July 25, 2025

Ms. Brooklyn James
EPA TBA Project Manager
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street
San Francisco, California 94105

Subject: **Final Analysis of Brownfields Cleanup Alternatives Report**
Hoopa Valley Tribe–521 Loop, Hoopa, CA
U.S. EPA Region 9, Resource Conservation and Recovery Act (RCRA) Enforcement, Permitting, and Assistance (REPA) Contract No. 68HERH19D0018, Task Order No. 68HE0922F0038

Dear Ms. James:

Toeroek Associates, Inc. (Toeroek) and Tetra Tech, Inc. (Tetra Tech) (hereafter "Toeroek Team") submit the attached Final Analysis of Brownfields Cleanup Alternatives Report regarding a Targeted Brownfields Assessment at the Hoopa Valley Tribe–521 Loop site.

This deliverable has been reviewed internally as part of Tech Tech's quality assurance program, as well as Toeroek's quality assurance program, and is consistent with Toeroek's Quality Management Plan for the REPA contract. There were no comments received from EPA or the Hoopa Valley Tribe concerning the Draft Analysis of Brownfields Cleanup Alternatives Report. Documentation of this review is retained in the Toeroek Team's project files.

If you have any questions or comments, please contact Greg Hanna at (720) 898-4102 or Cynthia Breene at (510) 302-6341.

Sincerely,

Greg Hanna
Toeroek Team Program Manager

Cynthia Breene
Toeroek Team Project Manager

Enclosure: Final Analysis of Brownfields Cleanup Alternatives Report

cc: Scott Stollman, EPA Region 9 TOCOR
Jinky Callado, EPA Region 9 Alternate TOCOR
Toeroek Team files

ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES REPORT

HOOPA VALLEY TRIBE–521 LOOP
HOOPA, CALIFORNIA

TARGETED BROWNFIELDS ASSESSMENT (TBA)

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA) ENFORCEMENT, PERMITTING, AND ASSISTANCE (REPA) CONTRACT

CONTRACT NO. 68HE0925C0001

Prepared for:

EPA REGION 9
TBA SUPPORT PROGRAM
75 HAWTHORNE STREET
SAN FRANCISCO, CALIFORNIA 94105

July 25, 2025

Final

Prepared by:

Toeroek Associates, Inc.
300 Union Boulevard, Suite 520
Lakewood, Colorado 80228
303-420-7735

and

Tetra Tech, Inc.
1999 Harrison Street, Suite 500
Oakland, California 94612
510-302-6300

ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES

HOOPA VALLEY TRIBE–521 LOOP
HOOPA, CALIFORNIA

CONTRACT NO. 68HE0925C0001

APPROVAL PAGE

Prepared by: Cynthia Breene Date: 7/25/25

Cynthia Breene, Project Manager
Tetra Tech, Inc.

Reviewed by: Bradley K. Martin Date: 7/25/25

Bradley K. Martin, P.E., Senior Engineer
Toeroek Associates, Inc.

Approved by: _____ Date: _____

Scott Stollman, Contracting Officer's Representative
U. S. Environmental Protection Agency, Region 9

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ACRONYMS AND ABBREVIATIONS

ABCA	Analysis of Brownfields Cleanup Alternatives
ACM	Asbestos-containing material
AHERA	Asbestos Hazard Emergency Response Act
Applicant	Hoopa Valley Tribe
ASTM	ASTM International
CCR	*California Code of Regulations*
CFR	*Code of Federal Regulations*
DTSC	California Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
ESA	Environmental site assessment
HAZWOPER	Hazardous Waste Operations and Emergency Response
HUD	U.S. Department of Housing and Urban Development
IC	Institutional control
LBP	Lead-based paint
NESHAP	National Emission Standards for Hazardous Air Pollutants
O&M	Operation and maintenance
OSHA	Occupational Safety and Health Administration
RACER	Remedial Action Cost Engineering and Requirements System
SEFA	Spreadsheets for Environmental Footprint Analysis
Site	Hoopa Valley Tribe–521 Loop
SL	Screening level
TBA	Targeted Brownfields Assessment
Toeroek Team	Toeroek Associates, Inc., and its subcontractor, Tetra Tech, Inc.

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) Region 9 tasked Toeroek Associates, Inc., and its subcontractor, Tetra Tech, Inc., (hereinafter the Toeroek Team) to conduct an Analysis of Brownfields Cleanup Alternatives (ABCA) Report for the Hoopa Valley Tribe–521 Loop (the Site) located at 521 Loop Road in Hoopa, Humboldt County, California (Figure 1 and Figure 2). The Site is approximately 3 acres in a residential area and is surrounded by schools, a Frontier Communications building, and a park.

The Hoopa Valley Tribe (the owner and Applicant) has interest in constructing a new building and remodeling the church building for use as a community center and the daycare building for use as the Hoopa Education Building. The purpose of this ABCA Report is to evaluate potential cleanup alternatives to address environmental conditions preventing or impeding the preferred type of Site redevelopment and to do so in a manner protective of human health. The cleanup alternatives considered were evaluated based on effectiveness, implementability, and cost.

A Phase II environmental site assessment (ESA) was performed by the Toeroek Team in 2025 for the Site. The Toeroek Team conducted soil sampling. In addition, a hazardous material building survey was conducted of the structures on Site. Lead in soil samples exceeded the California Department of Toxic Substances Control residential soil screening level (80 milligrams per kilogram) and background levels in three current and historical drip lines on the Site. Asbestos-containing material (ACM) and lead-based paint (LBP) were detected in the church building on the Site.

Based on the redevelopment use of the Site, including constructing a new building and remodeling the existing buildings, the following cleanup alternatives were considered for the Site:

- Alternative 1: No Action (Baseline)
- Alternative 2: Soil Excavation, Off-Site Disposal, ACM Abatement, and LBP Removal
- Alternative 3: Consolidation and Capping with Institutional Controls (ICs), ACM Enclosure, and LBP Removal

Alternative 1 for the Site is included as a baseline for comparison. This alternative would involve no containment, treatment, removal, or monitoring of contaminants and would not address potential exposure to contamination present on the Site.

Alternative 2 for the Site would involve the excavation of all contaminated soils at the Site above residential preliminary assumed cleanup levels based on results from the Phase II ESA, abatement of ACM, and removal

of LBP. This alternative would remove soil contamination above preliminary assumed cleanup levels and remove and dispose of all hazardous materials identified in the Phase II ESA off Site.

Alternative 3 for the Site would involve excavation, consolidation, and capping of contaminated soils in place with a cap; enclosure of ACM; and removal of LBP. This alternative would allow soil contamination above preliminary assumed cleanup levels identified in the Phase II ESA to remain on the Site with appropriate action taken to cap contaminated soil. It would also and stabilize, encapsulate or enclose the ACM contamination and remove LBP for future residential Site users. ICs and an operation and maintenance plan would be required for as long as contamination remains at the Site above residential preliminary assumed cleanup levels.

Table ES-1 summarizes the effectiveness, implementability, and cost for each cleanup alternative evaluated to address risk to human health from contamination that prevents or impedes the preferred type of Site redevelopment. The cost estimates presented in the table are order-of-magnitude estimates intended only for the relative comparison of the alternatives; they should not be used as budget- or design-level estimates.

1.0 INTRODUCTION AND BACKGROUND

The U.S. Environmental Protection Agency (EPA) Region 9 tasked Toeroek Associates, Inc., and its subcontractor, Tetra Tech, Inc., (hereinafter the Toeroek Team) to conduct an Analysis of Brownfields Cleanup Alternatives (ABCA) Report for the Hoopa Valley Tribe–521 Loop (the Site) located at 521 Loop Road in Hoopa, Humboldt County, California (Figure 1). The Hoopa Valley Tribe (the Applicant) has interest in constructing a new building and remodeling the church building for use as a community center and the daycare building for use as the Hoopa Education Building.

This ABCA Report considers cleanup alternatives that would be based on the California Department of Toxic Substances Control (DTSC) residential soil screening level (SL) (80 milligrams per kilogram) (DTSC 2022). This ABCA Report considers state and federal regulations regarding asbestos-containing material (ACM) and lead-based paint (LBP). Furthermore, this ABCA Report includes rough order-of-magnitude cost estimates (accuracy range of -25 to +75 percent based on the Project Management Institute's [2017] *A Guide to the Project Management Body of Knowledge*) of evaluated cleanup alternatives intended for comparison purposes only; they should not be used as budget- or design-level estimates.

1.1 SITE LOCATION

The Site is located at 521 Loop Road in Hoopa, Humboldt County, California (Figure 1). The Site is approximately 3 acres in a residential area and is surrounded by schools, a Frontier Communications building, and a park. The Site includes a storage building that was formerly a church, a daycare building, a Conex box (shipping container), one propane tank, a paved sport court, and three pole-mounted transformers (Figure 2). Three more buildings—named former buildings 1, 2, and 3 for the purposes of this report—were also formerly on the Site but removed. These buildings were built between 1954 and 1972, and their former uses are unknown. The three structures were demolished between 2009 and 2012; only the slab foundation of former building 1 remains on the Site and currently hosts the Conex box. The Site is surrounded by mixed commercial and residential properties.

1.2 OWNERSHIP AND PREVIOUS USE

The Site is owned by the Hoopa Valley Tribe and consists of one rectangular-shaped parcel: Assessor's Parcel Number 525-171-003. The church was previously known as the Presbytery of the Redwoods Church before 1980, when the property was transferred to the Hoopa Valley Tribe. The church was built in approximately

1922, and the daycare was built between 1954 and 1972. Three additional unidentified structures (former buildings) were built on the Site between 1954 and 1972 and were removed after 2009.

1.3 PREVIOUS INVESTIGATIONS

The Toeroek Team conducted a Phase II environmental site assessment (ESA) in 2025 in accordance with ASTM International (ASTM) Standard E1903-19 for Phase II ESAs and otherwise in compliance with EPA's "All Appropriate Inquiries" Rule (40 *Code of Federal Regulations* [CFR] Part 312) (ASTM 2019). The purposes of the Phase II ESA were to (1) confirm the presence or absence of the recognized environmental conditions identified during the Phase I ESA (Toeroek Team 2025), (2) acquire information regarding the nature of contamination (if present) and risks posed by that contamination, which would support informed business decisions about the property, and (3) where applicable, satisfy the innocent purchaser defense under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (ASTM 2019).

During the Phase II ESA, the Toeroek Team conducted soil sampling. Sample locations are depicted on Figure 3. In addition, the Toeroek Team collected samples of suspected ACM, verified quantities of confirmed ACM, and identified and quantified areas of LBP. Bulk samples of suspected polychlorinated biphenyl-containing caulk materials were also collected.

Review of analytical data from the Phase II ESA led to the following noteworthy findings summarized below; indicated on Figure 4; and presented in the Final Phase I/II ESA Targeted Brownfields Assessment (TBA) report (Toeroek Team 2025).

- **Site Buildings:** The hazardous building materials survey documented the presence of ACM and LBP in the church building materials on the Site.
- **Building Drip Lines:** At roof drip lines around the church building, former building 2, and former building 3, the lead concentrations exceeded the U.S. Geological Survey-reported maximum reported concentration and the DTSC residential soil SL (80 milligrams per kilogram). No lead sample result exceeded the EPA regional SL for residential soil (200 milligrams per kilogram) for lead.

Surface soils that contain lead at concentrations above the DTSC residential SL (DTSC 2022) may require removal or capping to limit exposure or release and to mitigate potential impacts on human health if the Site is used for tribal community purposes. Additionally, if soils are excavated for off-Site disposal, waste disposal testing is recommended.

Abatement of building materials containing ACM and LBP is recommended before any building renovation or demolition activities. Per California Division of Occupational Safety and Health asbestos material

regulations (*California Code of Regulations* [CCR] Section 5208), if or when the building is renovated for reuse or demolished, a qualified professional should remove and properly dispose of building materials that contain ACM above 0.1 percent asbestos. Likewise, for LBP, defined as paint containing more than 5,000 parts per million lead by the U.S. Department of Housing and Urban Development (HUD) (2012) and EPA regulations (40 CFR Part 745 – Lead-Based Paint Poisoning Prevention in Certain Residential Structures), a qualified professional should remove and properly dispose of building materials that contain LBP. In the interim, these materials should be inspected regularly to ensure they are not chipping, flaking, disintegrating, or becoming friable or more mobile.

No other prior environmental investigations have occurred at the Site. Figure 5 replicates the conceptual site model from the Phase II ESA for human health.

1.4 PROJECT GOAL

The overall goal of any brownfields cleanup action is to address environmental conditions preventing or impeding the preferred type of Site redevelopment and to do so in a manner protective of human health. The Applicant has interest in constructing a new building and remodeling the church building for use as a community center and the daycare building for use as the Hoopa Education Building. This ABCA Report applies assumed cleanup levels based on applicable federal and state SLs for soil, ACM, and LBP as follows:

- For soil, DTSC residential SLs (DTSC 2022)
- For ACM, California Division of Occupational Safety and Health and federal Occupational Safety and Health Administration (OSHA) regulations
- For LBP, HUD, California Department of Public Health, and EPA regulations

This ABCA Report does not present cleanup alternatives to address any potential ecological risks. The Phase II ESA did not include an ecological risk assessment or collection of data associated with evaluating ecological risks, as these are outside the scope of work for this TBA, and the Site is within an urban setting with minimal potential ecological habitat.

This ABCA Report addresses contaminants of concern as identified in the Phase II ESA, which are lead in soil and ACM and LBP in building materials in the church building (Toeroek Team 2025).

2.0 APPLICABLE REGULATIONS AND ASSUMED CLEANUP LEVELS

This section discusses oversight responsibility for cleanup, assumed cleanup levels, and applicable laws and regulations.

2.1 CLEANUP OVERSIGHT RESPONSIBILITY

Any future cleanup and redevelopment of the Site must be completed in compliance with applicable Hoopa Valley Tribe laws and regulations. If materials (that is, soil) are taken off the Hoopa Valley Reservation for disposal, California laws and regulations would apply. The Regional Water Quality Control Board and DTSC regulate and oversee cleanup of contaminated sites in California. Because the Site is within land held in trust by the United States for the Hoopa Valley Tribe, the lead agency for oversight of remedial activities is assumed to be the Hoopa Valley Tribe Environmental Protection Agency. The organization undertaking the cleanup will need to work with the oversight agency to establish Site-specific cleanup requirements.

2.2 ASSUMED CLEANUP LEVELS FOR MAJOR CONTAMINANTS

For the purpose of this ABCA Report, SLs are used as the assumed cleanup levels. The organization undertaking cleanup actions at the Site will need to work with the oversight agency to establish appropriate cleanup levels specific to the Site.

For the purpose of this ABCA Report, the assumed cleanup levels for soil are the DTSC residential SLs (DTSC 2022) (Table 1).

The cleanup standard for ACM is 1 percent asbestos as defined by OSHA Title 29 CFR 1910.1001(b) and 0.1 percent asbestos per California Division of Occupational Safety and Health asbestos material regulations (CCR Section 5208). The cleanup standard for LBP is the removal of paint containing greater than 0.5 percent lead by weight or 5,000 parts per million or 1 milligram per square centimeter total lead as defined by HUD, the California Department of Public Health, and EPA.

The Toeroek Team screened the analytical data collected during the Phase II ESA against the assumed cleanup levels identified above to determine the areas where remediation would be potentially warranted. The data are presented in the Phase I/II ESA TBA Report (Toeroek Team 2025). Figure 4 depicts the exceedances of the soil screening criteria and documented presence of hazardous building materials.

2.3 LAWS AND REGULATIONS APPLICABLE TO THE CLEANUP

Any future cleanup and redevelopment of the Site must be completed in compliance with applicable cleanup Hoopa Valley Tribe laws and regulations. General environmental laws and regulations that may be applicable to the cleanup activities are identified and briefly summarized below. This section is for informational purposes only. The party or parties conducting remedial activities are responsible to ensure compliance with all applicable laws and regulations.

Remedial activities should accord with OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) standards at 20 CFR 1910.120. HAZWOPER standards apply to cleanup operations required by federal, state, local, tribal, and other governmental bodies involved with hazardous substances.

Activities that generate waste for disposal in California would be subject to the waste management requirements in CCR, Title 22, Division 4.5 or CCR, Title 23, Division 3, both of which regulate hazardous waste, and CCR, Title 27, Division 2, which regulates certain solid wastes. These regulations contain requirements for handling, management, and disposal of waste depending on the determination of whether the waste is hazardous, designated, or nonhazardous solid waste. If waste were to be transported to another state, outside of California, that state's laws and regulations would apply to its transportation and disposal.

California Health and Safety Code, Division 20, Chapter 6.5; *California Civil Code*, Division 3; and CCR, Title 22, Division 4.5, Chapter 39 contain requirements for developing institutional controls (ICs) and land use covenants for property where hazardous substances remain at levels unacceptable for unrestricted use.

Abatement of asbestos should be conducted in compliance with the Asbestos Hazard Emergency Response Act (AHERA) (40 CFR Part 763), National Emission Standards for Hazardous Air Pollutants (NESHAP) (40 CFR Part 61), and Asbestos Construction Safety Standard (federal OSHA, 29 CFR 1926.1101, and California OSHA, CCR, Title 8, Section 1529). EPA regulations regarding the identification, handling, management, and abatement of ACM (as specified in AHERA and NESHAP) are implemented by the EPA. Both California OSHA and federal OSHA regulate asbestos as a worker health and safety issue. Transportation and disposal of asbestos-containing wastes are regulated by DTSC.

For LBP abatement, California OSHA is primarily concerned with worker protection and regulates procedures that disturb any amount of lead contained within painted building components. According to California OSHA (CCR, Title 8, Section 1532.1), employers may assume that the disturbance of coatings or materials shown to contain less than 0.06 percent lead by weight (or 600 parts per million lead) will not result in exposures above the applicable action level of 30 micrograms per cubic meter of air as long as workers are not performing any of the designated trigger tasks (such as building demolition, manual sanding or scraping,

or abrasive blasting). In addition, California OSHA specifies a permissible exposure limit for worker exposure to airborne lead particles of 50 micrograms per cubic meter of air as an 8-hour, time-weighted average. The federal OSHA Lead Construction Standard also lists an action level of 30 micrograms per cubic meter as an 8-hour, time-weighted average. Therefore, demolition activities that include materials with lead at any concentration could, under certain circumstances, trigger federal OSHA and California OSHA regulations.

All California employers must notify California OSHA at least 24 hours before starting any lead-related work per CCR, Title 8, Section 1532.1(p)(1). However, the employer is not required to notify the division if the amount of lead-containing materials to be disturbed is less than 100 square feet or 100 linear feet.

3.0 EVALUATION OF BROWNFIELDS CLEANUP ALTERNATIVES

The evaluation of cleanup alternatives in this ABCA Report is based on the anticipated future use scenario for the Site—constructing a new building and remodeling the church building for use as a community center and the daycare building for use as the Hoopa Education Building. Because a human health risk assessment of the Site has not been completed, SLs are used as the assumed cleanup levels. The organization undertaking cleanup actions at the Site will need to work with the oversight agency to establish appropriate cleanup levels specific to the Site. For the purpose of this ABCA Report, the assumed cleanup levels for soil are the DTSC residential SLs (DTSC 2022). The assumed cleanup standard for ACM is 1 percent asbestos, and the assumed cleanup standard for LBP is the removal of paint containing greater than 0.5 percent lead by weight or 5,000 parts per million or 1 milligram per square centimeter total lead.

3.1 CLEANUP ACTION OBJECTIVES

The cleanup action objectives for the Site are to mitigate potential human exposure to the contaminants identified in soil and building materials at the Site at levels exceeding the assumed cleanup levels presented in Section 2.2. Future redevelopment of the Site is assumed to include residential exposure scenarios. The cleanup alternatives and costs presented in this ABCA Report may change if different exposure scenarios are identified, additional data become available, or a human health risk assessment is performed.

3.2 IDENTIFICATION OF CLEANUP ALTERNATIVES

The cleanup alternatives for evaluation were initially assessed to determine technical feasibility and whether the alternative would be capable of achieving the project goal to address environmental conditions preventing or impeding the preferred type of Site redevelopment in a manner protective of human health. EPA (2020) provides guidance for the various technologies available to ensure contamination is either removed from a site or treated so it no longer poses a threat to human health.

Those alternatives deemed potentially capable of achieving the overall project goal were further evaluated for effectiveness, implementability, and cost. Effectiveness of each alternative is rated as low, moderate, or high based on the ability of the alternative to mitigate potential human exposure to contaminants identified in soil. Implementability of each alternative is rated as easy, moderate, or difficult based on availability of services and materials needed to implement the alternative, as well as how easily the components of each alternative could be applied. The cost estimates presented in this ABCA Report are rough order-of-magnitude estimates

(accuracy range of -25 to +75 percent) and are intended for comparison purposes only; they should not be used as budget- or design-level estimates (Table 2).

Section 3.2.4 and Table 3 discuss the alternatives considered but not further evaluated as a part of the evaluation of cleanup alternatives for the Site.

Based on the redevelopment use of the Site, including constructing a new building and remodeling the church and daycare buildings, the following cleanup alternatives were considered for the Site:

- Alternative 1: No Action (Baseline)
- Alternative 2: Soil Excavation, Off-Site Disposal, ACM Abatement, and LBP Removal
- Alternative 3: Consolidation and Capping with ICs, ACM Enclosure, and LBP Removal

Detailed descriptions of each alternative and the results of a comparative analysis of alternatives are presented in the subsections below.

3.2.1 Alternative 1 – No Action (Baseline)

The no action alternative is included as a baseline for comparison. This alternative would involve no containment, treatment, removal, or monitoring of contaminants. All contaminated soil and building materials would be left in place, and no restrictions on future land use would be imposed.

Effectiveness

Because the no action alternative would not be protective of human health for the proposed reuse of the Site, it is not considered effective.

Implementation

Implementation of this alternative would require no effort because no containment, treatment, removal, or monitoring of contaminants would occur.

Cost

No costs are associated with this alternative because no activities would occur.

3.2.2 Alternative 2 – Soil Excavation, Off-Site Disposal, ACM Abatement, and LBP Removal

This alternative would involve excavation of all contaminated soils at the Site containing contaminant concentrations above residential assumed cleanup levels based on results from the Phase II ESA, abatement of ACM, and removal of LBP in building components. Figure 4 shows the areas of contaminated soils that were above residential assumed cleanup levels. Figure 6 shows the areas of soil excavation for this alternative.

Alternative 2 would involve removing soil contamination above assumed cleanup levels from drip lines around the church building and the former buildings 2 and 3 footprints and removing and disposing of all hazardous building materials identified in the Phase II ESA off the Site. Following soil excavation, five-point composite confirmation soil samples would be collected from the walls and floor of each excavation area to confirm that contaminant concentrations in remaining soils are below residential assumed cleanup levels. Soil would be stockpiled on the Site for waste profile characterization before off-Site disposal. Following characterization for disposal, excavated soils would be hauled to and disposed of at an off-Site permitted disposal facility. Depending on hazardous and leaching characteristics, waste disposal may occur at a permitted hazardous or nonhazardous solid waste facility. The excavated areas would then be backfilled with clean soil.

This alternative also includes the abatement of ACM identified in the church building before renovation disturbs the ACM. Abatement by a California-licensed abatement professional would comply with applicable local, tribal, state, and federal regulations. EPA, California, and OSHA requirements must be met during the removal of ACM and during renovation because of the presence of LBP. The removed waste material would be transported to a disposal site that accepts friable ACM, non-friable ACM, or both as appropriate.

This alternative also includes the removal by demolition and disposal of LBP identified in the church building before demolition disturbs the LBP. Abatement by a California-licensed LBP abatement professional would comply with applicable local, tribal, state, and federal regulations. All surfaces and components that contain LBP assessed to be in good condition would be removed, demolished, and disposed of as demolition waste—assuming satisfactory results of a disposal characterization test using toxicity characterization leaching procedure analysis before disposal of the demolition debris. Application of removal and demolition techniques in a manner that does not chip, shred, mulch, or mill the LBP would be necessary.

For cost estimating purposes, the Toeroek Team assumed that 6,000 square feet of light-blue painted wood siding identified as LBP will be disposed of after building demolition. The ACM listed in Table 4 will be abated before building demolition and the ACM will be disposed of off the Site.

Effectiveness

Alternative 2 rates **high** for effectiveness as the lead-contaminated soil, ACM, and LBP would be removed from the Site. Neither ICs or operation and maintenance (O&M) activities would be required for the Site. This alternative would allow for the new construction and remodeling on the Site as proposed.

Implementation

Alternative 2 rates **easy** for implementation as ACM abatement and LBP demolition and removal are common remediation practices and the materials, services, and equipment necessary for implementation are readily available. Soil excavation by qualified equipment operators would comply with applicable local, tribal, and federal regulations. Excavation of approximately 62 cubic yards of soil is assumed. All waste soil excavated during this process would be transported to and disposed of at a Class I-, II-, or III-permitted facility, depending on the results of hazardous and leaching characteristics. In addition, planning these processes would require consideration of precautions concerning worker health and safety.

Cost

The total cost of Alternative 2 in 2025 dollars is estimated at $240,000, which includes capital cost for ACM abatement, LBP removal, and soil excavation with off-Site disposal. Costs were estimated by applying selected functions of RSMeans, Remedial Action Cost Engineering and Requirements System (RACER) Version 11.2.16.0, contractor quotes, and professional judgment, and include a 30 percent contingency to account for unknown costs associated with changes in scope that may occur during the design phase and unknown costs associated with the construction and implementation of the alternative. Cost details are presented in Table 2.

3.2.3 Alternative 3 – Consolidation and Capping with ICs, ACM Enclosure, and LBP Removal

This alternative would involve consolidation and capping contaminated soils in place with an asphalt cap, enclosing ACM, and removing LBP. LBP encapsulation is not a viable alternative for surfaces subject to impact, friction, or moisture, or for the outdoor LBP detected on the Site. Figure 7 shows the area of contaminated soils that were above assumed cleanup levels that would be consolidated and capped with an asphalt cap to prevent direct contact with future Site users. The total area of the cap is estimated at approximately 670 square feet and could be constructed under future Site buildings.

This alternative also includes enclosure of ACM identified in the church building before remodeling disturbs the ACM. ACM enclosure would involve creating an air-tight barrier over or around ACM, or both, or treating ACM with a bridging or penetrating encapsulant that surrounds or embeds asbestos fibers in an adhesive matrix to limit the release of fibers. This would reduce access to and disturbance of ACM identified during the Phase II ESA. Following ACM enclosure, an O&M plan would be written and updated annually. The O&M plan should include the following: (1) the duties of the program manager, the person responsible for overseeing all aspects related to the ACM identified in the building; (2) training for all employees and workers in the building; (3) periodic surveillance every 6 months of areas with ACM by any designated personnel and reinspection by an accredited asbestos inspector every 3 years; and (4) worker protection for

employees performing asbestos work. The O&M plan would be kept and updated for as long as ACM is present in the buildings.

This alternative also includes the removal by demolition and disposal of LBP identified in the church building before demolition disturbs the LBP. Abatement by a California-licensed LBP abatement professional would comply with applicable local, tribal, state, and federal regulations. All surfaces and components that contain LBP assessed to be in good condition would be removed, demolished, and disposed of as demolition waste—assuming satisfactory results of a disposal characterization test using toxicity characterization leaching procedure analysis before disposal of the demolition debris. Application of removal and demolition techniques in a manner that does not chip, shred, mulch, or mill the LBP would be necessary.

This alternative would allow soil contamination above residential assumed cleanup levels identified in the Phase II ESA to remain on the Site with appropriate action taken to cap soils. In addition, ACM would be stabilized and encapsulated or enclosed and LBP would be removed for future residential Site users.

ICs would be necessary to minimize exposure of construction workers, utility workers, and Site occupants to contaminated soils below the cap and enclosed ACM. In addition, long-term O&M would be required to maintain the effectiveness of the cap and protectiveness of ICs.

For Alternative 3, ICs would be necessary to confirm that (1) land use restrictions are in place in areas where soils are capped, (2) the capped area is maintained, and (3) ACM enclosures remain intact and undisturbed. In addition, O&M in perpetuity would be required to ensure the effectiveness of the cap and protectiveness of the ICs.

Alternative 3 would allow for residential use of the Site. ICs and an O&M plan would be required for as long as contamination remains at the Site above residential assumed cleanup levels.

For cost estimating purposes, the Toeroek Team made the following assumptions for this alternative:

- ACM will be enclosed or encapsulated (included in Table 4).
- Approximately 6,000 square feet of light-blue painted wood siding identified as LBP will be disposed of after building demolition (included in Table 5).

Effectiveness

Alternative 3 rates **moderate** for effectiveness as this method reduces long-term risk to human receptors by consolidating and capping contaminated soils, enclosing ACM, and removing LBP. Contaminants of concern would remain above assumed cleanup standards in the capped, encapsulated, and enclosed areas of the Site, requiring implementation of ICs in perpetuity to restrict land use in areas where soil is capped and ACM is

enclosed. Routine monitoring and maintenance would be required for the capped area. ICs would provide suitable protection of human health from capped contaminated soil and enclosed ACM, and provide protection for the capped and enclosed areas. LBP demolition and removal are common remediation practices, and the materials, services, and equipment necessary for implementation are readily available. This alternative would allow restricted commercial reuse of the Site and involve ICs. This alternative would limit the redevelopment of the Site to non-impacted areas for unrestricted residential use.

Implementation

Alternative 3 rates **moderate** for implementation as consolidating and capping is a common remediation practice and the materials, services, and equipment necessary for implementation are readily available; however, capped areas would require routine monitoring and maintenance in perpetuity. Approximately 670 square feet would be covered with an asphalt cap. Enclosure of ACM is a simple process that does not significantly alter structural conditions. ACM enclosure by a licensed asbestos professional must comply with applicable local, tribal, and federal regulations. The ACM enclosure process would require precautions concerning worker health and safety. Implementation of ICs would include a restrictive covenant that would be filed with the Register of Deeds to ensure that contamination left in place would not be disturbed during any future use scenario. Long-term O&M would also be required to ensure the effectiveness of the capped and enclosed areas, and the protectiveness of the ICs.

Cost

The total cost of Alternative 3 in 2025 dollars is estimated at $411,000, which includes a capital cost of $197,000 and $214,000 for ICs and O&M over 30 years. For cost estimating purposes, O&M is assumed to be required for 30 years; however, O&M will be needed in perpetuity as long as ACM remains in place at the Site and for the life of the asphalt cap for routine inspections and potential repairs or maintenance. Costs were estimated by applying selected functions of RSMeans, RACER Version 11.2.16.0, contractor quotes, and professional judgment , and include a 30 percent contingency to account for unknown costs associated with changes in scope that may occur during the design phase and unknown costs associated with the construction and implementation of the alternative. Cost details are presented in Table 2.

3.2.4 Alternatives Considered and Dismissed

A wide variety of alternatives are available for remediation of soil. Table 3 lists alternatives considered but not further evaluated as a part of alternatives at the Site.

3.3 COMPARISON OF ALTERNATIVES

The Toeroek Team assessed each cleanup alternative evaluated to determine its effectiveness, implementability, and cost in Section 3.2. A comparative analysis of alternatives based on the same criteria is provided in this section.

Effectiveness

Alternative 1, the no action alternative, would not be protective of human health and would not meet the project goal for the Site.

Alternative 2 rates high for effectiveness as contaminated soil, ACM, and LBP would be permanently removed from the Site to an off-Site permitted disposal facility. This alternative would allow for the unrestricted redevelopment of the Site if residential assumed cleanup levels were pursued.

Alternative 3 rates moderate for effectiveness as long-term risk to human receptors is reduced by consolidating and capping contaminated soils, enclosing ACM, and removing LBP. Contaminants of concern would remain above cleanup standards in the capped, encapsulated, and enclosed areas of the Site, requiring implementation of ICs in perpetuity to restrict land use in areas where soil is capped and ACM is enclosed. Routine monitoring and maintenance would be required for the capped area. ICs would provide suitable protection of human health from capped contaminated soil and enclosed ACM, and provide protection for the capped and enclosed areas. This alternative would allow restricted commercial reuse of the Site and involve ICs. This alternative would limit the redevelopment of the Site to non-impacted areas for unrestricted residential use.

Implementability

Alternative 2 is rated easy for ACM abatement and LBP demolition and removal, which are common remediation practices with materials, services, and equipment readily available. Alternative 3 is comparable to Alternative 2 with a rating of moderate.

Alternative 3 is rated moderate for implementation as consolidation and capping is a common remediation practice and the materials, services, and equipment necessary for implementation are readily available; however, capped areas would require routine monitoring and maintenance in perpetuity. Enclosure of ACM is a simple process that does not significantly alter structural conditions. The ACM enclosure processes would require precautions concerning worker health and safety. Implementation of ICs would include a restrictive covenant that would be filed with the Register of Deeds to ensure that contamination left in place would not

be disturbed during any future use scenario. Long-term O&M would also be required to ensure the effectiveness of the capped, encapsulated, and enclosed areas and the protectiveness of the ICs.

Cost

Alternative 2 is comparable with Alternative 3. Alternative 3 is expected to cost slightly more because of the addition of ICs and long-term O&M.

Table 6 summarizes each alternative based on effectiveness, implementability, and cost.

3.4 CONSIDERATION OF EXTREME WEATHER IMPACTS

Evidence demonstrates that extreme weather events are increasing at a rapid rate, posing a challenge to EPA in its ability to fulfill its mission to protect human health and the environment. EPA must increase adaptive capacity to continue to fulfill its statutory, regulatory, and programmatic requirements.

Vulnerabilities to consider specific to the northwest geographic region, where the Site is located, include the following items:

1. Warmer temperatures, resulting in reduced mountain snowpacks and shifting of peak spring runoff from snowmelt to earlier in the season, leading to a shortage of fresh water during the summer
2. Magnitude of projected temperature increases, significantly stressing the health, energy, and water supply in an area already undergoing high summer temperatures
3. Reduced groundwater supply because of a lack of recharge
4. Increased frequency and altered timing of flooding, increasing risks to people, ecosystems, and infrastructure
5. Magnitude and frequency of wildfires, which have increased over the last 30 years, affecting water quality in streams, creeks, rivers, lakes, and estuaries

The Site is within the northwest region of EPA Region 9 and, therefore, is susceptible to several of the vulnerabilities listed above, particularly #1, #4, and #5.

3.5 SUSTAINABLE REMEDIATION GUIDANCE

The cleanup of a site can improve the environmental and public health conditions of a site. However, these remediation efforts require energy, water, and other material resources to achieve cleanup objectives. Therefore, the process of remediation creates its own environmental footprint. EPA provides guidance on

how to optimize environmental performance and implement protective cleanups. EPA identifies the following elements that may assist in selecting and implementing five protective cleanup activities:

- Total energy use and renewable energy use
- Air pollutants and greenhouse gas emissions
- Water use and impacts to water resources
- Materials management and waste reduction
- Land management and ecosystem protection

The Toeroek Team conducted an analysis on the environmental footprints of the removal actions for the Site using the Spreadsheets for Environmental Footprint Analysis (SEFA) (EPA 2019). The analysis looks at the first two elements stated above and determines the total energy usage and the mass of different emissions generated by different construction activities, including greenhouse gases, nitrogen oxides, sulfur oxides, particulate matter, and listed air pollutants. Results of SEFA are summarized below and presented in Appendix A.

Impacts under Alternative 2 (Soil Excavation, Off-Site Disposal, ACM Abatement, and LBP Removal) are rated low for all emissions except nitrogen oxide, which is rated medium. Under this alternative, a low amount of energy input would be necessary and, thus, the environmental footprint would be low. Impacts under Alternative 3 (Consolidation and Capping with ICs, ACM Enclosure, and LBP Removal) are rated high for all emissions. Under this alternative, a high amount of energy input would be necessary and, thus, the environmental footprint would be high. Alternative 3 emissions are rated high because of the off-Site emissions associated with the asphalt used for capping. For the purposes of this remediation analysis, O&M is assumed to continue for a period of 30 years. Alternative 2 would affect the smallest environmental footprint.

3.5.1 Administrative Suggestions

When selecting remediation professionals, emphasis should be placed on those who follow remediation best management practices and take into consideration the five cleanup activities identified above. Redevelopment use of the Site should direct the type of remediation necessary to ensure that efficient and sustainable methods are used. Renewable energy should be considered for future redevelopment. Reporting efforts should use digital format as opposed to hard copy when feasible.

3.5.2 Operations Suggestions

The following operations suggestions should be considered to achieve sustainable remediation at the Site:

- Use of non-renewable energy should be minimized to the extent feasible by use of energy-efficient equipment and vehicles, renewable energy supplies, and renewable energy generation systems on the property.
- Sustainable practices that may reduce the use of fossil fuels, such as performing on-Site capping as opposed to off-Site disposal, and the use of native vegetation should be utilized when possible.
- Wastes should be minimized as much as possible by use of recycling and reuse efforts.
- Transport and disposal operations should function as efficiently as possible to reduce the number of trips needed.
- Drilling and excavation activities should include clean fuel and emission controls, such as idle reduction devises, use of ultra-low sulfur diesel and fuel-grade biodiesel, EPA- or California Air Resources Board-verified emission control technology, and routine engine maintenance.

3.5.3 Bioremediation Considerations

Bioremediation involves the use of microorganisms to degrade organic contaminants. The microorganisms break down contaminants by using them as a food source or co-metabolizing them with a food source. Nutrients are added to stimulate and create a favorable environment for microorganisms to grow and use contaminants as a food and energy source. Bioremediation was not considered in this ABCA Report because the source of soil contamination is inorganic (lead) and bioremediation is not effective for remediation of lead in soil. Therefore, bioremediation would not be an effective method to achieve the project goal.

4.0 LIMITATIONS AND ADDITIONAL ASSESSMENT NEEDS

The quantities and areas presented in this ABCA Report are estimates based on available information; actual Site conditions may vary. For instance, the extent of lead in soil and ACM and LBP in building materials may not be fully defined. Therefore, additional abatement or encapsulation may be required beyond the quantities presented in this ABCA Report.

This ABCA Report provides mitigation guidance, but it is not intended to be used as a removal characterization report or design document. This ABCA Report presents only the Site-specific recognized environmental conditions and opinion of the Toeroek Team environmental professional who prepared this document. The cost estimates presented are rough order-of-magnitude estimates solely for comparison purposes and should not be used as budget- or design-level estimates. In addition, other technologies may be available for remediation of the Site that were not considered in this ABCA Report.

While the exact areas to be redeveloped for each of the scenarios is undetermined at this time, the alternatives presented in this ABCA Report present options for residential land uses. Following the completion of a development plan for the Site, the alternatives and cost estimates presented in this ABCA Report should be reevaluated and adjusted as appropriate.

5.0 REFERENCES

ASTM International (ASTM). 2019. *Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process*. ASTM E1903-19. October.

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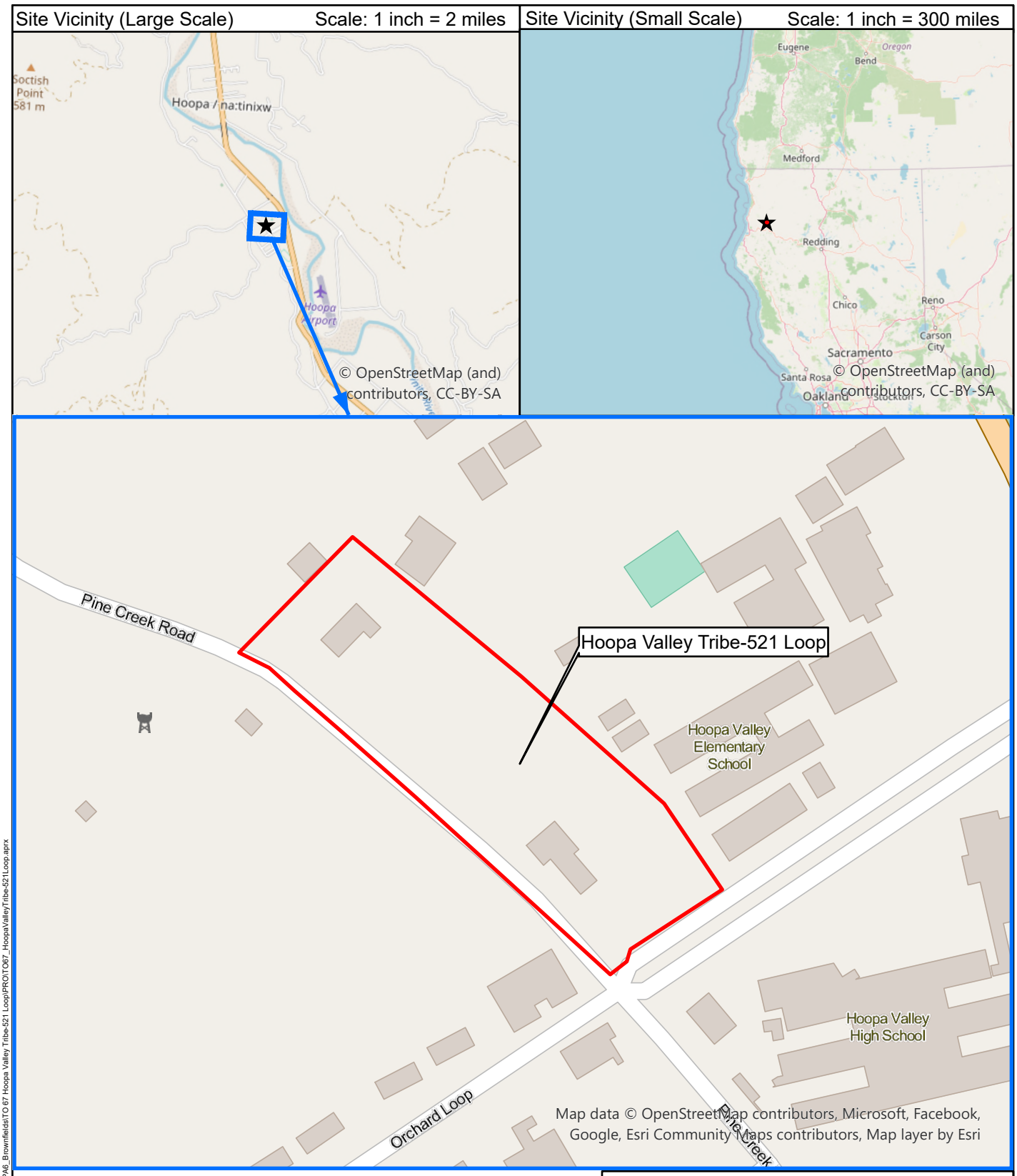
U.S. Environmental Protection Agency (EPA). 2020. "Technologies for Cleaning Up Contaminated Sites." https://www.epa.gov/remedytech

FIGURES



Legend

Site Boundary

N

0 150 300

Feet

Hoopa Valley Tribe-521 Loop
Targeted Brownfields Assessment
Hoopa, California

Figure 1
Site Location

TETRA TECH

TOEROEK ASSOCIATES, INC.

Date: 12/2/2024 Drawn By: Savannah Russell Project No: 103Z652108Y

Source: ESRI, ArcGIS Online, Open Streets Map Basemap, 2019

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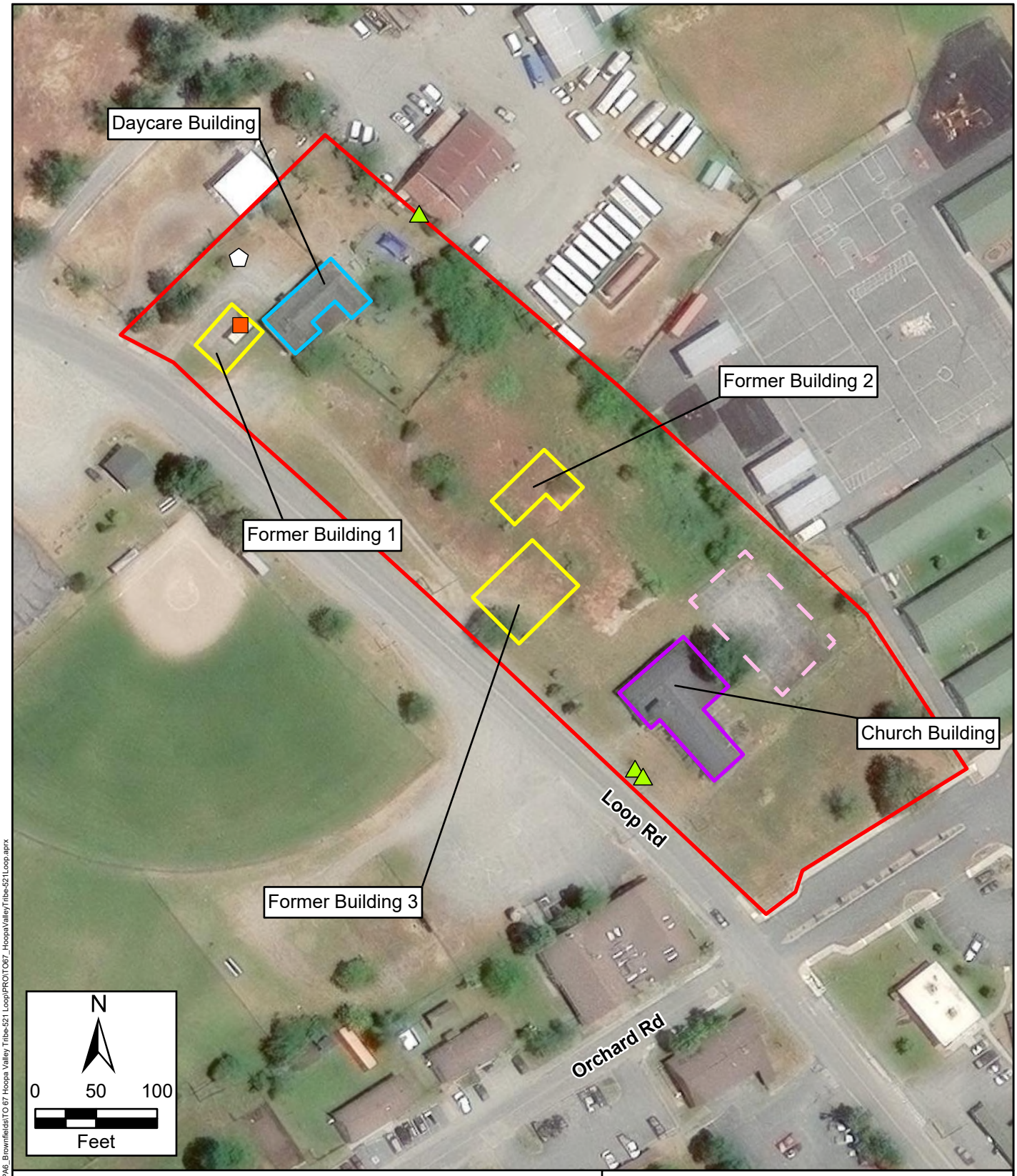

Legend

- Site Boundary
- Storage Building (Former Church)
- Daycare
- Former Building
- Sport Court (Paved)
- On-Site Pole-Mounted Transformer
- Propane Tank
- Conex Box

Hoopa Valley Tribe-521 Loop
Targeted Brownfields Assessment
Hoopa, California

Figure 2
Site Features

TETRA TECH
TOEROEK ASSOCIATES, INC.

Date: 4/23/2025 Drawn By: Savannah Russell Project No: 103Z652108Y

Source: ESRI, ArcGIS Online, World Imagery Basemap, 2023

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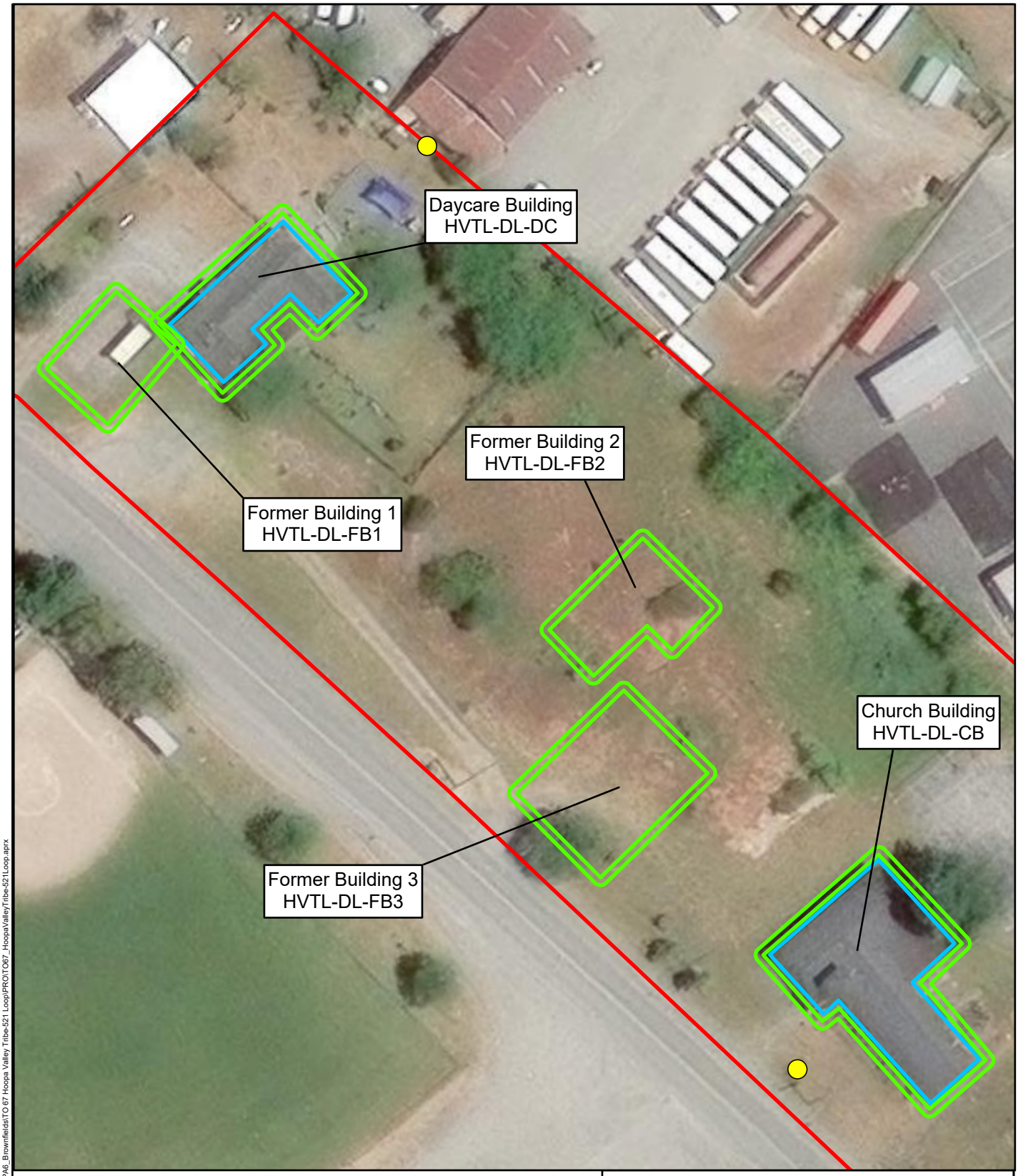

Legend

- Site Boundary
- Surface Soil Sample Decision Unit
- Hazardous Building Material Survey
- Discrete Surface Soil Sample/ Transformer Location

N

0 25 50

Feet

Hoopa Valley Tribe-521 Loop
Targeted Brownfields Assessment
Hoopa, California

Figure 3
Sample Locations

TETRA TECH

TOEROEK ASSOCIATES, INC.

Date: 4/14/2025 Drawn By: Savannah Russell Project No: 103Z652108Y

Source: ESRI, ArcGIS Online, World Imagery Basemap, 2023

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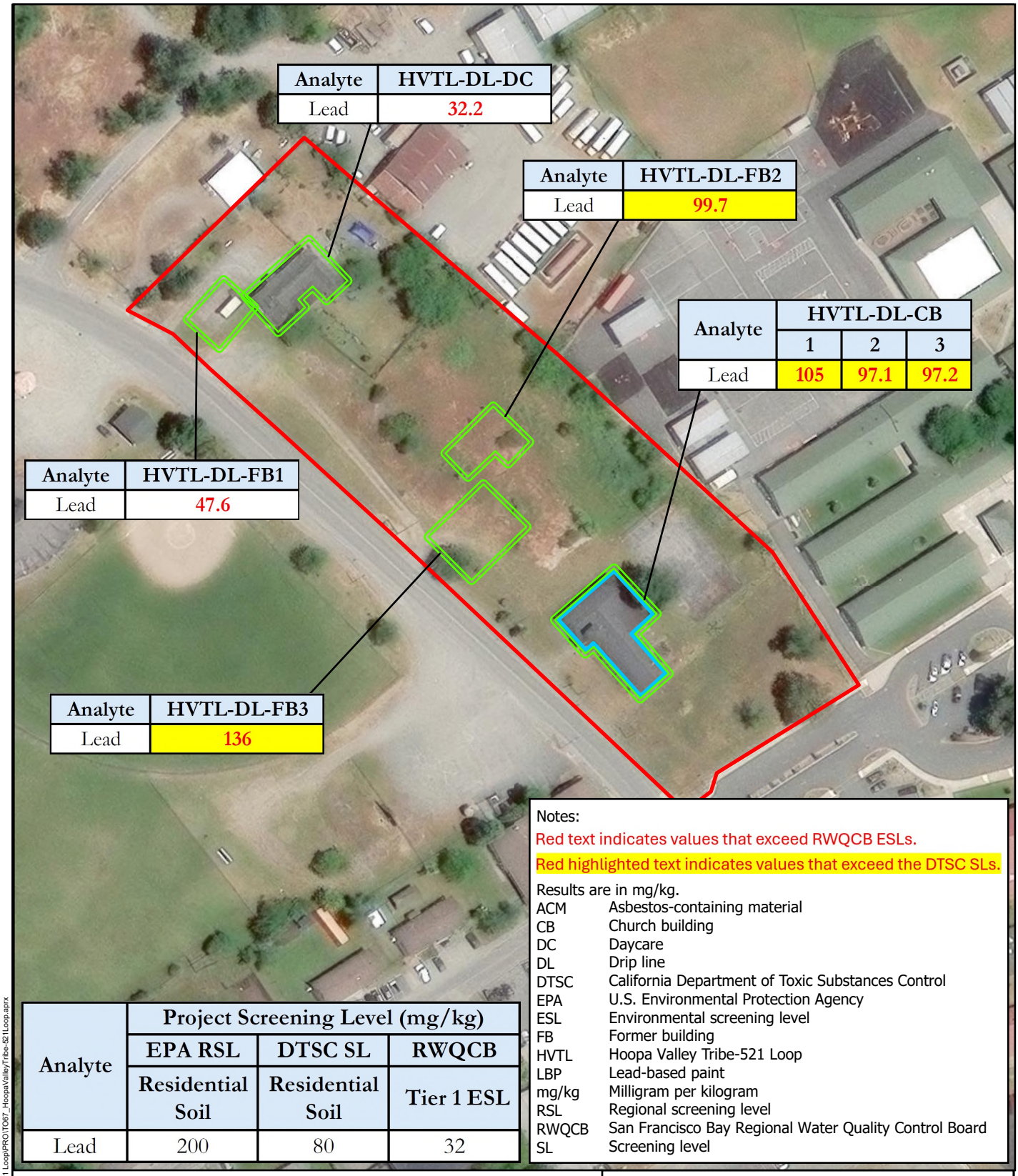

Analyte	Project Screening Level (mg/kg)		
	EPA RSL	DTSC SL	RWQCB
	Residential Soil	Residential Soil	Tier 1 ESL
Lead	200	80	32

Notes:

Red text indicates values that exceed RWQCB ESLs.

Red highlighted text indicates values that exceed the DTSC SLs.

Results are in mg/kg.

ACM	Asbestos-containing material
CB	Church building
DC	Daycare
DL	Drip line
DTSC	California Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
ESL	Environmental screening level
FB	Former building
HVTL	Hoopa Valley Tribe-521 Loop
LBP	Lead-based paint
mg/kg	Milligram per kilogram
RSL	Regional screening level
RWQCB	San Francisco Bay Regional Water Quality Control Board
SL	Screening level

Legend

- Site Boundary
- Surface Soil Sample Decision Unit
- Documented Presence of ACM and LBP

N

0 50 100

Feet

Hoopa Valley Tribe-521 Loop
Targeted Brownfields Assessment
Hoopa, California

Figure 4
Sample Exceedances

TETRA TECH | TOEROEK ASSOCIATES, INC.

Date: 6/12/2025 | Drawn By: Savannah Russell | Project No: 103Z652108Y

Source: ESRI, ArcGIS Online, World Imagery Basemap, 2023

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PRIMARY SOURCE	CONTAMINANTS	PRIMARY RELEASE MECHANISM	SECONDARY SOURCE	EXPOSURE ROUTE	POTENTIAL HUMAN RECEPTORS[a]	
					Future Unrestricted Use (Residential)	Future Commercial/ Industrial (Construction Worker)
Building Materials	ACM, LBP	Disturbance of friable ACM and LBP	Building Materials	Inhalation	●	●
				Dermal Absorption	◐	◐
				Incidental Ingestion	●	●
	LBP	Chipping, degradation of paint	Surface Soil (0 to 1 foot bgs)	Inhalation	●	●
				Dermal Absorption	●	●
				Incidental Ingestion	●	●

Notes:

(a) Construction workers or trespassers may be present at the Site in the future.

● Potentially complete exposure pathway

◐ Incomplete or negligible exposure pathway

ACM Asbestos-containing material

bgs Below ground surface

LBP Lead-based paint

NA Not applicable

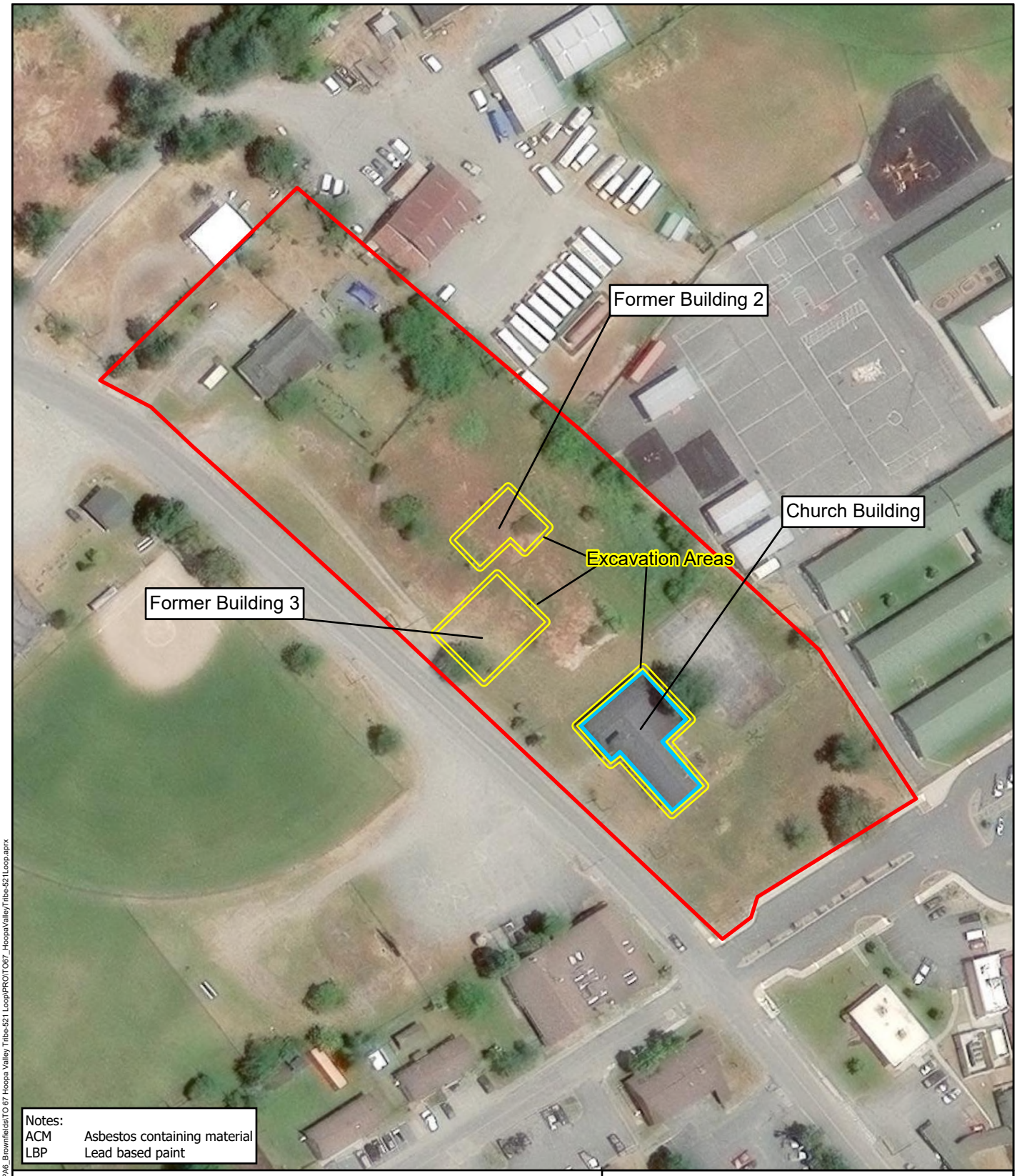
Hoopa Valley Tribe-521 Loop Road
Targeted Brownfields Assessment
Hoopa, California

TETRA TECH

TOEROEK ASSOCIATES, INC.

FIGURE 5

CONCEPTUAL SITE MODEL



Notes:
ACM Asbestos containing material
LBP Lead based paint

Legend

- Site Boundary
- Documented Presence of ACM and LBP
- Drip Line Excavation Area

N

0 50 100

Feet

Hoopa Valley Tribe-521 Loop
Targeted Brownfields Assessment
Hoopa, California

Figure 6
Alternative 2 Excavation Areas

TETRA TECH

TOEROEK ASSOCIATES, INC.

Date: 7/11/2025 Drawn By: Savannah Russell Project No: 103Z652108Y

Source: ESRI, ArcGIS Online, World Imagery Basemap, 2023

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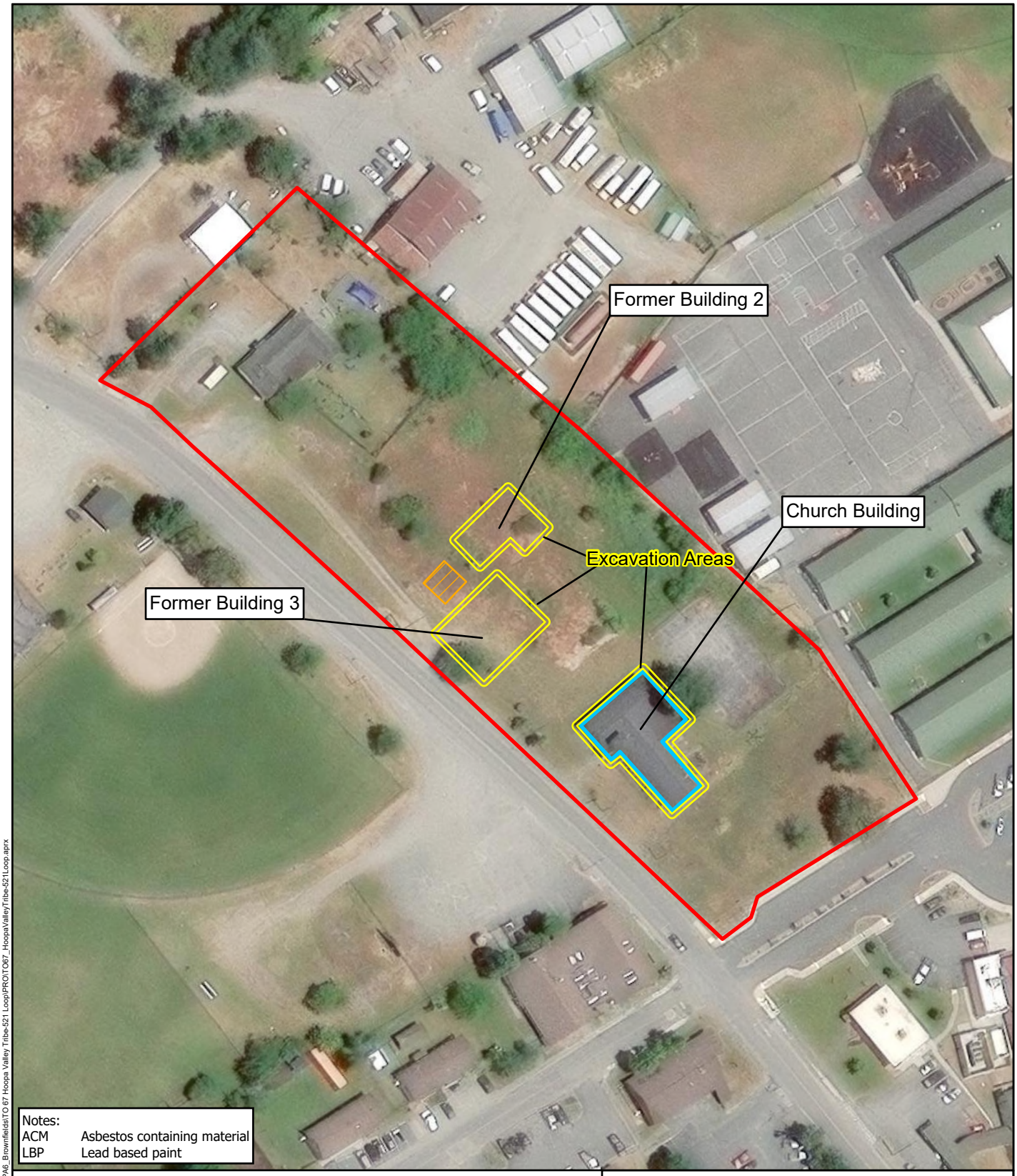

Notes:
ACM Asbestos containing material
LBP Lead based paint

Legend

- Site Boundary
- Documented Presence of ACM and LBP
- Capped Area
- Drip Line Excavation Area

N

0 50 100

Feet

Source: ESRI, ArcGIS Online, World Imagery Basemap, 2023

Hoopa Valley Tribe-521 Loop
Targeted Brownfields Assessment
Hoopa, California

Figure 7
Alternative 3 Excavation and Capped Areas

TETRA TECH

TOEROEK ASSOCIATES, INC.

Date: 7/11/2025 Drawn By: Savannah Russell Project No: 103Z652108Y

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TABLES

Table ES-1
Summary of Cleanup Alternatives
ABCA Report
Hoopa Valley Tribe–521 Loop

Alternative		Actions	Effectiveness	Implementation	Cost	Considerations
1	**No Action**	• None.	NA	NA	$0	This alternative would not be protective of human health and would not meet the project goal for the Site.
2	**Soil Excavation, Off-Site Disposal, ACM Abatement, and LBP Removal**	• Excavation of all contaminated soils at the Site containing concentrations above residential assumed cleanup levels based on results from the Phase II ESA. • Proper abatement of ACM identified in the church building before renovation. ACM abatement would comply with applicable local, tribal, state, and federal regulations. • LBP removal and disposal in compliance with applicable local, tribal, state, and federal regulations.	High	Easy	$240,000	This alternative assumes the church and daycare buildings on the Site will be remodeled and a new structure will be built.
3	**Consolidation and Capping with ICs, ACM Enclosure, and LBP Removal**	• Construction of an asphalt cap to cap contaminated soils in place to limit direct contact of future residential users. • Implementation of ICs to verify the continued integrity of the asphalt cap and ACM encapsulation. • Long-term O&M of the asphalt cap. • Proper enclosure of ACM identified in the church building before renovation. ACM enclosure would comply with applicable local, tribal, state, and federal regulations. • LBP removal and disposal in compliance with applicable local, tribal, state, and federal regulations.	Moderate	Moderate	$411,000	This alternative assumes the church and daycare buildings on the Site will be remodeled and a new structure will be built over the asphalt cap.

Notes:
ACM Asbestos-containing material
ESA Environmental site assessment
IC Institutional control
LBP Lead-based paint
NA Not applicable
O&M Operation and maintenance
Site Hoopa Valley Tribe-521 Loop

Table 1
Summary of Assumed Cleanup Levels
ABCA Report
Hoopa Valley Tribe–521 Loop

COC	Assumed Cleanup Level	Reference
Soil		
Lead	80 mg/kg	DTSC (2022) SL
Building Materials		
Lead	10 µg/ft²	Lead clearance level (HUD 2012)
Asbestos	0.01 f/cc	AHERA clearance level (40 CFR 763.90[i][2])

Notes:

µg/ft²	Microgram per square foot
AHERA	Asbestos Hazard Emergency Response Act
CFR	*Code of Federal Regulations*
COC	Contaminant of concern
DTSC	California Department of Toxic Substances Control
f/cc	Fiber per cubic centimeter
HUD	U.S. Department of Housing and Urban Development
mg/kg	Milligram per kilogram
SL	Screening level

Table 2
Summary of Cost Estimates
ABCA Report
Hoopa Valley Tribe–521 Loop

Alternative		Action Cost			Total Cost
		Type of Cost	Description	Cost	
1	**No Action**	Capital Cost	NA	$0	$0
		ICs	NA	$0	
		O&M	NA	$0	
2	**Soil Excavation, Off-Site Disposal, ACM Abatement, and LBP Removal**	Capital Cost	Soil Excavation, Confirmation Sampling, Waste Characterization, Off-Site Disposal of Soil (nonhazardous)	$122,000	$240,000
			ACM Abatement	$128,000	
			LBP Removal	$90,000	
3	**Consolidation and Capping with ICs, ACM Enclosure, and LBP Removal**	Capital Cost	Soil Excavation, Confirmation Sampling, Waste Characterization, Consolidation and Capping	$101,000	$411,000
			ACM Enclosure	$6,000	
			LBP Removal	$90,000	
		ICs	Restrictive Covenant	$45,000	
		O&M*	Routine Inspections, Cap Maintenance	$169,000	

Notes:
* Assumes O&M over a 30-year period at a discount rate of 7 percent.

ACM Asbestos-containing material
IC Institutional control
LBP Lead-based paint
NA Not applicable
O&M Operation and maintenance
Site Hoopa Valley Tribe–521 Loop

Table 3
Summary of Alternatives Considered and Dismissed
ABCA Report
Hoopa Valley Tribe–521 Loop

Alternative	Description	Considerations
Bioremediation	Bioremediation involves the use of microorganisms to degrade organic contaminants. The microorganisms break down contaminants by using them as a food source or co-metabolizing, converting them to end products such as methane and carbon dioxide.	Although it is effective for breakdown of organic contaminants in soil or groundwater such as gasoline, this alternative is not effective or inorganic contaminant like lead.
LBP Encapsulation	Encapsulation involves applying a durable, air- and dust-tight surface coating over LBP surfaces in fair or poor condition.	Although it is effective for reducing LBP exposure, this alternative is not cost efficient. The LBP identified is at the exterior of the building. Occupants within the building would be less likely to be exposed to the exterior LBP, and, therefore, encapsulation would not be necessary.

Note:
LBP Lead-based paint

Table 4
Summary of ACM to Be Removed and Type of Disposal
ABCA Report
Hoopa Valley Tribe–521 Loop

Material Description	Material Location	Estimated Quantity (SF/LF)[1]	ACM Category	Condition	NESHAP Category
Blue sheet flooring/fibrous backing/gray mastic	Church/ Kitchen	200 SF	Miscellaneous	Significantly Damaged	Category I non-friable
9-inch, white vinyl floor tile/black mastic	Church/ Kitchen	200 SF	Miscellaneous	Damaged	Category I non-friable
12-inch, tan vinyl floor tile	Church/ Hallway	100 SF	Miscellaneous	Damaged	Category I non-friable
9-inch, white vinyl floor tile/black mastic	Church/ Room 3	150 SF	Miscellaneous	Significantly Damaged	Category I non-friable
9-inch, brown vinyl floor tile/black mastic	Church/ Room 4	150 SF	Miscellaneous	Significantly Damaged	Category I non-friable
Transite pipe	Church/ Exterior	100 LF	Miscellaneous	Damaged	Category II non-friable
Black sink undercoating	Church/ Kitchen	5 SF	Surfacing material	Good	Friable

Notes:

[1] Quantities listed are estimated and should not be used for bidding purposes.

ACM Asbestos-containing material

LF Linear foot

NESHAP National Emission Standards for Hazardous Air Pollutants

SF Square foot

Table 5
Summary of LBP Materials and Locations
ABCA Report
Hoopa Valley Tribe–521 Loop

Material Description	Material Location	Estimated Quantity (SF)[1]
Light-blue paint on wood	Church building/ Exterior siding	6,000

Notes:

1	Quantities listed are estimated and should not be used for bidding purposes.
LBP	Lead-based paint
SF	Square Foot

Table 6
Summary of Alternatives
ABCA Report
Hoopa Valley Tribe–521 Loop

Criteria	Alternative 2		Alternative 3	
	Soil Excavation, Off-Site Disposal, ACM Abatement, and LBP Removal		Consolidation and Capping with ICs, ACM Enclosure, and LBP Removal	
	Rating	Score	Rating	Score
Effectiveness	High	5	Moderate	3
Implementation	Easy	5	Moderate	3
Cost	$240,000	5	$411,000	5
Overall Score	15		11	

Notes:

Effectiveness Ratings:		Implementation Ratings:		Cost Ratings:	
Low	1	Difficult	1	1	>$3 Million
Low to Moderate	2	Difficult to Moderate	2	2	$2.25 to $3 Million
Moderate	3	Moderate	3	3	$1.5 to $2.25 Million
Moderate to High	4	Easy to Moderate	4	4	$750,000 to $1.5 Million
High	5	Easy	5	5	$0 to $750,000

ACM Asbestos-containing material
IC Institutional control
LBP Lead-based paint

APPENDIX A

ENVIRONMENTAL FOOTPRINT EVALUATION

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Table A-2: Hoopa Valley Tribe – 521 Loop Detailed Effect Summary
Table A-3: Hoopa Valley Tribe – 521 Loop Detailed Effect Charts
Table A-4: Hoopa Valley Tribe – 521 Loop Alternative 2 Detailed Effect Charts
Table A-5: Hoopa Valley Tribe – 521 Loop Alternative 3 Detailed Effect Charts

LIST OF ATTACHMENTS

Attachment A-1: SEFA Inputs for the Hoopa Valley Tribe – 521 Loop TBA

A.1 GREEN REMEDIATION ANALYSIS

Toeroek Associates, Inc., and its subcontractor, Tetra Tech, Inc., (hereinafter the Toeroek Team), in support of the Analysis of Brownfields Cleanup Alternatives (ABCA) Report regarding the Hoopa Valley Tribe–521 Loop (the Site), conducted a remediation analysis to assist in the evaluation of potential cleanup alternatives. The U.S. Environmental Protection Agency (EPA) identifies the following elements of a cleanup assessment that may assist in selecting and implementing five protective cleanup activities:

- Total energy use and renewable energy use
- Air pollutants and gas emissions
- Water use and impacts to water resources
- Materials management and waste reduction
- Land management and ecosystem protection

The Toeroek Team conducted an analysis based on EPA's set of analytical workbooks called the Spreadsheets for Environmental Footprint Analysis (SEFA) tools for the potential cleanup alternatives for the Site. The SEFA analysis looks at the first two bullets presented above and determines total energy usage and masses of different emissions generated by different construction activities, including gas emissions, nitrogen oxides, sulfur oxides, particulate matter, and listed air pollutants. Result summaries of these analyses are in Table A-1. The SEFA analysis is based on the components of each alternative as follows.

Review of analytical data from the Phase II environmental site assessment (ESA) (Toeroek Team 2025) led to the following noteworthy findings:

- **Site Buildings:** The hazardous building materials survey documented the presence of asbestos-containing material (ACM) and lead-based paint (LBP) in the church building in building materials on the Site.
- **Building Drip Lines:** At drip lines around the church building, former building 2, and former building 3, the lead concentrations exceeded the U.S. Geological Survey-reported maximum reported concentration and the California Department of Toxic Substances Control residential soil screening level (80 milligrams per kilogram). No lead sample result exceeded the EPA regional screening level for residential soil (200 milligrams per kilogram) for lead.

The following cleanup alternatives were considered for the Site:

- **Alternative 1: No Action**
- **Alternative 2: Soil Excavation, Off-Site Disposal, ACM Abatement, and LBP Removal**
    - This alternative would involve excavation of all contaminated soils at the Site above residential preliminary assumed cleanup levels based on results from the Phase II ESA, abatement of ACM, and removal of LBP. This alternative would remove soil contamination above preliminary assumed cleanup levels and remove and dispose of all hazardous materials identified in the Phase II ESA off Site.
    - Following excavation, five-point composite confirmation soil samples would be collected from the walls and the floor of each excavation area to confirm contaminant concentrations in remaining soils are below residential preliminary assumed cleanup levels.
    - Soil would be stockpiled on the Site for waste profile characterization before off-Site disposal. Following characterization for disposal, excavated soils would be hauled to and disposed of at an off-Site permitted disposal facility. Depending on hazardous and leaching characteristics, waste disposal may occur at a Class I-, II-, or III-permitted facility.
    - Excavated areas would then be backfilled with clean fill material, graded, and seeded as appropriate.
    - Proper abatement of ACM identified in the former church building would be completed before renovation. Abatement by a licensed abatement professional would comply with applicable tribal, state, and federal regulations.
    - All surfaces and components that contain LBP at the former church observed to be in good condition would be removed for proper disposal. LBP removal by a licensed LBP removal professional would comply with applicable tribal, state, and federal regulations.
    - This alternative would allow for unrestricted use of the Site.
- **Alternative 3: Soil Capping with Institutional Controls (ICs), ACM Enclosure, and LBP Removal**
    - This alternative would involve excavating, consolidating, and capping contaminated soils in place with an asphalt cap; abatement of ACM; and removal of LBP. This alternative would permit soil contamination above preliminary assumed cleanup levels and ACM-related hazardous materials identified in the Phase II ESA to remain on Site with appropriate action taken to cap and stabilize remaining contamination, respectively, for future use of the former church building as a community center.

- All surfaces and components that contain LBP at the former church observed to be in good condition would be removed for proper disposal. LBP removal by a licensed LBP removal professional would comply with applicable tribal, state, and federal regulations.
- Contaminated soils exceeding preliminary assumed cleanup levels would be consolidated at a location elsewhere on the Site and capped with an asphalt cap to limit direct contact of future Site users.
- ICs would be necessary to limit exposure of construction workers, utility workers, visitors, school-age children, and office workers to contaminated soils below the cap and encapsulated ACM. In addition, long-term operation and maintenance (O&M) would be required to support the effectiveness of the cap and protectiveness of ICs.
- This alternative would involve creating an air-tight barrier over or around ACM, or both, or treatment of ACM with a bridging or penetrating encapsulant that surrounds or embeds asbestos fibers in an adhesive matrix to limit the release of fibers. This would limit access to and disturbance of ACM identified during the Phase II ESA within the former church building.
- Following enclosure or encapsulation, an O&M plan would be written and updated annually. The O&M plan should include the following: (1) the duties of the program manager, the person responsible for overseeing all aspects related to the ACM identified in the building; (2) training for all employees and workers in the building; (3) periodic surveillance every 6 months of areas with ACM by any designated personnel and reinspection by an accredited asbestos inspector every 3 years; and (4) worker protection for employees performing asbestos work. The O&M plan would be kept and updated for as long as ACM is present in the building.
- This alternative would allow for residential uses of the Site; however, ICs would be required as long as contamination remains at the Site above residential preliminary assumed cleanup levels.

SEFA Analysis

EPA (2019) developed a set of analytical workbooks called the SEFA tools to help decision-makers analyze the environmental footprint of a site cleanup project, determine which cleanup activities drive the footprint, and adjust project parameters to reduce the footprint. Information to be input into the spreadsheets was gathered from the Phase I/II ESA (Toeroek Team 2025), field records, and other resources. Automated calculations within SEFA generate outputs that quantify 21 metrics corresponding to core elements of a cleanup in response to natural hazards. The Toeroek Team use the SEFA tools to conduct an analysis of each alternative for the Site.

The SEFA tools require input of different equipment types, distances to transport personnel, on-site electricity use, materials use and transportation, waste disposal and transportation, and type of water used. These inputs

were required for each component of the cleanup alternative. The Toeroek Team estimated these inputs for the Site (Attachment A-1). Example components of an alternative include excavation, transportation, and O&M.

SEFA then automatically calculates energy and emissions derived from the inputs. The different types of energy and emissions include total energy consumed, gas emissions, nitrate emissions, sulfate emissions, particulate matter emissions, and listed air pollutants emissions. Methane emissions are not directly calculated by SEFA but are included as part of gas emissions. Based on this information, how quantification of effects of emitted gas emissions under each alternative is possible.

Results of the SEFA analysis of each potential alternative for the Site are in Table A-1 through Table A-5.

A.2 FINDINGS AND CONCLUSIONS

Summarized results of the remediation analyses are in Table A-1. Relative effects listed in these tables constitute a qualitative assessment of the relative footprint of each alternative: a rating of "High" for an alternative is assigned if it would affect 50 percent of the maximum footprint, a rating of "Medium" is assigned if it would affect between 20 and 50 percent of the maximum footprint, and a rating of "Low" is assigned if it would affect less than 20 percent of the maximum footprint.

Although Alternative 1 has the lowest environmental footprint, it is not considered to be very effective based on redevelopment goals for the Site. Therefore, Alternative 1 will not be discussed further. Effects under Alternative 2 (Soil Excavation, Off-Site Disposal, ACM Abatement, and LBP Removal) are rated low for all emissions except nitrogen oxide, which is rated medium. Under this alternative, a low amount of energy input would be necessary and, thus, the environmental footprint would be low. Effects under Alternative 3 (Capping with ICs, ACM Enclosure, and LBP Removal) are rated high for all emissions. Under this alternative, a high amount of energy input would be necessary and, thus, the environmental footprint would be high. Alternative 3 emissions are rated high because of the off-Site emissions associated with the asphalt used for capping. For the purposes of this remediation analysis, O&M is assumed to continue for a period of 30 years. Alternative 2 would have the smallest environmental footprint. Table A-1 and Table A-2 compare the effects of the mitigation options for Alternative 2 and Alternative 3. Table A-3, Table A-4, and Table A-5 compare the effects of each component in more detail.

A.3 REFERENCES

Toeroek Associates, Inc., and Tetra Tech, Inc. (Toeroek Team). 2025. Phase I/II Environmental Site Assessment Targeted Brownfields Assessment Report, Hoopa Valley Tribe–521 Loop, Hoopa, California. May 1.

U.S. Environmental Protection Agency (EPA). 2019. EPA Spreadsheets for Environmental Footprint Analysis (SEFA). Office of Superfund Remediation and Technology Innovation. https://clu-in.org/greenremediation/SEFA/

TABLES

Table A-1. Hoopa Valley Tribe – 521 Loop Relative Impact of Alternatives
ABCA Report
Hoopa Valley Tribe - 521 Loop

Removal Alternatives	Total Energy Used	GHG Emissions	NO_x Emissions	SO_x Emissions	PM Emissions	EPA LAP Emissions
	MMBTU	metric ton	lbs	lbs	lbs	lbs
Alternative 1: No Action	0	0	0	0	0	0
Alternative 2: Soil Excavation, Off-Site Disposal, ACM Abatement, and LBP Removal	1010	82	737	90	108	936
Alternative 3: Capping with ICs, ACM Enclosure, and LBP Removal	31,242	375	2,833	5,903	651	9,387

Removal Alternatives	Total Energy Used	GHG Emissions	NO_x Emissions	SO_x Emissions	PM Emissions	EPA LAP Emissions
	MMBTU	metric ton	lbs	lbs	lbs	lbs
Alternative 1: No Action	Low	Low	Low	Low	Low	Low
Alternative 2: Soil Excavation, Off-Site Disposal, ACM Abatement, and LBP Removal	Low	Low	Medium	Low	Low	Low
Alternative 3: Capping with ICs, ACM Enclosure, and LBP Removal	High	High	High	High	High	High

Notes:

The relative impact is a qualitative assessment of the relative footprint of each alternative; a rating of High for an alternative is assigned if it is 50 percent of the maximum footprint, a rating of Medium is assigned if it is between 20 and 50 percent of the maximum footprint, and a rating of Low is assigned if it is less than 20 percent of the maximum footprint.

List of LAPs are included in this list: https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications

ACM	Asbestos-containing material
EPA	U.S. Environmental Protection Agency
GHG	Greenhouse gas
IC	Institutional control
LAP	Listed air pollutant
LBP	Lead-based paint
lbs	Pounds
MMBTU	Million British thermal unit
NOx	Nitrogen oxide
PM	Particulate matter
SOx	Sulfur oxide

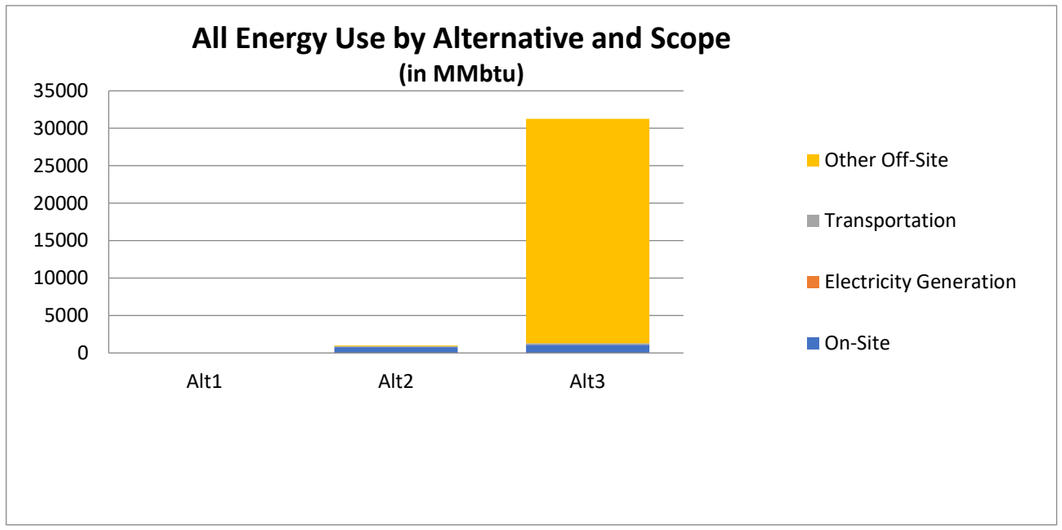
Table A-2. Hoopa Valley Tribe – 521 Loop Detailed Impact Summary
ABCA Report
Hoopa Valley Tribe - 521 Loop

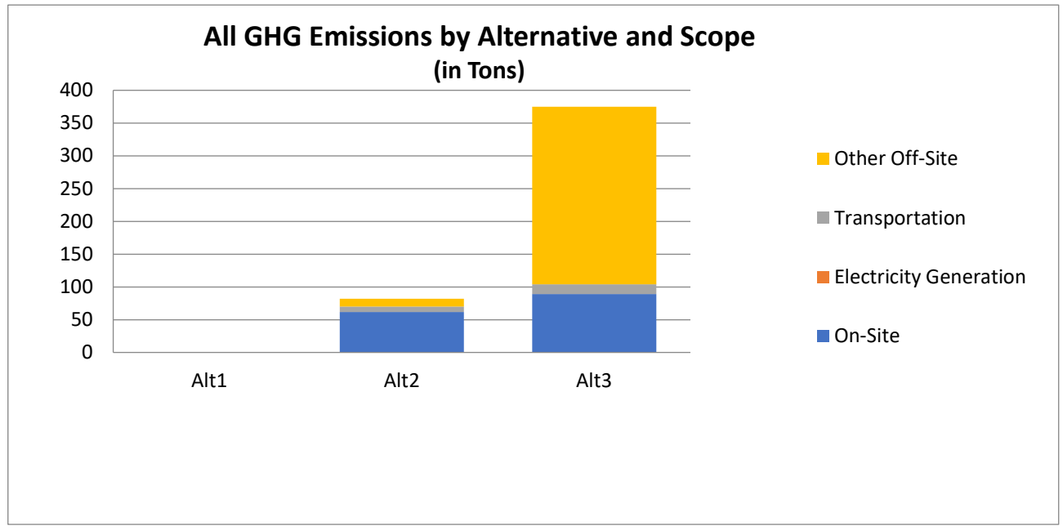
Phase	Activities	Total Energy Used	GHG Emissions	NO_x Emissions	SO_x Emissions	PM Emissions	EPA LAP Emissions
		MMBTU	metric ton	lbs	lbs	lbs	lbs
Alternative 1	On-Site	0	0	0	0	0	0
	Electricity Generation	0	0	0	0	0	0
	Transportation	0	0	0	0	0	0
	Other Off-Site	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Alternative 2	On-Site	774	62	563	1	50	613
	Electricity Generation	0	0	0	0	0	0
	Transportation	104	8	110	3	3	117
	Other Off-Site	132	11	64	86	55	205
	Total	1,010	82	737	90	108	936
Alternative 3	On-Site	1114	89	809	1	72	882
	Electricity Generation	0	0	0	0	0	0
	Transportation	186	15	163	4	7	174
	Other Off-Site	29943	271	1861	5898	572	8331
	Total	31,242	375	2833	5903	651	9387

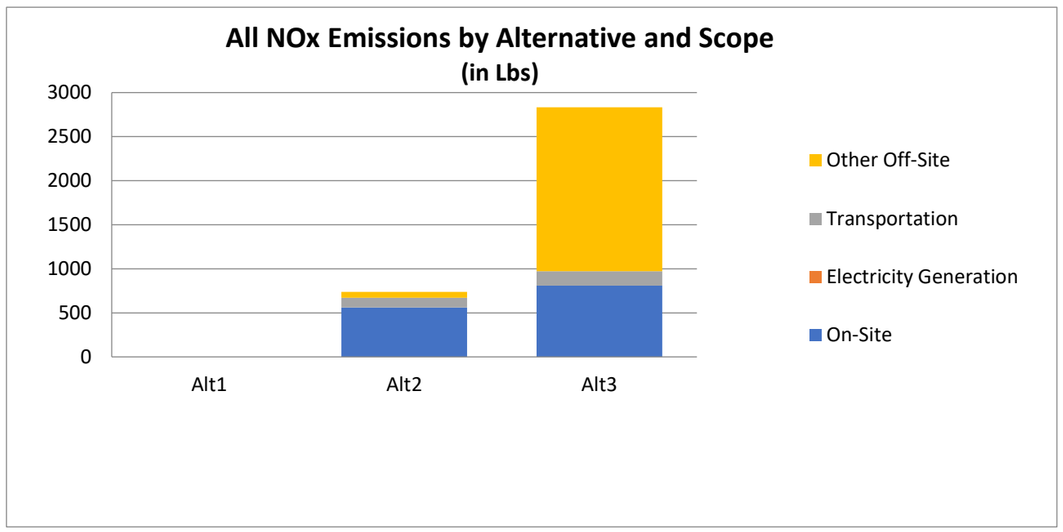
Notes:

EPA	U.S. Environmental Protection Agency	MMBTU	Million British thermal unit
GHG	Greenhouse gas	NOx	Nitrogen oxide
LAP	Listed air pollutant	PM	Particulate matter
lbs	Pounds	SOx	Sulfur oxide

Chart A-1. Hoopa Valley Tribe – 521 Loop Detailed Impact Charts
ABCA Report
Hoopa Valley Tribe - 521 Loop







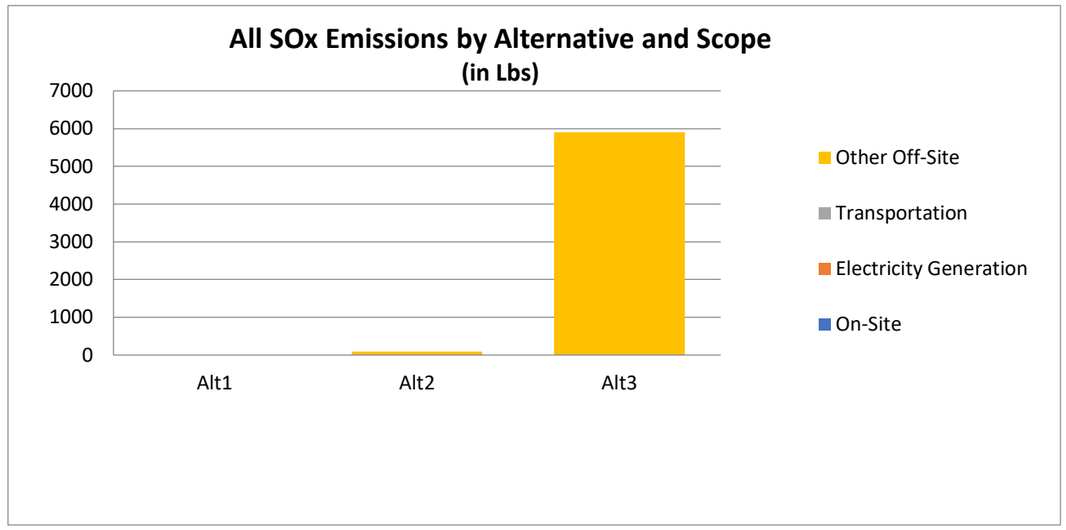
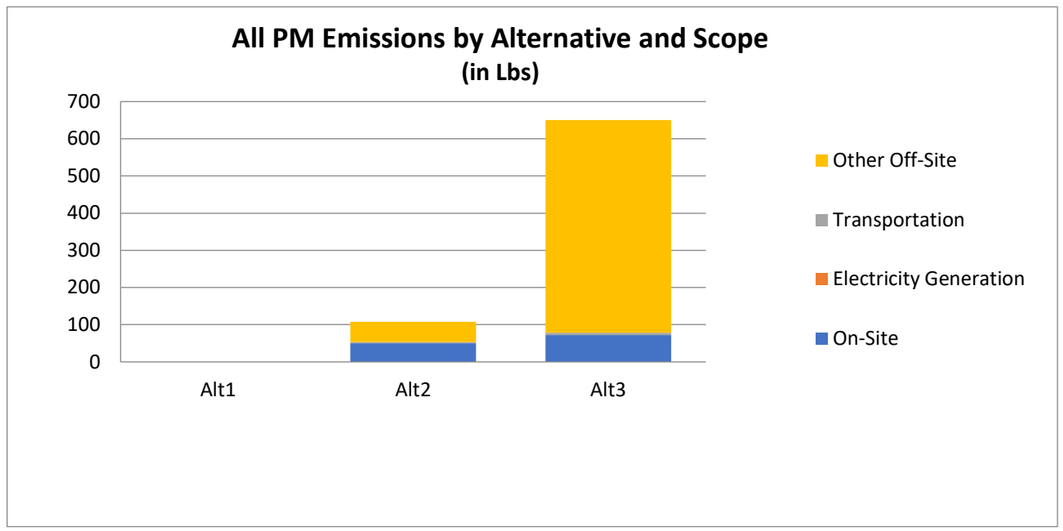
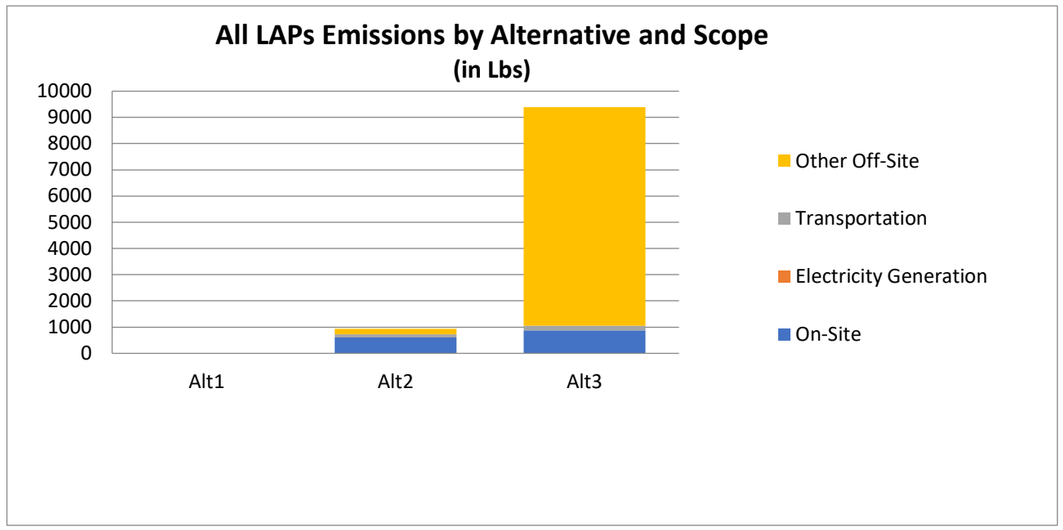


Chart A-1. Hoopa Valley Tribe – 521 Loop Detailed Impact Charts
ABCA Report
Hoopa Valley Tribe - 521 Loop

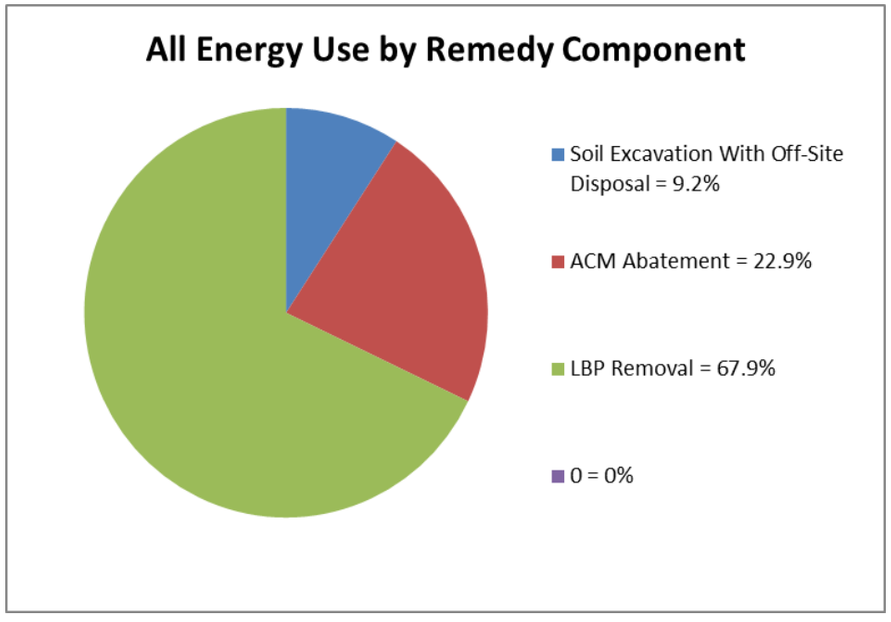


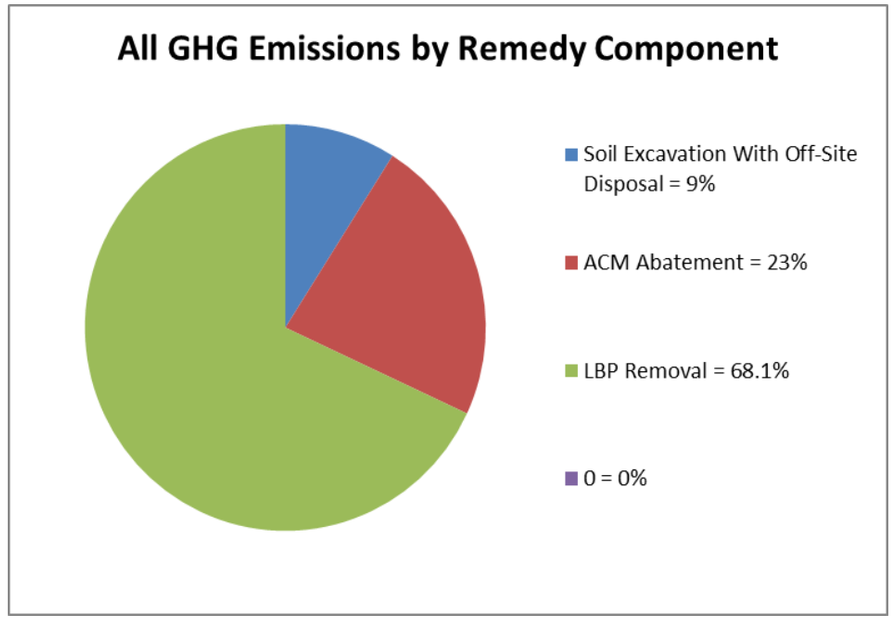


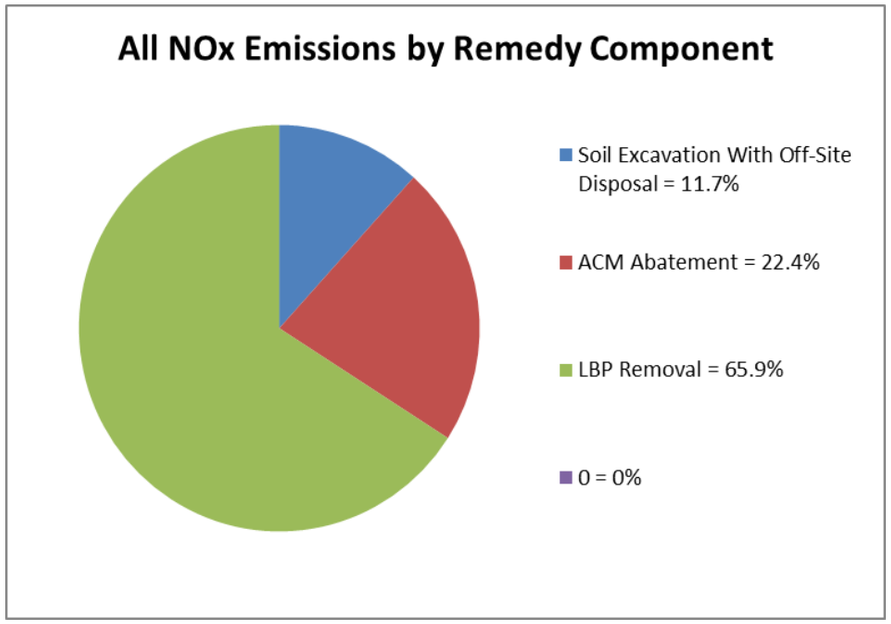
Notes:

EPA	U.S. Environmental Protection Agency
GHG	Greenhouse gas
LAP	Listed air pollutant
lbs	Pounds
MMBTU	Million British thermal unit
NOx	Nitrogen oxide
PM	Particulate matter
SOx	Sulfur oxide

Chart A-2. Hoopa Valley Tribe – 521 Loop Alternative 2 Detailed Impact Charts
ABCA Report
Hoopa Valley Tribe - 521 Loop







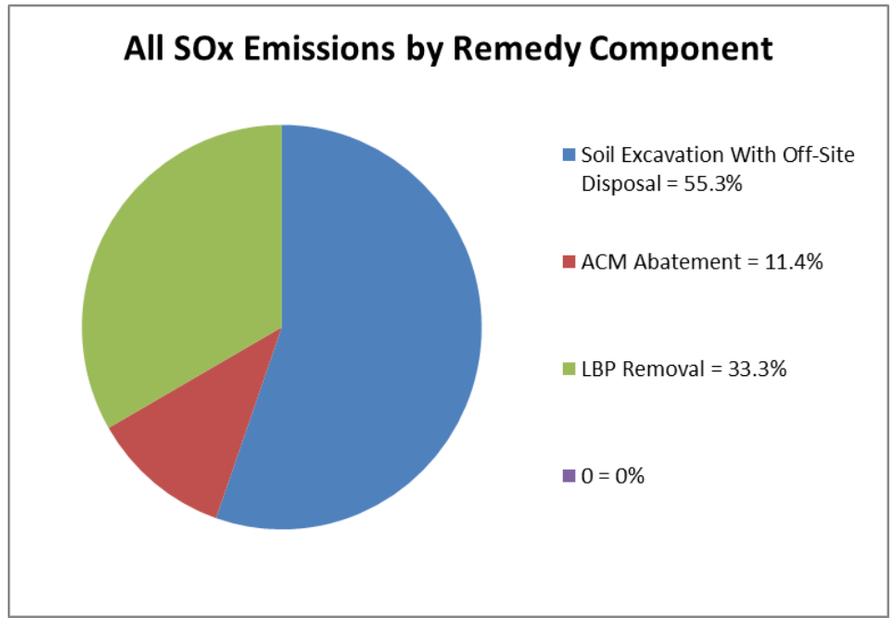
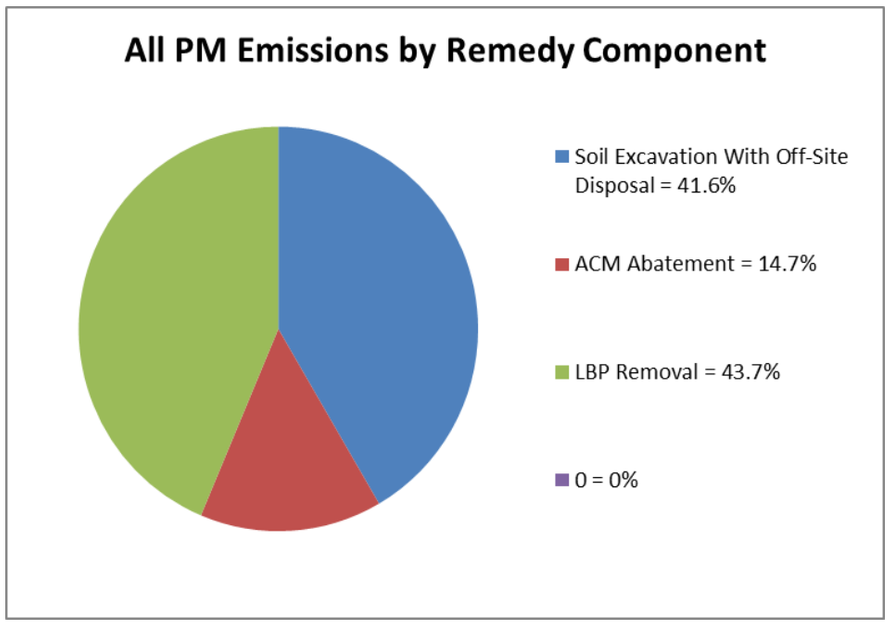
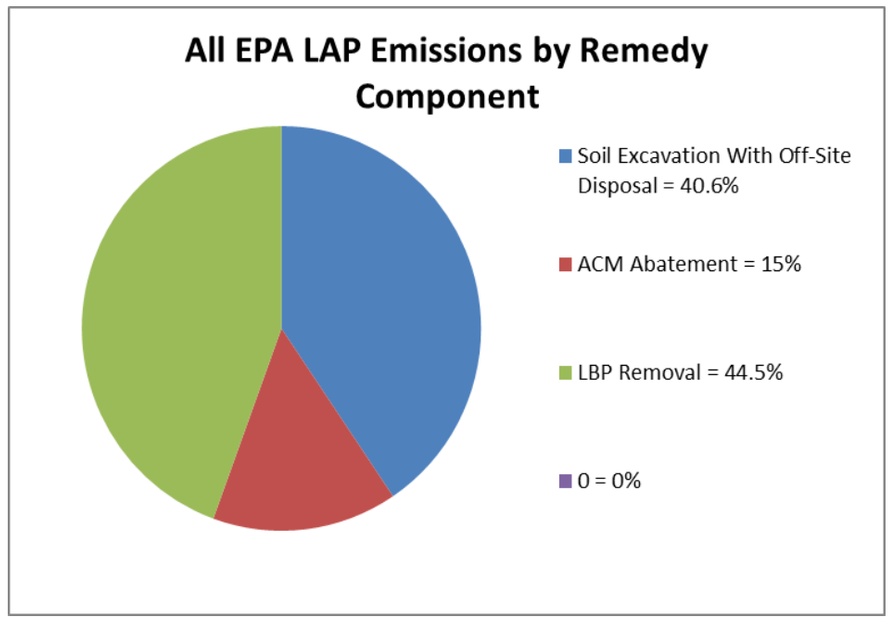


Chart A-2. Hoopa Valley Tribe – 521 Loop Alternative 2 Detailed Impact Charts
ABCA Report
Hoopa Valley Tribe - 521 Loop

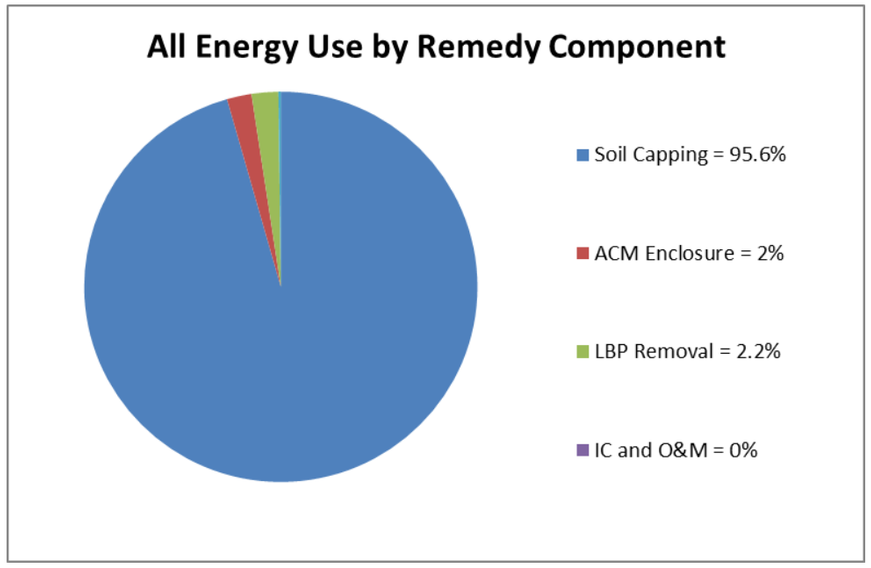


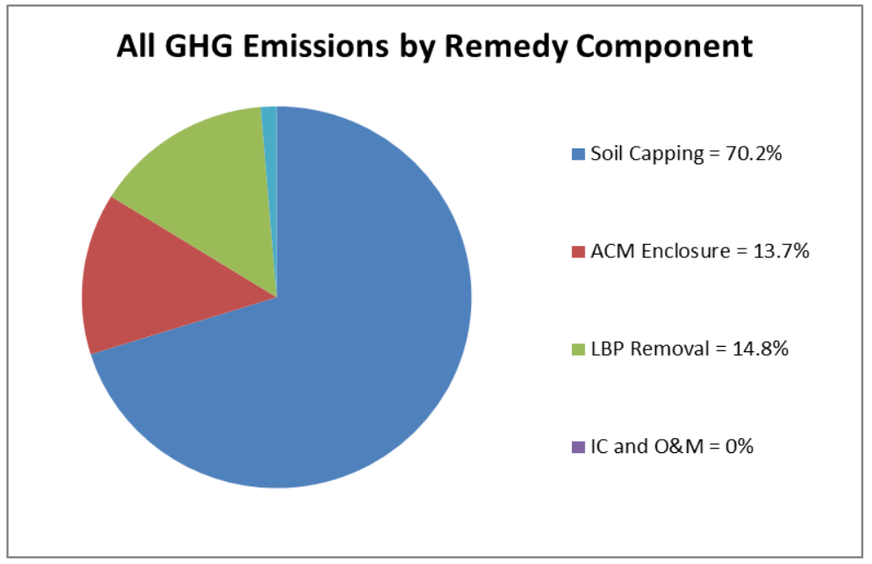


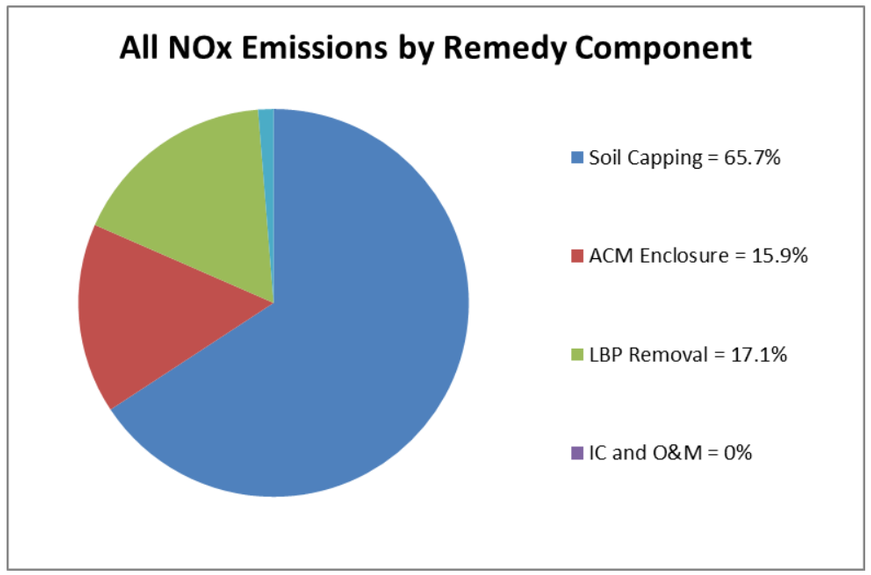
Notes:

EPA	U.S. Environmental Protection Agency
GHG	Greenhouse gas
LAP	Listed air pollutant
lbs	Pounds
MMBTU	Million British thermal unit
NOx	Nitrogen oxide
O&M	Operation and maintenance
PM	Particulate matter
SOx	Sulfur oxide

Chart A-3. Hoopa Valley Tribe – 521 Loop Alternative 3 Detailed Impact Charts
ABCA Report
Hoopa Valley Tribe - 521 Loop







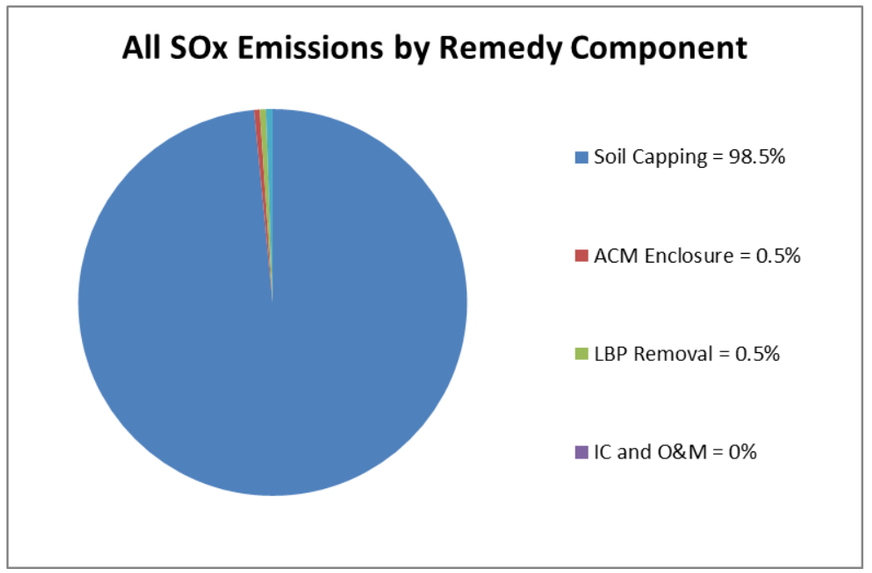
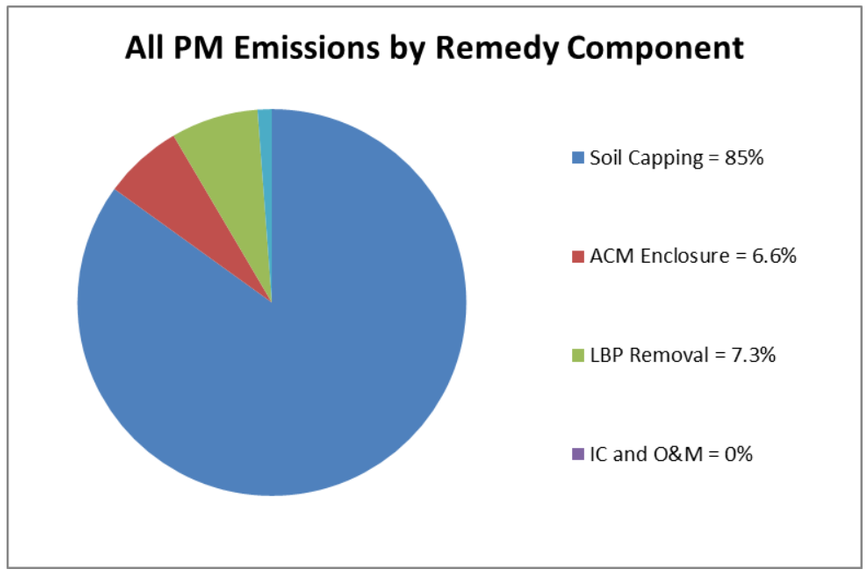
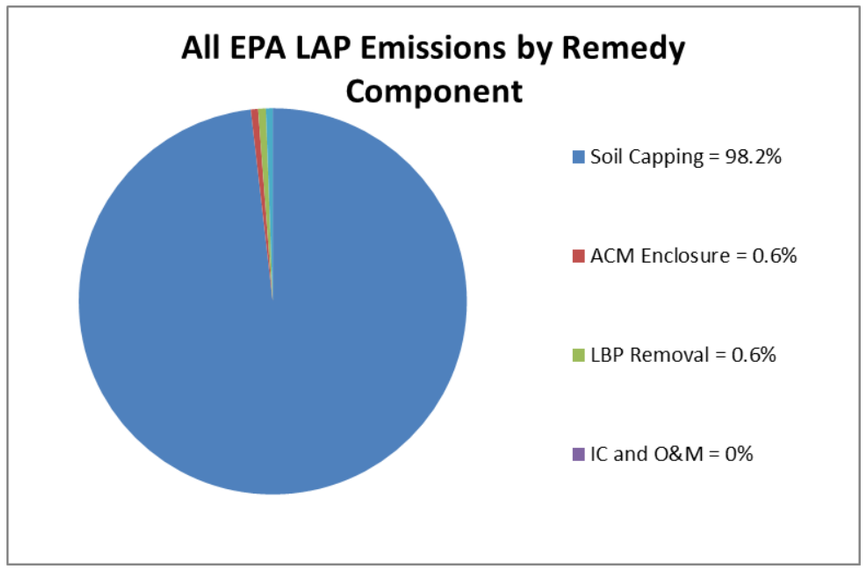


Chart A-3. Hoopa Valley Tribe – 521 Loop Alternative 3 Detailed Impact Charts
ABCA Report
Hoopa Valley Tribe - 521 Loop





Notes:

EPA	U.S. Environmental Protection Agency
GHG	Greenhouse gas
IC	Institutional control
LAP	Listed air pollutant
lbs	Pounds
MMBTU	Million British thermal unit
NOx	Nitrogen oxide
O&M	Operation and maintenance
PM	Particulate matter
SOx	Sulfur oxide

ATTACHMENT A-1

SEFA INPUTS FOR THE HOOPA VALLEY TRIBE – 521 LOOP TBA

Spreadsheets for Environmental Footprint Analysis (SEFA) Version 3.0, November 2019

#REF!

Input Worksheet for Excavation

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this Input worksheet from calculations and results)	**Component 1**	**Define Component**

General Scope

This alternative would involve excavation of all contaminated soils at the Site above residential preliminary cleanup goals to be disposed of off-site. Following excavation, five-point composite confirmation soil samples would be collected from the walls and the floor of each excavation area to ensure contaminant concentrations in remaining soils are below residential preliminary cleanup goals. Soil would be stockpiled on the Site for waste profile characterization before off-site disposal. Following characterization for disposal, excavated soils would be hauled to and disposed of at an off-site permitted disposal facility. Depending on hazardous and leaching characteristics, waste disposal may occur at a Class I, II, or III permitted facility. Excavated areas would then be backfilled with clean fill material, graded, and seeded as appropriate. This alternative would allow for unrestricted use of the Site.

Example Items Eliminated through Screening Process

Bioremediation, thermal remediation, soil vapor extraction

Other Notes and References

Personnel Transportation

Participant	Number of Roundtrips to Site	Roundtrip Distance to Site (miles)	Mode of Transportation*	Transport Fuel Type*	Total Distance Transported (miles)	Default Fuel Usage Rate**	Fuel Usage Rate Override**	Fuel Used for Personnel Transport**	Activity or Notes
Equipment Operater	3	60	Light-Duty/Passenger Truck	Diesel	180	15.1		11.9	
Laborer	2	60	Light-Duty/Passenger Truck	Diesel	120	15.1		7.9	
Truck Driver	4	60	Heavy-Duty Truck	Diesel	240	7.55		31.8	
Water Truck Driver	1	60	Heavy-Duty Truck	Diesel	60	7.55		7.9	

**** See the "Detailed Notes and Explanations" tab for explanation of transport and fuel options.***

***** for biodiesel, B20, diesel, and gasoline, units are gallons for Fuel Used and miles/gallon for Fuel Usage Rate; for natural gas, units are hundreds of cubic feet (ccf) for Fuel Used and ccf/miles for Fuel Usage Rate; for electricity, units are miles/kWh for Fuel Usage Rate and the kWh (Fuel Used) are added to total grid electricity used (cell G69).***

On-Site Equipment Use and Transportation

Equipment Type*	HP*	Load Factor (%)*	Equipment Fuel Type**	Equipment Fuel Usage Rate	Equipment Hours Operated	Fuel Used for On-site Equipment	Equipment weight (tons)	Number of Equipment Roundtrips to Site	Roundtrip Distance to Site (miles)	Total Distance Transported (miles)	Mode of Transportation	Transport Fuel Type***	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Equipment Transport (gallons)	Activity or Notes
Excavator - large (250 HP)	250	75%	Diesel between 75 and 750 hp	10.3021978	3	30.90659341	57	1	60	60	Truck (mpg)	Diesel	6		10	
Dump truck (400 HP)	400	75%	Diesel between 75 and 750 hp	16.48351648	5	82.41758242	14	1	60	60	Truck (mpg)	Diesel	6		10	
Dozer - large (200 HP)	200	75%	Diesel between 75 and 750 hp	8.241758242	1	8.241758242	73	1	60	60	Truck (mpg)	Diesel	6		10	
Grader (175 HP)	175	75%	Diesel between 75 and 750 hp	7.211538462	7	50.48076923	1	1	60	60	Truck (mpg)	Diesel	6		10	
Backhoe (100 HP)	100	75%	Diesel between 75 and 750 hp	4.120879121	18	74.17582418	8	1	60	60	Truck (mpg)	Diesel	6		10	
Water truck (400 HP)	400	75%	Diesel between 75 and 750 hp	16.48351648	3	49.45054945	182	1	60	60	Truck (mpg)	Diesel	6		10	

**** HP and Load Factor must be entered by user in Columns C and D. Please see the "Detailed Notes and Explanations" tab for further explanation.***

***** For biodiesel, B20, diesel, gasoline, and liquified petroleum gas, units are gallons for Fuel Used for On-site Equipment and gallons/hr for Equipment Fuel Usage Rate; for compressed natural gas units are ccf (hundreds of cubic feet) for Fuel Used for On-site Equipment and ccf/hr for Equipment Fuel Usage Rate.***

****** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation and other aspects of data entry in Columns M, N, and P. Units are gallons for Fuel Used for Equipment Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Input Worksheet for Excavation

Remedy Component that this Input worksheet is part of:	Component 1	Define Component

On-Site Electricity Use

Equipment Type	HP	Load Factor (%)	Efficiency (%)	Electrical Rating (kW)	Hours Used	Energy Used (kWh)	Notes
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
On-Site Generator, 55 kW							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
Estimated Total Electricity Usage Based on Above						0	
Renewable Electricity Generated On-Site*							
Total Electricity Usage Based on Personnel Transportation						0	
Total Grid Electricity Used						0	

**** Electricity generated on-site from renewable resources, for which the facility retains the rights to the renewable energy (i.e., does not sell renewable energy certificates associated with the renewable energy generation).***

On-Site Natural Gas Use

Equipment Type	Power Rating (Btu/hr)	Efficiency (%)	Hours Used	Energy Required (Btu)	Natural Gas Used (ccf)	Notes
					0	
				0		
Totals			0	0	0	

Landfill Gas Combusted On-Site for Energy Use

Equipment Type	Landfill Gas (ccf)	% Methane by volume	Used for electricity?	Landfill Gas Methane Used (ccf)	Notes
				0	
				0	
				0	
Total				0	

Please see the "Detailed Notes and Explanations" tab for instructions on using the two tables above ("On-site Natural Gas Use" and "Landfill Gas Combusted On-Site for Energy Use"). In the two tables above, ccf = hundreds of cubic feet.

Materials Use and Transportation

Material Type*	Unit	Quantity	Tons	Is the Material Refined or Unrefined?**	Material Source: Virgin, Recycled, or Reused?**	Calculate Item Footprint?**	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation***	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Materials Transport (gallons)	Notes and Description of Materials
Gravel/sand/clay	lb	142290	71.145	Refined	Virgin	Yes	25	25	1	No	25	Truck (mpg)	Diesel	6		4.167	
			0														
			0														
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**** Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined Materials" in the dropdown menu.***

***** Selections must be made in Columns F - H in order for the footprint calculations to be performed. Please see the "Detailed Notes and Explanations" tab for further information.***

****** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns L, N, O, and Q. Units are gallons for Fuel Used for Materials Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Input Worksheet for Excavation

Remedy Component that this Input worksheet is part of:	Component 1	Define Component

Waste Disposal and Transportation

Waste Destination*	Unit	Quantity	Tons	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation**	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Waste Transport (gallons)	Notes and Description of Waste
Off-site non-hazardous waste landfill	tons	69	69	25	60	1	No	60	Truck (mpg)	Diesel	6		10.0	
Off-site hazardous waste landfill	tons	17	17	500	100	1	No	100	Truck (mpg)	Diesel	6		16.7	
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											

**** No footprint is calculated for the Recycled/Reused On-Site and Off-Site selections. Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined" selections in the dropdown menu.***

***** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns I, K, L, and N. Units are gallons for Fuel Used for Waste Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Type of Water Used

Source of Water Used*	Unit	Quantity	Tons	Source Location/Aquifer (optional)	Quality of Water Used (optional)	Water Uses (optional)	Fate of Used Water (optional)
Public Water	gal x 1000	1	4.17				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				

**** Only the "Public Water" selection has an associated footprint. No footprint is calculated for the other water source selections.***

Note: Information entered in Columns F - V (Source/Quality/Use/Fate) is not compiled or reported by SEFA.

Input Worksheet for Excavation

Remedy Component that this Input worksheet is part of:	Component 1	Define Component

Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
On-Site				
User-defined on-site conventional energy use #1	*User-Defined	TBD		
User-defined on-site conventional energy use #2	*User-Defined	TBD		
On-site HAP process emissions**		lbs		
On-site GHG emissions**		lbs CO2e		
On-site carbon storage**		lbs CO2e		
Landfill gas flared on-site		ccf CH4		
Other on-site NOx emissions or reductions**		lbs		
Other on-site SOx emissions or reductions**		lbs		
Other on-site PM emissions or reductions**		lbs		
Transportation		**Units**	**Quantity**	**Notes**
User-defined conventional energy transportation #1	*User-Defined	TBD	10	
User-defined conventional energy transportation #2	*User-Defined	TBD		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Enter a positive number for emissions and a negative number for reductions, avoidances, or storage***
See the "Detailed Notes and Explanations" tab for use of this table.

Other Voluntary Renewable Energy Use

Item		Units	Quantity	Notes
User-defined on-site renewable energy use #1	*User-Defined	TBD		
User-defined on-site renewable energy use #2	*User-Defined	TBD		
User-defined renewable energy transportation #1	*User-Defined	TBD		
User-defined renewable energy transportation #2	*User-Defined	TBD		
Voluntary purchase of renewable electricity**		MWh		
Voluntary purchase of RECs**		MWh		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Complete information on provider in the table to the right. No footprint reductions are associated with the voluntary purchases.***
See the "Detailed Notes and Explanations" tab for use of this table

Off-Site Laboratory Analysis

Parameter and Notes	Number of Samples	Comments
Off-site Laboratory Analysis - Metals	25	
Totals	**25**	

Description of purchased renewable electricity (green pricing product or green marketing product)	Provider:	
	Type of product:	
	Type of renewable energy source:	
	Date of renewable system installation:	
Description of purchased RECs	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for ACM

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this Input worksheet from calculations and results)	**Component 2**	**Define Component**

General Scope

This alternative would involve abatement of ACM. Proper abatement of ACM identified in the former church building would be completed before renovation. Abatement by a licensed abatement contractor would comply with applicable local, state, and federal regulations. This alternative would allow for unrestricted use of the Site.

Example Items Eliminated through Screening Process

Bioremediation, thermal remediation, soil vapor extraction

Other Notes and References

Personnel Transportation

Participant	Number of Roundtrips to Site	Roundtrip Distance to Site (miles)	Mode of Transportation*	Transport Fuel Type*	Total Distance Transported (miles)	Default Fuel Usage Rate**	Fuel Usage Rate Override**	Fuel Used for Personnel Transport**	Activity or Notes
Asbestos Foreman	4	60	Light-Duty/Passenger Truck	Diesel	240	15.1		15.9	
Asbestos Workers	4	60	Light-Duty/Passenger Truck	Diesel	240	15.1		15.9	
Truck Driver	4	60	Heavy-Duty Truck	Diesel	240	7.55		31.8	
Water Truck Driver	4	60	Heavy-Duty Truck	Diesel	240	7.55		31.8	

**** See the "Detailed Notes and Explanations" tab for explanation of transport and fuel options.***

***** for biodiesel, B20, diesel, and gasoline, units are gallons for Fuel Used and miles/gallon for Fuel Usage Rate; for natural gas, units are hundreds of cubic feet (ccf) for Fuel Used and ccf/miles for Fuel Usage Rate; for electricity, units are miles/kWh for Fuel Usage Rate and the kWh (Fuel Used) are added to total grid electricity used (cell G69).***

On-Site Equipment Use and Transportation

Equipment Type*	HP*	Load Factor (%)*	Equipment Fuel Type**	Equipment Fuel Usage Rate	Equipment Hours Operated	Fuel Used for On-site Equipment	Equipment weight (tons)	Number of Equipment Roundtrips to Site	Roundtrip Distance to Site (miles)	Total Distance Transported (miles)	Mode of Transportation	Transport Fuel Type***	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Equipment Transport (gallons)	Activity or Notes
Dump truck (400 HP)	400	75%	Diesel between 75 and 750 hp	16.48351648	40	659.3406593	14	1	60	60	Truck (mpg)	Diesel	6		10	
Water truck (400 HP)	400	75%	Diesel between 75 and 750 hp	16.48351648	40	659.3406593	182	4	60	240	Truck (mpg)	Diesel	6		40	

**** HP and Load Factor must be entered by user in Columns C and D. Please see the "Detailed Notes and Explanations" tab for further explanation.***

***** For biodiesel, B20, diesel, gasoline, and liquified petroleum gas, units are gallons for Fuel Used for On-site Equipment and gallons/hr for Equipment Fuel Usage Rate; for compressed natural gas units are ccf (hundreds of cubic feet) for Fuel Used for On-site Equipment and ccf/hr for Equipment Fuel Usage Rate.***

****** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation and other aspects of data entry in Columns M, N, and P. Units are gallons for Fuel Used for Equipment Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Spreadsheets for Environmental Footprint Analysis (SEFA) Version 3.0, November 2019

Input Worksheet for ACM

#REF!

Remedy Component that this Input worksheet is part of:	Component 2	Define Component

On-Site Electricity Use

Equipment Type	HP	Load Factor (%)	Efficiency (%)	Electrical Rating (kW)	Hours Used	Energy Used (kWh)	Notes
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
On-Site Generator, 55 kW							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
Estimated Total Electricity Usage Based on Above						0	
Renewable Electricity Generated On-Site*							
Total Electricity Usage Based on Personnel Transportation						0	
Total Grid Electricity Used						0	

** Electricity generated on-site from renewable resources, for which the facility retains the rights to the renewable energy (i.e., does not sell renewable energy certificates associated with the renewable energy generation).*

On-Site Natural Gas Use

Equipment Type	Power Rating (Btu/hr)	Efficiency (%)	Hours Used	Energy Required (Btu)	Natural Gas Used (ccf)	Notes
					0	
				0		
		Totals	0	0	0	

Landfill Gas Combusted On-Site for Energy Use

Equipment Type	Landfill Gas (ccf)	% Methane by volume	Used for electricity?	Landfill Gas Methane Used (ccf)	Notes
				0	
				0	
				0	
			Total	0	

Please see the "Detailed Notes and Explanations" tab for instructions on using the two tables above ("On-site Natural Gas Use" and "Landfill Gas Combusted On-Site for Energy Use"). In the two tables above, ccf = hundreds of cubic feet.

Materials Use and Transportation

Material Type*	Unit	Quantity	Tons	Is the Material Refined or Unrefined?**	Material Source: Virgin, Recycled, or Reused?**	Calculate Item Footprint?**	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation***	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Materials Transport (gallons)	Notes and Description of Materials
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														

** Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined Materials" in the dropdown menu.*

*** Selections must be made in Columns F - H in order for the footprint calculations to be performed. Please see the "Detailed Notes and Explanations" tab for further information.*

**** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns L, N, O, and Q. Units are gallons for Fuel Used for Materials Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.*

Input Worksheet for ACM

Remedy Component that this Input worksheet is part of:	Component 2	Define Component

Waste Disposal and Transportation

Waste Destination*	Unit	Quantity	Tons	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation**	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Waste Transport (gallons)	Notes and Description of Waste
Off-site hazardous waste landfill	tons	2	2	500	100	1	No	100	Truck (mpg)	Diesel	6		16.7	
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											

**** No footprint is calculated for the Recycled/Reused On-Site and Off-Site selections. Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined" selections in the dropdown menu.***

***** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns I, K, L, and N. Units are gallons for Fuel Used for Waste Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Type of Water Used

Source of Water Used*	Unit	Quantity	Tons	Source Location/Aquifer (optional)	Quality of Water Used (optional)	Water Uses (optional)	Fate of Used Water (optional)
Public Water	gal x 1000	2.4	10.008				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				

**** Only the "Public Water" selection has an associated footprint. No footprint is calculated for the other water source selections.***

Note: Information entered in Columns F - V (Source/Quality/Use/Fate) is not compiled or reported by SEFA.

Input Worksheet for ACM

Remedy Component that this Input worksheet is part of:	Component 2	Define Component

Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
On-Site				
User-defined on-site conventional energy use #1	*User-Defined	TBD		
User-defined on-site conventional energy use #2	*User-Defined	TBD		
On-site HAP process emissions**		lbs		
On-site GHG emissions**		lbs CO2e		
On-site carbon storage**		lbs CO2e		
Landfill gas flared on-site		ccf CH4		
Other on-site NOx emissions or reductions**		lbs		
Other on-site SOx emissions or reductions**		lbs		
Other on-site PM emissions or reductions**		lbs		
Transportation		**Units**	**Quantity**	**Notes**
User-defined conventional energy transportation #1	*User-Defined	TBD	10	
User-defined conventional energy transportation #2	*User-Defined	TBD		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Enter a positive number for emissions and a negative number for reductions, avoidances, or storage***
See the "Detailed Notes and Explanations" tab for use of this table.

Other Voluntary Renewable Energy Use

Item		Units	Quantity	Notes
User-defined on-site renewable energy use #1	*User-Defined	TBD		
User-defined on-site renewable energy use #2	*User-Defined	TBD		
User-defined renewable energy transportation #1	*User-Defined	TBD		
User-defined renewable energy transportation #2	*User-Defined	TBD		
Voluntary purchase of renewable electricity**		MWh		
Voluntary purchase of RECs**		MWh		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Complete information on provider in the table to the right. No footprint reductions are associated with the voluntary purchases.***
See the "Detailed Notes and Explanations" tab for use of this table

Off-Site Laboratory Analysis

Parameter and Notes	Number of Samples	Comments
Totals	**0**	

Description of purchased renewable electricity (green pricing product or green marketing product)	Provider:	
	Type of product:	
	Type of renewable energy source:	
	Date of renewable system installation:	
Description of purchased RECs	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for LBP

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this Input worksheet from calculations and results)	**Component 3**	**Define Component**

General Scope

This alternative would involve removal of LBP. All surfaces and components that contain LBP at the former church determined to be in poor condition would be removed for proper disposal. LBP removal by a licensed LBP removal professional would comply with applicable local, state, and federal regulations. This alternative would allow for unrestricted use of the Site.

Example Items Eliminated through Screening Process

Bioremediation, thermal remediation, soil vapor extraction

Other Notes and References

Personnel Transportation

Participant	Number of Roundtrips to Site	Roundtrip Distance to Site (miles)	Mode of Transportation*	Transport Fuel Type*	Total Distance Transported (miles)	Default Fuel Usage Rate**	Fuel Usage Rate Override**	Fuel Used for Personnel Transport**	Activity or Notes
LBP Foreman	12	60	Light-Duty/Passenger Truck	Diesel	720	15.1		47.7	
LBP Workers	12	60	Light-Duty/Passenger Truck	Diesel	720	15.1		47.7	
Truck Driver	12	60	Heavy-Duty Truck	Diesel	720	7.55		95.4	
Water Truck Driver	12	60	Heavy-Duty Truck	Diesel	720	7.55		95.4	

**** See the "Detailed Notes and Explanations" tab for explanation of transport and fuel options.***

***** for biodiesel, B20, diesel, and gasoline, units are gallons for Fuel Used and miles/gallon for Fuel Usage Rate; for natural gas, units are hundreds of cubic feet (ccf) for Fuel Used and ccf/miles for Fuel Usage Rate; for electricity, units are miles/kWh for Fuel Usage Rate and the kWh (Fuel Used) are added to total grid electricity used (cell G69).***

On-Site Equipment Use and Transportation

Equipment Type*	HP*	Load Factor (%)*	Equipment Fuel Type**	Equipment Fuel Usage Rate	Equipment Hours Operated	Fuel Used for On-site Equipment	Equipment weight (tons)	Number of Equipment Roundtrips to Site	Roundtrip Distance to Site (miles)	Total Distance Transported (miles)	Mode of Transportation	Transport Fuel Type***	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Equipment Transport (gallons)	Activity or Notes
Dump truck (400 HP)	400	75%	Diesel between 75 and 750 hp	16.48351648	120	1978.021978	14	1	60	60	Truck (mpg)	Diesel	6		10	
Water truck (400 HP)	400	75%	Diesel between 75 and 750 hp	16.48351648	120	1978.021978	182	12	60	720	Truck (mpg)	Diesel	6		120	

**** HP and Load Factor must be entered by user in Columns C and D. Please see the "Detailed Notes and Explanations" tab for further explanation.***

***** For biodiesel, B20, diesel, gasoline, and liquified petroleum gas, units are gallons for Fuel Used for On-site Equipment and gallons/hr for Equipment Fuel Usage Rate; for compressed natural gas units are ccf (hundreds of cubic feet) for Fuel Used for On-site Equipment and ccf/hr for Equipment Fuel Usage Rate.***

****** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation and other aspects of data entry in Columns M, N, and P. Units are gallons for Fuel Used for Equipment Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Spreadsheets for Environmental Footprint Analysis (SEFA) Version 3.0, November 2019

Input Worksheet for LBP

#REF!

Remedy Component that this Input worksheet is part of:	Component 3	Define Component

On-Site Electricity Use

Equipment Type	HP	Load Factor (%)	Efficiency (%)	Electrical Rating (kW)	Hours Used	Energy Used (kWh)	Notes
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
On-Site Generator, 55 kW							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
					Estimated Total Electricity Usage Based on Above	0	
					Renewable Electricity Generated On-Site*		
					Total Electricity Usage Based on Personnel Transportation	0	
					Total Grid Electricity Used	0	

** Electricity generated on-site from renewable resources, for which the facility retains the rights to the renewable energy (i.e., does not sell renewable energy certificates associated with the renewable energy generation).*

On-Site Natural Gas Use

Equipment Type	Power Rating (Btu/hr)	Efficiency (%)	Hours Used	Energy Required (Btu)	Natural Gas Used (ccf)	Notes
					0	
				0		
		Totals	0	0	0	

Landfill Gas Combusted On-Site for Energy Use

Equipment Type	Landfill Gas (ccf)	% Methane by volume	Used for electricity?	Landfill Gas Methane Used (ccf)	Notes
				0	
				0	
				0	
			Total	0	

Please see the "Detailed Notes and Explanations" tab for instructions on using the two tables above ("On-site Natural Gas Use" and "Landfill Gas Combusted On-Site for Energy Use"). In the two tables above, ccf = hundreds of cubic feet.

Materials Use and Transportation

Material Type*	Unit	Quantity	Tons	Is the Material Refined or Unrefined?**	Material Source: Virgin, Recycled, or Reused?**	Calculate Item Footprint?**	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation***	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Materials Transport (gallons)	Notes and Description of Materials
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														

** Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined Materials" in the dropdown menu.*

*** Selections must be made in Columns F - H in order for the footprint calculations to be performed. Please see the "Detailed Notes and Explanations" tab for further information.*

**** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns L, N, O, and Q. Units are gallons for Fuel Used for Materials Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.*

Input Worksheet for LBP

Remedy Component that this Input worksheet is part of:	Component 3	Define Component

Waste Disposal and Transportation

Waste Destination*	Unit	Quantity	Tons	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation**	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Waste Transport (gallons)	Notes and Description of Waste
Off-site hazardous waste landfill	tons	5.2	5.2	500	100	1	No	100	Truck (mpg)	Diesel	6		16.7	
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											

**** No footprint is calculated for the Recycled/Reused On-Site and Off-Site selections. Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined" selections in the dropdown menu.***

***** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns I, K, L, and N. Units are gallons for Fuel Used for Waste Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Type of Water Used

Source of Water Used*	Unit	Quantity	Tons	Source Location/Aquifer (optional)	Quality of Water Used (optional)	Water Uses (optional)	Fate of Used Water (optional)
Public Water	gal x 1000	7.2	30.024				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				

**** Only the "Public Water" selection has an associated footprint. No footprint is calculated for the other water source selections.***

Note: Information entered in Columns F - V (Source/Quality/Use/Fate) is not compiled or reported by SEFA.

Input Worksheet for LBP

Remedy Component that this Input worksheet is part of:	Component 3	Define Component

Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
On-Site				
User-defined on-site conventional energy use #1	*User-Defined	TBD		
User-defined on-site conventional energy use #2	*User-Defined	TBD		
On-site HAP process emissions**		lbs		
On-site GHG emissions**		lbs CO2e		
On-site carbon storage**		lbs CO2e		
Landfill gas flared on-site		ccf CH4		
Other on-site NOx emissions or reductions**		lbs		
Other on-site SOx emissions or reductions**		lbs		
Other on-site PM emissions or reductions**		lbs		
Transportation		**Units**	**Quantity**	**Notes**
User-defined conventional energy transportation #1	*User-Defined	TBD	10	
User-defined conventional energy transportation #2	*User-Defined	TBD		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Enter a positive number for emissions and a negative number for reductions, avoidances, or storage***
See the "Detailed Notes and Explanations" tab for use of this table.

Other Voluntary Renewable Energy Use

Item		Units	Quantity	Notes
User-defined on-site renewable energy use #1	*User-Defined	TBD		
User-defined on-site renewable energy use #2	*User-Defined	TBD		
User-defined renewable energy transportation #1	*User-Defined	TBD		
User-defined renewable energy transportation #2	*User-Defined	TBD		
Voluntary purchase of renewable electricity**		MWh		
Voluntary purchase of RECs**		MWh		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Complete information on provider in the table to the right. No footprint reductions are associated with the voluntary purchases.***
See the "Detailed Notes and Explanations" tab for use of this table

Off-Site Laboratory Analysis

Parameter and Notes	Number of Samples	Comments
Totals	**0**	

Description of purchased renewable electricity (green pricing product or green marketing product)	Provider:	
	Type of product:	
	Type of renewable energy source:	
	Date of renewable system installation:	
Description of purchased RECs	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for Capping

#REF!

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this Input worksheet from calculations and results)	**Component 1**	**Define Component**

General Scope

This alternative would involve capping contaminated soils in place with an unlined earthen cap. This alternative would permit soil contamination above preliminary assumed cleanup goals identified in the Phase II ESA to remain on-Site, with appropriate action taken to cap remaining contamination for future usage of the community center. Contaminated soils exceeding preliminary assumed cleanup goals would be capped with a concrete cap to prevent direct contact of occupants. ICs would be necessary to prevent exposure of construction workers, utility workers, and occupants to contaminated soils below the cap. In addition, long term operation and maintenance (O&M) would be required to ensure the effectiveness of the cap and protectiveness of ICs. This alternative would allow for intended use of the Site with restrictions. ICs would be required to remain in place as long as contamination remains at the Site above residential preliminary cleanup goals.

Example Items Eliminated through Screening Process

Soil vapor extraction, bioremediation, thermal treatment

Other Notes and References

Personnel Transportation

Participant	Number of Roundtrips to Site	Roundtrip Distance to Site (miles)	Mode of Transportation*	Transport Fuel Type*	Total Distance Transported (miles)	Default Fuel Usage Rate**	Fuel Usage Rate Override**	Fuel Used for Personnel Transport**	Activity or Notes
Equipment Operater	4	60	Light-Duty/Passenger Truck	Diesel	240	15.1		15.9	
Laborer	2	60	Light-Duty/Passenger Truck	Diesel	120	15.1		7.9	
Truck Driver	1	60	Heavy-Duty Truck	Diesel	60	7.55		7.9	
Water Truck Driver	1	60	Heavy-Duty Truck	Diesel	60	7.55		7.9	

**** See the "Detailed Notes and Explanations" tab for explanation of transport and fuel options.***

***** for biodiesel, B20, diesel, and gasoline, units are gallons for Fuel Used and miles/gallon for Fuel Usage Rate; for natural gas, units are hundreds of cubic feet (ccf) for Fuel Used and ccf/miles for Fuel Usage Rate; for electricity, units are miles/kWh for Fuel Usage Rate and the kWh (Fuel Used) are added to total grid electricity used (cell G69).***

On-Site Equipment Use and Transportation

Equipment Type*	HP*	Load Factor (%)*	Equipment Fuel Type**	Equipment Fuel Usage Rate	Equipment Hours Operated	Fuel Used for On-site Equipment	Equipment weight (tons)	Number of Equipment Roundtrips to Site	Roundtrip Distance to Site (miles)	Total Distance Transported (miles)	Mode of Transportation	Transport Fuel Type***	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Equipment Transport (gallons)	Activity or Notes
Excavator - large (250 HP)	250	75%	Diesel between 75 and 750 hp	10.3021978	4	41.20879121	57	1	60	60	Truck (mpg)	Diesel	6		10	
Dump truck (400 HP)	400	75%	Diesel between 75 and 750 hp	16.48351648	10	164.8351648	14	1	60	60	Truck (mpg)	Diesel	6		10	
Dozer - large (200 HP)	200	75%	Diesel between 75 and 750 hp	8.241758242	1	8.241758242	73	1	60	60	Truck (mpg)	Diesel	6		10	
Grader (175 HP)	175	75%	Diesel between 75 and 750 hp	7.211538462	8	57.69230769	1	1	60	60	Truck (mpg)	Diesel	6		10	
Backhoe (100 HP)	100	75%	Diesel between 75 and 750 hp	4.120879121	22	90.65934066	8	1	60	60	Truck (mpg)	Diesel	6		10	
Water truck (400 HP)	400	75%	Diesel between 75 and 750 hp	16.48351648	4	65.93406593	182	1	60	60	Truck (mpg)	Diesel	6		10	

**** HP and Load Factor must be entered by user in Columns C and D. Please see the "Detailed Notes and Explanations" tab for further explanation.***

***** For biodiesel, B20, diesel, gasoline, and liquified petroleum gas, units are gallons for Fuel Used for On-site Equipment and gallons/hr for Equipment Fuel Usage Rate; for compressed natural gas units are ccf (hundreds of cubic feet) for Fuel Used for On-site Equipment and ccf/hr for Equipment Fuel Usage Rate.***

****** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation and other aspects of data entry in Columns M, N, and P. Units are gallons for Fuel Used for Equipment Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Input Worksheet for Capping

#REF!

Remedy Component that this Input worksheet is part of:	Component 1	Define Component

On-Site Electricity Use

Equipment Type	HP	Load Factor (%)	Efficiency (%)	Electrical Rating (kW)	Hours Used	Energy Used (kWh)	Notes
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
On-Site Generator, 55 kW							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
Estimated Total Electricity Usage Based on Above						0	
Renewable Electricity Generated On-Site*							
Total Electricity Usage Based on Personnel Transportation						0	
Total Grid Electricity Used						0	

**** Electricity generated on-site from renewable resources, for which the facility retains the rights to the renewable energy (i.e., does not sell renewable energy certificates associated with the renewable energy generation).***

On-Site Natural Gas Use

Equipment Type	Power Rating (Btu/hr)	Efficiency (%)	Hours Used	Energy Required (Btu)	Natural Gas Used (ccf)	Notes
					0	
				0		
Totals			0	0	0	

Landfill Gas Combusted On-Site for Energy Use

Equipment Type	Landfill Gas (ccf)	% Methane by volume	Used for electricity?	Landfill Gas Methane Used (ccf)	Notes
				0	
				0	
				0	
Total				0	

Please see the "Detailed Notes and Explanations" tab for instructions on using the two tables above ("On-site Natural Gas Use" and "Landfill Gas Combusted On-Site for Energy Use"). In the two tables above, ccf = hundreds of cubic feet.

Materials Use and Transportation

Material Type*	Unit	Quantity	Tons	Is the Material Refined or Unrefined?**	Material Source: Virgin, Recycled, or Reused?**	Calculate Item Footprint?**	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation***	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Materials Transport (gallons)	Notes and Description of Materials
Gravel/sand/clay	lb	142290	71.145	Refined	Virgin	Yes	25	60	1	No	60	Truck (mpg)	Diesel	6		10.000	
Asphalt, paving-grade	lb	59535	29.7675	Refined	Virgin	Yes	25	60	1	No	60	Truck (mpg)	Diesel	6		10.000	
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														

**** Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined Materials" in the dropdown menu.***

***** Selections must be made in Columns F - H in order for the footprint calculations to be performed. Please see the "Detailed Notes and Explanations" tab for further information.***

****** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns L, N, O, and Q. Units are gallons for Fuel Used for Materials Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Input Worksheet for Capping

Remedy Component that this Input worksheet is part of:	Component 1	Define Component

Waste Disposal and Transportation

Waste Destination*	Unit	Quantity	Tons	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation**	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Waste Transport (gallons)	Notes and Description of Waste
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											

**** No footprint is calculated for the Recycled/Reused On-Site and Off-Site selections. Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined" selections in the dropdown menu.***

***** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns I, K, L, and N. Units are gallons for Fuel Used for Waste Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Type of Water Used

Source of Water Used*	Unit	Quantity	Tons	Source Location/Aquifer (optional)	Quality of Water Used (optional)	Water Uses (optional)	Fate of Used Water (optional)
Public Water	gal x 1000	0.6	2.502				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				

**** Only the "Public Water" selection has an associated footprint. No footprint is calculated for the other water source selections.***

Note: Information entered in Columns F - V (Source/Quality/Use/Fate) is not compiled or reported by SEFA.

Input Worksheet for Capping

Remedy Component that this Input worksheet is part of:	Component 1	Define Component

Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
On-Site				
User-defined on-site conventional energy use #1	*User-Defined	TBD		
User-defined on-site conventional energy use #2	*User-Defined	TBD		
On-site HAP process emissions**		lbs		
On-site GHG emissions**		lbs CO2e		
On-site carbon storage**		lbs CO2e		
Landfill gas flared on-site		ccf CH4		
Other on-site NOx emissions or reductions**		lbs		
Other on-site SOx emissions or reductions**		lbs		
Other on-site PM emissions or reductions**		lbs		
Transportation		**Units**	**Quantity**	**Notes**
User-defined conventional energy transportation #1	*User-Defined	TBD	10	
User-defined conventional energy transportation #2	*User-Defined	TBD		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Enter a positive number for emissions and a negative number for reductions, avoidances, or storage***
See the "Detailed Notes and Explanations" tab for use of this table.

Other Voluntary Renewable Energy Use

Item		Units	Quantity	Notes
User-defined on-site renewable energy use #1	*User-Defined	TBD		
User-defined on-site renewable energy use #2	*User-Defined	TBD		
User-defined renewable energy transportation #1	*User-Defined	TBD		
User-defined renewable energy transportation #2	*User-Defined	TBD		
Voluntary purchase of renewable electricity**		MWh		
Voluntary purchase of RECs**		MWh		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Complete information on provider in the table to the right. No footprint reductions are associated with the voluntary purchases.***
See the "Detailed Notes and Explanations" tab for use of this table

Off-Site Laboratory Analysis

Parameter and Notes	Number of Samples	Comments
Off-site Laboratory Analysis - Metals	25	
Totals	**25**	

Description of purchased renewable electricity (green pricing product or green marketing product)	Provider:	
	Type of product:	
	Type of renewable energy source:	
	Date of renewable system installation:	
Description of purchased RECs	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for ACM

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this Input worksheet from calculations and results)	**Component 2**	**Define Component**

General Scope

This alternative would involve creating an air-tight barrier over or around ACM, or both; or treatment of ACM with a bridging or penetrating encapsulant that surrounds or embeds asbestos fibers in an adhesive matrix to limit the release of fibers. This will limit access to and disturbance of ACM identified during the Phase II ESA within the former church building.

Example Items Eliminated through Screening Process

Soil vapor extraction, bioremediation, thermal treatment

Other Notes and References

Personnel Transportation

Participant	Number of Roundtrips to Site	Roundtrip Distance to Site (miles)	Mode of Transportation*	Transport Fuel Type*	Total Distance Transported (miles)	Default Fuel Usage Rate**	Fuel Usage Rate Override**	Fuel Used for Personnel Transport**	Activity or Notes
Asbestos Foreman	12	60	Light-Duty/Passenger Truck	Diesel	720	15.1		47.7	
Asbestos Workers	12	60	Light-Duty/Passenger Truck	Diesel	720	15.1		47.7	
Trucker	12	60	Heavy-Duty Truck	Diesel	720	7.55		95.4	
Water Truck Driver	12	60	Heavy-Duty Truck	Diesel	720	7.55		95.4	

**** See the "Detailed Notes and Explanations" tab for explanation of transport and fuel options.***

***** for biodiesel, B20, diesel, and gasoline, units are gallons for Fuel Used and miles/gallon for Fuel Usage Rate; for natural gas, units are hundreds of cubic feet (ccf) for Fuel Used and ccf/miles for Fuel Usage Rate; for electricity, units are miles/kWh for Fuel Usage Rate and the kWh (Fuel Used) are added to total grid electricity used (cell G69).***

On-Site Equipment Use and Transportation

Equipment Type*	HP*	Load Factor (%)*	Equipment Fuel Type**	Equipment Fuel Usage Rate	Equipment Hours Operated	Fuel Used for On-site Equipment	Equipment weight (tons)	Number of Equipment Roundtrips to Site	Roundtrip Distance to Site (miles)	Total Distance Transported (miles)	Mode of Transportation	Transport Fuel Type***	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Equipment Transport (gallons)	Activity or Notes
Water truck (400 HP)	400	75%	Diesel between 75 and 750 hp	16.48351648	110	1813.186813	182	1	60	60	Truck (mpg)	Diesel	6		10	
Dump truck (400 HP)	400	75%	Diesel between 75 and 750 hp	16.48351648	110	1813.186813	14	12	60	720	Truck (mpg)	Diesel	6		120	

**** HP and Load Factor must be entered by user in Columns C and D. Please see the "Detailed Notes and Explanations" tab for further explanation.***

***** For biodiesel, B20, diesel, gasoline, and liquified petroleum gas, units are gallons for Fuel Used for On-site Equipment and gallons/hr for Equipment Fuel Usage Rate; for compressed natural gas units are ccf (hundreds of cubic feet) for Fuel Used for On-site Equipment and ccf/hr for Equipment Fuel Usage Rate.***

****** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation and other aspects of data entry in Columns M, N, and P. Units are gallons for Fuel Used for Equipment Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Input Worksheet for ACM

Remedy Component that this Input worksheet is part of:	Component 2	Define Component

On-Site Electricity Use

Equipment Type	HP	Load Factor (%)	Efficiency (%)	Electrical Rating (kW)	Hours Used	Energy Used (kWh)	Notes
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
On-Site Generator, 55 kW							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
Estimated Total Electricity Usage Based on Above						0	
Renewable Electricity Generated On-Site*							
Total Electricity Usage Based on Personnel Transportation						0	
Total Grid Electricity Used						0	

** Electricity generated on-site from renewable resources, for which the facility retains the rights to the renewable energy (i.e., does not sell renewable energy certificates associated with the renewable energy generation).*

On-Site Natural Gas Use

Equipment Type	Power Rating (Btu/hr)	Efficiency (%)	Hours Used	Energy Required (Btu)	Natural Gas Used (ccf)	Notes
					0	
				0		
Totals			0	0	0	

Landfill Gas Combusted On-Site for Energy Use

Equipment Type	Landfill Gas (ccf)	% Methane by volume	Used for electricity?	Landfill Gas Methane Used (ccf)	Notes
				0	
				0	
				0	
Total				0	

Please see the "Detailed Notes and Explanations" tab for instructions on using the two tables above ("On-site Natural Gas Use" and "Landfill Gas Combusted On-Site for Energy Use"). In the two tables above, ccf = hundreds of cubic feet.

Materials Use and Transportation

Material Type*	Unit	Quantity	Tons	Is the Material Refined or Unrefined?**	Material Source: Virgin, Recycled, or Reused?**	Calculate Item Footprint?**	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation***	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Materials Transport (gallons)	Notes and Description of Materials
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														

** Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined Materials" in the dropdown menu.*

*** Selections must be made in Columns F - H in order for the footprint calculations to be performed. Please see the "Detailed Notes and Explanations" tab for further information.*

**** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns L, N, O, and Q. Units are gallons for Fuel Used for Materials Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.*

Input Worksheet for ACM

Remedy Component that this Input worksheet is part of:	Component 2	Define Component

Waste Disposal and Transportation

Waste Destination*	Unit	Quantity	Tons	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation**	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Waste Transport (gallons)	Notes and Description of Waste
Off-site hazardous waste landfill	tons	3.1	3.1	500	60	1	No	60	Truck (mpg)	Diesel	6		10.0	
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											

**** No footprint is calculated for the Recycled/Reused On-Site and Off-Site selections. Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined" selections in the dropdown menu.***

***** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns I, K, L, and N. Units are gallons for Fuel Used for Waste Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Type of Water Used

Source of Water Used*	Unit	Quantity	Tons	Source Location/Aquifer (optional)	Quality of Water Used (optional)	Water Uses (optional)	Fate of Used Water (optional)
Public Water	gal x 1000	7.2	30.024				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				

**** Only the "Public Water" selection has an associated footprint. No footprint is calculated for the other water source selections.***

Note: Information entered in Columns F - V (Source/Quality/Use/Fate) is not compiled or reported by SEFA.

Input Worksheet for ACM

Remedy Component that this Input worksheet is part of:	Component 2	Define Component

Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
On-Site				
User-defined on-site conventional energy use #1	*User-Defined	TBD		
User-defined on-site conventional energy use #2	*User-Defined	TBD		
On-site HAP process emissions**		lbs		
On-site GHG emissions**		lbs CO2e		
On-site carbon storage**		lbs CO2e		
Landfill gas flared on-site		ccf CH4		
Other on-site NOx emissions or reductions**		lbs		
Other on-site SOx emissions or reductions**		lbs		
Other on-site PM emissions or reductions**		lbs		
Transportation		**Units**	**Quantity**	**Notes**
User-defined conventional energy transportation #1	*User-Defined	TBD	10	
User-defined conventional energy transportation #2	*User-Defined	TBD		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Enter a positive number for emissions and a negative number for reductions, avoidances, or storage***
See the "Detailed Notes and Explanations" tab for use of this table.

Other Voluntary Renewable Energy Use

Item		Units	Quantity	Notes
User-defined on-site renewable energy use #1	*User-Defined	TBD		
User-defined on-site renewable energy use #2	*User-Defined	TBD		
User-defined renewable energy transportation #1	*User-Defined	TBD		
User-defined renewable energy transportation #2	*User-Defined	TBD		
Voluntary purchase of renewable electricity**		MWh		
Voluntary purchase of RECs**		MWh		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Complete information on provider in the table to the right. No footprint reductions are associated with the voluntary purchases.***
See the "Detailed Notes and Explanations" tab for use of this table

Off-Site Laboratory Analysis

Parameter and Notes	Number of Samples	Comments
Totals	**0**	

Description of purchased renewable electricity (green pricing product or green marketing product)	Provider:	
	Type of product:	
	Type of renewable energy source:	
	Date of renewable system installation:	
Description of purchased RECs	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for LBP

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this Input worksheet from calculations and results)	**Component 3**	**Define Component**

General Scope

This alternative would involve removal of LBP. All surfaces and components that contain LBP determined to be in poor condition would be removed for proper disposal. LBP removal by a licensed LBP removal professional would comply with applicable local, state, and federal regulations. This alternative would allow for unrestricted use of the Site.

Example Items Eliminated through Screening Process

Soil vapor extraction, bioremediation, thermal treatment

Other Notes and References

Personnel Transportation

Participant	Number of Roundtrips to Site	Roundtrip Distance to Site (miles)	Mode of Transportation*	Transport Fuel Type*	Total Distance Transported (miles)	Default Fuel Usage Rate**	Fuel Usage Rate Override**	Fuel Used for Personnel Transport**	Activity or Notes
LBP Foreman	12	60	Light-Duty/Passenger Truck	Diesel	720	15.1		47.7	
LBP Worker	12	60	Light-Duty/Passenger Truck	Diesel	720	15.1		47.7	
Truck Driver	12	60	Heavy-Duty Truck	Diesel	720	7.55		95.4	
Water Truck Driver	12	60	Heavy-Duty Truck	Diesel	720	7.55		95.4	

**** See the "Detailed Notes and Explanations" tab for explanation of transport and fuel options.***

***** for biodiesel, B20, diesel, and gasoline, units are gallons for Fuel Used and miles/gallon for Fuel Usage Rate; for natural gas, units are hundreds of cubic feet (ccf) for Fuel Used and ccf/miles for Fuel Usage Rate; for electricity, units are miles/kWh for Fuel Usage Rate and the kWh (Fuel Used) are added to total grid electricity used (cell G69).***

On-Site Equipment Use and Transportation

Equipment Type*	HP*	Load Factor (%)*	Equipment Fuel Type**	Equipment Fuel Usage Rate	Equipment Hours Operated	Fuel Used for On-site Equipment	Equipment weight (tons)	Number of Equipment Roundtrips to Site	Roundtrip Distance to Site (miles)	Total Distance Transported (miles)	Mode of Transportation	Transport Fuel Type***	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Equipment Transport (gallons)	Activity or Notes
Dump truck (400 HP)	400	75%	Diesel between 75 and 750 hp	16.48351648	120	1978.021978	14	1	60	60	Truck (mpg)	Diesel	6		10	
Water truck (400 HP)	400	75%	Diesel between 75 and 750 hp	16.48351648	120	1978.021978	182	12	60	720	Truck (mpg)	Diesel	6		120	

**** HP and Load Factor must be entered by user in Columns C and D. Please see the "Detailed Notes and Explanations" tab for further explanation.***

***** For biodiesel, B20, diesel, gasoline, and liquified petroleum gas, units are gallons for Fuel Used for On-site Equipment and gallons/hr for Equipment Fuel Usage Rate; for compressed natural gas units are ccf (hundreds of cubic feet) for Fuel Used for On-site Equipment and ccf/hr for Equipment Fuel Usage Rate.***

****** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation and other aspects of data entry in Columns M, N, and P. Units are gallons for Fuel Used for Equipment Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Spreadsheets for Environmental Footprint Analysis (SEFA) Version 3.0, November 2019

Input Worksheet for LBP

#REF!

Remedy Component that this Input worksheet is part of:	Component 3	Define Component

On-Site Electricity Use

Equipment Type	HP	Load Factor (%)	Efficiency (%)	Electrical Rating (kW)	Hours Used	Energy Used (kWh)	Notes
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
On-Site Generator, 55 kW							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
					Estimated Total Electricity Usage Based on Above	0	
					Renewable Electricity Generated On-Site*		
					Total Electricity Usage Based on Personnel Transportation	0	
					Total Grid Electricity Used	0	

** Electricity generated on-site from renewable resources, for which the facility retains the rights to the renewable energy (i.e., does not sell renewable energy certificates associated with the renewable energy generation).*

On-Site Natural Gas Use

Equipment Type	Power Rating (Btu/hr)	Efficiency (%)	Hours Used	Energy Required (Btu)	Natural Gas Used (ccf)	Notes
					0	
				0		
		Totals	0	0	0	

Landfill Gas Combusted On-Site for Energy Use

Equipment Type	Landfill Gas (ccf)	% Methane by volume	Used for electricity?	Landfill Gas Methane Used (ccf)	Notes
				0	
				0	
				0	
			Total	0	

Please see the "Detailed Notes and Explanations" tab for instructions on using the two tables above ("On-site Natural Gas Use" and "Landfill Gas Combusted On-Site for Energy Use"). In the two tables above, ccf = hundreds of cubic feet.

Materials Use and Transportation

Material Type*	Unit	Quantity	Tons	Is the Material Refined or Unrefined?**	Material Source: Virgin, Recycled, or Reused?**	Calculate Item Footprint?**	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation* **	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Materials Transport (gallons)	Notes and Description of Materials
			0														
			0														
			0														
			0														
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** Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined Materials" in the dropdown menu.*

*** Selections must be made in Columns F - H in order for the footprint calculations to be performed. Please see the "Detailed Notes and Explanations" tab for further information.*

**** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns L, N, O, and Q. Units are gallons for Fuel Used for Materials Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.*

Input Worksheet for LBP

Remedy Component that this Input worksheet is part of:	Component 3	Define Component

Waste Disposal and Transportation

Waste Destination*	Unit	Quantity	Tons	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation**	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Waste Transport (gallons)	Notes and Description of Waste
Off-site hazardous waste landfill	tons	5.2	5.2	500	100	1	No	100	Truck (mpg)	Diesel	6		16.7	
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											

**** No footprint is calculated for the Recycled/Reused On-Site and Off-Site selections. Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined" selections in the dropdown menu.***

***** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns I, K, L, and N. Units are gallons for Fuel Used for Waste Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Type of Water Used

Source of Water Used*	Unit	Quantity	Tons	Source Location/Aquifer (optional)	Quality of Water Used (optional)	Water Uses (optional)	Fate of Used Water (optional)
Public Water	gal x 1000	7.2	30.024				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				

**** Only the "Public Water" selection has an associated footprint. No footprint is calculated for the other water source selections.***

Note: Information entered in Columns F - V (Source/Quality/Use/Fate) is not compiled or reported by SEFA.

Input Worksheet for LBP

Remedy Component that this Input worksheet is part of:	Component 3	Define Component

Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
On-Site				
User-defined on-site conventional energy use #1	*User-Defined	TBD		
User-defined on-site conventional energy use #2	*User-Defined	TBD		
On-site HAP process emissions**		lbs		
On-site GHG emissions**		lbs CO2e		
On-site carbon storage**		lbs CO2e		
Landfill gas flared on-site		ccf CH4		
Other on-site NOx emissions or reductions**		lbs		
Other on-site SOx emissions or reductions**		lbs		
Other on-site PM emissions or reductions**		lbs		
Transportation		**Units**	**Quantity**	**Notes**
User-defined conventional energy transportation #1	*User-Defined	TBD	10	
User-defined conventional energy transportation #2	*User-Defined	TBD		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Enter a positive number for emissions and a negative number for reductions, avoidances, or storage***
See the "Detailed Notes and Explanations" tab for use of this table.

Other Voluntary Renewable Energy Use

Item		Units	Quantity	Notes
User-defined on-site renewable energy use #1	*User-Defined	TBD		
User-defined on-site renewable energy use #2	*User-Defined	TBD		
User-defined renewable energy transportation #1	*User-Defined	TBD		
User-defined renewable energy transportation #2	*User-Defined	TBD		
Voluntary purchase of renewable electricity**		MWh		
Voluntary purchase of RECs**		MWh		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Complete information on provider in the table to the right. No footprint reductions are associated with the voluntary purchases.***
See the "Detailed Notes and Explanations" tab for use of this table

Off-Site Laboratory Analysis

Parameter and Notes	Number of Samples	Comments
Totals	**0**	

Description of purchased renewable electricity (green pricing product or green marketing product)	Provider:	
	Type of product:	
	Type of renewable energy source:	
	Date of renewable system installation:	
Description of purchased RECs	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for IC_O&M

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this Input worksheet from calculations and results)	**Component 4**	**Define Component**

General Scope

ICs would be necessary to prevent exposure of construction workers, utility workers, and occupants to contaminated soils below the cap. In addition, long term operation and maintenance (O&M) would be required to ensure the effectiveness of the cap and protectiveness of ICs. This alternative would allow for intended use of the Site with some restriction. ICs would be required to remain in place as long as contamination remains at the Site above residential preliminary assumed cleanup goals.

Example Items Eliminated through Screening Process

Soil vapor extraction, bioremediation, thermal treatment

Other Notes and References

This reflects a 30-year period

Personnel Transportation

Participant	Number of Roundtrips to Site	Roundtrip Distance to Site (miles)	Mode of Transportation*	Transport Fuel Type*	Total Distance Transported (miles)	Default Fuel Usage Rate**	Fuel Usage Rate Override**	Fuel Used for Personnel Transport**	Activity or Notes
Inspector	60	60	Light-Duty/Passenger Truck	Diesel	3600	15.1		238.4	
Scientist	30	60	Light-Duty/Passenger Truck	Diesel	1800	15.1		119.2	

**** See the "Detailed Notes and Explanations" tab for explanation of transport and fuel options.***

***** for biodiesel, B20, diesel, and gasoline, units are gallons for Fuel Used and miles/gallon for Fuel Usage Rate; for natural gas, units are hundreds of cubic feet (ccf) for Fuel Used and ccf/miles for Fuel Usage Rate; for electricity, units are miles/kWh for Fuel Usage Rate and the kWh (Fuel Used) are added to total grid electricity used (cell G69).***

On-Site Equipment Use and Transportation

Equipment Type*	HP*	Load Factor (%)*	Equipment Fuel Type**	Equipment Fuel Usage Rate	Equipment Hours Operated	Fuel Used for On-site Equipment	Equipment weight (tons)	Number of Equipment Roundtrips to Site	Roundtrip Distance to Site (miles)	Total Distance Transported (miles)	Mode of Transportation	Transport Fuel Type***	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Equipment Transport (gallons)	Activity or Notes

**** HP and Load Factor must be entered by user in Columns C and D. Please see the "Detailed Notes and Explanations" tab for further explanation.***

***** For biodiesel, B20, diesel, gasoline, and liquified petroleum gas, units are gallons for Fuel Used for On-site Equipment and gallons/hr for Equipment Fuel Usage Rate; for compressed natural gas units are ccf (hundreds of cubic feet) for Fuel Used for On-site Equipment and ccf/hr for Equipment Fuel Usage Rate.***

****** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation and other aspects of data entry in Columns M, N, and P. Units are gallons for Fuel Used for Equipment Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Input Worksheet for IC_O&M

Remedy Component that this Input worksheet is part of:	Component 4	Define Component

On-Site Electricity Use

Equipment Type	HP	Load Factor (%)	Efficiency (%)	Electrical Rating (kW)	Hours Used	Energy Used (kWh)	Notes
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
On-Site Generator, 55 kW							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known kW rating>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
<Equip. with known total Energy Used>							
Estimated Total Electricity Usage Based on Above						0	
Renewable Electricity Generated On-Site*							
Total Electricity Usage Based on Personnel Transportation						0	
Total Grid Electricity Used						0	

** Electricity generated on-site from renewable resources, for which the facility retains the rights to the renewable energy (i.e., does not sell renewable energy certificates associated with the renewable energy generation).*

On-Site Natural Gas Use

Equipment Type	Power Rating (Btu/hr)	Efficiency (%)	Hours Used	Energy Required (Btu)	Natural Gas Used (ccf)	Notes
					0	
				0		
		Totals	0	0	0	

Landfill Gas Combusted On-Site for Energy Use

Equipment Type	Landfill Gas (ccf)	% Methane by volume	Used for electricity?	Landfill Gas Methane Used (ccf)	Notes
				0	
				0	
				0	
			Total	0	

Please see the "Detailed Notes and Explanations" tab for instructions on using the two tables above ("On-site Natural Gas Use" and "Landfill Gas Combusted On-Site for Energy Use"). In the two tables above, ccf = hundreds of cubic feet.

Materials Use and Transportation

Material Type*	Unit	Quantity	Tons	Is the Material Refined or Unrefined?**	Material Source: Virgin, Recycled, or Reused?**	Calculate Item Footprint?**	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation* **	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Materials Transport (gallons)	Notes and Description of Materials
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
			0														
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			0														
			0														
			0														

** Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined Materials" in the dropdown menu.*

*** Selections must be made in Columns F - H in order for the footprint calculations to be performed. Please see the "Detailed Notes and Explanations" tab for further information.*

**** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns L, N, O, and Q. Units are gallons for Fuel Used for Materials Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.*

Input Worksheet for IC_O&M

Remedy Component that this Input worksheet is part of:	Component 4	Define Component

Waste Disposal and Transportation

Waste Destination*	Unit	Quantity	Tons	Default One-way Distance to Site (miles)	One-way Distance to Site Override (miles)	Number of One-way Trips to Site	Include Return Trip in Calculations?	Total Distance Transported (miles)	Mode of Transportation**	Transport Fuel Type	Default Transport Fuel Usage Rate (gptm or mpg)	Transport Fuel Usage Rate Override (gptm or mpg)	Fuel Used for Waste Transport (gallons)	Notes and Description of Waste
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											
			0											

**** No footprint is calculated for the Recycled/Reused On-Site and Off-Site selections. Please see the "Detailed Notes and Explanations" tab for instructions on specifying "User-Defined" selections in the dropdown menu.***

***** Please see the "Detailed Notes and Explanations" tab for instructions on selecting mode of transportation, accounting for empty return trips, and other aspects of data entry in Columns I, K, L, and N. Units are gallons for Fuel Used for Waste Transport and miles/gallon (mpg) or gallons per ton-mile (gptm) for Transport Fuel Usage Rate.***

Type of Water Used

Source of Water Used*	Unit	Quantity	Tons	Source Location/Aquifer (optional)	Quality of Water Used (optional)	Water Uses (optional)	Fate of Used Water (optional)
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				
			0				

**** Only the "Public Water" selection has an associated footprint. No footprint is calculated for the other water source selections.***

Note: Information entered in Columns F - V (Source/Quality/Use/Fate) is not compiled or reported by SEFA.

Input Worksheet for IC_O&M

Remedy Component that this Input worksheet is part of:	Component 4	Define Component

Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
On-Site				
User-defined on-site conventional energy use #1	*User-Defined	TBD		
User-defined on-site conventional energy use #2	*User-Defined	TBD		
On-site HAP process emissions**		lbs		
On-site GHG emissions**		lbs CO2e		
On-site carbon storage**		lbs CO2e		
Landfill gas flared on-site		ccf CH4		
Other on-site NOx emissions or reductions**		lbs		
Other on-site SOx emissions or reductions**		lbs		
Other on-site PM emissions or reductions**		lbs		
Transportation		**Units**	**Quantity**	**Notes**
User-defined conventional energy transportation #1	*User-Defined	TBD	10	
User-defined conventional energy transportation #2	*User-Defined	TBD		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Enter a positive number for emissions and a negative number for reductions, avoidances, or storage***
See the "Detailed Notes and Explanations" tab for use of this table.

Other Voluntary Renewable Energy Use

Item		Units	Quantity	Notes
User-defined on-site renewable energy use #1	*User-Defined	TBD		
User-defined on-site renewable energy use #2	*User-Defined	TBD		
User-defined renewable energy transportation #1	*User-Defined	TBD		
User-defined renewable energy transportation #2	*User-Defined	TBD		
Voluntary purchase of renewable electricity**		MWh		
Voluntary purchase of RECs**		MWh		

**** Enter units and conversion factors on "User Defined Factors" tab***
***** Complete information on provider in the table to the right. No footprint reductions are associated with the voluntary purchases.***
See the "Detailed Notes and Explanations" tab for use of this table

Off-Site Laboratory Analysis

Parameter and Notes	Number of Samples	Comments
Off-site Laboratory Analysis - Other	100	
Totals	**100**	

Description of purchased renewable electricity (green pricing product or green marketing product)	Provider:	
	Type of product:	
	Type of renewable energy source:	
	Date of renewable system installation:	
Description of purchased RECs	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	