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Ms. Sara Vela
California Environmental Protection Agency
Department of Toxic Substances Control
9211 Oakdale Avenue
Chatsworth, California 91311

September 18, 2020

**Subject: Submittal of the Draft Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site, Beverly Hills, California**

Dear Ms. Vela:

On behalf of Union Pacific Railroad (UPRR), enclosed is the Draft *Removal Action Work Plan* (RAW) for the Union Pacific Railroad Beverly Hills Site (also known as "Beverly Hills Lots 12 & 13") located at 9315 Civic Center Drive in Beverly Hills, California. Also enclosed are responses to comments from the Department of Toxic Substances Control on the August 28, 2020 version of the RAW.

If after reviewing this material you have any questions or comments, please feel free to contact me by email at david.hodson@jacobs.com or by phone at (510) 316-2323.

Sincerely

David A Hodson

David Hodson, P.E.
Project Manager

Enclosures:

one electronic copy of above referenced report

one electronic copy of response to comments

Electronic Copies Only: Kristen Stevens/UPRR

<table>
<tr><td colspan="4">Response to Comments Regarding the<br>Draft Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site, Beverly Hills, California (Removal Action Work Plan [RAW])<br>dated August 3, 2020<br>from<br>California Environmental Protection Agency, Department of Toxic Substances Control (DTSC)</td></tr>
<tr><th>No.</th><th>Section</th><th>Comments</th><th>Responses</th></tr>
<tr><td colspan="4">Sara Vela, Project Manager; DTSC Comments, <u>dated August 28, 2020</u></td></tr>
<tr><td>1</td><td></td><td>The clean backfill for the proposed excavations should be appropriately referred to as soil cover.</td><td>The RAW has been revised to refer to clean backfill as soil cover.</td></tr>
<tr><td>2.</td><td></td><td>Results for the Soluble Threshold Limit Concentration Analysis done at the site for arsenic should be presented in an appendix to the Workplan.</td><td>The RAW has been revised to include the Soluble Threshold Limit Concentration Analysis data.</td></tr>
<tr><td>3.</td><td></td><td>The term “final” referring to the remedy should be removed from the entire Workplan.</td><td>The RAW has been revised to remove the term “final” when referring to the remedy.</td></tr>
<tr><td>4.</td><td></td><td>The tribal community requested a Native American monitor be present at time of excavation at the Site.</td><td>The RAW has been revised to state a Native American monitor will be present at time of excavation at the Site.</td></tr>
<tr><td>5.</td><td></td><td>Content details of the Land Use Covenant for the Site should be elaborated on.</td><td>The RAW has been revised to provide additional information on the content of the proposed Land Use Covenant for the Site.</td></tr>
<tr><td>6.</td><td></td><td>South Coast Air Quality Management District Rule 1466, instead of rule 403, may be the more accurate rule to follow given the excavation quantities and type of contamination at the Site.</td><td>The RAW has been revised to reference Rule 1466, instead of Rule 403.</td></tr>
<tr><td>7.</td><td></td><td>Project Manager concurs with DTSC technical support staff comments enclosed.</td><td>Comment acknowledged.</td></tr>
<tr><td colspan="4">Christine Brown; DTSC Comments, <u>dated August 26, 2020</u></td></tr>
<tr><td>1.</td><td></td><td>I have reviewed the Response to Comments on the Draft Removal Action Workplan, Union Pacific Beverly Hills, prepared by Jacobs. The cover letter is dated December 19, 2019, but the Responses to Comments include comments from February 21, 2020. In particular, I reviewed the response to my comments of February 21, 2020 and I am fine with the response. I also agree with calling the cap a soil cover; it is not really an engineered cap.</td><td>Comment acknowledged.</td></tr>
<tr><td colspan="4">Pete Cooke; DTSC Comments, <u>dated August 12, 2020</u></td></tr>
<tr><td>1.</td><td></td><td>As stated in a previous memorandum, the subject work plan should be revised to make clear that the proposed removal action, which is limited laterally to the property lines and vertically to the first two feet of soil, only partially addresses site arsenic contamination. As stated in previous memoranda, arsenic characterization should extend to background concentrations, regardless of property lines or depth.</td><td>Section 5.1 of the RAW has been revised to make clear that the proposed removal action only applies to the site and up to 2 feet bgs.<br><br>Due to physical limitations by the presence of busy streets, arsenic characterization is not proposed outside the site boundaries.</td></tr>
<tr><td>2.</td><td></td><td>Sections 3.2 and 3.5 of Appendix F - Pre-Construction Investigation Work Plan indicate that the sampling boreholes are to be backfilled with the excavated material. It is recommended that boreholes remain empty or receive clean backfill, and the cuttings disposed of properly.</td><td>Appendix F (Pre-Construction Investigation Work Plan) has been revised to state that the boreholes will be backfilled with clean, imported fill and cuttings will be disposed of properly.</td></tr>
<tr><td>3.</td><td></td><td>The Appendix F - Pre-Construction Investigation Work Plan indicates that supplemental characterization sampling is to be conducted at 25’ intervals. A rationale for this distance should be provided. Note that a rationale for 10’ spacing was provided in a memorandum from this geologist dated 3 January 2020 on the 18 December 2019 should be used.</td><td>Appendix F (Pre-Construction Investigation Work Plan) has been revised to state that the rationale for the 25-foot spacing is to align with anticipated 25-foot removal action areas. The purpose of the pre-construction investigation is to provide a more refined understanding of the volume of soil anticipated to be impacted and subsequently removed. A 25-foot spacing grid presents a practical approach to meet this objective. Ultimately, the removal areas will be based on the results of pre-construction investigation data and verified using confirmation soil sampling.</td></tr>
<tr><td>4.</td><td></td><td>The subject document does not indicate the size of the initial area about each sampling location to be excavated. The removal action work plan should state the size of the initial area of the excavations about the sample locations to be addressed.<br><br>Depending upon the geometry of adjacent excavations and property lines, a minimum of four sidewall confirmation samples are recommended for each excavation. A 10’ linear sampling frequency of sidewalls is proposed, in accordance with the rational presented in a</td><td>Section 5.1 of the RAW has been revised to state that removal areas will be centered on sample locations where arsenic concentrations exceed the removal action goal and extend half way to the nearest sample location where arsenic concentrations are less than the removal action goal. Based on the proposed 25-foot sampling grid, excavation grids are anticipated to be at least 25 by 25 feet in dimension.</td></tr>
</table>

| Response to Comments Regarding the **Draft Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site, Beverly Hills, California (Removal Action Work Plan [RAW]) dated August 3, 2020** from California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) | | | |
|---|---|---|---|
| **No.** | **Section** | **Comments** | **Responses** |
| | | memorandum dated 3 January 2020 from this geologist on the 18 December 2019 draft Removal Action Work Plan, unless a different rationale is presented and validated. | Section 6.1 of the RAW has been revised to state sidewall samples will be collected one per every 10 feet of sidewall. |
| **William Bosan; DTSC Comments, dated August 21, 2020** | | | |
| 1. | | HERO reviewed the Union Pacific Railroad Beverly Hills Site, Removal Action Work Plan, dated August, 2020. Overall, HERO's previous issue regarding the soil sampling plan has been adequately addressed. The grid over the site with 25-foot spacing should allow for identification of soil sampling data gaps and fine-tuning the existing excavation areas. HERO has no additional comments at this time. | Comment acknowledged. |

# Union Pacific Railroad Beverly Hills Site, 9315 Civic Center Drive, Beverly Hills, California

## Removal Action Work Plan

Draft

September 2020

Union Pacific Railroad

# Union Pacific Railroad Beverly Hills Site, 9315 Civic Center Drive, Beverly Hills, California

| | |
|---|---|
| Project No: | UPSR0700 |
| Document Title: | Removal Action Work Plan |
| Document No.: | PPS0506191500PDX |
| Revision: | Draft |
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| Client Name: | Union Pacific Railroad |
| Project Manager: | David J Hodson |
| Author: | David J Hodson |

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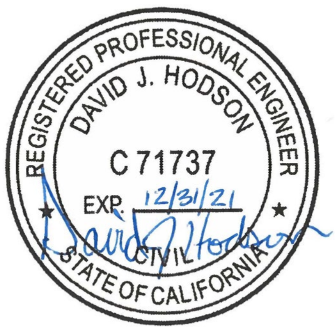
# Technical Certification

This removal action work plan was prepared under the direction of a Registered Civil Engineer in the State of California.




September 18, 2020

David J. Hodson, P.E. No. C71737
Project Manager

Date

# Contents

## Appendixes

## Tables



## Figures

# Acronyms and Abbreviations

| | |
|---|---|
| μg/L | microgram(s) per liter |
| 95UCL | 95 percent upper confidence limit |
| amsl | above mean sea level |
| ARAR | applicable or relevant and appropriate requirement |
| bgs | below ground surface |
| BHLC | Beverly Hills Land Company |
| BTEX | benzene, toluene, ethylbenzene, and xylenes |
| CCR | California Code of Regulations |
| CEQA | California Environmental Quality Act |
| CFR | *Code of Federal Regulations* |
| COC | chemical of concern |
| COPC | chemical of potential concern |
| DTSC | California Environmental Protection Agency, Department of Toxic Substances Control |
| ELCR | excess lifetime cancer risk |
| EPA | U.S. Environmental Protection Agency |
| EPC | exposure point concentration |
| HASP | health and safety plan |
| HHRA | *Human Health Risk Assessment* |
| HI | hazard index |
| HQ | hazard quotient |
| HSC | California Health and Safety Code |
| I | Interstate |
| IC | institutional control |
| IS/ND | Initial Study/Negative Declaration |
| Jacobs | Jacobs Engineering Group Inc. |
| LUC | land use control |
| mg/kg | milligram(s) per kilogram |
| mg/L | milligram(s) per liter |
| OSHA | Occupational Safety and Health Administration |
| PCB | polychlorinated biphenyl |
| PPE | personal protective equipment |
| PRG | preliminary remediation goal |
| RAO | removal action objective |
| RAW | removal action work plan |
| RCRA | Resource Conservation and Recovery Act |
| RI | remedial investigation |

| | |
|---|---|
| STLC | soluble threshold limit concentration |
| SVOC | semivolatile organic compound |
| TBC | to be considered |
| TPH | total petroleum hydrocarbons |
| TPH-g | total petroleum hydrocarbons as gasoline |
| TRPH | total recoverable petroleum hydrocarbon |
| TTLC | total threshold limit concentration |
| UPRR | Union Pacific Railroad |
| VCA | Voluntary Cleanup Agreement |
| VOC | volatile organic compound |
| $yd^3$ | cubic yard(s) |

# 1. Introduction

On behalf of Union Pacific Railroad (UPRR), Jacobs Engineering Group Inc. (Jacobs) has prepared this removal action work plan (RAW) to support selection of an appropriate removal action for arsenic in soil at the UPRR Beverly Hills site (site) located at 9315 Civic Center Drive in Beverly Hills, California (Figure 1). The site has also been known as “Beverly Hills Lots 12 & 13”. The site consists of approximately 5 acres and includes Lots 12 and 13, as well as a small Triangle Section east of Lot 13. UPRR entered the site into a Voluntary Cleanup Agreement (VCA) (Docket Number HSA-A 04/05-066) with the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) in December 2004 (DTSC, 2005).

This RAW was prepared in compliance with the VCA, California Health and Safety Code (HSC) Sections 25323.1 and 25356.1, and DTSC’s Guidance Memorandum, Removal Action Workplans – Senate Bill 1706 (1998) and Proven Technologies and Remedies Guidance, Remediation of Metals in Soil (2008). Pursuant to HSC Section 25356.1, the RAW is one of two remedy selection documents that may be prepared for a hazardous substance release site, and it is appropriate for removal actions that are projected to cost less than $2 million. In California HSC Section 25356.1, a RAW is defined as “a work plan prepared or approved by DTSC or the Regional Water Quality Control Board (Regional Board) which is developed to carry out a removal action, in an effective manner, that is protective of the public health and safety and the environment.”

## 1.1 Objectives

The objectives of this RAW include the following:

- Present and evaluate existing site conditions
- Establish appropriate removal action objectives (RAOs) for protection of human health and the environment
- Evaluate removal action alternatives and identify a recommendation for a preferred removal action for the site that is protective of human health and the environment

## 1.2 Organization

To accomplish these objectives and to satisfy regulatory requirements, this RAW is organized as follows:

- Objectives, site description and background, and purpose (Section 1)
- Previous investigations, site geology and hydrogeology, nature and extent of arsenic in soil identified as a chemical of concern (COC), and risk assessment (Section 2)
- Goals to be achieved by the removal action, including narrative RAOs, a review of applicable or relevant and appropriate requirements (ARARs), numerical removal goals, and identification of areas that will be targeted for the removal action (Section 3)
- Analysis of the alternatives considered and rejected, as well as the basis for the selection or rejection based on an evaluation of each of the alternatives’ relative performance against three evaluation criteria (effectiveness, implementability, and cost) (Section 4)
- Description of the recommended alternative, implementation plan, and completion reporting activities (Section 5)
- Sampling and Analysis Plan (Section 6)
- Transportation Plan (Section 7)
- Site Restoration Plan (Section 8)
- Health and Safety Plan (HASP) (Section 9)
- Public participation (Section 10)

- California Environmental Quality Act (CEQA) review (Section 11)
- References (Section 12)
- Administrative record (Appendix A)
- 95 Percent Upper Confidence Limit (95UCL) Statistical Evaluation (Appendix B)
- ARARs (Appendix C)
- Documentation of correspondences with DTSC (Appendix D)
- Cost estimates (Appendix E)
- Pre-Construction Investigation Work Plan (Appendix F)

## 1.3 Site Description and Background

The site is located at 9315 Civic Center Drive in Beverly Hills, California, and consists of three areas (Lots 12 and 13 and a small Triangle Section located east of Lot 13) with Los Angeles County Assessor's Identification Numbers 4342-015-038, 4342-015-039, 4342-015-040, and 4342-015-041. The site is the former railroad right-of-way adjacent to Santa Monica Boulevard, between Alpine Avenue and North Doheny Drive (Figure 2).

The site is divided into Operable Units 1 (Lots 12 and 13) and 2 (Triangle Section) and is approximately 3,600 feet long and 60 feet wide. The site covers approximately 5 acres, with the majority of the site unpaved. A chain-link fence surrounds the entire site. Ground elevations range from 255 feet above mean sea level (amsl) at the southwestern end of the site to 235 feet amsl at the northeastern end, with the site gently sloping from the south to the north.

### 1.3.1 Land Use

The site is currently vacant, open space. The current land use zoning is for transportation use. Land use in the vicinity of the site is fully developed as commercial, residential, and light industrial properties. The site is surrounded on all sides by public roadways, with Santa Monica Roadway serving as a high-traffic corridor. Figure 2 depicts the site plan and the surrounding community.

### 1.3.2 Adjacent Properties

The property is located in a mixed-use area of the City of Beverly Hills that includes commercial and residential land uses. Parcels to the north are residential and consist of single-family homes. Parcels to the south are a mix of residential and commercial land use. Commercial parcels consist of office buildings, rehabilitation facilities, salons, art galleries, film studios, public parking, and hotels. Residential parcels consist of apartment complexes. Parcels to the east and west of the property are public roadways.

### 1.3.3 Site History

The site was occupied by the railroad right-of-way from 1926 to approximately 1998 (CH2M, 2006). Aerial photographs indicate that the railroad, operated by the Pacific Electric Railway Company, was active from 1928 until between 1971 and 1979 (Lindmark, 1998a). A series of aerial photographs from years 1952, 1969, 1970, 1979, 1986, 1988, 1990, 1993, 1995, and 1998, did not indicate evidence that the site had been used for any purpose other than a railroad right-of-way (either active or inactive).

UPRR, the successor in interest to Pacific Electric Railway Company, transferred the site to Beverly Hills Land Company (BHLC) in 1998. BHLC is the current owner of the site.

## 1.4 Purpose

Based on previous investigations conducted at the site from 1998 through 2010 and a risk assessment (Section 2), DTSC has determined that further action is required to address the presence of arsenic detected in soil samples collected from the site. Following completion of the public comment period, DTSC will consider and respond to comments received. The RAW will be revised, as necessary, in responses to comments. If significant changes are not required, DTSC will then approve the RAW for implementation. After the selected remedy has been implemented, it will be documented in a Completion Report.

# 2. Site Characterization

The following subsections present a summary of previous investigations conducted at the site from 1998 through 2010, site geology and hydrogeology, nature and extent of COCs in soil, and potential site risks.

## 2.1 Previous Investigations

Several investigations were performed during due diligence for property transfers and, more recently, in compliance with the VCA to characterize the site.

The following documents pertaining to the site were prepared:

- *Proposed Phase I and II Environmental Investigation, Railroad Right-of-Way between North Doheny and Alpine Drives, Beverly Hills, California 90210* (Lindmark, 1998a)
- *Phase I and II Environmental Investigation, Railroad Right-of-Way between North Doheny and Alpine Drives, Beverly Hills, California 90210* (Lindmark, 1998b)
- *Stage 2 – Phase II Environmental Site Investigation, Lots 12 and 13 of the Beverly Hills Land Corporation Right-of-Way, Beverly Hills, California* (Lindmark, 2003)
- *Results of Arsenic Reanalysis and Arsenic Investigation Performed Subsequent to the Stage 2 - Phase II Environmental Site Investigation* (RWG, 2003)
- *Evaluation of Off-site Dust Impacts, Union Pacific Right-of-Way, Beverly Hills Land Corporation, Beverly Hills, California* (Geomatrix, 2004)
- *Remedial Investigation* (RI)*, Beverly Hills Land Corporation Site, 9315 Civic Center Drive, Beverly Hills, California* (CH2M, 2006)
- *Remedial Design Investigation Report, Beverly Hills Land Corporation Site, Beverly Hills, California* (CH2M, 2007a)
- *Groundwater Summary Report, Beverly Hills Land Corporation Site, 9315 Civic Center Drive, Beverly Hills, California* (CH2M, 2008)
- *Well Abandonment, Monitoring Wells MW-1 and MW-2, BHLC at 9315 Civic Center Drive, Beverly Hills, CA* (CH2M, 2010)

### 2.1.1 1998 Phase I and Phase II

Phases I and II investigations consisted of a records search and a soil sampling investigation performed in 1998 (Lindmark, 1998b). The Phase II soil sampling investigation consisted of advancing 35 soil borings to depths of 100 feet below ground surface (bgs) and excavating two exploratory trenches to 8 feet bgs (one trench at each end of the right-of-way).

Soil samples collected from these borings were analyzed for the following:

- Total petroleum hydrocarbons (TPH) by U.S. Environmental Protection Agency (EPA) Method 8015M
- Halogenated and aromatic volatile organic compounds (VOCs) by EPA Method 8010/8020
- pH by EPA Method 9045

One composited sample was analyzed for the following:

- Semivolatile organic compounds (SVOCs) by EPA Method 8270
- Herbicides by EPA Method 8150

No VOCs or SVOCs were detected in the soil samples analyzed. Three soil samples collected at 0.5 foot bgs contained detectable levels of TPH (quantified as heavy oil) at 220 milligrams per kilogram (mg/kg). The pH of the soil samples ranged from 6.91 to 8.73.

Groundwater samples were collected in four of the soil borings advanced during the Phase II investigation. The groundwater samples were analyzed for TPH as gasoline (TPH-g) by EPA Method 8015M; benzene, toluene, ethylbenzene, and xylenes (BTEX) with methyl tertiary butyl ether by EPA Method 8020; and halogenated VOCs by EPA Method 8010. The compounds listed above were not detected in the groundwater samples, with the exception of xylenes (0.9 microgram per liter [µg/L]) and chloroform (1.2 µg/L).

No soil or groundwater samples were analyzed for metals or polychlorinated biphenyls (PCBs) during the 1998 Phase II investigation.

### 2.1.2 2003 Stage 2 – Phase II Investigation

The Stage 2 – Phase II investigation consisted of advancing 36 soil borings to various depths (Lindmark, 2003). Eight soil borings were advanced to depths ranging from 48 to 55 feet bgs and 28 soil borings were advanced to a depth of 5 feet bgs.

Soil samples collected from these borings were analyzed for the following (not all samples were analyzed for all analyses):

- TPH by EPA Method 8015M
- VOCs (including TPH-g) by EPA Methods 8260B and 418.1
- SVOCs by EPA Method 8270
- Herbicides by EPA Method 8151A
- PCBs by EPA Method 8082
- Title 22 metals (total threshold limit concentration [TTLC]) by EPA Method 6010B/7471A
- Creosote by EPA Method 8015

The following analytes were not detected at or above the respective method reporting limits in any samples analyzed: TPH-g, TPH as diesel, VOCs, SVOCs, herbicides, PCBs, and creosote.

Total recoverable petroleum hydrocarbons (TRPH) were detected in 12 soil samples. With the exception of two samples (LE-19-2 and LE-19-5) with concentrations of 492 and 172 mg/kg, respectively, concentrations of TRPH were at or below 48 mg/kg in the remaining 10 samples where TRPH was detected.

Title 22 metals were initially analyzed in four soil samples collected during the investigation. Arsenic was the only metal detected with concentrations above the former residential preliminary remediation goal (PRG) (EPA, 2004). Based on these results, all of the soil samples collected during the Stage 2 – Phase II investigation were analyzed for arsenic. Concentrations of arsenic ranged from 5.3 to 229 mg/kg (RWG, 2003).

In October 2003, 66 additional soil samples were collected and analyzed for arsenic by EPA Method 6010B. Concentrations of arsenic ranged from non-detect (0.25 mg/kg) to 996 mg/kg.

Groundwater samples collected during the Stage 2 – Phase II investigation were analyzed for TPH-g and VOCs. TPH-g was not detected in any of the groundwater samples. Acetone was detected at a concentration of 58.1 µg/L in groundwater sample LE19-GW and was not detected in any other groundwater samples. Chloroform was detected in groundwater samples LE10-GW and LE25-GW at concentrations of 1.8 and 1.5 µg/L, respectively, and was not detected in any other groundwater samples. Acetone and chloroform are common laboratory contaminants. No other VOCs were detected in any of the groundwater samples collected during the Stage 2 – Phase II investigation (Lindmark, 2003). None of the groundwater samples were analyzed for metals.

### 2.1.3 2006 Remedial Investigation

The 2006 RI consisted of advancing 12 soil borings (SB1 to SB12) from the ground surface to approximately 50 feet bgs at various locations throughout the site in accordance with the RI Work Plan

(CH2M, 2005). Soil samples were collected at depths ranging from 2.5 to 50 feet bgs (Figures 3a through 3d). Five background soil samples were also collected from five soil boring locations (BK-1 to BK-5) at depths ranging from 2 to 5.5 feet bgs to develop a background or ambient arsenic concentration (Figure 2). Groundwater samples were collected from four locations (SB1, SB5, SB8, and SB11).

Soil and groundwater samples collected from these borings were analyzed for the following (not all samples were analyzed for all analyses):

- Total metals using EPA Method 6010B
- Soluble threshold limit concentration (STLC)
- Bioavailability

The following 20 metals were detected in soil samples: aluminum, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, molybdenum, nickel, potassium, selenium, thallium, vanadium, and zinc. Antimony, silver, and sodium were not detected. Arsenic was the only metal detected at concentrations above PRGs (EPA, 2004). Total arsenic was detected in the soil samples at concentrations ranging from 16 to 356 mg/kg. Arsenic was detected in background samples at concentrations ranging from 7.5 to 27.3 mg/kg.

The following 18 metals were detected in groundwater samples: aluminum, arsenic, barium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, molybdenum, nickel, potassium, sodium, vanadium, and zinc. The maximum detected results were aluminum at 29.4 milligrams per liter (mg/L), arsenic at 0.035 mg/L, barium at 0.8 mg/L, cadmium at 0.03 mg/L, calcium at 282 mg/L, chromium at 0.39 mg/L, cobalt at 0.29 mg/L, copper at 0.74 mg/L, iron at 84.5 mg/L, lead at 0.011 mg/L, magnesium at 108 mg/L, manganese at 9.5 mg/L, molybdenum at 0.082 mg/L, nickel at 0.61 mg/L, potassium at 10.9 mg/L, sodium at 125 mg/L, vanadium at 0.15 mg/L, and zinc at 23.6 mg/L.

Arsenic solubility was assessed on 11 soil samples (Table 1) using the STLC test in accordance with the RI Work Plan (CH2M, 2005). These samples were collected from borings SB2, SB5, SB8, and SB11 at sample depths ranging from 2 to 5.5 feet bgs because the highest arsenic concentrations were observed in the upper 5 feet of soil. One sample (SB5 at 10 feet bgs) was collected at 10 feet bgs to test the solubility of arsenic in native material. Arsenic was not detected in the leachate from the STLC soil samples except for the sample at SB5 (collected at 2 feet bgs), which had arsenic concentration of 84.5 mg/kg and a corresponding STLC of 2.1 mg/L. STLC test results indicated that elevated arsenic concentrations in the shallow soils are not leaching to the deeper soils. This was proven through a groundwater investigation conducted from 2009 to 2010 (Section 2.1.5).

The bioavailability of arsenic was assessed in nine samples in accordance with the RI Work Plan (CH2M, 2005). Total arsenic in the samples ranged from 16 to 356 mg/kg. The bioavailability study indicated that as total arsenic concentration increased above 100 mg/kg, 30 to 40 percent of that total concentration was potentially bioavailable (CH2M, 2006). These data were evaluated in the *Human Health Risk Assessment* (HHRA) (CH2M, 2007b) (Section 2.4), which assessed risks from exposure to site soils and concluded that the bioavailability of arsenic in soil results in a lower overall risk estimate.

### 2.1.4 2007 Remedial Design Investigation

A remedial design investigation was conducted in 2007 at the site for remedial planning purposes; the investigation consisted of advancing 55 soil borings (A100 to A155) from the ground surface to approximately 10 feet bgs (CH2M, 2007a). Soil samples were collected at depths of 5, 7, and 10 feet bgs to delineate the vertical extent of arsenic at concentrations above background (ambient conditions). The results were incorporated into the database of arsenic concentrations in site soils. The distribution of arsenic in site soils is shown on Figures 3a through 3d.

### 2.1.5 2009 through 2010 Groundwater Investigation

To confirm the findings of the arsenic solubility testing and to confirm that groundwater beneath the site does not present a complete exposure pathway, a groundwater investigation was conducted from 2009 to 2010. Two wells were installed in 2009, and the wells were sampled in October 2009 and March 2010.

DTSC collected split samples during the March 2010 sampling event. The maximum total arsenic was detected at a concentration of 1.2 µg/L and maximum dissolved arsenic was detected at a concentration of 1.6 µg/L. DTSC approved the abandonment of the wells in June 2010 and concluded that “based on the long time existence of arsenic in soils and the groundwater sampling results, DTSC does not believe that arsenic contamination in soils is a threat to groundwater quality” (DTSC, 2010).

## 2.2 Site Geology and Hydrogeology

The site is located within the Coastal Plain of Los Angeles County, in the northwestern portion of the Central Groundwater Basin. The Central Basin is bounded on the north and east by the Hollywood Basin and a series of low-lying hills, on the west by the Santa Monica Basin, and on the south by the Los Angeles-Orange County line (DWR, 1961).

Site geology and hydrogeology is based on soil boring logs from the RI (CH2M, 2007a), the Stage 2 – Phase II investigation (Lindmark, 2003), and the 2009 through 2010 groundwater investigation. A geological cross section for the site is shown on Figure 4. Borings from the center of the right-of-way were used to create the cross section.

Non-native fill material was identified throughout the site. The thickness of the fill material ranges from approximately 5 feet bgs at the northeastern portion of the site to 10 feet bgs at the southwestern portion of the site (Figure 4). The soil, including both fill and native material, was described as primarily silty or clayey sand, with a few isolated clay lenses. The soil beneath the site is consistent with deposits in the recent alluvium, which is known to be present throughout the Hollywood Basin (DWR, 1961).

Groundwater in sediments underlying the site is replenished by percolation of precipitation and by subsurface flow from alluvial channels originating in the Santa Monica Mountains to the north. The regional groundwater flow near the site is generally to the south-southeast because of the orientation of the alluvial channels and general slope of the watershed from the Santa Monica Mountains in the area (DWR, 1961). Groundwater was encountered at approximately 45 to 52 feet bgs during the Stage 2 – Phase II investigation (Lindmark, 2003). Seasonal fluctuations of the groundwater do occur. Depths to groundwater beneath the site ranged from approximately 50 to 60 feet bgs during the 2009 and 2010 groundwater investigation.

## 2.3 Nature and Extent of Arsenic in Soil

The following section presents the nature and extent of arsenic in soil based on previous investigations at the site. Almost 50 soil samples have been collected at the site between 0.5 and 50 feet bgs. Previous sampling focused on remedial investigation within the site boundaries with few samples collected offsite. Sampling offsite would have been challenging due to heavily used public roadways on all sides of the site. Results from previous investigations indicate that concentrations of arsenic in soil range from 16 to 996 mg/kg, with the highest concentrations observed in soil (primarily within fill material) from 0 to 5 feet bgs along the center of the right-of-way (Table 2 and Figures 3a through 3d). With few exceptions, the highest concentrations of arsenic in soils are within the shallow soils along the centerline of the site and decrease in concentrations away from the centerline of the site. While some data gaps exist, the data is considered adequate for evaluating remedial action alternatives for the site. Additional soil samples (Appendix F) will be collected to better define remedial target areas prior to removal action activities.

Exposure point concentrations (EPCs) were calculated and evaluated for arsenic at the site. EPCs are estimated chemical concentrations that a receptor might contact in an exposure medium. The EPCs for soil at the site were calculated using a statistical estimate of an upper bound on the average exposure concentrations in accordance with EPA recommendations for statistical analysis of monitoring data (EPA, 2011a).

The EPC is based on the 95UCL of the mean concentration for an exposure area or medium. The UCL was calculated using the most recent statistical recommendations (EPA, 2011a) provided with ProUCL software, Version 4.1.00 (EPA, 2011b). Parametric and nonparametric methods were used to compute the 95UCLs. Parametric methods (where parametric indicates a reliance on a distributional assumption), including those based on the normal distribution, gamma distribution, and lognormal distribution, were recommended. The potential parametric approaches include setting proxy levels for non-detect results that are based on the distributional assumption. In addition, multiple nonparametric methods (that is, not reliant on a distributional assumption) have been proposed for environmental data sets; these methods include various Kaplan-Meier calculations that do not use specific proxy levels for each non-detect result. The most appropriate method for calculating the 95UCL for arsenic was based on sample size, goodness of fit to distributions, variability, and skewness.

The arsenic data set was divided into two unique sample areas by assigning each sample to one of the units (Operable Units 1 and 2). EPCs for arsenic were calculated for each of these sample areas. The EPC for arsenic in soil samples collected from Operable Unit 1 is 95.7 mg/kg and the EPC for arsenic in soil samples collected from Operable Unit 2 is 142.1 mg/kg. A summary of the statistical assessment of arsenic concentrations in soil samples from the site is presented in Table 3. The numerical results of the 95UCL statistical evaluation for arsenic are included in Appendix B.

The STLC analysis and the groundwater investigation have shown that the arsenic in soils is not leachable and has not impacted groundwater. Arsenic in soils is not migrating from the shallow soils and centerline of the site. Arsenic has not impacted groundwater at the site (Section 2.1.5) and migration to groundwater is considered an incomplete pathway.

The source of elevated concentrations of arsenic present in shallow soils along the centerline of the site is unknown. Human receptors may be exposed to arsenic in soil through ingestion of soil and dermal contact with the soil. Dust generation from the site was demonstrated to not be a concern (Geomatrix, 2004).

## 2.4 Conceptual Site Model

The site was a former railroad right-of-way and there were no known railroad operations. The source of arsenic at the site is also unknown and is likely associated with fill material at the site. Arsenic likely migrated into shallow soil, adhering to soil particles. Soil sample data does not indicate elevated levels of arsenic in soil below 5 feet bgs. Likewise, arsenic was not detected at elevated levels in groundwater samples collected at the site. Potential migration pathways and receptors are described in the Risk Assessment section (Section 2.5).

## 2.5 Risk Assessment

An HHRA was completed in May 2007 to evaluate potential future risks to human health from arsenic detected in soil within the site (CH2M, 2007b). Potential risks to human health and the environment (ecological receptors) were evaluated by considering the concentrations of arsenic detected in soil, current and potential future uses of the site, and the different ways that exposure to arsenic may occur (exposure scenarios). For a potential risk to be present, first a complete pathway, a potential receptor, and an exposure route must be identified (exposure scenario). Second, arsenic in soil at the site must be present at concentrations that could pose a cancer risk or non-cancer health effect.

Under existing site conditions and considering the location, likely future use, and limited vegetation and habitat, no complete exposure pathways for ecological receptors were identified; potential ecological risks were not evaluated.

The HHRA consisted of the following components:

- Selection of chemicals of potential concern (COPCs)
- Exposure Assessment
- Toxicity Assessment
- Risk Characterization

### 2.5.1 Identification of Chemicals of Potential Concern

COPCs in soil were identified using data collected from 2003 through 2006. A total of 310 soil samples collected from 0 to 10 feet bgs at the site as part of the Stage 2 – Phase II investigation (Lindmark, 2003), arsenic reanalysis and arsenic investigation (RWG, 2003), and the RI (CH2M, 2006) were used in the HHRA.

Arsenic was identified as the only COPC for soil.

No COPCs for groundwater were identified.

### 2.5.2 Risk Assessment Summary

The HHRA concluded that ELCRs and HQ estimates for exposure to arsenic in soil at the site are above the DTSC regulatory point of departure value of $1 \times 10^{-6}$ and 1, respectively, for all human health exposure scenarios evaluated. A removal action goal of 27.3 mg/kg for arsenic, based on background concentrations, was recommended as protective of human health for residential and commercial/industrial scenarios.

Subsequent risk assessment discussions with DTSC, and DTSC's independent risk analysis, established an arsenic background concentration of 25 mg/kg (DTSC, 2010).

# 3. Removal Action Goals and Objectives

Site characterization indicates the presence of arsenic in soils above background concentrations at the site. RAOs were developed based on the current environmental conditions and the potential future use of the site.

Based on the RAOs, removal goals were established that are protective of human health and the environment and consistent with the determined arsenic background concentrations in the area. The background concentration and therefore the removal goal were developed for the site from (1) information obtained during investigations of the site and the surrounding area and (2) risk management decisions based on anticipated future use of the site. Information used to develop the removal goal includes laboratory analytical data, hydrogeologic data, soil leaching analysis, Site-specific risk evaluation, and statistical analysis of the dataset to establish the background concentration conducted in accordance with the DTSC guidance document *Arsenic Strategies – Determination of Arsenic Remediation – Development of Arsenic Cleanup Goals for Proposed and Existing School Sites* (DTSC, 2007a).

In addition, a review of pertinent laws, regulations, and other criteria was performed to identify ARARs and other criteria to be considered (TBC) for remediating the site. A summary of the potentially applicable ARARs and TBCs is presented in Appendix C.

The following sections present narrative RAOs, ARARs, and other TBCs for cleaning up the site.

## 3.1 Removal Action Objectives

RAOs are narrative statements that are used to define media-specific cleanup levels for protecting human health and the environment. The RAO for the site is to reduce potential human exposure by occupational workers, construction workers, or hypothetical future residents via dermal contact, incidental ingestion, and inhalation of dust to arsenic-impacted soil above the background level (25 mg/kg). The DTSC (2010) established a site-specific background concentration of arsenic following the procedures presented in the DTSC Guidance Document, *Arsenic Strategies: Determination of Arsenic Remediation – Determination of Arsenic Cleanup Goals for Proposed and Existing School Sites* (DTSC, 2007a), using the arsenic data collected from the site. Based on this evaluation, DTSC established an upper-bound arsenic concentration of 25 mg/kg, which it considered to be representative of background conditions at this particular site and recommended an arsenic cleanup goal of 25 mg/kg for those areas where future receptors may contact surface soils. DTSC also noted that higher concentrations of arsenic may be left onsite depending on site-specific considerations, such as road or other similar caps or covering that would limit exposure (DTSC, 2010). Copies of correspondence from DTSC are provided in Appendix D.

## 3.2 Applicable or Relevant and Appropriate Requirements

The development of remedial actions requires reviewing and applying ARARs so that compliance with applicable laws and regulations is achieved by the overall remedial action. Applicable requirements are those cleanup standards, criteria, or limitations promulgated under federal or state law that specifically address the situation at a site. If a requirement is not legally applicable, the requirement is evaluated to determine whether it is relevant and appropriate. Relevant and appropriate requirements are cleanup standards; standards of control; and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not applicable, address problems or situations sufficiently similar to the circumstances of the proposed response action and are well suited to the conditions of the site.

A requirement may not meet the definition of an ARAR as previously described, but a requirement might still be useful in determining whether to take action at a site and to what degree action is necessary. This can be particularly true when there are no ARARs for a site, action, or contaminant. Such requirements are called “TBC” criteria.

TBC criteria are non-promulgated advisories or guidance issued by federal or state government that are not legally binding but may provide useful information or recommended procedures for remedial action. Although TBC criteria do not have the status of ARARs, they are considered along with ARARs to establish the required level of cleanup for protection of health or the environment. The critical difference between a TBC criterion and an ARAR is that the responsible party is not required to comply with or meet a TBC criterion when choosing a remedial action.

ARARs are a key consideration in the analysis of removal action alternatives because the alternatives must comply with ARARs to be further considered. Compliance with ARARs often has a significant effect on the cost and implementability of a particular alternative during both implementation and long-term operation. ARARs are generally classified as chemical-, location-, or action-specific, as described below:

- **Chemical-specific Requirements:** Chemical-specific ARARs include those laws and requirements that regulate the release to the environment of materials possessing certain chemical or physical characteristics or containing specified chemical compounds. These requirements generally set health- or risk-based concentration limits or discharge limitations for specific hazardous substances.
- **Location-specific Requirements:** Location-specific ARARs relate to the geographical or physical position of the site, rather than the nature of the contaminants or the proposed site remedial actions.
- **Action-specific Requirements:** Action-specific requirements are technology- or activity-based requirements or limitations on actions taken with respect to hazardous wastes or hazardous substances.

A summary of the potentially applicable ARARs and TBCs is presented in Appendix C.

## 3.3 Removal Action Goals

Removal action goals were selected based on DTSC's cleanup guidelines (DTSC, 2012) developed to assist developers and financial institutions determine accurate costs associated with potential development of the site, as follows:

- Landscape Areas (ground level planters, open space, etc.):
  - 0 to 2 feet bgs less than 25 mg/kg
  - 2 to 5 feet bgs less than 75 mg/kg
  - Greater than 5 feet bgs left in place
- Hardscape Areas (areas under buildings, parking lots, sidewalks, etc.):
  - 0 to 3 feet bgs less than 75 mg/kg
  - Greater than 3 feet bgs left in place

While the cleanup guidelines were originally developed by DTSC to be implemented after a development plan for the site has been approved, they have been applied in this RAW to develop and evaluate removal action alternatives capable of achieving the RAO based on current and potential future land use scenarios.

# 4. Development and Analysis of Removal Action Alternatives

The purpose of this section of the RAW is to identify and screen possible removal action alternatives that may best achieve the RAO discussed in Section 3. Four potential removal action alternatives were identified, and each was evaluated against three evaluation criteria (effectiveness, implementability, and cost) to support selection of a preferred removal action alternative (Sections 4.2 and 4.3).

## 4.1 Identification and Analysis of Removal Action Alternatives

The response actions for addressing arsenic in soils at the site include no action, asphalt capping in place with institutional controls (ICs), excavation and offsite disposal, and soil covering with limited excavation, offsite disposal, and ICs. Screening of these response actions using three evaluation criteria (effectiveness, implementability, and cost) was conducted to assemble removal action alternatives for further evaluation. Based on this screening, the following four removal action alternatives were assembled:

- Alternative 1—No Action
- Alternative 2—Consolidation and Asphalt Capping in Place with ICs
- Alternative 3—Excavation with Offsite Disposal
- Alternative 4 – Soil Cover with Limited Excavation, Offsite Disposal, and ICs
- Alternative 5 – Excavation with Offsite Disposal during Development

### 4.1.1 Alternative 1— No Action

As required by DTSC, the Alternative 1 was included to provide baseline conditions against which other alternatives can be compared. Alternative 1 would not require implementing any remedial actions at the site and no costs would be incurred. This action includes no ICs, no capping or removal of soil, and no monitoring. Under this alternative, no provisions would be made to maintain the existing soil and no measures would be instituted to restrict future activities.

### 4.1.2 Alternative 2— Consolidation and Asphalt Capping in Place with Institutional Controls

Alternative 2 would consist of capping the ground surface where arsenic concentrations are greater than 25 mg/kg. The proposed areas to be capped include areas where arsenic concentrations in soil samples exceed 25 mg/kg at the ground surface (Figures 3a through 3d).

The cap would consist of 4 inches of subbase and a 2-inch thick asphalt cap. Weed block fabric and a pre-emergent herbicide would be applied to the ground surface prior to the placement of the subbase and asphalt. The asphalt cap would restrict the potential for people to come into contact with the arsenic-impacted soil. Limited excavations (approximately 400 cubic yards [$yd^3$]) would be conducted to remove soils with arsenic concentrations greater than 25 mg/kg from surface soils at the perimeters of the site. The excavated soil would be moved and placed within the center line of the right-of-way (20 feet wide) to be capped. In this alternative, approximately 51,000 square feet (1.17 acres) would be capped. The capped areas would be graded to drain into the City of Beverly Hills stormwater drainage system.

ICs in the form of a land use restriction would be executed between the landowners and DTSC to ensure that the cap is maintained and that future use of the property is consistent with the purpose and maintenance of the cap. The ICs would restrict future use of the property for sensitive uses, such as daycare centers, hospitals or care facilities, and single-family residences. An maintenance plan would be submitted for approval by DTSC. The maintenance plan would require routine inspections and reporting on the condition of the cap and repairs to the cap (such as periodic sealing and crack repair) so that the remedy remains protective. An maintenance agreement would be submitted by the owners, with DTSC specifying the maintenance requirements. The landowners would provide financial assurances for future maintenance of the cap. A soil management plan providing guidance on how to manage soils in the event of future disturbance or excavation of the caps would be submitted by the landowners for approval by

DTSC. The soil management plan would specify how arsenic-impacted soils would be identified, characterized, handled, and disposed, and how the protection of the capped areas would be restored. An additional IC would include posting signage at the site notifying potential excavators of the presence of arsenic-impacted soil and providing guidance for soil disturbance and management requirements.

#### 4.1.3 Alternative 3—Excavation with Offsite Disposal

Alternative 3 consists of excavating arsenic-contaminated soils consistent with DTSC's cleanup guidelines.

Assuming the land use remains open space, DTSC's cleanup guidelines for landscape areas were applied to identify areas where soils would be excavated to a depth of 2 feet bgs where concentrations of arsenic are greater than 25 mg/kg, and to a depth of 5 feet bgs where concentrations are greater than 75 mg/kg. Excavation would not be conducted at depths below 5 feet bgs. Based on the distribution of arsenic sample results (Figures 3a through 3d), approximately 14,700 $yd^3$ of soil would be excavated and disposed of offsite.

Excavation and offsite disposal of soil would consist of removing and transporting the soil to an appropriate, permitted offsite facility for disposal. Excavation, stockpiling, loading, and onsite grading would be conducted with excavators, front-end loaders, graders, and other appropriate equipment. Excavation and grading operations would generate dust. Therefore, suppressants, water, or other forms of dust control may be required during construction, and workers may be required to use personal protective equipment (PPE) to reduce exposure to arsenic in dust during construction.

Confirmation samples would be collected from the sidewalls and bottom of the excavations during the removal action to verify that soils meet the removal goals for the various depths and areas.

Excavation areas would then be backfilled with clean, imported soil and the site would be restored by hydroseeding.

#### 4.1.4 Alternative 4—Soil Cover with Limited Excavation, Offsite Disposal, and Institutional Controls

Alternative 4 consists of excavating arsenic-impacted soils at limited locations, and establishment of a soil cover across the site. Like Alternative 3, assuming the land use remains open space, DTSC's cleanup guidelines for landscape areas were applied to identify areas where soils would be excavated to a depth of 2 feet bgs where concentrations of arsenic are greater than 25 mg/kg. Excavation would not be conducted at depths below 2 feet bgs. Based on the distribution of arsenic sample results (Figures 3a through 3d), approximately 4,400 $yd^3$ of soil would be excavated and disposed of offsite.

Excavation and offsite disposal of soil would consist of removing and transporting the soil to an appropriate, permitted offsite facility for disposal. Excavation, stockpiling, loading, and onsite grading would be conducted with excavators, front-end loaders, graders, and other appropriate equipment. Excavation and grading operations would generate dust. Therefore, suppressants, water, and other forms of dust control may be required during construction, and workers may be required to use personal protective equipment (PPE) to reduce exposure to arsenic in dust during construction.

Confirmation samples would be collected from the sidewalls of the excavations during the removal action to verify that soils meet the removal goals for the shallow areas.

The soil cover will then be established by emplacing clean, imported soil within the excavation areas and the site would be restored by hydroseeding to reduce surface runoff and erosion. Following excavation and soil cover placement, the unimpacted soil from 0 to 2 feet bgs, including imported soil applied to the removal areas, would establish the 2-foot soil cover across the site consistent with the current grade.

ICs in the form of a land use restriction would be executed between the landowners and DTSC to ensure that the areas where arsenic-impacted soil at concentrations above the DTSC-provided removal levels (depth- and location-dependent) are maintained, and that future use of the property is consistent with the purpose and maintenance of those areas. The ICs would restrict future use of the property for sensitive uses, such as daycare centers, hospitals or care facilities, and single-family residences. The landowners would provide financial assurances for future maintenance. A soil management plan would be submitted providing guidance on how to manage soils in the event of future disturbance of soil beneath 2 feet bgs for approval by DTSC. The soil management plan would specify how arsenic-impacted soils would be identified, characterized, handled, and disposed, and how the disturbed areas would be restored.

#### 4.1.5 Alternative 5 — Excavation with Offsite Disposal during Development

Based on recent conversations with BHLC, BHLC is pursing development of the site. Alternative 5 has been developed to accommodate potential development activities. Alternative 5 consists of excavating arsenic-impacted soils, similar to Alternative 4, but would leave excavated areas within the proposed development footprint open (for example, no imported soil placement) to allow construction to proceed. The soil cover will be placed within areas excavated as part of Alternative 5 but outside of the proposed development footprint. This approach is contingent on the property owner obtaining the appropriate permits and approvals to allow construction to proceed by the start of mobilization activities for this remedial alternative. If the construction schedule does not align with the removal action schedule, then this alternative would be implemented like Alternative 4.

Like Alternative 4, DTSC's cleanup guidelines for landscape areas were applied to identify areas where soils would be excavated to a depth of 2 feet bgs where concentrations of arsenic are greater than 25 mg/kg. Based on the distribution of arsenic sample results (Figures 3a through 3d), approximately 4,400 $yd^3$ of soil would be excavated and disposed of offsite prior to development-related excavation.

Confirmation samples would be collected from the sidewalls of the excavations during the removal action to verify that soils meet the removal goals for the shallow areas.

The clean, imported soil cover will be placed within areas excavated as part of Alternative 5 but outside of the proposed development footprint. The soil cover would be hydroseeded to reduce surface runoff and erosion. Following excavation and soil cover placement in these areas, the unimpacted soil from 0 to 2 feet bgs, including imported soil applied to the removal areas, would establish the 2-foot soil cover consistent with the current grade.

Excavation and offsite disposal of soil would consist of removing and transporting the soil to an appropriate, permitted offsite facility for disposal. Excavation, stockpiling, loading, and onsite grading (where necessary) would be conducted with excavators, front-end loaders, graders, and other appropriate equipment. Excavation and grading operations would generate dust. Therefore, suppressants, water, and other forms of dust control may be required during construction, and workers may be required to use personal protective equipment (PPE) to reduce exposure to arsenic in dust during construction.

If necessary, ICs in the form of a land use restriction would be executed between the landowners and DTSC to ensure that the areas where arsenic-impacted soil at concentrations above the DTSC-provided removal levels (depth- and location-dependent) are maintained, and that future use of the property is consistent with the purpose and maintenance of those areas. The ICs would restrict future use of the property for sensitive uses, such as daycare centers, hospitals or care facilities, and single-family residences. The landowners would provide financial assurances for future maintenance. A soil management plan would be submitted providing guidance on how to manage soils in the event of future disturbance of soil beneath 2 feet bgs for approval by DTSC. The soil management plan would specify how arsenic-impacted soils would be identified, characterized, handled, and disposed, and how the disturbed areas would be restored.

## 4.2 Evaluation Criteria

Each removal action alternative was independently evaluated against three criteria—effectiveness, technical implementability, and relative cost—without consideration of the other alternatives. The relative performance of each of the alternatives was then compared to support the selection of a preferred removal alternative. The evaluation criteria are as follows:

- **Effectiveness—**Effectiveness considers the ability of each alternative to protect human health and the environment. In the effectiveness evaluation, the following factors are considered:
  - *Overall Protection of Human Health and the Environment*—This criterion evaluates whether the removal alternative provides adequate protection to human health and the environment and is able to meet the site's RAO.
  - *Compliance with ARARs/TBCs*—This criterion evaluates the ability of the removal alternative to comply with ARARs and TBCs.
  - *Short-term Effectiveness*—This criterion evaluates the effects of the removal alternative during the construction and implementation phase until removal objectives are met. It accounts for the protection of workers and the community during removal activities and also evaluates environmental impacts resulting from implementing the removal action.
  - *Long-term Effectiveness and Permanence*—This criterion addresses issues related to the management of residual risk remaining onsite after a removal action has been performed and has met its objectives. The primary focus is on the controls that may be required to manage risk posed by treatment residuals and/or untreated wastes.
  - *Reduction of Toxicity, Mobility, or Volume*—This criterion evaluates whether the removal technology to be employed will result in significant reduction in toxicity, mobility, or volume of the hazardous substances.
- **Implementability—**Implementability considers the technical and administrative feasibility of implementing the alternative, as well as the availability of necessary equipment and services. This includes the ability to design and perform the removal alternative; the ability to obtain the necessary equipment and services; the ability to monitor the performance and effectiveness of the removal alternative; and the ability to obtain necessary permits and approvals from agencies, the State, and the community.
- **Cost—**This criterion considers the relative cost of each technology based on estimated fixed capital costs for initial construction plus the ongoing maintenance costs. The actual costs are dependent on true labor and material costs, competitive market conditions, project scope, and the implementation schedule.

## 4.3 Analysis of Removal Action Alternatives

The three criteria as applied to each alternative are discussed in the following sections.

### 4.3.1 Alternative 1—No Action

#### 4.3.1.1 Effectiveness

Alternative 1 would not require implementing any measures at the site and would still include an LUC. No activities would disturb site soil, and therefore, no short-term risks to site workers or the community would occur as a result of implementing Alternative 1. However, under Alternative 1, arsenic would remain in the soil at concentrations that would not support future reuse of the site and there would be no reduction in potential risks. This alternative does not meet the effectiveness criterion. As a result, acceptance by the State would be unobtainable.

### 4.3.2 Alternative 2— Consolidation and Asphalt Capping in Place with Institutional Controls

#### 4.3.2.1 Effectiveness

Alternative 2 has the potential to address potential risks to human health from arsenic in soil and to comply with ARARs. Alternative 2 would require minimal disturbance of the arsenic-impacted soils. There would be little exposure to arsenic in soils in the short term, and risks would be low. With capping, arsenic would remain onsite and would require long-term inspection and maintenance to meet ARARs and to maintain adequate long-term protection of human health and the environment.

Periodic inspections would be required to check for settlement, cracking, ponding of water, erosion, and naturally occurring invasion of deep-rooted plants. Precautions would need to be taken so that the integrity of the cap is not compromised by land use activities. ICs, as discussed in Section 4.1.2, would need to be put in place so that the cap is not compromised and to manage soils and restore the cap in the event that the cap and the underlying soil are disturbed.

Capping in place would not lessen the toxicity or the volume of arsenic-impacted soils; however, it would reduce potential exposure of impacted soil and limit infiltration of surface water. As noted, the STLC test results indicated that arsenic concentrations in the shallow soils are not leaching to the deeper soils.

#### 4.3.2.2 Implementability

Capping in place is a relatively simple technology that is easily implemented and can be quickly installed. Because arsenic in soils would be left in place, obtaining permits, regulatory approvals, and community acceptance may be difficult.

#### 4.3.2.3 Cost

Containment technologies typically involve low to moderate costs. Industry costs for the placement of an asphalt cap, not including mobilization, permitting, and site preparation activities, are approximately $3.00 per square foot.

### 4.3.3 Alternative 3—Excavation with Offsite Disposal

#### 4.3.3.1 Effectiveness

Alternative 3 has the potential to address potential risks to human health from arsenic in soil and to comply with ARARs. Potential short-term risks to onsite workers, public health, and the environment could result from dust or particulates generated during excavation and soil-handling activities, such as stockpiling, loading, or grading. These risks can be mitigated by using PPE for onsite workers and engineering controls, such as dust suppressants and additional traffic and equipment operating standards, for the protection of the surrounding community and to meet the ARARs. Excavation and removal would remove arsenic-impacted soils from the site so that long-term risks are reduced while achieving the RAO.

Removing arsenic-impacted soils from the site does not reduce the toxicity or volume of the arsenic. By placing the impacted soil in an engineered landfill suitable for receiving arsenic-impacted soil, the mobility of arsenic can be reduced. Some grading of surface or shallow soils would likely be required within the footprint of future building and parking areas of Operable Unit 1 during construction, leaving some arsenic-impacted soil under the buildings or parking areas. While this leaves arsenic-impacted soil onsite, it is under an impervious structure, thereby reducing the potential for any exposure pathway. ICs, as described in Section 4.1.3, would be put in place by the property owners so that future disturbance is minimized and managed properly in the event that the soils need to be dug up or exposed.

#### 4.3.3.2 Implementability

Excavation, offsite disposal, grading, and compaction are well-proven, readily implementable technologies that are common methods for cleaning up contaminated sites. The process is relatively simple with proven results. The equipment and labor required to implement this alternative are uncomplicated and readily available. The shallow depths of excavation or re-grading at the site for the removal of arsenic-impacted soils make excavation implementable. It is anticipated that regulatory approval would be granted because this is a proven and permanent technology. However, this alternative would involve considerable disruption to traffic in the area, and may not be accepted by the community.

#### 4.3.3.3 Cost

The estimated cost to load, transport, and dispose of the impacted soils is approximately $110 per ton, not including engineering, permitting, and other preconstruction site preparation activities. This estimate includes loading, transportation, and disposal at an approved offsite disposal facility. The grading of surface or shallow soils would take place as part of the building or parking area construction.

The cost analysis bases the disposal costs on non-hazardous disposal. The investigation-derived wastes resulting from soil cutting from drilling operations onsite have been profiled and characterized as non-hazardous wastes. The excavated and stockpiled soils would be sampled and profiled to determine the proper characterization for disposal.

### 4.3.4 Alternative 4— Soil Cover with Limited Excavation, Offsite Disposal, and Institutional Controls

#### 4.3.4.1 Effectiveness

Alternative 4 has the potential to address potential risks to human health from arsenic in soil and to comply with ARARs. The technical effectiveness of excavation for addressing soils containing arsenic receives a high rating. It is an effective technology for addressing soils containing arsenic and its limits can be adapted to accommodate unexpected contamination. A soil cover involves installing a surface cover over the remaining arsenic-impacted soil to limit direct contact between receptors and impacted soil, and to reduce precipitation from infiltrating the subsurface. Cover systems provide a stable surface over the impacted soil. Cover construction is typically performed with standard construction equipment and requires little specialized knowledge. With a soil cover at the site, arsenic-impacted soil remains in place and future land use restriction will not be minimized, thus, the technical effectiveness of a soil cover received a medium rating.

#### 4.3.4.2 Implementability

Implementability of excavation is moderately high. The excavation in alternative 4 is shallow and standard earthwork equipment and construction methods would be used. Potential implementation issues associated with excavation include the need for engineering controls (for example, dust suppression) to protect workers and the public during remediation activities. Because the soil cover will consist of unimpacted soil, including soil cover for removal areas, implementability of a soil cover receives an easy rating.

#### 4.3.4.3 Cost

Capital costs for excavation and offsite disposal are moderate and less than Alternative 3, because less soil would be excavated.

### 4.3.5 Alternative 5— Excavation with Offsite Disposal during Development

#### 4.3.5.1 Effectiveness

Alternative 5 has the potential to address potential risks to human health from arsenic in soil and to comply with ARARs. The technical effectiveness of excavation for addressing soils containing arsenic receives a high rating. It is an effective technology for addressing soils containing arsenic and its limits can be adapted to accommodate unexpected contamination. A soil cover, if necessary, involves installing a surface soil cover over the remaining arsenic-impacted soil to limit direct contact between receptors and impacted soil, and to reduce precipitation from infiltrating the subsurface. Cover systems provide a stable surface over the impacted soil. Cover construction is typically performed with standard construction equipment and requires little specialized knowledge. With a soil cover at the site, arsenic-impacted soil remains in place and future land use restriction will not be minimized, thus, the technical effectiveness of a soil cover received a medium rating.

#### 4.3.5.2 Implementability

Implementability of excavation is moderately high. The excavation in alternative 5 is shallow and standard earthwork equipment and construction methods would be used. Potential implementation issues associated with excavation include the need for engineering controls (for example, dust suppression) to protect workers and the public during remediation activities. Because the soil cover, if necessary, will consist of unimpacted soil, including soil cover for removal areas, implementability of a soil cover receives an easy rating.

#### 4.3.5.3 Cost

Capital costs for excavation and offsite disposal are moderate and less than Alternative 3 and 4, because less soil would be excavated and less soil cover would be required.

## 4.4 Comparative Analysis of Removal Action Alternatives

A comparative analysis was conducted to identify the advantages and disadvantages of each removal alternative. The comparative analysis of the removal alternatives was conducted to address the criteria listed in Section 4.2.

### 4.4.1 Effectiveness

Under Alternative 1, the impacts associated with arsenic would not be addressed. Consequently, there would be no reduction in the potential risks and the RAO would not be achieved. Alternatives 1 and 2 do not involve activities that would significantly disturb the impacted soil. Therefore, there would be no short-term risks to onsite workers or the community as a result of implementing these alternatives. Alternatives 3, 4, and 5 would require removing, handling, and transporting the impacted soil, resulting in higher short-term exposure risks. However, it is expected that these risks can be sufficiently mitigated through site control measures.

Alternatives 2, 3, 4, and 5 reduce or eliminate with various degrees of effectiveness potential exposure to arsenic, and therefore accomplish the RAO. Once implemented, Alternative 2 would require long-term monitoring to ensure its effectiveness. In addition, future changes in land use could disturb the soil. Because concentrations of arsenic would be left onsite, ICs would be required. Alternatives 3, 4, and 5 would remove arsenic from the site to specified depths. Because concentrations of arsenic would be left onsite, ICs would be required. Based upon this evaluation, Alternative 3 (excavation with offsite disposal and institutional controls) is favored under this criterion because it removes the largest quantity of arsenic-impacted soils.

### 4.4.2 Implementability

No measures would be implemented for Alternative 1. Alternatives 2, 3, 4, and 5 are both well-proven, readily implementable technologies. However, it is more than likely that Alternative 2 would not be accepted by the State because it does not remove arsenic-impacted soils above the RAO. Alternative 4 would require removal of less removal of arsenic-impacted soil and less disruption to the community. Alternative 5 would require less soil cover and less disruption of the community. Accordingly, Alternative 5 (excavation with offsite disposal during development) is favored by this criterion.

### 4.4.3 Cost

A summary of estimated costs to implement the proposed alternatives is presented in Table 4. The cost estimates are feasibility study-level costs and are developed to an accuracy range of -30 percent to +50 percent. The sources of these cost estimates include vendors, estimates for similar projects, standard costing guidance documents, and professional judgment. Cost details are presented in Appendix E. Alternative 3 (excavation with offsite disposal) is the highest cost alternative and Alternative 5 (excavation with offsite disposal during development) is the least costly alternative.

## 4.5 Recommended Removal Action Alternative

Based on the evaluation of alternatives presented in Sections 4.3 and 4.4, the preferred and recommended removal action alternative for the site is Alternative 5 (excavation with offsite disposal during development). Alternative 1 (no action) does not address the potential risks posed by arsenic in the shallow soil, and arsenic would remain in soil at concentrations that would not support future reuse of the site. Alternative 2 (capping in place with ICs), while providing some reduction in the potential mobility and potential risks from arsenic, does not remove the arsenic-impacted soil and limits future reuse of the site without further remediation. Alternative 3 (excavation with offsite disposal) removes arsenic-impacted soil based DTSC's guidelines and allows for reuse of the site, while reducing potential arsenic mobility and providing protection from exposure to remaining arsenic in soil at the site. Alternative 4 (soil cover with excavation, offsite disposal, and ICs) provides similar level of protectiveness as Alternative 3, but is significantly less disruptive to the community. Alternative 5 (excavation with offsite disposal during development) provides the similar level of protectiveness as Alternative 3 and 4, but is significantly less disruptive to the community and consistent with potential development of the site.

# 5. Implementation Plan

Implementation of Alternative 5 (excavation with offsite disposal during development), the preferred removal action for the site, consists of a series of tasks. The subsections that follow discuss each of the following tasks and their associated activities:

- Selecting excavation locations
- Permitting, notifications, utility clearance, and site preparation
- Excavation methodology and confirmation sampling
- ICs
- Control measures
- Dust monitoring during excavation
- Decontamination
- Field variances
- Reporting

BHLC has indicated the intent to conduct construction activities within the site. Preparation for implementing the removal action will be conducted in coordination with BHLC to attempt to conduct removal action activities in concert with construction activities conducted by BHLC. If applicable, construction activities may be conducted immediately after removal action excavation and confirmation sampling, which would negate the need to place the soil cover within the removal areas.

## 5.1 Selecting Excavation Locations

To better define removal areas, additional soil sampling will be conducted prior to initiation of excavation activities (Appendix F).

Excavation will be conducted within the upper 2 feet of soil where arsenic concentrations exceed 25 mg/kg within the site boundaries, as shown on Figures 5a through 5d. Based on the distribution of data, the approximate volume of soil to be excavated is 4,400 $yd^3$. However, removal areas will be modified based on the results of preconstruction investigation sampling conducted prior to initiation of excavation activities. Removal areas will be defined by soil samples with arsenic concentrations above 25 mg/kg. Removal areas will be centered on sample locations where arsenic concentrations exceed 25 mg/kg and extend half way to the nearest sample location where arsenic concentrations are less than 25 mg/kg. Based on the proposed 25-foot sampling grid, excavation grids are anticipated to be at least 25 by 25 feet in dimension. Arsenic concentrations in soil samples collected at 2 feet bgs are considered representative of soils below 2 feet bgs and are not used to identify removal areas. Excavation will not be conducted outside the site boundaries and deeper than 2 feet bgs within the site boundaries. The proposed excavation dimensions were established for cost estimating purposes and as an initial attempt to efficiently conduct excavation and confirmation sampling operations to achieve the remedial action objectives. Ultimately, the extent of the removal areas will be based on the results of confirmation sample results.

## 5.2 Permitting, Notifications, Utility Clearance, and Site Preparation

The following activities will be completed prior to beginning the removal action:

- Grading permits will be obtained from the City of Beverly Hills. The current estimate is that approximately 4,400 $yd^3$ of arsenic-impacted soil will be removed from the site. The removal action will be conducted under this grading permit.

- Underground Service Alert will be contacted for utility clearance at least 3 working days before beginning fieldwork. In addition, a private subsurface utility service will complete a supplemental search for underground utilities within the site. A work zone will be established at each removal area. A temporary fence, where necessary, will be erected at the site at the time of remedy implementation. The fence will remain in place during the removal actions. Each work zone, all within the existing fence line, will be identified using yellow caution tape. The work zones will include the removal area in addition to a working perimeter of a minimum of 15 feet for personnel and equipment. The work zone may be modified as appropriate during planning and construction. Access to the work zone will be restricted to personnel required to conduct and oversee the removal action.

- Other site preparation activities include clearing and grubbing of shrubs, grasses/weeds and debris from the removal areas to be performed, setting up and providing dust monitoring and control for the removal action, and preparing a contractor staging area for equipment and decontamination areas. Select trees within the site may be removed to facilitate the proposed removal action.

It is likely that limited lane closure and traffic control will need to be implemented as part of the removal action.

## 5.3 Excavation Methodology and Confirmation Sampling

Excavation will be implemented as follows:

- Excavation will be performed in accordance with the guidelines presented in California Occupational Safety and Health Administration, California Code of Regulations (CCR), Title 8, Division 1, Chapter 4, Subchapter 4, Article 6 – Excavations (Sections 1539 through 1541).
- Excavations for the removal action will be less than 2 feet deep with a backhoe or excavator. The excavated soils will be stockpiled in accordance with the remediation waste staging requirements in HSC, Division 20, Chapter 6.5, Article 2, Section 25123.3[b][4][B]), as follows:
  - Stockpiles will be constructed within the work zone or adjacent to the work zone and on a level surface. Stockpiles will be constructed to minimize the footprint of the stockpile area. The stockpile will remain covered with a minimum of 6-mil plastic, except when soil is being placed or removed. The soil stockpiles will be constructed with berms (or straw wattle) and plastic liners (20-mil-thick minimum on the bottom in paved areas, 60-mil base in unpaved areas). Stockpiles will be sized so that overlapped seams are not required in the lining.
  - The stockpile covers will be weighed down with sand bags, used tires, or other means so that the stockpiles remain covered during periods of high winds. Site controls, including the existing site fencing, around the piles will be maintained in good condition at all times, including during non-working hours, until the stockpiles are removed from the work zone.
  - Erosion control measures will be employed to minimize the contribution of stockpiled soil to surface runoff and wind-generated particulate matter.
  - The arsenic-impacted stockpile soil will not remain onsite for longer than 90 days.
  - The stockpiled soils will not contain free liquids.
  - The stockpiles will be inspected weekly and after storms to verify that the controls for windblown dispersion and precipitation runoff and runon are functioning properly.
- The stockpiles will be composite sampled for arsenic and other analytes as required by the disposal facilities, for profiling for disposal. Four subsamples composited into one sample will be collected for every 500 $yd^3$ of stockpiled material. For the first 500 $yd^3$ of excavated soils, two composite samples will be taken for every 100 $yd^3$. After 500 $yd^3$ has been sampled, one composite sample per every 500 $yd^3$ will be taken for waste disposal classification. The profiling analytical data will be reviewed to determine the appropriate soil classification (non-hazardous, non-Resource Conservation and Recovery Act [RCRA] hazardous or RCRA hazardous) and to select the appropriate disposal facility. DTSC will be notified and will approve the proposed determination and disposal facility.
- Upon selection of the appropriate disposal facility, the stockpiles will be loaded into trucks for transport to the disposal facility. Loading will be conducted with a front-end loader. Dust control during loading will be implemented by limiting the drop height from the loader and with water spray. Trucks will be tarped and dry brushed prior to leaving the site.
- After the final stockpile is removed from the site, the stockpile area and any materials or equipment associated with the stockpile area will be inspected for contamination and remediated as necessary within 30 days after the last stockpile is removed.

- The stockpile area will be certified by a registered engineer for compliance with the previously listed measures.
- Confirmation sampling and analysis to determine residual concentrations remaining at the site and whether the removal goals have been met (Section 6.1).
- In the event that cultural resources are found during the course of remediation activities, work will be suspended while a qualified archaeologist makes an assessment of the area and arrangements are made to protect or preserve any resources that are located.
- In the event of the accidental discovery or recognition of any human remains during ground disturbance activities, excavation or disturbance of the site or any nearby area shall stop immediately and the County Coroner notified to determine its origin. Procedures prescribed under CEQA Guidelines, CCR Section 15064.5(e), and Health and Safety Code Section 7050.5 will be implemented to ensure compliance with the appropriate California laws and regulations in protecting cultural resources.

## 5.4 Soil Cover Demarcation

As presented in Section 5.1, excavation of arsenic-impacted soil will be conducted up to 2 feet bgs. A demarcation layer will be installed within areas where arsenic-impacted soil was excavated up to 2 feet bgs and where arsenic-impacted soil remains in place at depths greater than 2 feet bgs to provide a physical indicator for the protection of potential construction workers performing excavation in these areas. In these areas, the demarcation layer will be placed directly on the soil surface before soil cover placement. Demarcation material consisting of polyvinyl chloride caution and warning tape will be placed in a 10-foot spaced grid pattern.

Following completion of the removal action, a collection of maps will be prepared showing the location of soil samples, excavation areas, and demarcation areas to be incorporated into the maintenance plan.

## 5.5 Institutional Controls

ICs are used to stop or reduce the exposure of human receptors. ICs are non-engineering mechanisms used so that the intended future land use is consistent with cleanup and engineering controls (for example, caps and soil covers). ICs where contamination remains in place include land use controls (LUCs) and soil management plan. LUCs are used when DTSC has determined that it is safe to leave specific types of contamination at a property as long as defined restrictions are adhered to. LUCs allow ongoing use of the property as long as a site maintains the ICs and that the future use complies with the LUC. The LUC for the site will restrict future use of the property to prevent sensitive uses, such as daycare centers, hospitals or care facilities, and single-family residences. DTSC and the property owner(s) enter a LUC that allows ongoing use of the property where arsenic-impacted soil remains. The LUC will document, including graphical illustration, where arsenic-impacted soil remains, at what depths, and at what concentrations. Common LUC provisions include stating that a remedial system should not be disturbed, limiting soil disturbance, or disallowing sensitive uses. Restrictions identified in LUCs apply to affected areas only and are not more restrictive than is needed to protect human health and the environment.

The ICs will also include a soil management plan that specify the requirements for proper soil management should future site activities disturb arsenic-impacted soil and for the routine inspection, maintenance, and reporting on the containment and landscaped areas.

## 5.6 Control Measures

During the removal of the arsenic-impacted soil, control measures will include site security, site access control, noise control, cultural resources protection, and dust source and receptor control.

### 5.6.1 Site Security

A chain-link fence surrounds the entire site. If and where fencing is not present at the time of the removal action, a temporary fence will be erected. The fences will serve to separate the work zones from the surrounding community, provide protection for the equipment, allow site control for a safe working environment, and prevent unauthorized entry into the work zone.

### 5.6.2 Site Access

During work activities, site access will be limited to authorized personnel. A sign-in log will be maintained at each work zone to document the entry and exit of all personnel.

For Lots 12 and 13, equipment and truck access and egress during the removal action will be from Civic Center Drive and not from the busier Santa Monica Boulevard, Beverly Boulevard, or Doheny Drive.

For the Triangle Section, a lane closure will likely be required on Santa Monica Boulevard for staging of equipment and trucks to complete the removal action.

### 5.6.3 Noise

Field activities during the proposed remedial action are not expected to exceed City of Beverly Hills noise ordinance guidelines. Removal action activities will take place only between the City-permitted construction hours of 8:00 AM and 6:00 PM Monday through Friday, excluding public holidays.

### 5.6.4 Cultural Resources Protection

Because the upper 5 to 10 feet of soil at the site and surrounding area consist of fill materials, as described in Section 2.2, there is little potential for cultural or archaeological resources to be encountered. Nonetheless, in the event resources of historical, archaeological or cultural significance or human remains are located, work will cease as required by 14 CCR, Section 15064.5. In the unlikely event that deposits of paleontological materials or Native American artifacts are encountered during ground-disturbing activities, work will be redirected to avoid further impact to the discovery. Project personnel will not collect or move any possible paleontological materials or Native American artifacts. A Native American monitor will be present during excavation activities. A qualified archaeologist or paleontologist will be contacted to evaluate paleontological materials if discovered during the excavation and to make recommendations for the treatment of potential discoveries in consultation with DTSC and other agencies, as appropriate.

### 5.6.5 Dust Sources and Receptors

The primary dust sources within the work zone will be exposed soil during excavation, stockpiling, and truck-loading activities. Potential dust receptors include construction workers, the nearby community, offsite pedestrians, and vehicle traffic around the site. Dust control will be implemented to prevent offsite migration of dust during excavation activities. A construction barrier will be considered to mitigate noise and dust after consulting with public participation to evaluate the level of community concern.

#### 5.6.5.1 Dust Monitoring

Dust monitoring strategies and methodologies will follow the South Coast Air Quality Management District's Rule 1466. This includes monitoring and abating dusts generated by wind or by the remediation equipment at the site. The methods will be implemented and stated in detail in a dust control and monitoring plan. These dust control strategies will be implemented during the removal action to achieve the following goals:

- Identify and measure dust generated during the removal actions, along with decontamination procedures to assign the appropriate level of PPE

- Identify and measure dust at points along the site perimeter; conduct dust monitoring to measure potential exposure to the surrounding community as a result of the removal actions
- Provide real-time information to the dust control monitor so that the appropriate dust control measure can be implemented

The dust monitoring plan will provide specific details and state the requirements called out for in Rule 1466. This will include, but not be limited to, visible dust limitation, particulate matter less than 10 micrometers in aerodynamic diameter levels, track out limitations, etc. Action levels will be stated and contingent actions listed.

The dust control and monitoring plan will be submitted to DTSC for review and approval.

#### 5.6.5.2 Dust Suppression Measures

Dust suppression measures to be implemented include having a water truck or fire hydrant with sufficient hose available at all times during soil excavation, stockpiling, handling, and loading activities. A specified worker will provide dust suppression (for example, water) to generating sources as necessary; however, the amount of water will be limited to avoid generating surface water runoff. If the dust cannot be suppressed using the identified measures, then work will cease until additional measures can be implemented or until meteorological conditions are favorable.

## 5.7 Decontamination

### 5.7.1 Equipment Decontamination

Heavy equipment used to perform the excavation will be dry-broom cleaned to remove the bulk of soil or debris that remains on the equipment after it exits the work zone. In most cases, this will be sufficient to allow egress from the site. If dry-broom cleaning is not successful in cleaning the equipment, a pressure washer or steam cleaner will be used to clean the equipment. Personnel operating the pressure washer or steam cleaner will wear appropriate PPE, as required by a site-specific HASP. The equipment will be placed in a temporary decontamination cell that will allow collection of the wash water and debris removed from the equipment. The temporary decontamination cell will be constructed using plastic film on the ground and berms under the edges of the plastic to contain the water. The temporary decontamination cell material, debris, and wastewater will be appropriately disposed. If necessary, temporary decontamination cells will be constructed on Lots 12 and 13 and the Triangle Section so that public streets do not need to be crossed to complete the equipment decontamination. South Coast Air Quality management District’s Rule 1466 will be followed on limiting track out contamination from site vehicles.

### 5.7.2 Personnel Decontamination

This work will be performed in Level D PPE, which consists of coveralls, safety-toe work boots, safety glasses, hard hats, traffic vests, and ear protection, as required for worker protection. Personnel will use disposable PPE to minimize decontamination when exiting the exclusion zone. Used disposable PPE will be doffed and placed in garbage bags in the hazard reduction zone. The garbage bags containing the used PPE will be placed in the contaminated soil stockpile areas and will be disposed with the waste soil.

## 5.8 Field Variances

Variance from the work plan will be discussed with DTSC prior to action being taken except for emergencies (when an immediate response is required). DTSC will be notified if an emergency response is implemented. The field variance will be documented in the Removal Action Completion Report prepared for the project.

## 5.9 Implementation Schedule

It is anticipated that the selected remedial alternative will be implemented approximately 7 months following submittal of this RAW. This provides time to obtain the permits, obtain competitive bids, and complete excavation. The schedule could be modified to sequence work in coordination with potential construction/development of Lot 12. The remediation is anticipated to last approximately 2 months. A summary of the schedule is presented in Table 5.

## 5.10 Removal Action Completion Report

A removal action completion report summarizing excavation activities will be submitted to DTSC for review and comment approximately 8 weeks following completion of the excavation activities and receipt of the weigh tickets from the disposal facility. The report will include a brief summary of the excavation activities, a summary table of the pre-construction investigation and confirmation sampling analytical results, a figure showing the pre-construction investigation and confirmation sampling locations and the removal areas, waste profiling analytical data, disposal documentation (waste manifests) for the excavated soil, a discussion of field variance from this RAW completed during the removal action, and a request for no further action status for the site.

# 6. Sampling and Analysis Plan

The proposed removal action will require the collection and analysis of samples to confirm the removal of arsenic-impacted soil. Sampling will be conducted in general accordance with the applicable field procedures, quality assurance/quality control protocols, and quality assurance project plan that will be prepared. The following subsections describe confirmation sampling and waste disposal classification sampling.

## 6.1 Confirmation Sampling of Excavated Areas

During the removal action, confirmation samples will be collected from the sidewalls of the excavations to verify that removal goals, which are dependent on depth, are met and that the RAO is achieved. Sidewall samples will be collected one per every 10 feet of sidewall and at approximately 1 foot bgs (half the distance to the bottom of the excavation). Bottom samples are not anticipated, because excavation is not planned below 2 feet bgs. Confirmation samples will be collected by placing soil into a laboratory-provided container (glass, brass, or stainless steel) directly from the sidewalls of the excavation. Confirmation samples will be forwarded to a state-certified laboratory for analysis for arsenic by EPA Method 6010D on a rush turnaround basis.

Confirmation soil sampling results will be compared with removal goals to confirm that the RAO has been met and to document the remaining arsenic concentrations at the site. If a confirmation sample result exceeds the removal goals for arsenic of 25 mg/kg, over-excavation of arsenic-impacted soil will be conducted to the extent feasible.

## 6.2 Waste Disposal Classification Sampling

Soils management, profiling, and waste classification details are presented in Section 5.3. The profiling soil samples will be forwarded to a state-certified laboratory for analysis for arsenic by EPA Method 6010D and additional analyses as may be required by a specific disposal facility for profiling purposes. Analysis will be on a rush turnaround basis.

# 7. Transportation Plan

The proposed removal action will require use of existing heavily-traveled roadways. A site-specific transportation plan will be prepared in accordance with state and local regulations. The following subsections present a summary of a preliminary transportation plan.

## 7.1 Characteristics and Destination of Soil to be Transported Offsite

Elevated levels of arsenic have been detected in site soils. Total arsenic has been detected at concentrations up to 996 mg/kg and STLC up to 2.1 mg/L. The TTLC for hazardous waste classification for arsenic is 500 mg/kg. The STLC for hazardous waste classification is 5 mg/L for soluble arsenic. The toxicity characteristic leaching procedure limit for classifying arsenic-impacted soil as a hazardous waste under RCRA is 5 mg/L. The excavation soils will be stockpiled onsite and will be composite sampled for waste profiling. A State-certified analytical laboratory will analyze the samples for arsenic and other profiling analyses as may be required by the disposal facilities. Depending on the results from the stockpiles, the site soils may be disposed of as non-hazardous waste, non-RCRA hazardous waste, or RCRA hazardous waste.

If the profiling analysis shows the arsenic-impacted soil to be a RCRA or non-RCRA hazardous waste, UPRR will obtain an EPA Identification Number from DTSC for the proper management of the soils. Compliance with the DTSC requirements for hazardous waste generation, temporary onsite storage, transportation, and disposal will be required. Within 90 days after its generation, the hazardous waste will be transported offsite for disposal. Any shipment of hazardous waste will be transported by a registered hazardous waste hauler under a Uniform Hazardous Waste Manifest. Land ban requirements will be followed as necessary. Any shipment of non-hazardous waste will be transported under a bill of lading.

Waste is anticipated to be disposed of as follows:

- RCRA hazardous waste: Waste Management, Kettleman Hills Landfill, 35251 Old Skyline Highway, Kettleman City, California 93239.
- Non-RCRA hazardous waste: Copper Mountain Landfill, 3485 E. County 12$^{th}$ Street, Welton, Arizona 85356.
- Non-hazardous waste: Waste Management, Asuza Landfill, 1121 West Gladstone Street, Azusa, California 91702.

Alternate appropriate disposal facilities may be considered at the time of site work depending on capacity and availability.

## 7.2 Truck Transportation

Assuming that 6,600 tons of soil are removed, and assuming that each truck carries approximately 20 tons per load, an estimated 330 truckloads of soil will leave the site. Depending on hazard classification, destination, available trucks, loading rate, and the scheduling of the removal actions, it is estimated that approximately 10 trucks per day will leave the site during an approximate 6-week period. Open-top trailers will be covered before leaving the site.

All permitted disposal facilities operate a certified weight station at their facility. Each truck will be weighed before and after offloading its payload. Weigh tickets or bills of lading will be provided to the removal action subcontractor after all the soil has been shipped offsite. The anticipated truck routes to the previously listed disposal facilities follows.

Trucks leaving the site with soils for disposal at Kettleman Hills will travel as follows:

- Exit the site onto Civic Center Drive and head southwest
- Turn right onto Burton Way and then right again onto North Canon Drive
- From North Canon Drive, take the first left onto Santa Monica Boulevard

- Proceed southwest on Santa Monica Boulevard approximately 4 miles to Cotner Avenue
- Turn right onto Cotner Avenue and merge onto Interstate (I) 405 North/Santa Monica Freeway
- Continue on I-405 North for approximately 84 miles and then merge onto I-5 North
- Continue on I-5 North for approximately 175 miles
- Exit onto CA-41 South (Exit 309 on I-5 North)
- Follow signs to CA-41 South and then turn left on CA-41 South in approximately 3 miles
- Turn right onto Old State Highway and then left into the Kettleman Hills Facility

Trucks leaving the site with soils for disposal at Copper Mountain will travel as follows:

- Exit the site onto Civic Center Drive and head northeast
- Turn right onto Beverly Boulevard, then turn right onto Civic Center Drive
- Make a slight right turn onto Santa Monica Boulevard heading east
- Turn right onto US-101 South/Hollywood Freeway
- Continue for approximately 13 miles and then merge on I-5 South
- Continue on I-5 South for approximately 115 miles
- Merge onto I-805 South
- Take Exit 17B on I-805 South and merge onto I-8 East toward El Centro
- Take Exit 3 for Avenue 3E toward Arizona 280 South
- Turn right onto South Avenue 3E and continue to East 32nd Street
- Turn left onto East 32nd Street for 1 mile
- Turn right onto South Avenue 4E for 1 mile
- Turn left onto East 40th Street/East County 12th Street
- Turn left into Copper Mountain Facility

Trucks leaving the site with soils for disposal at Azusa will travel as follows:

- Exit the site onto Civic Center Drive and head northeast
- Turn right onto Beverly Boulevard, then turn right onto Civic Center Drive
- Make a slight right turn onto Santa Monica Boulevard heading east
- Turn right onto US-101 South/Hollywood Freeway
- Continue for approximately 5 miles and then merge on I-10 East
- Continue on I-10 East for approximately 12 miles
- Take Exit 31B to I-605 North and continue for approximately 5 miles
- Take Exit 27A onto I-210 East/foothill freeway toward San Bernardino
- Take Exit 38 for Irwindale Avenue
- Turn right onto North Irwindale Avenue and continue for 1 mile
- Turn left onto West Gladstone Street
- Turn left into Asuza Landfill

Truck traffic through the City of Beverly Hills will be limited to between 7:30 AM and 4:00 PM.

Before leaving the site, each truck driver will be instructed to notify the site manager. Each truck driver will be provided with a Uniform Hazardous Waste Manifest or bill of lading and the cellular phone number for the site manager. It will be the responsibility of the site manager to notify UPRR of any unforeseen incidents. UPRR will also notify DTSC. Each truck driver will be instructed to use the freeway Call Box System (if available), a cellular telephone, and/or their radio dispatch system to call for roadside assistance and to report roadside emergencies.

## 7.3 Site Traffic Control

During soil transport activities, trucks will enter Operable Unit 1 from Civic Center Boulevard. During loading operations, trucks will be staged adjacent to Operable Unit 2 in a lane closed to traffic on Beverly Boulevard. A flag person will be located at each site to assist the truck drivers to safely enter and exit the site. Drivers of onsite trucks will be in communication with the site trucking coordinator. In addition, all vehicles driving onsite will be required to maintain slow speeds (that is, less than 5 miles per hour) for safety and for dust control purposes.

Prior to exiting the site, vehicles will be swept to remove any extra soil from areas not covered or protected. A cleanup/decontamination area will be set up as close to the loading area as possible to minimize spreading the impacted soil. Prior to the offsite transport, the site manager will be responsible for inspecting each truck to check that the payloads are adequately covered, that the trucks are cleaned of excess soil and properly placarded, and that the truck manifests have been completed and signed by the generator (or its agent) and the transporter. As the trucks leave the site, the flag person will assist the truck drivers to safely merge with traffic on Civic Center Boulevard.

## 7.4 Record Keeping

The removal action contractor performing loading, transportation, and disposal of soil will be responsible for maintaining a field logbook, which will serve to document observations, personnel onsite, equipment arrival and departure times, and other important project information. Logbook entries will be complete and accurate enough to permit reconstruction of field activities. Logbooks will be bound with consecutively numbered pages, and each page will indicate the date and time of the entry. All entries will be legible, written in black or blue ink, and signed by the author. Language will be factual and objective. If an error is made, corrections will be made by crossing a line through the error and entering the correct information. Corrections will be dated and initialed.

If the soil is profiled as hazardous waste under California regulations, the Uniform Hazardous Waste Manifest form will be used to track the movement of soil from the point of generation to the point of ultimate disposition. The hazardous waste manifests will include the following information:

- Name and address of the generator, transporter, and the destination facility
- U.S. Department of Transportation description of the waste being transported and any associated hazards
- Waste quantity
- Name and phone number of a contact in case of an emergency
- EPA Hazardous Waste Generator Number
- Other information required by EPA and/or DTSC

Any soil that is profiled as non-hazardous and sent offsite for disposal will be documented using a bill of lading form. At a minimum, this form will include the following information:

- Generator name and address
- Transportation company
- Accepting facility name and address
- Waste shipping name and description

Prior to transporting the excavated soil offsite, an authorized representative of UPRR will sign each Uniform Hazardous Waste Manifest or bill of lading. The removal action site manager will maintain one copy of all Uniform Hazardous Waste Manifests or bills of lading onsite.

# 8. Site Restoration Plan

Clean imported soil from offsite sources will be placed within removal areas to establish the soil cover. The offsite sources will be identified during preparation for the proposed removal action. Before delivery of the imported fill to the work zone, fill source material samples will be collected and will be analyzed by a California-certified laboratory in accordance with DTSC Clean Fill Guidelines (DTSC, 2001). One soil sample will be collected for every 250 $yd^3$ of imported soil used up to 1,000 $yd^3$ and then one soil sample per each additional 500 $yd^3$ of imported soil used. Depending on the source of fill material, the samples may be analyzed for the following:

- Heavy metals (EPA Method 6010B)
- Organochlorine pesticides (EPA Method 8081B/8080A)
- Polynuclear aromatic hydrocarbons (EPA Method 8310 or 8270)
- VOCs (EPA Method 8021/8260B)
- SVOC by EPA Method 8270C
- PCBs (EPA Method 8082/8080A
- TPH (EPA Method 8015 Modified)
- Asbestos (Occupational Safety and Health Administration [OSHA] Method ID-191)

Samples will be reported in dry weight. Geotechnical analysis will also be performed to generate compaction curves for in-place compaction testing that will be conducted during soil cover placement operations.

Geotechnical analysis of imported fill material, including laboratory compaction tests, will be performed to generate moisture-density curves. Assuming the imported soil appears to be uniform in composition, one four-point composite sample will be collected for geotechnical analysis to generate a three-point moisture-density curve using modified Proctor methods (ASTM-D1557). If imported soil does not appear to be homogeneous, additional soil samples for geotechnical analysis will be considered. The moisture-density curves will be used to determine the optimum moisture content for in-place field density compaction testing conducted during soil cover placement operations. In-place field density compaction testing will be performed using a nuclear density gauge operated by trained personnel.

If construction/development activities within the site are conducted by BHLC soon after removal action excavation, the soil cover will not be emplaced within removal areas to allow for continued excavation and construction in accordance with the potential development plan of the site. In the event that construction permits are not obtained for development purposes prior to initiation of removal action activities conducted in accordance with this RAW, a 2-foot soil cover will be established to minimize the duration for open removal areas.

Imported soil will be placed within removal areas to establish the soil cover to meet existing surrounding grades and the boundaries of the removal areas will be established using a professional survey. Boundary monuments will be installed to establish the location of emplaced imported soil, where necessary.

Following potential soil cover placement activities, the ground surface will be seeded and maintained to reduce surface runoff and erosion. An maintenance plan will be prepared that describes the approach to conduct inspection and repairs to reduce damage to the soil cover from burrowing animals.

The maintenance plan will document how the soil cover will be maintained (such as: inspections, repairs to drainage controls, and maintenance of the two-foot-thick soil cover and vegetation) following completion of the removal action. This maintenance plan will be reviewed and approved by DTSC to ensure that the soil cover remains protective of human health and the environment.

# 9. Health and Safety Plan

Contractors involved in the removal action will be responsible for operating in accordance with the most current requirements of State and Federal Standards for Hazardous Waste Operations and Emergency Response (CCR, Title 8, Section 5192; 29 *Code of Federal Regulations* [CFR] 1910.120). Onsite personnel are responsible for operating in accordance with all applicable regulations of the Occupational Safety and Health Administration (OSHA) outlined in the State General Industry and Construction Safety Orders (CCR, Title 8) and Federal Construction Industry Standards (29 CFR 1910 and 29 CFR 1926), as well as other applicable federal, state, and local laws and regulations.

In addition, California OSHA's Construction Safety Orders (especially CCR, Title 8, Sections 1539 and 1541) will be followed as appropriate. Specific requirements are identified as follows:

- Utility locating will be conducted prior to initiating the removal action.
- No workers involved in the removal action will enter an excavation greater than 5 feet in depth.

A site-specific HASP will be prepared for the site in accordance with current health and safety standards as specified by the federal and California OSHAs and submitted to DTSC prior to initiation of field work.

The provisions of the HASP are mandatory for all personnel involved in the removal action. The contractor and its subcontractors conducting the removal action in association with this RAW will either adopt and abide by the HASP or shall develop their own safety plans that, at a minimum, meet the requirements of the HASP. All onsite personnel shall read the HASP and sign the "Plan Acceptance Form" before starting site activities.

# 10. Public Participation

The public participation requirements for the RAW process include (1) developing a community profile; (2) publishing in the Beverly Hills Courier a Public Notice of the availability of the RAW for a 30-day public review and comment period, which also describes that the site complies with the CEQA requirements; (3) making the RAW and other supporting documents available at DTSC's Chatsworth office and in the Beverly Hills Library; and (4) responding to public comments received on the RAW and CEQA documents. In accordance with a Community Profile prepared for this site, the following additional activities will be conducted:

- A fact sheet will be sent out to the site mailing list describing the site and the proposed removal action (Date to be determined).
- The public review and comment period will be 30 days.
- A public meeting or workshop will be held if there is sufficient community interest (Date to be determined).
- Site documents will be available in electronic format on DTSC's publicly accessible EnviroStor database.

Once the public comment period is completed, DTSC will review and respond to the comments received. The RAW will be revised, as necessary, to address the comments received. If significant changes to the RAW are required, the RAW will be revised and will be resubmitted for public review and comment. If significant changes are not required to the RAW, the RAW will be modified and DTSC will approve the modified RAW for implementation.

# 11. California Environmental Quality Act Documentation

CEQA, modeled after the National Environmental Policy Act of 1969, was enacted in 1970 as a system of checks and balances for land use development and management decisions in California. It is an administrative procedure developed to ensure comprehensive environmental review of cumulative impacts prior to project approval. CEQA has no agency enforcement tool; however, challenges are allowed in courts.

A CEQA project has a potential for resulting in a direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment. CEQA applies to all discretionary projects proposed to be carried out or approved by California public agencies, unless an exemption applies.

As part of DTSC's CEQA process, DTSC conducted two Biological Rarefind surveys for the Beverly Hills and Hollywood areas. DTSC concluded that these surveys do not identify any species that may exist within the site's area of potential effect. DTSC also determined that this project is considered exempt since it will not have a significant negative impact on the human health and the environment because it will prevent, minimize, stabilize, mitigate, or eliminate the release or threat of release of a hazardous waste or substance. The excavation will also not require the onsite use of a hazardous waste incinerator or thermal treatment unit, and will not require the relocation of residences or businesses. In accordance with CEQA, an Initial Study/Negative Declaration (IS/ND) has been prepared and reviewed by DTSC. This IS/ND evaluated the proposed removal action and states that the proposed removal action will not have a significant effect on human health and the environment.

# 12. References


California Department of Water Resources (DWR). 1961. *Bulletin No. 104, Planned Utilization of the Groundwater Basins of the Coastal Plan of Los Angeles County, Appendix A, Groundwater Geology*. Southern District. June.

California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). 1992. *Supplemental Guidance for Human Health Multimedia Risk Assessment of Hazardous Waste Sites and Permitted Facilities, Sacramento, CA*. July.

California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). 1997. *Selecting Inorganic Constituents as Chemicals of Potential Concern at Risk Assessments at Hazardous Waste Sites and Permitted Facilities, Final Policy*. Human and Ecological Risk Division. February.

California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). 1998. *Guidance Memorandum, Removal Action Workplans – Senate Bill 1706.* www.dtsc.ca.gov/SiteCleanup/upload/SMP_POL_RAWGuidance.pdf. September 23.

California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). 1999. Development and Implementation of Land Use Covenants.

California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). 2001. *Information Advisory, Clean Imported Fill Requirements.*

California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). 2005. *Voluntary Cleanup Agreement, Docket No. HSA-A 04/05-066, In the Matter of 9315 Civic Center Drive, Beverly Hills, CA*. February.

California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). 2007a. *Arsenic Strategies – Determination of Arsenic Remediation – Development of Arsenic Cleanup Goals for Proposed and Existing School Sites.*

California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). 2007b. *Comment Responses to Draft Risk Assessment Work Plan, Beverly Hills Land Corporation Site.* January 30.

California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). 2008. *Proven Technologies and Remedies Guidance, Remediation of Metals in Soil.* http://www.dtsc.ca.gov/SiteCleanup/PTandR.cfm#CP_JUMP_398245. August 29.

California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). 2010. *HERO Evaluation of Site Arsenic Data, Beverly Hills Land Corp. Site. December 23*.

California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). 2012. *Arsenic Cleanup Levels Regarding Lots 12 and 13 Site, Beverly Hills, California*. May 12.

California Environmental Protection Agency, State Water Resources Control Board (State Water Board). 2011. A Compilation of Water Quality Goals. http://www.waterboards.ca.gov/water_issues/programs/water_quality_goals/index.shtml. September 9.

CH2M HILL, Inc. (CH2M). 2005. *Remedial Investigation Work Plan, Beverly Hills Land Corporation Site (Lots 12 and 13)*. March.

CH2M HILL, Inc. (CH2M). 2006. *Remedial Investigation, Beverly Hills Land Corporation Site, 9315 Civic Center Drive, Beverly Hills, CA*.

CH2M HILL, Inc. (CH2M). 2007a. *Remedial Design Investigation Report, Beverly Hills Land Corporation Site (Lots 12 and 13), Beverly Hills, California*. March.

CH2M HILL, Inc. (CH2M). 2007b. *Human Health Risk Assessment*. May.

CH2M HILL, Inc. (CH2M). 2008. *Groundwater Summary Report, Beverly Hills Land Corporation Site, 9315 Civic Center Drive, Beverly Hills, California*.

CH2M HILL, Inc. (CH2M). 2010. *Well Abandonment, Monitoring Wells MW-1 and MW-2, BHLC at 9315 Civic Center Drive, Beverly Hills*, *CA.* June.

Geomatrix. 2004. *Evaluation of Off-site Dust Impacts, Union Pacific Right-of-Way, Beverly Hills Land Corporation, Beverly Hills, CA*. July 23.

Lindmark Engineering (Lindmark). 1998a. *Proposed Phase I and II Environmental Investigation, Railroad Right-of-Way between North Doheny and Alpine Drives, Beverly Hills, CA 90210*. October 2.

Lindmark Engineering (Lindmark). 1998b. *Phase I and II Environmental Investigation, Railroad Right-of-Way between North Doheny and Alpine Drives, Beverly Hills, CA 90210*. November 12.

Lindmark Engineering (Lindmark). 2003. *Stage 2 – Phase II Environmental Site Investigation, Lots 12 and 13 of the Beverly Hills Land Corporation Right-of-Way, Beverly Hills, CA*. June 30.

Richards Watson Gershon (RWG). 2003. *Results of Arsenic Reanalysis and Arsenic Investigation Performed Subsequent to the Stage 2 - Phase II Environmental Site Investigation*. Letter to Kim N. A. Boras, Esq., Latham & Watkins. December 10.

U.S. Environmental Protection Agency (EPA). 1989. *Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual (Part A).* Office of Emergency and Remedial Response. EPA/540/1-89/002. December.

U.S. Environmental Protection Agency (EPA). 1991a. *Risk Assessment Guidance for Superfund. Volume 1: Human Health Evaluation Manual. Supplemental Guidance*. Standard Default Exposure Factors. Office of Emergency and Remedial Response, Toxics Integration Branch. March 25.

U.S. Environmental Protection Agency (EPA). 1991b. *Risk Assessment Guidance for Superfund. Volume I – Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals)*. Publication 9285.701B.

U.S. Environmental Protection Agency (EPA). 2002. *Contract Laboratory National Functional Guidelines for Inorganic Data Review*. July.

U.S. Environmental Protection Agency (EPA). 2004. *Region 9 Preliminary Remediation Goals*. http://www.epa.gov/region09/waste/sfund/prg/files/04prgtable.pdf. October.

U.S. Environmental Protection Agency (EPA). 2011a. *ProUCL Version 4.1.00 Technical Guide (Draft)*. Office of Research and Development. February.

U.S. Environmental Protection Agency (EPA). 2011b. *ProUCL Version 4.1.00, Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations*. Office of Research and Development. February.

U.S. Environmental Protection Agency (EPA). 2012. *Regional Screening Levels (Formerly PRGs)*. http://www.epa.gov/region09/superfund/prg/index.html. May.

# Tables

**Table 1. Arsenic Soil Leachate and Bioavailability Results**

*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site, 9315 Civic Center Drive, Beverly Hills, California*

| Location | Arsenic Soil Target (STL data) | | Arsenic STLC Test (STL data) | | Arsenic Bioavailability (CH2M HILL data) | | | |
|---|---|---|---|---|---|---|---|---|
| | Total | | | | Total | Total | Bioavailable | Extractable Fraction |
| | mg/kg wet wt | Qual | mg/L | Qual | mg/kg dry wt * | mg/kg wet wt ** | mg/kg | percent |
| **SB02-02** | 24 | | 1 | U | 58.4 | 50.8 | 9.53 | 16.3 |
| **SB02-05** | 29.5 | | 1 | U | 30 | 26.1 | 1.69 | 5.6 |
| **SB02-05D** | 22.2 | | 1 | U | 34 | 29.6 | 2.12 | 6.2 |
| **SB05-02** | 84.5 | | 2.1 | | 296 | 257.4 | 85.8 | 29 |
| **SB05-02D** | 90.5 | | 2 | | 356 | 309.6 | 116 | 32.6 |
| **SB05-05** | 68 | | 1 | U | 175 | 152.2 | 72.6 | 41.5 |
| **SB05-10** | 16.6 | | 1 | U | NA | NA | NA | NA |
| **SB08-02** | 55.5 | | 1 | U | 88.8 | 77.2 | 37.4 | 42.1 |
| **SB08-05** | 23.5 | | 1 | U | NA | NA | NA | NA |
| **SB11-02** | 10.2 | | 1 | U | 16.2 | 14.1 | 1.85 | 11.4 |
| **SB11-05** | 20.7 | | 1 | U | 34 | 29.6 | 8.59 | 25.3 |

* sample was sieved to yield particles less than 500 uM for the bioavailability test

** converted dry wt data to wet wt data assuming a moisture content of 15 percent

**Table 2. Summary of Analytical Soil Data for Arsenic**
*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site*
*9315 Civic Center Drive, Beverly Hills, California*

| | | | | Arsenic |
|---|---|---|---|---|
| Location | Sample Date | Depth | Type | Analytical Data (mg/kg) |
| A1 | 1998 | 0.5 - 1 | N | 25.6 |
| | 1998 | 2 - 2.5 | N | 120 |
| | 1998 | 5 - 5.5 | N | 21.6 |
| A2 | 1998 | 2 - 2.5 | N | 66.1 |
| | 1998 | 5 - 5.5 | N | 21 |
| A3 | 1998 | 0.5 - 1 | N | 137 |
| | 1998 | 2 - 2.5 | N | 54.2 |
| | 1998 | 5 - 5.5 | N | 10.4 |
| A4 | 1998 | 0.5 - 1 | N | 150 |
| | 1998 | 2 - 2.5 | N | 36 |
| | 1998 | 5 - 5.5 | N | 14.4 |
| A5 | 1998 | 0.5 - 1 | N | 71.7 |
| | 1998 | 2 - 2.5 | N | 97.6 |
| | 1998 | 5 - 5.5 | N | 16.5 |
| A6 | 1998 | 0.5 - 1 | N | 14.8 |
| | 1998 | 2 - 2.5 | N | 22.1 |
| | 1998 | 5 - 5.5 | N | 12.6 |
| A7 | 1998 | 0.5 - 1 | N | 15.2 |
| | 1998 | 2 - 2.5 | N | 24.3 |
| | 1998 | 5 - 5.5 | N | 11.1 |
| A8 | 1998 | 0.5 - 1 | N | 14.2 |
| | 1998 | 2 - 2.5 | N | 26.9 |
| | 1998 | 5 - 5.5 | N | 21 |
| A9 | 1998 | 0.5 - 1 | N | 173 |
| | 1998 | 2 - 2.5 | N | 84.8 |
| | 1998 | 5 - 5.5 | N | 34.6 |
| A10 | 1998 | 0.5 - 1 | N | 38.7 |
| | 1998 | 2 - 2.5 | N | 83.3 |
| | 1998 | 5 - 5.5 | N | 5.52 |
| A11 | 1998 | 0.5 - 1 | N | 74.9 |
| | 1998 | 2 - 2.5 | N | 75 |
| | 1998 | 5 - 5.5 | N | 146 |
| A12 | 1998 | 0.5 - 1 | N | 426 |
| | 1998 | 2 - 2.5 | N | 198 |
| | 1998 | 5 - 5.5 | N | 11.2 |
| A13 | 1998 | 0.5 - 1 | N | 171 |
| | 1998 | 2 - 2.5 | N | 264 |
| | 1998 | 5 - 5.5 | N | 7.39 |
| A14 | 1998 | 2 - 2.5 | N | 59.9 |
| | 1998 | 5 - 5.5 | N | 14.3 |

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**Table 2. Summary of Analytical Soil Data for Arsenic**
*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site*
*9315 Civic Center Drive, Beverly Hills, California*

| | | | | Arsenic |
|---|---|---|---|---|
| Location | Sample Date | Depth | Type | Analytical Data (mg/kg) |
| A15 | 1998 | 0.5 - 1 | N | 130 |
| | 1998 | 2 - 2.5 | N | 118 |
| | 1998 | 5 - 5.5 | N | 9.11 |
| A16 | 1998 | 0.5 - 1 | N | 6.67 |
| | 1998 | 2 - 2.5 | N | 58.9 |
| | 1998 | 5 - 5.5 | N | 73.3 |
| A17 | 1998 | 0.5 - 1 | N | 163 |
| | 1998 | 2 - 2.5 | N | 94.9 |
| | 1998 | 5 - 5.5 | N | 6.16 |
| A18 | 1998 | 0.5 - 1 | N | 74.9 |
| | 1998 | 2 - 2.5 | N | 996 |
| | 1998 | 5 - 5.5 | N | 8.81 |
| A19 | 1998 | 0.5 - 1 | N | 141 |
| | 1998 | 2 - 2.5 | N | 109 |
| | 1998 | 5 - 5.5 | N | 43.9 |
| A20 | 1998 | 0.5 - 1 | N | 68.4 |
| | 1998 | 2 - 2.5 | N | 33.9 |
| | 1998 | 5 - 5.5 | N | 5.57 |
| A21 | 1998 | 0.5 - 1 | N | 158 |
| | 1998 | 10 - 10.5 | N | 18.7 |
| | 1998 | 15 - 15.5 | N | 16.1 |
| A22 | 1998 | 0.5 - 1 | N | 37 |
| | 1998 | 10 - 10.5 | N | 20.3 |
| | 1998 | 15 - 15.5 | N | 6.58 |
| A23 | 1998 | 0.5 - 1 | N | 123 |
| | 1998 | 10 - 10.5 | N | 13.3 |
| | 1998 | 15 - 15.5 | N | 8.23 |
| A24 | 1998 | 0.5 - 1 | N | 101 |
| | 1998 | 10 - 10.5 | N | 6.54 |
| | 1998 | 15 - 15.5 | N | 5.11 |
| A25 | 1998 | 0.5 - 1 | N | 104 |
| | 1998 | 10 - 10.5 | N | 6.31 |
| | 1998 | 15 - 15.5 | N | 5.8 |
| A26 | 1998 | 0.5 - 1 | N | 164 |
| | 1998 | 10 - 10.5 | N | 2.34 |
| | 1998 | 15 - 15.5 | N | 1.98 |
| A27 | 1998 | 0.5 - 1 | N | 27.6 |
| | 1998 | 2 - 2.5 | N | 224 |
| | 1998 | 5 - 5.5 | N | 169 |

**Table 2. Summary of Analytical Soil Data for Arsenic**

*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site*

*9315 Civic Center Drive, Beverly Hills, California*

| | | | | Arsenic |
|---|---|---|---|---|
| Location | Sample Date | Depth | Type | Analytical Data (mg/kg) |
| A28 | 1998 | 0.5 - 1 | N | 25.3 |
| | 1998 | 2 - 2.5 | N | 171 |
| | 1998 | 5 - 5.5 | N | 79.7 |
| A29 | 1998 | 0.5 - 1 | N | 88.1 |
| | 1998 | 2 - 2.5 | N | 124 |
| | 1998 | 5 - 5.5 | N | 22.2 |
| A30 | 1998 | 0.5 - 1 | N | 132 |
| | 1998 | 2 - 2.5 | N | 27.1 |
| | 1998 | 5 - 5.5 | N | 23.2 |
| A31 | 1998 | 0.5 - 1 | N | 16 |
| | 1998 | 2 - 2.5 | N | 156 |
| | 1998 | 5 - 5.5 | N | 23.5 |
| A32 | 1998 | 0.5 - 1 | N | 39.5 |
| | 1998 | 2 - 2.5 | N | 23.1 |
| | 1998 | 5 - 5.5 | N | 62 |
| A33 | 1998 | 0.5 - 1 | N | 296 |
| | 1998 | 2 - 2.5 | N | 18.8 |
| | 1998 | 5 - 5.5 | N | 17 |
| A34 | 1998 | 0.5 - 1 | N | 23.8 |
| | 1998 | 2 - 2.5 | N | 108 |
| | 1998 | 5 - 5.5 | N | 19.9 |
| A35 | 1998 | 0.5 - 1 | N | 15.4 |
| | 1998 | 2 - 2.5 | N | 25.5 |
| | 1998 | 5 - 5.5 | N | 68.2 |
| A36 | 1998 | 0.5 - 1 | N | 251 |
| | 1998 | 2 - 2.5 | N | 22.9 |
| | 1998 | 5 - 5.5 | N | 18.5 |
| A37 | 1998 | 0.5 - 1 | N | 18.4 |
| | 1998 | 2 - 2.5 | N | 15.4 |
| | 1998 | 5 - 5.5 | N | 71.9 |
| A38 | 1998 | 0.5 - 1 | N | 39.8 |
| | 1998 | 2 - 2.5 | N | 78.7 |
| | 1998 | 5 - 5.5 | N | 19.7 |
| A39 | 1998 | 0.5 - 1 | N | 16.7 |
| | 1998 | 2 - 2.5 | N | 169 |
| | 1998 | 5 - 5.5 | N | 336 |
| A40 | 1998 | 0.5 - 1 | N | 126 |
| | 1998 | 2 - 2.5 | N | 223 |
| | 1998 | 5 - 5.5 | N | 114 |

**Table 2. Summary of Analytical Soil Data for Arsenic**
*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site*
*9315 Civic Center Drive, Beverly Hills, California*

| | | | | Arsenic |
|---|---|---|---|---|
| Location | Sample Date | Depth | Type | Analytical Data (mg/kg) |
| A41 | 1998 | 0.5 - 1 | N | 48.4 |
| | 1998 | 2 - 2.5 | N | 67 |
| | 1998 | 5 - 5.5 | N | 13.8 |
| A42 | 1998 | 0.5 - 1 | N | 190 |
| | 1998 | 2 - 2.5 | N | 296 |
| | 1998 | 5 - 5.5 | N | 223 |
| A43 | 1998 | 0.5 - 1 | N | 85.7 |
| | 1998 | 2 - 2.5 | N | 118 |
| | 1998 | 5 - 5.5 | N | 60.7 |
| A44 | 1998 | 0.5 - 1 | N | 24.8 |
| | 1998 | 2 - 2.5 | N | 22.3 |
| | 1998 | 5 - 5.5 | N | 141 |
| A45 | 1998 | 0.5 - 1 | N | 92.9 |
| | 1998 | 2 - 2.5 | N | 114 |
| | 1998 | 5 - 5.5 | N | 19.2 |
| A46 | 1998 | 0.5 - 1 | N | 94.8 |
| | 1998 | 2 - 2.5 | N | 108 |
| | 1998 | 5 - 5.5 | N | 164 |
| A47 | 1998 | 0.5 - 1 | N | 94.3 |
| | 1998 | 2 - 2.5 | N | 135 |
| | 1998 | 5 - 5.5 | N | 20.7 |
| A48 | 1998 | 2 - 2.5 | N | 46.4 |
| | 1998 | 5 - 5.5 | N | 13.9 |
| A49 | 1998 | 0.5 - 1 | N | 39.9 |
| | 1998 | 2 - 2.5 | N | 41.1 |
| | 1998 | 5 - 5.5 | N | 19.8 |
| A50 | 1998 | 0.5 - 1 | N | 16.7 |
| | 1998 | 2 - 2.5 | N | 0.55 |
| | 1998 | 5 - 5.5 | N | 5.24 |
| A51 | 1998 | 0.5 - 1 | N | 86.1 |
| | 1998 | 2 - 2.5 | N | 12.4 |
| | 1998 | 5 - 5.5 | N | 5 |
| A52 | 1998 | 0.5 - 1 | N | 134 |
| | 1998 | 2 - 2.5 | N | 4.96 |
| | 1998 | 5 - 5.5 | N | 4.33 |
| A53 | 1998 | 0.5 - 1 | N | 258 |
| | 1998 | 2 - 2.5 | N | 180 |
| | 1998 | 5 - 5.5 | N | 5.69 |
| A54 | 1998 | 0.5 - 1 | N | 266 |
| | 1998 | 2 - 2.5 | N | 148 |

**Table 2. Summary of Analytical Soil Data for Arsenic**
*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site*
*9315 Civic Center Drive, Beverly Hills, California*

| | | | | Arsenic |
|---|---|---|---|---|
| Location | Sample Date | Depth | Type | Analytical Data (mg/kg) |
| | 1998 | 5 - 5.5 | N | 9.89 |
| A55 | 1998 | 0.5 - 1 | N | 68 |
| | 1998 | 2 - 2.5 | N | 137 |
| | 1998 | 5 - 5.5 | N | 5.51 |
| A56 | 1998 | 0.5 - 1 | N | 99.5 |
| | 1998 | 2 - 2.5 | N | 44.7 |
| | 1998 | 5 - 5.5 | N | 13 |
| A57 | 1998 | 0.5 - 1 | N | 14.7 |
| | 1998 | 2 - 2.5 | N | 19.9 |
| | 1998 | 5 - 5.5 | N | 102 |
| A58 | 1998 | 0.5 - 1 | N | 17.6 |
| | 1998 | 2 - 2.5 | N | 12.6 |
| | 1998 | 5 - 5.5 | N | 15.5 |
| A59 | 1998 | 0.5 - 1 | N | 15.6 |
| | 1998 | 2 - 2.5 | N | 119 |
| | 1998 | 5 - 5.5 | N | 20 |
| A60 | 1998 | 0.5 - 1 | N | 16.3 |
| | 1998 | 2 - 2.5 | N | 5 |
| | 1998 | 5 - 5.5 | N | 5.92 |
| A61 | 1998 | 0.5 - 1 | N | 61.7 |
| | 1998 | 2 - 2.5 | N | 36.7 |
| | 1998 | 5 - 5.5 | N | 5.07 |
| A62 | 1998 | 0.5 - 1 | N | 10.1 |
| | 1998 | 2 - 2.5 | N | 18.4 |
| | 1998 | 5 - 5.5 | N | 27.3 |
| A63 | 1998 | 0.5 - 1 | N | 17.4 |
| | 1998 | 2 - 2.5 | N | 20.6 |
| | 1998 | 5 - 5.5 | N | 203 |
| A64 | 1998 | 0.5 - 1 | N | 44.7 |
| | 1998 | 2 - 2.5 | N | 15.5 |
| | 1998 | 5 - 5.5 | N | 11.9 |
| A65 | 1998 | 0.5 - 1 | N | 17.5 |
| | 1998 | 2 - 2.5 | N | 9.8 |
| | 1998 | 5 - 5.5 | N | 19.7 |
| A66 | 1998 | 0.5 - 1 | N | 21.8 |
| | 1998 | 2 - 2.5 | N | 14.6 |
| | 1998 | 5 - 5.5 | N | 6.45 |
| A100 | 7/24/2007 | 5 - 5.5 | N | 22 |
| A101 | 7/24/2007 | 5 - 5.5 | N | 27 |
| | 7/24/2007 | 7 - 7.5 | N | 22 |
| A102 | 7/24/2007 | 5 - 5.5 | N | 26 |

**Table 2. Summary of Analytical Soil Data for Arsenic**
*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site*
*9315 Civic Center Drive, Beverly Hills, California*

| | | | | Arsenic |
|---|---|---|---|---|
| Location | Sample Date | Depth | Type | Analytical Data (mg/kg) |
| A103 | 7/24/2007 | 5 - 5.5 | N | 24 |
| A104 | 7/24/2007 | 5 - 5.5 | N | 20 |
| A105 | 7/24/2007 | 5 - 5.5 | N | 24 |
| A106 | 7/24/2007 | 5 - 5.5 | N | 22 |
| A107 | 7/24/2007 | 5 - 5.5 | N | 22 |
| A108 | 7/24/2007 | 5 - 5.5 | N | 50 |
| | 7/24/2007 | 7 - 7.5 | N | 40 |
| | 7/24/2007 | 10 - 10.5 | N | 24 |
| A109 | 7/24/2007 | 5 - 5.5 | N | 29 |
| | 7/24/2007 | 10 - 10.5 | N | 20 |
| A110 | 7/24/2007 | 5 - 5.5 | N | 22 |
| A111 | 7/24/2007 | 5 - 5.5 | N | 28 |
| | 7/24/2007 | 7 - 7.5 | N | 15 |
| A112 | 7/24/2007 | 5 - 5.5 | N | 21 |
| A113 | 7/24/2007 | 5 - 5.5 | N | 31 |
| | 7/24/2007 | 5 - 5.5 | FD | 21 |
| | 7/24/2007 | 7 - 7.5 | N | 19 |
| A114 | 7/24/2007 | 5 - 5.5 | N | 22 |
| A115 | 7/24/2007 | 5 - 5.5 | N | 23 |
| | 7/24/2007 | 5 - 5.5 | FD | 21 |
| A116 | 7/26/2007 | 5 - 5.5 | N | 18 |
| A117 | 7/26/2007 | 5 - 5.5 | N | 19 |
| A118 | 7/26/2007 | 5 - 5.5 | N | 17 |
| A119 | 7/26/2007 | 5 - 5.5 | N | 14 |
| A120 | 7/26/2007 | 5 - 5.5 | N | 20 |
| A121 | 7/26/2007 | 5 - 5.5 | N | 11 |
| A122 | 7/26/2007 | 5 - 5.5 | N | 13 |
| A123 | 7/26/2007 | 5 - 5.5 | N | 10 |
| A124 | 7/23/2007 | 5 - 5.5 | N | 20 |
| A125 | 7/23/2007 | 5 - 5.5 | N | 20 |
| A126 | 7/23/2007 | 5 - 5.5 | N | 20 |
| A127 | 7/23/2007 | 5 - 5.5 | N | 22 |
| A128 | 7/23/2007 | 5 - 5.5 | N | 22 |
| A129 | 7/23/2007 | 5 - 5.5 | N | 20 |
| A130 | 7/23/2007 | 5 - 5.5 | N | 24 |
| A131 | 7/23/2007 | 5 - 5.5 | N | 23 |
| A132 | 7/23/2007 | 5 - 5.5 | N | 19 |
| A133 | 7/23/2007 | 5 - 5.5 | N | 21 |
| A134 | 7/23/2007 | 5 - 5.5 | N | 24 |
| A135 | 7/23/2007 | 5 - 5.5 | N | 22 J |

**Table 2. Summary of Analytical Soil Data for Arsenic**
*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site*
*9315 Civic Center Drive, Beverly Hills, California*

| | | | | Arsenic |
|---|---|---|---|---|
| Location | Sample Date | Depth | Type | Analytical Data (mg/kg) |
| A136 | 7/24/2007 | 5 - 5.5 | N | 11 |
| A137 | 7/24/2007 | 5 - 5.5 | N | 21 |
| A138 | 7/24/2007 | 5 - 5.5 | N | 16 |
| | 7/24/2007 | 5 - 5.5 | FD | 11 |
| A139 | 7/24/2007 | 5 - 5.5 | N | 20 |
| A140 | 7/24/2007 | 5 - 5.5 | N | 9.6 |
| A141 | 7/25/2007 | 5 - 5.5 | N | 12 |
| A142 | 7/25/2007 | 5 - 5.5 | N | 17 |
| A143 | 7/25/2007 | 5 - 5.5 | N | 10 |
| A144 | 7/25/2007 | 5 - 5.5 | N | 8.6 |
| A145 | 7/25/2007 | 5 - 5.5 | N | 9.1 |
| A146 | 7/25/2007 | 5 - 5.5 | N | 10 |
| A147 | 7/25/2007 | 5 - 5.5 | N | 7.7 |
| A148 | 7/25/2007 | 5 - 5.5 | N | 12 |
| A149 | 7/25/2007 | 5 - 5.5 | N | 7.7 |
| A150 | 7/25/2007 | 5 - 5.5 | N | 9.7 |
| A151 | 7/25/2007 | 5 - 5.5 | N | 7.3 |
| A153 | 7/25/2007 | 5 - 5.5 | N | 9.3 |
| A154 | 7/25/2007 | 5 - 5.5 | N | 8 |
| A155 | 7/25/2007 | 5 - 5.5 | N | 8 |
| BK-1 | 2006 | 2 - 2.5 | N | 27.3 |
| | 2006 | 5 - 5.5 | N | 23.6 |
| BK-1D | 2006 | 2 - 2.5 | N | 26.8 |
| BK-2 | 2006 | 2 - 2.5 | N | 20.9 |
| | 2006 | 5 - 5.5 | N | 17.4 |
| BK-3 | 2006 | 2 - 2.5 | N | 21.5 |
| | 2006 | 5 - 5.5 | N | 14.4 |
| BK-4 | 2006 | 2 - 2.5 | N | 8.5 |
| | 2006 | 5 - 5.5 | N | 7.5 |
| BK-5 | 2006 | 2 - 2.5 | N | 10.6 |
| | 2006 | 5 - 5.5 | N | 10.6 |
| DTSC-BHLC-BCKG-1 | UNK | 8 - 8.5 | N | 11 |
| DTSC-BHLC-BCKG-1 - CH2M HILL | UNK | 5 - 5.5 | N | 15.4 |
| | UNK | 8 - 8.5 | N | 28.8 |
| DTSC-BHLC-BCKG-2 | UNK | 5 - 5.5 | N | 13 |
| DTSC-BHLC-BCKG-3 | UNK | 5 - 5.5 | N | 10 |
| DTSC-BHLC-BCKG-4 | UNK | 8 - 8.5 | N | 14 |
| LE1 | 2003 | 2 - 2.5 | N | 36.2 |
| | 2003 | 5 - 5.5 | N | 26.2 |

**Table 2. Summary of Analytical Soil Data for Arsenic**
*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site*
*9315 Civic Center Drive, Beverly Hills, California*

| | | | | Arsenic |
|---|---|---|---|---|
| Location | Sample Date | Depth | Type | Analytical Data (mg/kg) |
| | 2003 | 15 - 15.5 | N | 21.9 |
| | 2003 | 25 - 25.5 | N | 16.3 |
| | 2003 | 35 - 35.5 | N | 18 |
| | 2003 | 45 - 45.5 | N | 14.5 |
| LE2 | 2003 | 2 - 2.5 | N | 188 |
| | 2003 | 5 - 5.5 | N | 120 |
| LE3 | 2003 | 2 - 2.5 | N | 130 |
| | 2003 | 5 - 5.5 | N | 22.6 |
| LE4 | 2003 | 2 - 2.5 | N | 25.8 |
| | 2003 | 5 - 5.5 | N | 25.3 |
| | 2003 | 15 - 15.5 | N | 5.03 |
| | 2003 | 25 - 25.5 | N | 13.3 |
| | 2003 | 35 - 35.5 | N | 12 |
| | 2003 | 45 - 45.5 | N | 16.7 |
| LE5 | 2003 | 2 - 2.5 | N | 16.7 |
| | 2003 | 5 - 5.5 | N | 38.8 |
| LE6 | 2003 | 2 - 2.5 | N | 25.2 |
| | 2003 | 5 - 5.5 | N | 23.2 |
| LE7 | 2003 | 2 - 2.5 | N | 196 |
| | 2003 | 5 - 5.5 | N | 21 |
| | 2003 | 15 - 15.5 | N | 19.4 |
| | 2003 | 25 - 25.5 | N | 14.4 |
| | 2003 | 35 - 35.5 | N | 16.4 |
| | 2003 | 45 - 45.5 | N | 20 |
| LE8 | 2003 | 2 - 2.5 | N | 146 |
| | 2003 | 5 - 5.5 | N | 18.6 |
| LE9 | 2003 | 2 - 2.5 | N | 194 |
| | 2003 | 5 - 5.5 | N | 15.6 |
| LE10 | 2003 | 2 - 2.5 | N | 197 |
| | 2003 | 5 - 5.5 | N | 20.8 |
| | 2003 | 15 - 15.5 | N | 14.7 |
| | 2003 | 25 - 25.5 | N | 12.3 |
| | 2003 | 35 - 35.5 | N | 13.7 |
| | 2003 | 45 - 45.5 | N | 17.7 |
| LE11 | 2003 | 2 - 2.5 | N | 168 |
| | 2003 | 5 - 5.5 | N | 17.2 |
| LE12 | 2003 | 2 - 2.5 | N | 201 |
| | 2003 | 5 - 5.5 | N | 25.4 |
| LE13 | 2003 | 2 - 2.5 | N | 53.6 |
| | 2003 | 5 - 5.5 | N | 23 |

**Table 2. Summary of Analytical Soil Data for Arsenic**
*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site*
*9315 Civic Center Drive, Beverly Hills, California*

| | | | | Arsenic |
|---|---|---|---|---|
| Location | Sample Date | Depth | Type | Analytical Data (mg/kg) |
| | 2003 | 15 - 15.5 | N | 12.4 |
| | 2003 | 25 - 25.5 | N | 16.4 |
| | 2003 | 35 - 35.5 | N | 10.3 |
| | 2003 | 45 - 45.5 | N | 17.6 |
| LE14 | 2003 | 2 - 2.5 | N | 187 |
| | 2003 | 5 - 5.5 | N | 13.4 |
| LE15 | 2003 | 2 - 2.5 | N | 18.5 |
| | 2003 | 5 - 5.5 | N | 13.1 |
| LE16 | 2003 | 2 - 2.5 | N | 107 |
| | 2003 | 5 - 5.5 | N | 15.5 |
| LE17 | 2003 | 2 - 2.5 | N | 30.1 |
| | 2003 | 5 - 5.5 | N | 17.6 |
| LE18 | 2003 | 2 - 2.5 | N | 18.6 |
| | 2003 | 5 - 5.5 | N | 18.6 |
| LE19 | 2003 | 2 - 2.5 | N | 191 |
| | 2003 | 5 - 5.5 | N | 229 |
| | 2003 | 15 - 15.5 | N | 10.7 |
| | 2003 | 25 - 25.5 | N | 15.3 |
| | 2003 | 35 - 35.5 | N | 16.2 |
| | 2003 | 45 - 45.5 | N | 11.3 |
| LE20 | 2003 | 2 - 2.5 | N | 63.7 |
| | 2003 | 5 - 5.5 | N | 143 |
| LE21 | 2003 | 2 - 2.5 | N | 98.4 |
| | 2003 | 5 - 5.5 | N | 21 |
| LE22 | 2003 | 2 - 2.5 | N | 12.7 |
| | 2003 | 5 - 5.5 | N | 22 |
| | 2003 | 15 - 15.5 | N | 8.62 |
| | 2003 | 25 - 25.5 | N | 22.1 |
| | 2003 | 35 - 35.5 | N | 12.7 |
| | 2003 | 45 - 45.5 | N | 17 |
| LE23 | 2003 | 2 - 2.5 | N | 114 |
| | 2003 | 5 - 5.5 | N | 208 |
| LE24 | 2003 | 2 - 2.5 | N | 142 |
| | 2003 | 5 - 5.5 | N | 17.6 |
| LE25 | 2003 | 2 - 2.5 | N | 92.3 |
| | 2003 | 5 - 5.5 | N | 6.84 |
| | 2003 | 15 - 15.5 | N | 7.51 |
| | 2003 | 25 - 25.5 | N | 19.1 |
| | 2003 | 35 - 35.5 | N | 16 |
| | 2003 | 45 - 45.5 | N | 43.2 |

**Table 2. Summary of Analytical Soil Data for Arsenic**
*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site*
*9315 Civic Center Drive, Beverly Hills, California*

| | | | | Arsenic |
|---|---|---|---|---|
| Location | Sample Date | Depth | Type | Analytical Data (mg/kg) |
| LE26 | 2003 | 2 - 2.5 | N | 29 |
| | 2003 | 5 - 5.5 | N | 10.7 |
| LE27 | 2003 | 2 - 2.5 | N | 1.04 |
| | 2003 | 5 - 5.5 | N | 9.57 |
| LE28 | 2003 | 2 - 2.5 | N | 9.03 |
| | 2003 | 5 - 5.5 | N | 8.4 |
| | 2003 | 15 - 15.5 | N | 7.13 |
| | 2003 | 25 - 25.5 | N | 10.2 |
| | 2003 | 35 - 35.5 | N | 20.1 |
| | 2003 | 45 - 45.5 | N | 20.7 |
| LE29 | 2003 | 2 - 2.5 | N | 54.2 |
| | 2003 | 5 - 5.5 | N | 10.9 |
| LE30 | 2003 | 2 - 2.5 | N | 155 |
| | 2003 | 5 - 5.5 | N | 95.7 |
| LE31 | 2003 | 2 - 2.5 | N | 7.8 |
| | 2003 | 5 - 5.5 | N | 12.8 |
| LE32 | 2003 | 2 - 2.5 | N | 67.6 |
| | 2003 | 5 - 5.5 | N | 10.1 |
| LE33 | 2003 | 2 - 2.5 | N | 9.08 |
| | 2003 | 5 - 5.5 | N | 7.65 |
| LE34 | 2003 | 2 - 2.5 | N | 45.1 |
| | 2003 | 5 - 5.5 | N | 7.34 |
| LE35 | 2003 | 2 - 2.5 | N | 23.1 |
| | 2003 | 5 - 5.5 | N | 7.49 |
| LE36 | 2003 | 2 - 2.5 | N | 8.21 |
| | 2003 | 5 - 5.5 | N | 122 |
| MW-1 | 9/14/2009 | 0.5 | N | 63 |
| | 9/14/2009 | 6 | N | 23 |
| | 9/14/2009 | 10 | N | 19 |
| | 9/14/2009 | 20 | N | 17 |
| | 9/14/2009 | 20 | FD | 17 |
| | 9/14/2009 | 30 | N | 9.5 |
| | 9/14/2009 | 40 | N | 15 |
| | 9/14/2009 | 50 | N | 16 |
| MW-2 | 9/15/2009 | 0.5 | N | 350 |
| | 9/15/2009 | 5 | N | 2.4 J |
| | 9/15/2009 | 5 | FD | 25 J |
| | 9/15/2009 | 10 | N | 8.1 |
| | 9/15/2009 | 20 | N | 3.1 J |
| | 9/15/2009 | 30 | N | 21 |

**Table 2. Summary of Analytical Soil Data for Arsenic**
*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site*
*9315 Civic Center Drive, Beverly Hills, California*

| Location | Sample Date | Depth | Type | Arsenic Analytical Data (mg/kg) |
|---|---|---|---|---|
| | 9/15/2009 | 35 | N | 15 |
| SB1 | 2006 | 2 - 2.5 | N | 37.4 |
| | 2006 | 2 - 2.5 | FD | 31.3 |
| | 2006 | 5 - 5.5 | N | 17.3 |
| | 2006 | 10 - 10.5 | N | 41.9 |
| | 2006 | 20 - 20.5 | N | 7.2 |
| | 2006 | 30 - 30.5 | N | 16.8 |
| | 2006 | 39 - 39.5 | N | 20 |
| | 2006 | 50 - 50.5 | N | 15.5 |
| SB2 | 2006 | 2 - 2.5 | N | 24 |
| | 2006 | 5 - 5.5 | N | 29.5 |
| | 2006 | 5 - 5.5 | FD | 22.2 |
| | 2006 | 10 - 10.5 | N | 160 |
| | 2006 | 20 - 20.5 | N | 9.9 |
| | 2006 | 30 - 30.5 | N | 152 |
| | 2006 | 40 - 40.5 | N | 25.7 |
| | 2006 | 50 - 50.5 | N | 14.5 |
| SB3 | 2006 | 2 - 2.5 | N | 44.9 |
| | 2006 | 5 - 5.5 | N | 18.2 |
| | 2006 | 10 - 10.5 | N | 23.2 |
| | 2006 | 20 - 20.5 | N | 12.2 |
| | 2006 | 20 - 20.5 | FD | 8 |
| | 2006 | 30 - 30.5 | N | 21.5 |
| | 2006 | 40 - 40.5 | N | 15.7 |
| | 2006 | 50 - 50.5 | N | 12.9 |
| SB4 | 2006 | 2 - 2.5 | N | 16.8 |
| | 2006 | 5 - 5.5 | N | 19.2 |
| | 2006 | 10 - 10.5 | N | 23.1 |
| | 2006 | 20 - 20.5 | N | 15.4 |
| | 2006 | 30 - 30.5 | N | 18.8 |
| | 2006 | 40 - 40.5 | N | 13.1 |
| | 2006 | 50 - 50.5 | N | 14.3 |
| SB5 | 2006 | 2 - 2.5 | N | 84.5 |
| | 2006 | 2 - 2.5 | FD | 90.5 |
| | 2006 | 5 - 5.5 | N | 68 |
| | 2006 | 10 - 10.5 | N | 16.6 |
| | 2006 | 20 - 20.5 | N | 17.7 |
| | 2006 | 30 - 30.5 | N | 21.5 |
| | 2006 | 40 - 40.5 | N | 14.8 |
| | 2006 | 50 - 50.5 | N | 13.6 |

**Table 2. Summary of Analytical Soil Data for Arsenic**
*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site*
*9315 Civic Center Drive, Beverly Hills, California*

| | | | | Arsenic |
|---|---|---|---|---|
| Location | Sample Date | Depth | Type | Analytical Data (mg/kg) |
| SB6 | 2006 | 2 - 2.5 | N | 19.1 |
| | 2006 | 5 - 5.5 | N | 25.4 |
| | 2006 | 5 - 5.5 | FD | 13.4 |
| | 2006 | 10 - 10.5 | N | 24.6 |
| | 2006 | 20 - 20.5 | N | 16.7 |
| | 2006 | 30 - 30.5 | N | 12.1 |
| | 2006 | 38 - 38.5 | N | 11.3 |
| | 2006 | 50 - 50.5 | N | 18.5 |
| SB7 | 2006 | 2 - 2.5 | N | 34.3 |
| | 2006 | 5 - 5.5 | N | 26.2 |
| | 2006 | 10 - 10.5 | N | 16.9 |
| | 2006 | 10 - 10.5 | FD | 15.8 |
| | 2006 | 20 - 20.5 | N | 16.4 |
| | 2006 | 30 - 30.5 | N | 12.1 |
| | 2006 | 40 - 40.5 | N | 22 |
| SB8 | 2006 | 2 - 2.5 | N | 55.5 |
| | 2006 | 5 - 5.5 | N | 23.5 |
| | 2006 | 10 - 10.5 | N | 16.3 |
| | 2006 | 20 - 20.5 | N | 13.2 |
| | 2006 | 20 - 20.5 | FD | 51.9 |
| | 2006 | 30 - 30.5 | N | 13.4 |
| | 2006 | 40 - 40.5 | N | 28.3 |
| SB9 | 2006 | 2 - 2.5 | N | 52.6 |
| | 2006 | 5 - 5.5 | N | 23.2 |
| | 2006 | 10 - 10.5 | N | 14.9 |
| | 2006 | 20 - 20.5 | N | 14.8 |
| | 2006 | 30 - 30.5 | N | 14.4 |
| | 2006 | 40 - 40.5 | N | 17.9 |
| SB10 | 2006 | 2 - 2.5 | N | 17.6 |
| | 2006 | 5 - 5.5 | N | 11.2 |
| | 2006 | 10 - 10.5 | N | 10.5 |
| | 2006 | 20 - 20.5 | N | 12.1 |
| | 2006 | 20 - 20.5 | FD | 13.6 |
| | 2006 | 30 - 30.5 | N | 18.9 |
| SB11 | 2006 | 2 - 2.5 | N | 10.2 |
| | 2006 | 5 - 5.5 | N | 20.7 |
| | 2006 | 10.5 - 11 | N | 21.6 |
| | 2006 | 10.5 - 11 | FD | 12.1 |
| | 2006 | 20 - 20.5 | N | 13.6 |
| | 2006 | 30 - 30.5 | N | 14.1 |

**Table 2. Summary of Analytical Soil Data for Arsenic**
*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site*
*9315 Civic Center Drive, Beverly Hills, California*

| | | | | Arsenic |
|---|---|---|---|---|
| Location | Sample Date | Depth | Type | Analytical Data (mg/kg) |
| SB12 | 2006 | 2 - 2.5 | N | 11.1 |
| | 2006 | 5 - 5.5 | N | 10 |
| | 2006 | 10 - 10.5 | N | 9.5 |
| | 2006 | 19 - 19.5 | N | 12.6 |
| | 2006 | 30 - 30.5 | N | 24.5 |
| SS1 | UNK | 0.5 - 1 | N | 199 |
| SS2 | UNK | 0.5 - 1 | N | 14 |
| SS3 | UNK | 0.5 - 1 | N | 25.2 |
| SS4 | UNK | 0.5 - 1 | N | 30.7 |
| SS5 | UNK | 0.5 - 1 | N | 21.3 |
| SS6 | UNK | 0.5 - 1 | N | 38.5 |
| SS7 | UNK | 0.5 - 1 | N | 16.3 |
| SS8 | UNK | 0.5 - 1 | N | 13.4 |
| SS9 | UNK | 0.5 - 1 | N | 15.6 |
| SS10 | UNK | 0.5 - 1 | N | 25.5 |
| SS11 | UNK | 0.5 - 1 | N | 24.2 |
| SS12 | UNK | 0.5 - 1 | N | 46.3 |
| SS13 | UNK | 0.5 - 1 | N | 26.8 |
| SS14 | UNK | 0.5 - 1 | N | 82 |

Notes:
FD = field duplicate
J = estimated result
mg/kg = milligram(s) per kilogram
N = normal sample
NA = sample collected at undocumented depth
UNK = unknown

**Table 3. Statistical Assessment of Soil Arsenic Concentrations**

*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site, 9315 Civic Center Drive, Beverly Hills, California*

| Sample Area | Sample Size | Average Concentration (mg/kg) | Minimum Concentration (mg/kg) | Maximum Concentration (mg/kg) | 95UCL (mg/kg) | EPC (mg/kg) |
|---|---|---|---|---|---|---|
| Operable Unit 1 – Lots 12 and 13 | 245 | 70 | 0.55 | 966 | 95.7 | 95.7 |
| Operable Unit 2 – Triangle Section | 26 | 74 | 4.33 | 266 | 142.1 | 142.1 |

Notes:

Value based on 95 percent Chebyshev Upper Confidence Limit (EPA, 2011b)
95UCL = 95 percent upper confidence limit
EPC = exposure point concentration
mg/kg = milligram(s) per kilogram

**Table 4. Alternative Cost Estimate**

*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site, 9315 Civic Center Drive, Beverly Hills, California*

| Alternative | Present Worth Cost ($)[a] | Comment Summary |
|---|---|---|
| 1. No action | $0 | No cost would be associated with implementing Alternative 1 because no action would be taken. |
| 2. Capping in place, and Institutional Controls | $1,991,000 (assumes 15 years of maintenance) | Easily implemented. Effective in reducing exposure to shallow arsenic-impacted soils. Existing perimeter fencing reduces damage to the cap and potential exposure to underlying soils. Requires institutional controls, Operation and Maintenance Plan, and a Soil Management Plan approved by DTSC. Requires annual inspection, reporting, and routine maintenance. |
| 3. Excavation and offsite disposal/onsite containment | $5,501,000 | Highest cost alternative. Provides greatest long-term effectiveness but has greater short-term impacts and risk.<br>Soils disposed offsite reduce mobility by placement in an engineered landfill. Site restoration may include soil cover establishment and hydroseeding |
| 4. Soil Cover with Limited Excavation, Offsite Disposal, and Institutional Controls | $1,949,000 | Provides long-term and short-term effectiveness.<br>Soils disposed offsite reduce mobility by placement in an engineered landfill. A 2-foot soil cover will reduce potential exposure of remaining arsenic-impacted soil to human receptors. Site restoration may include soil cover establishment and hydroseeding. Institutional controls will be prepared by property owner and approved by DTSC. |
| 5. Excavation with Offsite Disposal during Development | $1,508,000 | Least cost alternative. Provides long-term and short-term effectiveness.<br>Soil excavated during development of the site and disposed offsite reduce mobility by placement in an engineered landfill. A 2-foot soil cover will reduce potential exposure of remaining arsenic-impacted soil to human receptors, if required. Site restoration may include soil cover establishment and hydroseeding. Institutional controls may be prepared by property owner and approved by DTSC. |

[a]Costs presented are 2019 costs.

Notes:

DTSC = California Environmental Protection Agency, Department of Toxic Substances Control

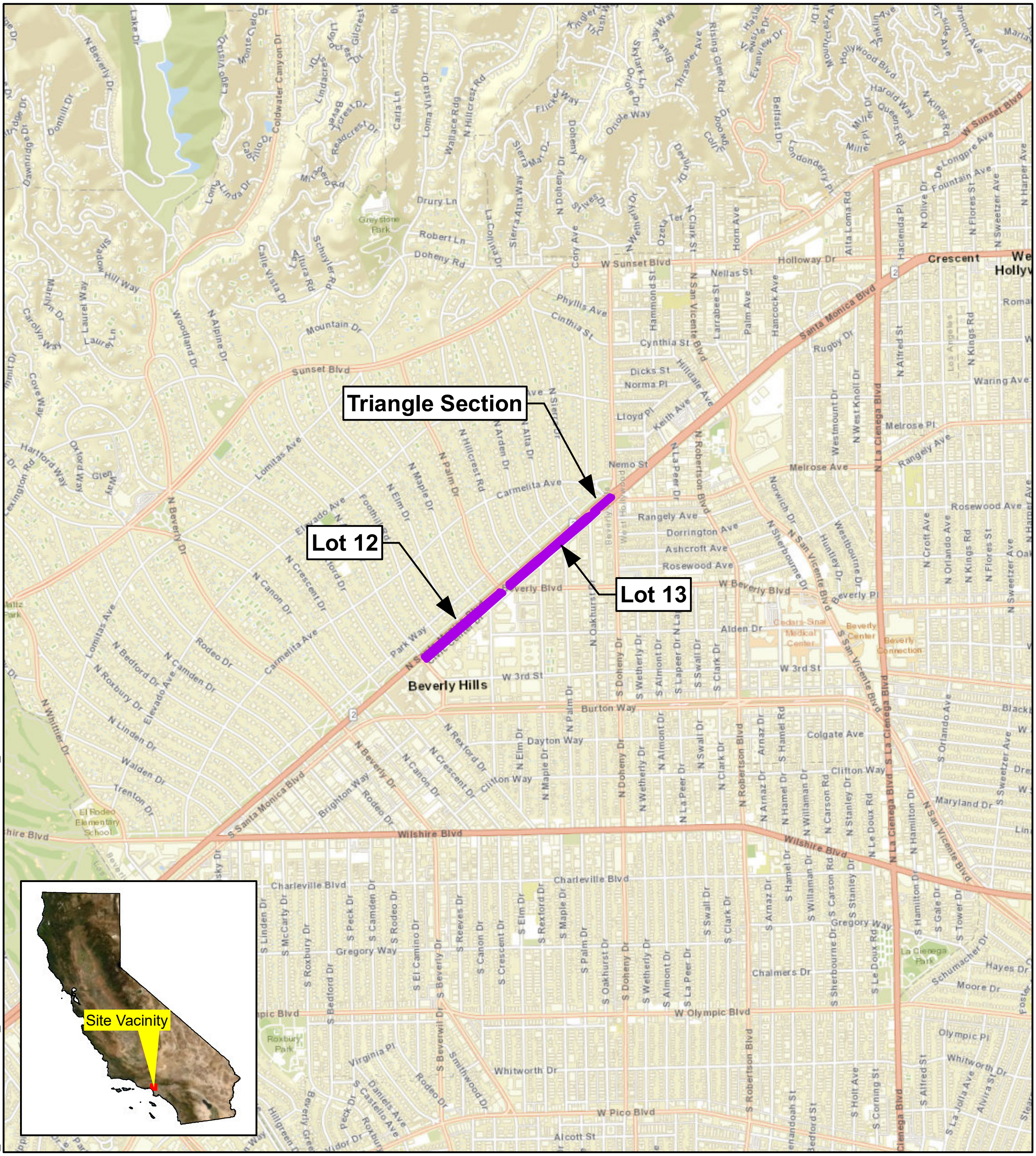
**Table 5. Estimated Construction Schedule**

*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site, 9315 Civic Center Drive, Beverly Hills, California*

| Activity | Tentative Schedule |
|---|---|
| Submittal of RAW | September 2020 |
| Regulatory review and approval of RAW, including public participation | September - November 2020 (3 months) |
| Remedial design | December 2020 - January 2021 (2 months) |
| Contractor procurement | February - March 2021 (2 months) |
| Permit procurement and preconstruction preparation, including preconstruction sampling | April - May 2021 (2 months) |
| Remedial action construction | June - July 2021 (2 months) |

Note:
Some tasks may be initiated prior to completing the proceeding task

# Figures




**LEGEND**

Site

Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

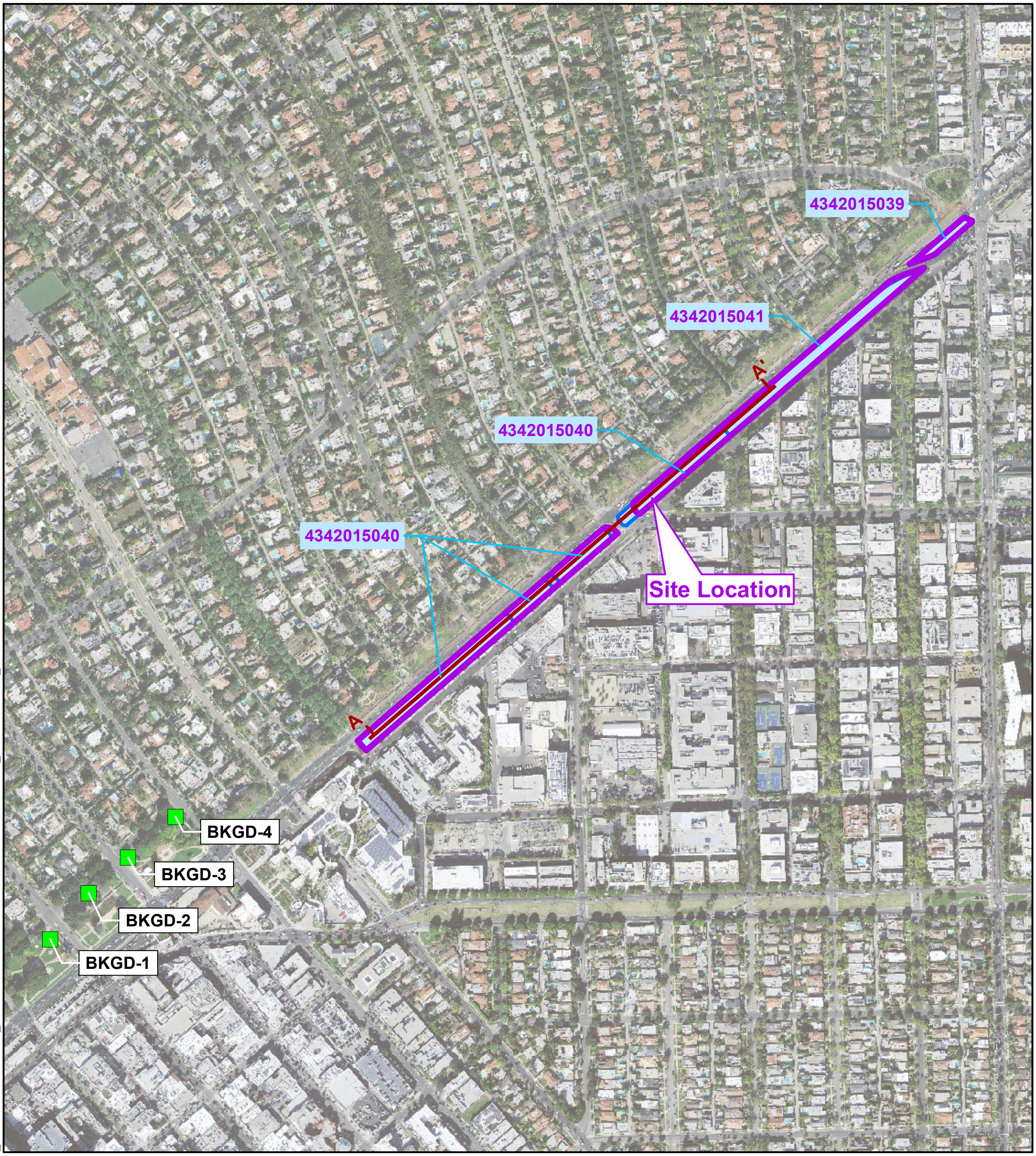
N

0 0.5
Miles

**FIGURE 1**
**Site Locaton**
Removal Action Work Plan
*Union Pacific Railroad Beverly Hills Site,*
*9315 Civic Center Drive,*
*Beverly Hills, California*

JACOBS

\\BROOKSIDEFILES\GIS_SHARE\ENBG\00_PROJ\U\UPRR\UPRR_BEVERLYHILLS\MAPS\REPORT\2019\RAWP\FIG1_SITELOCATION.MXD 10/28/2019




\\BROOKSIDEFILES\GIS_SHARE\ENBG\00_PROJ\U\UPRR\UPRR_BEVERLYHILLS\MAPS\REPORT\2019\RAWP\FIG2_BACKGROUND_LOCATIONS.MXD 10/28/2019

**LEGEND**

Background Sample Locations

Cross Section

Site

N

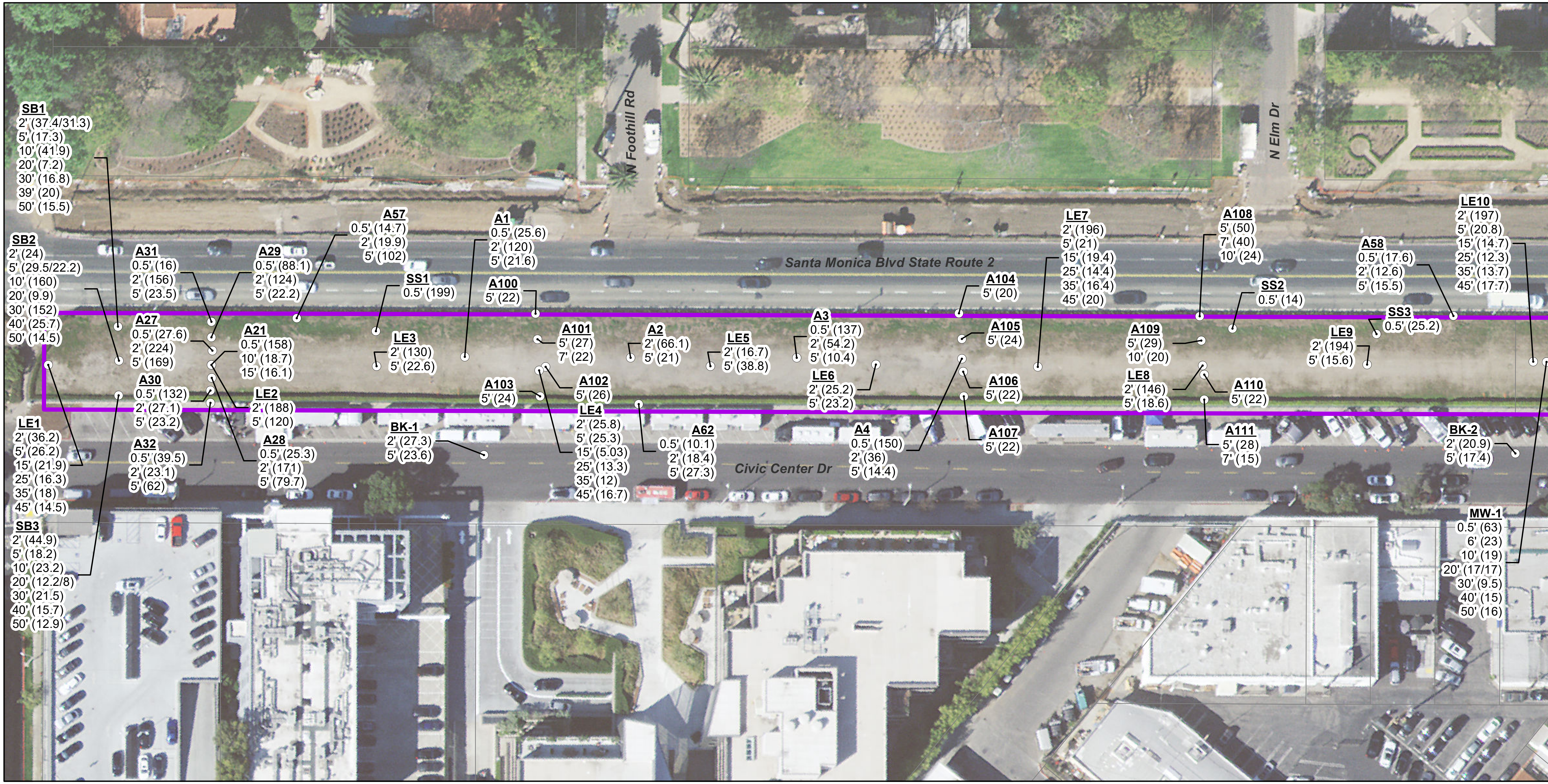
0 750

Feet

**Image Credits:**
Hexagon Valtus Aerial Imagery, Date Collected: 02/15/2018, Source: MapMart

**FIGURE 2**
**Background Sample Locations**
Removal Action Work Plan
*Union Pacific Railroad Beverly Hills Site,*
*9315 Civic Center Drive,*
*Beverly Hills, California*

JACOBS




LEGEND

Site

County Parcels

Soil Sample Location

Notes:

Location ID — A113
Sample Depth — 5' (31/21)
Soil Concentration (mg/kg)
Soil Concentration [Field Duplicate] (mg/kg)

mg/kg = milligrams per kilogram

N

0 25 50 100
Feet

1 inch = 60 feet

**Figure 3 a**
**Arsenic Concentration in Soil**
Removal Action Work Plan
*Union Pacific Railroad Beverly Hills Site,*
*9315 Civic Center Drive,*
*Beverly Hills, California*

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

\\BROOKSIDEFILES\GIS_SHARE\ENBG\00_PROJ\U\UPRR\UPRR_BEVERLYHILLS\MAPS\REPORT\2019\RAWP\FIG3_ARSENIC_ALLDEPTHS.MXD GMOON 10/28/2019 11:23:55 AM

JACOBS


LEGEND

Site

County Parcels

Soil Sample Location

Notes:

Location ID — A113

Sample Depth — 5' (31/21)

Soil Concentration (mg/kg)

Soil Concentration [Field Duplicate] (mg/kg)

mg/kg = milligrams per kilogram

N

0 25 50 100

Feet

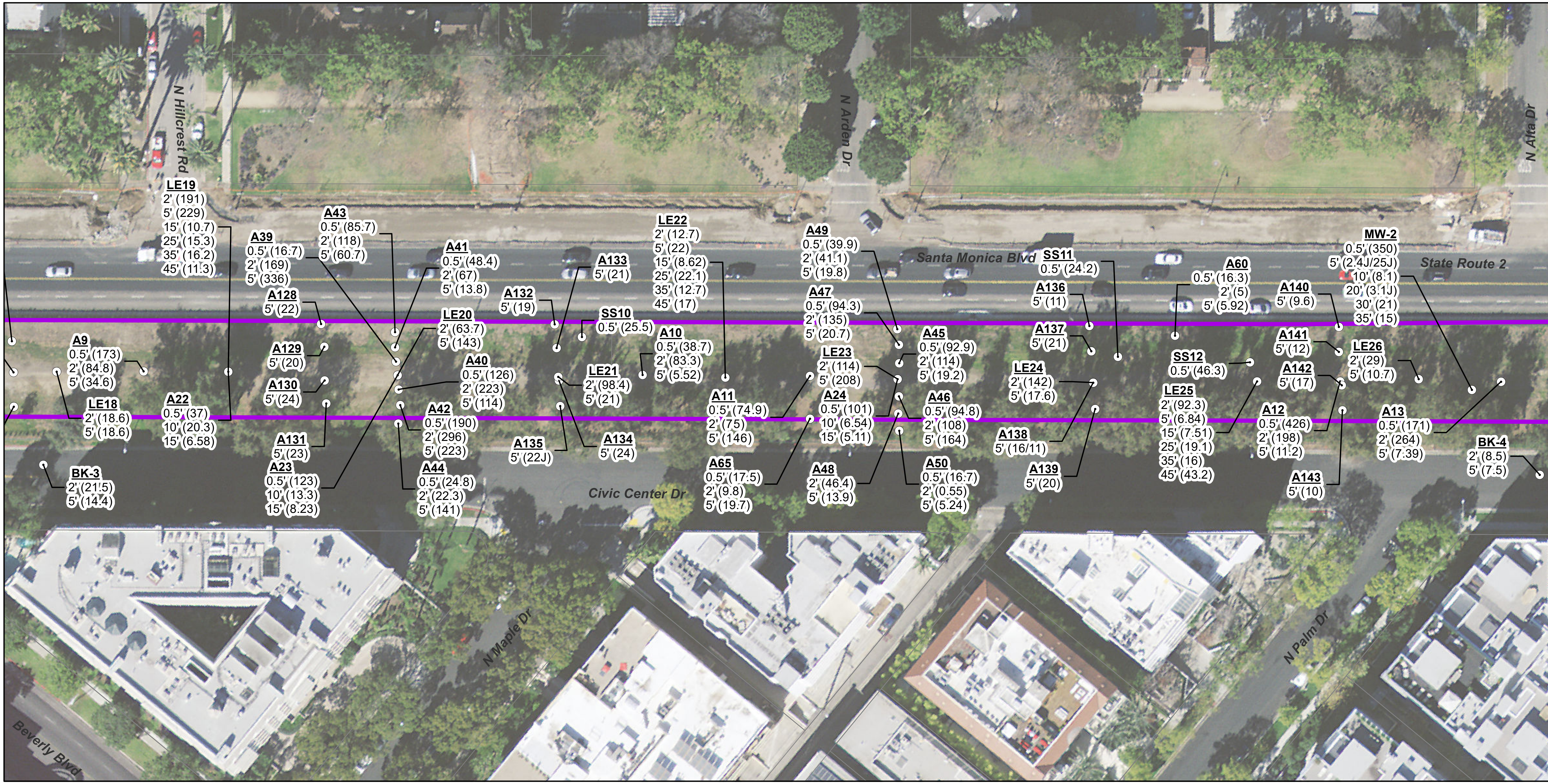
1 inch = 60 feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 3 b**
**Arsenic Concentration in Soil**
Removal Action Work Plan
*Union Pacific Railroad Beverly Hills Site,*
*9315 Civic Center Drive,*
*Beverly Hills, California*

\\BROOKSIDEFILES\GIS_SHARE\ENBG\00_PROJ\U\UPRR\UPRR_BEVERLYHILLS\MAPS\REPORT\2019\RAWP\FIG3_ARSENIC_ALLDEPTHS.MXD GMOON 10/28/2019 11:23:55 AM

JACOBS




LEGEND

Site

County Parcels

Soil Sample Location

Notes:

Location ID — A113
Sample Depth — 5' (31/21)
Soil Concentration (mg/kg)
Soil Concentration [Field Duplicate] (mg/kg)

mg/kg = milligrams per kilogram

N

0 25 50 100
Feet

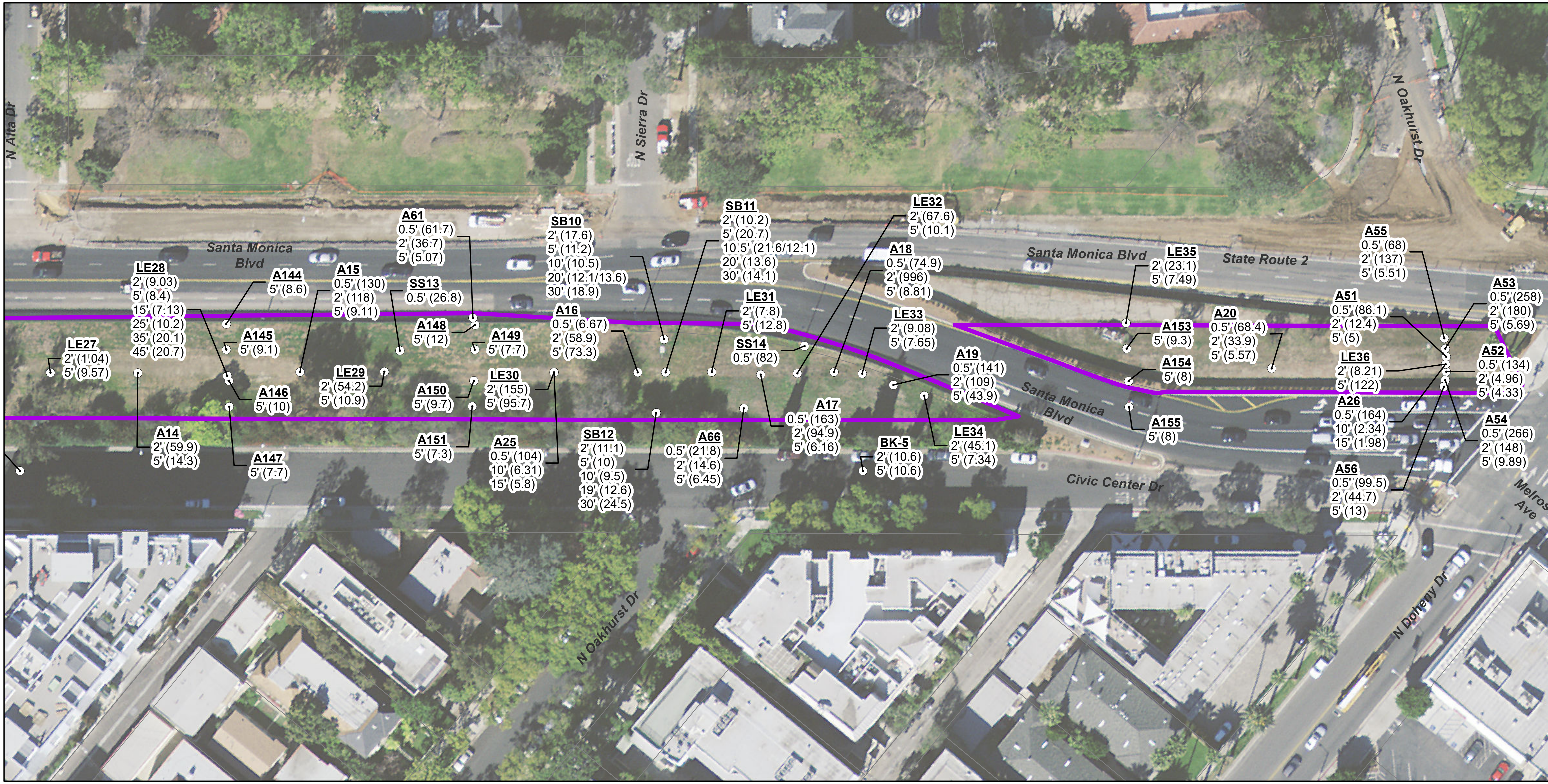
1 inch = 60 feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 3 c**
**Arsenic Concentration in Soil**
Removal Action Work Plan
*Union Pacific Railroad Beverly Hills Site,*
*9315 Civic Center Drive,*
*Beverly Hills, California*

\\BROOKSIDEFILES\GIS_SHARE\ENBG\00_PROJ\U\UPRR\UPRR_BEVERLYHILLS\MAPS\REPORT\2019\RAWP\FIG3_ARSENIC_ALLDEPTHS.MXD GMOON 10/28/2019 11:23:55 AM

JACOBS




LEGEND

Site

County Parcels

Soil Sample Location

Notes:

Location ID —— **A113**
Sample Depth —— 5' (31/21)
Soil Concentration (mg/kg)
Soil Concentration [Field Duplicate] (mg/kg)

mg/kg = milligrams per kilogram

N

0 25 50 100
Feet

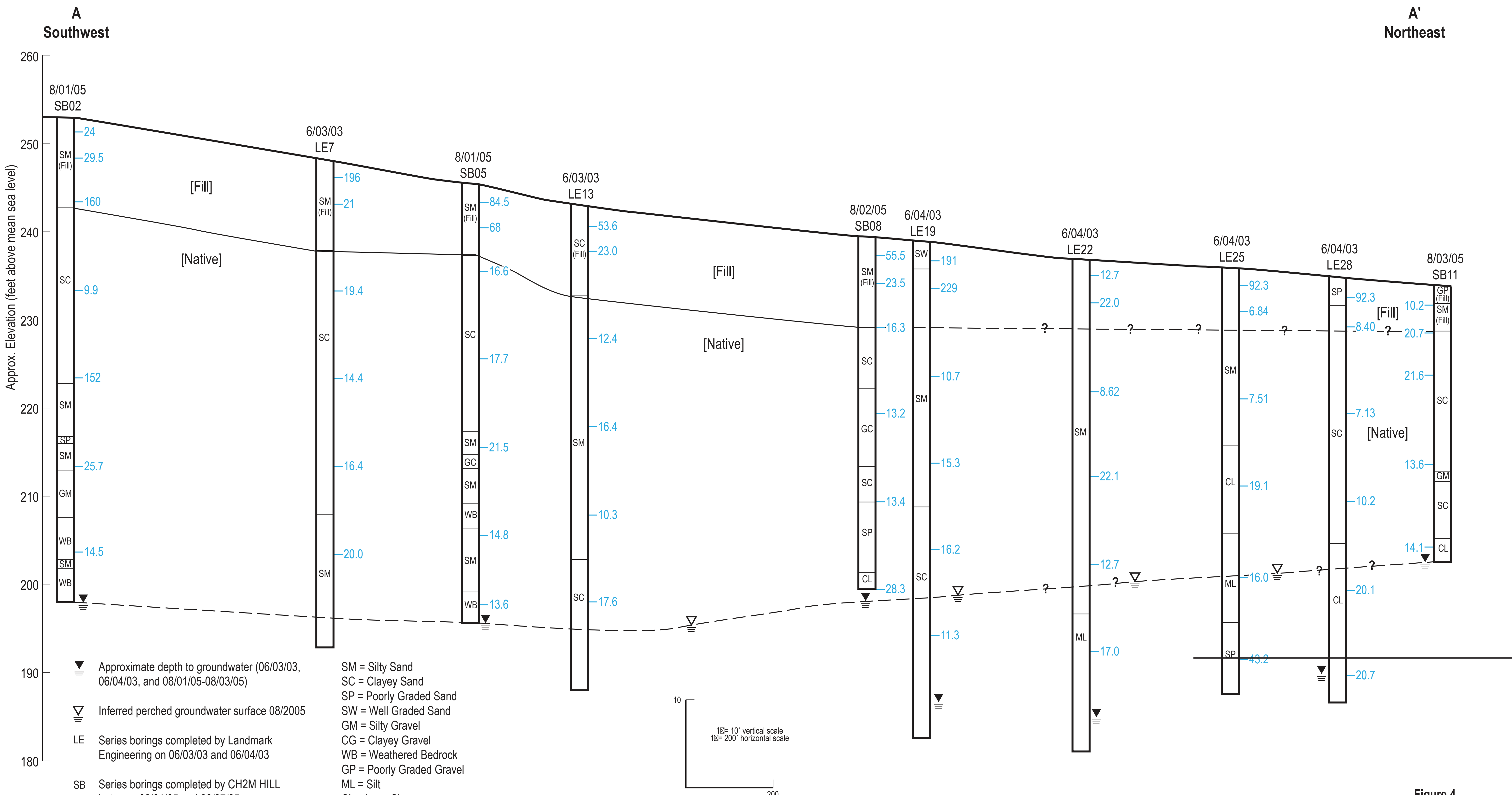
1 inch = 60 feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 3 d**
**Arsenic Concentration in Soil**
Removal Action Work Plan
*Union Pacific Railroad Beverly Hills Site,*
*9315 Civic Center Drive,*
*Beverly Hills, California*

\\BROOKSIDEFILES\GIS_SHARE\ENBG\00_PROJ\U\UPRR\UPRR_BEVERLYHILLS\MAPS\REPORT\2019\RAWP\FIG3_ARSENIC_ALLDEPTHS.MXD GMOON 10/28/2019 11:23:55 AM

JACOBS




Approximate depth to groundwater (06/03/03, 06/04/03, and 08/01/05-08/03/05)

Inferred perched groundwater surface 08/2005

LE Series borings completed by Landmark Engineering on 06/03/03 and 06/04/03

SB Series borings completed by CH2M HILL between 08/01/05 and 08/07/05

WB Weathered bedrock

24 Arsenic levels in mg/kg

SM = Silty Sand
SC = Clayey Sand
SP = Poorly Graded Sand
SW = Well Graded Sand
GM = Silty Gravel
CG = Clayey Gravel
WB = Weathered Bedrock
GP = Poorly Graded Gravel
ML = Silt
CL = Lean Clay

**Figure 4**
**Geological Cross-Section with Arsenic Data**
Removal Action Work Plan

*Union Pacific Railroad Beverly Hills Site, 9315 Civic Center Drive, Beverly Hills, California*

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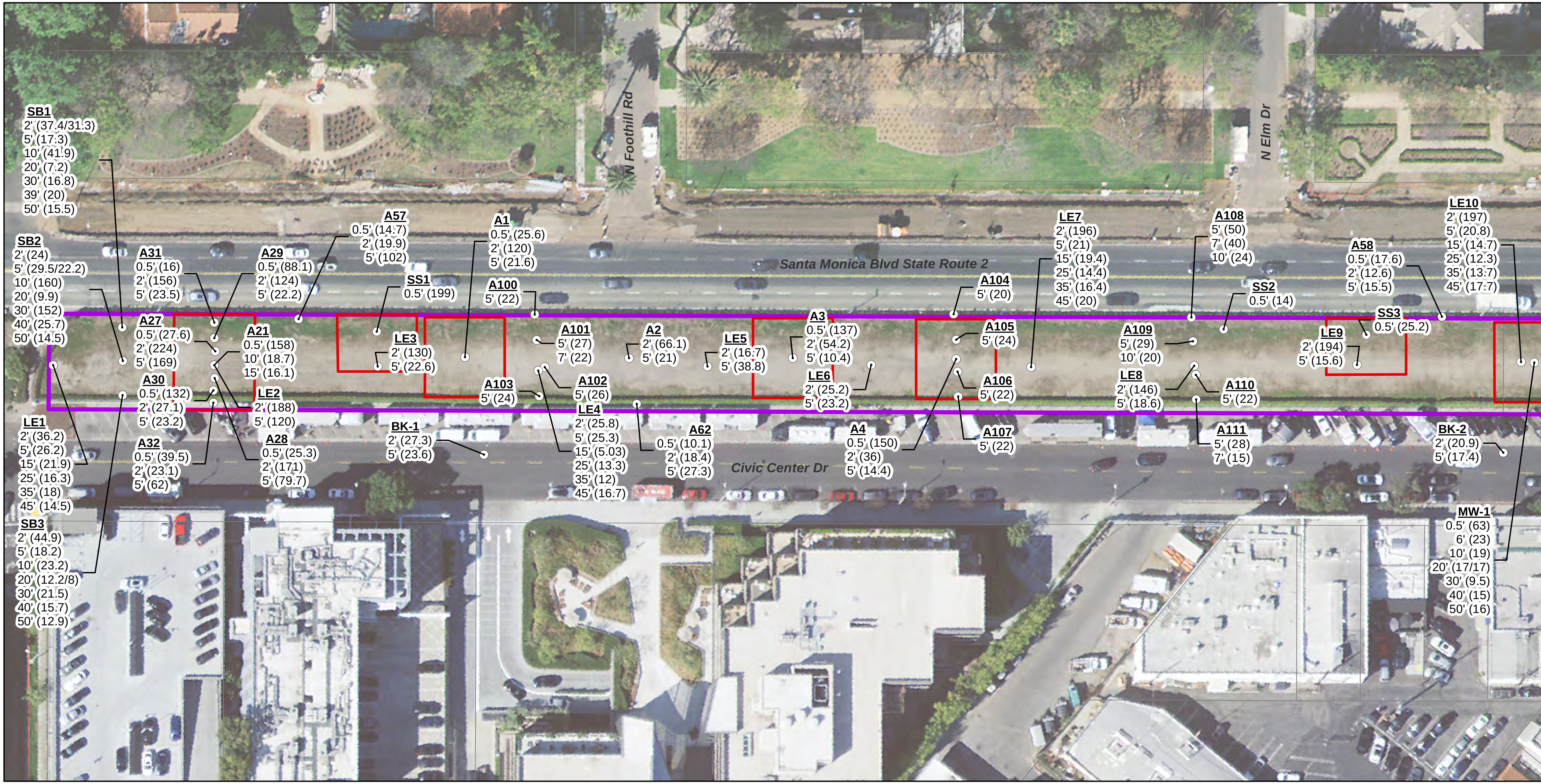
E092005006SCO316114.04.16 BHLCcrossxction.ai 9/05

ES060112213101SAC Figure_4_V2.ai 06.03.2019 tdaus




LEGEND

- ⊙ Soil Sample Location
- Excavation 0-2 feet bgs
- Site
- County Parcels

Notes:

| | |
|---|---|
| Location ID | A113 |
| Sample Depth | 5' (31/21) |
| Soil Concentration (mg/kg) | |
| Soil Concentration [Field Duplicate] (mg/kg) | |

mg/kg = milligrams per kilogram
bgs = below ground surface

N

0 25 50 100
Feet

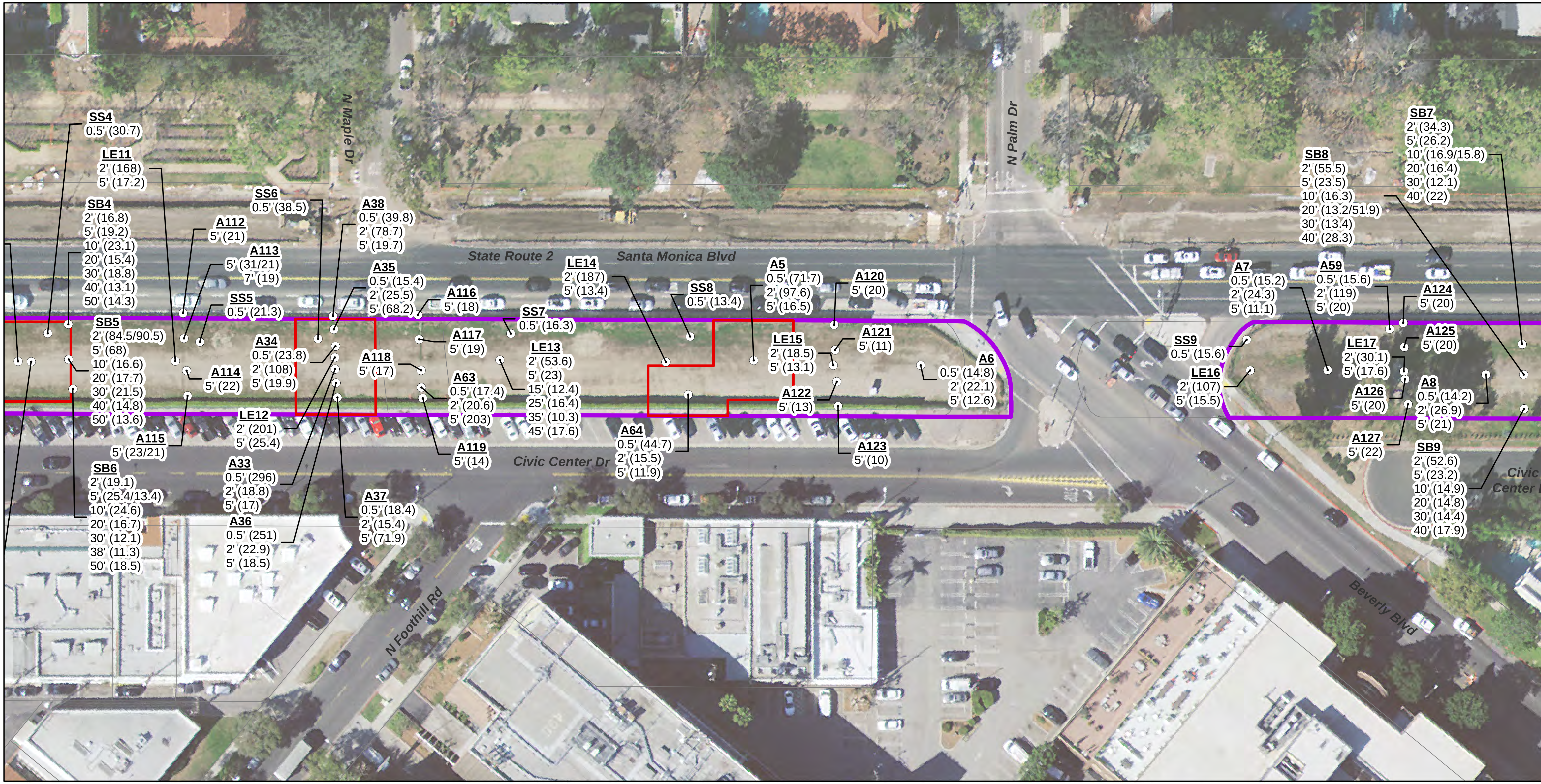
1 inch = 61 feet

**Figure 5 a**
**Arsenic Concentration in Soil**
Removal Action Work Plan
*Union Pacific Railroad Beverly Hills Site,*
*9315 Civic Center Drive,*
*Beverly Hills, California*

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



JACOBS




LEGEND

- ⊙ Soil Sample Location
- Excavation 0-2 feet bgs
- Site
- County Parcels

Notes:

Location ID — A113
Sample Depth — 5' (31/21)
Soil Concentration (mg/kg)
Soil Concentration [Field Duplicate] (mg/kg)

mg/kg = milligrams per kilogram
bgs = below ground surface

N

0 25 50 100
Feet

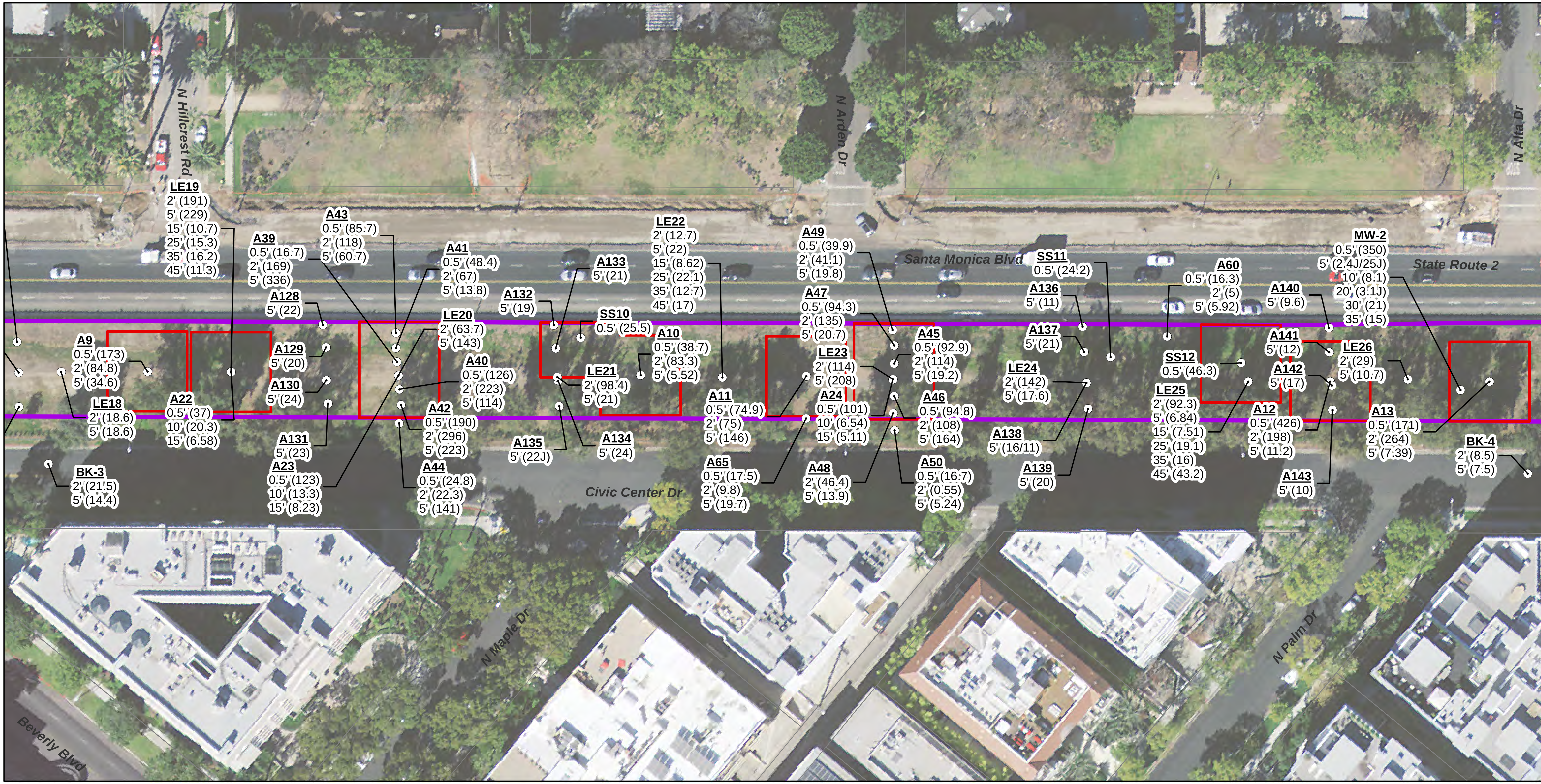
1 inch = 61 feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 5 b**
**Arsenic Concentration in Soil**
Removal Action Work Plan
*Union Pacific Railroad Beverly Hills Site,*
*9315 Civic Center Drive,*
*Beverly Hills, California*

JACOBS

\\BROOKSIDEFILES\GIS_SHARE\ENBG\00_PROJ\U\UPRR\UPRR_BEVERLYHILLS\MAPS\REPORT\2019\RAWP\FIG5_ARSENIC_ALLDEPTHS_WEXCAVATIONS.MXD GMOON 3/26/2020 1:31:59 PM




LEGEND

- Soil Sample Location
- Excavation 0-2 feet bgs
- Site
- County Parcels

Notes:

| | |
|---|---|
| Location ID | A113 |
| Sample Depth | 5' (31/21) |
| Soil Concentration (mg/kg) | 31 |
| Soil Concentration [Field Duplicate] (mg/kg) | 21 |

mg/kg = milligrams per kilogram
bgs = below ground surface

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

N

0 25 50 100
Feet

1 inch = 61 feet

**Figure 5 c**
**Arsenic Concentration in Soil**
Removal Action Work Plan
*Union Pacific Railroad Beverly Hills Site,*
*9315 Civic Center Drive,*
*Beverly Hills, California*

\\BROOKSIDEFILES\GIS_SHARE\ENBG\00_PROJ\U\UPRR\UPRR_BEVERLYHILLS\MAPS\REPORT\2019\RAWP\FIG5_ARSENIC_ALLDEPTHS_WEXCAVATIONS.MXD GMOON 3/26/2020 1:31:59 PM

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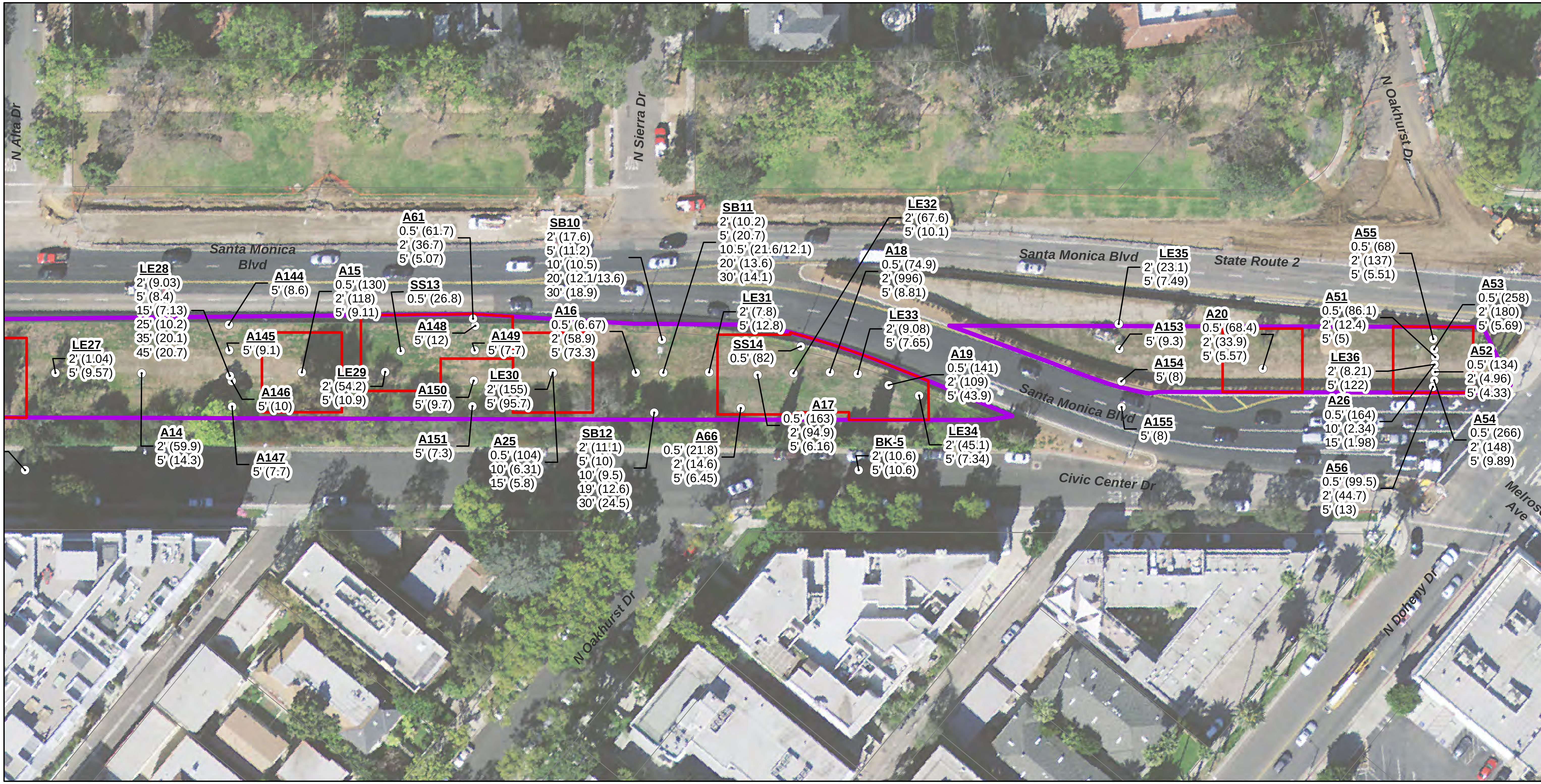


LEGEND

- Soil Sample Location
- Excavation 0-2 feet bgs
- Site
- County Parcels

Notes:

Location ID — A113
Sample Depth — 5' (31/21)
Soil Concentration (mg/kg)
Soil Concentration [Field Duplicate] (mg/kg)

mg/kg = milligrams per kilogram
bgs = below ground surface

N

0 25 50 100
Feet

1 inch = 61 feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Figure 5 d**
**Arsenic Concentration in Soil**
Removal Action Work Plan
*Union Pacific Railroad Beverly Hills Site, 9315 Civic Center Drive, Beverly Hills, California*

\\BROOKSIDEFILES\GIS_SHARE\ENBG\00_PROJ\U\UPRR\UPRR_BEVERLYHILLS\MAPS\REPORT\2019\RAWP\FIG5_ARSENIC_ALLDEPTHS_WEXCAVATIONS.MXD GMOON 3/26/2020 1:31:59 PM

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# Appendix A
# Administrative Record

# Appendix A. Administrative Record

## Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site, 9315 Civic Center Drive, Beverly Hills, California

## A.1 Administrative Record List

The following is a non-exclusive list of records, documents, and other communications relied upon in the development of the Removal Action Work Plan for the Beverly Hills Lots 12 and 13 Site. The list is divided into the following sections: (1) Statutes, regulations, and guidance documents; (2) reports; and (3) correspondence, including letters, electronic mails, and phone notes. The documents are listed in chronological order within each section.

### A.1.1 Statutes, Regulations, and Guidance

DOCDATE: September 1986
DOCTYPE: Statute
TITLE/SUMM: The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as Amended by the Superfund Amendments and Reauthorization Act of 1986
AUTHOR/AFF: U.S. Congress

DOCDATE: October 1988
DOCTYPE: Guidance
TITLE/SUMM: Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA
AUTHOR/AFF: U.S. Environmental Protection Agency (U.S. EPA)

DOCDATE: December 1989
DOCTYPE: Guidance
TITLE/SUMM: Risk Assessment Guidance for Superfund, Volume I – Human Health Evaluation Manual, EPA/540/1-89/002
AUTHOR/AFF: U.S. EPA DTSC. 2005.

DOCDATE: June 1992
DOCTYPE: Statute
TITLE/SUMM: Porter-Cologne Water Quality Control Act
AUTHOR/AFF: California State Water Resources Control Board
DOCDATE: 1996
DOCTYPE: Guidance
TITLE/SUMM: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. SW-846
AUTHOR/AFF: U.S. EPA, Office of Solid Waste and Emergency Response

DOCDATE: October 2001
DOCTYPE: Guidance
TITLE/SUMM: DTSC Public Participation Manual
AUTHOR/AFF: DTSC
DOCDATE: August 2002
DOCTYPE: Guidance
TITLE/SUMM: South Coast Air Quality Management District (SCAQMD) CEQA Handbook, Mitigation Measures Controlling Dust From Construction and Demolition
AUTHOR/AFF: SCAQMD

DOCDATE: 13 December 2004
DOCTYPE: Agreement
TITLE/SUMM: Voluntary Cleanup Agreement, Docket No. HSA-A 04/05-066, In the Matter of 9315 Civic

Center Drive, Beverly Hills, CA. February.
AUTHOR/AFF:DTSC

DOCDATE: 28 August 2008
DOCTYPE: Guidance Memorandum
TITLE/SUMM: Proven Technologies and Remedies Guidance, Remediation of Metals in Soil, Appendix C-3.
AUTHOR/AFF: California Department of Toxic Substances Control (DTSC)

DOCDATE: February 2009
DOCTYPE: Guidance
TITLE/SUMM: *ProUCL Version 4.00.04 Technical Guide (Draft).* Office of Research and Development
AUTHOR/AFF: U.S. EPA

DOCDATE: 2010
DOCTYPE: Regulation
TITLE/SUMM: California Code of Regulations, Title 8, Division 1, Chapter 4, Subchapter 4 – Construction Safety Orders, and Subchapter 7 – General Industry Safety Orders
AUTHOR/AFF: California Department of Industrial Relations, Division of Occupational Safety and Health

DOCDATE: 2010
DOCTYPE: Regulation
TITLE/SUMM: California Code of Regulations, Title 22, Division 4.5
AUTHOR/AFF: State of California

DOCDATE: 2010
DOCTYPE: Statutes
TITLE/SUMM: California Health and Safety Code, Division 20, Chapters 6.5 and 6.8
AUTHOR/AFF: State of California

DOCDATE: 2010
DOCTYPE: REGULATION
TITLE/SUMM: 40 Code of Federal Regulations (CFR) Part 300, National Oil and Hazardous Substances Pollution Contingency Plan
AUTHOR/AFF: U.S. Government

DOCDATE: 2010
DOCTYPE: Regulation
TITLE/SUMM: 40 CFR Chapter 1 Part 6 Appendix A
AUTHOR/AFF: U.S. Government

DOCDATE: 2010
DOCTYPE: Regulation
TITLE/SUMM: 40 CFR Subchapter I (Parts 260 - 282)
AUTHOR/AFF: U.S. Government

DOCDATE: January 2010
DOCTYPE: Statutes and Guidelines
TITLE/SUMM: California Environmental Quality Act Statutes and Guidelines
AUTHOR/AFF: California Resources Agency

DOCDATE: 2010
DOCTYPE: Regulation
TITLE/SUMM: California Code of Regulations, Title 23, Division 3, Chapter 15
AUTHOR/AFF: State of California

DOCDATE: 2010
DOCTYPE: Regulation
TITLE/SUMM: California Code of Regulations, Title 27, Division 2
AUTHOR/AFF: State of California

DOCDATE: 2012
DOCTYPE: Ordinance
TITLE/SUMM: City of Beverly Hills Municipal Code
AUTHOR/AFF: City of Beverly Hills

### A.1.2 Correspondence

DOCDATE: 9 July 2010
DOCTYPE: Letter
TITLE/SUMM: Approval of Groundwater Monitoring Well Sampling Summary and Well Abandonment Letter for Beverly Hills Lots 12 and 13 in Beverly Hills, California
AUTHOR/AFF: DTSC

DOCDATE: 23 December 2010
DOCTYPE: Memorandum
TITLE/SUMM: HERO Evaluation of Site Arsenic Data, Beverly Hills, California
AUTHOR/AFF: DTSC

DOCDATE: 21 May 2012
DOCTYPE: Letter
TITLE/SUMM: Arsenic Cleanup Levels Regarding Beverly Hills Lots 12 and 13 Site Located in Beverly Hills, California
AUTHOR/AFF: DTSC

DOCDATE: August 2012
DOCTYPE: Letter
TITLE/SUMM: *Comments on the DRAFT Removal Action Work Plan, Beverly Hills Land Corporation Site, Beverly Hills, California, dated August 2012*
AUTHOR/AFF: California Environmental Protection Agency, Department of Toxic Substances Control (DTSC)

### A.1.3 Reports

DOCDATE: 1961
DOCTYPE: Report
TITLE/SUMM: Department of Water Resources (DWR) Southern District. 1961. Bulletin No. 104, Planned Utilization of the Groundwater Basins of the Coastal Plan of Los Angeles County, Appendix A, Groundwater Geology
AUTHOR/AFF: State of California

DOCDATE: 23 July 2004
DOCTYPE: Report
TITLE/SUMM: Evaluation of Off-site Dust Impacts, Union Pacific Right-of-Way, Beverly Hills Land Corporation, Beverly Hills, CA.
AUTHOR/AFF: Geomatrix

DOCDATE: 30 June 1998
DOCTYPE: Report
TITLE/SUMM: Proposed Phase I and II Environmental Investigation, Railroad Right-of-Way between North Doheny and Alpine Drives, Beverly Hills, CA 90210.
AUTHOR/AFF: Lindmark Engineering

DOCDATE: 12 November 1998
DOCTYPE: Report
TITLE/SUMM: Phase I and II Environmental Investigation, Railroad Right-of-Way between North Doheny and Alpine Drives, Beverly Hills, CA 90210.
AUTHOR/AFF: Lindmark Engineering

DOCDATE: 30 June 2003
DOCTYPE: Report
TITLE/SUMM: Stage 2 – Phase II Environmental Site Investigation, Lots 12 and 13 of the Beverly Hills Land Corporation Right-of-Way, Beverly Hills, CA.
AUTHOR/AFF: Lindmark Engineering

DOCDATE: March 2005
DOCTYPE: Report
TITLE/SUMM: Remedial Investigation Work Plan, Beverly Hills Land Corporation Site (Lots 12 and 13).
AUTHOR/AFF: CH2M HILL

DOCDATE: 2006
DOCTYPE: Report
TITLE/SUMM: Remedial Investigation, Beverly Hills Land Corporation Site, 9315 Civic Center Drive, Beverly Hills, CA.
AUTHOR/AFF: CH2M HILL

DOCDATE: March 2007
DOCTYPE: Report
TITLE/SUMM: Remedial Investigation Work Plan, Beverly Hills Land Corporation Site (Lots 12 and 13).
AUTHOR/AFF: CH2M HILL

# Appendix B
# 95UCL Statistical Evaluation

# Lots 12 and 13 Database

Appendix B. Upper Confidence Limit (UCL) Calculations – Lots 12 and 13

Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site, 9315 Civic Center Drive, Beverly Hills, California

General UCL Statistics for Data Sets with Non-Detects

| | | | |
|---|---|---|---|
| User Selected Options | | | |
| From File | WorkSheet.wst | | |
| Full Precision | OFF | | |
| Confidence Coefficient | 95% | | |
| Number of Bootstrap Operations | 10000 | | |
| | | | |
| Lot12/13 | | | |
| | | | |
| General Statistics | | | |
| Number of Valid Data | 245 | Number of Detected Data | 243 |
| Number of Distinct Detected Data | 203 | Number of Non-Detect Data | 2 |
| | | Percent Non-Detects | 0.82% |
| | | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum Detected | 0.55 | Minimum Detected | -0.598 |
| Maximum Detected | 996 | Maximum Detected | 6.904 |
| Mean of Detected | 70.47 | Mean of Detected | 3.642 |
| SD of Detected | 93.03 | SD of Detected | 1.14 |
| Minimum Non-Detect | 2.9 | Minimum Non-Detect | 1.065 |
| Maximum Non-Detect | 2.9 | Maximum Non-Detect | 1.065 |
| | | | |
| UCL Statistics | | | |
| Normal Distribution Test with Detected Values Only | | Lognormal Distribution Test with Detected Values Only | |
| Lilliefors Test Statistic | 0.233 | Lilliefors Test Statistic | 0.122 |
| 5% Lilliefors Critical Value | 0.0568 | 5% Lilliefors Critical Value | 0.0568 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |
| | | | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| DL/2 Substitution Method | | DL/2 Substitution Method | |
| Mean | 69.91 | Mean | 3.615 |
| SD | 92.86 | SD | 1.173 |
| 95% DL/2 (t) UCL | 79.7 | 95% H-Stat (DL/2) UCL | 87.93 |
| | | | |
| Maximum Likelihood Estimate(MLE) Method | | Log ROS Method | |
| Mean | 69.04 | Mean in Log Scale | 3.619 |
| SD | 93.74 | SD in Log Scale | 1.164 |
| 95% MLE (t) UCL | 78.93 | Mean in Original Scale | 69.92 |
| 95% MLE (Tiku) UCL | 78.1 | SD in Original Scale | 92.85 |
| | | 95% t UCL | 79.71 |
| | | 95% Percentile Bootstrap UCL | 80.41 |
| | | 95% BCA Bootstrap UCL | 82.29 |
| | | 95% H UCL | 87.12 |
| | | | |
| Gamma Distribution Test with Detected Values Only | | Data Distribution Test with Detected Values Only | |
| k star (bias corrected) | 0.939 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 75.09 | | |
| nu star | 456.1 | | |
| | | | |
| A-D Test Statistic | 6.444 | Nonparametric Statistics | |
| 5% A-D Critical Value | 0.787 | Kaplan-Meier (KM) Method | |

| Arsenic | d_Arsenic | Arsenic | d_Arsenic | Arsenic | d_Arsenic |
|---|---|---|---|---|---|
| 16.0 | 1 | 36.2 | 36.2 | 26.2 | 26.2 |
| 25.3 | 1 | 156 | 156 | 23.5 | 23.5 |
| 27.6 | 1 | 171 | 171 | 79.7 | 79.7 |
| 39.5 | 1 | 224 | 224 | 169 | 169 |
| 88.1 | 1 | 23.1 | 23.1 | 62.0 | 62.0 |
| 132 | 1 | 124 | 124 | 22.2 | 22.2 |
| 158 | 1 | 27.1 | 27.1 | 23.2 | 23.2 |
| 14.7 | 1 | 188 | 188 | 120 | 120 |
| 199 | 1 | 19.9 | 19.9 | 102 | 102 |
| 25.6 | 1 | 130 | 130 | 22.6 | 22.6 |
| 10.1 | 1 | 120 | 120 | 21.6 | 21.6 |
| 137 | 1 | 25.8 | 25.8 | 25.3 | 25.3 |
| 150 | 1 | 18.4 | 18.4 | 27.3 | 27.3 |
| 14.0 | 1 | 66.1 | 66.1 | 21.0 | 21.0 |
| 25.2 | 1 | 16.7 | 16.7 | 38.8 | 38.8 |
| 17.6 | 1 | 54.2 | 54.2 | 10.4 | 10.4 |
| 30.7 | 1 | 36.0 | 36.0 | 14.4 | 14.4 |
| 21.3 | 1 | 25.2 | 25.2 | 23.2 | 23.2 |
| 38.5 | 1 | 196 | 196 | 21.0 | 21.0 |
| 15.4 | 1 | 146 | 146 | 18.6 | 18.6 |
| 18.4 | 1 | 194 | 194 | 15.6 | 15.6 |
| 23.8 | 1 | 12.6 | 12.6 | 15.5 | 15.5 |
| 39.8 | 1 | 197 | 197 | 20.8 | 20.8 |
| 251 | 1 | 168 | 168 | 17.2 | 17.2 |
| 296 | 1 | 25.5 | 25.5 | 68.2 | 68.2 |
| 17.4 | 1 | 15.4 | 15.4 | 71.9 | 71.9 |
| 16.3 | 1 | 108 | 108 | 19.9 | 19.9 |
| 13.4 | 1 | 78.7 | 78.7 | 19.7 | 19.7 |
| 44.7 | 1 | 22.9 | 22.9 | 18.5 | 18.5 |
| 71.7 | 1 | 18.8 | 18.8 | 17.0 | 17.0 |
| 14.8 | 1 | 201 | 201 | 25.4 | 25.4 |
| 15.6 | 1 | 20.6 | 20.6 | 203 | 203 |
| 15.2 | 1 | 53.6 | 53.6 | 23.0 | 23.0 |
| 15.6 | 1 | 187 | 187 | 13.4 | 13.4 |
| 14.2 | 1 | 15.5 | 15.5 | 11.9 | 11.9 |
| 173 | 1 | 97.6 | 97.6 | 16.5 | 16.5 |
| 16.7 | 1 | 18.5 | 18.5 | 13.1 | 13.1 |
| 24.8 | 1 | 22.1 | 22.1 | 12.6 | 12.6 |
| 37.0 | 1 | 107 | 107 | 15.5 | 15.5 |
| 48.4 | 1 | 24.3 | 24.3 | 11.1 | 11.1 |
| 85.7 | 1 | 119 | 119 | 20.0 | 20.0 |
| 126 | 1 | 30.1 | 30.1 | 17.6 | 17.6 |
| 190 | 1 | 26.9 | 26.9 | 21.0 | 21.0 |
| 123 | 1 | 18.6 | 18.6 | 18.6 | 18.6 |
| 25.5 | 1 | 84.8 | 84.8 | 34.6 | 34.6 |
| 38.7 | 1 | 169 | 169 | 336 | 336 |
| 17.5 | 1 | 22.3 | 22.3 | 141 | 141 |
| 74.9 | 1 | 67.0 | 67.0 | 13.8 | 13.8 |
| 2.9 | 0 | 118 | 118 | 60.7 | 60.7 |
| 16.7 | 1 | 223 | 223 | 114 | 114 |
| 39.9 | 1 | 296 | 296 | 223 | 223 |

Appendix B. Upper Confidence Limit (UCL) Calculations – Lots 12 and 13

Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site, 9315 Civic Center Drive, Beverly Hills, California

General UCL Statistics for Data Sets with Non-Detects

| | | | |
|---|---|---|---|
| User Selected Options | | | |
| K-S Test Statistic | 0.787 | Mean | 69.9 |
| 5% K-S Critical Value | 0.0605 | SD | 92.67 |
| Data not Gamma Distributed at 5% Significance Level | | SE of Mean | 5.933 |
| | | 95% KM (t) UCL | 79.7 |
| Assuming Gamma Distribution | | 95% KM (z) UCL | 79.66 |
| Gamma ROS Statistics using Extrapolated Data | | 95% KM (jackknife) UCL | 79.7 |
| Minimum | 1.00E-06 | 95% KM (bootstrap t) UCL | 82.23 |
| Maximum | 996 | 95% KM (BCA) UCL | 80.61 |
| Mean | 69.9 | 95% KM (Percentile Bootstrap) UCL | 80.04 |
| Median | 26.9 | 95% KM (Chebyshev) UCL | 95.76 |
| SD | 92.86 | 97.5% KM (Chebyshev) UCL | 107 |
| k star | 0.788 | 99% KM (Chebyshev) UCL | 128.9 |
| Theta star | 88.73 | | |
| Nu star | 386 | Potential UCLs to Use | |
| AppChi2 | 341.4 | 95% KM (Chebyshev) UCL | 95.76 |
| 95% Gamma Approximate UCL (Use when n >= 40) | 79.01 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 79.07 | | |
| Note: DL/2 is not a recommended method. | | | |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
For additional insight, the user may want to consult a statistician.

| Arsenic | d_Arsenic | Arsenic | d_Arsenic | Arsenic | d_Arsenic |
|---|---|---|---|---|---|
| 92.9 | 1 | 191 | 191 | 229 | 229 |
| 94.3 | 1 | 63.7 | 63.7 | 143 | 143 |
| 94.8 | 1 | 98.4 | 98.4 | 21.0 | 21.0 |
| 101 | 1 | 83.3 | 83.3 | 5.52 | 5.52 |
| 24.2 | 1 | 12.7 | 12.7 | 22.0 | 22.0 |
| 16.3 | 1 | 9.80 | 9.80 | 19.7 | 19.7 |
| 46.3 | 1 | 75.0 | 75.0 | 146 | 146 |
| 426 | 1 | 0.55 | 0.55 | 5.24 | 5.24 |
| 171 | 1 | 41.1 | 41.1 | 19.8 | 19.8 |
| 2.9 | 0 | 114 | 114 | 19.2 | 19.2 |
| 130 | 1 | 135 | 135 | 20.7 | 20.7 |
| 26.8 | 1 | 108 | 108 | 164 | 164 |
| 61.7 | 1 | 46.4 | 46.4 | 13.9 | 13.9 |
| 104 | 1 | 114 | 114 | 208 | 208 |
| 6.67 | 1 | 142 | 142 | 17.6 | 17.6 |
| 21.8 | 1 | 5.00 | 5.00 | 5.92 | 5.92 |
| 163 | 1 | 92.3 | 92.3 | 6.84 | 6.84 |
| 82.0 | 1 | 198 | 198 | 11.2 | 11.2 |
| 74.9 | 1 | 29.0 | 29.0 | 10.7 | 10.7 |
| 141 | 1 | 264 | 264 | 7.39 | 7.39 |
| | | 1.04 | 1.04 | 9.57 | 9.57 |
| | | 59.9 | 59.9 | 14.3 | 14.3 |
| | | 9.03 | 9.03 | 8.40 | 8.40 |
| | | 118 | 118 | 9.11 | 9.11 |
| | | 54.2 | 54.2 | 10.9 | 10.9 |
| | | 36.7 | 36.7 | 5.07 | 5.07 |
| | | 155 | 155 | 95.7 | 95.7 |
| | | 58.9 | 58.9 | 73.3 | 73.3 |
| | | 7.80 | 7.80 | 12.8 | 12.8 |
| | | 14.6 | 14.6 | 6.45 | 6.45 |
| | | 94.9 | 94.9 | 6.16 | 6.16 |
| | | 67.6 | 67.6 | 10.1 | 10.1 |
| | | 996 | 996 | 8.81 | 8.81 |
| | | 9.08 | 9.08 | 7.65 | 7.65 |
| | | 109 | 109 | 43.9 | 43.9 |
| | | 45.1 | 45.1 | 36.3708079 | 36.3708079 |

Appendix B. Upper Confidence Limit (UCL) Calculations – Triangle Area
Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site, 9315 Civic Center Drive, Beverly Hills, California

General UCL Statistics for Data Sets with Non-Detects

| | | | |
|---|---|---|---|
| User Selected Options | | | |
| From File | WorkSheet.wst | | |
| Full Precision | OFF | | |
| Confidence Coefficient | 95% | | |
| Number of Bootstrap Operations | 10,000 | | |
| | | | |
| Arsenic | | | |
| | | | |
| General Statistics | | | |
| Number of Valid Observations | 26 | Number of Distinct Observations | 26 |
| | | | |
| Raw Statistics | | Log-transformed Statistics | |
| Minimum | 4.33 | Minimum of Log Data | 1.466 |
| Maximum | 266 | Maximum of Log Data | 5.583 |
| Mean | 73.64 | Mean of log Data | 3.475 |
| Geometric Mean | 32.29 | SD of log Data | 1.463 |
| Median | 39.3 | | |
| SD | 80.03 | | |
| Std. Error of Mean | 15.7 | | |
| Coefficient of Variation | 1.087 | | |
| Skewness | 1.092 | | |
| | | | |
| Relevant UCL Statistics | | | |
| Normal Distribution Test | | Lognormal Distribution Test | |
| Shapiro Wilk Test Statistic | 0.824 | Shapiro Wilk Test Statistic | 0.882 |
| Shapiro Wilk Critical Value | 0.92 | Shapiro Wilk Critical Value | 0.92 |
| Data not Normal at 5% Significance Level | | Data not Lognormal at 5% Significance Level | |
| | | | |
| Assuming Normal Distribution | | Assuming Lognormal Distribution | |
| 95% Student's-t UCL | 100.5 | 95% H-UCL | 237.6 |
| 95% UCLs (Adjusted for Skewness) | | 95% Chebyshev (MVUE) UCL | 221.8 |
| 95% Adjusted-CLT UCL (Chen-1995) | 103.1 | 97.5% Chebyshev (MVUE) UCL | 280 |
| 95% Modified-t UCL (Johnson-1978) | 101 | 99% Chebyshev (MVUE) UCL | 394.4 |
| | | | |
| Gamma Distribution Test | | Data Distribution | |
| k star (bias corrected) | 0.67 | Data do not follow a Discernable Distribution (0.05) | |
| Theta Star | 109.8 | | |
| MLE of Mean | 73.64 | | |
| MLE of Standard Deviation | 89.94 | | |
| nu star | 34.86 | | |
| Approximate Chi Square Value (.05) | 22.36 | Nonparametric Statistics | |
| Adjusted Level of Significance | 0.0398 | 95% CLT UCL | 99.46 |
| Adjusted Chi Square Value | 21.69 | 95% Jackknife UCL | 100.5 |
| | | 95% Standard Bootstrap UCL | 98.66 |
| Anderson-Darling Test Statistic | 1.009 | 95% Bootstrap-t UCL | 104.7 |
| Anderson-Darling 5% Critical Value | 0.786 | 95% Hall's Bootstrap UCL | 103.3 |
| Kolmogorov-Smirnov Test Statistic | 0.191 | 95% Percentile Bootstrap UCL | 99.66 |

| Arsenic | d_Arsenic |
|---|---|
| 68.4 | 1 |
| 68.0 | 1 |
| 86.1 | 1 |
| 99.5 | 1 |
| 134 | 1 |
| 164 | 1 |
| 258 | 1 |
| 266 | 1 |
| 23.1 | 1 |
| 33.9 | 1 |
| 137 | 1 |
| 12.4 | 1 |
| 44.7 | 1 |
| 4.96 | 1 |
| 180 | 1 |
| 148 | 1 |
| 8.21 | 1 |
| 7.49 | 1 |
| 5.57 | 1 |
| 5.51 | 1 |
| 5.00 | 1 |
| 13.0 | 1 |
| 4.33 | 1 |
| 5.69 | 1 |
| 9.89 | 1 |
| 122 | 1 |

General UCL Statistics for Data Sets with Non-Detects

| | | | |
|---|---|---|---|
| Kolmogorov-Smirnov 5% Critical Value | 0.178 | 95% BCA Bootstrap UCL | 102.9 |
| Data not Gamma Distributed at 5% Significance Level | | 95% Chebyshev(Mean, Sd) UCL | 142.1 |
| | | 97.5% Chebyshev(Mean, Sd) UCL | 171.7 |
| Assuming Gamma Distribution | | 99% Chebyshev(Mean, Sd) UCL | 229.8 |
| 95% Approximate Gamma UCL (Use when n >= 40) | 114.8 | | |
| 95% Adjusted Gamma UCL (Use when n < 40) | 118.4 | | |
| | | | |
| Potential UCL to Use | | Use 95% Chebyshev (Mean, Sd) UCL | 142.1 |

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002) and Singh and Singh (2003). For additional insight, the user may want to consult a statistician.

# Appendix C
# Applicable or Relevant and Appropriate Requirements

# Appendix C. Applicable or Relevant and Appropriate Requirements

**Table C-1. Potential Chemical-specific Applicable or Relevant and Appropriate Requirements**

*Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site, 9315 Civic Center Drive, Beverly Hills, California*

| Standard, Requirement, Criterion, or Limitation | ARAR Status | Description | Comment |
|---|---|---|---|
| RCRA Hazardous Waste Determination Title 22 CCR, Division 4.5, Chapter 11, 66261.21, 66261.22(a)(1), 66261.22(a)(2), 66261.23, and 66261.24(a)(1) or Article 4, Chapter 11 | Potential | Federal act that classifies and regulates hazardous waste and facilities that treat, store, or dispose hazardous waste.<br>A hazardous waste is considered a RCRA hazardous waste if it exhibits any of the characteristics of ignitability, corrosivity, reactivity, or toxicity, or if it is listed as a hazardous waste. Most waste determinations will focus on whether the generated waste (e.g., contaminated soil and treatment residuals) could be classified as toxicity-characteristic waste as defined by the contaminant concentrations. | Applicable for determining whether soil impacted by arsenic is a RCRA hazardous waste. Soil generated during construction, excavation, or remedial activities must be characterized. If the soil is RCRA hazardous, it must be managed in accordance with Title 22 requirements for RCRA hazardous waste. |
| California Hazardous Waste Determination 22 CCR 66262.22(a)(3), 66262.22(a)(4), 66261.24(a)(2) through (a)(8) | Potential | State act that classifies and regulates State-specific, non-RCRA hazardous wastes and facilities that treat, store, or dispose of non-RCRA hazardous wastes. Wastes can be classified as non-RCRA, State-only hazardous wastes if they exceed the soluble threshold limit concentration or total threshold limit concentration values. | Applicable for determining whether soil impacted with arsenic is a State-only, non-RCRA hazardous waste. Wastes generated during construction, excavation, or remedial activities must be characterized. If the soil is non-RCRA hazardous, it must be managed in accordance with State hazardous waste management requirements. |

Notes:

ARAR = applicable or relevant and appropriate requirement
CCR = California Code of Regulations
RCRA = Resource Conservation and Recovery Act

**Table C-2. Potential Location-specific Applicable or Relevant and Appropriate Requirements**
*Removal Action Work Plan, Beverly Hills Lots 12 and 13 Site, Beverly Hills, California*

| Location | Requirement | ARAR Status | Description | Comments |
|---|---|---|---|---|
| Within area where action may cause irreparable harm, loss, or destruction of significant artifacts | National Archaeological and Historic Preservation Act (16 USC Section 469); 36 CFR Part 65 | Not applicable | Alteration of terrain that threatens significant scientific, prehistoric, historic, or archaeological data and may require actions to recover and preserve artifacts. | The proposed actions will not alter or destroy known prehistoric or historic archaeological features. The site is developed, and no known cultural resources have been identified. |

Notes:

ARAR = applicable or relevant and appropriate requirement
CFR = *Code of Federal Regulations*
USC = United States Code

**Table C-3. Potential Action-specific Applicable or Relevant and Appropriate Requirements**
*Removal Action Work Plan, Beverly Hills Lots 12 and 13 Site, Beverly Hills, California*

| Action | Standard, Requirement, Criterion, or Limitation | ARAR Status | Description | Comment |
|---|---|---|---|---|
| Cleanup of releases to the environment | 27 CCR 20080 and 20090<br>23 CCR 2510 and 2511 | Potential | Actions taken at the direction of a public agency to clean up pollution that are intended to contain wastes at the place of release must implement applicable provisions of 27 CCR Division 2, Subdivision 1 /23 CCR Chapter 15 to the extent feasible. Engineered alternatives to prescriptive standards are allowed if the prescriptive standard is not feasible, and the engineered alternative is consistent with the performance goal of the prescriptive standard and affords equivalent protection against water quality impairment. | Applicable if contaminated soil is allowed to remain in place. |
| Remediation with contaminants remaining in place | 27 CCR 21090<br>23 CCR 2581 | Potential | Landfills must be closed in a manner that meets specified requirements for a final cover, and for post-closure maintenance. | Applicable if contaminated soil is allowed to remain in place. |
| Hazardous waste transport | 22 CCR Division 4.5, Chapter 13 | Potentially applicable | Standards applicable to transporters of hazardous waste in California. | Applicable is the wastes are characterized as RCRA or non-RCRA hazardous waste. |
| Control of air emissions from construction activities | South Coast AQMD Rule 403, Fugitive Dusts | Applicable | Limits visible particulate emissions to the property line and requires implementation of specified dust control measures. | Applicable to removal actions that may result in the production of fugitive dust. |
| Soil stockpiling | California Health and Safety Code Section 25123.3 (a)(2) and 25123.3(b)(4)(B) | Potentially applicable | State requirements for remediation staging in stockpiles of non-RCRA hazardous waste. | These requirements must be met for hazardous wastes to be staged in stockpiles without requiring a permit. |
| Worker protection in hazardous waste cleanup | Cal OSHA (8 CCR 5192) | Potentially applicable | Requires workers in hazardous waste cleanup operations to perform operations in accordance with Cal OSHA health and safety requirements. | Applicable if soils are determined to be RCRA or non-RCRA hazardous waste. |
| Hazardous waste generation: generator requirements | 22 CCR Division 4.5, Chapter 12 | Potentially applicable | Requirements for waste identification; obtaining an EPA Identification Number; use of the hazardous waste manifest; packaging, marking and labeling; accumulation time; recordkeeping and reporting. | Applicable to onsite activities involving generation and onsite management of hazardous waste. |
| Hazardous waste generation: preparedness and prevention | 22 CCR Division 4.5, Chapter 15, Article 3 | Potentially applicable | Requirements for preparing for and preventing releases of hazardous waste, including specified spill control, fire control and communication equipment in hazardous waste management areas, maintaining adequate aisle space for hazardous waste containers, and making arrangements with local authorities for emergency response. | Applicable to onsite activities involving generation and onsite management of hazardous waste. |

**Table C-3. Potential Action-specific Applicable or Relevant and Appropriate Requirements**
*Removal Action Work Plan, Beverly Hills Lots 12 and 13 Site, Beverly Hills, California*

| Action | Standard, Requirement, Criterion, or Limitation | ARAR Status | Description | Comment |
|---|---|---|---|---|
| Hazardous waste generation: contingency plan and emergency procedures | 22 CCR Division 4.5, Chapter 15, Article 4 | Potentially applicable | Requirements for preparing a Contingency Plan and taking specified actions in response to releases of hazardous waste. | Applicable to onsite activities involving generation and onsite management of hazardous waste. |
| Hazardous waste generation: training | 22 CCR 66265.16 | Potentially applicable | Requirements for presenting training on contingency plan and hazardous waste management duties to employees managing hazardous waste. | Applicable to onsite activities involving generation and onsite management of hazardous waste. |
| Hazardous waste generation: container management | 22 CCR Division 4.5, Chapter 15, Article 10 | Potentially applicable | Requirements for managing hazardous waste containers, including maintaining containers in good condition, keeping containers closed, and minimum setback distances for containers of ignitable or reactive waste. | Applicable to onsite activities involving generation and onsite management of hazardous waste. |
| Cleanup of releases to the environment | 22 CCR 66264.550 through 66264.552.5 | Potentially applicable | Establishes requirements for CAMUs created during permit-exempt remedial activities. Creation of a CAMU does not trigger the land disposal restriction and minimum technology requirements that apply to permitted hazardous waste disposal units. | May be potentially applicable to alternatives that allow hazardous waste to remain onsite. |
| Cleanup of releases to the environment | Title 22, CCR, Section 66264.553 | Potentially applicable | For temporary tanks and container storage areas used for treatment or storage of hazardous remediation waste during corrective action activities, it might be determined that a design, operating, or closure standard applicable to such units might be replaced by alternative requirements that are protective of human health or the environment. The temporary unit might be in place for 1 year with the possibility of a 1-year extension. | This provision would allow for temporary storage of hazardous waste that is excavated and stored at the site. |
| Land use restrictions | 22 CCR, Section 67391.1 | Potentially applicable | Except as provided in Section 67391.1(e)(2) and (f), a land use covenant imposing appropriate limitations on land use shall be executed and recorded when hazardous materials, hazardous wastes or constituents, or hazardous substances will remain at the property at levels which are not suitable for unrestricted use of the land. | When waste is left in place above standards for unrestricted use, an appropriate land use covenant must be recorded. |

**Table C-3. Potential Action-specific Applicable or Relevant and Appropriate Requirements**
*Removal Action Work Plan, Beverly Hills Lots 12 and 13 Site, Beverly Hills, California*

| Action | Standard, Requirement, Criterion, or Limitation | ARAR Status | Description | Comment |
|---|---|---|---|---|
| Discharge of stormwater from construction activity | General NPDES Permit for Discharges of Storm Water Associated With Construction Activity<br>Water Quality Order 2009-0009-DWQ | Potentially applicable | Establishes requirements to prevent discharges of pollutants to stormwater from construction activities that disturb 1 or more acres of soil, including requirements to implement best management practices and perform monitoring of stormwater discharges. | Applicable if remedial activities disturb 1 or more acres of soil. |
| Onsite management of hazardous materials or hazardous waste: Hazardous Materials Release Response Plans and Inventory | California Health and Safety Code<br>Division 20, Chapter 6.95<br>19 CCR Division 2, Chapter 4, Article 4 | Potentially applicable | Requires reporting of releases or threatened releases to Office of Emergency Services and the Certified Unified Program Agency. Requires preparation of Hazardous Materials Business Plan that contains specified information, including hazardous materials inventory and procedures to respond to releases, if hazardous materials or waste are present onsite in greater than threshold quantities. | Applicable if remediation activities cause regulated quantities of hazardous materials or waste to be present onsite. |
| Conducting activities that cause exposure to Proposition 65-listed substances | Cal. Health and Safety Code, Division 20, Chapter 6.6, | Applicable | Requires warnings of exposure to listed chemicals above specified concentrations or risk levels. Prohibits discharge of listed chemicals to sources of drinking water. | Arsenic is a Proposition 65-listed substance. |

Notes:

AQMD = Air Quality Management District
ARAR = applicable or relevant and appropriate requirement
Cal OSHA = California Occupational Safety and Health Administration
CAMU = corrective action management unit
CCR = *California Code of Regulations*
CEQA = California Environmental Quality Act
CFR = *Code of Federal Regulations*
DTSC = California Environmental Protection Agency, Department of Toxic Substances Control
LDR = land discharge requirement
RCRA = Resource Conservation and Recovery Act
TBC = to be considered
WDR = waste discharge requirements

# Appendix D
# DTSC Correspondence

Department of Toxic Substances Control

Linda S. Adams
Secretary for
Environmental Protection

Maziar Movassaghi,
Acting Director
5796 Corporate Avenue
Cypress, California 90630

Arnold Schwarzenegger
Governor

**TO:** Robert Krug
Project Manager - Cleanup Program
Chatsworth, CA

**FROM:** William S. Bosan, Ph.D.
Senior Toxicologist
Human and Ecological Risk Office
Cypress, CA

**DATE:** December 23, 2010

**SUBJECT:** HERO Evaluation of Site Arsenic Data, Beverly Hills Land Corp. Site

PCA: 12060 Site Code: 301247-11

**Background**

The Human and Ecological Risk Office (HERO) evaluated the arsenic data set for the above-referenced site, located in Beverly Hills, California. The site is part of the right-of-way of the former Pacific Electric Railway, which operated as public transportation on Santa Monica Boulevard until the 1970's. Previously, an arsenic concentration of 27.3 mg/kg was proposed as the upper-bound "background level" for this site.

**Evaluation of Arsenic Data**

Mr. Robert Krug, DTSC Project Manager, provided HERO with the arsenic data for the site, which included data collected at the surface, two feet below ground surface (bgs.), five feet bgs., ten feet bgs, and more than ten feet bgs. HERO previously evaluated soil arsenic data collected from proposed school sites throughout southern California and established an ambient, upper-bound arsenic concentration in soil of 12 mg/kg. The arsenic data for this Beverly Hills Site appear elevated in comparison to most of Los Angeles County, so HERO decided to evaluate the data by depth for the site. The arsenic data were evaluated using the DTSC Guidance Document: **Arsenic Strategies: Determination of Arsenic Remediation - Development of Arsenic Cleanup Goals for Proposed and Existing School Sites**, available at www.dtsc.ca.gov/AssessingRisk/humanrisk2.cfm#guidance.

The approach used a visual evaluation of the data plots (graphical evaluation) by creating normality plots (i.e., probability plots) of the arsenic data by depth in order to evaluate the arsenic data distributions at differing depths. Consistent with the arsenic data throughout southern California, the Beverly Hills Site data appeared to be log-normally distributed. Consequently, all plots were based on log-transformed data values.

Figure 1 presents the site arsenic data distributions by depth. The surface and two-feet

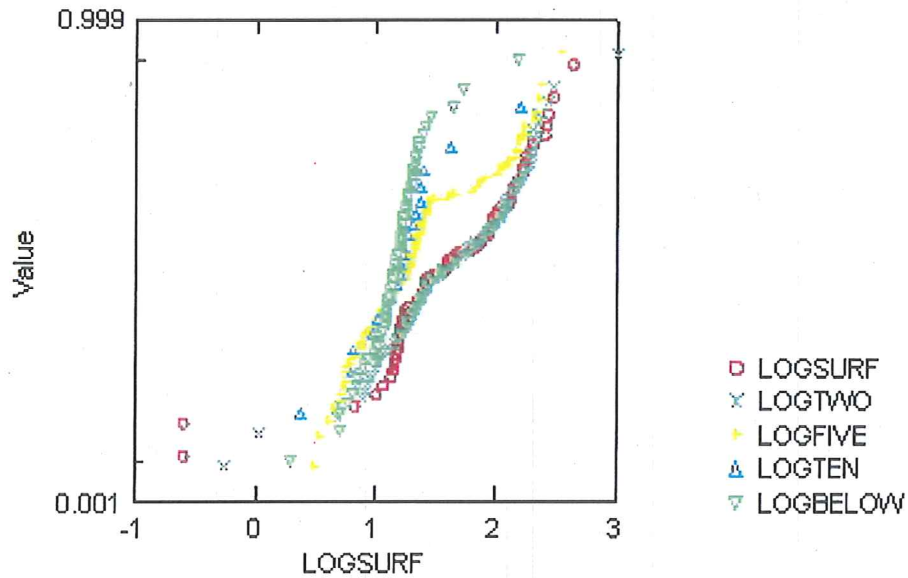


**Figure 1**

depths show the highest concentrations of arsenic and also exhibit multiple inflection points, indicating multiple populations within the distribution. This is consistent with what has been observed at other railroad right-of-way sites in southern California with site-related arsenic contamination. The five-foot, ten-foot and deeper arsenic samples overlap and exhibit an inflection point at approximately log 1.4 or 25 mg/kg. While some contamination is noted at the five-foot depth, the deeper samples appear to be relatively un-impacted by site activities and are most likely representative of background conditions.

Figure 2 shows the probability plot for all arsenic data on-site in all depth groups. Consistent with the depth-specific plots shown in Figure 1, an inflection point is clearly seen at approximately log 1.4, or 25 mg/kg arsenic.

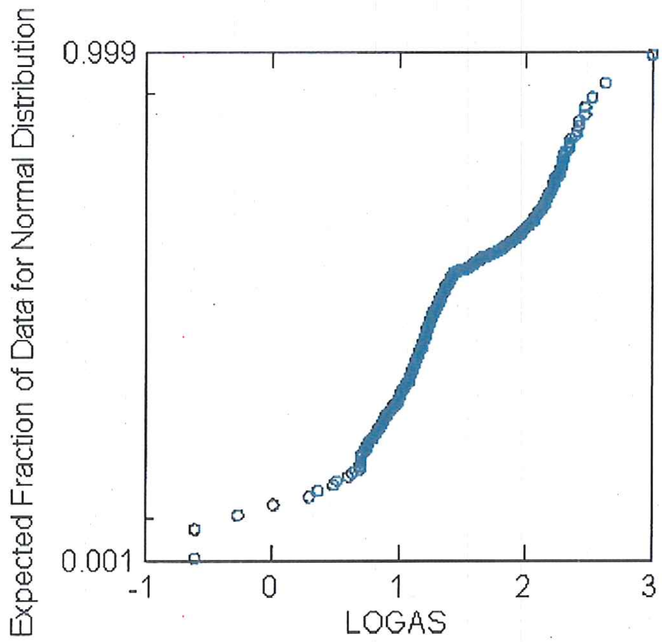


**Figure 2**

## Conclusions

Using the graphical evaluation of arsenic data for the Beverly Hills Land Corp. Site, HERO established an upper-bound arsenic concentration of 25 mg/kg, which it considers representative of background conditions at this particular site. Arsenic detections above 25 mg/kg would be considered site-related contamination. Therefore, HERO recommends an arsenic cleanup goal of 25 mg/kg for those areas on-site where future receptors may directly contact site soils. Note, higher concentrations of arsenic may be left on-site depending on site-specific considerations, such as a road or other similar caps or coverings which would limit exposure. If you have additional questions, please contact me at (714) 484-5399 or bbosan@dtsc.ca.gov.

**Reviewed by:**

James M. Polisini, Ph.D.
Senior Toxicologist
Human and Ecological Risk Office

Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

Deborah O. Raphael, Director
9211 Oakdale Avenue
Chatsworth, California 91311

Edmund G. Brown Jr.
Governor

May 21, 2012

Mr. Jim E. Diel
Manager of Environmental Site Remediation
Union Pacific Railroad
9451 Atkinson Street, Suite 100
Roseville, California 95747

**ARSENIC CLEANUP LEVELS REGARDING THE BEVERLY HILLS LOTS 12 & 13 SITE LOCATED IN BEVERLY HILLS, CALIFORNIA**

Dear Mr. Diel:

The Department of Toxic Substances Control (DTSC) and representatives for Union Pacific Railroad, Beverly Hills Land Company, and CH2MHill met on April 12, 2012 to discuss the delay in submitting a draft RAW/RAP. It was determined that it would be helpful if DTSC could provide an arsenic cleanup level guideline to assist developers and financial institutions determine accurate costs associated with any potential development plan of the site. Below is the guideline that DTSC has determined:

<u>For Remediation of Future Landscape Areas:</u>
0-2 Feet < 25 ppm
2-5 Feet < 75 ppm
Below 5 Feet = Left in Place

<u>For Remediation of Future Hardscape Areas:</u>
0-3 Feet < 75 ppm
Below 3 Feet = Left in Place

A Land Use Covenant (LUC) would be required if these cleanup levels are used. Included in the LUC would be a soil management plan that specifies the actions to be taken when future site activities require the disturbance of any elevated arsenic soils left in place.

If you have any questions please call me at (818) 717-6562 or email me at Rkrug@dtsc.ca.gov, or you may contact my Branch Chief, Steve Lavinger, at (818) 717-6528.

Sincerely,

Robert E Krug

Robert Krug
Project Manager
Brownfields and Environmental Restoration Program – Chatsworth Office

cc: Mr. Eugene M. St. John, Jr.
Beverly Hills land Company
136 EL Camino, Suite 416
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Mr. Jim Curtis, P.E.
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Brian J. Jacobs, P.G., C.HG.
Principal Scientist/Vice President
URS Corporation
915 Wilshire Boulevard, Suite 700
Los Angeles, California 90017

# Appendix E
# Cost Estimate

| | |
|---|---|
| **Site:** | Lots 12 and 13, Beverly Hills, CA |
| **Phase:** | Feasibility Study Level Costs (AACE Level 4, Accuracy -30% - +50%) |
| **Date:** | November 13, 2019 |

| Alternative | Remedial Action Description | RA System Installation (Capital Costs) | Annual O&M Costs | O&M Years | Total Annual O&M Costs | Total Project Cost |
|---|---|---|---|---|---|---|
| Alternative 1 | No Action | $ - | $ - | 0 | $ - | **$ -** |
| Alternative 2 | Consolidation and Asphalt Capping in Place (15 years) and Institutional Controls | $ 1,556,000 | $ 29,000 | 15 | $ 435,000 | **$ 1,991,000** |
| Alternative 3 | Excavation and Offsite Disposal | $ 5,501,000 | $ - | 0 | $ - | **$ 5,501,000** |
| Alternative 4 | Soil Cap with Limited Excavation, Offsite Disposal, and Institutional Controls | $ 1,948,000 | $ - | 0 | $ - | **$ 1,948,000** |
| Alternative 5 | Excavation and Offsite Disposal during Development | $ 1,508,000 | $ - | 0 | $ - | **$ 1,508,000** |

Notes:
RA = remedial action
O&M = Operation and Maintanence

# Beverly Hills Lots 12 and 13 Site
## 9315 Civic Center Drive, Beverly Hills, CA
## Alternative 2: Capping

Assumptions:

- Alternative 2 would consist of capping the ground surface where arsenic concentrations are greater than 25 mg/kg.
- Excavation of 400 cubic yards of material at concentrations greater than 25 mg/kg from perimeter of site and placement along centerline of site to be capped.
- 2-inch asphalt cap with 4-inch roadbase, primarily down center line of Site and extending out to 10 to 15 feet of center line either side, depending on location.
- All trees and shrubs are within 5 to 10 feet of sidewalk, perimeter of the site. No major tree or shrub removal.
- City will allow runoff to City storm drains. Storm drains are located within 100 feet of lot discharge points, no deeper than 10 feet, and no traffic lanes to cross. One lane closure required for each connection to storm drain.
- Assumes no environmental assessment by the City.
- Assumes no encroachment permit will be needed.
- Existing fencing and landscaping to remain in place.

| Description | Quantity | Units | | Unit Cost | | Item Cost | Comments |
|---|---|---|---|---|---|---|---|
| **Construction** | | | | | | | |
| **General Site Preparation** | | | | | | | |
| Mobilization, Office, and Facilities | 1 | LS | $ | 100,000 | | $100,000 | |
| City Plan Check | 1 | LS | $ | 1,500 | | $1,500 | |
| City Grading Permit | 2% | of | $ | 590,772 | | $11,815 | City website, fees, and taxes |
| City Heavy Haul Permit | 1 | EA | $ | 1,500 | | $1,500 | Assumes 50 trips, City website, fees, and taxes |
| Construction Stormwater Pollution Prevention Plan | 1 | LS | $ | 12,500 | | $12,500 | |
| City ROW Encroachment Permit | 5000 | LS | | | | $0 | |
| Traffic Control | 10 | DAYS | | $1,500 | | $15,000 | Blocking one lane of Santa Monica Boulevard, two-man crew and signs |
| Construct Decon Pads | 4 | EA | $ | 8,100 | | $32,400 | Dry brush |
| Sidewalk/Curb and Gutter Replacement Permit Fee | 2 | EA | $ | 1,000 | | $2,000 | City website, fees, taxes |
| | **General Site Preparation Subtotal** | | | | | **$176,715** | |
| **Construction** | | | | | | | Lot 12 – 71,000 squre feet to be capped<br>Lot 13 – 122,000 square feet to be capped |
| Dust Control | 1 | LS | $ | 20,000 | | $20,000 | |
| Light Clear and Grub, Prepare Areas of Hot-spot Removal, and Capping | 41,250 | SF | $ | 0.20 | | $8,250 | Small debris, small branches, no concrete, 1 ton of material each lot |
| Dispose of Clear and Grub Material | 3 | TON | $ | 300 | | $900 | Municipal waste, SoCal disposal, 4 miles one way |
| **Capping** | | | | | | | |
| Hot Spot Removal at Perimeter of Site | 400 | CY | $ | 30 | | $12,000 | Excavation of small hot spots and placement along center line of site |
| Scarify, Compact, and Rough Grading | 77320 | SF | $ | 0.25 | | $19,330 | |
| AC Base Material, Procure, and Place | 950 | TON | $ | 25 | | $23,750 | 4-inch ABII compacted; 1.5 ton/cubic yard |
| Weed Block – Pre-emergent Application | 1.33 | ACRE | $ | 250 | | $333 | 4 quart/acre mix concentrate in 25 gallons water |
| Weed Block – Pre-emergent Application – Second Application | 1.33 | ACRE | $ | 250 | | $333 | 4 quart/acre mix concentrate in 25 gallons water, apply 100 days after first application |
| Weed Block Membrane | 75000 | SF | $ | 0.50 | | $37,500 | Two layers, placed in perpendicular direction |
| Paving | 68000 | SF | $ | 3 | | $204,000 | 3,200 feet long x 20 feet wide; 2 inches |
| Asphalt Curb and Gutter | 7500 | LF | $ | 5 | | $37,500 | 6 inch AC curb to direct stormwater to two discharge points, one at each end of parcel |
| Construct Drop Inlet Onsite | 7 | EA | $ | 5,000 | | $35,000 | |
| Utility Clearance | 2 | LS | $ | 2,500 | | $5,000 | Clear utilities for connection to City storm drains |
| Remove, Replace Section of Existing Fence | 7 | EA | $ | 1,500 | | $10,500 | |
| Remove, Replace Section of Sidewalk | 7 | EA | $ | 2,400 | | $16,800 | 3 feet wide, 5 feet long, 4 inches thick |
| Lane Closure | 7 | EA | $ | 3,000 | | $21,000 | 3 days each |
| City Street AC Removal | 7 | EA | $ | 2,500 | | $17,500 | 10 feet wide, 100 feet long, 4 inches thick |
| Excavate, Expose Stormdrain, Stockpile Soil | 1330 | CY | $ | 30 | | $39,900 | Maximum 10 feet deep |
| Pipe Placement and Connection | 420 | LF | $ | 40 | | $16,800 | 6-inch concrete connect to 12-inch concrete |
| Pipe Bedding | 30 | CY | $ | 35 | | $1,050 | Sand |
| Backfill Excavation | 1305 | CY | $ | 10 | | $13,050 | Reuse soil |
| Repave City Street | 7 | EA | $ | 5,000 | | $35,000 | 10 feet wide, 100 feet long, 4 inches thick |
| Street Sweep | 6 | DY | $ | 1,500 | | $9,000 | Three spearate mobilizations |
| Dispose of Miscellanous Construction Debris | 45 | TONS | $ | 50 | | $2,250 | Municipal waste, 15 cubic yards soil plus AC; SoCal Disposal, 4 miles one way |
| Transport and Dispose of Decon Soil | 1 | TONS | $ | 600 | | $600 | Azuza Landfill, Rico cost, 45 miles one way |
| Construction Inspection | 8 | HR | $ | 125 | | $1,000 | City website, fees, and taxes, 4 hours per lot |
| Stormwater Pollution Prevention Plan Inspection | 10 | HR | $ | 125 | | $1,250 | City website, fees, and taxes, 3 hours per lot |
| Sidewalk/Curb and Gutter/Pavement Replacement Inspection | 9 | SF | $ | 125.00 | | $1,125 | |
| | **Construction Subtotal** | | | | | **$590,720** | |
| **Subtotal Capital Cost** | | | | | | **$767,435** | |
| **Allowances** | | | | | | | |
| Site Work Allowance | 5% | of | $ | 767,435 | $ | 38,372 | |
| Utility Allowance | 5% | of | $ | 767,435 | $ | 38,372 | Allowance for the repair and/or re-routing of underground or above ground utilities |
| Safety Allowance | 2% | of | $ | 767,435 | $ | 15,349 | |
| Miscellaneous Equipment Allowance | 7% | of | $ | 767,435 | $ | 53,720 | |
| **Subtotal Capital Cost** | | | | | $ | 913,248 | |
| Project Management | 8% | of | $ | 913,248 | $ | 73,060 | |
| Design | 12% | of | $ | 913,248 | $ | 109,590 | Includes preparation of long-term Operation and Maintenance Plan |
| Permitting | 8% | of | $ | 913,248 | $ | 73,060 | |
| Construction Management | 14% | of | $ | 913,248 | $ | 127,855 | |
| **Undefined Scope** | 20% | of | $ | 1,296,812 | $ | 259,362 | |
| **CAPITAL COST** | | | | | **$** | **1,556,000** | **(Rounded)** |

Assumptions:

- PE not needed for annual inspection
- Sealing paved area once every 5 years
- Assumes 100 linear feet of cracks/1,000 feet of length
- No fence and landscape maintenance

## Beverly Hills Lots 12 and 13 Site
## 9315 Civic Center Drive, Beverly Hills, CA
## Alternative 2: Capping

| | | | | | | |
|---|---|---|---|---|---|---|
| Annual O&M Costs | | | | | | |
| **Construction (this occurs every 5 years)** | | | | | | |
| **Pavement Sealing – Asphalt cap on all Three Lots (37,500 SF)** | | | | | | |
| Clean surface for sealing | 1 | LS | $ 240 | $ 240 | 37,500 SF; $1,200 every 5 years |
| Caulk or sand cracks | 720 | LF | $ 4 | $576 | |
| Slurry seal surface | 50820 | SF | $ 1 | $10,164 | 12# Aggregate/square yard, two coats |
| Tech 2 Labor | 80 | hrs | $ 90 | $ 7,200 | site visits |
| Engineer Labor | 40 | hrs | $ 117 | $ 4,680 | |
| Maintenance Items | 24 | MO | $ 250 | $ 6,000 | |
| Travel | 2 | WK | $ 250 | $ 500 | mileage, meals, tolls, parking |
| **Subtotal Annual O&M Costs** | | | | **$ 29,000** | **Rounded** |
| Total Operation & Maintenance Cost | 15 | yrs | $ 29,000 | $ 435,000 | |
| **Total Project Cost** | | | | **$ 1,991,000** | **(Rounded)** |

| | | |
|---|---|---|
| **Class 5 Estimate Range:** | **50%** | **$ 2,986,500** |
| | **-30%** | **$ 1,393,700** |

**This estimate is not an offer for construction and/or project execution. These ACEC Classification 5 cost estimates are intended to reflect the actual installed costs within the range of -30% and +50% of the costs indicated. The cost estimate has been prepared for guidance in project evaluation and implementation from the information available at the time of the estimate. The final costs of the project will depend on actual labor and material costs and competitive variable factors. Because of this, project feasibility and funding needs must be carefully reviewed prior to making specific decisions to help insure proper project evaluation and adequate funding.**

# Beverly Hills Lots 12 and 13 Site
## 9315 Civic Center Drive, Beverly Hills, CA
## Alternative 3: Load, Transport, and Haul Impacted Soil

Assumptions:
- Excavation of entire site per DTSC cleanup guidelines for the site. 2,500SF Exc/sample exceedance
- Backfill with imported fill
- No operation and maintenance once disposal is completed.

| Description | Quantity | Units | Unit Cost | Item Cost | Comments |
|---|---|---|---|---|---|
| **Construction** | | | | | |
| **Preconstruction and Mobilization** | | | | | |
| Investigation | 1 | LS | | $102,068 | |
| Mobilization | 1 | LS | | $50,000 | |
| Prepare Dust Control/Monitoring Plan | 1 | LS | | $6,200 | |
| Prepare Traffic Plan | 1 | LS | | $12,300 | |
| Prepare Transportation Plan | 1 | LS | | $9,800 | |
| Obtain City Heavy Haul Permit | 1,380 | LOAD | $20 | $27,604 | City website |
| **Preconstruciton and Mobilization Subtotal** | | | | **$207,972** | |
| **Site Preparation** | | | | | |
| Construct/Relocate/Remove Decon Pad | 3 | LOCATION | $8,100 | $24,300 | |
| **Site Preparation Subtotal** | | | | **$24,300** | |
| **Excavate, Load, Transport, and Dispose** | | | | | |
| Excavate Soil Lot 12, Lot 13, Triangle, 0-2 ft bgs | 1,296 | CY | $15 | $19,444 | 2,500SF Exc/sample exceedance |
| Excavate - Overexcavation 0-2 ft bgs (25%) | 324 | CY | $20 | $6,481 | 25% of mass excavation |
| Excavate Soil Lot 12, Lot 13, Triangle, 0-5 ft bgs | 13,426 | CY | $15 | $201,389 | 2,500SF Exc/sample exceedance |
| Excavate - Overexcavation 0-5 ft bgs (25%) | 3,356 | CY | $20 | $67,130 | 25% of mass excavation |
| Load Soil Lot 12, Lot 13, Triangle | 14,722 | CY | $8 | $117,778 | |
| Load - Overexcavation (25%) | 3,681 | CY | $8 | $29,444 | 25% of mass excavation |
| Survey Control at 2 feet | 3 | DAYS | $3,100 | $9,300 | |
| Profile Sampling | 5 | EA | $160.00 | $800 | |
| Confirmation Sampling | 0 | EA | $20.00 | $0 | |
| Ambient Air Sampling | 1.15 | MO | $28,550 | $32,837 | |
| Transport | 27,604 | TON | $30.00 | $828,125 | 1.5 tons/cubic yard, Azuza landfill, 26 miles one way |
| Disposal | 27,604 | TON | $35.00 | $966,146 | Class II material |
| Street Sweeping | 35 | DAYS | $1,500 | $51,758 | 40 trucks per day |
| Decontamination | 35 | DAYS | $1,100 | $37,956 | |
| **Excvation, Load, Transport, and Dispose Subtotal** | | | | $2,368,588 | |
| **Site Restoration** | | | | | |
| Purchase and Place Import Fill | 18,403 | CY | $40.00 | $736,111 | |
| Rough Grading | 205,000 | SF | $0.25 | $51,250 | |
| **Site Restoration Subtotal** | | | | **$787,361** | |
| **Subtotal Capital Cost** | | | | **$3,388,221** | |
| **Allowances** | | | | | |
| Site Work Allowance | 3% | CF | $ 3,388,221 | $ 101,647 | |
| Safety Allowance | 2% | CF | $ 3,388,221 | $ 67,764 | |
| Miscellaneous Equipment Allowance | 5% | CF | $ 3,388,221 | $ 169,411 | |
| **Subtotal Capital Cost** | | | | $ 3,727,043 | |
| Project Management | 5% | CF | $ 3,727,043 | $ 186,352 | |
| Design | 8% | CF | $ 3,727,043 | $ 298,163 | |
| Permitting | 2% | CF | $ 3,727,043 | $ 74,541 | |
| Construction Management | 8% | CF | $ 3,727,043 | $ 298,163 | |
| **Undefined Scope** | 20% | CF | $ 4,584,263 | $ 916,853 | |
| **Total Project Cost** | | | | **$ 5,501,000** | |
| | | **Class 5 Estimate Range:** | **100%** | **$ 11,002,000** | |
| | | | **-50%** | **$ 2,750,500** | |

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**Beverly Hills Lots 12 and 13 Site**
**9315 Civic Center Drive, Beverly Hills, CA**

## Alternative 4: Load, Transport, and Haul Impacted Soil During Development, Onsite Containment

Assumptions:
- Excavation of entire site per ONLY DTSC cleanup guidelines for soil from 0-2 feet bgs 2,500SF Exc/sample exceedance
- 2-foot clean surface soil following excavation and backfill to provide soil cap
- Includes deed restriction restricting/managing below 2 feet bgs
- Backfill with imported fill

| Description | Quantity | Units | Unit Cost | Item Cost | Comments |
|---|---|---|---|---|---|
| **Construction** | | | | | |
| **Preconstruction and Mobilization** | | | | | |
| Soil Sampling Investigation | 1 | LS | | $102,068 | Hand auger to 5 feet bgs at 230 (30ft centers) locations; Collect 3 samples per boring for arsenic analysis; 1 hr per boring for 2 people; 6 people (2 person teams) can complete 24 locations per day |
| Mobilization | 1 | LS | | $50,000 | |
| Prepare Dust Control/Monitoring Plan | 1 | LS | | $6,200 | |
| Prepare Traffic Plan | 1 | LS | | $12,300 | |
| Prepare Transportation Plan | 1 | LS | | $9,800 | |
| Obtain City Heavy Haul Permit | 417 | LOAD | $20 | $8,333 | City website |
| **Preconstruciton and Mobilization Subtotal** | | | | **$188,701** | |
| **Site Preparation** | | | | | |
| Construct/Relocate/Remove Decon Pad | 3 | LOCATION | $8,100 | $24,300 | |
| **Site Preparation Subtotal** | | | | **$24,300** | |
| **Excavate, Load, Transport, and Dispose** | | | | | |
| Excavate Soil Lot 12, Lot 13, Triangle, 0-2 ft bgs | 4,444 | CY | $15 | $66,667 | 2,500SF Exc/sample exceedance |
| Excavate - Overexcavation 0-2 ft bgs (25%) | 1,111 | CY | $20 | $22,222 | 25% of mass excavation |
| Excavate Soil Lot 12, Lot 13, Triangle, 0-5 ft bgs | - | CY | $15 | $0 | 2,500SF Exc/sample exceedance |
| Excavate - Overexcavation 0-5 ft bgs (25%) | - | CY | $20 | $0 | 25% of mass excavation |
| Load Soil Lot 12, Lot 13, Triangle | 4,444 | CY | $8 | $35,556 | |
| Load - Overexcavation (25%) | 1,111 | CY | $8 | $8,889 | 25% of mass excavation |
| Survey Control at 2 feet | 3 | DAYS | $3,100 | $9,300 | |
| Profile Sampling | 5 | EA | $160.00 | $800 | |
| Confirmation Sampling | 96 | EA | $20.00 | $1,920 | |
| Ambient Air Sampling | 0.35 | MO | $28,550 | $9,913 | |
| Transport | 8,333 | TON | $30.00 | $250,000 | 1.5 tons/cubic yard, Azuza landfill, 26 miles one way |
| Disposal | 8,333 | TON | $35.00 | $291,667 | Class II material |
| Street Sweeping | 10 | DAYS | $1,500 | $15,000 | 40 trucks per day |
| Decontamination | 10 | DAYS | $1,100 | $11,458 | |
| **Excvation, Load, Transport, and Dispose Subtotal** | | | | $723,391 | |
| **Site Restoration** | | | | | |
| Purchase and Place Import Fill | 5,556 | CY | $40.00 | $222,222 | |
| Rough Grading | 205,000 | SF | $0.25 | $51,250 | |
| **Site Restoration Subtotal** | | | | **$273,472** | |
| **Subtotal Capital Cost** | | | | **$1,209,865** | |
| **Allowances** | | | | | |
| Site Work Allowance | 3% | CF | $ 1,209,865 | $ 36,296 | |
| Safety Allowance | 2% | CF | $ 1,209,865 | $ 24,197 | |
| Miscellaneous Equipment Allowance | 5% | CF | $ 1,209,865 | $ 60,493 | |
| **Subtotal Capital Cost** | | | | $ 1,330,851 | |
| Project Management | 4% | CF | $ 1,330,851 | $ 53,234 | |
| Design | 8% | CF | $ 1,330,851 | $ 106,468 | |
| Permitting | 2% | CF | $ 1,330,851 | $ 26,617 | |
| Construction Management | 8% | CF | $ 1,330,851 | $ 106,468 | |
| **Undefined Scope** | 20% | CF | $ 1,623,639 | $ 324,728 | |
| **Total Project Cost** | | | | **$ 1,948,000** | |

| | | |
|---|---|---|
| **Class 5 Estimate Range:** | **100%** | **$ 3,896,000** |
| | **-50%** | **$ 974,000** |

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## Beverly Hills Lots 12 and 13 Site
## 9315 Civic Center Drive, Beverly Hills, CA
## Alternative 5: Load, Transport, and Haul Impacted Soil During Development, Onsite Containment

Assumptions:
- Excavation of entire site per ONLY DTSC cleanup guidelines for soil from 0-2 feet bgs 2,500SF Exc/sample exceedance
- 2-foot clean surface soil following excavation and backfill to provide soil cap
- Assumes development excavation will continue to remove additional soil to 5 feet bgs or a soil cap and institutional controls will be developed.

| Description | Quantity | Units | Unit Cost | Item Cost | Comments |
|---|---|---|---|---|---|
| **Construction** | | | | | |
| **Preconstruction and Mobilization** | | | | | |
| Soil Sampling Investigation | 1 | LS | | $102,068 | Hand auger to 5 feet bgs at 230 (30ft centers) locations; Collect 3 samples per boring for arsenic analysis; 1 hr per boring for 2 people; 6 people (2 person teams) can complete 24 locations per day |
| Mobilization | 1 | LS | | $50,000 | |
| Prepare Dust Control/Monitoring Plan | 1 | LS | | $6,200 | |
| Prepare Traffic Plan | 1 | LS | | $12,300 | |
| Prepare Transportation Plan | 1 | LS | | $9,800 | |
| Obtain City Heavy Haul Permit | 417 | LOAD | $20 | $8,333 | City website |
| **Preconstruciton and Mobilization Subtotal** | | | | **$188,701** | |
| **Site Preparation** | | | | | |
| Construct/Relocate/Remove Decon Pad | 3 | LOCATION | $8,100 | $24,300 | |
| **Site Preparation Subtotal** | | | | **$24,300** | |
| **Excavate, Load, Transport, and Dispose** | | | | | |
| Excavate Soil Lot 12, Lot 13, Triangle, 0-2 ft bgs | 4,444 | CY | $15 | $66,667 | 2,500SF Exc/sample exceedance |
| Excavate - Overexcavation 0-2 ft bgs (25%) | 1,111 | CY | $20 | $22,222 | 25% of mass excavation |
| Excavate Soil Lot 12, Lot 13, Triangle, 0-5 ft bgs | - | CY | $15 | $0 | 2,500SF Exc/sample exceedance |
| Excavate - Overexcavation 0-5 ft bgs (25%) | - | CY | $20 | $0 | 25% of mass excavation |
| Load Soil Lot 12, Lot 13, Triangle | 4,444 | CY | $8 | $35,556 | |
| Load - Overexcavation (25%) | 1,111 | CY | $8 | $8,889 | 25% of mass excavation |
| Survey Control at 2 feet | 3 | DAYS | $3,100 | $9,300 | |
| Profile Sampling | 5 | EA | $160.00 | $800 | |
| Confirmation Sampling | 96 | EA | $20.00 | $1,920 | |
| Ambient Air Sampling | 0.35 | MO | $28,550 | $9,913 | |
| Transport | 8,333 | TON | $30.00 | $250,000 | 1.5 tons/cubic yard, Azuza landfill, 26 miles one way |
| Disposal | 8,333 | TON | $35.00 | $291,667 | Class II material |
| Street Sweeping | 10 | DAYS | $1,500 | $15,000 | 40 trucks per day |
| Decontamination | 10 | DAYS | $1,100 | $11,458 | |
| **Excvation, Load, Transport, and Dispose Subtotal** | | | | $723,391 | |
| **Site Restoration** | | | | | |
| Purchase and Place Import Fill | - | CY | $40.00 | $0 | |
| Rough Grading | 0 | SF | $0.25 | $0 | |
| **Site Restoration Subtotal** | | | | **$0** | |
| **Subtotal Capital Cost** | | | | **$936,393** | |
| **Allowances** | | | | | |
| Site Work Allowance | 3% | CF | $ 936,393 | $ 28,092 | |
| Safety Allowance | 2% | CF | $ 936,393 | $ 18,728 | |
| Miscellaneous Equipment Allowance | 5% | CF | $ 936,393 | $ 46,820 | |
| **Subtotal Capital Cost** | | | | $ 1,030,032 | |
| Project Management | 4% | CF | $ 1,030,032 | $ 41,201 | |
| Design | 8% | CF | $ 1,030,032 | $ 82,403 | |
| Permitting | 2% | CF | $ 1,030,032 | $ 20,601 | |
| Construction Management | 8% | CF | $ 1,030,032 | $ 82,403 | |
| **Undefined Scope** | 20% | CF | $ 1,256,639 | $ 251,328 | |
| **Total Project Cost** | | | | **$ 1,508,000** | |

| | | |
|---|---|---|
| **Class 5 Estimate Range:** | **100%** | **$ 3,016,000** |
| | **-50%** | **$ 754,000** |

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# Appendix F
# Pre-Construction Investigation Work Plan

# Union Pacific Railroad Beverly Hills Site, 9315 Civic Center Drive, Beverly Hills, California

## Pre-Construction Investigation Work Plan

May 2020

Union Pacific Railroad

# Union Pacific Railroad Beverly Hills Site, 9315 Civic Center Drive, Beverly Hills, California

| | |
|---|---|
| Project No: | UPSRWA05 |
| Document Title: | Pre-Construction Investigation Work Plan |
| Document No.: | PPS0430201349PDX |
| Date: | April 2020 |
| Client Name: | Union Pacific Railroad |
| Project Manager: | David Hodson |

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# Technical Certification

This work plan has been prepared under the direction of a Registered Civil Engineer in the State of California.

________________________________________
David J. Hodson, P.E. No. C71737
Project Manager

__________________________________
Date

# Contents

# Acronyms and Abbreviations

| | |
|---|---|
| bgs | below ground surface |
| DQO | data quality objective |
| DTSC | California Environmental Protection Agency, Department of Toxic Substances Control |
| FD | field duplicate |
| HAZWOPER | Hazardous Waste Operations and Emergency Response |
| Jacobs | Jacobs Engineering Group Inc. |
| QC | quality control |
| ROW | right-of-way |
| UPRR | Union Pacific Railroad |

# 1. Introduction

On behalf of Union Pacific Railroad (UPRR), Jacobs Engineering Group Inc. (Jacobs) has prepared this work plan to support pre-construction delineation of proposed removal action areas at the UPRR Beverly Hills site (site) located at 9315 Civic Center Drive in Beverly Hills, California (Figure 1-1). The site is also known as “Beverly Hills Lots 12 & 13” and consists of approximately 5 acres, including Lots 12 and 13, as well as a small triangular section east of Lot 13. UPRR entered the site into a Voluntary Cleanup Agreement (Docket Number HSA-A 04/05-066) with the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) in December 2004 (DTSC, 2005).

## 1.1 Purpose and Scope

The proposed sampling includes soil sample collection and analysis to refine areas requiring removal of arsenic-impacted soil at the site (Jacobs, 2020). Soil samples will be collected on 25-foot grid spacing across the site to identify potential removal areas that would be reasonable to excavate, if necessary, using typical excavation equipment. Soil samples will be collected at ground surface and 1 foot below ground surface (bgs) to evaluate where potential removal areas will extend to either 1 or 2 feet bgs.

## 1.2 Report Organization

This work plan is organized into the following sections:

- **Section 1, Introduction,** presents the document purpose and general organization.
- **Section 2, Data Quality Objectives,** proposes data quality objectives (DQOs) associated with the proposed sampling activities.
- **Section 3, Sampling and Analysis Plan,** describes the proposed methodology for conducting sampling and analysis for the proposed sampling activities.
- **Section 4, References,** presents the references used to prepare this document.

## 1.3 Site Background

The site is located at 9315 Civic Center Drive in Beverly Hills, California, and consists of three areas (Lots 12 and 13 and a small triangular section located east of Lot 13) with Los Angeles County Assessor’s Identification Numbers 4342-015-038, 4342-015-040, 4342-015-041, and 4342-015-039. The site is the former railroad right-of-way (ROW) adjacent to Santa Monica Boulevard, between Alpine Avenue and North Doheny Drive (Figure 1-1).

The site was occupied by the railroad ROW from 1926 to approximately 1998 (CH2M, 2006). Aerial photographs indicate that the railroad, operated by the Pacific Electric Railway Company, was active from 1928 until between 1971 and 1979 (Lindmark, 1998). A series of aerial photographs from 1952, 1969, 1970, 1979, 1986, 1988, 1990, 1993, 1995, and 1998 did not indicate evidence that the site had been used for purposes other than a railroad ROW (either active or inactive).

In 1998, UPRR, the successor in interest to Pacific Electric Railway Company, transferred the site to Beverly Hills Land Company, the site’s current owner.

The site was a former railroad ROW, and there are no known railroad operations. Previous investigation activities (Jacobs, 2020) identified elevated levels of arsenic in soil. The arsenic source at the site is also unknown and is likely associated with fill material at the site. Arsenic likely migrated into shallow soil, adhering to soil particles. Soil sample data do not indicate elevated levels of arsenic in soil below 5 feet bgs. Likewise, arsenic was not detected at elevated levels in groundwater samples collected at the site.

# 2. Data Quality Objectives

This section presets a summary of project objectives and DQOs.

## 2.1 Objectives and Problem Definition

This work plan proposes a pre-construction investigation to collect soil samples for arsenic analysis to assess areas with elevated levels of arsenic that require removal.

## 2.2 Data Quality Objectives

Data collected from the proposed sampling activities will be used to obtain representative measurements of arsenic in soil to adequately refine proposed removal action areas to reduce the volume of arsenic-impacted soil at the site.

## 2.3 Data Management

Pre-construction investigation sampling will generate analytical soil data across the site up to 1 foot bgs. Sample location data will be obtained using a handheld GPS device with sub-meter accuracy to identify the location of soil samples to support identification of excavation areas. Soil analytical data will be obtained quantifying levels of arsenic to compare against removal action goals to support development of excavation volumes. Data will be validated and managed in a database.

The data management system will be designed to provide ready access to information for statistical summary and analysis. Data will be reviewed by project subject matter experts. Quality control review will be conducted by a senior scientist and any questionable data will be reviewed and resolved.

# 3. Sampling and Analysis Plan

This section presents the activities associated with the proposed sampling plan.

## 3.1 Field Preparation Activities

Workers involved in soil-disturbing activities will be advised of the potential presence of hazardous substances in site soil in advance of field work, and field personnel will have appropriate training and qualifications for the anticipated work (for example, Occupational Safety and Health Administration Hazardous Waste Operations and Emergency Response [HAZWOPER] training, if necessary). Fieldwork will be performed in accordance with site health and safety procedures by staff who are appropriately informed, trained, and certified to complete the work.

The following tasks will be completed before the field activities described in this work plan:

- Update the site-specific health and safety plan to identify the chemical and physical hazards associated with the additional investigation activities.
- Conduct one pre-investigation site visit to identify sampling locations, which will be marked with white paint.
- Contact Underground Service Alert for utility clearance, and work with a private subsurface utility locating company to survey the sampling locations for subsurface utilities.
- Obtain applicable access agreements for sampling.

## 3.2 Soil Sampling

Sample locations will be based on an approximate grid with 25-foot spacing, as shown on Figures 2-1a through 2-1d. Samples will be collected at 0.5-foot depths at ground surface and 1 foot bgs. Hand augering will be conducted to reach the desired sample depth. Soil samples will be collected directly from the hand auger. Hand auger boreholes will be backfilled using the excavated material.

Sample locations will be determined through field measurements, using a mechanical measuring wheel. A flag will be placed with a location identification at each sampling location. Sample locations will be surveyed using a handheld global positioning system instrument with sub-meter accuracy.

Samples will be placed in glass jars for the analysis to be conducted. In general, a minimum of 8 ounces of sample material (or as determined necessary case by case) should be collected for each soil sample. Sample containers will be sealed, labeled with a sample identification number in indelible ink, and stored in accordance with industry standard practice and chain-of-custody procedures. Each sample must be assigned a unique identification number for documentation and tracking purposes. Chain-of-custody protocols will be followed. If multi-use sampling equipment is used during sampling, the equipment will be decontaminated after each use.

Accurate field records must be maintained to document soil disturbance and sampling activities. Specifically, the field sampling records should include the following, at a minimum:

- Description of the soil sampling location and purpose
- Entity and field personnel responsible for the soil disturbance
- Sampling location (sketch or description)
- Sample date and time
- Soil characteristics (for example, odor and color)
- Sample collection method
- Sample identification
- Photographs, if possible

## 3.3 Sample Analysis

Soil samples will be forwarded to a state-certified laboratory for analysis for arsenic by U.S. Environmental Protection Agency Method 6010D on a normal turnaround basis. The reporting limit will be 0.25 milligram per kilogram.

## 3.4 Field and Laboratory Quality Control Samples

Quality control (QC) samples will be collected to assist in determining data quality and reliability. QC samples collected in the field include field duplicates (FDs) and laboratory QC samples (MS and MSD analyses). In addition equipment blanks, temperature blanks and trip blanks are submitted to support QC objectives. QC samples will be collected using the same procedures and immediately following collection of the target or “normal” sample.

FDs will be collected at a rate of 10 percent for soil samples (1 in 10 samples). An FD is an independent sample collected as close as possible to the original sample from the same source, and is used to assess sampling precision. FDs will be labeled as “FD” and packaged in the same manner as normal samples so the laboratory cannot distinguish between normal samples and duplicates. Each FD will be taken using the same sampling and preservation method as other samples.

Laboratory QC samples will be collected to perform MS and MSD analyses. MS/MSD samples will be collected at a frequency of 5 percent for soil and water samples (1 in 20 samples). A MS is an aliquot of a sample that is spiked with a known concentration of target analyte(s) in the laboratory. An MS analysis provides a measure of the method accuracy. A MSD is an additional sample same as the MS and is used to determine the precision of the method. Three times the normal sample volume will be collected for MS/MSD laboratory QC samples. Laboratory QC samples will be labeled as such on sample bottles and chain-of-custody forms.

For each sampling event that includes decontamination of sampling equipment for soil an equipment blank should be taken for each matrix and be analyzed for the analytes reported in that matrix. One equipment blank should be taken per matrix for each event, week or 20 normal samples, whichever is more frequent.

One temperature blank will be included with each cooler shipment containing soil and water samples (regardless of targeted analysis) sent to the laboratory. Temperature blanks provide a means of verifying that samples have been maintained at the proper temperature (0-6 degrees Celsius) following collection and during transport to the laboratory. The laboratory will supply the temperature blank as part of each bottle order request (to be returned with the batch of samples).

## 3.5 Waste Management

No excess soil investigation-derived waste will be generated during sampling activities because hand auger boreholes will be backfilled using excavated soil. Liquid waste consisting of decontamination fluids will be stored in U.S. Department of Transportation-approved drums and sampled to determine waste characteristics before being disposed of at an approved, offsite disposal facility in compliance with applicable laws and regulations.

## 3.6 Estimated Project Schedule

Sampling activities are intended to be conducted immediately prior to removal action activities to refine the proposed removal action activities and are expected to be completed within 2 weeks.

## 3.7 Reporting

Sampling activity results will be used to refine proposed removal action activities. Prior to establishing the proposed removal action activities, proposed removal action areas, based on sample results, will be shared with DTSC to verify compliance with removal action objectives. Following completion of removal action activities, the proposed sampling activity results will be described in a post-construction report.

This report will incorporate investigation results and include the following:

- A brief description of the site
- Modifications to the sampling plan presented in this work plan that are based on field conditions
- Field activity results
- Figures showing the site vicinity and sampling locations
- Tables summarizing laboratory analytical data for soil samples
- Data quality evaluation report
- Supporting documentation, such as chain-of-custody forms, analytical reports, lithologic logs, and field documentation
- Conclusions from the investigation and recommendations, as appropriate

# 4. References

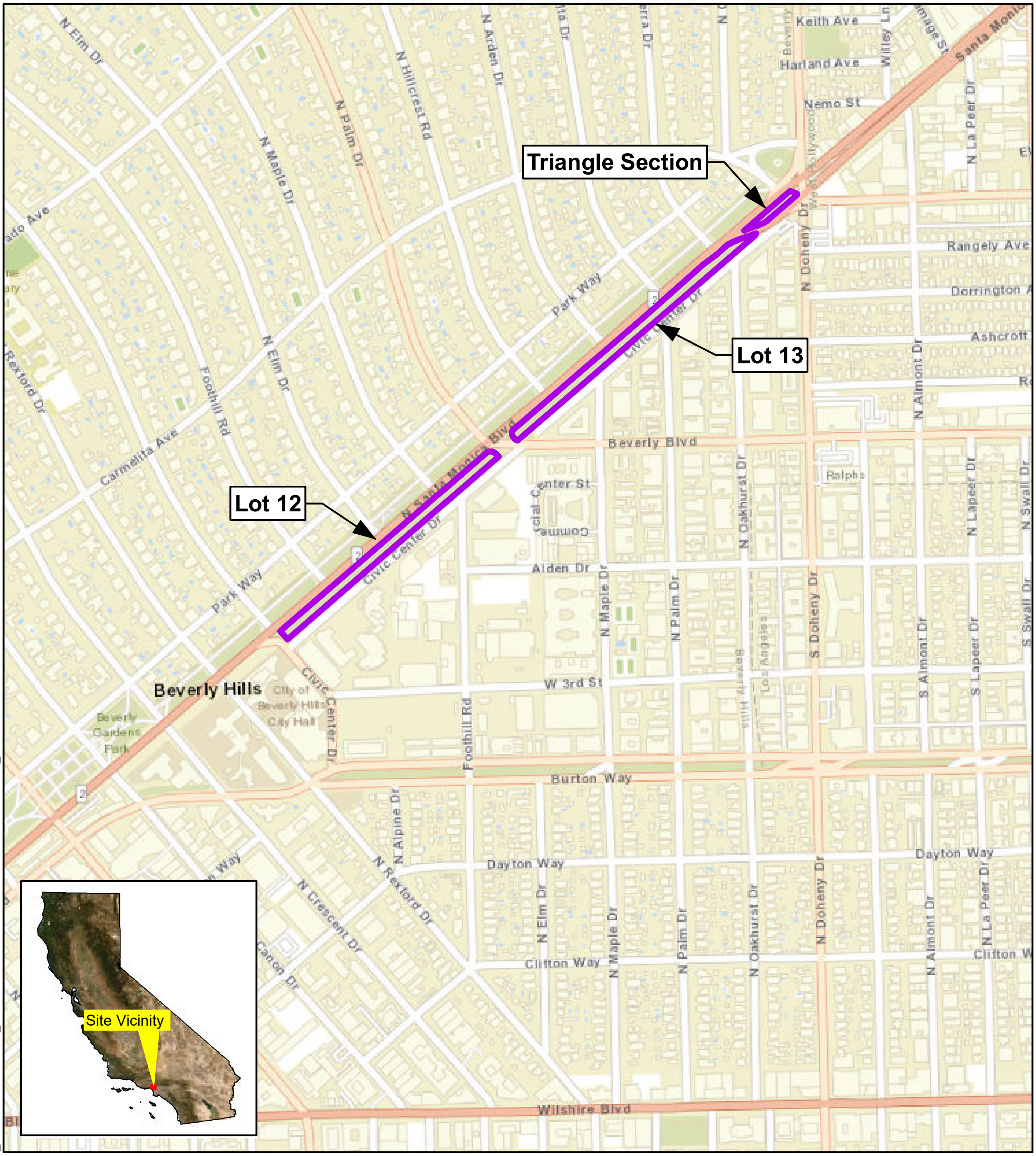
California Environmental Protection Agency, Department of Toxic Substances Control (DTSC). 2005. *Voluntary Cleanup Agreement, Docket No. HSA-A 04/05-066, In the Matter of 9315 Civic Center Drive, Beverly Hills, CA.* February.

CH2M HILL, Inc. (CH2M). 2006. *Remedial Investigation, Beverly Hills Land Corporation Site, 9315 Civic Center Drive, Beverly Hills, CA*.

Jacobs Engineering Group Inc. (Jacobs). 2020. *Removal Action Work Plan, Union Pacific Railroad Beverly Hills Site, 9315 Civic Center Drive in Beverly Hills, California*. XXX.

Lindmark Engineering (Lindmark). 1998. *Proposed Phase I and II Environmental Investigation, Railroad Right-of-Way between North Doheny and Alpine Drives, Beverly Hills, CA 90210*. October 2.

# Figures




**LEGEND**

Site

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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

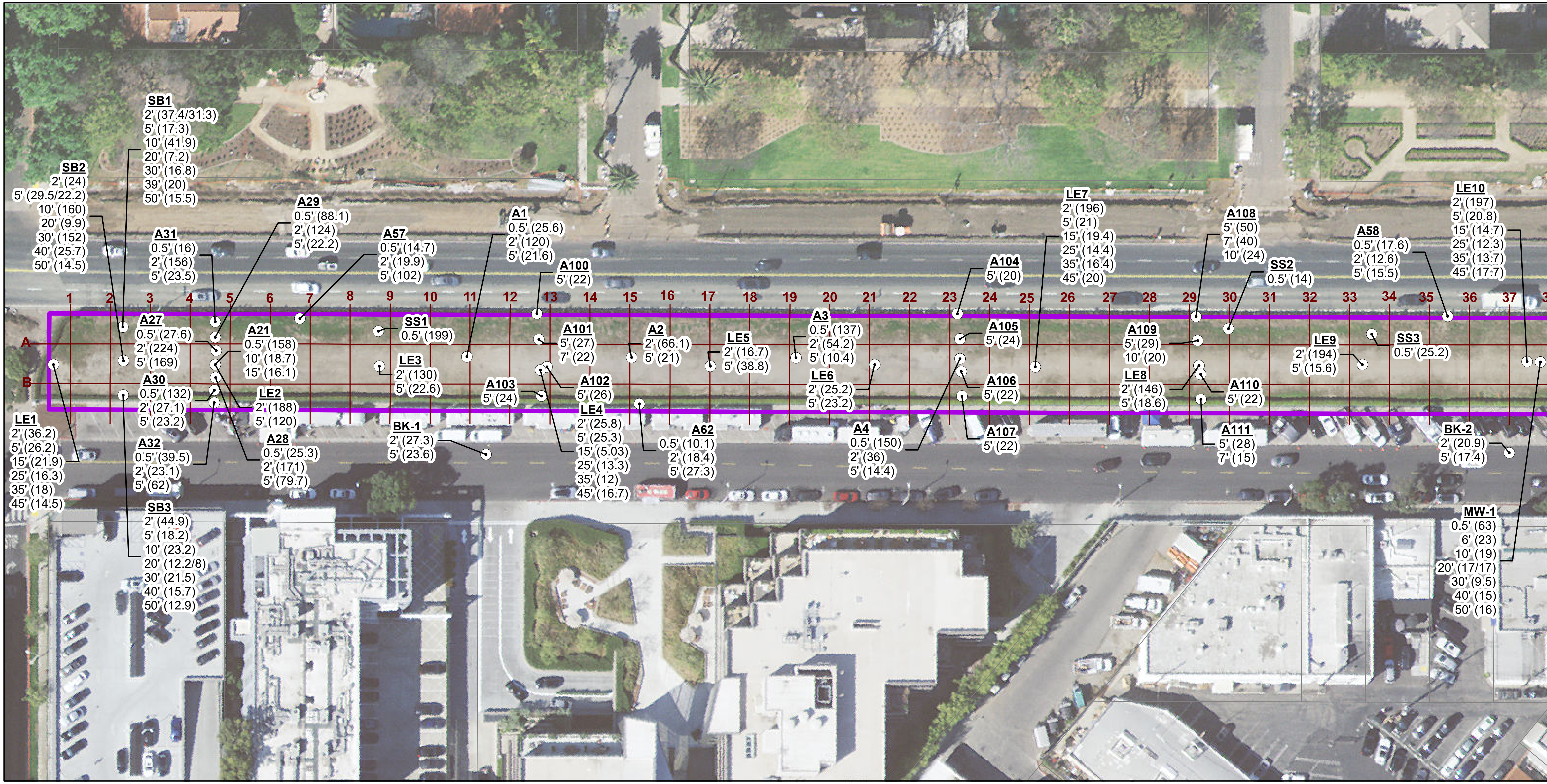
N

0 0.25
Miles

**Figure 1-1**
**Site Location**
Pre-Construction Investigation Work Plan
*Union Pacific Railroad Beverly Hills Site,*
*9315 Civic Center Drive,*
*Beverly Hills, California*

JACOBS

\\BROOKSIDEFILES\GIS_SHARE\ENBG\00_PROJ\U\UPRR\UPRR_BEVERLYHILLS\MAPS\REPORT\2020\SAP\FIG1-1_SITELOCATION.MXD 3/31/2020




LEGEND

Site

County Parcels

Soil Sample Location

Sampling Grid

Notes:

Location ID — **A113**
Sample Depth — 5' (31/21)
Soil Concentration (mg/kg)
Soil Concentration [Field Duplicate] (mg/kg)

mg/kg = milligrams per kilogram

N

0 25 50 100
Feet

1 inch = 61 feet

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**Figure 2-1a**
**Proposed Sampling Grid**
Pre-Construction Investigation Work Plan
*Union Pacific Railroad Beverly Hills Site,*
*9315 Civic Center Drive,*
*Beverly Hills, California*

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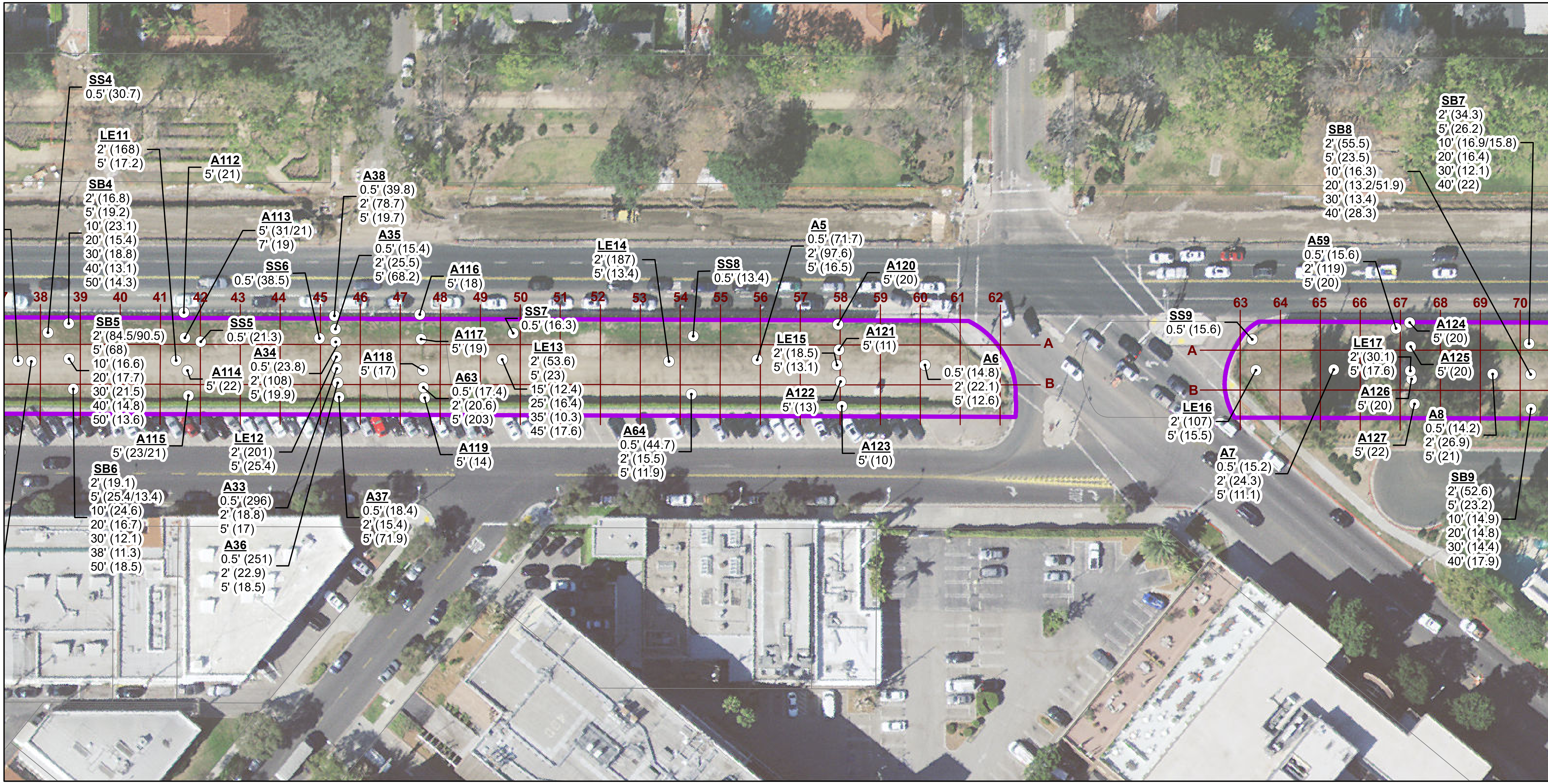


LEGEND

Site

County Parcels

Soil Sample Location

Sampling Grid

Notes:

Location ID — A113

Sample Depth — 5' (31/21)

Soil Concentration (mg/kg)

Soil Concentration [Field Duplicate] (mg/kg)

mg/kg = milligrams per kilogram

N

0 25 50 100

Feet

1 inch = 61 feet

**Figure 2-1b**

**Proposed Sampling Grid**

Pre-Construction Investigation Work Plan

*Union Pacific Railroad Beverly Hills Site,*

*9315 Civic Center Drive,*

*Beverly Hills, California*

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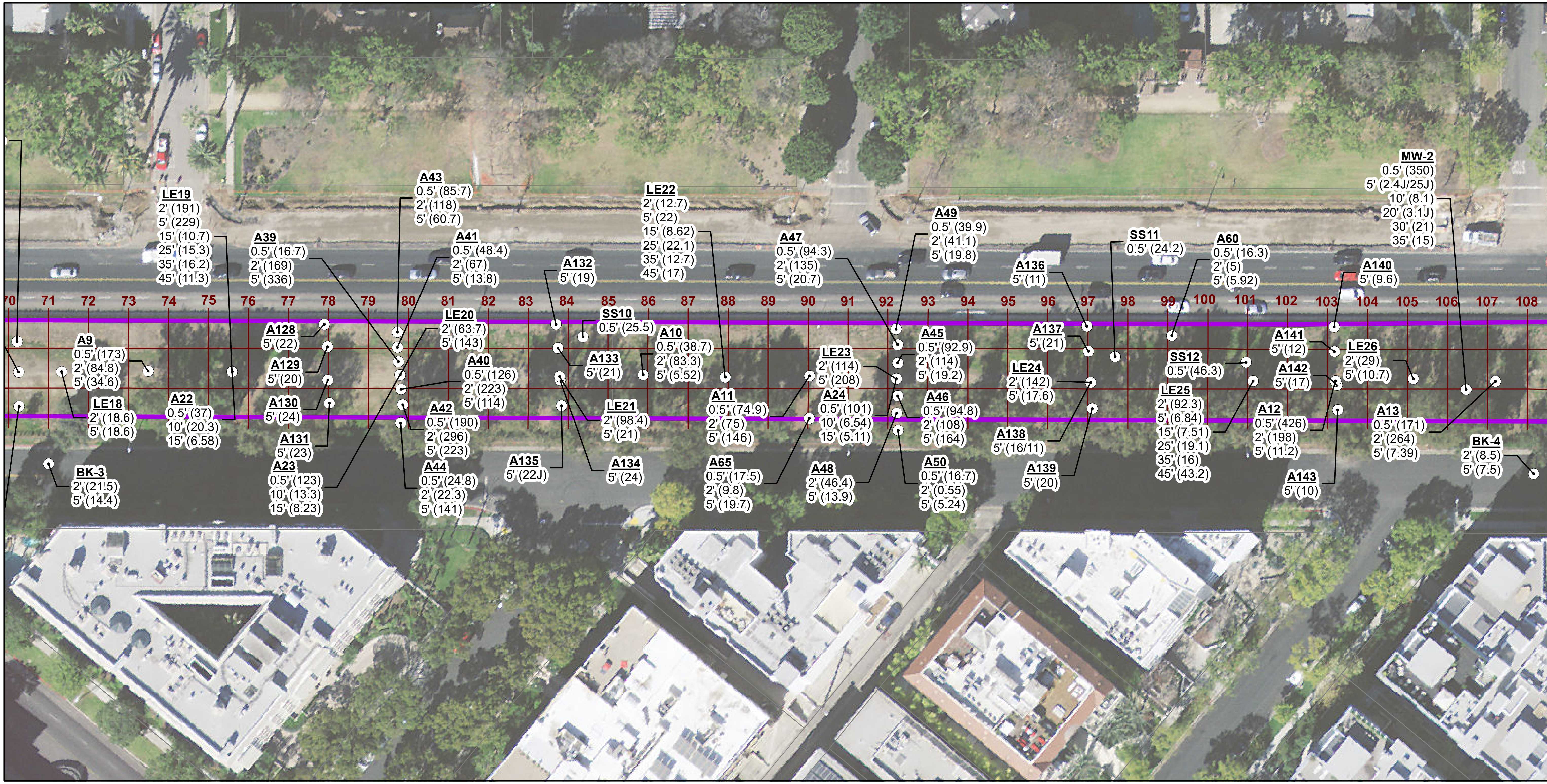


LEGEND

- Site
- County Parcels
- Soil Sample Location
- Sampling Grid

Notes:

Location ID — **A113**
Sample Depth — 5' (31/21)
Soil Concentration (mg/kg)
Soil Concentration [Field Duplicate] (mg/kg)

mg/kg = milligrams per kilogram

N

0 25 50 100
Feet

1 inch = 61 feet

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**Figure 2-1c**
**Proposed Sampling Grid**
Pre-Construction Investigation Work Plan
*Union Pacific Railroad Beverly Hills Site,*
*9315 Civic Center Drive,*
*Beverly Hills, California*

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LEGEND

- Site
- County Parcels
- Soil Sample Location
- Sampling Grid

Notes:

Location ID — A113
Sample Depth — 5' (31/21)
Soil Concentration (mg/kg)
Soil Concentration [Field Duplicate] (mg/kg)

mg/kg = milligrams per kilogram

N

0 25 50 100
Feet

1 inch = 61 feet

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**Figure 2-1d**
**Proposed Sampling Grid**
Pre-Construction Investigation Work Plan
*Union Pacific Railroad Beverly Hills Site,*
*9315 Civic Center Drive,*
*Beverly Hills, California*

\\BROOKSIDEFILES\GIS_SHARE\ENBG\00_PROJ\U\UPRR\UPRR_BEVERLYHILLS\MAPS\REPORT\2020\SAP\FIG2-1_SAMPLINGGRID.MXD GMOON 3/31/2020 3:30:59 PM

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