

**RESIDENCES
2006 PRIORITY ACTION WORK PLAN
EMPIRE MINE STATE HISTORIC PARK
JULY 2006**

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1.0 PURPOSE

The purpose of the 2006 Residential 2006 Priority Action Work Plan is to describe priority action measures to limit potential human health (HH) exposure pathways at eight residences, located within the Empire Mine State Historic Park (SHP), from natural or mine and mill related metals in soil, dust and interior surfaces. The exposure pathways will be eliminated by the implementation of prescribed actions presented in this work plan for the residential interiors, removal of soils from residential yards and gardens that exceed the specified criteria, and by examination of the potable and non-potable water sources.

The residences are currently occupied by employees of the California Department of Parks and Recreation (CDPR) who work at the SHP. The eight residences consist of six houses, which were constructed in the early to mid-1930s, and two trailer homes. Each of the residences has either a garage, storage shed, or both of these structures. Defined lawn areas are present at most of the residences that are irrigated with non-potable water pumped from the Empire Mine Shaft. Three of the residences have vegetable garden areas.

2.0 WORK PLAN

2.1 Description of Potential Sources

This work plan describes the specific nature of the potential sources that may exist in:

- Accumulation of household dust which could contain elevated metals in carpets and on surfaces in excess of the HH criteria
- Soils in residential yards and gardens that contain elevated metals in excess of HH criteria that pose a potential exposure pathway through direct contact or by vegetation uptake and consumption
- Use of non-potable water for irrigation of gardens and lawns and other domestic non-potable water use

2.2 Criteria for Priority Action

The potential presence of elevated metals at the SHP residences could be related to mine/mill related metals due to historic mine and milling operations dating from the early 1900s, the transport of associated materials containing metals by air, water, on clothing, the use of mine or mill materials as fill materials at the residences, or the natural presence of the metals within the soils at the residential locations.

2.2.1 Residential Soils

In the absence of background data, the California Human Health Screening Levels (CHHSLs) for residential land use where they exist for California Administrative Manual 17 (CAM 17) metals plus the USEPA Region 9 residential Preliminary Remediation Goal (PRG) for aluminum will be used as the criteria to identify soil to be removed in the residential yard and garden areas for the specific purpose of facilitating implementation of this priority action in a timely manner. The arsenic action level for residential soil will, however, be determined in consultation with the California Department of Toxic Substances Control (DTSC). Regardless of natural background metal concentrations for soil, soil in residential yards and gardens that contain concentrations higher than the residential CHHSLs, the USEPA PRG for aluminum, or the DTSC approved action level for arsenic will be addressed as part of this priority action.

2.2.2 Household Dust

This work plan assumes that each residential dwelling has been appropriately surveyed for asbestos containing materials (ACMs) and lead based paint. It is also assumed that all necessary ACM and lead based paint abatement has been performed in each residential dwelling prior to the implementation of this work plan. As discussed in Section 5, surfaces such as floors, carpets, draperies, window sills and upholstered furniture will be cleaned, removed or replaced within each residence to eliminate dust potentially containing lead. Following completion of the indoor priority action measures, confirmation

sampling will be performed to verify that household dust in the residences contains lead levels less than 250 $\mu\text{g}/\text{ft}^2$ on interior horizontal window surfaces and 50 $\mu\text{g}/\text{ft}^2$ of lead in dust on interior floor surfaces in accordance with Title 17, California Code of Regulations, Division 1, Chapter 8.

2.2.3 Water Supplies

Water samples will be collected from the residential potable and non-potable water sources. These samples will be analyzed and evaluated for CAM-17 metals. The collection of the potable and non-potable water samples will be completed to ensure the residence has been properly plumbed. If the potable water results indicate the residence is not properly plumbed, the potable water supply system will be re-plumbed to ensure appropriate potable water system distribution.

If the non-potable water sample results do not exceed the limitations contained within the State of California Proposition 65 requirements, no action will be taken. If the non-potable water sample results exceed the Proposition 65 requirements, the water source will be labeled “Non-Potable Water Supply – Do Not Drink” and any other requirements of Proposition 65 will be addressed.

3.0 SOIL SAMPLING METHOD

Soil within the defined yard and garden areas at all eight residential properties will be sampled. Soil sampling will be based on the criteria outlined in *Superfund Lead-Contaminated Residential Sites Handbook* by EPA. For residential yard areas with a total surface area of less than 5,000 square feet, five-point composite soil samples will be collected from each of the following locations: the front yard, the back yard, and the side yard. The front, back and side yard composites will be equally spaced within the respective portion of the yard, and will be outside of the drip zones and away from the influences of any other painted surfaces. Composites will consist of aliquots collected from the same depth interval (Figure 1).

For residential yards with a total surface area greater than 5,000 square feet, the yard will be divided into four quadrants of roughly equal surface area. The two quadrants in the front yard will encompass one half of the total yard size and the two quadrants in the back will encompass one half of the total yard size (Figure 2). One five point composite of aliquots collected at equal spacing and from the same depth interval will be obtained from each quadrant. Each aliquot will be collected away from influences of the drip zones and any other painted surfaces.

Prior to soil sampling, a yard plan will be developed and the location of all sampling points will be plotted on the plan. At the time of sampling, the sampling crew will designate discrete areas, such as driveways, play areas, parking areas, etc., on the plan, and indicate where samples are collected.

3.1 Drip Zones

A four-point composite sample will be collected from the drip zone of the residential homes. The composite sample will consist of a minimum of four aliquots collected between 6 and 30 inches from the exterior walls of the house. Each aliquot will generally be collected from the midpoint of each side of the house. Collection of additional aliquots shall be considered if other factors exist, such as bare spots and areas where runoff collects. Samples of the soil from downspout discharge areas will be sampled, if present.

3.2 Soil Sampling Equipment and Information Collection

The sampling equipment will include the following items: soil sampling probe, shovel, pick, trowel, stainless steel bowls, knife, measuring tape, sample bags, camera, log book, pen, pencil, and marker.

Information that will be collected from each sampling point will include the GPS location and sampling depth. All sampling equipment used for the extraction of soil will be decontaminated. Decontamination equipment will include, pump sprayers, spray bottles, deionized water, phosphate free soap solution,

scrub brushes, buckets, disposable gloves, etc. Procedures described in the Soil Sampling Analysis Plan will be followed.

3.3 Soil Sampling Locations and Depths

Composite samples will consist of discrete aliquots of equal amounts of soil. The soil from each aliquot will be collected into one clean container each. Sampling of residential soils will be conducted to a depth of 18 inches. Composite samples will be collected at 6-inch depth intervals, i.e. 0-6 inches, 6-12 inches 12-18 inches. Composites will consist of aliquots collected from the same depth interval. Five-point composite surface soil samples will also be collected from a depth of 0 to 1 inch. Procedures and analysis described in the Soil Sampling and Analysis Plan will be followed.

4.0 DUST SAMPLING METHOD

Dust samples within the eight residential homes will be collected after cleanup/removal activities have been completed. Samples will be evaluated for the presence of lead only. The following sampling method describes the confirmation sampling strategy, techniques, and quality control (QC) procedures necessary to perform the house dust sampling. These procedures ensure the precision, accuracy, and documentation of data generated during sampling activities.

4.1 Vacuum Sampling

High-efficiency particulate (HEPA) vacuum samples will be collected within each residence after cleanup is completed in each home. The HEPA vacuum cleaner dust sample will be obtained to quantify lead concentrations in house dust. Procedures for sampling, sample handling, documentation, and transport are described in the following subsections.

The vacuum dust sample will be used to confirm cleanup levels within the residence. Therefore, prior to sample collection the sampler will verify that the vacuum has been properly decontaminated from previous uses to ensure the collection of a representative sample. The vacuum dust sample and analysis will be performed according to procedures outlined in the Dust Sample Analysis and Plan.

4.2 Wipe Sampling

Wipe samples will be collected on hard surfaces such as floors and sills after cleaning. Dust wipe sampling will be conducted in accordance with ASTM Method 1728, Standard Practice for Field Collection of Settled Dust Samples Using Wipe Sampling Methods for Lead Determination by Atomic Spectrometry Techniques. The media used to collect dust wipe samples will be ghost wipes for surface lead dust sampling, a pre-wetted cellulose pad which constitutes an acceptable wipe material as defined in ASTM Method E 1792, Standard Specification for Wipe Sampling Materials for Lead in Surface Dust. Samples will be tested for lead in the laboratory by EPA Method 6010B. Procedures outlined in the Sample and Analysis Plan will be followed. The confirmation sampling will be performed to verify that household dust in the residences contains lead levels less than 250 $\mu\text{g}/\text{ft}^2$ on interior horizontal window surfaces and 50 $\mu\text{g}/\text{ft}^2$ on interior floor surfaces.

5.0 RESIDENCE PRIORITY ACTION MEASURES

Implementation of the remediation work plan will achieve the following results:

- 1) Reduce human contact with soil, dust and non-potable water above State of California and/or EPA action levels
- 2) Reduce metals bearing dust generation in the vicinity of the residential properties
- 3) Dispose of removed soil and household dust accumulations from residential areas in such a manner that human contact is prevented, and re-migration of these materials are controlled.

5.1 Residence Yards

For those residential yard or garden areas that equal or exceed the CHHSL action levels for CAM 17 metals, the EPA residential PRG for aluminum, and the DTSC approved action level for arsenic in the soils, the soils will be remediated. If soil remediation is required, the following action measures will be implemented:

- Removal of 12 inches of soil will be performed in areas that exceed the identified action levels. A maximum of 12 inches of clean imported soil will be used as backfill to reestablish original ground contour and to establish an adequate barrier if contaminated soil exists in the residential yard area below 12 inches in depth. A delineation fabric covering will be installed prior to the placement of the 12 inches of imported soil.
- Garden soils that exceed the CHHSLs for CAM 17 metals, aluminum and the DTSC approved action level for arsenic will be excavated to a maximum depth of 12 inches and receive 24 inches of clean replacement soil in a raised bed. The size of the replaced garden area will be the same as the existing garden area. Each residential area will be furnished with a garden area.
- During the excavation process, all existing sod and soil coverings will be removed and disposed of along with the soil. Larger trees and shrubs will be left in place. After spreading, compaction and grading, clean fill will be revegetated, as appropriate. The lawn areas of remediated yards will generally be revegetated with sod. Other remediated areas not currently planted with lawns, will be stabilized and seeded with native grasses to achieve a ground-cover. To the extent practicable, all yard landscaping will be returned to its original condition unless CDPR decides otherwise. Removed contaminated soils shall be disposed of at a DTSC approved facility.

Clean replacement material (including soil, gravel, etc.) will be selected in accordance with the State of California Department of Toxic Substances *Information Advisory, Clean Imported Fill* (2001) fact sheet. Replacement soil for yards, gardens, flower beds, and other landscaped yard areas will have properties that promote plant growth. Remediated areas that do not require revegetation may receive clean gravel instead of backfill soil. Unpaved roadways, driveways or parking areas in the vicinity of the residences will be paved after excavation activities have been completed to minimize future generation of fugitive dust.

Care will be taken to minimize or eliminate a need to remove trees, established landscapes (i.e. shrubs or bushes) or structural components (i.e. sidewalks, foundations, or retaining walls) during the implementation of the work plan. Excavation techniques will be implemented to avoid damage to root structures of trees.

5.2 Indoor Priority Action Measures

Dust removal measures will be implemented as described in this work plan. Surfaces such as floors, carpets, window sills and upholstered furniture will be cleaned to eliminate dust potentially containing lead. Confirmation sampling will be performed after the indoor priority action measures have been implemented. The residence will be cleaned as follows:

- Remove potential identified sources containing metals accumulations from the residence (i.e., carpet, draperies).
- HEPA Vacuum. Vacuum all surfaces in the house (including furniture) starting with ceilings and walls and work downwards. Work in a direction furthest from the entry of an individual room in a direction towards the entry.
- Wet Clean. Following thorough HEPA vacuuming, wash all hard surfaces with any suitable cleaning detergent following the same cleaning pattern (high to low/furthest from and toward entrance). Change the cleaning solution as it becomes dirty. Rinse all areas with a fresh cloth/mop. Do not reuse contaminated mops and cloths. Use a three bucket system for cleaning (Detergent solution in first bucket/rinse water for mop in second/surface rinse on floor).
- HEPA vacuum again as required in Step 2.
- Properly dispose of all cleaning and vacuum related materials.

Persons other than properly trained workers, skilled in observing the HASP, and protected with appropriate personal protective equipment and prescribed engineering controls will not be allowed in the work area until all work is completed. Work will be initiated on any second floors of residences. Clean up work will begin at the top and back corner in each room and move to the front entrance in a systematic motion.

Workers will prevent dust generation during cleanup by adhering to the following criteria during the cleanup process.

- 1) Seal doors, windows and other openings between clean up areas and other areas with materials such as fire-rated polyethylene; seal both sides (inside and outside) to provide a secondary dust barrier and prevent the doors and windows from being used.
- 2) Clean up must be conducted under negative pressure in relation to adjacent areas. This means that more air is exhausted from the area than is supplied so that dust

accumulations is contained within the work area, and no dust can enter other areas of the residence; exhaust air must be filtered with a HEPA filter.

6.0 IMPLEMENTATION PLAN

An Implementation Plan will be developed that will include:

- Schedule
- Contractor selection
- HASP

7.0 COMPLETION REPORT

Sixty days following completion of all 2006 residential priority activities, a completion report will be prepared and submitted to the California Department of Toxic Substance Control (DTSC) and the California Central Valley Regional Water Quality Control Board (CVRWQCB). The completion report will detail residential cleanup activities, areas and volumes of soil excavation, source and volume of replacement soil, excavated soil management and disposal, etc. The completion report will also specify maintenance activities that will be performed for the residential yard areas in which soil has been removed. Each portion of this work will be adequately recorded, mapped, supported by the applicable field log book and will be represented on appropriate figures.

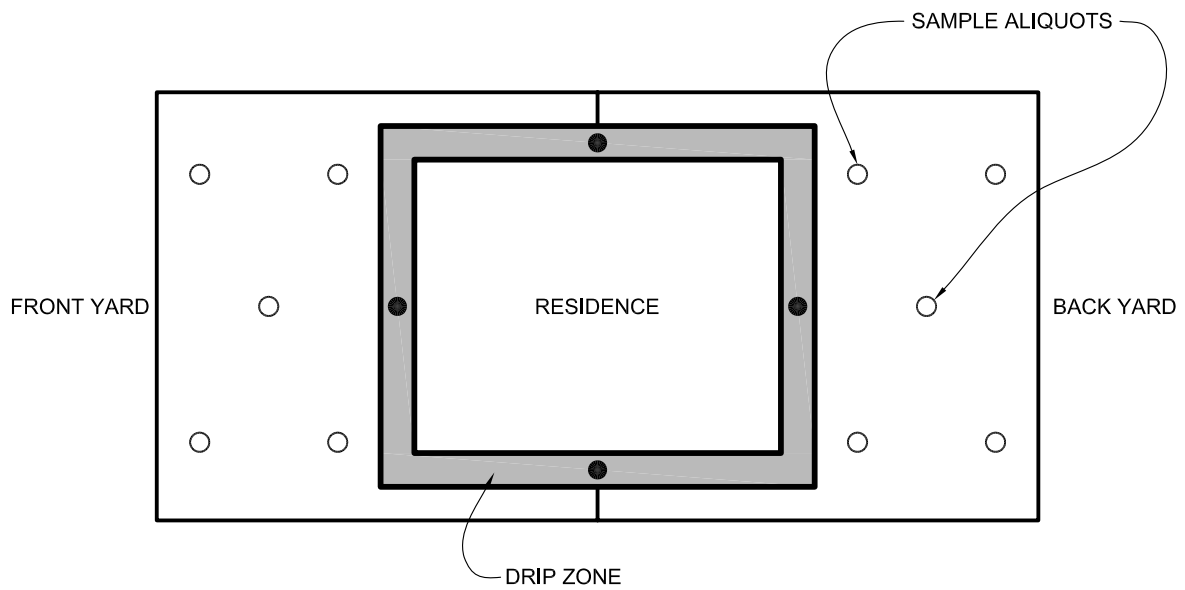


FIGURE 1
MINIMUM SOIL SAMPLING IN YARDS
LESS THAN OR EQUAL TO 5,000 SQ. FT.

Date:	APRIL 2006
Project:	180156
File:	RESIDENCE-SAMPLE

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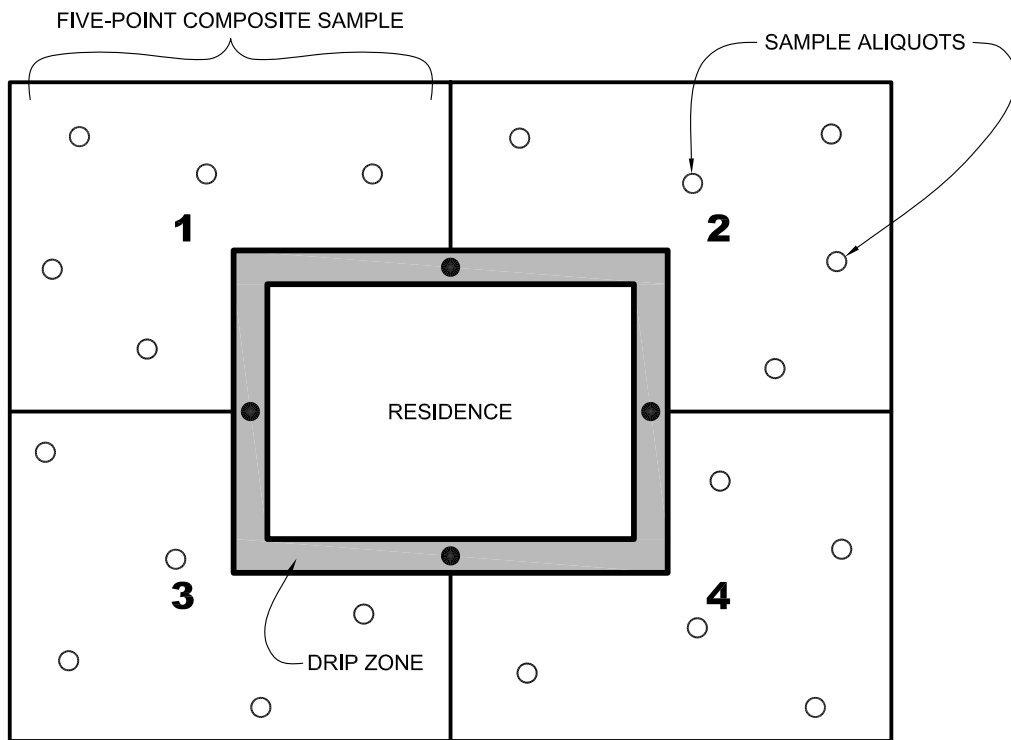


FIGURE 2
MINIMUM SOIL SAMPLING IN YARDS
GREATER THAN 5,000 SQ. FT.

APPENDIX A
SAMPLING AND ANALYSIS PLAN

FINAL

RESIDENCES
SAMPLING AND ANALYSIS PLAN
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Table 1 Wipe Technique for Indoor Residential Dust Sample Collection

1.0 SOIL SAMPLING AND ANALYSIS PLAN

1.1 Soil Sampling Method

Soil samples will be collected from all of the eight residences. When sampling residences with a yard less than 5,000 square feet, five point composite samples will be collected from each of the following locations: the front yard, the back yard, and the side yard. The front, back and side yard composite samples will be equally spaced within the respective portion of the yard, and will be outside of the drip zone and away from the influences of any other painted surfaces. Composites will consist of aliquots collected from the same depth interval.

Prior to soil sampling, a sampling plan will be developed and the location of all sampling points will be plotted on the plan. At the time of sampling, the sampling crew will designate discrete areas, such as gravel driveways, play areas, parking areas, etc, on the plan, and indicate where any special discrete area samples are collected, as necessary. Locations of samples will be located with a handheld, commercial GPS unit.

1.2 Soil Sampling Equipment and Information Collection

The sampling equipment will include the following items: dedicated plastic sampling trowel, soil sampling probe, shovel, pick, trowel, stainless steel bowls, knife, measuring tape, sample bags, digital camera, log book, pen, pencil, and marker.

Information that will be collected from each sampling point will include the GPS location and sampling depth. All equipment used for soil sampling will be dedicated or will be decontaminated prior to sample collection. Decontamination equipment will include, pump sprayers, spray bottles, deionized water, phosphate free soap solution, scrub brushes, buckets, disposable gloves, etc.

1.3 Soil Sampling Locations and Depths

Composite samples will consist of discrete aliquots of equal amounts of soil. The soil from each aliquot will be collected into one clean container each. Initial sampling for contamination in residential soils will be conducted to a depth of at least 18-inches. Composite samples will be collected at 6-inch depth intervals, i.e. 0-6 inches, 6-12 inches and 12-18 inches. Composites will consist of aliquots collected from the same depth interval. Five point composite surface soil samples will be collected from 0 to 1 inch.

1.4 Soil Collection and Handling Procedures

Soil samples will typically be collected using a dedicated plastic sampling trowel or a sliding drop hammer with a 2-inch soil core diameter, capable of a vertical penetration into soil of 18-inches. The drop hammer will be used to extract each of the 6-inch core intervals. The soil sample shall consist of soil only. Samples may be collected with a trowel, soil probe, hand auger, or spade. The specific sampling tool utilized will be left to the discretion of the field sampling crew based on the soil composition.

Field personnel will wear disposable polyethylene gloves to avoid sample cross contamination during the collection of soil samples. Field sampling crews will avoid the collection of samples under or immediately adjacent to trees, shrubs and or structures.

1.5 Equipment Decontamination

The following information describes the general decontamination procedures for field equipment. Sampling equipment will be decontaminated between sample collection points, if the equipment is not disposable, in order to avoid cross contamination between samples.

Field personnel will wear disposable gloves while decontaminating equipment. Personnel will be required to take every precaution to prevent contaminating themselves with the wash water and rinse water used in the decontamination process.

The following procedures will be followed to ensure that sampling equipment is thoroughly decontaminated:

- 1) Visually inspect sampling equipment for soil; a stiff brush will be used to remove any visible material
- 2) Wash the field equipment with phosphate free soap and water, rinse with distilled water, and air dry or wipe with disposable paper towels
- 3) Water used for decontamination will be disposed of on site. All disposable items such as, paper towels, disposable gloves and wash cloths, will be deposited into a garbage bag and disposed of in a solid waste landfill

1.6 Soil Sample Custody

A chain of custody form will be maintained for all soil samples from the time of collection until its final deposition, as described in the Quality Assurance Project Plan (QAPP).

1.7 Soil Sample Documentation

In order to provide adequate information of the residential yard sampling event, the field sampling crew will maintain a field logbook and field documents. The field documents will contain sufficient details. Entries will be made in indelible ink, with all corrections consisting of initialed line-out deletions.

The documents to be completed for each sample generated during the residential yard sampling program are:

- Site Plan (Plot Plan)
- Chain-of-Custody transmittal form
- Sample tag and/or label
- Sample master log

The sampling identification system for all residential yard samples includes:

- The year
- The type of matrix (sands, clays, gravels)
- The house or yard number

Upon completion, a Chain-of-Custody transmittal form will be filled out and samples will be delivered to the laboratory.

1.8 Field Log Form

All pertinent field survey and sampling information will be recorded on a field form, during each day of the field sampling and at each sample site. Each day's entries will be initialed and dated at the end of each day by the field sampling crew.

At minimum, entries in the field log shall include:

- Date and time at the start of work and description of weather conditions
- Names of field sampling crew
- Project name or number
- Description of site conditions and any unusual circumstances
- Location of sample site, including map reference
- Equipment identification
- Details of actual work effort, particularly any deviations from the aforementioned methods
- Field observations

- Time that field work was terminated for the day
- Specific details for each sampling location will be recorded
- Details of photo documentation, if any
- Site description (i.e., physical address and assessor parcel number)

1.9 Soil Sample Packaging and Shipping

Each sample container will be properly labeled in the field. All containers will be checked for proper seal and entered by sample number on the chain of custody form. After collection, individual samples will be placed in an insulated cooler for storage in the field. Samples will be shipped to the laboratory in a cooler with ice. The ice in the cooler will be double-bagged. One copy of the chain of custody form will be enclosed in a plastic bag in each cooler containing the samples identified on the form. The cooler will be taped shut and custody seals will be attached to the outside of the cooler to ensure that the cooler cannot be opened without breaking the seal. The cooler will be shipped using an authorized shipping service to the laboratory for analysis.

1.10 Soil Sampling Quality Control

Duplicate samples will be collected and submitted to the laboratory to evaluate the precision and reproducibility of sampling and analysis procedures. Duplicate samples will be collected at a minimum of one for every 10 soil samples. The duplicate samples will be collected, preserved, packaged, and handled in the same manner as the soil samples. No equipment blanks or field blanks will be collected. A sample split will be provided to the DTSC or CVRWQCB if requested.

1.11 Analytical Protocols

The soil samples will be analyzed for the CAM-17 metals and aluminum using methods detailed in Test Methods for Evaluating Solid Waste, Revised Methods, SW-846. Soil samples will be digested in accordance with SW-846 EPA Method 3050. After digestion, all samples will be analyzed by EPA Method 6010B.

The report of analytical results will include a cover letter from the laboratory identifying the sample group and any non-complaint quality control results together with the affected samples. Attached to the cover letter will be a summary of sample results and a summary of quality control results. The summary of quality control results will include instrument performance results such as standard recoveries and blanks results; matrix QC results such as spikes, duplicates and procedural blanks; and laboratory control standard recoveries. Sample analytical reports will be provided to each of the respective Project Managers.

1.12 Data Collection and Management

All residential yard soils sampling data and analytical results will be managed in an electronic database. The data will be provided to the agencies upon request or with the Priority Actions completion report. Data validation procedures will correspond to Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses, as per U.S. EPA.

2.0 DUST SAMPLING AND ANALYSIS PLAN

This sampling method describes the confirmation sampling strategy, techniques, and quality control (QC) procedures necessary to perform the house dust sampling. These procedures ensure the precision, accuracy, and documentation of data generated during sampling activities.

Dust samples at the eight residential locations on the SHP site will be collected after cleanup activities have been completed. All personnel involved with dust sampling should wear shoe covers while indoors.

2.1 Vacuum Sampling

Vacuum samples will be collected at each residence to quantify the lead concentrations and lead and soil loading in the home. A HEPA vacuum cleaner dust sample will be obtained to quantify lead concentrations in house dust, after cleaning activities have taken place.

Procedures for sampling, sample handling, documentation, and transport are described in the following subsections and in the sample and analysis plan.

2.1.2 Vacuum Dust Sampling Procedures

Cleaned surfaces and soft surfaces such as upholstered furniture will be sampled for dust containing lead.

The dust sample will be collected from a HEPA equipped vacuum cleaner as follows.

- 1) The HEPA Vacuum will take a sample of the dust by sampling as much of the surface as possible, using the vacuum.
- 2) The vacuum cleaner should be removed from the house and taken outside to prevent spread of dust when the sample is removed.
- 3) The sampler will wear clean latex gloves while handling the vacuum cleaner bag and collecting the sample. A new pair of gloves will be used for each sample.
- 4) The vacuum cleaner bag will be removed from the vacuum.
- 5) The sampler will tap the bottom of the vacuum cleaner bag to help settle the dust to the bottom.
- 6) Dust will be removed from the bottom of the bag, where fine material has settled. An 18-ounce Whirl-Pak[®] sample bag should be filled about 1/3 full with dust.
- 7) All sample bags, tags, the site description form, and the field log book will be filled out as the sample is collected. The sample tag will be attached to the sample at the time of collection.
- 8) Any relevant information will be recorded in the field log book or on the site description form.

2.1.3 Decontamination/Disposal Procedure

- Wipe out interior vacuum housing and port with dry disposable wipes. Be sure to clean both inside and outside of the apparatus. If dust is obvious or wipes show soiling, vacuum with sanitary vacuum. Wipe with damp disposable wipe, and blow dry with compressed air. Repeat until dry disposable wipe shows no soiling.
- Clean hose and nozzle by washing with soap and water, passing cleaning brush with clean disposable wipe down the hose until clean. Be sure to clean both inside and outside the apparatus. Rinse hose and nozzle with distilled water, and dry with compressed air.
- Clean vacuum table area between each sampling with damp disposable wipe until clean; blow dry with compressed air.
- Clean all general areas with sanitary vacuum, including accessible clothing, if necessary. Dispose of all cleaning materials in a lined garbage can with a closing cover. Remove and dispose of gloves between each sample.
- At end of sampling session, seal, remove, and double bag trash bags from garbage cans; clean interior of can with sanitary vacuum; vacuum and damp mop processing area, Clean the laboratory; clean all sampling equipment; dispose of sanitary vacuum bag (when necessary) with other materials; notify supervisor of any problems or material requiring disposal.

2.1.4 Records

- Double check all logs and inventory forms for accuracy, completeness, and legibility. Make two copies of all records. Return originals to secure storage as directed. Bring two copies to supervisor, one for inspection and one for data entry.
- Disposal of all materials shall be in accordance with the processing lab procedures and policies.

2.1.5 Preparing Samples for Shipment

All Ziploc[®] bags, containers or vials will be checked for proper seal (reseal containers or re-bag any leaking bags) and entered by sample number on the chain of custody form. A chain of custody form will be completed and signed for each box or container shipped. One copy of the form will be enclosed in a plastic bag in each package. One copy should be placed in the project file, and one copy should be provided to the supervisor. All containers and bags should be sealed in accordance with sample transport and shipping procedures.

2.1.6 Forms Required

- Master log
- Chain of custody forms

2.1.7 Log Books

A field and lab log book will be maintained on a daily basis to document all sampling activities. All notes will be made in indelible ink. Entries on each page will be initialed at the end of each page by the sampling crew member who entered the information. If any changes are made to the record, the original notation will be crossed out with a single line and initialed.

At a minimum, log book entries should include:

- Date and time at the start of work and sampling conditions
- Names of sampling crew
- Project name and number
- Description of site conditions and any unusual circumstances
- Location of sample sites, including map reference
- Equipment identification
- Details of actual work effort, including deviations from the specified methods
- Observations
- Time work terminated for the day
- Details of photo documentation, if any

2.1.8 Sample Identification (Field Sample ID Number)

Each sample location will be assigned a unique identification number, and each sample collected will have a unique identification code that will identify the home from which the sample was collected and the sample type. The field sample ID number will be coded as follows:

- The first two characters identify the project (HD = House Dust)
- Characters 3 through 5 identify the house number (001 = first house visited, 002=second house visited, etc.)
- Characters 6 and 7 indicate the sample year (98)
- Character 8 indicates the type of sample (V - Vacuum bag)
- Characters 9 through 11 indicate a QC sample (RB - Rinsate Blank, DUP - Duplicate, STD - Standard)

Example: HD-001-98-V-DUP

Rinsate blanks are used to monitor sample handling procedures, equipment cleanup, and to document cross contamination, Rinsate blanks will be prepared in the vacuum lab and handled in the same manner as collected samples. Rinsate blanks will be placed and remain in the sample storage container during the sampling effort, and will be analyzed by the same laboratory that analyzing the other samples. The rinsate blank will be distilled or de-ionized water poured over a representative, decontaminated vacuum hose and parts.

Duplicate vacuum dust samples are collected in the same manner as the original sample but are placed into a separate container. One vacuum dust duplicate will be collected for every 20 samples taken.

The sample bank personnel will review field QC samples as required. The sample bank will also be responsible for inserting one laboratory dust standard into the sample train for every 20 samples sent to the lab.

2.1.9 Sample Transfer Procedures/Chain-of-custody

A chain of custody form will be maintained for all soil samples from the time of collection until its final deposition, as described in the Quality Assurance Project Plan (QAPP).

2.2 Wipe Sampling

Dust samples can be collected using a wet wipe media that meet the following criteria:

- (i) Contains background levels of heavy metals less than 5 µg/wipe
- (ii) Is a single thickness
- (iii) Is durable and does not tear easily
- (iv) Does not contain aloe
- (v) Can be digested in the laboratory
- (vi) Has been shown to yield 80-120% recovery rates from spiked samples
- (vii) Must remain moist during the wipe sampling process

2.2.1 Wipe Sample Equipment

- Non sterilized non-powdered disposable gloves
- Sealable disposable plastic bag (Ziploc®), plastic vial or glass container
- Container labels or permanent marker
- Wet wipe media and solvent

2.2.2 Wipe Sample Collection Procedure

For uniformity, the following method should be used for all surfaces to be sampled.

1. Moisten the sample media with 1 to 2 ml of the appropriate solvent (see Table 1) or use pre-moistened wipe. Apply only enough solvent to moisten approximately 80% of the area of the media. Avoid excess solvent on the filter or pad as it may cause drips and running on the surface, thus diluting the sample.
2. Place a template over the area to be sampled or measure out one-square foot or 100 square centimeter surface area or outline area with tape, as per Table 1.
3. Wipe the surface with firm pressure, using S-strokes (edge to edge direction) covering the entire surface area. Fold the exposed side of the pad or filter inward (i.e. fold in half).
4. Using the once-folded media, wipe the same area with S-strokes at right angles to the first series of wipes. Fold the exposed side of the pad or filter in.
5. Using the twice-folded media, wipe with S-strokes in the original direction. Fold the exposed side of the pad or filter in.
6. Place the media in a plastic bag, container or vial. Seal the zip lock, container or vial.
7. Record the sample Identification on the bag or vial, surface area sampled and description of the sample and surface on the sample bag and in notes.
8. If using a template, thoroughly clean it or discard. Templates may be disposed of in normal trash bin or trash bag.
9. Remove gloves and discard appropriately before handling next pad or filter. Gloves may be disposed of in normal trash bin or trash bag.
10. Include 1 blank filter or pad (moisten and placed in bags or vials) with each set of samples (provide 1 blank per 6 samples)
11. After sampling, wash hands thoroughly with plenty of soap and water.

Table 1 Wipe Technique for Indoor Residential Dust Sample Collection

Contaminant	Media	Solvent	PPE Gloves Disposable Style	Sample Size
Lead	Gauze or filter	Distilled Water	Natural Latex Rubber, Nitrile, PVC, or Polyethylene	1 square foot
	Ghost Wipe™ should be cut in half	Wipe is premoistened (Water and Benzalkonium)		

2.3 Sample Handling

Sample containers will be kept closed and maintained under custody of the sampling technician until analysis. Samples will be labeled as they are collected. Sample collection data, including label information, will be recorded in the log book as the samples are collected. Sample containers will be placed in a stable container immediately after sample collection. Except for rinsate blanks, samples do not require preservation, so containers need only be adequate for transportation and sealing with custody seals. Rinsate blanks will be placed in a hard shell container for delivery to the laboratory.

2.4 Quality Control (QC) Samples

Quality Control (QC) samples will be used to check the precision and accuracy of analyses completed by the analytical laboratory. The sampling team will strive to maintain uniformity in the sampling techniques and preparation of QC samples to limit potential sampling errors.

QC samples will consist of rinsate blanks and field duplicates. All samples will have coded sample numbers such that they are submitted “blind” to the analytical laboratory. These QC samples will be clearly identified in the field log book and master log. Samples identified in the field log book will include:

- Vacuum bag samples
- Vacuum bag duplicates
- Rinsate (equipment) blanks
- Dust Wipes

One duplicate and one standard dust sample will be collected and submitted for analysis for every 20 vacuum bag samples. One rinsate blank will be collected from selected batches of decontaminated sample equipment during the project. The QC samples will be defined as follows:

- 1) A vacuum bag duplicate sample will consist of a second sample collected from the vacuum cleaner bag in the same manner as the original
- 2) A rinsate (equipment) blank will be a deionized or distilled water rinse over decontaminated sampling equipment, collected into a sample bottle

2.5 Analytical Procedures

Vacuum bag samples will be prepared by sieving through a U.S. number 80 mesh sieve and then analyzed for lead using methods detailed in Test Methods for Evaluating Solid Wastes, SW-846. The vacuum bag samples will be digested in accordance with SW-846 Method 3050. Wipe samples will be digested in

accordance with Modified SW-846 Method 3050A Acid Digestion Procedure for Single-Wipe Samples. After digestion, all dust samples will be analyzed for lead by EPA Method 6010B.

2.6 Quality Control Procedures

Quality control procedures, including sampling handling, laboratory analysis methods, data validation, data management, and corrective actions are defined in the QAPP.

3.0 POTABLE AND NON-POTABLE WATER SAMPLING AND ANALYSIS PLAN

Water samples will be collected from the residential potable and non-potable water sources. These samples will be analyzed for CAM-17 metals, as described in the Quality Assurance Project Plan.