "to be considered" (TBCs) that provide useful standards or policy direction for this NTCRA.

1. Section 4.1.5 of the *2006 NPS Management Policies* provides: "The Service will reestablish natural functions and processes in parks unless otherwise directed by Congress-....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."
2. NPS Reference Manual (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).
3. *PS-28: Cultural Resource Management Guidelines* 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.

5.4 Project Schedule

NPS plans to begin excavating soil in June or July 2019, depending on weather. The transportation of the material off-Site is anticipated to occur upon completion of the soil excavation. Site restoration via limited grading at the time of soil removal will be the last phase of the NTCRA.

5.5 Estimated Costs

Projected total costs for the NTCRA, including design, contracting, oversight, and contingency, are estimated to be \$44,560. The estimated additional (contingency) cost to remove potentially lead-impacted soil from the southern half of DU-1 is \$58,175.

There are no long-term operations, maintenance, or monitoring costs associated with this removal action as all contaminants above the unrestricted use standard PRG will be removed.

6. EXPECTED CHANGE IN SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If the proposed NTCRA is delayed or not taken, hazardous concentrations of lead will continue to be released, or there is a substantial threat of such release, at the Site that continues to pose a risk to ecological receptors in particular, and, to a lesser extent due to the remote location, Forest Service or NPS employees or the public.

7. OUTSTANDING POLICY ISSUES

No outstanding policy issues exist for this NTCRA.

8. RECOMMENDATION

This decision document presents the selected NTCRA for the Former Firing Range site, located within 1500 ft of the Lassen Volcanic National Park western boundary on Federal lands managed by the Hat Creek Ranger District, Lassen National Forest, which was developed in accordance with CERCLA, as amended, and is not inconsistent with the NCP.

Conditions at the Site meet the NCP Section 300.415(b) criteria for a non-time critical removal action and through this document; I am approving the proposed NTCRA.

On the basis of the evaluation conducted and the factors outlined in the NCP, the NPS has determined that the release or substantial threat of release of hazardous substances at the Site pose a risk to human health and the environment, and that a NTCRA is necessary and appropriate in order to abate, prevent, mitigate or eliminate the threat posed by the release or substantial threat of release of these substances. Because conditions at the Site meet all

applicable CERCLA and NCP criteria for undertaking a NTCRA, I
recommend/concur/approve that the NPS implement the NTCRA as proposed herein.

Recommended: Deirdre Hanners Date: 1/19/18

Deirdre Hanners
Environmental Protection Specialist
Lassen Volcanic National Park

Concurred: Jim Richardson Date: 1/19/18

James Richardson
Superintendent
Lassen Volcanic National Park

Concurred: Stephen J. Mitchell Date: 1/23/18

Stephen J. Mitchell, PE
Operations/Environmental Programs Branch Chief
National Park Service, Pacific West Region

Approved: Ken Handwerker Date: 1/26/2018

For Martha Lee
Acting Regional Director
National Park Service, Pacific West Region

TABLE 1 – LABORATORY RESULTS

Location	Sample	Lead	STLC	SPLP
DU - 1	LAVO-DU-1 (0-2")	18.8	NA	NA
	LAVO-DU-1A (0-2")	16.1	NA	NA
DU - 2	LAVO-DU-2 (0-2")	567	60	ND
	LAVO-DU-2A (0-2")	4,570	58.9	ND
DU - 3 (Background)	LAVO-DU-3 (0-2")	5.5	NA	NA

TABLE 2 -- SUMMARY OF SITE SOIL DATA AND SCREENING VALUE EXCEEDANCES.

LAVO Former Firing Range	Reporting Units		Human Health								Ecological			DU-1		DU-2		Background DU-3*		Human Health COPC ^a	Exceeds Soil-GW SSL	Ecological COPC ^b		
	EPA RSLs (Residential)	EPA RSLs (Industrial)	DTSC-SLs (Residential)	DTSC-SLs (Industrial)	CHHSLs (Residential)	CHHSLs (Industrial)	CHHSLs (Residential)	CHHSLs (Industrial)	Final SL	EPA Soil-GW SSLs	NPS ESVs (Plants & Soil Invertebrates)	NPS ESVs (Birds & Mammals)	Final ESV	LAVO-DU-1	LAVO-DU-2	LAVO-DU-2	LAVO-DU-2	LAVO-DU-3*	11/12/2015				11/12/2015	
Total Lead	400	800	80	320	80	320	80	320	80	14	50	0.94	0.94	18.8	16.1	567	4570	5.5	11/12/2015	11/12/2015	11/12/2015	YES DU-2	YES DU-1/DU-2	YES DU-1/DU-2
Soluble Lead (STLC)																60	58.9							
Soluble Lead (SPLP)																ND	ND							

Notes:

- EPA RSLs = Environmental Protection Agency (EPA) Regional Screening Levels (RSL) (May, 2016)
- EPA Soil-GW SSLs = EPA soil to groundwater screening values obtained from the RSL Table (May, 2016).
- CHHSLs = California Human Health Screening Levels (CHHSL) (CalEPA, 2010)
- DTSC-SLs = California Department of Toxic Substances Control Human Health Screening Levels (June 2016).
- Final SL = Minimum of available human health residential and industrial screening levels.
- NPS ESV = National Park Service Ecological Screening Value for SLERA COPEC Selection (NPS February 2016 Revision 2, Tables 5 and 6).
- NPS ESV Final = Minimum of plants and soil invertebrates ESV and birds and mammals ESV.
- ^a Human Health Contaminants of Potential Concern (HH COPCs) selected based on detected concentrations in exceedance of Final SL. Shaded values indicate HH COPCs.
- ^b Ecological Contaminants of Potential Ecological Concern (COPECs) selected based on detected concentrations in exceedance of Final ESV. Bolded values indicate Ecological COPECs.
- *LAVO-DU-3 D from Site Investigation was not included. Sample is a laboratory duplicate and not representative of the sample set. LAVO-DU-3 is site specific background concentration.
- ND = not detected.

Bold values indicate exceedances of Final ESV.

Shaded values indicate exceedances of Final SL.

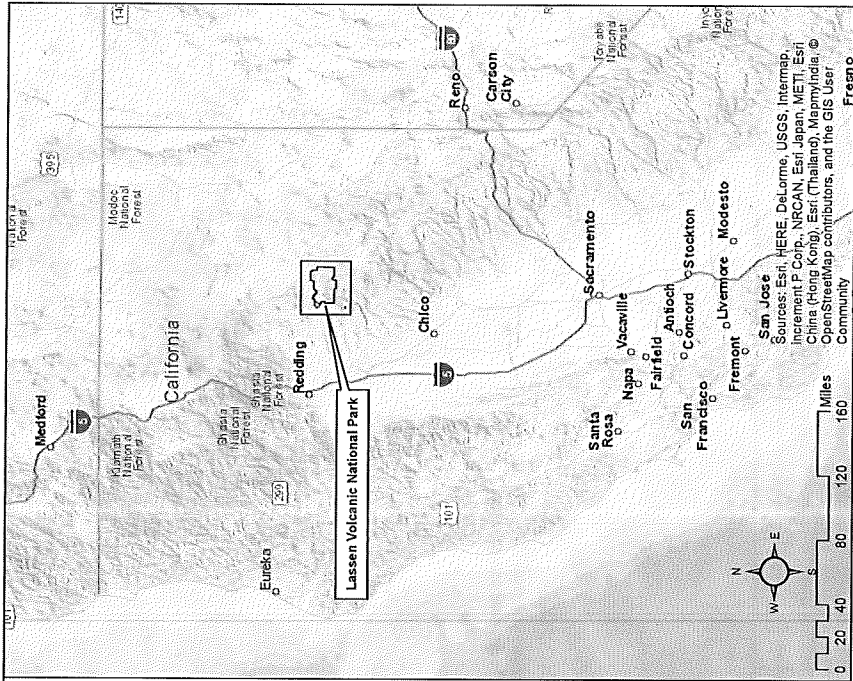
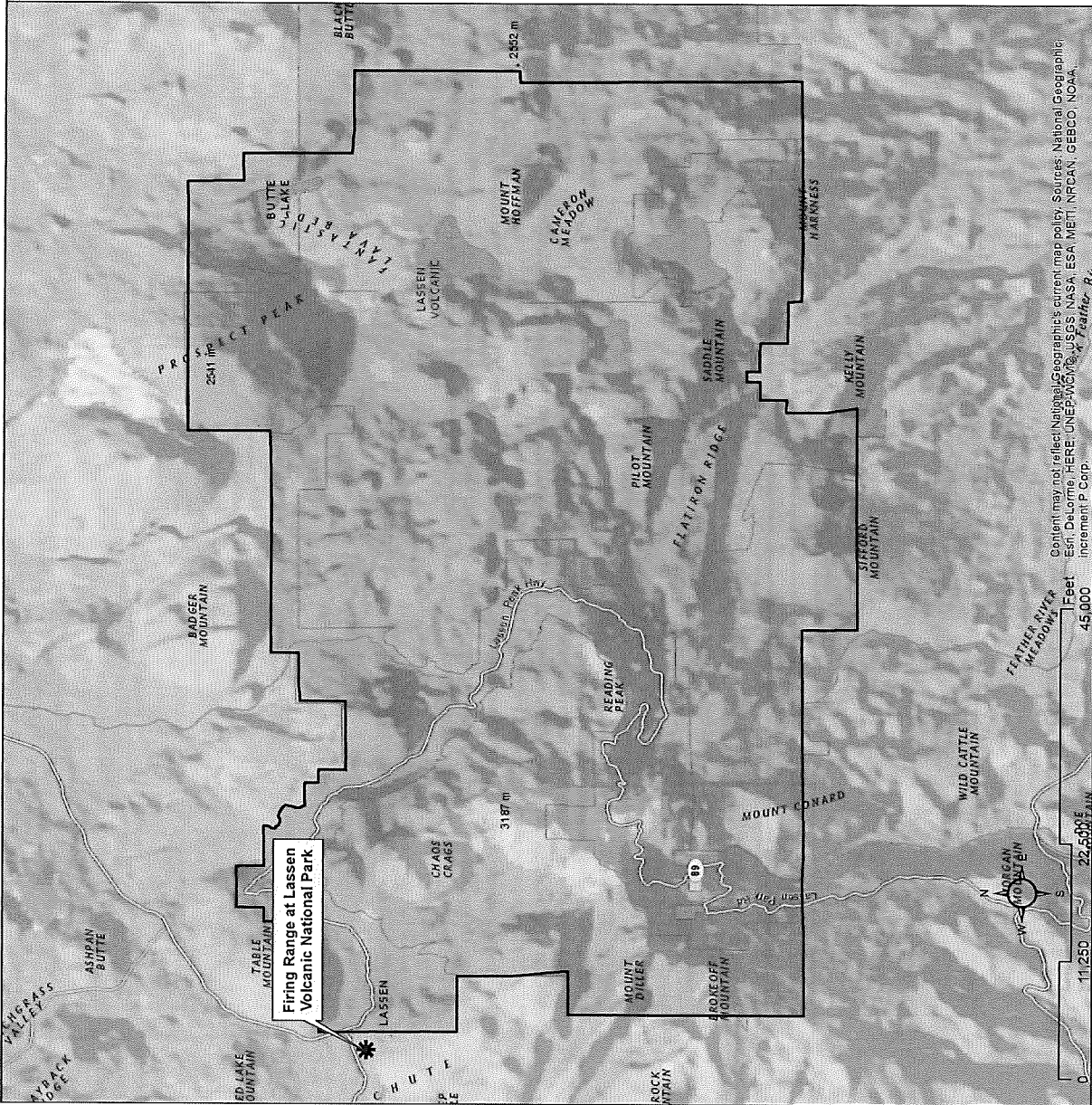


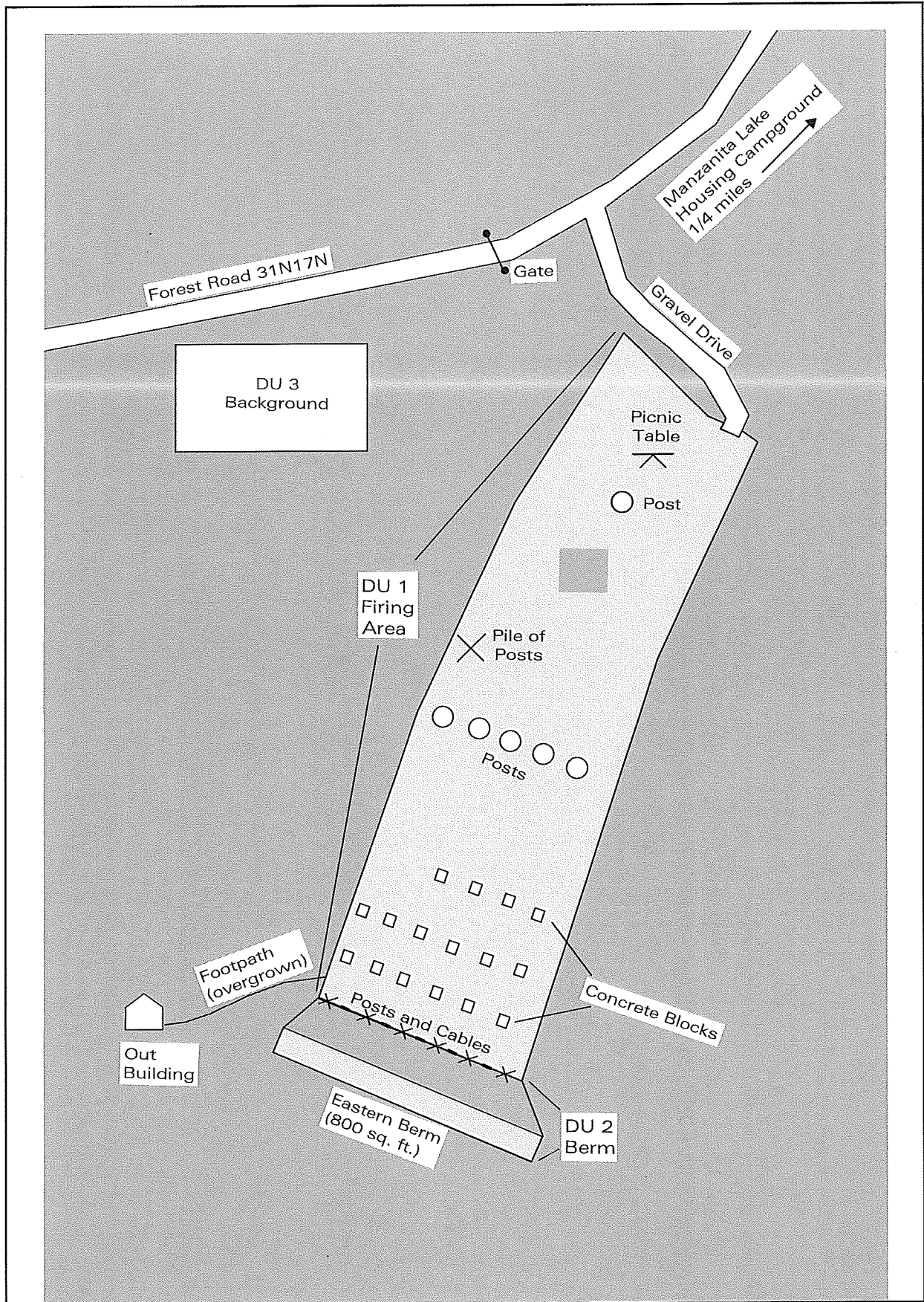
FIGURE 1

SITE LOCATION MAP
SPECIAL USE FIRING RANGE

U.S. DEPARTMENT OF THE INTERIOR,
NATIONAL PARK SERVICE
LASSEN VOLCANIC NATIONAL PARK
SHASTA COUNTY, CALIFORNIA



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NOTES:
LOCATIONS NOT SURVEYED

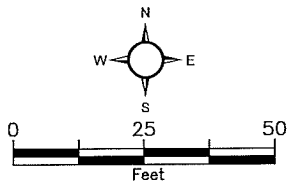


FIGURE 2
 SAMPLE LOCATION MAP
 SPECIAL USE FIRING RANGE
 LASSEN VOLCANIC NATIONAL PARK
 SHASTA COUNTY, CALIFORNIA
AVATAR
 ENVIRONMENTAL

