



September 8, 2021

Ms. Lisa Hanusiak
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U.S. Environmental Protection Agency, Region 9
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San Francisco, CA 94105

**Subject: Draft Analysis of Brownfields Cleanup Alternatives Report
Fort McDermitt Tribe-Green & Old Cavalry Bldgs, McDermitt, Nevada
U.S. EPA Region 9, Resource Conservation and Recovery Act (RCRA) Enforcement,
Permitting, and Assistance (REPA) Contract No. 68HERH19D0018, Task Order
No. 68HE0920F0007**

Dear Ms. Hanusiak:

Toeroek Associates, Inc. (Toeroek) and Tetra Tech, Inc. (Tetra Tech) (hereinafter the Toeroek Team) submit the attached Draft Analysis of Brownfields Cleanup Alternatives Report regarding a targeted brownfields assessment at the Fort McDermitt Tribe-Green & Old Cavalry Bldgs 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. 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 Mike Ferrif at (510) 302-6320.

Sincerely,

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ANALYSIS OF BROWNFIELDS CLEANUP ALTERNATIVES

**FORT MCDERMITT TRIBE-GREEN & OLD CAVALRY BLDGS
MCDERMITT, NEVADA
TARGETED BROWNFIELDS ASSESSMENT (TBA)**

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

CONTRACT NO. 68HERH19D0018; TASK ORDER NO. 68HE0920F0007

Prepared for:

**EPA REGION 9
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SEPTEMBER 8, 2021

Draft Version 0

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FORT MCDERMITT TRIBE – GREEN & OLD CAVALRY BLDGS
MCDERMITT, NEVADA

CONTRACT NO. 68HERH19D0018;
TASK ORDER NO. 68HE0920F0007

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ACRONYMS AND ABBREVIATIONS

ABCA	Analysis of Brownfields Cleanup Alternatives
Applicant	Fort McDermitt Paiute Shoshone Tribe
ACM	Asbestos-containing material
AHERA	Asbestos Hazard Emergency Response Act
AST	Aboveground storage tank
ASTM	ASTM International
bgs	Below ground surface
CFR	<i>Code of Federal Regulations</i>
COC	Contaminant of concern
CY	Cubic yard
DRO	Diesel range organics
EDR	Environmental Data Resources, Inc.
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
LF	Linear foot
mg/cm ²	Milligram per square centimeter
mg/cm ³	Milligram per cubic centimeter
NDEP	Nevada Division of Environmental Protection
NESHAP	National Emission Standards for Hazardous Air Pollutants
ORO	Oil range organics
OSHA	Occupational Safety and Health Administration
O&M	Operation and maintenance
PCB	Polychlorinated biphenyls
ppm	Parts per million
RACER	Remedial Action Cost Engineering and Requirements System
RC	Reportable concentration
REC	Recognized environmental condition
RSL	Regional screening level



ACRONYMS AND ABBREVIATIONS (CONTINUED)

SEFA	Spreadsheets for Environmental Footprint Analysis
SF	Square foot
Site	Fort McDermitt Tribe – Green & Old Cavalry Buildings site
SL	Screening level
SMP	Site management plan
TBA	Targeted Brownfields Assessment
TCE	Trichloroethylene
Toeroek Team	Toeroek Associates, Inc., and its subcontractor, Tetra Tech, Inc.
TPH	Total petroleum hydrocarbons
UST	Underground storage tank
VISL	Vapor intrusion screening level



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) for the Fort McDermitt Tribe – Green & Old Cavalry Bldgs site (the Site) at 435 South Reservation Road (Green Building) and 111 North Reservation Road (Old Cavalry Building) in McDermitt, Humboldt County, Nevada (Figure 1). For Site features, see Figure 2 and Figure 3.

The Fort McDermitt Paiute Shoshone Tribe (the Applicant) has interest in repairing and renovating the buildings on the Site. The Applicant would also like to achieve a historical building designation for the Old Cavalry Building and use this building as a cultural center, museum, or both. The purpose of this ABCA 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 2021 for the Site. The Toeroek Team collected soil, soil gas, air samples and surveyed hazardous building materials at both buildings. At the Green Building, concentrations of VOCs in soil gas samples exceeded screening levels (SLs) (Figure 4). At the Green Building's former disposal pit, concentrations of copper, nickel, and total petroleum hydrocarbons (TPH) in subsurface soil samples exceeded SLs (Figure 4). Lead, likely derived from weathering of lead-based paint (LBP), exceeded SLs in all soil samples collected from the Old Cavalry Building drip lines (Figure 5). ACM and LBP were found in both buildings.

Based on the planned future use of the Site, the following cleanup alternatives were considered to meet residential and commercial assumed cleanup levels for the Green Building and the Old Cavalry Building.

Green Building

- Alternative 1: No Action (Baseline)
- Alternative 2: Passive Vapor Mitigation, In-Place Capping, ACM Enclosure, LBP Encapsulation, Operation and Maintenance (O&M), and Institutional Controls (ICs)
- Alternative 3: Active Vapor Mitigation System, Soil Excavation with Off-Site Disposal, ACM Abatement, LBP Removal, O&M, and ICs



Alternative 1 for the Green Building is included as a baseline for comparison to the other proposed alternatives. This alternative would involve no containment, treatment, removal, or monitoring of contaminants.

Alternative 2 for the Green Building would involve installation of a passive vapor mitigation system for the existing structure, in-place capping of all contaminated soils within the former disposal pit, enclosure of all ACM, and encapsulation of all LBP.

Alternative 3 for the Green Building would involve installation of an active vapor mitigation system for the existing structure, excavation of contaminated soils within the former disposal pit with off-site disposal, abatement of all ACM, and removal of all LBP.

Old Cavalry Building

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

Alternative 1 for the Old Cavalry Building is included as a baseline for comparison to the other proposed alternatives. This alternative would involve no containment, treatment, removal, or monitoring of contaminants.

Alternative 2 for the Old Cavalry Building would involve excavation of contaminated soils along the drip line with on-site consolidation and capping, enclosure of all ACM, and encapsulation of all LBP.

Alternative 3 for the Old Cavalry Building would involve excavation of contaminated soils along the drip line with off-site disposal, abatement of all ACM, and removal of all LBP.

[Table ES-1](#) summarizes the effectiveness, implementability, and cost for each cleanup alternative evaluated to address environmental conditions preventing or impeding the preferred type of Site redevelopment. The cost estimates presented in this 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) for the Fort McDermitt Tribe – Green & Old Cavalry Buildings (the Site) at 435 South Reservation Road (Green Building) and 111 North Reservation Road (Old Cavalry Building) in McDermitt, Humboldt County, Nevada (Figure 1). Both areas of the Site contain a single structure and are primarily used for storage (Figure 2 and Figure 3). The Fort McDermitt Paiute Shoshone Tribe (the Applicant) has interest in repairing and renovating the buildings on the Site. Additionally, the Applicant would like to achieve a historical building designation for the Old Cavalry Building and use this building as a cultural center or museum, or both.

This ABCA considers cleanup alternatives based on EPA (2021a) vapor intrusion screening levels (VISLs) for sub-slab soil vapor and soil gas, EPA (2021a) regional screening levels (RSLs) for metals in soil, and Nevada Division of Environmental Protection (NDEP) (2020) reportable concentration (RC) screening levels (SLs) for total petroleum hydrocarbons (TPH) in soil. This ABCA considers state and federal regulations regarding asbestos-containing material (ACM) and lead-based paint (LBP). Furthermore, this ABCA 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 encompasses 0.6 acre at 435 South Reservation Road (Green Building) and 0.13 acre at 111 North Reservation Road (Old Cavalry Building) in McDermitt, Nevada (Figure 1). Both areas of the Site contain a single structure in poor condition and are primarily used for storage (Figure 2 and Figure 3). The Green Building is approximately 6,000 square feet (SF) and the Old Cavalry Building is approximately 2,500 SF.

The Green Building area is bounded to the north by undeveloped land, to the east by a solid waste transfer station, to the south by South Reservation Road and residential properties beyond, and to the west by two U.S. Bureau of Indian Affairs Police structures. The Old Cavalry Building area is bounded to the north by North Reservation Road, tribal offices, and undeveloped land beyond; to the east by a tribal community center building and undeveloped land beyond; to the south by a community center structure and the Quinn River beyond; and to the west by an undeveloped paved lot and residential properties beyond. Uses of surrounding properties include residential and commercial for both areas of the Site.



1.2 OWNERSHIP AND PREVIOUS USE

Unless otherwise indicated, this discussion of ownership and previous use is derived from the Phase I/II Environmental Site Assessment (ESA) conducted in 2020 and 2021 by the Toeroek Team (in process).

During the Phase I ESA site visit on March 12, 2020, the former manager of the Green Building, Mr. Raphael Belle, told the Toeroek Team that the Green Building was constructed in 1969 and was used as a machine shop to mill metal and asbestos into components for electrical testing equipment. Manufacturing processes included (1) cutting and milling asbestos-containing panels into 4-inch washers and (2) milling metal components on lathes and other metal milling machinery. Both water-soluble and non-water-soluble cutting fluids were used in the metal milling process, and finished metal components were cleaned with the degreasing solvent trichloroethylene (TCE). Waste from the machine shop, including spent TCE, cutting fluids, and metal shavings, was disposed in a pit near the northeastern corner of the Green Building. On a 1980 aerial photograph, an area of disturbed soil is visible at the approximate location of the disposal pit area. Unused TCE and cutting fluids were stored on an asphalt-paved area between the disposal pit and the Green Building. Machine shop operations ceased in 1987, and the Green Building has since been used for storage by the tribal maintenance department. The earliest available historical aerial photograph was taken in 1974 while the machine shop was in operation. [Figure 2](#) shows the Green Building area features.

The Old Cavalry Building was constructed around 1865 as part of Quinn River Camp #33, which was established as a military outpost protecting the road between Virginia City, Nevada, and eastern Oregon. The Old Cavalry Building served as a military building for approximately 24 years before being converted into an American Indian reservation school in 1889 (Nevada State Historic Preservation Office 2020). According to Environmental Data Resources, Inc. (EDR) reports assembled for the Phase I ESA, the Old Cavalry Building served as a store with a single diesel underground storage tank (UST) in the 1940s. The length of service and condition of the UST are unknown. After use as a store, the Old Cavalry Building was converted into and used primarily as a senior citizen dining hall. The date of the transition from a store to a dining hall could not be determined. The earliest available historical aerial photograph was taken in 1954 and shows the Old Cavalry Building. [Figure 3](#) shows the Old Cavalry Building area features.



1.3 PREVIOUS INVESTIGATIONS

The Toeroek Team (2021) completed a Phase I ESA of the Site in 2021 (in process). The Toeroek Team identified the following recognized environmental conditions (RECs) and *de minimis* environmental concerns:

- A former disposal pit east of the Green Building was reportedly used to dispose of spent cutting fluids, spent cleaning fluids (including TCE), metal shavings, and potentially other unknown wastes. The possible presence of soil and groundwater contamination from the disposal of cutting fluids, TCE-containing cleaning products, scrap metal, and other wastes is a REC for the Green Building area.
- During the operational period of the Green Building as a machine shop, ACM panels were cut and milled into components used in electrical testing equipment, potentially contaminating the interior of the Green Building with asbestos-containing dust. Based on the year the Green Building was constructed (1969), ACM was possibly used during initial construction. The possible presence of asbestos-containing dust and ACM inside the Green Building is a REC for the Green Building area.
- An abandoned UST containing diesel fuel was reported to be at the Old Cavalry Building area. Two locations for the UST were reported. Documentation about the closure of the UST was not available. The possible presence of an abandoned UST without closure documentation is a REC for the Old Cavalry Building area.
- The Fort McDermitt landfill is listed as a Class II landfill and is closed; however, the presence of the landfill 0.2 mile upgradient (north) of the Old Cavalry Building area and potential contamination from leachate from the landfill presents a groundwater concern and is a REC for the Old Cavalry Building area. However, this Phase II ESA did not investigate groundwater or whether contaminants in soil may pose a threat to groundwater. Sampling of groundwater and associated risks were determined to be nonessential for this Targeted Brownfields Assessment (TBA) because current or future plans for groundwater use at the Site do not include drinking water or any other purpose.
- Based on the years the Green Building and the Old Cavalry Building were constructed, LBP was possibly used during initial construction. The possible presence of lead contamination in the soil along roof drip lines from externally applied LBP is a REC for both the Green Building and Old Cavalry Building areas.



- A heating oil aboveground storage tank (AST) was observed inside the north portion of the Old Cavalry Building. While no evidence of a leak or release was observed, the material threat of a release poses an environmental concern for the Old Cavalry Building area.
- The Green Building and Old Cavalry Building were constructed before the ban on ACM, LBP, and polychlorinated biphenyls (PCB) use in construction materials. The possible presence of hazardous building materials (possible friable ACM, LBP, and PCB-containing caulk) is an environmental concern for both the Green Building and Old Cavalry Building areas.
- Multiple instances of solid waste disposal were observed on the Green Building and Old Cavalry Building areas during the Site reconnaissance. Discarded solid waste included construction debris, insulation, broken furniture, empty food and drink containers, and other empty plastic containers. However, the waste was not investigated as part of the Phase II ESA, as the waste did not appear to pose any environmental risks to the Site.
- Some staining on the concrete floor was observed in a vehicle storage area inside the Green Building and *de minimis* staining was observed in the parking areas south and east of the Green Building during the Phase I ESA Site reconnaissance. The possible presence of contamination from spills is an environmental concern for the Green Building area.

The Toeroek Team conducted a Phase II ESA in 2021 in accordance with ASTM International (ASTM) Standard E1903-19 for Phase II ESAs and in compliance with EPA's "All Appropriate Inquiries" Rule (Title 40 *Code of Federal Regulations* [40 CFR] Part 312) (ASTM 2019). The purposes of the Phase II ESA were to (1) confirm the presence or absence of the RECs identified during the Phase I ESA, (2) acquire information regarding the nature of contamination (if present) and risks posed by that contamination that 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.

During the Phase II ESA, the Toeroek Team collected samples of surface soil, sub-slab soil vapor and soil vapor, and suspected ACM and LBP, and inventoried hazardous materials on the Site. Review of analytical data from the Phase II ESA led to the following noteworthy findings summarized below, shown on [Figure 4](#) and [Figure 5](#), and presented in the Phase I/II ESA TBA Report (in process):

- **Green Building Sub-Slab Soil Vapor:** TCE exceeded both residential and commercial VISLs in three of the five sub-slab soil vapor samples collected at the Green Building.



- **Green Building Former Disposal Pit:** The former disposal pit was observed to be present to an approximate depth of 12 feet below ground surface (bgs). Copper and nickel exceeded residential EPA RSLs. TPH-diesel range organics (DRO) and TPH-oil range organics (ORO) exceeded NDEP RCs.
- **Building Drip Lines:** Lead exceeded residential EPA RSLs in all soil samples collected from the Old Cavalry Building drip lines. Samples collected from the West #2 side of the Old Cavalry Building exceeded both residential and commercial EPA RSLs.
- **Hazardous Building Materials Survey:** The hazardous building materials survey documented the presence of ACM and LBP in building materials in the Green Building and Old Cavalry Building.

The Phase II ESA concluded that a vapor encroachment concern remains at the Green Building and that soil concentrations exceed SLs at the Green Building former disposal pit and the Old Cavalry Building drip lines. Use of the Green Building area for residential or commercial purposes could require installing a vapor mitigation system in any current and future buildings and treating, removing, or capping contaminated soil to prevent exposure or release and to mitigate potential impacts on human health. Use of the Old Cavalry Building area for residential or commercial purposes could require treating, removing, or capping contaminated soil to prevent exposure or release and to mitigate potential impacts on human health.

Building materials containing ACM and LBP will require abatement before any building renovation or demolition activities. Per the Occupational Safety and Health Administration (OSHA) asbestos material regulations (Title 29 CFR 1910.1001 and *Nevada Administrative Code* 618.850-618.986), if the building is renovated for reuse or demolished, a qualified contractor should remove and properly dispose of building materials that contain ACM above 1 percent asbestos. Likewise, for LBP, defined as paint containing more than 5,000 parts per million (ppm) lead by the U.S. Department of Housing and Urban Development (HUD) (2012) and EPA (2021a), a qualified contractor should remove and properly dispose of building materials that contain LBP. In the interim, these materials should be inspected regularly to ensure that they are not chipping, flaking, disintegrating, or becoming friable or more mobile.

No other environmental investigations have occurred at the Site.

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 repairing and renovating the buildings on the Site. Additionally, the Applicant would



like to achieve a historical building designation for the Old Cavalry Building and use this building as a cultural center or museum, or both. This ABCA applies assumed cleanup levels based on EPA RSLs for soil and EPA VISLs for sub-slab soil vapor. This ABCA applies OSHA regulations regarding ACM, as well as HUD and EPA regulations regarding LBP.

This ABCA does not present cleanup alternatives to address any potential ecological risks. The Phase II ESA investigation 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. The Site is within a rural setting with potential ecological habitat.

This ABCA addresses the contaminants of concern (COCs) as identified in the Phase II ESA, which are TCE in sub-slab soil vapor; copper, nickel, TPH-DRO, TPH-ORO, and lead in soils; and ACM and LBP in building materials.



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

Unless a waiver is granted by EPA, Site cleanup and redevelopment must be completed in compliance with applicable laws and regulations. As the Site is on tribal lands owned by the Fort McDermitt Paiute Shoshone Tribe, the lead agency for oversight of remedial activities is assumed to be the Fort McDermitt Paiute Shoshone Tribe.

2.2 ASSUMED CLEANUP LEVELS FOR MAJOR CONTAMINANTS

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

For the purpose of this ABCA, assumed cleanup levels for sub-slab soil vapor are based on the most conservative EPA (2021a) VISLs for commercial and residential soils as presented in the Phase II ESA (Table 1). Assumed cleanup levels for soil are based on the most conservative EPA (2021a) RSLs and NDEP RCs (2020) for commercial and residential soils as presented in the Phase II ESA (Table 2).

The assumed cleanup level for ACM is 1 percent asbestos as defined by OSHA 29 CFR 1910.1001 and *Nevada Administrative Code* 618.850-618.986. The assumed cleanup level for LBP is the removal of paint containing greater than 0.5 percent lead by weight or 5,000 ppm or 1 milligram per square centimeter (mg/cm²) total lead as defined by HUD (2012) and EPA (2021a).

The Toeroek Team screened the analytical data collected during previous investigations against the assumed cleanup levels identified above to determine the areas where remediation is needed. The data are presented in the Phase I/II ESA TBA Report (in process). Figure 4 and Figure 5 depict the exceedances of the screening criteria while Figure 6 and Figure 7 show the approximate areas where remediation is needed based on the data. These areas are a rough approximation and actual Site conditions may vary.

2.3 LAWS AND REGULATIONS APPLICABLE TO THE CLEANUP

This subsection is for informational purposes only. It is the responsibility of the Applicant and party or parties conducting remedial activities 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, and other governmental bodies involved with hazardous substances.

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 *Nevada Administrative Code* 618.850-618.986). EPA regulations regarding the identification, handling, management, and abatement of ACM (as specified in AHERA and NESHAP) are implemented by EPA. OSHA and Nevada OSHA regulate asbestos as a worker health and safety issue. Transportation and disposal of asbestos-containing wastes are regulated by EPA.

For LBP abatement, OSHA is primarily concerned with worker protection and regulates procedures that disturb any amount of lead contained within painted building components. According to OSHA (29 CFR 1910.1025), employers may assume that the disturbance of coatings or materials shown to contain less than 0.06 percent lead by weight (or 600 ppm lead) will not result in exposures above the applicable action level of 30 milligrams per cubic centimeter (mg/cm^3) 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, OSHA specifies a permissible exposure limit for worker exposure to airborne lead particles of 50 mg/cm^3 of air as an 8-hour, time-weighted average. The OSHA Lead in Construction Standard also lists an action level of 30 mg/cm^3 as an 8-hour, time-weighted average. Therefore, demolition activities that include materials with lead at any concentration could, under certain circumstances, trigger OSHA and Nevada OSHA regulations.

Federal law, 20 CFR Part 35 and 40 CFR Part 745, requires sellers or lessors of residential units constructed before 1978, except housing for the elderly or persons with disabilities (unless any child who is less than 6 years of age resides or is expected to reside in such housing) or any zero-bedroom dwelling, to disclose and provide a copy of the Lead Risk Assessment Report to new purchasers or lessors before they become obligated under a lease or sales contract. Property owners and sellers are also required to ensure that parents have the information they need to protect children from LBP hazards by (1) distributing an educational pamphlet approved by EPA and (2) including standard warning language in sales contracts or in or attached to lease contracts.

All Nevada employers must notify OSHA at least 24 hours before starting any lead-related work per 29 CFR 1910.1025. However, the employer is not required to notify the division if the amount of lead-containing materials to be disturbed is less than 100 SF or 100 linear feet (LF).



Applicable federal laws and regulations may include the Small Business Liability Relief and Brownfields Revitalization Act and the Davis-Bacon Act. In addition, procurement of contractors to conduct remediation may require compliance with applicable federal, state, and local laws.

Additional regulations and requirements potentially applicable or relevant to on-site cleanup may include consultation under Section 106 of the National Historic Preservation Act and the Endangered Species Act. Costs of these consultations and potential cultural resources or threatened and endangered species monitoring are not included in this ABCA.



3.0 EVALUATION OF BROWNFIELDS CLEANUP ALTERNATIVES

The evaluation of cleanup alternatives in this ABCA is based on the anticipated future use scenario for the Site—repairing and renovating the buildings on the Site. Additionally, the Applicant would like to achieve a historical building designation for the Old Cavalry Building and use this building as a cultural center or museum, or both. Because a human health risk assessment of the Site has not been completed, assumed cleanup levels will be based on EPA RSLs for copper, nickel, and lead in soil; NDEP RCs for TPH-DRO and TPH-ORO in soil; EPA VISLs for TCE in sub-slab soil vapor; and the Humboldt County background concentration for arsenic in soil. The cleanup standard for ACM is 1 percent asbestos and for LBP is the removal of paint containing greater than 0.5 percent lead by weight or 5,000 ppm or 1 mg/cm² total lead.

3.1 CLEANUP ACTION OBJECTIVES

The cleanup action objectives for the Site are to mitigate potential human exposure to contaminants identified in soil, sub-slab soil vapor, and building materials at the Site at levels exceeding the assumed cleanup levels presented in [Section 2.2](#). Future redevelopment of the Site is intended to include residential and commercial exposure scenarios. The cleanup alternatives and costs presented in this ABCA may change if different exposure scenarios are identified, additional data becomes available, or a human health risk assessment is performed.

3.2 IDENTIFICATION OF CLEANUP ALTERNATIVES

The cleanup alternatives selected for evaluation were initially assessed to determine technical feasibility and capability 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 (2020a) provides guidance for the various technologies available to ensure that contamination is either removed from a site or treated so that 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. The cost estimates presented in this ABCA 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.

[Section 3.2.3](#) and [Table 4](#) discuss alternatives considered but not selected for further evaluation as a part of the evaluation of cleanup alternatives for the Site.



Based on the planned future use of the Site, potentially including repairing and renovating the buildings on the Site and achieving a historical building designation for the Old Cavalry Building, the following cleanup alternatives were considered:

Green Building:

- Alternative 1: No Action (Baseline)
- Alternative 2: Passive Vapor Mitigation, In-Place Capping, ACM Enclosure, LBP Encapsulation, Operation and Maintenance (O&M), and Institutional Controls (ICs)
- Alternative 3: Active Vapor Mitigation System, Soil Excavation with Off-Site Disposal, ACM Abatement, LBP Removal, O&M, and ICs

Old Cavalry Building:

- Alternative 1: No Action (Baseline)
- Alternative 2: Excavation with On-Site Consolidation and Capping, ACM Enclosure, LBP Encapsulation, O&M, and ICs
- Alternative 3: Soil Excavation with Off-Site Disposal, ACM Abatement, 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 Green Building

Detailed descriptions of each alternative evaluated for the Green Building area are included in the subsections below.

3.2.1.1 Green Building: Alternative 1 – No Action (Baseline)

The no action alternative is included as a baseline for comparison to the other proposed alternatives. 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 Green Building area, this alternative 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.

3.2.1.2 Green Building: Alternative 2 – Passive Vapor Mitigation, In-Place Capping, ACM Enclosure, LBP Encapsulation, O&M, and ICs

Alternative 2 would involve construction of a passive vapor mitigation system for the Green Building. A passive vapor mitigation system would create a small negative pressure (via natural air flow) and diffusion underneath the slab of the structure, providing a preferential flow pathway for vapor, thus allowing the vapors to move through the perforated piping and outside rather than into the occupied structure. The passive vapor mitigation system would include a gravel layer with perforated piping and a vapor barrier consisting of metalized film sheet, nitrile-modified asphalt, and protection fabric layers. Vent risers would extend through the roof of the structure. The soil gas vapor collected would be vented outside to the atmosphere through these risers. Regular inspections and potential repairs and maintenance of the vapor mitigation system would be needed for as long as the structure is occupied and TCE remains in soil gas above the assumed cleanup levels.

Under Alternative 2, soils contaminated with copper, nickel, TPH-DRO, and TPH-ORO are to be left in place at the former disposal pit and capped with an unlined earthen cap to prevent direct contact and incidental ingestion by future residents, construction workers, and commercial users of the Green Building area. However, a site management plan (SMP) would be necessary to guide proper handling of soil within and beneath the cap if the soil is disturbed (for example, during new structure construction). The SMP would present a tiered approach to soil management, regulatory approval, documentation, and record keeping to minimize administrative requirements.

Alternative 2 would also include the enclosure of ACM identified in the Green Building before renovation disturbs the ACM. An air-tight barrier would be created over or around ACM, or ACM would be treated with a bridging or penetrating encapsulant that surrounds or embeds asbestos fibers in an adhesive matrix to prevent the release of fibers. Encapsulation or enclosure would prevent access to, and disturbance of, the ACM within the structure. All significantly damaged ACM that cannot be encapsulated or enclosed would be bagged for disposal and would be taken to an EPA-approved landfill licensed to accept friable or non-friable asbestos waste, or both. Enclosure by a Nevada-licensed contractor would comply with applicable local, state,



and federal regulations. EPA, Nevada, and OSHA requirements must be met during the enclosure of ACM and during renovation because of the presence of LBP.

Alternative 2 would also include stabilization of LBP in poor condition (peeling, flaking, etc.) and application of an encapsulant to all LBP surfaces. The encapsulant would be a durable, air- and dust-tight, surface-coating material. Application of the encapsulant would ensure that LBP remaining could not leach to the surface and pose a threat to future occupants. LBP stabilization entails removing deteriorated paint, preparing the substrate for repainting, and repainting (HUD 2012). Paint cannot be effectively stabilized unless substrates are dry, structurally sound, and waterproof. Stabilization is unlikely to be effective if the building has substantial structural defects or if interior or exterior walls or major components, such as windows and porches, are seriously deteriorated or subject to excessive moisture. Following enclosure or encapsulation of LBP, all previous LBP inspection reports should be kept for as long as LBP is in the Green Building area. LBP surfaces should be monitored at least every 6 months to determine if the surface condition has changed. Deterioration of the painted surface or substrate may require additional abatement procedures.

Following installation of the passive vapor mitigation system, in-place cap, and enclosure or encapsulation of ACM and LBP, an O&M plan would be written and updated annually. The O&M plan should include the following five components: (1) defined duties of the program manager, the person responsible for overseeing all aspects related to the contaminants identified in the Green Building area; (2) training for all employees and workers in the Green Building area; (3) periodic surveillance of areas with known contamination by any designated personnel every 6 months and reinspection by an accredited inspector every 3 years; (4) worker protection for employees; and (5) periodic updates of the O&M plan for as long as contamination is present in the Green Building area.

ICs would be necessary to (1) protect construction workers and utility workers who may encounter contamination; (2) ensure a vapor mitigation system is implemented for the existing structure and any new structures to be built; (3) ensure the continued integrity of the mitigation efforts; and (4) ensure ACM enclosure and LBP encapsulation remain intact and undisturbed. A SMP would be necessary to guide proper handling of soil within the cap if the soil is disturbed and would present a tiered approach to soil management, regulatory approval, documentation, and record keeping to minimize administrative requirements.

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

- Passive vapor mitigation system: The existing building is approximately 6,000 SF. No other buildings or structures are planned for the Green Building area.



- In-place capping: The area of the former disposal pit is approximately 4,000 SF.
- ACM assumed to be enclosed on the Green Building:
 - Approximately 6,100 SF of ACM drywall wall system (drywall and joint compound) finished with ACM textures (troweled-on knockdown and sprayed-on acoustical [popcorn]) was detected within the Green Building.
 - Approximately 15 LF of black mastic wrap was detected within the Green Building.
- LBP assumed to be encapsulated on the Green Building :
 - Approximately 20 LF of LBP was detected within the white on wood paint in room 2 along the door frame and door jamb.

Effectiveness

Alternative 2 rates **low** for effectiveness as this method reduces long-term risk to human receptors by passively mitigating contaminated sub-slab soil vapor, capping contaminated soils, enclosing ACM, and encapsulating LBP. However, except potentially for the sub-slab soil vapor, COCs would remain above residential and commercial assumed cleanup levels within the Green Building area, requiring implementation of ICs in perpetuity to restrict land use of this area. Routine monitoring and maintenance would be required. ICs would provide suitable protection of human health from contaminants. This alternative would allow redevelopment of the Green Building area as planned; however, restrictions (ICs) would apply.

Implementation

Alternative 2 rates **easy to moderate** for implementation as passive vapor mitigation, capping, ACM enclosure, and LBP encapsulation are common remediation practices and equipment and contractors are readily available. However, this alternative would require routine inspections and potential repairs and maintenance. ICs would also be easy to implement as no physical remediation would be required. Implementation of ICs would include a restrictive covenant that would be filed with the Register of Deeds to ensure that the cap is maintained, ACM and LBP left in place would not be disturbed during any future use scenario, and existing or new structures built at the Green Building area are designed with a vapor mitigation system.

Cost

The total cost of Alternative 2 in 2021 dollars is estimated at \$412,000, which includes a capital cost of \$327,000, \$53,000 for ICs, and \$32,000 for O&M over 30 years. Costs were estimated by applying selected



functions of 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 3](#), including unit costs.

3.2.1.3 Green Building: Alternative 3 – Active Vapor Mitigation System, Soil Excavation with Off-Site Disposal, ACM Abatement, LBP Removal, O&M, and ICs

Alternative 3 would involve construction of an active vapor mitigation system for the Green Building. The active vapor mitigation system would consist of a sub-slab depressurization system that would mechanically create a vacuum to collect soil gas from beneath the structure and vent the vapors outside. The components of the active vapor mitigation system would be similar to the passive vapor mitigation system described in Alternative 2; however, the system would be an active system with the addition of blowers to mechanically create a vacuum. Long-term O&M would be needed for the Green Building for as long as TCE remains in soil gas above assumed cleanup levels. Electricity would be required to operate the blowers, and occasional maintenance or replacement of the blowers may be needed.

Under Alternative 3, soil would be excavated to a depth of 12 feet bgs from the former disposal pit where copper, nickel, TPH-DRO, and TPH-ORO exceeded the assumed cleanup levels. This excavation would encompass 1,926 cubic yards (CY) of contaminated soil, assuming an area of 4,000 SF and a depth of 13 feet bgs. Following the excavation of the contaminated area, 10 five-point composite samples would be collected from the walls and floor of the excavated area to ensure contaminant concentrations in remaining soils are below applicable residential and commercial cleanup levels. Excavated areas will then be backfilled with clean off-Site material, graded, and seeded as needed for redevelopment. 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 results on hazardous and leaching characteristics. A SMP would be necessary to guide proper handling of contaminated soil left in place at the Green Building area if the soil is disturbed (for example, during new structure construction and utility installation). The SMP would present a tiered approach to soil management, regulatory approval, documentation, and record keeping to minimize administrative requirements.

Alternative 3 would also include the abatement of ACM identified in the Green Building before renovation disturbs the ACM. Abatement by a Nevada-licensed abatement contractor would comply with applicable local, state, and federal regulations. EPA, Nevada, and OSHA requirements must be met during the removal of ACM because of the presence of LBP. The removed waste material would be transported to a disposal site that accepts friable ACM or non-friable ACM, or both.



Alternative 3 would also include the removal of LBP in the Green Building before renovation disturbs the LBP. Removal by a Nevada-licensed contractor would comply with applicable local, state, and federal regulations. EPA, Nevada, and OSHA requirements must be met during the removal of LBP because of the presence of ACM. All surfaces and components that contain LBP determined to be in good condition would be removed and 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. The removed waste material would be transported to a disposal site that accepts hazardous waste or construction and demolition wastes, or both.

ICs would be necessary to (1) ensure a vapor mitigation system is implemented for the Green Building and any new structures to be built; (2) ensure the continued integrity of the vapor mitigation system; and (3) restrict land use in the Green Building area where contaminated soil might remain above residential and commercial assumed cleanup levels. A SMP would be necessary to guide proper handling of any contaminated soil left in place if the soil is disturbed and would present a tiered approach to soil management, regulatory approval, documentation, and record keeping to minimize administrative requirements.

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

- Active vapor mitigation system: The existing building is approximately 6,000 SF. No other buildings or structures are planned for this space.
- Soil excavation of former disposal pit: The volume of soil to be excavated to the assumed cleanup levels is 1,926 CY, assuming an area of 4,000 SF and a depth of 12 feet bgs. Shoring would be needed because of the excavation depth. The area requiring excavation is depicted on [Figure 6](#). 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 results on hazardous and leaching characteristics.
- Confirmation sampling: A total of 10 five-point composite samples will be collected from the walls and floor of the excavated area for confirmation sampling.
- ACM assumed to be abated on the Green Building:
 - Approximately 6,100 SF of ACM drywall wall system (drywall and joint compound) finished with ACM textures (troweled-on knockdown and sprayed-on acoustical [popcorn]) was detected within the Green Building.



- Approximately 15 LF of black mastic wrap was detected within the Green Building.
- LBP assumed to be removed on the Green Building:
 - Approximately 20 LF of LBP was detected within the white on wood paint in room 2 along the door frame and door jamb.

Effectiveness

Alternative 3 rates **high** for effectiveness as soil containing contaminant concentrations above residential and commercial assumed cleanup levels and building materials containing ACM and LBP would be permanently removed from the Green Building area. The active vapor mitigation system would also limit exposure of potential vapors to Green Building area receptors by pushing air into the venting layer below the slab with the use of electric blowers. However, long-term O&M and ICs would be required for the active vapor mitigation system to ensure (1) new structures built at the Green Building area are designed with a vapor mitigation system and (2) the continued integrity of the vapor mitigation system. This alternative would allow the Green Building area to be redeveloped as planned.

Implementation

Alternative 3 rates **moderate to difficult** for implementation as the active vapor mitigation system would require electricity usage and long-term O&M until vapor concentrations are below assumed cleanup levels. Any structure to be built at the Green Building area would be designed with an active vapor mitigation system, including a vapor barrier, gravel layer, perforated piping, and blowers. Implementation of ICs would include a restrictive covenant that would be filed with the Register of Deeds to ensure new and old structures at the Green Building area are designed with an active vapor mitigation system. However, vapor mitigation is a common remediation practice and the materials, services, and equipment necessary for implementation are readily available.

Excavation is a common remediation practice and equipment and contractors are readily available.

Excavation preparation would involve obtaining buried utility clearances, securing the area, and constructing runoff controls for surface drainage. The work area would be secured to prevent unauthorized access. During construction, a stormwater pollution prevention plan would be required to meet the requirements of the State of Nevada. Soil excavation by qualified equipment operators would comply with applicable state and federal regulations. In total, excavation of 1,926 CY 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 results on hazardous and leaching characteristics.



This alternative assumes that no major structural changes are necessary to remove the ACM and LBP-containing building materials and that direct regulatory oversight is not required.

Cost

The total cost of Alternative 3 in 2021 dollars is estimated at \$2,325,000, which includes a capital cost of \$1,245,000, \$53,000 for ICs, and \$1,027,000 for O&M over 30 years. Costs were estimated by applying selected functions of 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 3](#).

3.2.2 Old Cavalry Building

Detailed descriptions of each alternative evaluated for the Old Cavalry Building area are included in the subsections below.

3.2.2.1 Old Cavalry Building: Alternative 1 – No Action (Baseline)

The no action alternative is included as a baseline for comparison to the other proposed alternatives. 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 Old Cavalry Building area, this alternative 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.

3.2.2.2 Old Cavalry Building: Alternative 2 – Soil Excavation with On-Site Consolidation and Capping, ACM Enclosure, LBP Encapsulation, O&M, and ICs

Alternative 2 would involve the excavation of soil contaminated with lead along the Old Cavalry Building drip line to a depth of 1 foot bgs. Following excavation of the contaminated areas, 6 five-point composite



confirmation samples would be collected from the walls and floor of each excavation area to ensure lead concentrations in remaining soils are below applicable residential and commercial cleanup levels. Excavated areas will be backfilled with clean off-Site material, graded, and seeded as needed for redevelopment. Excavated soils would likely be consolidated in the northwest corner of the Old Cavalry Building area as shown on [Figure 7](#). Consolidated soils would then be capped with a lined earthen cap to prevent direct contact and incidental ingestion by future residents, construction workers, and commercial users. A SMP would be necessary to guide proper handling of any contaminated soil left in place at the Old Cavalry Building area if the soil is disturbed (for example, during new structure construction and utility installation). The SMP would present a tiered approach to soil management, regulatory approval, documentation, and record keeping to minimize administrative requirements.

Alternative 2 would also include the enclosure of ACM identified in the Old Cavalry Building before renovation disturbs the ACM. An air-tight barrier would be created over or around ACM, or ACM would be treated with a bridging or penetrating encapsulant that surrounds or embeds asbestos fibers in an adhesive matrix to prevent the release of fibers. Enclosure by a Nevada-licensed contractor would comply with applicable local, state, and federal regulations. EPA, Nevada, and OSHA requirements must be met during the enclosure of ACM and during renovation because of the presence of LBP.

Alternative 2 would also include stabilization of LBP in poor condition (peeling, flaking, etc.) and application of an encapsulant to all LBP surfaces. The encapsulant would be a durable, air- and dust-tight, surface-coating material. Application of the encapsulant would ensure that LBP remaining could not leach to the surface and pose a threat to future occupants. LBP stabilization entails removing deteriorated paint, preparing the substrate for repainting, and repainting (HUD 2012). Paint cannot be effectively stabilized unless substrates are dry, structurally sound, and waterproof. Stabilization is unlikely to be effective if the building has substantial structural defects or if interior or exterior walls or major components, such as windows and porches, are seriously deteriorated or subject to excessive moisture. Following enclosure or encapsulation of LBP, all previous LBP inspection reports should be kept for as long as LBP is in the Old Cavalry Building. LBP surfaces should be monitored at least every 6 months to determine if the surface condition has changed. Deterioration of the painted surface or substrate may require additional abatement procedures.

Following installation of the cap and enclosure or encapsulation of ACM and LBP, an O&M plan would be written and updated annually. The O&M plan should include the following five components: (1) defined duties of the program manager, the person responsible for overseeing all aspects related to the contaminants identified in the Old Cavalry Building area; (2) training for all employees and workers in the Old Cavalry Building area; (3) periodic surveillance of areas with known contamination by any designated personnel every



6 months and reinspection by an accredited inspector every 3 years; (4) worker protection for employees; and (5) periodic updates of the O&M plan for as long as contamination is present in the Old Cavalry Building area.

ICs would be necessary to (1) protect construction workers and utility workers who may encounter contamination; (2) ensure the continued integrity of the mitigation efforts; and (3) ensure ACM enclosure and LBP encapsulation remain intact and undisturbed. A SMP would be necessary to guide proper handling of soil within or beneath the cap if the soil is disturbed and would present a tiered approach to soil management, regulatory approval, documentation, and record keeping to minimize administrative requirements.

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

- Soil excavation around drip line: The volume of soil to be excavated to the assumed cleanup levels is 87 CY, assuming an area of 1,133 SF and a depth of 1 foot bgs. The area requiring excavation is depicted on [Figure 7](#).
- Confirmation sampling: A total of 6 five-point composite samples will be collected from the walls and floor of each excavated area for confirmation sampling.
- Capping: The capped area will be in the northwest portion of the Old Cavalry Building area and cover an area of 1,133 SF.
- ACM assumed to be enclosed on the Old Cavalry Building:
 - Approximately 2,400 SF of ACM vinyl sheet flooring and floor tile with non-ACM mastic was detected within the Old Cavalry Building.
- LBP assumed to be encapsulated on the Old Cavalry Building:
 - Approximately 2,900 SF of LBP was detected within the white on drywall paint along the interior walls and window cases.
 - Approximately 100 SF of LBP was detected within the white on wood paint along the building baseboards.
 - Approximately 2,000 SF of LBP was detected within the white on brick paint along the building exterior.
 - Approximately 600 SF of LBP was detected within the white on wood paint along the building exterior.



Effectiveness

Alternative 2 rates **low to moderate** for effectiveness as long-term risk to human receptors would be reduced by capping contaminated soils, enclosing ACM, and encapsulating LBP. However, COCs would remain above residential and commercial assumed cleanup levels within the Old Cavalry Building area, requiring implementation of ICs in perpetuity to restrict land use. Routine monitoring and maintenance would be required. ICs would provide suitable protection of human health from contaminants. This alternative would allow redevelopment of the Old Cavalry Building area as planned; however, restrictions (ICs) would apply.

Implementation

Alternative 2 rates **easy to moderate** for implementation as capping, ACM enclosure, and LBP encapsulation are common remediation practices and equipment and contractors are readily available. However, this alternative would require routine inspections and potential repairs and maintenance. ICs would also be easy to implement as no physical remediation would be required.

Excavation preparation would involve obtaining buried utility clearances, securing the area, and constructing runoff controls for surface drainage. The work area would be secured to prevent unauthorized access. During construction, a stormwater pollution prevention plan would be required to meet the requirements of the State of Nevada. Soil excavation by qualified equipment operators would comply with applicable state and federal regulations. In total, excavation of 87 CY of soil is assumed.

Cost

The total cost of Alternative 2 in 2021 dollars is estimated at \$290,000, which includes a capital cost of \$217,000, \$53,000 for ICs, and \$20,000 for O&M over 30 years. Costs were estimated by applying selected functions of 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 3](#), including unit costs.

3.2.2.3 Old Cavalry Building: Alternative 3 – Soil Excavation with Off-Site Disposal, ACM Abatement, and LBP Removal

Alternative 3 would involve the excavation of contaminated soils from the Old Cavalry Building drip lines where lead exceeded the assumed cleanup levels. Following the excavation of the contaminated area, 6 five-point composite confirmation samples will be collected from the walls and floor of each excavation area to ensure contaminant concentrations in remaining soils are below applicable residential and commercial assumed cleanup levels.



Alternative 3 would also include the abatement of ACM identified in the Old Cavalry Building before renovation disturbs the ACM. Abatement by a Nevada-licensed abatement contractor would comply with applicable local, state, and federal regulations. EPA, Nevada, and OSHA requirements must be met during the removal of ACM because of the presence of LBP. The removed waste material would be transported to a disposal site that accepts friable ACM or non-friable ACM, or both.

Alternative 3 would also include the removal of LBP in the Old Cavalry Building before renovation disturbs the LBP. Removal by a Nevada-licensed contractor would comply with applicable local, state, and federal regulations. EPA, Nevada, and OSHA requirements must be met during the removal of LBP because of the presence of ACM. All surfaces and components that contain LBP determined to be in good condition would be removed and 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. The removed waste material would be transported to a disposal site that accepts hazardous waste or construction and demolition wastes, or both.

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

- Soil excavation around drip line: The volume of soil to be excavated to the assumed cleanup levels is 87 CY, assuming an area of 1,133 SF and a depth of 1 foot bgs. The area requiring excavation is depicted on [Figure 7](#). 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 results on hazardous and leaching characteristics.
- Confirmation sampling: A total of 6 five-point composite samples will be collected from the walls and floor of each excavated area for confirmation sampling.
- ACM assumed to be abated on the Old Cavalry Building:
 - Approximately 2,400 SF of ACM vinyl sheet flooring and floor tile with non-ACM mastic was detected within the Old Cavalry Building.
- LBP assumed to be removed on the Old Cavalry Building:
 - Approximately 2,900 SF of LBP was detected within the white on drywall paint along the interior walls and window cases.
 - Approximately 100 SF of LBP was detected within the white on wood paint along the building baseboards.



- Approximately 2,000 SF of LBP was detected within the white on brick paint along the building exterior.
- Approximately 600 SF of LBP was detected within the white on wood paint along the building exterior.

Effectiveness

Alternative 3 rates **high** for effectiveness soil containing contaminant concentrations above residential and commercial assumed cleanup levels and building materials containing ACM and LBP would be permanently removed from the Old Cavalry Building area. This alternative would allow for unrestricted use of the Old Cavalry Building area.

Implementation

Alternative 3 rates **easy** for implementation as excavation is a common remediation practice and equipment and contractors are readily available. Excavation preparation would involve obtaining buried utility clearances, securing the area, and constructing runoff controls for surface drainage. The work area would be secured to prevent unauthorized access. During construction, a stormwater pollution prevention plan would be required to meet the requirements of the State of Nevada. Soil excavation by qualified equipment operators would comply with applicable state and federal regulations. In total, excavation of 87 CY 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 results on hazardous and leaching characteristics.

This alternative assumes that no major structural changes are necessary to remove the ACM and LBP-containing building materials and that direct regulatory oversight is not required.

Cost

The total cost of Alternative 3 in 2021 dollars is estimated at \$335,000, which includes a capital cost of \$335,000. Costs were estimated by applying selected functions of 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 3](#).

3.2.3 Alternatives Considered and Dismissed

A wide variety of alternatives are available for the remediation of sub-slab soil vapor and soil. [Table 4](#) identifies alternatives considered but not selected for further evaluation as a part of alternatives at the Site.



3.3 COMPARISON OF ALTERNATIVES

The Toeroek Team assessed each cleanup alternative selected for evaluation 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.

3.3.1 *Green Building*

Effectiveness

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

Alternative 3 would be more effective than Alternative 2 because contaminated soil and building materials would be permanently removed from the Green Building area. Alternative 3 would also limit exposure of potential vapors to Green Building area receptors by pushing air into the venting layer below the slab with the use of electric blowers. Under Alternative 2, COCs would remain at the Green Building area above assumed cleanup levels. Both action alternatives would require long-term O&M and ICs and allow for the Green Building area to be redeveloped as planned.

Implementability

Alternative 1 would require no effort because no containment, treatment, removal, or monitoring of contaminants would occur.

Alternative 2 would be more implementable than Alternative 3 because passive vapor mitigation, capping, ACM enclosure, and LBP encapsulation are common remediation practices and equipment and contractors are readily available. ICs would also be easy to implement as no physical remediation would be required.

Under Alternative 3, the active vapor mitigation system would require electricity usage until vapor concentrations are below assumed cleanup levels, and excavation preparation would involve obtaining buried utility clearances, securing the area, and constructing runoff controls for surface drainage. The work area would be secured to prevent unauthorized access. During construction, a stormwater pollution prevention plan would be required to meet the requirements of the State of Nevada.

Both action alternatives would require long-term O&M and ICs and allow for the Green Building area to be redeveloped as planned.



Cost

Alternative 3 is expected to cost more than Alternative 2 because contaminated soils will be excavated and disposed of off-Site, hazardous building materials will be abated, electricity usage will be required, and higher levels of O&M will be necessary.

Table 5 summarizes each alternative for the Green Building area based on effectiveness, implementability, and cost.

3.3.2 Old Cavalry Building

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 3 would be more effective than Alternative 2 because contaminated soil and building materials would be permanently removed from the Old Cavalry Building area. Under Alternative 2, COCs would remain at the Old Cavalry Building area above residential and commercial assumed cleanup levels. Only Alternative 2 would require long-term O&M and ICs. Both action alternatives would allow for redevelopment at the Old Cavalry Building area as planned.

Implementability

Alternative 1 would require no effort because no containment, treatment, removal, or monitoring of contaminants would occur.

Alternative 3 is slightly more implementable than Alternative 2 because ICs and O&M would not be required. Both action alternatives include common remediation practices, and equipment and contractors are readily available. Excavation preparation would involve obtaining buried utility clearances, securing the area, and constructing runoff controls for surface drainage. The work area would be secured to prevent unauthorized access. During construction, a stormwater pollution prevention plan would be required to meet the requirements of the State of Nevada. Soil excavation by qualified equipment operators would comply with applicable state and federal regulations.

Cost

Alternative 3 is expected to cost slightly more than Alternative 2 because contaminated soils will be excavated and disposed of off Site and hazardous building materials will be abated.



Table 5 summarizes each alternative for the Old Calvary Building area based on effectiveness, implementability, and cost.

3.4 CONSIDERATION OF CLIMATE CHANGE IMPACTS

Scientific evidence demonstrates that the climate is changing at an increasingly rapid rate, beyond the range to which society has previously adapted, posing a challenge to EPA in its ability to fulfill its mission to protect human health and the environment. EPA must adapt to climate change to continue to fulfill its statutory, regulatory, and programmatic requirements. In January 2014, EPA (2014a) published a Climate Change Adaptation Plan, which described priority actions for EPA to integrate into its programs, policies, rules, and operations.

EPA Region 9's Climate Change Adaptation Implementation Plan identifies the adverse impacts of climate change as air temperature increase, precipitation decrease, storm intensity increase, ocean acidification and warming, and sea level rise. Vulnerabilities specific to the southwest geographic region, where the Site is located, include (EPA 2014b):

- Warmer temperatures, resulting in reduced mountain snowpacks and shifting of peak spring runoff from snow melt to earlier in the season, leading to a shortage of fresh water during the summer
- Magnitude of projected temperature increases represent significant stresses to health, energy, and water supply in an area that is already experiencing high summer temperatures
- Reduced groundwater supply because of a lack of recharge
- Increased frequency and altered timing of flooding increasing risks to people, ecosystems, and infrastructure
- Magnitude and frequency of wildfires, which has increased over the last 30 years, impacting water quality in streams, creeks, rivers, lakes, and estuaries

EPA Region 9's Climate Change Adaptation Implementation Plan also identifies vulnerabilities specific to tribal lands. Tribes are more vulnerable to climate change as they are more dependent on a specific geographic area for their livelihoods and because of the degree to which those geographic areas encompass climate-sensitive environments and their unique cultural, economic, and political characteristics and contexts. Tribes also tend to have few resources to prepare, respond, or recover from natural hazards related to climate change. EPA (2014b) identifies drought as possibly the most pervasive climate-induced weather impact on



tribes because water is key to many tribal cultures and often serves as the foundation of their livelihoods, economies, subsistence, and treaty rights.

The Site is on tribal land within a residential area east of McDermitt, Nevada, and is, therefore, directly susceptible to many of the vulnerabilities identified above. The Site is located approximately 340 miles east of the Pacific Ocean coast at an elevation of approximately 4,500 feet above mean sea level and is unlikely to be affected by sea level rise.

In June 2021, EPA (2021b) published a Climate Smart Brownfields Manual that provides guidance to communities related to climate mitigation, adaptation, and resilience in the context of brownfield cleanup and redevelopment. As the Applicant moves toward cleanup of the Site, this manual may be useful in identifying ways to reduce climate impacts through greener demolition or implementing greener cleanups.

3.5 GREEN AND SUSTAINABLE REMEDIATION GUIDANCE

The cleanup of a site can be seen as “green” in that the cleanup improves 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 that are greener. In *Principles for Greener Cleanups*, which serves as the foundation for the greener cleanup policy, EPA (2020b) identifies the following elements of a green cleanup assessment that may assist in selecting and implementing 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 Green Building and Old Cavalry Building areas using the Spreadsheets for Environmental Footprint Analysis (SEFA) (EPA 2019). The analysis determined 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 the SEFA are summarized below and in [Appendix A](#).



Green Building

The impacts for Alternative 2 are rated low for total energy usage and all emissions compared to the other alternatives considered. The impacts for Alternative 3 are rated high for all emissions and total energy usage compared to Alternative 2. Alternatives 2 and 3 are similar in the technologies used; however, Alternative 3 would require more total energy usage and would produce more emissions compared to Alternative 2 because of the electricity required to continually operate the blowers for an assumed period of 30 years. For Alternative 3, a portion of the electricity usage could also be offset by installing solar panels if allowed by the property owner and adequate space is available. However, the treatment system itself would require direct connection to the main power grid because of heavy start up and continuous amperage loading.

Old Cavalry Building

The impacts for Alternative 2 are rated high for total energy usage and all emissions compared to the other alternatives considered. The impacts for Alternative 3 are rated low for most emissions and total energy usage compared to Alternative 3. Alternatives 2 and 3 are similar in the technologies used; however, Alternative 2 would require more total energy usage and would produce more emissions compared to Alternative 3 because contaminated soils would be consolidated and capped on the Old Cavalry Building area, hazardous building materials would be enclosed and encapsulated, and O&M and ICs would occur.

3.5.1 Administrative Suggestions

When selecting remediation contractors, emphasis should be placed on those who follow green remediation best management practices and take into consideration the five elements identified above. Redevelopment plans and planned future 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 green and 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 Site.
- 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 devices, use of ultra-low sulfur diesel and fuel-grade biodiesel, EPA or Nevada Air Resources Board-verified emission control technology, and routine engine maintenance.



4.0 LIMITATIONS AND ADDITIONAL ASSESSMENT NEEDS

The volumes and areas presented in this ABCA are estimates based on available information; actual Site conditions may vary. For instance, the vertical extent of metals in soils may not be fully characterized and contamination may extend beyond the depths identified by the Toeroek Team. Therefore, additional excavation may be required beyond the depths and volumes presented in this ABCA down to depths below ground surface that match the risk calculations in the cleanup goals. Although the Toeroek Team has defined the lateral extent of metals in surface soil, metals concentrations can be highly variable in soils and concentrations of contaminants may extend outside the boundaries defined in this ABCA, requiring additional excavation or an increased capping area.

This ABCA provides mitigation guidance, but it is not intended to be used as a removal characterization report or design document. This ABCA presents only the Site-specific RECs 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.

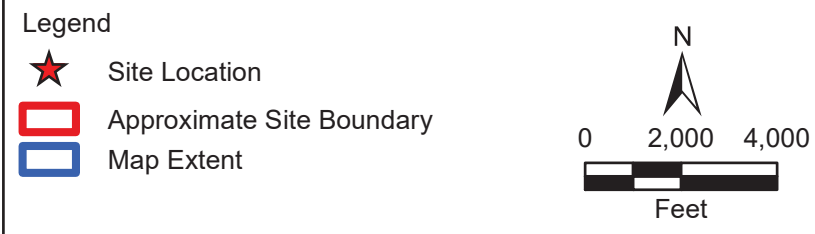
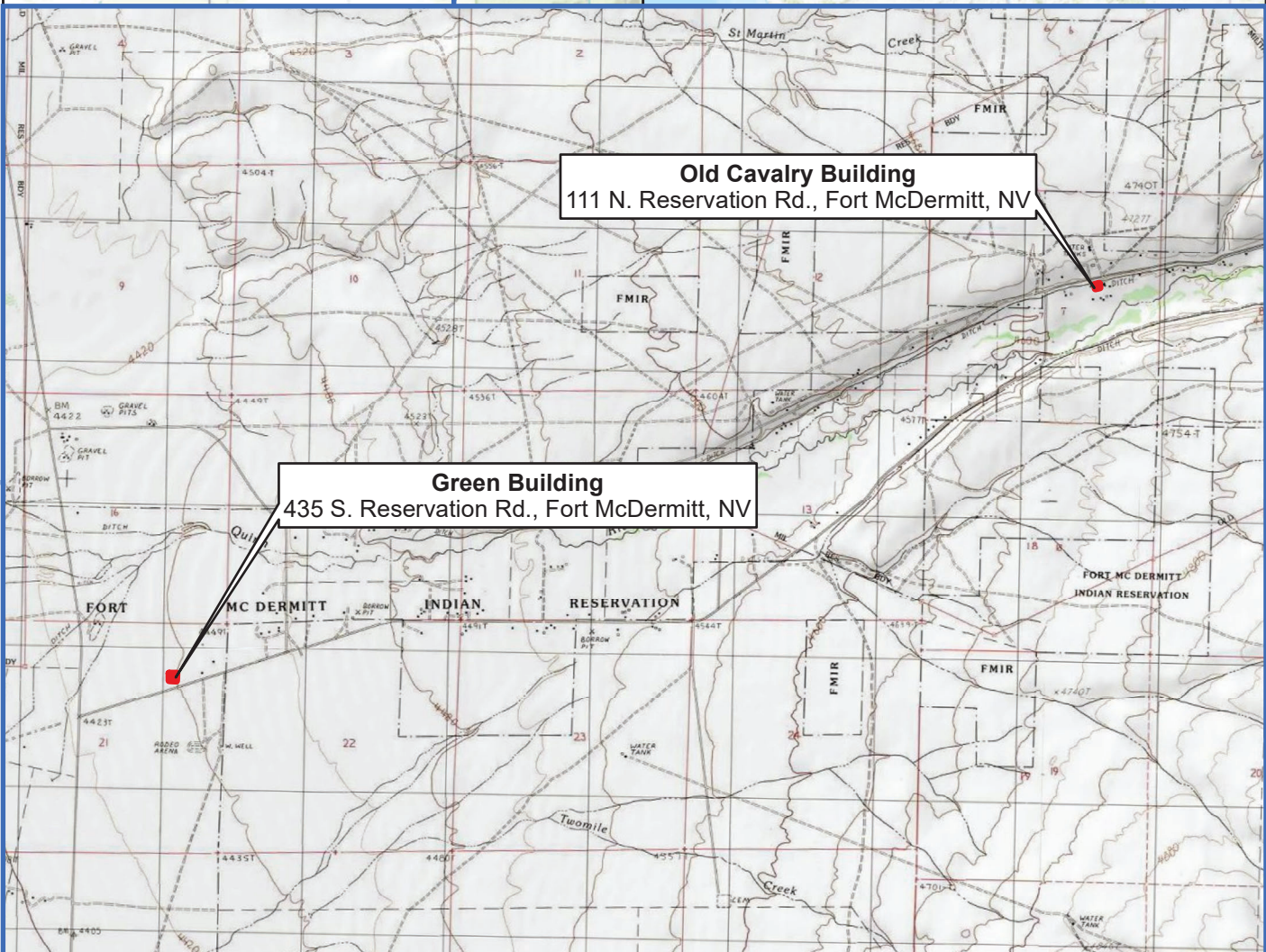
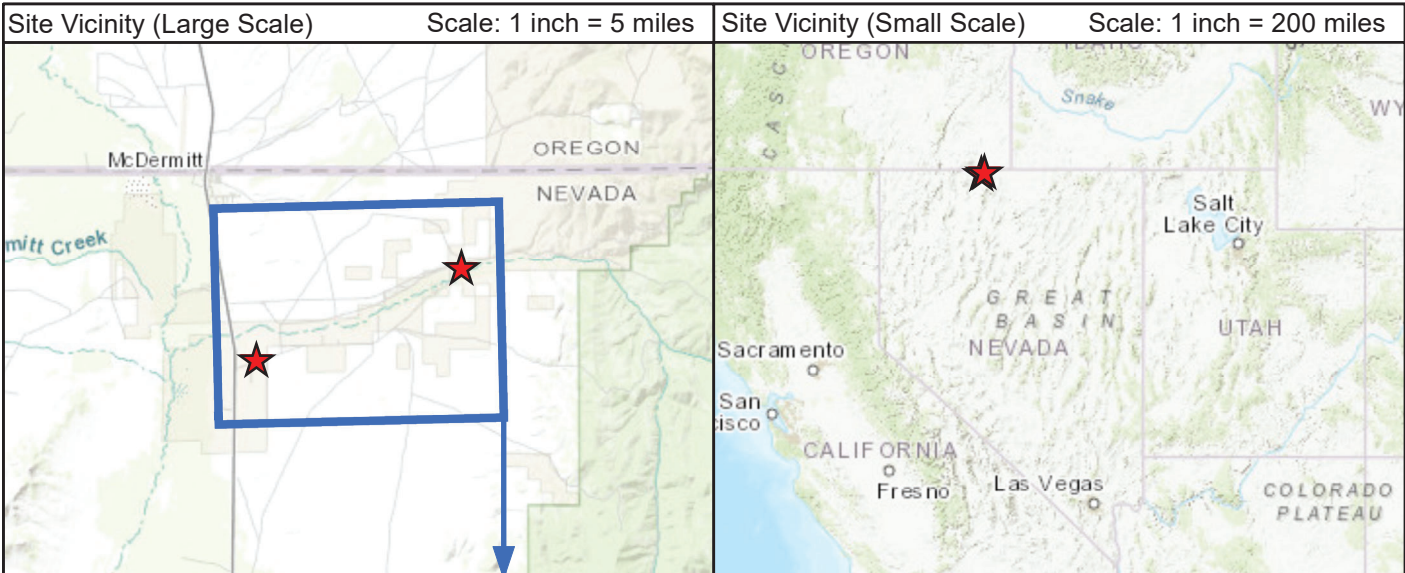
While the exact areas to be redeveloped for each of the scenarios is undetermined at this time, the alternatives presented in this ABCA present options for residential and commercial land uses. Following the completion of a development plan for the Site, the alternatives and cost estimates presented in this ABCA 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.
- Nevada Division of Environmental Protection (NDEP). 2020. “eMap.” Accessed May 11.
<http://webgis.ndep.nv.gov/>.
- Nevada State Historic Preservation Office. 2020. “Fort McDermitt.” Accessed August 24.
<http://shpo.nv.gov/nevadas-historical-markers/historical-markers/fort-mcdermitt>.
- Project Management Institute. 2017. *A Guide to the Project Management Body of Knowledge*. Sixth edition. Project Management Institute. Newtown Square, PA.
- Toeroek Associates, Inc., and its subcontractor, Tetra Tech, Inc. (Toeroek Team). In process. Phase I/II Environmental Site Assessment Targeted Brownfields Assessment Report at Fort McDermitt Tribe – Green & Old Cavalry Bldgs, McDermitt, NV.
- U.S. Department of Housing and Urban Development (HUD). 2012. Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing. Second Edition. July.
- U.S. Environmental Protection Agency (EPA). 2014a. “Climate Change Adaptation Plan.” EPA 100-K-14-001. January.
- U.S. Environmental Protection Agency (EPA). 2014b. “EPA Region 9 Climate Change Adaptation Implementation Plan.” EPA-100-K-14-001P. May.
- 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/>.
- U.S. Environmental Protection Agency (EPA). 2020a. “Technologies for Cleaning Up Contaminated Sites.” <https://www.epa.gov/remedytech>.
- U.S. Environmental Protection Agency (EPA). 2020b. “EPA Principles for Greener Cleanups.” <https://www.epa.gov/greenercleanups/epa-principles-greener-cleanups>.
- U.S. Environmental Protection Agency (EPA). 2021a. “Regional Screening Levels (RSLs) – Generic Tables.” <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables>.

FIGURES



Fort McDermitt Tribe - Green & Old Cavalry Bldgs
Targeted Brownfields Assessment
McDermitt, NV

Figure 1
Site Locations









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

Date: 8/3/2021 Drawn By: Elaia McDonald Project No: 10326521007B

PIEPA_REPA6_Brownfields2020_TASK_ORDERSITD_02_FortMcDermittGIS\WXD\A\CA\T02_Fig2_FIMcDermitt_GreenBuildingSiteFeatures.mxd



- Legend**
-  Concrete Pad for White Goods Storage Prior to Disposal
 -  Fuel Drum Storage
 -  Former TCE and Cutting Fluid Storage Area
 -  Approximate Disposal Pit Area
 -  *De minimis* Staining
 -  Approximate Site Boundary

Notes:
TCE Trichloroethylene
De minimis Trifling or of little importance. Usually refers to something so small, whether in dollar terms, importance, or severity, that the law will not consider it.

Fort McDermitt Tribe - Green & Old Cavalry Bldgs
Targeted Brownfields Assessment
McDermitt, NV







Figure 2
Green Building - Site Features





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Legend

-  Approximate Site Boundary
-  Former Fuel Pump
-  Sodium Fluoride Bag Storage
-  Heating Oil Tank
-  Estimated Suspect UST Location
-  Approximate Geophysical Survey Boundary



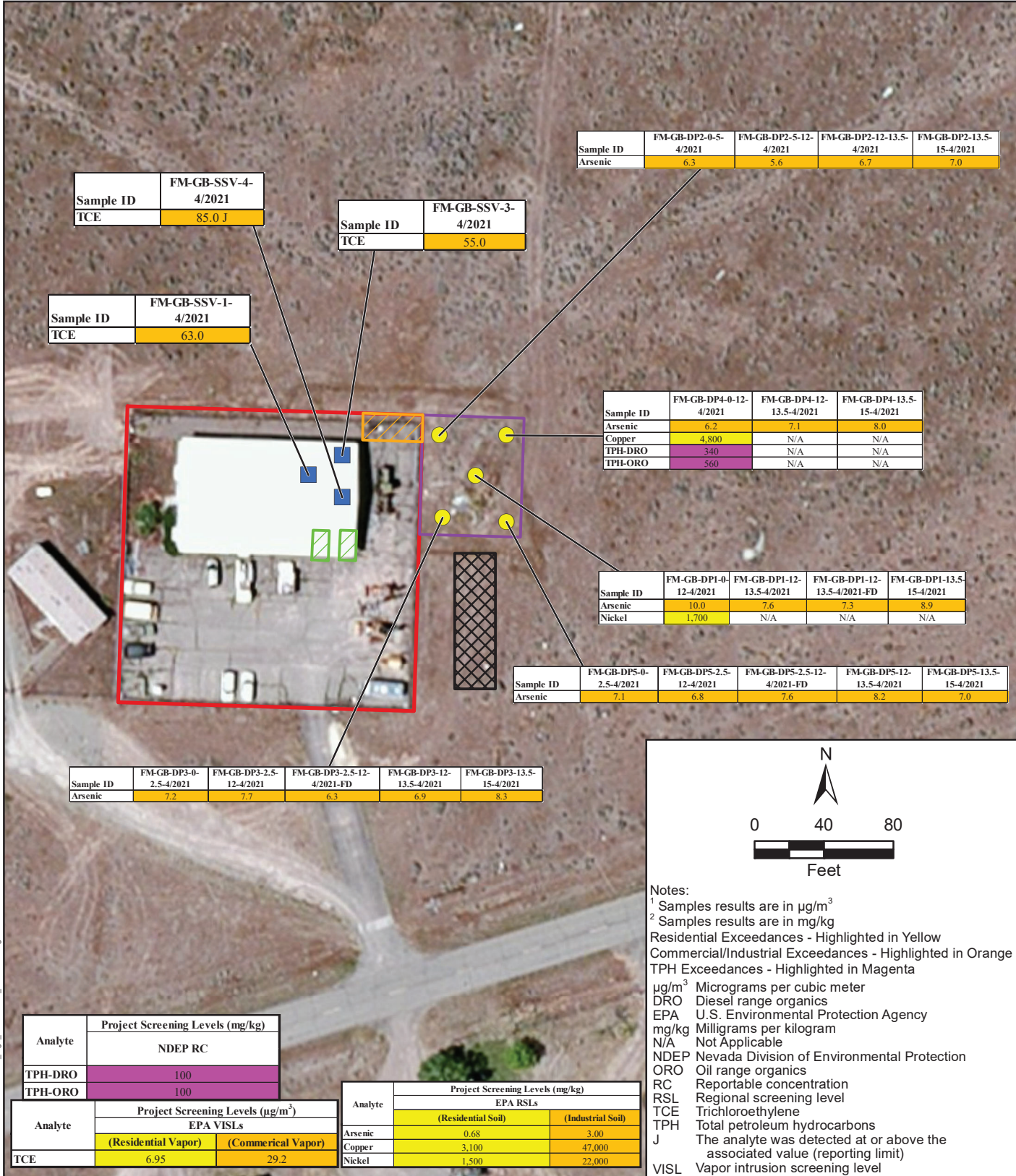
Notes:
 UST Underground Storage Tank

Fort McDermitt Tribe - Green & Old Cavalry Bldgs
 Targeted Brownfields Assessment
 McDermitt, NV

Figure 3
 Site Features - Old Cavalry Building



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Sample ID	FM-GB-SSV-4-4/2021
TCE	85.0 J

Sample ID	FM-GB-SSV-3-4/2021
TCE	55.0

Sample ID	FM-GB-SSV-1-4/2021
TCE	63.0

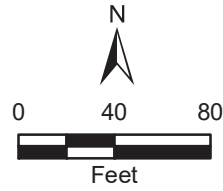
Sample ID	FM-GB-DP2-0-5-4/2021	FM-GB-DP2-5-12-4/2021	FM-GB-DP2-12-13.5-4/2021	FM-GB-DP2-13.5-15-4/2021
Arsenic	6.3	5.6	6.7	7.0

Sample ID	FM-GB-DP4-0-12-4/2021	FM-GB-DP4-12-13.5-4/2021	FM-GB-DP4-13.5-15-4/2021
Arsenic	6.2	7.1	8.0
Copper	4,800	N/A	N/A
TPH-DRO	340	N/A	N/A
TPH-ORO	560	N/A	N/A

Sample ID	FM-GB-DP1-0-12-4/2021	FM-GB-DP1-12-13.5-4/2021	FM-GB-DP1-12-13.5-4/2021-FD	FM-GB-DP1-13.5-15-4/2021
Arsenic	10.0	7.6	7.3	8.9
Nickel	1,700	N/A	N/A	N/A

Sample ID	FM-GB-DP5-0-2.5-4/2021	FM-GB-DP5-2.5-12-4/2021	FM-GB-DP5-2.5-12-4/2021-FD	FM-GB-DP5-12-13.5-4/2021	FM-GB-DP5-13.5-15-4/2021
Arsenic	7.1	6.8	7.6	8.2	7.0

Sample ID	FM-GB-DP3-0-2.5-4/2021	FM-GB-DP3-2.5-12-4/2021	FM-GB-DP3-2.5-12-4/2021-FD	FM-GB-DP3-12-13.5-4/2021	FM-GB-DP3-13.5-15-4/2021
Arsenic	7.2	7.7	6.3	6.9	8.3



Notes:
¹ Samples results are in $\mu\text{g}/\text{m}^3$
² Samples results are in mg/kg
 Residential Exceedances - Highlighted in Yellow
 Commercial/Industrial Exceedances - Highlighted in Orange
 TPH Exceedances - Highlighted in Magenta
 $\mu\text{g}/\text{m}^3$ Micrograms per cubic meter
 DRO Diesel range organics
 EPA U.S. Environmental Protection Agency
 mg/kg Milligrams per kilogram
 N/A Not Applicable
 NDEP Nevada Division of Environmental Protection
 ORO Oil range organics
 RC Reportable concentration
 RSL Regional screening level
 TCE Trichloroethylene
 TPH Total petroleum hydrocarbons
 J The analyte was detected at or above the associated value (reporting limit)
 VISL Vapor intrusion screening level

Analyte	Project Screening Levels (mg/kg)	
	NDEP RC	
TPH-DRO	100	
TPH-ORO	100	

Analyte	Project Screening Levels (mg/kg)	
	EPA RSLs	
	(Residential Soil)	(Industrial Soil)
Arsenic	0.68	3.00
Copper	3,100	47,000
Nickel	1,500	22,000

Analyte	Project Screening Levels ($\mu\text{g}/\text{m}^3$)	
	EPA VISLs	
	(Residential Vapor)	(Commercial Vapor)
TCE	6.95	29.2

- Legend**
- Sub-slab Vapor Sampling Location¹
 - Soil Boring Sampling Location²
 - Concrete Pad for White Goods Storage Prior to Disposal
 - Fuel Drum Storage
 - Former TCE and Cutting Fluid Storage Area
 - Approximate Disposal Pit Area
 - Approximate Site Boundary

Fort McDermitt Tribe - Green & Old Cavalry Bldgs
 Targeted Brownfields Assessment
 McDermitt, NV

Figure 4
 Sampling Locations and Results Exceeding Screening Levels - Green Building



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Analyte	Project Screening Levels (mg/kg)	
	EPA RSLs	
	(Residential Soil)	(Industrial Soil)
Lead	400	800

Notes:
 All samples are in mg/kg
 EPA U.S. Environmental Protection Agency
 mg/kg Milligrams per kilogram
 RSL Regional screening level
 UST Underground Storage Tank

- Legend**
- Drip Line Soil Sample Industrial Exceedance
 - Drip Line Soil Sample Residential Exceedance
 - Estimated Suspect UST Location
 - Approximate Site Boundary



Fort McDermitt Tribe - Green & Old Cavalry Bldgs
 Targeted Brownfields Assessment
 McDermitt, NV

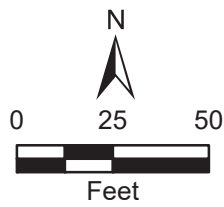
Figure 5
 Sampling Locations and Results Exceeding
 Screening Levels - Old Cavalry Building





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- Legend**
-  Area to Be Excavated
 -  Approximate Site Boundary



Fort McDermitt Tribe - Green & Old Cavalry Bldgs
 Targeted Brownfields Assessment
 McDermitt, NV





Figure 6
 Alternative 3: Approximate Area to Be
 Excavated - Green Building

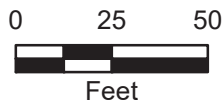


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Legend

-  Area to Be Excavated
-  Proposed Cap Area
-  Estimated Suspect UST Location
-  Approximate Site Boundary



Notes:
UST Underground Storage Tank

Fort McDermitt Tribe - Green & Old Cavalry Bldgs
Targeted Brownfields Assessment
McDermitt, NV

Figure 7

Alternatives 2 and 3: Approximate Areas
to Be Excavated - Old Cavalry Building



TABLES

**Table ES-1
Summary of Cleanup Alternatives
ABCA Document
Fort McDermitt Tribe - Green & Old Cavalry Buildings**

Green Building						
Alternative	Actions	Effectiveness	Implementation	Cost	Considerations	
1	No Action	<ul style="list-style-type: none"> None 	NA	NA	\$0	This alternative would not be protective of human health and the environment and would not meet the project goal for the site.
2	Passive Vapor Mitigation, In-Place Capping, ACM Enclosure, LBP Encapsulation, O&M, and ICs	<ul style="list-style-type: none"> Installation of a passive vapor mitigation system for an existing structure (assumed to be 6,000 SF of floor space). In-place capping of contaminated soil on site. Enclosure of ACM. Encapsulation of LBP. Implementation of ICs to restrict land use in areas where soil is capped, where LBP is encapsulated, and where ACM is enclosed. Routine monitoring and maintenance of capped areas. Long-term O&M to ensure the effectiveness of capped areas and protectiveness of ICs. 	Low	Easy to Moderate	\$412,000	<p>This alternative assumes a footprint for an existing structure; however, this is an estimate and the actual footprint may vary. In addition, routine monitoring and maintenance would be required.</p> <p>The on-site cap would be required to meet solid waste closure requirements for hazardous waste. In addition, routine monitoring and maintenance would be required.</p> <p>This alternative includes enclosure of ACM and encapsulation of LBP. In addition, routine monitoring and maintenance would be required.</p>

Notes:

Effectiveness Ratings:

Low
Low to Moderate
Moderate
Moderate to High
High

Implementation Ratings:

Difficult
Moderate to Difficult
Moderate
Easy to Moderate
Easy

ACM Asbestos-containing material
CY Cubic yard
IC Institutional control
LBP Lead-based paint
NA Not applicable
O&M Operation and maintenance
SF Square foot

**Table ES-1
Summary of Cleanup Alternatives
ABCA Document
Fort McDermitt Tribe - Green & Old Cavalry Buildings**

Green Building					
Alternative	Actions	Effectiveness	Implementation	Cost	Considerations
3	Active Vapor Mitigation System, Soil Excavation with Off-Site Disposal, ACM Abatement, LBP Removal, O&M, and ICs	High	Moderate to Difficult	\$2,325,000	<p>This alternative assumes a footprint for an existing structure; however, this is an estimate and the actual footprint may vary. In addition, routine monitoring and maintenance would be required.</p> <p>This alternative includes an estimated volume of soil for excavation; however, the extent of contamination is unknown and actual site conditions may vary.</p> <p>This alternative assumes clean fill material for backfilling excavated areas is available off site.</p> <p>This alternative includes abatement and disposal of ACM and removal and disposal of LBP.</p>

Notes:

<u>Effectiveness Ratings:</u>	<u>Implementation Ratings:</u>	ACM	Asbestos-containing material
Low	Difficult	CY	Cubic yard
Low to Moderate	Moderate to Difficult	IC	Institutional control
Moderate	Moderate	LBP	Lead-based paint
Moderate to High	Easy to Moderate	NA	Not applicable
High	Easy	O&M	Operation and maintenance
		SF	Square foot

**Table ES-1
Summary of Cleanup Alternatives
ABCA Document
Fort McDermitt Tribe - Green & Old Cavalry Buildings**

Old Cavalry Building						
Alternative	Actions	Effectiveness	Implementation	Cost	Considerations	
1	No Action	<ul style="list-style-type: none"> None 	NA	NA	\$0	This alternative would not be protective of human health and the environment and would not meet the project goal for the site.
2	On-Site Consolidation and Capping, ACM Enclosure, LBP Encapsulation, O&M, and ICs	<ul style="list-style-type: none"> Excavation of 87 CY of contaminated soil. Consolidation of excavated materials on site. Capping of excavated soil on site. Implementation of ICs to restrict land use in areas where soil is capped, where LBP is encapsulated, and where ACM is enclosed. Routine monitoring and maintenance of capped areas. Long-term O&M to ensure the effectiveness of capped areas and protectiveness of ICs. Proper enclosure of ACM. Encapsulation of LBP. 	Low to Moderate	Easy to Moderate	\$290,000	<p>The on-site cap would be required to meet solid waste closure requirements for hazardous waste. In addition, routine monitoring and maintenance would be required.</p> <p>This alternative includes enclosure of ACM and encapsulation of LBP. In addition, routine monitoring and maintenance would be required.</p>

Notes:

Effectiveness Ratings:

Low
Low to Moderate
Moderate
Moderate to High
High

Implementation Ratings:

Difficult
Moderate to Difficult
Moderate
Easy to Moderate
Easy

ACM	Asbestos-containing material
CY	Cubic yard
IC	Institutional control
LBP	Lead-based paint
NA	Not applicable
O&M	Operation and maintenance
SF	Square foot

**Table ES-1
Summary of Cleanup Alternatives
ABCA Document
Fort McDermitt Tribe - Green & Old Cavalry Buildings**

Old Cavalry Building					
Alternative	Actions	Effectiveness	Implementation	Cost	Considerations
3	Soil Excavation with Off-Site Disposal, ACM Abatement, and LBP Removal	High	Easy	\$335,000	<p>This alternative includes an estimated volume of soil for excavation; however, the extent of contamination is unknown and actual site conditions may vary.</p> <p>This alternative assumes clean fill material for backfilling will be brought in from off site.</p> <p>This alternative includes abatement and disposal of ACM and removal and disposal of LBP.</p>

Notes:

Effectiveness Ratings:

Low
Low to Moderate
Moderate
Moderate to High
High

Implementation Ratings:

Difficult
Moderate to Difficult
Moderate
Easy to Moderate
Easy

ACM	Asbestos-containing material
CY	Cubic yard
IC	Institutional control
LBP	Lead-based paint
NA	Not applicable
O&M	Operation and maintenance
SF	Square foot

Table 1
Summary of Assumed Cleanup Levels for Sub-Slab Soil Vapor
ABCA Document
Fort McDermitt Tribe - Green & Old Cavalry Buildings

COC	Assumed Cleanup Level ($\mu\text{g}/\text{m}^3$)	Reference
TCE	6.95	EPA (2021a) VISL

Notes:

- $\mu\text{g}/\text{m}^3$ Microgram per cubic meter
- COC Contaminant of concern
- EPA U.S. Environmental Protection Agency
- TCE Trichloroethylene
- VISL Vapor intrusion screening level

Table 2
Summary of Assumed Cleanup Levels for Soil
ABCA Document
Fort McDermitt Tribe - Green & Old Cavalry Buildings

COC	Assumed Cleanup Level (mg/kg)	Reference
Arsenic	0.68	EPA (2021a) RSL
Chromium	120,000	EPA (2021a) RSL
Copper	3,100	EPA (2021a) RSL
Lead	400	EPA (2021a) RSL
Nickel	1,500	EPA (2021a) RSL
Thallium	0.78	EPA (2021a) RSL
TPH-DRO	100	NDEP (2020) RC
TPH-ORO	100	NDEP (2020) RC

Notes:

COC Contaminant of concern
EPA U.S. Environmental Protection Agency
mg/kg Milligram per kilogram
NDEP Nevada Division Of Environmental Protection
RC Reportable concentration
RSL Regional screening level
TPH-DRO Total petroleum hydrocarbons – diesel range organics
TPH-ORO Total petroleum hydrocarbons – oil range organics

Table 3
Summary of Cost Estimates
ABCA Document
Fort McDermitt Tribe - Green & Old Cavalry Buildings

Alternative	Action Cost			Total Cost	Land Uses Allowed	
	Type of Cost	Description	Cost			
Green Building						
1	No Action	Capital Cost	NA	\$0	\$0	NA
		ICs	NA	\$0		
		O&M	NA	\$0		
2	Passive Vapor Mitigation, In-Place Capping, ACM Enclosure, LBP Encapsulation, O&M, and ICs	Capital Cost	Passive Vapor Mitigation System	\$94,000	\$412,000	Residential and Commercial
			In-Place Capping	\$101,000		
			Enclosure/Encapsulation of ACM and LBP	\$132,000		
		ICs	Restrictive Covenant, Meetings with Agencies, Prepare LUC Implementation Plan	\$53,000		
O&M*	Cap Repair and Maintenance, Inspections, and Monitoring	\$32,000				
3	Active Vapor Mitigation System, Soil Excavation with Off-Site Disposal, ACM Abatement, LBP Removal, O&M, and ICs	Capital Cost	Active Vapor Mitigation System	\$210,000	\$2,325,000	Residential and Commercial
			Excavation and Off-Site Disposal of Soil	\$718,000		
			Abatement and Removal of ACM and LBP	\$317,000		
		ICs	Restrictive Covenant, Meetings with Agencies, Prepare LUC Implementation Plan	\$53,000		
		O&M*	Blower replacement, routine inspections	\$1,027,000		

Notes:

- * Assumes O&M over a 30-year time period.
- ACM Asbestos-containing material
- IC Institutional control
- LBP Lead-based paint
- LUC Land use control
- NA Not applicable
- O&M Operation and maintenance

Table 3
Summary of Cost Estimates
ABCA Document
Fort McDermitt Tribe - Green & Old Cavalry Buildings

Alternative	Action Cost			Total Cost	Land Uses Allowed	
	Type of Cost	Description	Cost			
Old Cavalry Building						
1	No Action	Capital Cost	NA	\$0	\$0	NA
		ICs	NA	\$0		
		O&M	NA	\$0		
2	Soil Excavation with On-Site Consolidation and Capping, ACM Enclosure, LBP Encapsulation, O&M, and IC	Capital Cost	Soil Excavation with On-Site Consolidation	\$64,000	\$290,000	Commercial
			Capping of Soil	\$37,000		
			Enclosure/Encapsulation of ACM and LBP	\$116,000		
		ICs	Restrictive Covenant, Meetings with Agencies, Prepare LUC Implementation Plan	\$53,000		
O&M*	Cap Repair and Maintenance, Inspections and Monitoring	\$20,000				
3	Soil Excavation with Off-Site Disposal, ACM Abatement, and LBP Removal	Capital Cost	Soil Excavation and Off-Site Disposal	\$109,000	\$335,000	Unrestricted
			Abatement and Removal of ACM and LBP	\$226,000		
		ICs	NA	\$0		
		O&M	NA	\$0		

Notes:

- * Assumes O&M over a 30-year time period.
- ACM Asbestos-containing material
- IC Institutional control
- LBP Lead-based paint
- LUC Land use control
- NA Not applicable
- O&M Operation and maintenance

Table 4
Summary of Alternatives Considered and Dismissed
ABCA Document
Fort McDermitt Tribe - Green & Old Cavalry Buildings

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 bioremediation is effective for the breakdown of organic contaminants such as gasoline, this alternative is not effective in remediating the inorganic contaminants (e.g., lead) present at the Site. Bioremediation is often not uniform and requires maintaining proper moisture, pH, temperature, and nutrients. This alternative may require longer treatment times. However, bioremediation could be used in combination with other treatment technologies.
In Situ Thermal Treatment	In situ thermal treatment uses temperature to increase the volatility of the contaminants in the soils and groundwater. It may require off-gas and residual liquid treatment.	This alternative is not effective in remediating the inorganic contaminants (e.g., lead) present at the Site. In addition, this alternative requires longer treatment time and remediation is often not uniform. This alternative is the costliest treatment (driven by energy and equipment costs) and is O&M intensive.
Phytoremediation	Phytoremediation is a process that uses plants to extract, degrade, contain, or immobilize contaminants in soils and sediment.	Because of the depth of contaminated soils at the Site (up to 12 feet bgs), this alternative would not be effective as phytoremediation would be limited to the treatment of shallow soil.

Notes:

- bgs Below ground surface
- O&M Operation and maintenance
- Site Fort McDermitt Tribe – Green & Old Cavalry Buildings site

Table 5
Summary of Alternatives
ABCA Document
Fort McDermitt Tribe - Green & Old Cavalry Buildings

Criteria	Green Building			
	Alternative 2		Alternative 3	
	Passive Vapor Mitigation, In-Place Capping, ACM Enclosure, LBP Encapsulation, O&M, and ICs		Active Vapor Mitigation System, Soil Excavation with Off-Site Disposal, ACM Abatement, LBP Removal, O&M, and ICs	
	Rating	Score	Rating	Score
Effectiveness	Low	1	High	5
Implementation	Easy to Moderate	4	Moderate to Difficult	1
Cost	\$412,000	5	\$2,325,000	4
Overall Score	10		10	

Notes:

Effectiveness Ratings:

Low	1
Low to Moderate	2
Moderate	3
Moderate to High	4
High	5

Cost Ratings:

>\$7 Million	1
\$5 to \$7 Million	2
\$3 to \$5 Million	3
\$1 to \$3 Million	4
\$0 to \$1 Million	5

Implementation Ratings:

Difficult	1
Difficult to Moderate	2
Moderate	3
Easy to Moderate	4
Easy	5

ACM	Asbestos-containing material
IC	Institutional control
LBP	Lead-based paint
O&M	Operation and maintenance

Table 5
Summary of Alternatives
ABCA Document
Fort McDermitt Tribe - Green & Old Cavalry Buildings

Criteria	Old Cavalry Building			
	Alternative 2		Alternative 3	
	On-Site Consolidation and Capping, ACM Enclosure, LBP Encapsulation, O&M, and ICs		Soil Excavation with Off-Site Disposal, ACM Abatement, and LBP Removal	
	Rating	Score	Rating	Score
Effectiveness	Low to Moderate	2	High	5
Implementation	Easy to Moderate	4	Easy	5
Cost	\$290,000	5	\$335,000	5
Overall Score	11		15	

Notes:

Effectiveness Ratings:

Low	1
Low to Moderate	2
Moderate	3
Moderate to High	4
High	5

Cost Ratings:

>\$7 Million	1
\$5 to \$7 Million	2
\$3 to \$5 Million	3
\$1 to \$3 Million	4
\$0 to \$1 Million	5

Implementation Ratings:

Difficult	1
Difficult to Moderate	2
Moderate	3
Easy to Moderate	4
Easy	5

ACM	Asbestos-containing material
IC	Institutional control
LBP	Lead-based paint
O&M	Operation and maintenance

APPENDIX A

ENVIRONMENTAL FOOTPRINT ANALYSIS



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- Attachment A-2: SEFA Inputs for the Old Cavalry Building



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 for the Fort McDermitt Tribe-Green & Old Cavalry Buildings site (the Site), conducted a green remediation analysis to assist in the evaluation of potential cleanup alternatives. This analysis is based on the U.S. Environmental Protection Agency's (EPA) set of analytical workbooks called the Spreadsheets for Environmental Footprint Analysis (SEFA) tools and was conducted for potential cleanup alternatives for both the Green Building and Old Cavalry Building areas. Result summaries of these analyses can be found in [Table A-1](#) for the Green Building area and [Table A-6](#) for the Old Cavalry Building area. The analysis using the SEFA tools is based on the components of each alternative as follows.

A.1.1 Contamination Observed

Review of analytical data from the Phase II Environmental Site Assessment (ESA) led to the following noteworthy findings:

Green Building Sub-Slab Soil Vapor: Trichloroethylene (TCE) was detected in three of five sub-slab soil vapor samples at concentrations ranging from 55 to 85 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), exceeding the EPA vapor intrusion screening levels (VISLs) for residential and commercial/industrial receptors of $6.95 \mu\text{g}/\text{m}^3$ and $29.2 \mu\text{g}/\text{m}^3$, respectively.

Green Building Former Disposal Pit: Copper was detected in one of five surface soil samples within 0 to 12 feet below ground surface (bgs) at 4,800 milligrams per kilogram (mg/kg), exceeding the EPA regional screening level (RSL) for residential receptors of 3,100 mg/kg. Nickel was detected in one of five surface soil samples within 0 to 12 feet bgs at 1,700 mg/kg, exceeding the EPA RSL for residential receptors of 1,500 mg/kg. Total petroleum hydrocarbons-diesel range organics (TPH-DRO) and total petroleum hydrocarbons-oil range organics (TPH-ORO) were detected in one of five surface soil samples within 0 to 12 feet bgs at 340 mg/kg and 560 mg/kg, respectively, exceeding the Nevada Division of Environmental Protection (NDEP) reportable concentration (RC) of 100 mg/kg.

Old Cavalry Building Drip Lines: Lead was detected in all surface soil samples within 0 to 3 inches bgs at concentrations ranging from 440 to 2,900 mg/kg, exceeding the EPA RSLs for residential and commercial/industrial receptors of 400 mg/kg and 800 mg/kg, respectively.



Hazardous Building Materials: The hazardous building materials survey documented the presence of asbestos-containing material (ACM) and lead-based paint (LBP) in building materials in the Green Building and Old Cavalry Building.

The arsenic concentrations detected at the Site are not consistent with a release from historic operations and may be naturally occurring. Additional background sampling is recommended to verify if background concentrations in the area are at a higher concentration than 10.8 mg/kg. However, for the purpose of the ABCA, cleanup alternatives consider the maximum U.S. Geological Survey regional background concentration for arsenic.

The following cleanup alternatives were considered for the Site:

The Green Building

- Alternative 1: No Action
- Alternative 2: Passive Vapor Mitigation, In-Place Capping, ACM Enclosure, LBP Encapsulation, Operation and Maintenance (O&M), and Institutional Controls (ICs)
 - This alternative would involve construction of a passive vapor mitigation system, where advection (differences in gas pressure) and diffusion (differences in contaminant concentrations) would draw soil gas out from underneath the Green Building to the atmosphere. Long-term inspection and potential repairs and maintenance of the vapor mitigation system would be required for as long as the structure is occupied.
 - This alternative would involve capping contaminated soils in place with an unlined earthen cap at the former disposal pit. If contaminated soils are found to potentially leach metals, a lined cap may be necessary to reduce infiltration and leaching of contaminants into the underlying clean soil and groundwater. The lined cap could consist of a thicker earthen cap, geomembrane, geosynthetic clay liner, or compacted clay layer.
 - This alternative would also involve ACM enclosure, stabilization of LBP in building materials in poor condition (peeling, flaking, etc.), and application of an encapsulant to all LBP surfaces and components. This alternative would permit ACM and LBP-related hazardous materials identified in the Phase II ESA to remain with appropriate action taken to stabilize and encapsulate or enclose remaining contamination.
 - An air-tight barrier would be created over or around ACM, or ACM would be treated with a bridging or penetrating encapsulant that surrounds or embeds asbestos fibers in an adhesive



- matrix to prevent the release of fibers. This would prevent access and disturbance of ACM identified during the Phase II ESA within the building.
- Following enclosure or encapsulation of ACM, an O&M plan would be written and updated annually. The O&M plan should include the following five components: (1) defined duties of the program manager, the person responsible for overseeing all aspects related to the ACM identified in the Green Building; (2) training for all employees and workers in the Green Building; (3) periodic surveillance of areas with ACM by any designated personnel every 6 months and reinspection by an accredited asbestos inspector every 3 years; (4) worker protection for employees performing asbestos work; and (5) periodic updates of the O&M plan for as long as ACM is present in the Green Building.
 - LBP-containing surfaces would be inspected, and removal of loose LBP would be required. Removed LBP residue would be segregated for proper disposal.
 - LBP encapsulant would be a durable, air- and dust-tight surface coating. Application of the encapsulant would ensure that remaining LBP could not leach to the painted surface and pose a threat to current or future occupants.
 - Following enclosure or encapsulation of LBP, all previous LBP inspection reports should be kept for as long as LBP remains in the Green Building. LBP surfaces should be monitored at least every 6 months to determine if the surface condition has changed. Deterioration of the painted surface or substrate may require additional abatement procedures.
 - ICs would be necessary to (1) protect construction workers and utility workers who may encounter contaminated soils below the cap; (2) ensure a vapor mitigation system is implemented for the existing structure and any new structures to be built; (3) ensure the continued integrity of the vapor mitigation system; and (4) ensure ACM enclosure and LBP encapsulation remain intact and undisturbed.
 - Long-term O&M would be required to ensure the effectiveness of the cap and protectiveness of ICs.
 - This alternative may be standalone or combined with other alternatives.
 - This alternative would allow for commercial and industrial use of the Green Building area; however, ICs would be necessary to ensure the continued integrity of the vapor mitigation system, the soil cap, and ACM and LBP left in place.



- Alternative 3: Active Vapor Mitigation System, Soil Excavation with Off-Site Disposal, ACM Abatement, LBP Removal, O&M, and ICs
 - This alternative would involve construction of an active vapor mitigation system underneath the Green Building. The active vapor mitigation system would consist of a sub-slab depressurization system that would use pumps, blowers, and fans to mechanically create a vacuum and suck soil gas from beneath the building and vent and expel vapors outside to the atmosphere.
 - This alternative would require long-term O&M of the vapor mitigation system for as long as a structure is occupied. The system also would require electricity and occasional maintenance or replacement of the blowers, fans, and pumps.
 - This alternative would involve excavation of all contaminated soils within the former disposal pit above commercial and industrial assumed cleanup levels based on the results from the Phase II ESA.
 - Following excavation, confirmation samples would be collected from the sidewalls and bottom of the excavation area to ensure that contaminant concentrations in remaining soils are below commercial and industrial preliminary assumed cleanup levels.
 - Soil would be stockpiled on the Green Building area for waste profile characterization before off-Site disposal. Following characterization, excavated soils would be hauled to an off-Site permitted disposal facility for disposal. Depending on hazardous and leaching characteristics, waste disposal may occur at a Class I-, II-, or III-permitted landfill.
 - Excavated areas would then be backfilled with clean fill material, graded, and seeded as appropriate.
 - ICs would be necessary to (1) ensure a vapor mitigation system is implemented for the existing structure and any new structures to be built; (2) ensure the continued integrity of the vapor mitigation system; and (3) restrict land use in the area where contaminated soil will remain above residential assumed cleanup levels.
 - ACM abatement would be performed by a licensed abatement contractor in accordance with applicable local, state, and federal regulations. Following removal of ACM, the licensed contractor would properly bag and label ACM waste in accordance with 29 *Code of Federal Regulations* (CFR) 1926.1101. The ACM waste would be disposed of at an EPA-approved landfill that accepts friable or non-friable ACM.



- All surfaces and components that contain LBP would be removed by demolition for proper disposal. LBP removal by a licensed LBP removal contractor would comply with applicable local, state, and federal regulations.
- This alternative would allow for commercial and industrial use of the Green Building; however, ICs would be necessary to ensure the continued integrity of the vapor mitigation system and restrict use of the Green Building area to commercial and industrial uses only.

Old Cavalry Building

- Alternative 1: No Action
- Alternative 2: Excavation with On-Site Consolidation and Capping, ACM Enclosure, LBP Encapsulation, O&M, and ICs
 - This alternative would involve excavation of all contaminated soils at the Old Cavalry Building above residential assumed cleanup levels based on results from the Phase II ESA. Excavated soils would be mixed with a stabilizing agent, such as Portland cement, to reduce mobility and leaching of metals to underlying clean soil and groundwater. The soils would then be consolidated on the Old Cavalry Building area.
 - Contaminated soils exceeding assumed cleanup levels would be capped with an unlined earthen cap to prevent direct contact and incidental ingestion of future workers and visitors to the Old Cavalry Building area.
 - ICs would be necessary to prevent exposure of future workers and visitors to the Old Cavalry Building area to contaminated soils below the cap. In addition, long-term O&M would be required to ensure the effectiveness of the cap and protectiveness of ICs.
 - This alternative would also involve ACM enclosure, stabilization of LBP in building materials in poor condition (peeling, flaking, etc.), and application of an encapsulant to all LBP surfaces and components. This alternative would permit ACM and LBP-related hazardous materials identified in the Phase II ESA to remain with appropriate action taken to stabilize and encapsulate or enclose remaining contamination.
 - An air-tight barrier would be created over or around ACM, or ACM would be treated with a bridging or penetrating encapsulant that surrounds or embeds asbestos fibers in an adhesive matrix to prevent the release of fibers. This would prevent access and disturbance of ACM identified during the Phase II ESA within the building.



- Following enclosure or encapsulation of ACM, 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 Old Cavalry Building; (2) training for all employees and workers in the Old Cavalry Building; (3) periodic surveillance of areas with ACM by any designated personnel every 6 months and reinspection by an accredited asbestos inspector every 3 years; (4) worker protection for employees performing asbestos work, and (5) periodic updates to the O&M plan for as long as ACM is present in the Old Cavalry Building.
- LBP-containing surfaces would be inspected, and removal of loose LBP would be required. Removed LBP residue would be segregated for proper disposal.
- LBP encapsulant would be a durable, air- and dust-tight surface coating. Application of the encapsulant would ensure that remaining LBP could not leach to the painted surface and pose a threat to current or future occupants.
- Following enclosure or encapsulation of LBP, all previous LBP inspection reports should be kept for as long as LBP is in the Old Cavalry Building. LBP surfaces should be monitored at least every 6 months to determine if the surface condition has changed. Deterioration of the painted surface or substrate may require additional abatement procedures.
- This alternative would allow for residential use or commercial and industrial use, or both, of the Old Cavalry Building area; however, ICs would be necessary to ensure the continued integrity of the soil cap and the ACM and LBP left in place.
- Alternative 3: Soil Excavation with Off-Site Disposal, ACM Abatement, and LBP Removal
 - This alternative would involve excavation of all contaminated soils at the Old Cavalry Building area above residential assumed cleanup levels based on the results from the Phase II ESA.
 - Following excavation, confirmation samples would be collected from the sidewalls and bottom of each excavation area to ensure that contaminant concentrations in remaining soils are below residential assumed cleanup levels.
 - Soil would be stockpiled on the Old Cavalry Building area for waste profile characterization before off-Site disposal. Following characterization, excavated soils would be hauled to an off-Site permitted disposal facility for disposal. Depending on hazardous and leaching characteristics, waste disposal may occur at a Class I-, II-, or III-permitted landfill.



- Excavated areas would then be backfilled with clean fill material, graded, and seeded as appropriate.
- ACM abatement would be performed by a licensed abatement contractor in accordance with applicable local, state, and federal regulations. Following removal of ACM, the licensed contractor would properly bag and label ACM waste in accordance with 29 CFR 1926.1101. The ACM waste would be disposed of at an EPA-approved landfill that accepts friable or non-friable ACM.
- All surfaces and components that contain LBP would be removed by demolition for proper disposal. LBP removal by a licensed LBP removal contractor would comply with applicable local, state, and federal regulations.
- This alternative would allow for unrestricted use of the Old Cavalry Building area.

A.1.2 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 size of the footprint, and adjust project parameters to reduce the size of the footprint. Information to be input into the spreadsheets was gathered from the Phase II ESA (in process), field records, and other existing resources. Automated calculations within SEFA tools generate outputs that quantify 21 metrics corresponding to core elements of a greener cleanup. An analysis with the SEFA tools for each alternative was conducted for the Green Building and Old Cavalry Building areas.

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. The inputs were estimated for the alternative-specific components for the Green Building and Old Cavalry Building areas (see [Attachment A-1](#) for the Green Building and [Attachment A-2](#) for the Old Cavalry Building). These inputs were required for each component of the cleanup alternative. An example of the components of an alternative include excavation, consolidation, capping, a passive vapor mitigation system, an active vapor mitigation system, O&M, and ICs.

SEFA tools then automatically calculate the energy and emissions derived from the inputs. The different types of energy and emissions include total energy consumed, greenhouse 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 greenhouse gases emissions. All the different types of energy and emissions have an effect on the changing climate.



The results of the analysis using the SEFA tools for each potential alternative for the Green Building and Old Cavalry Building areas can be found in [Table A-2](#) through [Table A-5](#) and [Table A-6](#) through [Table A-10](#), respectively.

A.2 FINDINGS AND CONCLUSIONS

Result summaries of the green remediation analyses can be found in [Table A-1](#) for the Green Building area and [Table A-6](#) for the Old Cavalry Building area. The relative impacts in these tables are 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. Calculating the relative footprint of each alternative will allow for a better representation of how this decision will impact climate change.

Green Building

The impacts for all emissions and total energy usage are low for Alternative 2 and high for Alternative 3. While both action alternatives are similar in the technologies used, Alternative 3 would require more total energy usage and produce more emissions than Alternative 2 because of the active vapor mitigation system, soil excavation with off-site disposal, ACM abatement, and LBP removal (see [Table A-1](#)).

[Table A-2](#) includes a detailed impact summary for each alternative for the Green Building area that is broken down by the associated activities (on the Green Building area, off the Green Building area, transportation, and electricity generation). All other tables within this attachment for the Green Building area are based off the numerical data in [Table A-2](#). [Table A-3](#) shows that most of the environmental impacts at the Green Building area will be from off-site activities (such as acquiring fill, polyvinyl chloride [PVC] pipe, topsoil, etc.) and grid electricity generation (from the active vapor mitigation system). Some environmental impacts will be from on-site activities (use of heavy machinery, excavation, consolidation, etc.), but environmental impacts from transportation will be almost undetectable comparatively.

For Alternative 2, environmental impacts will be primarily from in-place capping of contaminated soils and secondarily from the passive vapor mitigation system (see [Table A-4](#)). The remaining components (ACM enclosure, LBP encapsulation, O&M, and ICs) compose <2 percent of the overall environmental impact. Alternative 2 would have the lowest environmental impact of the alternatives considered primarily because contamination will be mitigated but remain on the Green Building area (see [Table A-1](#)).



For Alternative 3, most of the environmental impacts will be primarily from the active vapor mitigation system and secondarily from the excavation of contaminated soils with off-site disposal (see [Table A-5](#)). The remaining components (ACM abatement, LBP removal, O&M, and ICs) compose <1 percent of the overall environmental impact. Alternative 3 would have the highest environmental impact of the alternatives considered primarily because contamination will be removed from the Green Building area, which will be very labor intensive and pose a greater hazard initially but will be safer in the long run (see [Table A-1](#)).

Old Cavalry Building

The impacts for all emissions and total energy usage are high for Alternative 2 and low for Alternative 3. While both action alternatives are similar in the technologies used, Alternative 2 would require more total energy usage and produce more emissions than Alternative 3 because of the excavation of contaminated soils with on-site consolidation and capping, ACM enclosure, and LBP encapsulation (see [Table A-6](#)).

[Table A-7](#) includes a detailed impact summary for each alternative for the Old Cavalry Building area that is broken down by the associated activities (on the Old Cavalry Building area, off the Old Cavalry Building area, transportation, and electricity generation). All other tables within this attachment for the Old Cavalry Building area are based off the numerical data in [Table A-7](#). [Table A-8](#) shows that most of the environmental impacts from the Old Cavalry Building area will be from off-site activities (such as acquiring fill, PVC pipe, topsoil, etc.) and on-site activities (use of heavy machinery, excavation, consolidation, etc.). Some environmental impacts will be from transportation, and no grid electricity will be generated for either action alternatives considered.

For Alternative 2, environmental impacts will be primarily from capping contaminated soils and secondarily from excavating contaminated soils with on-site consolidation (see [Table A-9](#)). The remaining components (ACM enclosure, LBP encapsulation, O&M, and ICs) compose <1 percent of the overall environmental impact. Alternative 2 would have the highest environmental impact of the alternatives considered primarily because contamination will be mitigated but remain on the Old Cavalry Building area (see [Table A-6](#)).

For Alternative 3, most of the environmental impacts will be from the excavation of contaminated soils with off-site disposal (see [Table A-10](#)). The remaining components (ACM abatement and LBP removal) compose <10 percent of the overall environmental impact. Alternative 3 would have the lowest environmental impact of the alternatives considered (except for particulate matter emissions, which shows medium impact) primarily because contamination will be removed from the Old Cavalry Building area (see [Table A-6](#)).



A.3 REFERENCES

Toeroek Associates, Inc., and its subcontractor, Tetra Tech, Inc. (Toeroek Team). In process. “Phase I/Phase II Environmental Site Assessment Targeted Brownfields Assessment Report, Fort McDermitt Tribe - Green & Old Cavalry Bldgs, McDermitt, Nevada.”

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. Green Building Relative Impact of Alternatives

Removal Alternatives	Total Energy Used	GHG Emmissions	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: Passive Vapor Mitigation, In-Place Capping, ACM Enclosure, LBP Encapsulation, O&M, and ICs	938	146,000	539	122	72	734
Alternative 3: Active Vapor Mitigation System, Soil Excavation with Off-Site Disposal, ACM Abatement, LBP Removal, O&M, and ICs	23,233	2,375,300	5,149	16,002	667	21,891

Removal Alternatives	Total Energy Used	GHG Emmissions	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: Passive Vapor Mitigation, In-Place Capping, ACM Enclosure, LBP Encapsulation, O&M, and ICs	Low	Low	Low	Low	Low	Low
Alternative 3: Active Vapor Mitigation System, Soil Excavation with Off-Site Disposal, ACM Abatement, LBP Removal, O&M, and ICs	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 materials
EPA	U.S. Environmental Protection Agency
GHG	Greenhouse gas
IC	Institutional control
LAP	Listed air pollutant
LBP	Lead-based paint
lbs	Pound
MMBTU	Million British thermal unit
NO _x	Nitrogen oxide
O&M	Operation and maintenance
PM	Particulate matter
SO _x	Sulfur oxide

Table A-2. Green Building Detailed Impact Summary

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 ¹	0	0	0	0	0	0
	Electricity Generation	0	0	0	0	0	0
	Transportation	0	0	0	0	0	0
	Other Off-Site ²	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Alternative 2	On-Site ¹	560	89,000	420	2	35	460
	Electricity Generation	0	0	0	0	0	0
	Transportation	88	14,000	40	0	4	44
	Other Off-Site ²	290	43,000	79	120	33	230
	Total	938	146,000	539	122	72	734
Alternative 3	On-Site ¹	6,300	70,000	330	2	27	360
	Electricity Generation	12,000	1,900,000	3,900	7,900	99	12,000
	Transportation	33	5,300	29	1	1	31
	Other Off-Site ²	4,900	400,000	890	8,100	540	9,500
	Total	23,233	2,375,300	5,149	16,002	667	21,891

Notes:

1. On-Site refers to fuel consumption on site (i.e., heavy equipment).

2. Other Off-Site refers to all other energy uses not covered under on site, electricity generation, or transportation, such as energy required for producing materials (i.e., PVC, gravel, and GAC), lab analyses, and production of fuels.

EPA	U.S. Environmental Protection Agency	MMBTU	Million British thermal unit
GAC	Granular activated carbon	NO _x	Nitrogen oxide
GHG	Greenhouse gas	PM	Particulate matter
LAP	Listed air pollutant	PVC	Polyvinyl chloride
lbs	Pound	SO _x	Sulfur oxide

Table A-3. Green Building Detailed Impact Charts

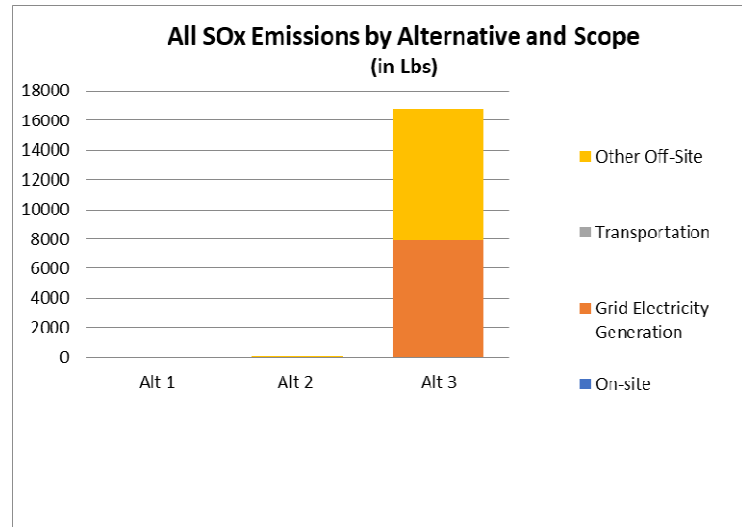
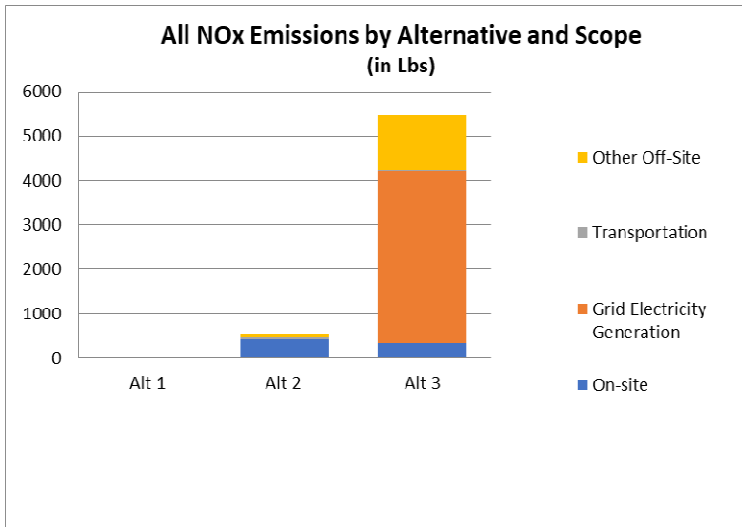
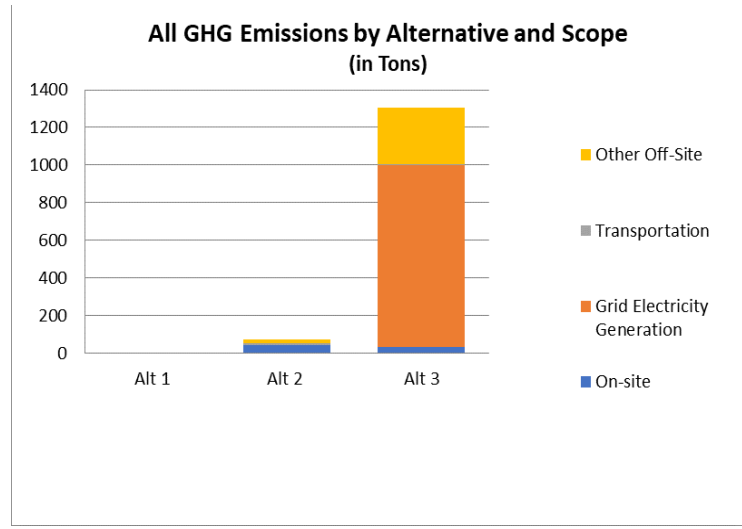
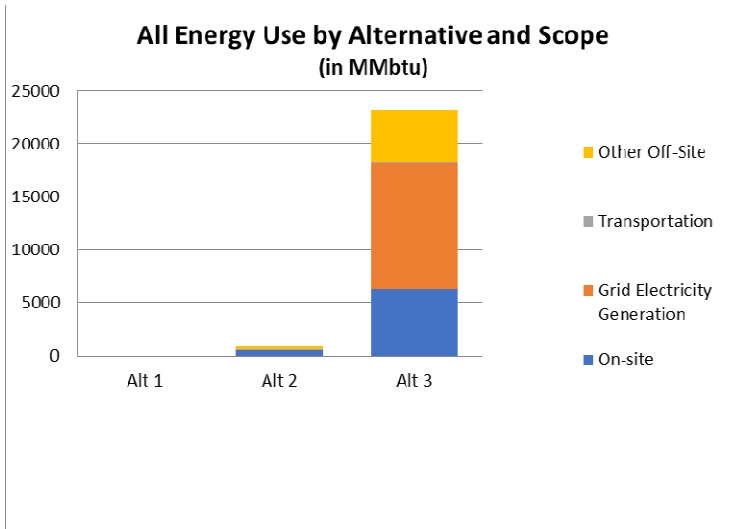
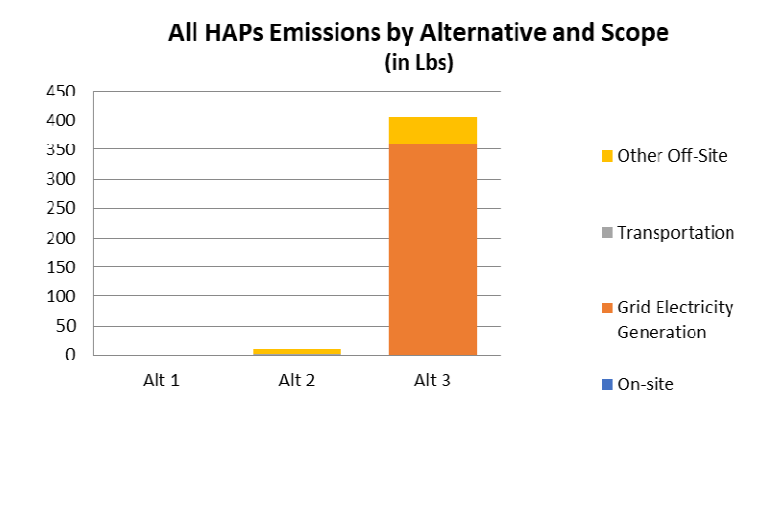
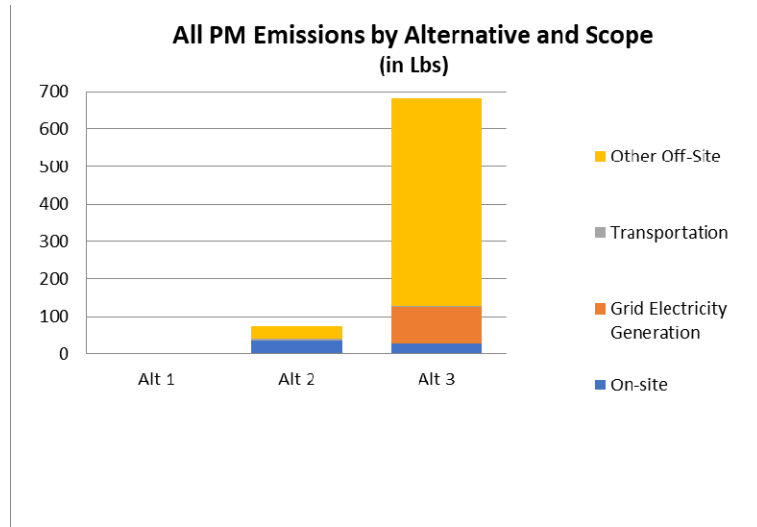


Table A-3. Green Building Detailed Impact Charts



Notes:

GHG	Greenhouse gas	NOx	Nitrogen oxide
LAP	Listed air pollutant	PM	Particulate matter
lbs	Pound	SOx	Sulfur oxide
MMBTU	Million British thermal unit		

Table A-4. Green Building Alternative 2 Detailed Impact Charts

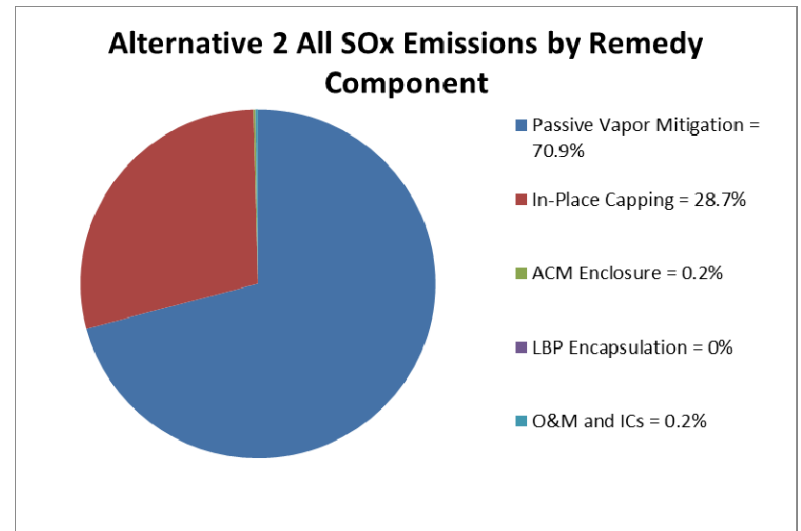
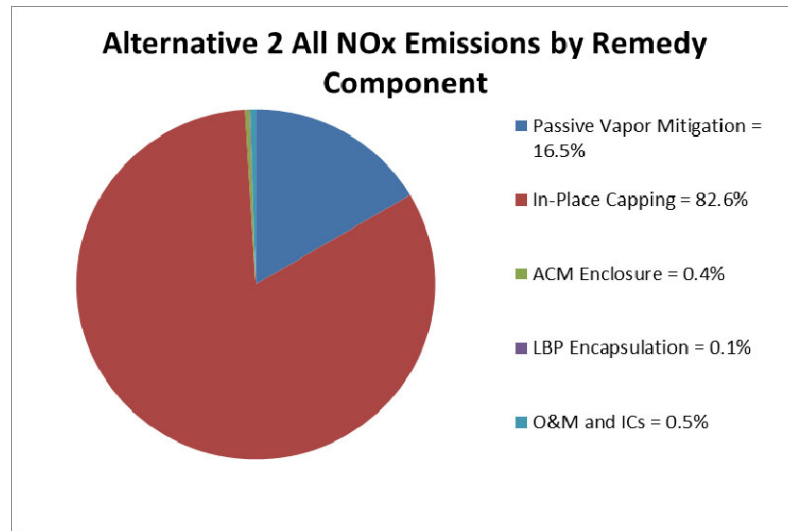
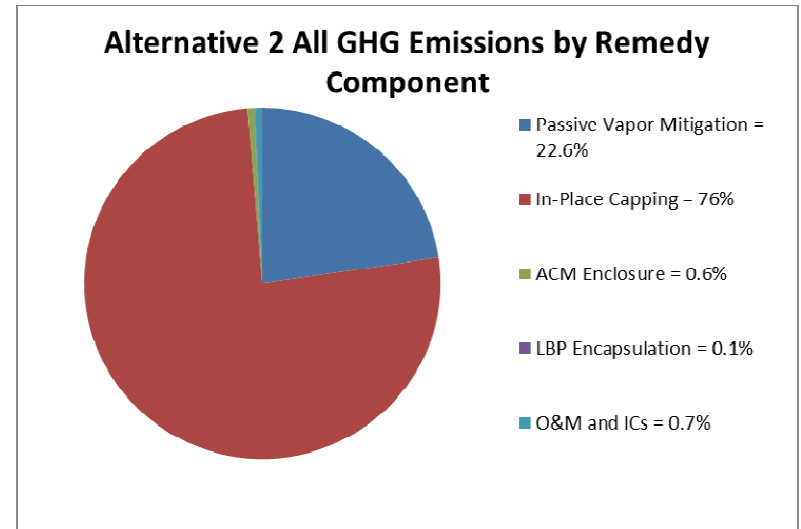
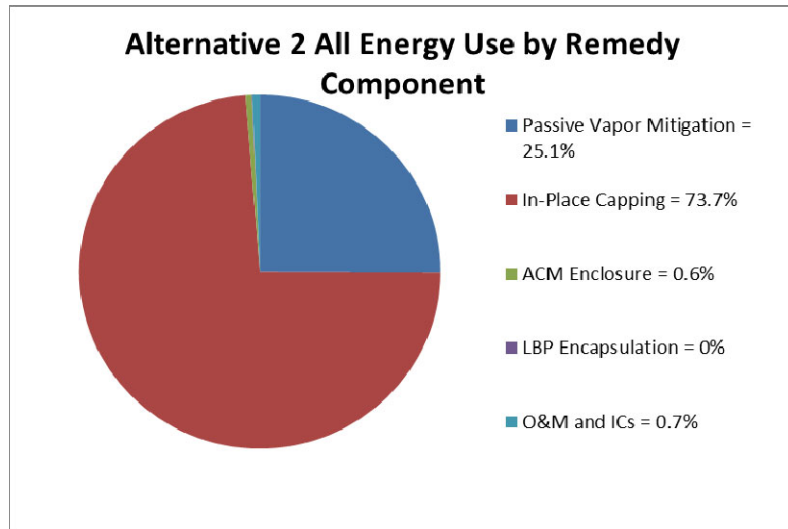
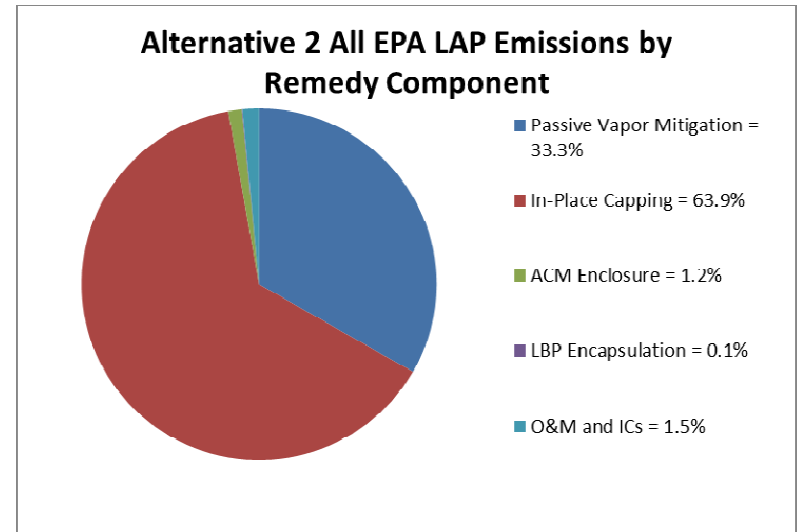
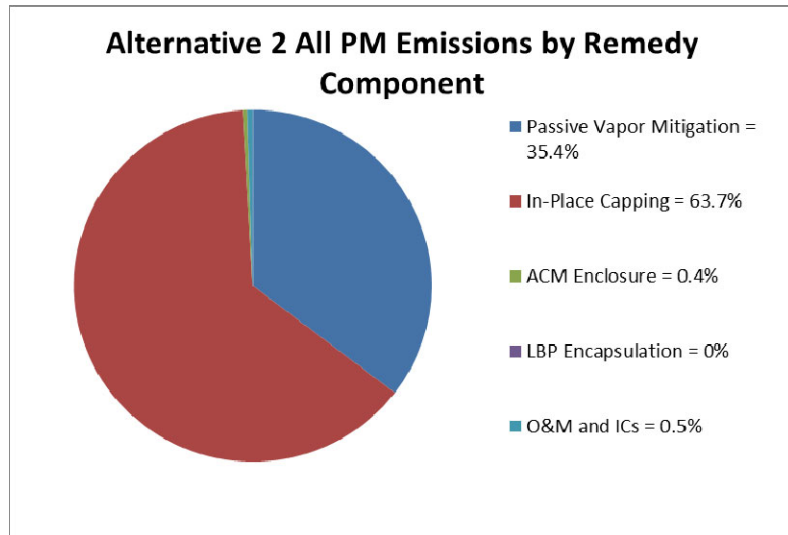


Table A-4. Green Building Alternative 2 Detailed Impact Charts



Notes:

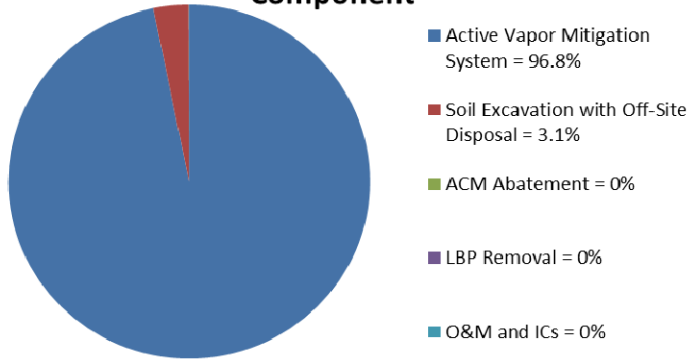
ACM Asbestos-containing material
 EPA Environmental Protection Agency
 GHG Greenhouse gas
 IC Institutional control

LAP Listed air pollutant
 LBP Lead-based paint
 lbs Pound
 MMBTU Million British thermal unit

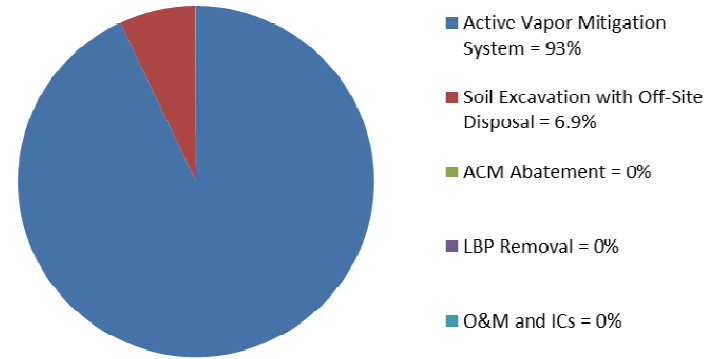
NOx Nitrogen oxide
 O&M Operation and maintenance
 PM Particulate matter
 SOx Sulfur oxide

Table A-5. Green Building Alternative 3 Detailed Impact Charts

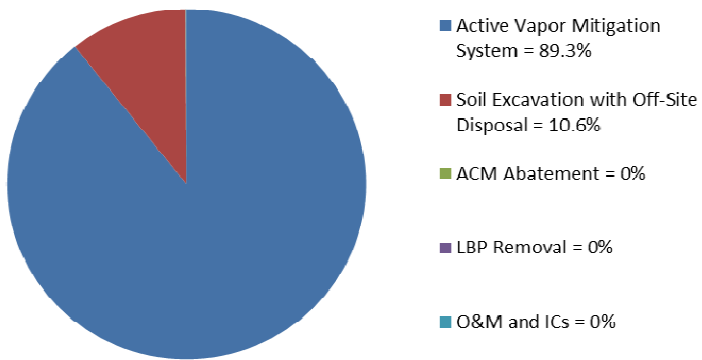
Alternative 3 All Energy Use by Remedy Component



Alternative 3 All GHG Emissions by Remedy Component



Alternative 3 All NOx Emissions by Remedy Component



Alternative 3 All SOx Emissions by Remedy Component

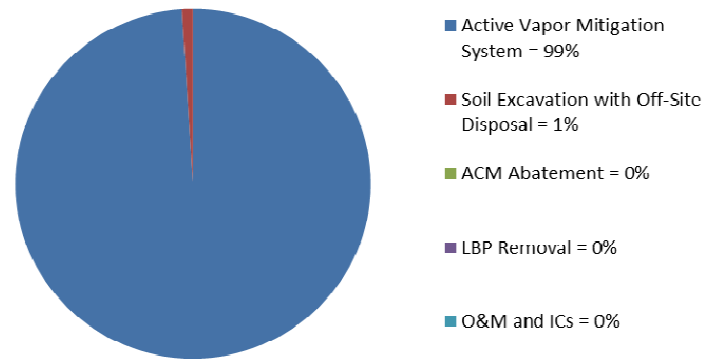
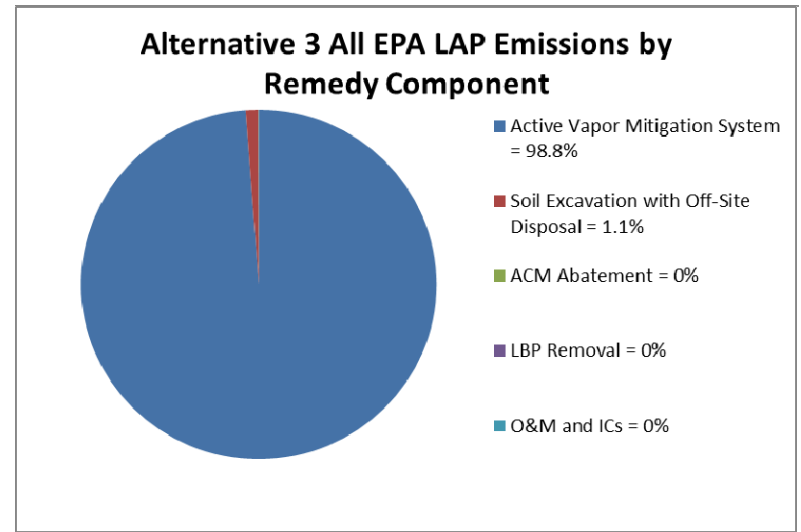
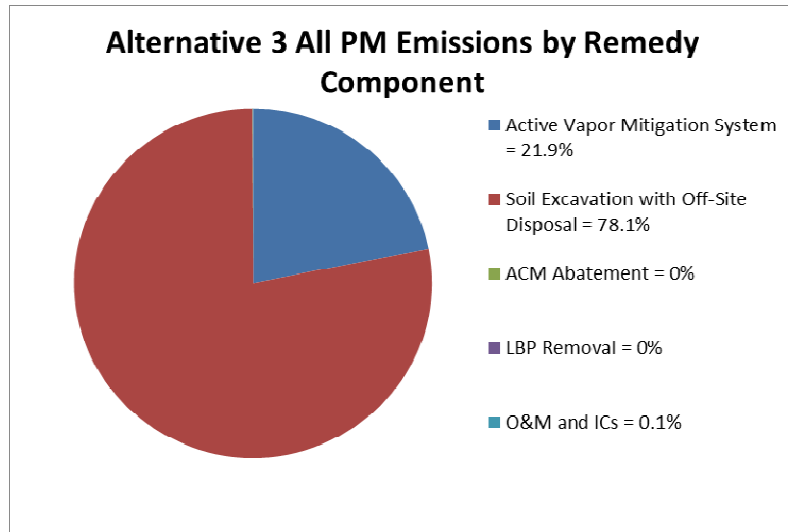


Table A-5. Green Building Alternative 3 Detailed Impact Charts



Notes:

ACM Asbestos-containing material
 EPA Environmental Protection Agency
 GHG Greenhouse gas
 IC Institutional control

LAP Listed air pollutant
 LBP Lead-based paint
 lbs Pound
 MMBTU Million British thermal unit

NOx Nitrogen oxide
 O&M Operation and maintenance
 PM Particulate matter
 SOx Sulfur oxide

Table A-6. Old Cavalry Building Relative Impact of Alternatives

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: Excavation with On-Site Consolidation and Capping, ACM Enclosure, LBP Encapsulation, O&M and ICs	1,109	154,000	630	431	239	1,305
Alternative 3: Soil Excavation with Off-Site Disposal, ACM Abatement and LBP Removal	139	36,600	114	36	124	271

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: Excavation with On-Site Consolidation and Capping, ACM Enclosure, LBP Encapsulation, O&M and ICs	High	High	High	High	High	High
Alternative 3: Soil Excavation with Off-Site Disposal, ACM Abatement and LBP Removal	Low	Low	Low	Low	Medium	Low

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	NO _x	Nitrogen oxide
EPA	U.S. Environmental Protection Agency	O&M	Operation and maintenance
GHG	Greenhouse gas	PM	Particulate matter
IC	Institutional control	SMP	Soil Management Plan
LAP	Listed air pollutant	SO _x	Sulfur oxide
LBP	Lead-based paint		
lbs	Pound		
MMBTU	Million British thermal unit		

Table A-7. Old Cavalry Building Detailed Impact Summary

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 ¹	0	0	0	0	0	0
	Electricity Generation	0	0	0	0	0	0
	Transportation	0	0	0	0	0	0
	Other Off-Site ²	0	0	0	0	0	0
	Total	0	0	0	0	0	0
Alternative 2	On-Site ¹	390	62,000	280	0	25	310
	Electricity Generation	0	0	0	0	0	0
	Transportation	79	13,000	50	1	4	55
	Other Off-Site ²	640	79,000	300	430	210	940
	Total	1109	154,000	630	431	239	1305
Alternative 3	On-Site ¹	63	10,000	46	0	4	51
	Electricity Generation	0	0	0	0	0	0
	Transportation	10	1,600	9	0	0	10
	Other Off-Site ²	66	25,000	59	36	120	210
	Total	139	36,600	114	36	124	271

Notes:

1. On-Site refers to fuel consumption on site (i.e., heavy equipment).

2. Other Off-Site refers to all other energy uses not covered under on site, electricity generation, or transportation, such as energy required for producing materials (i.e., PVC, gravel, and GAC), lab analyses, and production of fuels.

EPA	U.S. Environmental Protection Agency	MMBTU	Million British thermal unit
GAC	Granular activated carbon	NO _x	Nitrogen oxide
GHG	Greenhouse gas	PM	Particulate matter
LAP	Listed air pollutant	PVC	Polyvinyl chloride
lbs	Pound	SO _x	Sulfur oxide

Table A-8. Old Cavalry Building Detailed Impact Charts

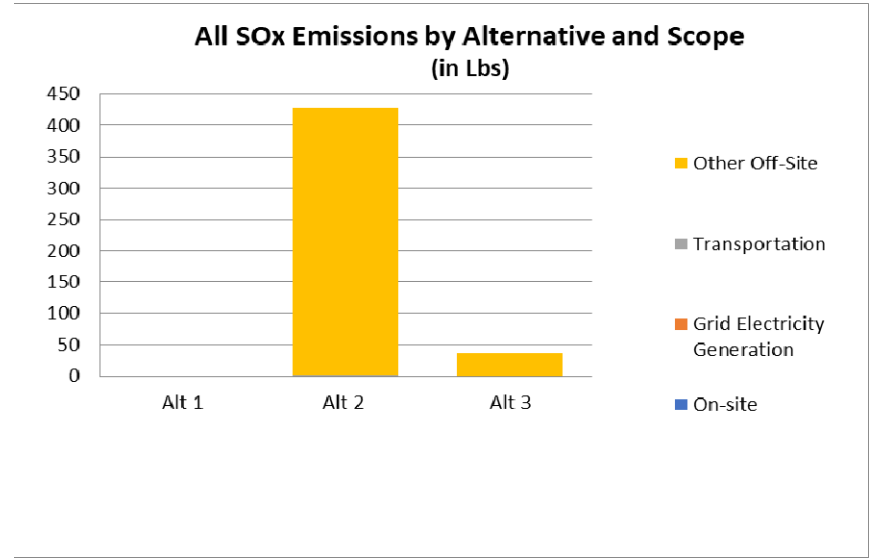
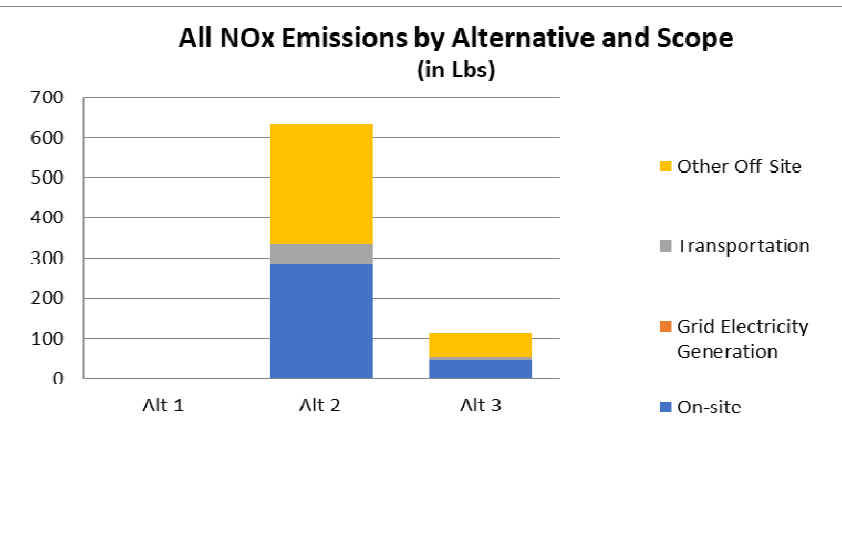
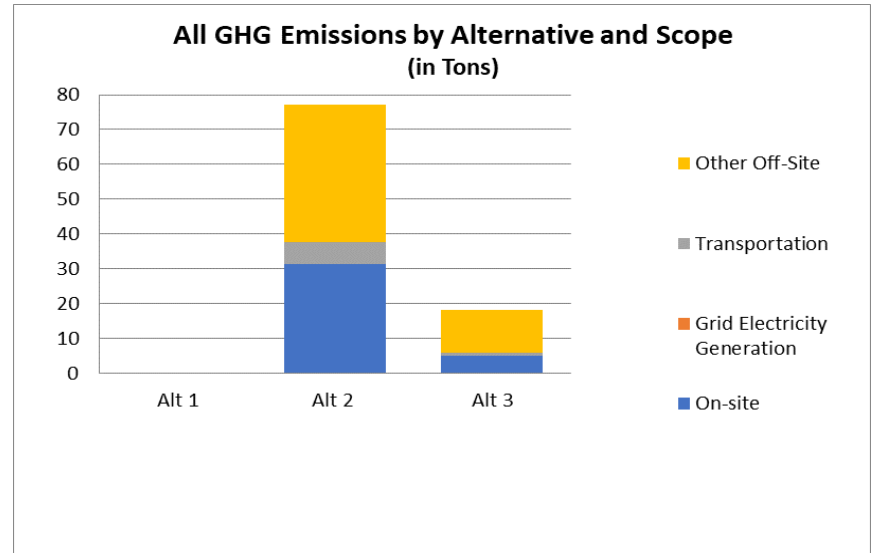
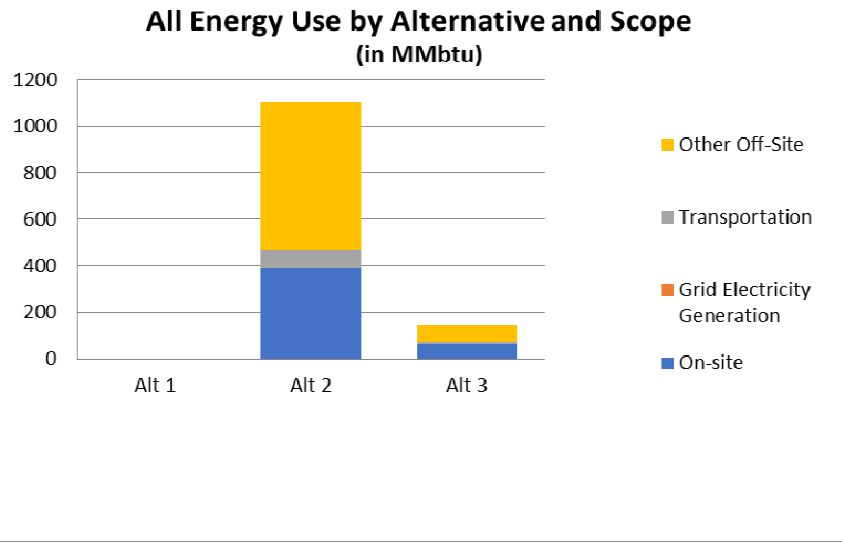
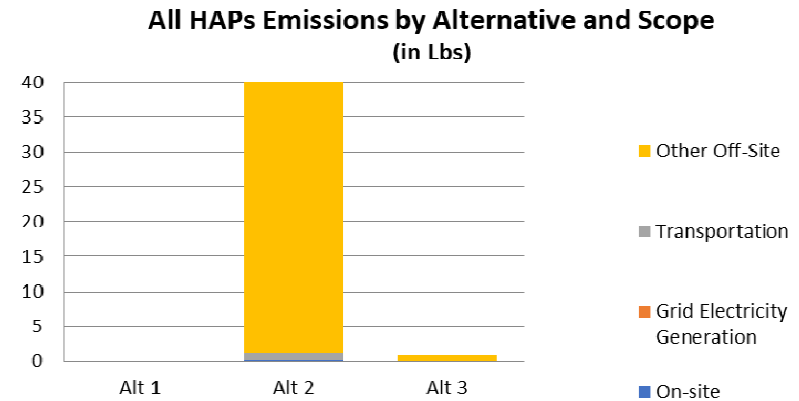
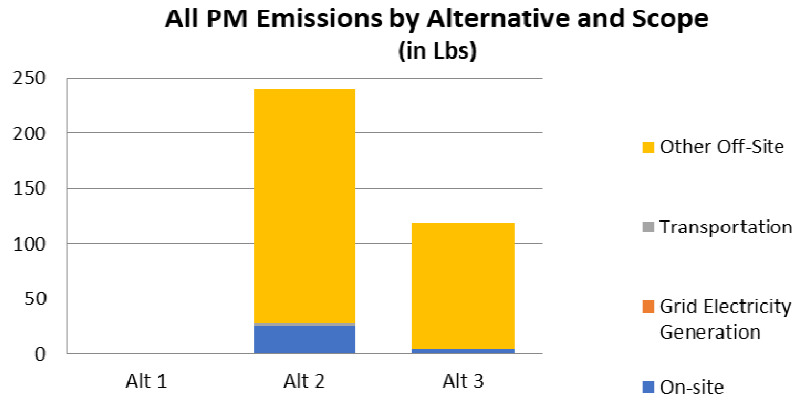


Table A-8. Old Cavalry Building Detailed Impact Charts



Notes:

GHG	Greenhouse gas	NOx	Nitrogen oxide
LAP	Listed air pollutant	PM	Particulate matter
lbs	Pound	SOx	Sulfur oxide
MMBTU	Million British thermal unit		

Table A-9. Old Cavalry Building Alternative 2 Detailed Impact Charts

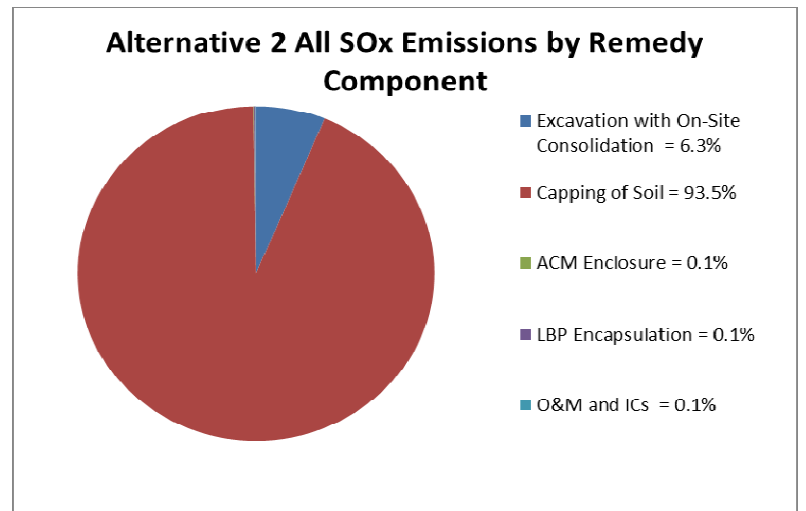
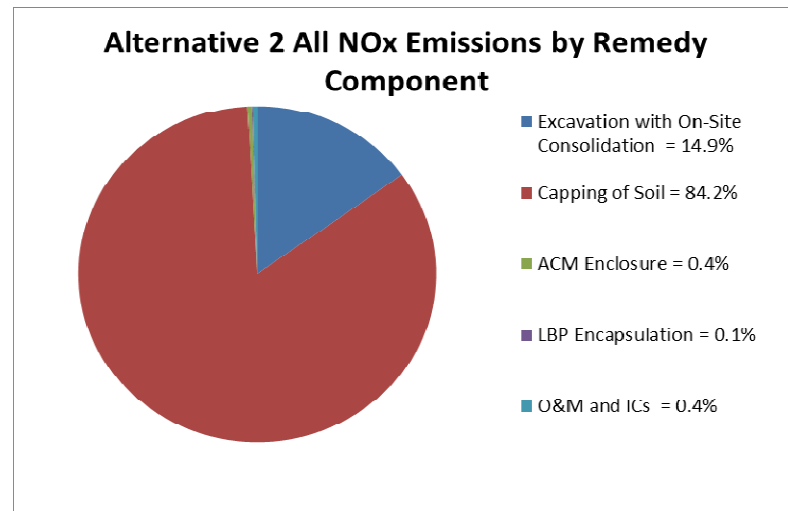
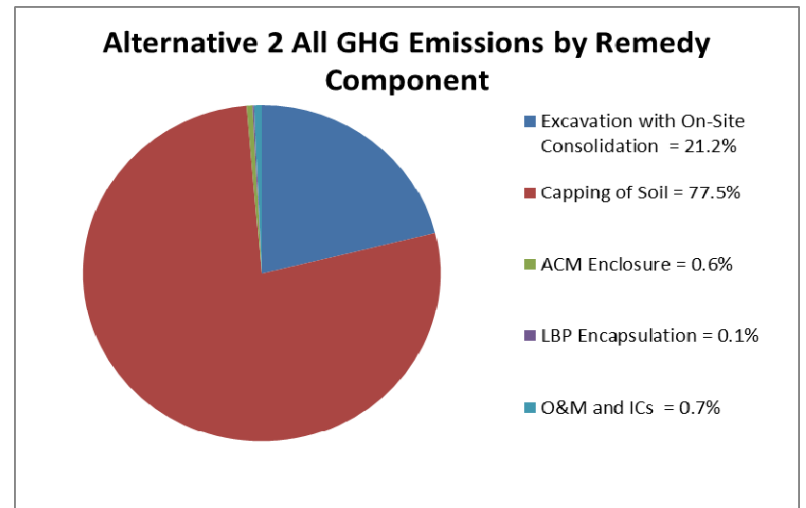
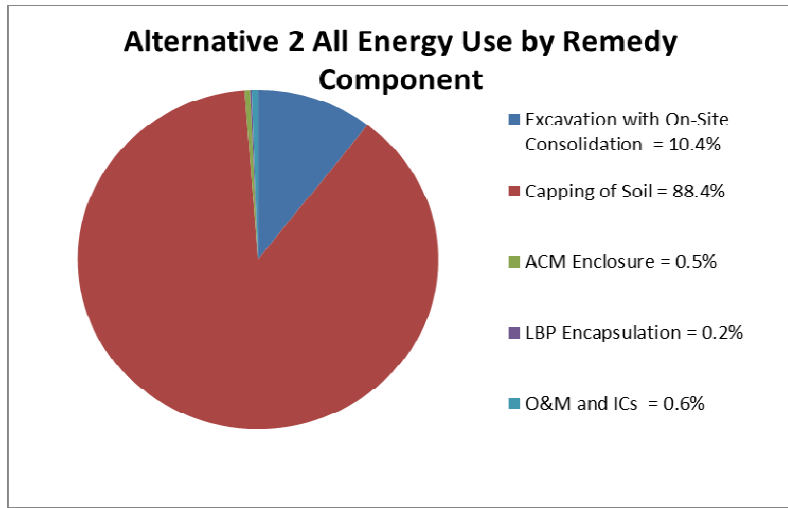
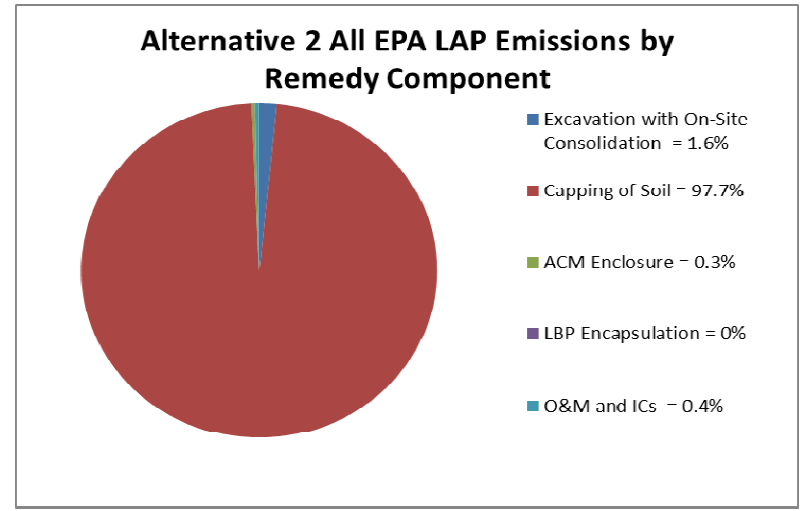
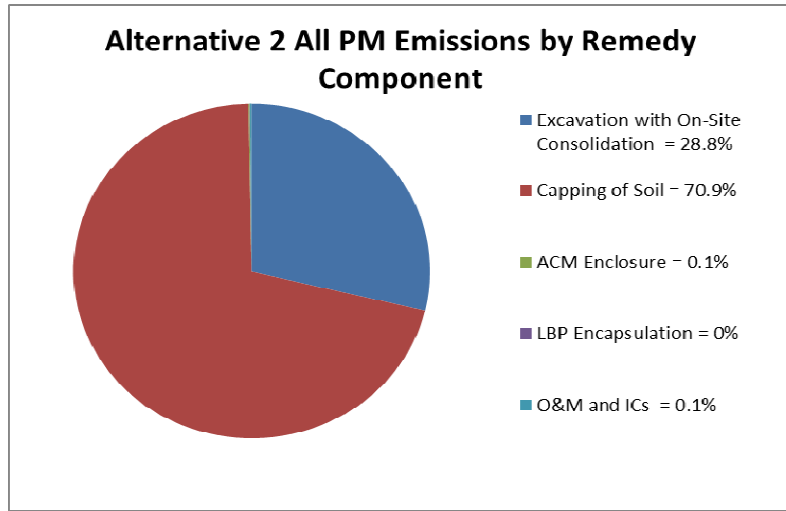


Table A-9. Old Cavalry Building Alternative 2 Detailed Impact Charts



Notes:

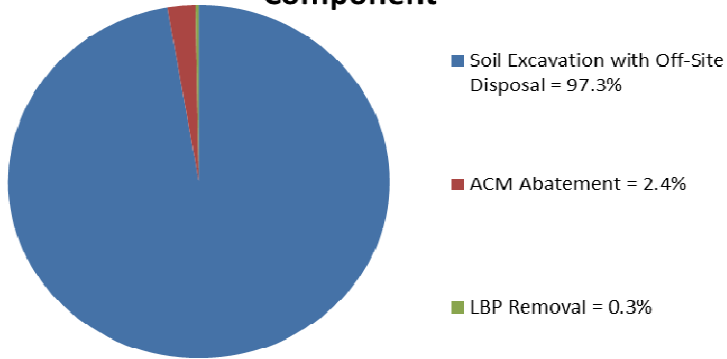
ACM Asbestos-containing material
 EPA Environmental Protection Agency
 GHG Greenhouse gas
 IC Institutional control

LAP Listed air pollutant
 LBP Lead-based paint
 lbs Pound
 MMBTU Million British thermal unit

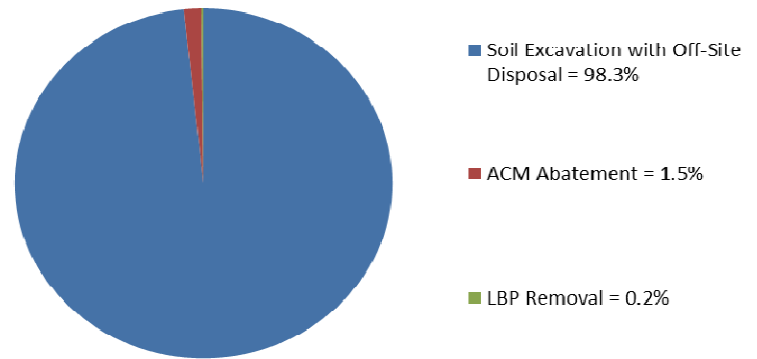
NOx Nitrogen oxide
 O&M Operation and maintenance
 PM Particulate matter
 SOx Sulfur oxide

Table A-10. Old Cavalry Building Alternative 3 Detailed Impact Charts

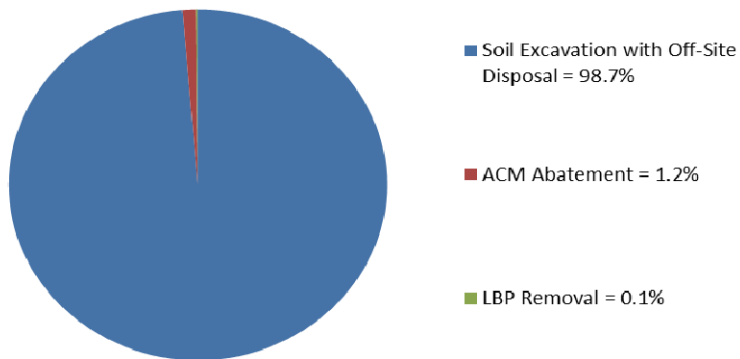
Alternative 3 All Energy Use by Remedy Component



Alternative 3 All GHG Emissions by Remedy Component



Alternative 3 All NOx Emissions by Remedy Component



Alternative 3 All SOx Emissions by Remedy Component

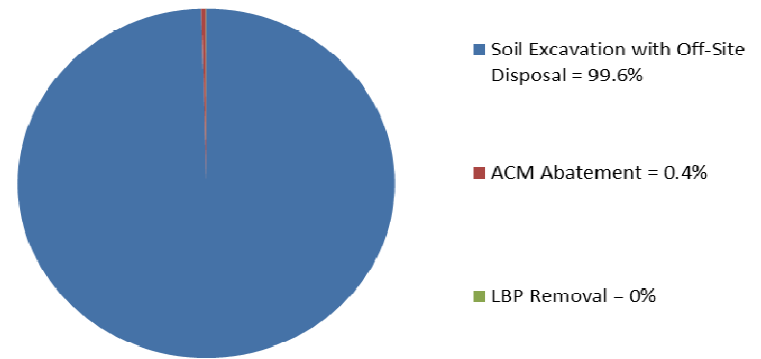
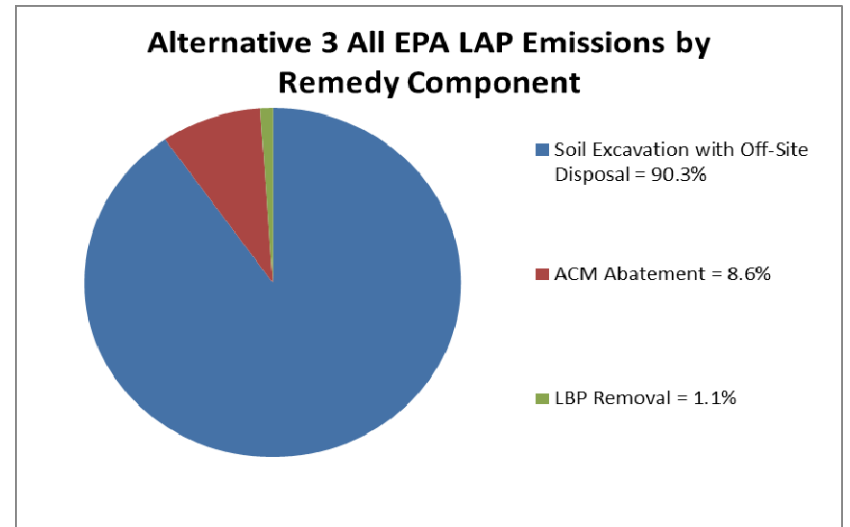
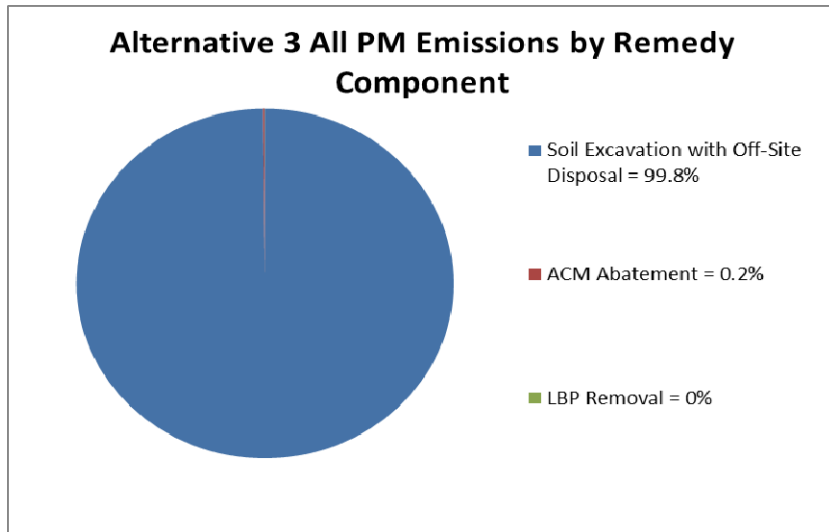


Table A-10. Old Cavalry Building Alternative 3 Detailed Impact Charts



Notes:

ACM Asbestos-containing material
 EPA Environmental Protection Agency
 GHG Greenhouse gas
 IC Institutional control

LAP Listed air pollutant
 LBP Lead-based paint
 lbs Pound
 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 GREEN BUILDING

Input Worksheet for Passive Vapor Mitigation

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

General Scope

This alternative would involve construction of a passive vapor mitigation system, where advection (differences in gas pressure) and diffusion (differences in contaminant concentrations) would draw soil gas out from underneath the Green Building to the atmosphere. Long-term inspection and potential repairs and maintenance of the vapor mitigation system would be required for as long as the structure is occupied.

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

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
1 Truck Driver	1	20	Heavy-Duty Truck	Diesel	20	7.55		2.6	
1 Carpenter	1	20	Light-Duty/Passenger Truck	Diesel	20	15.1		1.3	
1 Labor Foreman	1	20	Light-Duty/Passenger Truck	Diesel	20	15.1		1.3	
2 Laborers	2	20	Light-Duty/Passenger Truck	Diesel	40	15.1		2.6	

* 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 (gpm or mpg)	Transport Fuel Usage Rate Override (gpm or mpg)	Fuel Used for Equipment Transport (gallons)	Activity or Notes
Dump truck (400 HP)	400	75%	Diesel	15	15	225	400	1	20	20	Truck (mpg)	Diesel	6		3.3	

* 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 liquefied 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 Passive Vapor Mitigation

Remedy Component that this Input worksheet is part of:	Component 1	Passive Vapor Mitigation
--	-------------	--------------------------

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>							
<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>							
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	
				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	
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	276,008.76	138.0043818	Unrefined	Virgin	Yes	25	10	1	No	10	Truck (mpg)	Diesel	6		1.667	
PVC	lb	735	0.3675	Refined	Virgin	Yes	500	10	1	No	10	Truck (mpg)	Diesel	6		1.667	
Aluminum, Rolled Sheet	lb	2676	1.338	Refined	Virgin	Yes	500	10	1	No	10	Truck (mpg)	Diesel	6		1.667	
		0															
		0															
		0															
		0															
		0															
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		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 Passive Vapor Mitigation

Remedy Component that this Input worksheet is part of:

Component 1	Passive Vapor Mitigation
-------------	--------------------------

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											

* 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 Passive Vapor Mitigation

Remedy Component that this Input worksheet is part of:	Component 1	Passive Vapor Mitigation
--	-------------	--------------------------

Other Energy Use and Air Emissions

Item	Units	Quantity	Notes
<i>On-Site</i>			
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		
<i>Transportation</i>			
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for In-Place Capping

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this input worksheet from calculations and results)	Component 2	In-Place Capping
--	-------------	------------------

General Scope

This alternative would involve capping contaminated soils in place with an unlined earthen cap at the former disposal pit. If contaminated soils are found to potentially leach metals, a lined cap may be necessary to reduce infiltration and leaching of contaminants into the underlying clean soil and groundwater. The lined cap could consist of a thicker earthen cap, geomembrane, geosynthetic clay liner, or compacted clay layer.

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

Other Notes and References

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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
1 Carpenter Foreman	31	20	Light-Duty/Passenger Truck	Diesel	620	15.1		41.1	
6 Carpenters	186	20	Light-Duty/Passenger Truck	Diesel	3720	15.1		246.4	
2 Rodmen	62	20	Light-Duty/Passenger Truck	Diesel	1240	15.1		82.1	
4 Laborers	124	20	Light-Duty/Passenger Truck	Diesel	2480	15.1		164.2	

* 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 (gpm or mpg)	Transport Fuel Usage Rate Override (gpm or mpg)	Fuel Used for Equipment Transport (gallons)	Activity or Notes
Concrete paving machine (200 HP)	200	75%	Diesel between 75 and 750 hp	8.241758242	306.212	2523.725275	23	1	20	20	Truck (mpg)	Diesel	6		3.3	
Roller (100 HP)	100	75%	Diesel between 75 and 750 hp	4.120879121	306.212	1261.862637	20	1	20	20	Truck (mpg)	Diesel	6		3.3	

* 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 liquefied 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 In-Place Capping

Remedy Component that this Input worksheet is part of:

Component 2	In-Place Capping
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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>							
<Equip. with known kW rating>							
<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	
				0	0	
				0	0	
Totals				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	456,000.00	228	Refined	Virgin	Yes	25	10	1	No	10	Truck (mpg)	Diesel	6		1.667		
			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 In-Place Capping

Remedy Component that this Input worksheet is part of:

Component 2	In-Place Capping
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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 In-Place Capping

Remedy Component that this Input worksheet is part of:	Component 2	In-Place Capping
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Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
<i>On-Site</i>				
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		
<i>Transportation</i>				
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for ACM Enclosure

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

This alternative would also involve ACM enclosure, stabilization of LBP in building materials in poor condition (peeling, flaking, etc.), and application of an encapsulant to all LBP surfaces and components. This alternative would permit ACM and LBP-related hazardous materials identified in the Phase II ESA to remain with appropriate action taken to stabilize and encapsulate or enclose remaining contamination. An air-tight barrier would be created over or around ACM, or ACM would be treated with a bridging or penetrating encapsulant that surrounds or embeds asbestos fibers in an adhesive matrix to prevent the release of fibers. This would prevent access and disturbance of ACM identified during the Phase II ESA within the building. Following enclosure or

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

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
1 Asbestos Foreman	3	20	Light-Duty/Passenger Truck	Diesel	60	15.1		4	
7 Asbestos Workers	21	20	Light-Duty/Passenger Truck	Diesel	420	15.1		27.8	

* 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 (gpm or mpg)	Transport Fuel Usage Rate Override (gpm 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 liquefied 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 Enclosure

Remedy Component that this Input worksheet is part of:	Component 3	ACM Enclosure
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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>							
<Equip. with known kW rating>							
<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	
				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	
Other Treatment Chemicals & Materials	lb	120	0.06	Refined	Virgin	Yes	500	10	1	No	10	Truck (mpg)	Diesel	6		1.667		
			0															
			0															
			0															
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			0															
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			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 Enclosure

Remedy Component that this Input worksheet is part of:

Component 3	ACM Enclosure
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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											

* 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				

* 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 Enclosure

Remedy Component that this Input worksheet is part of:	Component 3	ACM Enclosure
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Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
<i>On-Site</i>				
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		
<i>Transportation</i>				
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for LBP Encapsulation

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

This alternative would also involve ACM enclosure, stabilization of LBP in building materials in poor condition (peeling, flaking, etc.), and application of an encapsulant to all LBP surfaces and components. This alternative would permit ACM and LBP-related hazardous materials identified in the Phase II ESA to remain with appropriate action taken to stabilize and encapsulate or enclose remaining contamination. LBP-containing surfaces would be inspected, and removal of loose LBP would be required. Removed LBP residue would be segregated for proper disposal. LBP encapsulant would be a durable, air- and dust-tight surface coating. Application of the encapsulant would ensure that remaining LBP could not leach to the painted surface and pose a threat to current or

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

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
1 Worker	1	20	Light-Duty/Passenger Truck	Diesel	20	15.1		1.3	

* 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 (gpm or mpg)	Transport Fuel Usage Rate Override (gpm 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 liquefied 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 LBP Encapsulation

Remedy Component that this Input worksheet is part of:	Component 4	LBP Encapsulation
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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>							
<Equip. with known kW rating>							
<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	

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	
Other Treatment Chemicals & Materials	lb	120	0.06	Refined	Virgin	No	500	10	1	No	10	Truck (mpg)	Diesel	6		1.667		
			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 Encapsulation

Remedy Component that this Input worksheet is part of:

Component 4	LBP Encapsulation
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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											
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			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				
			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 Encapsulation

Remedy Component that this Input worksheet is part of:	Component 4	LBP Encapsulation
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Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
<i>On-Site</i>				
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		
<i>Transportation</i>				
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for O&M and ICs

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this input worksheet from calculations and results)	Component 5	O&M and ICs
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General Scope

Following enclosure or encapsulation of ACM, an O&M plan would be written and updated annually. The O&M plan should include the following five components: (1) defined duties of the program manager, the person responsible for overseeing all aspects related to the ACM identified in the Green Building; (2) training for all employees and workers in the Green Building; (3) periodic surveillance of areas with ACM by any designated personnel every 6 months and reinspection by an accredited asbestos inspector every 3 years; (4) worker protection for employees performing asbestos work; and (5) periodic updates of the O&M plan for as long as ACM is present in the Green Building. ICs would be necessary to (1) protect construction workers and utility workers

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

Other Notes and References

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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
1 Inspector/Repair Person	30	20	Light-Duty/Passenger Truck	Diesel	600	15.1		39.7	

* 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 (gpm or mpg)	Transport Fuel Usage Rate Override (gpm 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 liquefied 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 O&M and ICs

Remedy Component that this Input worksheet is part of:	Component 5	O&M and ICs
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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>							
<Equip. with known kW rating>							
<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	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 O&M and ICs

Remedy Component that this Input worksheet is part of:

Component 5	O&M and ICs
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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 O&M and ICs

Remedy Component that this Input worksheet is part of:	Component 5	O&M and ICs
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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			
User-defined conventional energy transportation #1	*User-Defined	TBD	
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for Active Vapor Mitigation System

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this Input worksheet from calculations and results)	Component 1	Active Vapor Mitigation System
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General Scope

This alternative would involve construction of an active vapor mitigation system underneath the Green Building. The active vapor mitigation system would consist of a sub-slab depressurization system that would use pumps, blowers, and fans to mechanically create a vacuum and suck soil gas from beneath the building and vent and expel vapors outside to the atmosphere. This alternative would require long-term O&M of the vapor mitigation system for as long as a structure is occupied. The system also would require electricity and occasional maintenance or replacement of the blowers, fans, and pumps. ICs would be necessary to (1) ensure a vapor mitigation system is implemented for the existing structure and any new structures to be built; (2) ensure the continued

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

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
1 Truck Driver	2	20	Heavy-Duty Truck	Diesel	40	7.55		5.3	
1 Carpenter	2	20	Light-Duty/Passenger Truck	Diesel	40	15.1		2.6	
1 Labor Foreman	1	20	Light-Duty/Passenger Truck	Diesel	20	15.1		1.3	
2 Laborers	2	20	Light-Duty/Passenger Truck	Diesel	40	15.1		2.6	
1 Plumber	2	20	Light-Duty/Passenger Truck	Diesel	40	15.1		2.6	
2 Plumber Apprentices	4	20	Light-Duty/Passenger Truck	Diesel	80	15.1		5.3	

* 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	15	15	225	400	2	20	40	Truck (mpg)	Diesel	6		6.7	

* 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 liquefied 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 Active Vapor Mitigation System

Remedy Component that this Input worksheet is part of:	Component 1	Active Vapor Mitigation System
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On-Site Electricity Use

Equipment Type	HP	Load Factor (%)	Efficiency (%)	Electrical Rating (kW)	Hours Used	Energy Used (kWh)	Notes
Prepacked medium pressure (7 to 14 PSIG) bl	263.04655	75%	75%	196.2327263	8760	1718998.682	Based on 1 year of usage
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<Equip. with HP, Efficiency, and Hours>							
<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>							
Estimated Total Electricity Usage Based on Above						1718998.682	
Renewable Electricity Generated On-Site*							
Total Electricity Usage Based on Personnel Transportation						0	
Total Grid Electricity Used						1718998.682	

* 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	
				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	
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	276,008.76	138.0043818	Unrefined	Virgin	Yes	25	10	1	No	10	Truck (mpg)	Diesel	6		1.667	
PVC	lb	735	0.3675	Refined	Virgin	Yes	500	10	1	No	10	Truck (mpg)	Diesel	6		1.667	
Aluminum, Rolled Sheet	lb	2676	1.338	Refined	Virgin	Yes	500	10	1	No	10	Truck (mpg)	Diesel	6		1.667	
		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 Active Vapor Mitigation System

Remedy Component that this Input worksheet is part of:

Component 1	Active Vapor Mitigation System
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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				
			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 Active Vapor Mitigation System

Remedy Component that this Input worksheet is part of:	Component 1	Active Vapor Mitigation System
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Other Energy Use and Air Emissions

Item	Units	Quantity	Notes
<i>On-Site</i>			
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		
<i>Transportation</i>			
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for Soil Excavation

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this Input worksheet from calculations and results)	Component 2	Soil Excavation with Off-Site Disposal
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General Scope

This alternative would involve excavation of all contaminated soils within the former disposal pit above commercial and industrial assumed cleanup levels based on the results from the Phase II ESA. Following excavation, confirmation samples would be collected from the sidewalls and bottom of the excavation area to ensure that contaminant concentrations in remaining soils are below commercial and industrial preliminary assumed cleanup levels. Soil would be stockpiled on the Site for waste profile characterization before off-Site disposal. Following characterization, excavated soils would be hauled to an off-Site permitted disposal facility for disposal. Depending on hazardous and leaching characteristics, waste disposal may occur at a Class I, II, or III-permitted

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

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
1 Equipment Operator	9	20	Light-Duty/Passenger Truck	Diesel	180	15.1		11.9	
1 Laborer	7	20	Light-Duty/Passenger Truck	Diesel	140	15.1		9.3	
1 Truck Driver	13	20	Heavy-Duty Truck	Diesel	260	7.55		34.4	
Water truck driver	9	20	Heavy-Duty Truck	Diesel	180	7.55		23.8	

* 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
Excavator/hoer - small (75 HP)	75	75%	Diesel between 75 and 750 hp	3.090659341	46.224	142.8626374	33.9325	1	20	20	Truck (mpg)	Diesel	6		3.3	
Dump truck (400 HP)	220	75%	Diesel between 75 and 750 hp	9.065934066	129.042	1169.886264	13.0965	3	20	60	Truck (mpg)	Diesel	6		10	
Dozer - small (100 HP)	80	75%	Diesel between 75 and 750 hp	3.296703297	13.482	44.44615385	50	1	20	20	Truck (mpg)	Diesel	6		3.3	
Grader (175 HP)	175	75%	Diesel between 75 and 750 hp	7.211538462	8	57.69230769	0.035	1	20	20	Truck (mpg)	Diesel	6		3.3	
Hydroseeder (20 HP)	20	75%	Diesel less than 75 hp	0.917431193	21.312	19.55229358	7.5575	1	20	20	Truck (mpg)	Diesel	6		3.3	
Water truck (400 HP)	400	75%	Diesel between 75 and 750 hp	16.48351648	90	1483.516484	20	5	20	100	Truck (mpg)	Diesel	6		16.7	

* 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 liquefied 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 Soil Excavation

Remedy Component that this Input worksheet is part of: **Component 2** **Soil Excavation with Off-Site Disposal**

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>							
<Equip. with known kW rating>							
<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	
				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	
				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														

* 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 Soil Excavation

Remedy Component that this Input worksheet is part of: **Component 2** **Soil Excavation with Off-Site Disposal**

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	104	104	500	10	3	Yes	60	Truck (mpg)	Diesel	6		10.0	
Off-site non-hazardous waste landfill	tons	416	416	25	10	3	Yes	60	Truck (mpg)	Diesel	6		10.0	
			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	18,000	75060				
			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 Soil Excavation

Remedy Component that this Input worksheet is part of:	Component 2	Soil Excavation with Off-Site Disposal
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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				
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for ACM Abatement

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

ACM abatement would be performed by a licensed abatement contractor in accordance with applicable local, state, and federal regulations. Following removal of ACM, the licensed contractor would properly bag and label ACM waste in accordance with 29 Code of Federal Regulations (CFR) 1926.1101. The ACM waste would be disposed of at an EPA-approved landfill that accepts friable or non-friable ACM.

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

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
1 Asbestos Foreman	2	20	Light-Duty/Passenger Truck	Diesel	40	15.1		2.6	
7 Asbestos Workers	14	20	Light-Duty/Passenger Truck	Diesel	280	15.1		18.5	

* 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 (gpm or mpg)	Transport Fuel Usage Rate Override (gpm 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 liquefied 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 Abatement

Remedy Component that this Input worksheet is part of:	Component 3	ACM Abatement
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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>							
<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	

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	
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														

* 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 Abatement

Remedy Component that this Input worksheet is part of:

Component 3	ACM Abatement
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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				
			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 Abatement

Remedy Component that this Input worksheet is part of:	Component 3	ACM Abatement
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Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
<i>On-Site</i>				
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		
<i>Transportation</i>				
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for LBP Removal

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this Input worksheet from calculations and results)	Component 1	Active Vapor Mitigation System
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General Scope

All surfaces and components that contain LBP would be removed by demolition for proper disposal. LBP removal by a licensed LBP removal contractor would comply with applicable local, state, and federal regulations.

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

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
1 Worker	2	20	Light-Duty/Passenger Truck	Diesel	40	15.1		2.6	

* 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 (gpm or mpg)	Transport Fuel Usage Rate Override (gpm 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 liquefied 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 LBP Removal

Remedy Component that this Input worksheet is part of:	Component 1	Active Vapor Mitigation System
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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>							
<Equip. with known kW rating>							
<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
Totals				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
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														

* 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 Removal

Remedy Component that this Input worksheet is part of:

Component 1	Active Vapor Mitigation System
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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											
			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				
			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 Removal

Remedy Component that this Input worksheet is part of:	Component 1	Active Vapor Mitigation System
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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				
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for O&M and ICs

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this Input worksheet from calculations and results)	Component 1	Active Vapor Mitigation System
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General Scope

This alternative would require long-term O&M of the vapor mitigation system for as long as a structure is occupied. The system also would require electricity and occasional maintenance or replacement of the blowers, fans, and pumps. ICs would be necessary to (1) ensure a vapor mitigation system is implemented for the existing structure and any new structures to be built; (2) ensure the continued integrity of the vapor mitigation system; and (3) restrict land use in the area where contaminated soil will remain above residential assumed cleanup levels.

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

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
1 Inspector/Repair Person	30	20	Light-Duty/Passenger Truck	Diesel	600	15.1		39.7	

* 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 (gpm or mpg)	Transport Fuel Usage Rate Override (gpm 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 liquefied 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 O&M and ICs

Remedy Component that this Input worksheet is part of:

Component 1	Active Vapor Mitigation System
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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>							
<Equip. with known kW rating>							
<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	
				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														

* 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 O&M and ICs

Remedy Component that this Input worksheet is part of: Component 1 Active Vapor Mitigation System

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											

* 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 O&M and ICs

Remedy Component that this Input worksheet is part of:	Component 1	Active Vapor Mitigation System
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Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
<i>On-Site</i>				
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		
<i>Transportation</i>				
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

ATTACHMENT A-2
SEFA INPUTS FOR THE OLD CAVALRY BUILDING

Input Worksheet for On-Site Consolidation

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this input worksheet from calculations and results)	Component 1	Excavation with On-Site Consolidation
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General Scope

This alternative would involve excavation of all contaminated soils at the Old Cavalry Building above residential assumed cleanup levels based on results from the Phase II ESA. Excavated soils would be mixed with a stabilizing agent, such as Portland cement, to reduce mobility and leaching of metals to underlying clean soil and groundwater. The soils would then be consolidated on the Site.

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

Other Notes and References

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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
1 Equipment Operator	2	20	Light-Duty/Passenger Truck	Diesel	40	15.1		2.6	
1 Truck Driver	2	20	Heavy-Duty Truck	Diesel	40	7.55		5.3	
1 Laborer	1	20	Light-Duty/Passenger Truck	Diesel	20	15.1		1.3	
Water Truck Driver	2	20	Heavy-Duty Truck	Diesel	40	7.55		5.3	

* 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)	220	75%	Diesel between 75 and 750 hp	9.065934066	10.117	91.72005495	13.0965	2	20	40	Truck (mpg)	Diesel	6		6.7	
Water truck (400 HP)	400	75%	Diesel between 75 and 750 hp	16.48351648	20	329.6703297	20	2	20	40	Truck (mpg)	Diesel	6		6.7	
Excavator/hoer - small (75 HP)	75	75%	Diesel between 75 and 750 hp	3.090659341	2.856	8.826923077	33.9325	1	20	20	Truck (mpg)	Diesel	6		3.3	
Dozer - small (100 HP)	80	75%	Diesel between 75 and 750 hp	3.296703297	1.057	3.484615385	50	1	20	20	Truck (mpg)	Diesel	6		3.3	
Grader (175 HP)	175	75%	Diesel between 75 and 750 hp	7.211538462	2.266	16.34134615	0.035	1	20	20	Truck (mpg)	Diesel	6		3.3	
Hydroseeder (20 HP)	20	75%	Diesel less than 75 hp	0.917431193	6.042666	5.543730275	7.5575	1	20	20	Truck (mpg)	Diesel	6		3.3	

* 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 On-Site Consolidation

Remedy Component that this Input worksheet is part of:

Component 1	Excavation with On-Site Consolidation
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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>							
<Equip. with known kW rating>							
<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
Totals				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
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
Portland cement, US average	lb	35,235.00	17.6175	Refined	Virgin	Yes	25	10	1	No	10	Truck (mpg)	Diesel	6		1.667	
			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 On-Site Consolidation

Remedy Component that this Input worksheet is part of:

Component 1	Excavation with On-Site Consolidation
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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											
			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	4000	16680				
			0				
			0				
			0				
			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 On-Site Consolidation

Remedy Component that this Input worksheet is part of:	Component 1	Excavation with On-Site Consolidation
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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			
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for Capping

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

General Scope

Contaminated soils exceeding assumed cleanup levels would be capped with an unlined earthen cap to prevent direct contact and incidental ingestion of future workers and visitors to the cultural center/museum. ICs would be necessary to prevent exposure of future workers and visitors to the cultural center/museum to contaminated soils below the cap. In addition, long-term O&M would be required to ensure the effectiveness of the cap and protectiveness of ICs.

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

Other Notes and References

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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
1 Carpenter Foreman	20	20	Light-Duty/Passenger Truck	Diesel	400	15.1		26.5	
6 Carpenter	120	20	Light-Duty/Passenger Truck	Diesel	2400	15.1		158.9	
2 Rodmen	40	20	Light-Duty/Passenger Truck	Diesel	800	15.1		53	
4 Laborers	80	20	Light-Duty/Passenger Truck	Diesel	1600	15.1		106	

* 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 (gpm or mpg)	Transport Fuel Usage Rate Override (gpm or mpg)	Fuel Used for Equipment Transport (gallons)	Activity or Notes
Concrete paving machine (200 HP)	200	75%	Diesel between 75 and 750 hp	8.241758242	190.348	1568.802198	400	28	20	560	Truck (mpg)	Diesel	6		93.3	
Roller (100 HP)	100	75%	Diesel between 75 and 750 hp	4.120879121	190.348	784.4010989	20	4	20	80	Truck (mpg)	Diesel	6		13.3	

* 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 liquefied 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

Remedy Component that this Input worksheet is part of:

Component 2	Capping of Soil
-------------	-----------------

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											
			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				
			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 2	Capping of Soil
--	-------------	-----------------

Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
<i>On-Site</i>				
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		
<i>Transportation</i>				
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for ACM Enclosure

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

This alternative would also involve ACM enclosure, stabilization of LBP in building materials in poor condition (peeling, flaking, etc.), and application of an encapsulant to all LBP surfaces and components. This alternative would permit ACM and LBP-related hazardous materials identified in the Phase II ESA to remain with appropriate action taken to stabilize and encapsulate or enclose remaining contamination. An air-tight barrier would be created over or around ACM, or ACM would be treated with a bridging or penetrating encapsulant that surrounds or embeds asbestos fibers in an adhesive matrix to prevent the release of fibers. This would prevent access and disturbance of ACM identified during the Phase II ESA within the building. Following enclosure or

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

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
1 Asbestos Foreman	3	20	Light-Duty/Passenger Truck	Diesel	60	15.1		4	
7 Asbestos Workers	21	20	Light-Duty/Passenger Truck	Diesel	420	15.1		27.8	

* 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 (gpm or mpg)	Transport Fuel Usage Rate Override (gpm 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 liquefied 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 Enclosure

Remedy Component that this Input worksheet is part of:

Component 3	ACM Enclosure
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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											
			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				
			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 Enclosure

Remedy Component that this Input worksheet is part of:	Component 3	ACM Enclosure
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Other Energy Use and Air Emissions

Item	Units	Quantity	Notes
<i>On-Site</i>			
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		
<i>Transportation</i>			
User-defined conventional energy transportation #1	*User-Defined	TBD	
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for LBP Encapsulation

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

This alternative would also involve ACM enclosure, stabilization of LBP in building materials in poor condition (peeling, flaking, etc.), and application of an encapsulant to all LBP surfaces and components. This alternative would permit ACM and LBP-related hazardous materials identified in the Phase II ESA to remain with appropriate action taken to stabilize and encapsulate or enclose remaining contamination. LBP-containing surfaces would be inspected, and removal of loose LBP would be required. Removed LBP residue would be segregated for proper disposal. LBP encapsulant would be a durable, air- and dust-tight surface coating. Application of the encapsulant would ensure that remaining LBP could not leach to the painted surface and pose a threat to current or

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

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
1 Worker	1	20	Light-Duty/Passenger Truck	Diesel	20	15.1		1.3	

* 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 (gpm or mpg)	Transport Fuel Usage Rate Override (gpm 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 liquefied 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 LBP Encapsulation

Remedy Component that this Input worksheet is part of:

Component 4	LBP Encapsulation
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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				
			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 Encapsulation

Remedy Component that this Input worksheet is part of:	Component 4	LBP Encapsulation
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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			
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for O&M and ICs

Please specify which Remedy Component this Input worksheet is part of: (Select "Off" to exclude this Input worksheet from calculations and results)	Component 5	O&M and ICs
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General Scope

ICs would be necessary to prevent exposure of future workers and visitors to the cultural center/museum to contaminated soils below the cap. In addition, long-term O&M would be required to ensure the effectiveness of the cap and protectiveness of ICs. Following enclosure or encapsulation of ACM, 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 Old Cavalry Building; (2) training for all employees and workers in on-site buildings; (3) periodic surveillance of areas with ACM by any designated personnel every 6 months and reinspection by an accredited asbestos inspector every 3 years; (4) worker

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

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
1 Inspector/Repair Person	30	20	Light-Duty/Passenger Truck	Diesel	600	15.1		39.7	

* 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 (gpm or mpg)	Transport Fuel Usage Rate Override (gpm 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 liquefied 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 O&M and ICs

Remedy Component that this Input worksheet is part of:

Component 5	O&M and ICs
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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											

* 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 O&M and ICs

Remedy Component that this Input worksheet is part of:	Component 5	O&M and ICs
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Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
<i>On-Site</i>				
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		
<i>Transportation</i>				
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for Soil 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	Soil Excavation with Off-Site Disposal
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General Scope

This alternative would involve excavation of all contaminated soils at the Old Cavalry Building above residential assumed cleanup levels based on the results from the Phase II ESA. Following excavation, confirmation samples would be collected from the sidewalls and bottom of each excavation area to ensure 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, excavated soils would be hauled to an off-site permitted disposal facility for disposal. Depending on hazardous and leaching characteristics, waste disposal may occur at a Class I, II, or III-permitted landfill. Excavated areas would then be backfilled with clean fill material, graded, and seeded as appropriate.

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

Other Notes and References

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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
1 Equipment Operator	2	20	Light-Duty/Passenger Truck	Diesel	40	15.1		2.6	
1 Truck Driver	2	20	Heavy-Duty Truck	Diesel	40	7.55		5.3	
1 Laborer	1	20	Light-Duty/Passenger Truck	Diesel	20	15.1		1.3	
1 Water Truck Driver	2	20	Heavy-Duty Truck	Diesel	40	7.55		5.3	

* 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 (gpm or mpg)	Transport Fuel Usage Rate Override (gpm or mpg)	Fuel Used for Equipment Transport (gallons)	Activity or Notes
Dump truck (400 HP)	220	75%	Diesel between 75 and 750 hp	9.065934066	10.117	91.72005495	13.0965	2	20	40	Truck (mpg)	Diesel	6		6.7	
Water truck (400 HP)	400	75%	Diesel between 75 and 750 hp	16.48351648	20	329.6703297	20	2	20	40	Truck (mpg)	Diesel	6		6.7	
Excavator/hoer - small (75 HP)	75	75%	Diesel between 75 and 750 hp	3.090659341	2.856	8.826923077	33.9325	1	20	20	Truck (mpg)	Diesel	6		3.3	
Dozer - small (100 HP)	80	75%	Diesel between 75 and 750 hp	3.296703297	1.057	3.484615385	50	1	20	20	Truck (mpg)	Diesel	6		3.3	
Grader (175 HP)	175	75%	Diesel between 75 and 750 hp	7.211538462	2.266	16.34134615	0.035	1	20	20	Truck (mpg)	Diesel	6		3.3	
Hydroseeder (20 HP)	20	75%	Diesel less than 75 hp	0.917431193	6.042666	5.543730275	7.5575	1	20	20	Truck (mpg)	Diesel	6		3.3	

* 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 liquefied 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 (gpm) for Transport Fuel Usage Rate.

Input Worksheet for Soil Excavation

Remedy Component that this Input worksheet is part of:	Component 1	Soil Excavation with Off-Site Disposal
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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>							
<Equip. with known kW rating>							
<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>							
<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	

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	
			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														
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			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 Soil Excavation

Remedy Component that this Input worksheet is part of: **Component 1** **Soil Excavation with Off-Site Disposal**

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	24.708	24.708	500	10	2	No	20	Truck (mpg)	Diesel	6		3.3	
Off-site non-hazardous waste landfill	tons	98.832	98.832	25	10	2	No	20	Truck (mpg)	Diesel	6		3.3	
			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	4000	16680				
			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 Soil Excavation

Remedy Component that this Input worksheet is part of:	Component 1	Soil Excavation with Off-Site Disposal
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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			
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for ACM Abatement

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

ACM abatement would be performed by a licensed abatement contractor in accordance with applicable local, state, and federal regulations. Following removal of ACM, the licensed contractor would properly bag and label ACM waste in accordance with 29 CFR 1926.1101. The ACM waste would be disposed of at an EPA-approved landfill that accepts friable or non-friable ACM.

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

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
1 Asbestos Foreman	2	20	Light-Duty/Passenger Truck	Diesel	40	15.1		2.6	
7 Asbestos Workers	14	20	Light-Duty/Passenger Truck	Diesel	280	15.1		18.5	

* 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 (gpm or mpg)	Transport Fuel Usage Rate Override (gpm 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 ACM Abatement

Remedy Component that this Input worksheet is part of:	Component 2	ACM Abatement
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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>							
<Equip. with known kW rating>							
<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	

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														
			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 Abatement

Remedy Component that this Input worksheet is part of:

Component 2	ACM Abatement
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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				
			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 Abatement

Remedy Component that this Input worksheet is part of:	Component 2	ACM Abatement
--	-------------	---------------

Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
<i>On-Site</i>				
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		
<i>Transportation</i>				
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	

Input Worksheet for LBP Removal

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

All surfaces and components that contain LBP would be removed by demolition for proper disposal. LBP removal by a licensed LBP removal contractor would comply with applicable local, state, and federal regulations.

Example Items Eliminated through Screening Process

Bioremediation, Chemical Treatment, Thermal Treatment, Phytoremediation

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
1 Worker	2	20	Light-Duty/Passenger Truck	Diesel	40	15.1		2.6	

* 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 (gpm or mpg)	Transport Fuel Usage Rate Override (gpm 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 liquefied 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 LBP Removal

Remedy Component that this Input worksheet is part of:

Component 3	LBP Removal
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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											

* 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 LBP Removal

Remedy Component that this Input worksheet is part of:	Component 3	LBP Removal
--	-------------	-------------

Other Energy Use and Air Emissions

Item		Units	Quantity	Notes
<i>On-Site</i>				
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		
<i>Transportation</i>				
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:	
Description of purchased RECs	Date of renewable system installation:	
	Provider:	
	Type of renewable energy source:	
	Date of renewable system installation:	
	Location of renewable system installation:	