Executive Summary

The purpose of this Engineering Evaluation/Cost Analysis (EE/CA) Executive Summary is to highlight the key information contained in the EE/CA Report. The Executive Summary contains a summary of the site description, including investigation results and an updated conceptual site model based on these results. A summary of the risk assessment and of applicable or relevant and appropriate requirements (ARARs) is also included along with the scope and objectives of the removal action. The final sections of the Executive Summary provide information on the removal action alternatives analyzed and the recommended removal action.

ES 1. Introduction and Purpose

The former Quarry Firing Range (QFR, the Site) is located within the Hawai‘i Volcanoes National Park (HAVO), which is owned by the United States and managed by the National Park Service (NPS). The Site is being investigated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). NPS is the lead agency under CERCLA at the former QFR because the Site is under the jurisdiction of NPS. NPS retained Professional Environmental Engineers, Inc. (PE) to evaluate previous assessment data and prepare this EE/CA Report.

This EE/CA has been prepared pursuant to the authorities of Section 104(b) of CERCLA and Section 300.415 (b)(4)(i) of the National Oil and Hazardous Substances Pollution Contingency Plan, commonly called the National Contingency Plan (NCP), which authorize NPS to conduct investigations and studies to characterize the nature and extent of contamination at the Site and to evaluate the need for a response to such contamination to protect public health or welfare or the environment.

The purpose of the EE/CA is to document the release, nature, and extent of hazardous substances at the Site, conduct human health and ecological risk assessments, and, if needed, provide a framework for evaluating removal action alternatives. The EE/CA identifies removal action objectives (RAOs) and removal goals (RGs) and analyzes the effectiveness, implementability, and cost of removal action alternatives that may be used to satisfy the RAOs and RGs.

ES 2. Site Description, Investigation Results, and Conceptual Site Model

The Site is located on the southeast flank of Mauna Loa volcano on the Island of Hawai‘i, approximately 10 miles south of HAVO headquarters. It is situated in an abandoned quarry about 260 feet west of Highway 11. The Site is accessed by a dirt road with a locked gate off of Highway 11 (near mile marker 38). The access road to the Site curves down to a bowl-shaped depression (the former quarry) that was used as the firing range. The east, southeast and south slopes of the “bowl” were used as the backstop for firearms practice.

Use of the former quarry as a firing range reportedly began in 1940; the Site was used in this capacity until 1982 when the Hilina Pali Firing Range was constructed (the Hilina Pali Firing Range is located eight miles east of the Site). According to records, rifle, machine gun, small-bore arms, and pistol practice

were conducted by personnel from the Kilauea Military Camp, the emergency police guard, Federal Bureau of Investigation (FBI), and NPS Park Rangers, between 1937 and 1958 (frequencies of the practices were unknown); NPS Park Rangers and others continued to use the range until 1982.

Previous investigations, including a Preliminary Assessment, a Site Inspection, and a Supplemental Site Inspection, were conducted at the Site from 2013 to 2017. Results of the investigations indicated that a thin layer of soil (approximately four inches or less) covered the underlying basalt bedrock; bullets and bullet fragments were observed within the soils surrounding the former backstop, firing line/lanes, and other related areas that were sampled as separate decision units (DUs), or sub-DUs. Lead, antimony, and copper were determined to be contaminants of potential concern. Potential human receptors include Site workers and recreational users; potential ecological receptors include plants, soil invertebrates, birds, and mammals, including several protected wildlife species: the Hawaiian hoary bat (opeʻapeʻa), Hawaiian goose (nēnē), Hawaiian short-eared owl (pueo), and Hawaiian hawk (ʻio).

ES 3. Risk Assessment Summary

The risk assessment for this Site included a baseline human health risk assessment, a screening level ecological risk assessment, and a baseline ecological risk assessment. Unacceptable human health and ecological risks exist for lead and antimony, and final risk-based RGs were derived for the two contaminants. Approximately 110 cubic yards of surface soil were above these RGs within DUs 1A, 2A, 2C, and 4.

ES 4. Identification and Analysis of Applicable or Relevant and Appropriate Requirements

Chemical- and location-specific ARARs were identified for this Site, including RCRA hazardous waste transportation and disposal requirements, the NPS Organic Act, and NPS Management Policies.

ES 5. Removal Action Objectives and Preliminary Removal Goals

RAOs for this EE/CA included the following:

- Eliminate, or reduce to the extent practicable, levels of lead in soil that present unacceptable risk via direct human contact (DU1A).
- Eliminate, or reduce to the extent practicable, levels of lead in soil that present unacceptable risk for ecological receptors (DU1A, DU2A, and DU4).
- Eliminate, or reduce to the extent practicable, levels of antimony in soil that present unacceptable risk for ecological receptors (DU1A, DU2A, and DU2C).
- Eliminate contaminant-related constraints on the full enjoyment and utilization of park resources consistent with NPS mandates.
- Attain federal and state ARARs identified for this Site.

ES 6. Identification of Removal Action Alternatives

Removal action alternatives evaluated for the EE/CA at this Site included the following:

1. No action (as required by the NCP);
2. Full excavation and off-site disposal of soil in DU1A, DU2A, DU2C, and DU4; and
3. Cover impacted materials in DU1A, DU2A, DU2C, and DU4 with clean fill.

Removal action alternative 2 included options 2A and 2B. Option 2A was excavation and disposal of material into a non-hazardous (special waste) landfill; 2B was excavation and disposal of material into a hazardous waste landfill. It is possible that the material may have to be disposed of in a hazardous landfill since no TCLP tests have been performed on soil samples at the Site.

ES 7. Comparative Analysis of Removal Action Alternatives

Each of the three removal action alternatives described above were analyzed using the following evaluation criteria: effectiveness, implementability, and cost. All options were technically feasible. Alternative 1 was not protective of human health and the environment (nor in compliance with ARARs). Alternative 2 was determined to be the most effective remedy as a permanent solution. Alternative 3 requires future operation/maintenance, inspection, and reporting activities with potential downstream liabilities. Costs to implement the removal action alternatives are summarized below.

- Alternative 1 = No Cost
- Alternative 2A = $65,000 to $140,000
- Alternative 2B = $195,000 to $415,000
- Alternative 3 = $40,000 to $90,000 (plus $5,000 annually)

The estimates above are within −30 to +50 percent of the contractor costs to perform the excavation, transportation/disposal, and/or cover/capping activities. They do not include costs to prepare work plans and specifications, solicit and evaluate contractor bids, oversee contractor's work, administer the contract, and/or prepare a closure report (if required by NPS or state regulators).

ES. 8 Recommended Removal Action Alternative

Assuming that TCLP metals testing indicates on-site soils are non-hazardous, Alternative 2A (excavation and disposal off site as non-hazardous waste) is the recommended removal action alternative based on results of the comparative analysis, which shows that this alternative provides a permanent remedy for protecting human health and the environment, and becomes the least expensive option after 5 to 10 years

of implementation. If (after conducting TCLP metals testing) the on-Site wastes are determined to be hazardous, Alternative 2B is the recommended removal action based on results of the comparative analysis, which shows this alternative to provide a permanent remedy for protecting human health and the environment, and becomes the least expensive feasible option after 31 to 65 years of implementation.

Once the EE/CA is finalized, the report will be made available for public comment for 30 days to allow for public comment on the EE/CA and the Administrative Record supporting this EE/CA. Following receipt and evaluation of public comments, NPS will prepare an Action Memorandum. The Action Memorandum, as the decision document selecting a Non-Time Critical Removal Action (NTCRA), summarizes the need for the removal action, identifies the selected action, provides the rationale for the action, and addresses significant comments received from the public, including those received from other jurisdictions (e.g., states, tribes, USEPA).