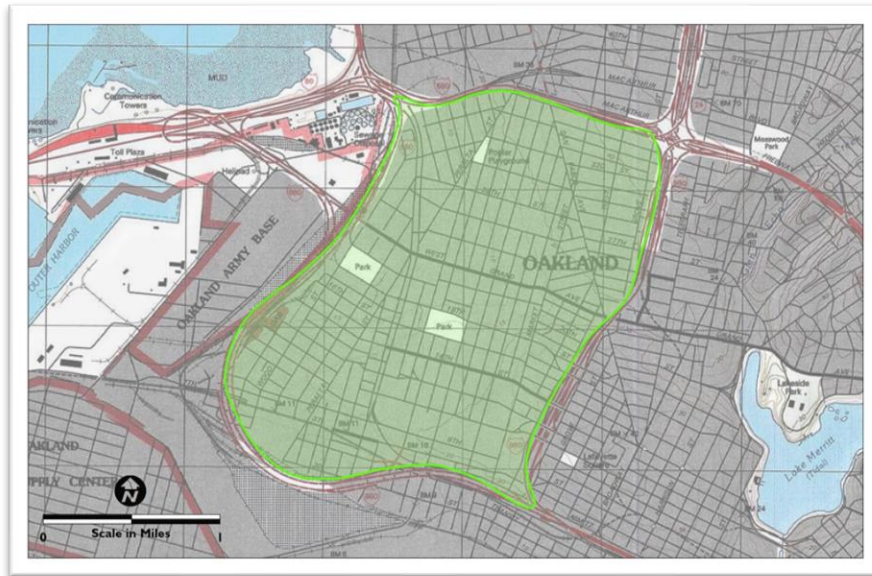


WEST OAKLAND LEAD SAMPLING REPORT

Oakland, Alameda County, California



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**U.S. ENVIRONMENTAL PROTECTION AGENCY
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LIST OF ACRONYMS

%	percent
Acme	Acme Galvanizing
AMCO	AMCO Chemical Corporation
Bercovich	A. Bercovich/Sunset Smelting and Refining Company
bgs	below ground surface
CASLr	California Screening Level for Residential Soil
CASS	Custom Alloy Scrap Sales
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
DTSC	Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
Globe Metals	Global Metals Company
HRS	Hazard Ranking System
LBP	lead based paint
mg/kg	milligrams per kilogram
MS/MSD	matrix spike/matrix spike duplicate
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NTCRA	Non-time Critical Removal Action
OEHHA	Office of Environmental Health Hazard Assessment
PA	Preliminary Assessment
PCS	Pre-CERCLA Screening
PEA	Preliminary Endangerment Assessment
QC	Quality Control
RSLi	Regional Screening Level for Industrial Soil
RSLr	Regional Screening Level for Residential Soil
RWQCB	Regional Water Quality Control Board
Sampling Area	West Oakland Lead Sampling Area
SAP	Sampling and Analysis Plan
SI	Site investigation
Report	West Oakland Lead Sampling Report
ROW	right-of-way
THQ	target hazard quotient
TPH	total
UCL	Upper Confidence Limit
USGS	United States Geologic Survey
VOC	volatile organic compound
WESTON®	Weston Solutions, Inc.

EXECUTIVE SUMMARY

The West Oakland Lead Sampling Report (Report) summarizes EPA soil sampling activities conducted in West Oakland, Alameda County, California in June 2018. For the purposes of this report, the Sampling Area is defined as an approximate 2.26-square-mile area bounded by the I-880 freeway to the west and south, the I-980 freeway to the east, and the I-580 freeway to the north, which includes residential, commercial, and industrial properties. The U.S. Environmental Protection Agency (EPA) and the California Department of Toxic Substances Control (DTSC) jointly selected the West Oakland neighborhood to conduct the sampling because it is comprised of both residential and industrial properties. Industrial activity, both present and past, was considered with regard to the potential release of lead into area soils.

The goal of this Report is to better understand the distribution of lead contamination and to determine whether that information could be used to address lead contamination in the Sampling Area. Two primary objectives were established to do this: 1) Characterize Lead Concentrations within the Sampling Area; and 2) Determine Potential Sources of Lead Contamination.

Weston Solutions, Inc. (WESTON®) was tasked to conduct sampling and to provide results for investigation and potential cleanup. The Sampling Area was divided into 203 grids to allow for random sampling of locations. A total of 396 composite soil samples and 40 duplicate samples were collected from tree wells and other unpaved public rights-of-way (ROWs) at surface and shallow subsurface depths (0 to 2 inches and 2 to 6 inches, respectively) and were analyzed for lead.

With respect to *Objective 1, Characterize Lead Concentrations*, lead was detected in all soil samples ranging from 22 milligrams per kilogram (mg/kg) to 1,900 mg/kg in surface samples, and 8.7 mg/kg to 3,900 mg/kg in shallow subsurface samples. Lead concentrations across the Sampling Area did not suggest discernable differences in pattern or concentrations. The majority of concentrations found were between 80 mg/kg and 400 mg/kg (58 percent [%]), with an overall average concentration of 314.5 mg/kg. The next highest range was between 400 mg/kg and 800 mg/kg (21%); therefore, the majority (79%) of the samples were between 80 mg/kg and 800 mg/kg.

With respect to *Objective 2, Determine Potential Sources of Lead Contamination*, no single stationary source was found. Although identification of discrete, primary, and industrial sources of lead was attempted, due to widespread lead concentrations across the entire Sampling Area, it was not possible to attribute significant lead concentrations solely to a specific site. Additionally, the data suggests that elevated lead levels in the Sampling Area is likely a result of many point and non-point sources impacting the area over time, e.g., auto emissions, lead paint, or former smelting operations. Based on the findings of the Report, EPA initiated Preliminary Assessments (PAs) at two facilities: Globe Metals Company (Globe Metals) and Custom Alloy Scrap Sales (CASS), and Pre-CERCLA Screenings (PCSs) at three facilities: Acme Galvanizing (Acme), Foster's Plating, and Pacific Pipe. Following the completion of the PAs and PCSs, it was determined that none of the facilities met the criteria for further evaluation under Superfund.

Based on the sample results, subsequent investigations may be appropriate for State and local authorities who are investigating lead contamination and lead exposure in the area. EPA has discussed the data with the California DTSC, a collaborator on this project, and they have made plans to do additional work in the area under their authorities. Further efforts by EPA under the Site Assessment Program are not warranted as the Superfund Program requires that a site potentially responsible for the contamination be identified. As discussed previously, lead contamination in the Sampling Area is associated with multiple sources, past and present, none of which appear responsible for the majority of the contamination.

1.0 INTRODUCTION

1.1 PROJECT BACKGROUND

The U.S. Environmental Protection Agency, Region 9 (EPA) tasked Weston Solutions, Inc. (WESTON®) to measure lead concentrations in the specific mixed-use (industrial/residential) urban environment of the West Oakland neighborhood in Oakland, California.

EJSCREEN, a nationwide tool developed by EPA, ranks the Sampling Area in the 90th percentile for lead-based paint exposure and the 94th percentile for hazardous waste proximity (EPA, 2019). CalEnviroScreen, a statewide tool developed by the California Office of Environmental Health Hazard Assessment (OEHHA), ranks the Sampling Area in the 89th percentile of pollution burden, an indicator of the local population's exposure and vulnerability to the effects of pollution (OEHHA, 2018).

1.2 PROJECT OBJECTIVES

The goal of the Report is to better understand the distribution of lead contamination in the Sampling Area to determine whether that information could be applicable to addressing area lead contamination and possibly be used as a test case to facilitate the understanding of lead contamination issues in other analogous areas. To do this, two primary objectives were established:

- *Objective 1) Characterize Lead Concentrations within the Sampling Area:* Methodically sample and analyze lead concentrations in soil throughout the Sampling Area to determine whether contamination is present and whether patterns could be associated with that contamination.
- *Objective 2) Determine Potential Source Identification:* Determine whether analytical data suggest the location of past and present facilities that may have contributed to lead contamination within the Sampling Area soils and conduct either Desktop Screens or Preliminary Assessments (PAs) of potential sites.

1.3 POTENTIAL LEAD CONTAMINATION AND EXPOSURE

Lead is a highly toxic metal that is known to be harmful to human health. The scientific evidence shows that lead exposure can cause cognitive function decrements in children. There is no evidence of a threshold for cognitive effects in children, which means that there does not appear to be a level of exposure below which this health effect is not observed. In addition, lead exposure can cause decreased attention, increased impulsivity and hyperactivity, and may also lead to behavior disorders in children and young adults. Other health effects of lead exposure include hypertension and harmful effects on sperm, the blood and blood-forming organs, and the immune system (EPA, 2018a).

Soil can act as a reservoir for lead released into the environment. Exposure to soil contaminated with deposited lead can occur through re-suspended dust as well as hand-to-mouth contact, which is the main pathway of lead exposure in childhood (EPA, 2018a).

Lead can be released into the environment from three basic sources: industrial emissions, leaded gasoline emissions from automobiles, and lead paint. Several studies have indicated that elevated levels of lead are found in soil exposed to industrial emissions (Dermont et al., 2010; Verstraete and Van Meirvenne, 2008; Jennings and Ma, 2007; van Herwijnen et al., 2007; Deng and Jennings, 2006). For example, smelting and refining of secondary scrap metal material are processes that may contribute to elevated soil lead levels. Another potential source of lead in soil is the historical use of leaded gasoline, which was used to fuel most vehicles until it was phased out, starting in the 1970s. Exhaust from on-road gasoline emissions resulted in lead deposited near roadways. Additionally, lead-based paint (LBP) may have been released into soils near houses, bridges, and other structures that were built before LBP was banned in 1978 (EPA, 2018a).

1.4 USEPA SUPERFUND PROGRAM: SITE ASSESSMENT PROCESS

The Site Assessment process starts with a Pre-Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Screening (PCS) to determine whether to add a site to the Superfund Active site inventory for further assessment. If a site is added to the Superfund Active site inventory, a Preliminary Assessment (PA) is conducted. The PA involves gathering historical and other available information about site conditions to evaluate whether a site poses a threat to human health and the environment and/or whether further investigation is warranted for Superfund listing on the National Priorities List (NPL), a list of the most serious sites identified for long-term cleanup. The PA also helps identify sites that may need immediate or short-term response actions.

If the PA determines that further investigation is warranted, a Site Inspection (SI) is then conducted. The SI tests air, water, and soil at a site to determine what hazardous substances are present and whether they are being released to the environment and pose a potential threat to human health. The SI initiates sampling of the potential source of contamination and surrounding areas to determine if contamination from a site is migrating off-site.

Information about a site that is collected in the PA/SI phase helps EPA to evaluate the risks posed by a site using its Hazard Ranking System (HRS). Sites that score at or above an established level qualify for cleanup under Superfund and are proposed for listing on the NPL.

The sampling data collected for this Report does not constitute a PA/SI. The Report data serves only to indicate the distribution of lead concentrations in public rights-of-ways.

Under a cooperative agreement with EPA, DTSC conducted three Pre-CERCLA Screenings within the Sampling Area in 2018 and 2019. The PCS sites included Acme Galvanizing (Acme), Globe Metals Company (Globe Metals), and Custom Alloy Scrap Sales (CASS). Based on the results of the Report, EPA initiated PAs at Globe Metals and CASS and PCSs at Acme, Foster's

Plating, and Pacific Pipe to determine whether any of the facilities of concern may be identified as potential sources of the elevated lead concentrations.

CASS and Globe Metals were identified as potential lead sources due to historical operations, however, the only documented lead-contaminated soils have been excavated and removed and both facilities are entirely paved, preventing any residual on-site soil contamination from impacting the surrounding area. Based on those factors, along with the other potential stationary and non-stationary sources in the area, including industrial facilities, residential leaded paint, and historical auto emissions, Globe Metals and CASS did not meet the criteria for further assessment after completion of the PA.

Acme Galvanizing, Pacific Pipe, and Fosters Plating were found not eligible for further investigation under Superfund as PAs. No definitive documented source of contamination was identified at these sites, so further efforts under Superfund are not warranted. The PAs and PCS sites are discussed in further detail in Section 4.4.

2.0 SAMPLING AREA DESCRIPTION

(See Figure 1 and Figure 2)

The Report summarizes sampling activities conducted in the West Oakland neighborhood of Oakland, Alameda County, California. The site is situated in the northwestern corner of Oakland, west of downtown, south of Emeryville, and north of Alameda. The Sampling Area is defined as an approximate 2.26-square-mile area that is bounded by the I-880 freeway to the west and south, the I-980 freeway to the east, and the I-580 freeway to the north. The Sampling Area includes residential neighborhoods with commercial and industrial properties. The extent of the Sampling Area is shown on **Figure 1**.

The West Oakland neighborhood has been a hub of industrial activity since the mid-1800s when it became a major rail terminal. Industrial uses include conveyance of goods from the Port of Oakland and factory activity such as metals fabrication, metals recycling, and smelting. The City's population expanded over time to support increased industrial activity, and some industrial properties were, in turn, redeveloped into residential areas.

Apparent concerns in the Sampling Area that resulted in EPA and the California DTSC initiating the Report are as follows:

- The Sampling Area in West Oakland may have been impacted by industrial activity dating back to the early 1900s, resulting in elevated levels of certain contaminants in soil. Soil matrices in this area may include elevated metals in various concentrations. This contaminant distribution may, or may not, be connected to a specific release or spill from a source where EPA and the California DTSC have regulatory authority to take further actions.
- The West Oakland neighborhood was selected because its residential population is close to industrial sources of lead and other heavy metals and because of its status as a highly impacted environmental justice community, as evidenced by the EPA EJSCREEN (EPA, 2018b).

The Sampling Area was divided into grids for sampling. Each grid square measures approximately 7.13 acres, resulting in 203 grids. The areas sampled were in public ROWs and tree wells, within City property. The sampling grids are shown on **Figure 2**.

3.0 AGENCY INVESTIGATIONS

3.1 HISTORICAL EPA SUPERFUND PROGRAM LEAD INVESTIGATIONS AND CLEANUPS

(See [Figure 3](#) and [Table 3-1](#))

The AMCO Chemical Corporation (AMCO) NPL site (EPA ID: CA0001576081) is in the southern portion of the Sampling Area. AMCO operated as a chemical distribution facility from the 1960s to 1989. In 2007, EPA performed an assessment of lead in residential soils at properties located immediately adjacent to the former AMCO property. This investigation revealed lead in the soil of bordering residential properties at concentrations up to 2,700 milligrams per kilogram (mg/kg) and prompted EPA to conduct removal actions at eight residential properties. Currently, EPA is conducting a non-time-critical removal action (NTCRA) at the AMCO site to address the portions of the site with the highest concentrations of volatile organic compounds (VOCs).

South Prescott is a 100-year-old neighborhood in West Oakland that has a history of industrial activity. The neighborhood is in the southern portion of the Sampling Area. In 2009, EPA identified residential properties with elevated levels of lead in soil at concentrations exceeding the Residential Regional Screening Level (RSLr) of 400 mg/kg. EPA's Removal Program reduced human exposure to lead by treating the soil with a phosphate-induced stabilization reagent (ground fish bones), which reacts with lead to form pyromorphite. The remedial efforts reduced the bioavailability of lead in the treated soil by an estimated 20 to 70 percent (%). The soil was then covered with a green cap, such as sod, clean soil with mulch, raised garden beds, or gravel. The combination of 8 inches of treated soil with 4 inches of a green cap significantly reduced lead exposure in the upper 12 inches of soil. Of 151 targeted properties in South Prescott, 143 were remediated in this manner. Unpaved easement strips between sidewalks and streets were also treated.

The A. Bercovich/Sunset Smelting and Refining Company (Bercovich) site (also referred to as the Mark Aboudi property) (EPA ID: CAN000909419) is in the western portion of the Sampling Area. Site operations included paint manufacturing from 1912 to 1914, a metals refining operation from 1914 to 1962, a metal salvage business from 1963 to 1983, a paper recycling business from 1983 to 1991, and currently, a trucking company. In 2002, EPA and the California DTSC worked together to evaluate the property and agreed that the California DTSC would oversee the site. In 2005, a Preliminary Endangerment Assessment (PEA) was completed, which included a recommendation to completely pave the property on which the current and former industrial operations were located to limit exposure to lead-contaminated soil. The property was paved, and land use restrictions were put in place with oversight from the California DTSC.

In fall 2016, the EPA Removal Program visually inspected the Bercovich site and its surroundings. The proximity of residential yards resulted in a determination by EPA and DTSC that a more in-depth evaluation was needed in parcels adjacent to the Bercovich property. Subsequent soil samples and soil screening showed elevated levels of lead in 11 yards immediately adjacent to the

site. In April 2018, EPA, with California DTSC assistance, conducted soil removal actions on 11 residential properties adjacent to the site.

In 2009, EPA awarded the City of Oakland two “community-wide” Brownsfield assessment grants totaling \$400,000 for use in West Oakland. The City of Oakland has used this money to investigate potential soil, groundwater, asbestos, and LBP contamination at West Oakland sites that are targeted for redevelopment.

Under a cooperative agreement with EPA, DTSC conducted three PCSs within the Sampling Area in 2018 and 2019. The PCS sites included Acme Galvanizing (Acme), Globe Metals Company (Globe Metals), and Custom Alloy Scrap Sales (CASS). Based on the results of the Report, EPA initiated PAs at Globe Metals and CASS and additional PCSs at Acme, Foster’s Plating, and Pacific Pipe to determine whether any of the facilities of concern may be identified as potential sources of the elevated lead concentrations. The PA and PCS sites are discussed in further detail in Section 4.4.

3.2 HISTORICAL DTSC LEAD INVESTIGATIONS AND CLEANUPS

(See Figure 3 and Table 3-1)

DTSC has worked to clean up lead-impacted sites in West Oakland to promote or advance reuses that benefit the community, including the new Oakland Main Post Office parking structure, the Mandela Parkway Park, the Mandela Parkway extension, numerous sites associated with the realigned Cypress Freeway, the new Fire Station #3, South Prescott Park, and the AMTRAK maintenance facility. Other sites cleaned up in West Oakland include the Gaines property, the Giampolini site, and the Willow Park site (cleaned up by the City with EPA grant funds), among others. DTSC is currently overseeing investigation and cleanup activities at Lane Metal Finishers, Cal Tech Metals, and Harris Dry Cleaners and is assisting EPA in remediation at the AMCO Superfund site. For this Report, EPA collaborated with California DTSC to identify other potentially lead-impacted locations in the West Oakland neighborhood and to identify sources where possible.

Table 3-1. Summary of Agency Investigations

Site(s)	Dates	Lead Agency	Investigation Summary
Bercovich	2005, 2016 - 2018	DTSC, EPA	<p>2005 – DTSC Preliminary Endangerment Assessment (PEA)</p> <ul style="list-style-type: none"> • Recommendation to completely pave property. • Following the PEA, the property was paved, and land use restrictions were put in place. <p>2016-2018 - EPA Sampling/Removal</p> <ul style="list-style-type: none"> • Based on an EPA inspection of the site, it was determined that more evaluation was needed in adjacent residential parcels. • In 2018, EPA, with DTSC assistance, conducted soil removal actions on 11 adjacent residential properties.
AMCO	2007	EPA	<p>2007 - EPA Residential Lead Assessment</p> <ul style="list-style-type: none"> • An assessment of lead in residential soils adjacent to the former AMCO property found lead in the soil up to 2,700 mg/kg. • EPA conducted removal actions at eight residential properties. • Currently, EPA is conducting a non-time-critical removal action to address the portions of the site with the highest concentrations of VOCs and lead.
South Prescott	2009	EPA	<p>2009 - EPA Remediation</p> <ul style="list-style-type: none"> • EPA identified residential properties with lead above 400 mg/kg. • The EPA Removal Program treated the soil with a phosphate-induced stabilization reagent that reduced the bioavailability of lead by 70%. • 143 properties were treated.
Community-wide	2009	EPA	<p>2009 - EPA Brownfields Grant</p> <ul style="list-style-type: none"> • EPA awarded the City of Oakland two “community-wide” Brownfield assessment grants for use in West Oakland. • The City has investigated soil, groundwater, asbestos, and lead contamination at sites that are targeted for redevelopment.
CASS, Globe Metals, Acme, Foster's Plating, Pacific Pipe	2020	DTSC, EPA	<p>2018-2019 - DTSC Pre-CERCLA Screenings (PCSs)</p> <ul style="list-style-type: none"> • Acme Galvanizing (Acme), Globe Metals Company (Globe Metals) and Custom Alloy Scrap Sales (CASS). <p>2020 – EPA Preliminary Assessments and PCSs</p> <ul style="list-style-type: none"> • Preliminary Assessments - Globe Metals, CASS. • PCSs - Acme, Foster's Plating, Pacific Pipe.

4.0 LEAD REPORT SOIL SAMPLING

In order to meet the objectives of the Report, EPA tasked WESTON to conduct soil sampling in public rights-of-ways and tree wells throughout the Sampling Area. Field activities were conducted from June 4, 2018, to June 14, 2018. WESTON conducted the soil sampling in accordance with the Sampling and Analysis Plan (SAP) (Appendix B). At each target sampling location, three-point composite surface soil samples were collected from two depths, using a coring device, which accessed surface and shallow subsurface soil. Surface samples refer to those samples taken from the upper 2 inches of soil below vegetation, mulch, or rocks, and may indicate immediate or direct risk of exposure to contamination. Shallow subsurface samples refer to those samples taken from the undisturbed soil horizon, approximately 3 to 6 inches below ground surface (bgs) and may indicate the potential risk from invasive exposure. For sampling areas supporting plant growth, the initial sample core was collected to a depth of 4 inches bgs to allow removal of turf plug and root zone. If coring device refusal occurred before achieving a 4-inch depth, the sampler relocated the sample location within a 2-foot diameter zone around the initial sample core until the required penetration depth was achieved. No excursion into soil below 6 inches bgs took place.

During field sampling activities, composite samples were collected at 197 sample grids at these two depths. For each composite soil sample, three aliquots were collected from adjacent borings. The location of each aliquot was photographed. One location was used to establish each of the sample coordinates in a grid. A total of 210 samples were collected at 0 to 2 inches bgs (surface samples), including 12 field duplicates, from 197 sample grids. A total of 226 samples were collected at 2 to 6 inches bgs (shallow subsurface samples), including 28 field duplicates, from 197 sample grids.

4.1 SOIL SAMPLING RESULTS

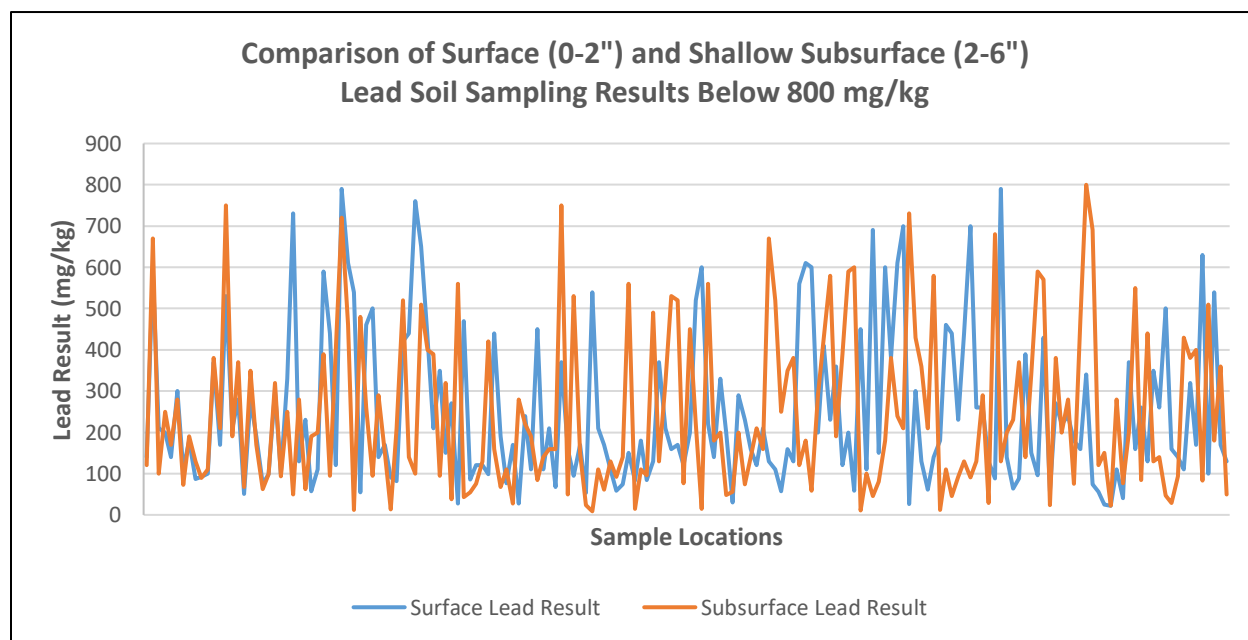
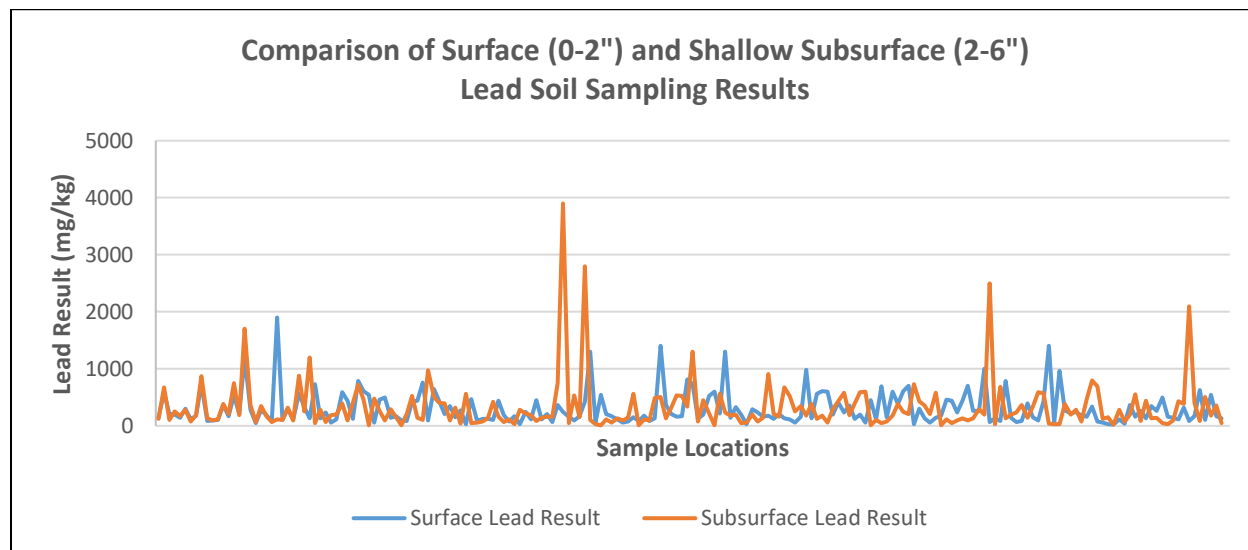
(See Figure 4, Figure 5, Table 4-1, and Table A-1)

Lead was detected in all soil samples and field duplicate samples, ranging from 22 mg/kg to 1,900 mg/kg in surface samples and from 8.7 mg/kg to 3,900 mg/kg in shallow subsurface samples. Soil samples were taken at two depths: surface samples at 0 - 2"; shallow subsurface samples at 2" - 6". A comparison of results to applicable screening levels is discussed in Section 4.2. The distribution of the lead concentrations appeared to be highly variable, widespread throughout the Sampling Area, and without any discernable pattern to indicate a discrete source(s). The average lead concentrations from samples collected within residential areas were found to be marginally lower than the overall average.

While the overall distribution of lead sample concentrations appeared to be heterogeneous, an evaluation of sample results found that concentrations below 800 mg/kg appeared to be more homogeneous with a more consistent distribution, likely indicating less influence from contamination sources, as discussed in Section 4.4. A summary of the analytical results for surface and shallow subsurface soil samples is shown in Table 4-1. All soil sampling results are shown in Table A-1.

Table 4-1. Summary of Analytical Results

Sample Depth	Number of Field Samples	Number of Duplicate Samples	Minimum Lead Result	Maximum Lead Result
Surface Samples (0 - 2 in) ¹	198	12	22 mg/kg	1,900 mg/kg
Shallow Subsurface Samples (2 - 6 in) ¹	198	28	8.7 mg/kg	3,900 mg/kg
All Samples ¹	396	40	8.7 mg/kg	3,900 mg/kg
1 = Includes highest result at duplicate sampling locations				



4.2 COMPARISON TO SCREENING LEVELS

(See Figure 6 and Table 4-2)

As summarized in Table 4-2, lead sampling results collected from the Sampling Area were compared to the following screening levels:

- EPA Region 9 Regional Screening Level for industrial soils (RSLi) of 800 mg/kg.
- EPA Region 9 Regional Screening Level for residential soils (RSLr) of 400 mg/kg.
- DTSC California Screening Level for residential soils (CASLr) of 80 mg/kg.

Of the 396 lead samples (and 40 duplicate samples) collected:

- 6% of all lead sample results exceeded the RSLi.
- 26% of all lead sample results exceeded the RSLr.
- 84% of all lead sample results exceeded the CASLr.

Of the 197 grids where samples were collected:

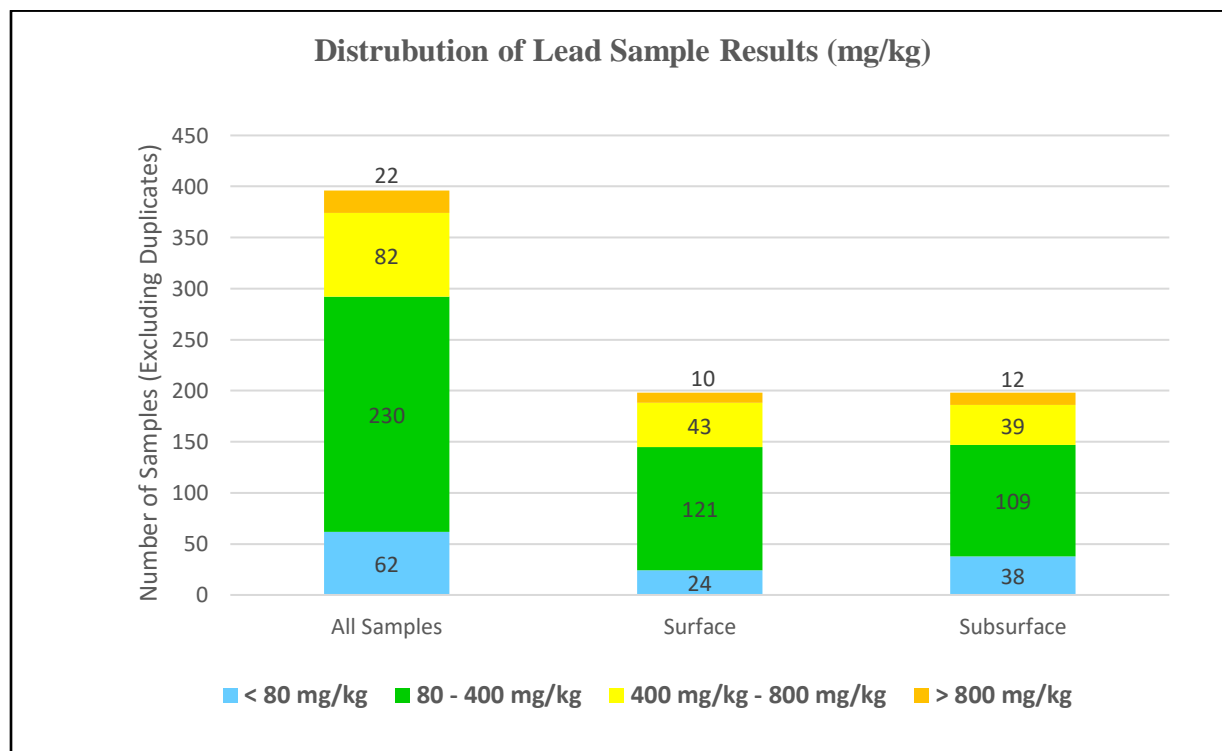
- 9% included at least one sample result exceeding the RSLi.
- 33% included at least one sample result exceeding the RSLr.
- 90% included at least one sample result exceeding the CASLr.

Of the 197 grids where samples were collected, 133 were located completely or partially within residential areas. Of the 133 residential grids where samples were collected:

- 6% included at least one sample result exceeding the RSLi.
- 31% included at least one sample result exceeding the RSLr.
- 89% included at least one sample result exceeding the CASLr.

Table 4-2. Sample Results Exceeding Screening Levels

Description	Screening Levels for Lead			
	Total Samples	RSLi	RSLr	CASLr
		800 mg/kg	400 mg/kg	80 mg/kg
Surface Samples Exceeding Screening Level ¹	198	14 (5%)	56 (27%)	174 (88%)
Subsurface Samples Exceeding Screening Level ¹	198	10 (6%)	59 (26%)	160 (81%)
Total Samples Exceeding Screening Level ¹	396	24 (6%)	115 (26%)	334 (84%)
Residential Samples Exceeding Screening Level ¹	266	9 (2%)	62 (23%)	222 (83%)
Total Sample Grids Exceeding Screening Level ²	197	17 (9%)	65 (33%)	179 (90%)
Residential Sample Grids Exceeding Screening Level ²	133	8 (6%)	41 (31%)	119 (89%)
¹ = Includes highest result at duplicate sampling locations ² = Includes sample grids with exceedance at any depth RSLr = U.S. Environmental Protection Agency (EPA) Regional Screening Level for Residential Soils, Target Hazard Quotient (THQ) =1.0 RSLi = EPA Regional Screening Level for Industrial Soils, THQ=1.0 CASLr = Department of Toxic Substances Control (DTSC) California Screening Level for Residential Soils, Non-cancer Endpoint mg/kg = milligrams per kilogram				



4.3 STATISTICAL ANALYSIS

(See [Table 4-3](#))

To compare analytical results across the Sampling Area and determine an average (or mean) concentration that addresses uncertainties in the distribution of results, statistical confidence limits were calculated. The confidence limits can provide a more conservative and appropriate average concentration, less influenced by outlier results that may skew the data. In accordance with current EPA standard practices, and in discussions with WESTON Risk Assessors, each subset of results was analyzed using the EPA ProUCL 5.1 software to calculate the 95% Upper Confidence Limit (UCL) of the mean and identify potential outliers. The 95% UCL is defined as a value that, when calculated repeatedly for randomly drawn subsets of data, equals or exceeds the true mean 95% of the time. Comparing the lead sampling results to the 95% UCL is a useful method for identifying areas of concern across the Sampling Area. As shown below in [Table 4-3](#), the mean lead concentration for all samples (assuming the higher result from collocated duplicate samples) was 314.5 mg/kg, while the 95% UCL concentration was 352.1 mg/kg. In total:

- 35% of lead sample results exceeded the calculated mean.
- 31% of lead sample results exceeded the 95% UCL.

Statistical analysis of the surface and shallow subsurface sample results indicated that the surface sample results were significantly more consistent than the shallow subsurface sample results, with a narrower range of results and substantially lower standard deviation.

Table 4-3. Summary of Analytical Result Statistics

Sample Depth	Mean ¹	Std Deviation ¹	Outliers ^{1,2}	95% UCL ^{1,3}
Surface Samples	303.0 mg/kg	291.9 mg/kg	1,900 mg/kg	341.1 mg/kg
Shallow Subsurface Samples	325.9 mg/kg	450.4 mg/kg	3,900 mg/kg	389.1 mg/kg
All Sample Locations	314.5 mg/kg	379.2 mg/kg	3,900 mg/kg	352.1 mg/kg
¹ = Includes highest result of collocated field sample and field duplicates ² = Outlier identified using ProUCL 5.1 ³ = Assumes lognormal distribution mg/kg = milligrams per kilogram UCL = Upper Confidence Limit				

background.” The average ambient

4.4 POTENTIAL FACILITIES OF CONCERN

(See [Figure 7](#), [Table 4-4](#), [Table 4-5](#), and [Appendix F](#))

Following the results of the Report, EPA initiated PAs at Globe Metals and CASS and PCSs at Acme, Foster’s Plating, and Pacific Pipe to determine whether any of the facilities of concern may be identified as potential sources of the elevated lead concentrations. The PA and PCS sites were selected based on the proximity of elevated lead sample results, as well as historical operations conducted at each facility. Sample results collected within 0.25 mile of the follow-up facilities of concern were analyzed to determine whether lead concentrations correlated to their proximity to the facilities. As shown in [Table 4-4](#), results were evaluated separately using all known sample data within a 0.25-mile radius, as well as data focusing on historically downwind/crosswind areas, where airborne migration of the lead may have occurred. Approximate areas of paved (capped)

and unpaved (uncapped) soil were calculated as part of the EPA HRS criteria, assessing the potential exposure to contaminated soil. As shown in Appendix F the lead concentrations appeared to show trends of reducing as the distance from the facilities increased in all surface and shallow subsurface samples, with the exception of Acme, where shallow subsurface results showed the opposite trend. Acme, however, is located downwind of Globe Metals, which may account for the trend variation. No definitive documented source of lead contamination was identified at Acme, Pacific Pipe, or Fosters Plating, therefore they are not eligible for further investigation under Superfund. However, further evaluation by other agencies may still be considered.

Table 4-4. Summary of EPA Follow-Up Facilities of Concern

Facility Name	CASS	Globe Metals	Foster's Plating	Acme	Pacific Pipe
Address	2601 Peralta St	1820 10th St	1570 34th St	1655 17th St	2000 Mandela Pkwy
Current Operator	CASS Recycling/NKP Sulprizio	California Waste Solutions	Possible Residence	Bailey Property Investments	Pacific Pile Co
Follow-Up EPA Action	PA	PA	PCS	PCS	PCS
Justification	Historical Lead Smelter	Historical Lead Smelter	Historical Lead Smelter	Metal Plating/Processing	Metal Pipe Manufacturing
Nearby Lead Result	1,200 mg/kg, 249 ft North	1,300 mg/kg, 5 ft Northeast	1,700 mg/kg, 1,227 ft Southwest	1,400 mg/kg, 75 ft Southeast	3,900 mg/kg, 16 ft Northeast
Most Recent Agency Involvement	DTSC PCS - 2019, PA - 2007	DTSC Site Screen - 2019	EPA Removal - 2009	DTSC Site Screen - 2018	Unknown
Wind Direction	West (77%), North (23%)	West (77%), North (23%)	West (77%), North (23%)	West (77%), North (23%)	West (77%), North (23%)
Paved Acres within 0.25 mi	112.9	103.9	109.6	96.7	106.9
Unpaved Acres within 0.25 mi	9.8	14.5	15.1	25.6	14.4
Percent Unpaved ¹	8%	12%	12%	20%	11%
¹ = Does not include unpaved area with known fill material along I-880 or Mandela Parkway DTSC = Department of Toxic Substances Control EPA = U.S. Environmental Protection Agency ft = feet mg/kg = milligrams per kilogram mi = miles PA = Preliminary Assessment PCS = Pre-Comprehensive Environmental Response, Compensation, and Liability Act Screening					

Based on the findings of the PAs, both Globe Metals and CASS were identified as potential sources of lead; however, the widespread lead concentrations across the entire Sampling Area could not be solely attributable to either site based on the available data and is likely a result of many potential sources. A summary of findings and conclusions from the Globe Metals and CASS PAs is shown in Table 4-5.

Table 4-5. Summary of Preliminary Assessments

Globe Metals	
PA Findings	<ul style="list-style-type: none"> The Globe Metals site is currently owned and operated by California Waste Solutions, a commercial and residential recycling center. When the site was owned by Globe Metals from 1969 to 1993, operations included secondary smelting and alloying of aluminum, lead, and other metals. Entirely paved, contains at least three industrial buildings, and is found within a mixed use and industrial area. Residential single-family homes are located directly adjacent to the east and southeast, and newly constructed condominiums are located to the northwest. Alameda County oversaw the excavation of lead-contaminated soil from the northeastern portion of the site, where lead was found at levels as great as 2,200 mg/kg. Excavation and removal of lead soil at two off-site properties approx. 50 feet east: <ul style="list-style-type: none"> Gaines property. Former Jenkins Auto Wreckers.
PA Conclusion	<ul style="list-style-type: none"> The PA concluded that Globe Metals was a source of elevated lead concentrations but did not meet the criteria to be placed on the NPL for the following reasons: <ul style="list-style-type: none"> There are no benchmarks for lead within the Superfund Chemical Data Matrix utilized by the HRS to evaluate potential NPL sites. On-site soil cleaned up via excavation and asphalt capping. Additional nearby potential sources include industrial operations and historical vehicle emissions from I-880. Known soil removals conducted at nearby sources: <ol style="list-style-type: none"> 1796 11th Street – Gains Property and 2) 1014 Pine Street
CASS	
PA Findings	<ul style="list-style-type: none"> Includes nine parcels used as scrap metal recycling operation and aluminum smelting facility. CASS has operated at the main facility since 1979. It was owned and operated by an aluminum smelting company from 1951 to 1979 and operated as a lead and zinc smelter until 1959. Entirely paved and fenced. Residential single-family homes are located directly adjacent to the northeast of the eastern portion of the site, and a community garden is located adjacent to the north. Since 1988, Alameda County and the Regional Water Quality Control Board (RWQCB) have overseen soil and groundwater investigations. Elevated lead, VOCs, and total petroleum hydrocarbons (TPH) documented in the site groundwater and soil. DTSC conducted Site Screening Assessments in 2006 and 2007. PCBs, TPH, and VOCs were detected in soil and groundwater above screening levels.
PA Conclusion	<ul style="list-style-type: none"> The PA concluded that CASS was a potential source of elevated lead concentrations but did not meet the criteria to be placed on the NPL for the following reasons: <ul style="list-style-type: none"> There are no benchmarks for lead within the Superfund Chemical Data Matrix utilized by the HRS to evaluate potential NPL sites. On-site soil has an asphalt cap which contains any potential release from soil. Additional nearby potential sources include industrial operations and historical vehicle emissions from I-880.

4.5 DEVIATIONS FROM THE SAMPLING AND ANALYSIS PLAN

A total of 203 grids were outlined; however, 6 grids along the western boundary of the Sampling Area were not sampled: Grids 28, 78, 122, 165, 166, and 178. These grids were not sampled because no appropriate sampling locations were present. For example, several locations did not have a publicly accessible right-of-way. In addition, composite samples were collected twice from Grid 86 by different sampling teams. The composite samples were not collected in the same location within the grid and cannot be considered field duplicates.

The Soil Profile sampler originally selected for use during this assessment was not always able to excavate the dense soil easily. On June 6, 2018 (Field Day 3), with approval from the EPA Site Assessment Manager, a slide hammer with a 1-inch core barrel lined with an acetate sleeve replaced the Soil Profile sampler and was used to collect the remaining soil samples.

For Quality Control (QC), the SAP designated matrix spike/matrix spike duplicate (MS/MSD) samples from surface soil samples collected from predesignated locations. The EPA Region 9 Laboratory (“Laboratory”) advised that the sample volume from the predesignated samples was not enough to perform MS/MSD analyses. The limited soil volume for surface soil samples was caused by splitting the surface soil sample into two samples to obtain blind duplicate QC samples. The EPA Site Assessment Manager, in consultation with Laboratory Manager, approved a field decision to allow the Laboratory to determine the appropriate sample to run MS/MSD analysis for each sample delivery group and to collect blind duplicate QC samples from subsurface samples, which had more soil volume. This deviation was in alignment with Laboratory standard QC procedures.

The decontamination fluids that were generated in the sampling event were drummed and staged at the AMCO NPL site pending laboratory analysis to allow discharge via AMCO National Pollutant Discharge Elimination System (NPDES) permit. Samples of the fluid were sent to the Laboratory and to a private laboratory for analysis. The analysis showed that the required analytes for the NPDES permit were not detected or were below permit thresholds; however, the samples were too soapy to meet permit detection limits. After consultation with the AMCO Remedial Project Manager and the Region Quality Assurance Office, the EPA Site Assessment Manager determined that the remaining 10 to 15 gallons of decontamination fluid could be disposed of by evaporation. After the determination, WESTON allowed the fluid to evaporate in a secondary drum containment area at the AMCO NPL site. Subsequently, the drum was washed with non-phosphatic soap and rinsed for re-use. There was no residue in the drum prior to it being washed. The empty drum was then removed from the AMCO NPL site by WESTON.

5.0 SUMMARY

The Report was jointly conducted by EPA Region 9 and DTSC in West Oakland, California, a 2.26-square-mile urban area that includes residential and industrial activities.

The primary objectives of this Report were as follows:

- *Objective 1) Characterize Lead Concentrations within the Sampling Area:* Methodically sample and analyze lead concentrations in soil throughout the Sampling Area to determine whether contamination is present and whether patterns could be associated with that contamination.
- *Objective 2) Potential Source Identification:* Determine whether analytical data suggest the location of past and present facilities that may have contributed to lead contamination within the Sampling Area soils and conduct either Desktop Screens or PAs of potential sites.

In order to meet the objectives of the Report, 396 composite soil samples (and 40 duplicate samples) were collected from tree wells, medians, and other unpaved public rights-of-way across 197 sampling grids at surface and shallow subsurface depths and analyzed for lead.

Although further action under Superfund Site Assessment is not warranted because no definitive source could be identified, DTSC plans to conduct further sampling under State authorities.

5.1 SUMMARY OF OBSERVATIONS

5.1.1 Objective 1) Characterize Lead Concentrations within the Sampling Area

- Sampling Area-Wide Distribution
 - Lead was detected in all soil samples, ranging from 22 mg/kg to 1,900 mg/kg in surface samples and from 8.7 mg/kg to 3,900 mg/kg in shallow subsurface samples.
 - Lead concentrations across the Sampling Area do not suggest discernable differences in pattern. The majority (58%) of concentrations were uniformly between 80 mg/kg and 400 mg/kg, with an overall average concentration of 314.5 mg/kg.
 - Lead concentrations were found to be more consistent with less deviation in surface samples than in shallow subsurface samples, with both the minimum and maximum lead results found in shallow subsurface samples. The consistent shallow and inconsistent shallow subsurface lead results suggest that deposition from a stationary or non-stationary source cannot be substantiated.
- Residential Distribution – limited to public median strips and tree wells

- Average lead concentrations from samples collected within residential right-of-way areas were found to be marginally lower than the Report-wide averages, particularly within the higher ranges, where 2% of residential samples exceeded the RSLi of 800 mg/kg as compared to 6% of all samples.
- Comparison to Screening Levels
 - Lead sampling results were compared to the Federal EPA RSLi and RSLr and the State DTSC CASLr.
 - A relatively small percentage (6%) of the lead sample results exceeded the Federal benchmarks for industrial soil; however, more than a quarter (26%) exceeded the Federal benchmarks for residential soil.
 - The majority (84%) of the lead sample results exceeded the State benchmarks for residential soil.
 - The arithmetic mean lead concentration for all samples was 314.5 mg/kg. A total of 35% of all lead sample results were found to exceed the mean.
 - The 95% UCL lead concentration was 352.1 mg/kg. A total of 31% of all lead sample results were found to exceed the 95% UCL.

5.1.2 Objective 2) Determine Potential Source Identification

- To identify potential sources of soil contamination, EPA evaluated the sampling locations with the greatest lead concentrations. Evaluation factors used to determine potential sources included past and present land use, historical operations at or near the elevated sample locations, previous or ongoing investigations and cleanups, the likelihood of surficial soil exposure, and proximity to potential populations and sensitive environments.
- EPA initiated evaluations at five sites identified as a result of the Report:
 - PAs were conducted at Globe Metals and CASS.
 - PCSs were conducted at Acme, Foster's Plating, and Pacific Pipe.
 - Globe Metals and CASS were identified as potential sources of elevated lead concentrations; however, the only documented contaminated soils have been excavated and removed, and both facilities are entirely paved, limiting exposure to residual on-site soil contamination. Based on those factors, the widespread contamination across the entire Sampling Area could not be solely attributable to any single site based on the available data, and the contamination is likely a result of many potential stationary and non-stationary sources which may be regulated under other State and Federal programs.

- Acme, Pacific Pipe, and Fosters Plating were found not eligible for further investigation under Superfund as PAs. No definitive documented source of lead contamination was identified at these sites, so further efforts under Superfund are not warranted.

6.0 CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL FOLLOW-UP SAMPLING

California Department of Toxic Substances Control (DTSC) has written a Sampling and Analysis Plan (SAP) for taking additional soil samples in portions of the sampling area. This work is a follow-up to the report herein. The SAP may be revised based on new information which DTSC plans to collect from meeting with the community. However, currently, DTSC plans to collect soil samples at up to 155 residential parcels in West Oakland. Additional investigative samples will be collected at up to 15 community parks and local school yards (DTSC, 2023).

7.0 REFERENCES

- DTSC, 2023 California Department of Toxic Substances Control, Sampling and Analysis Plan, Oakland Metals Study, March 2023.
- EPA, 2018a U.S. Environmental Protection Agency, Integrated Science Assessment (ISA) for Lead, <https://www.epa.gov/isa/integrated-science-assessment-isa-lead>, data accessed November 2018.
- EPA, 2019 U.S. Environmental Protection Agency, EJSCREEN Report, West Oakland Sampling Area, <https://ejscreen.epa.gov/mapper/>, Version 2019.
- OEHHA, 2018 California Office of Environmental Health Hazard Assessment, CalEnviroScreen 3.0 Results and Indicator Maps, West Oakland Sampling Area, <https://oehha.ca.gov/calenviroscreen/maps-data>, June 2018 Update.
- USGS, 2013 Smith, D.B., Cannon, W.F., Woodruff, L.G., Solano, Federico, Kilburn, J.E., and Fey, D.L., 2013, Geochemical and Mineralogical Data for Soils of the Conterminous United States: U.S. Geological Survey Data Series 801, 19 p., <https://pubs.usgs.gov/ds/801>

Figures



0 Scale in Miles 2

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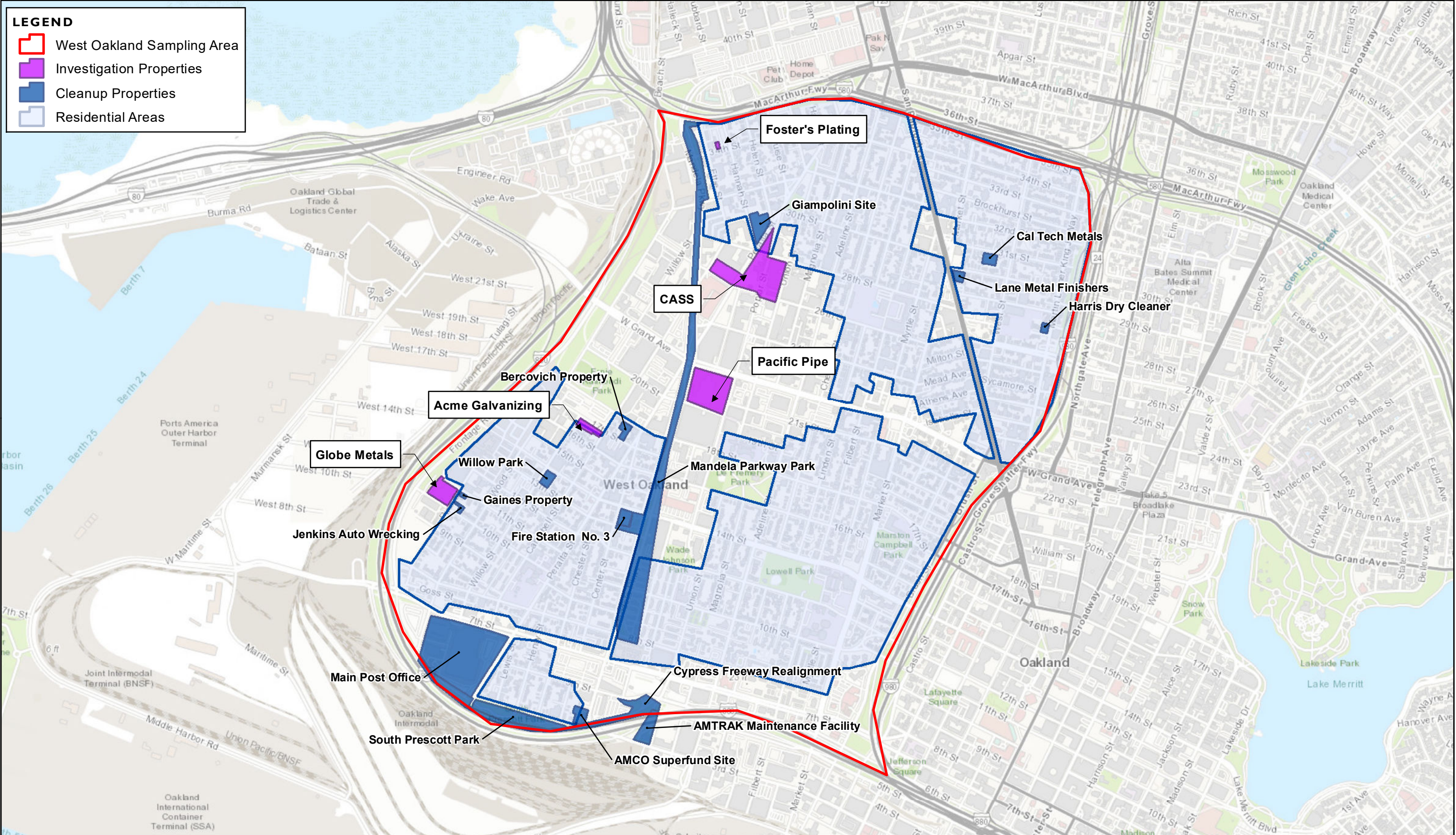


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FIGURE I
SITE LOCATION MAP
West Oakland Lead Sampling Report
Oakland, Alameda County, CA





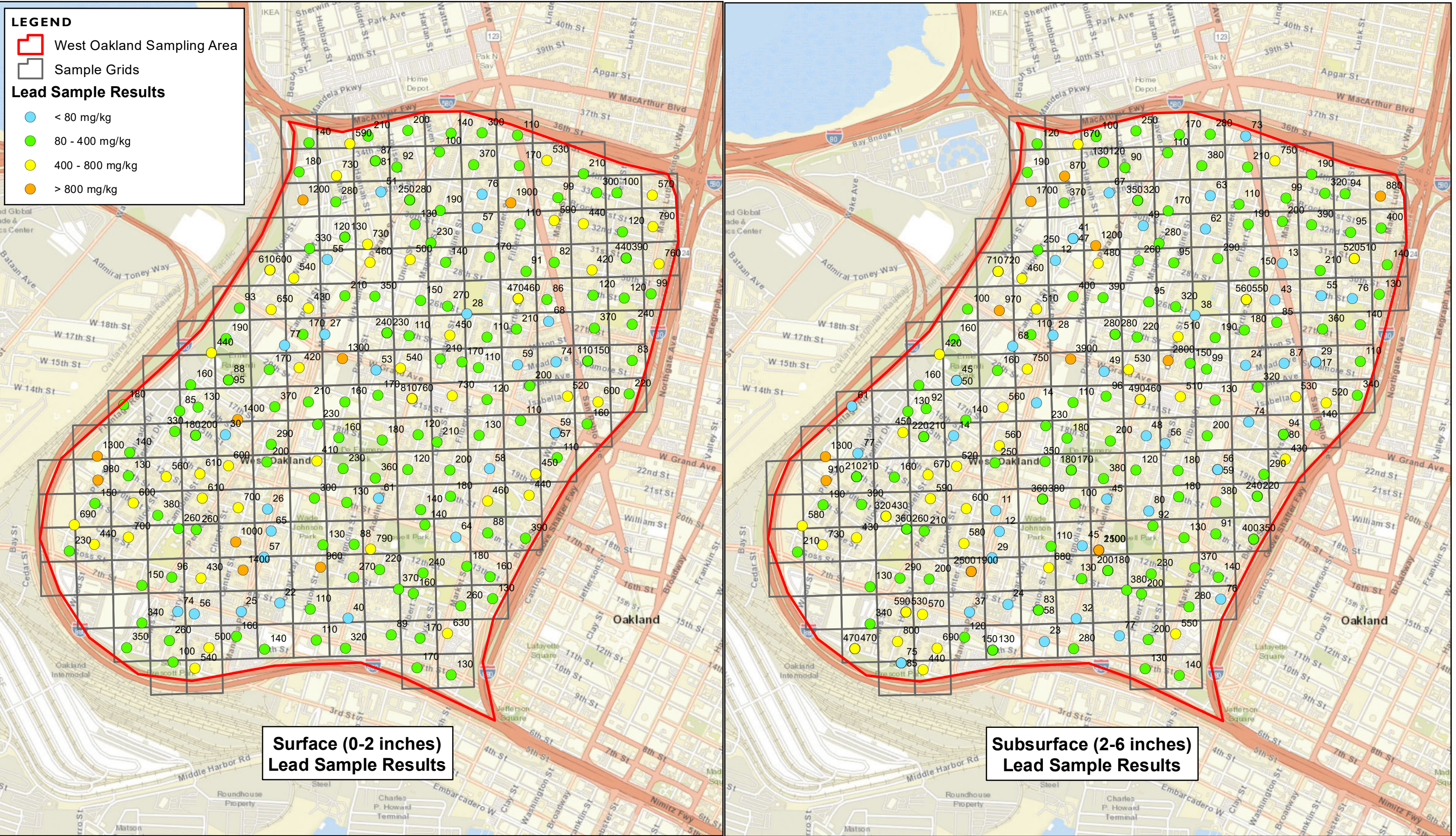
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Surface (0-2 inches)
Lead Sample Results

Subsurface (2-6 inches)
Lead Sample Results



0 Scale in Miles 0.5

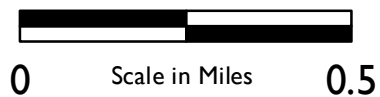
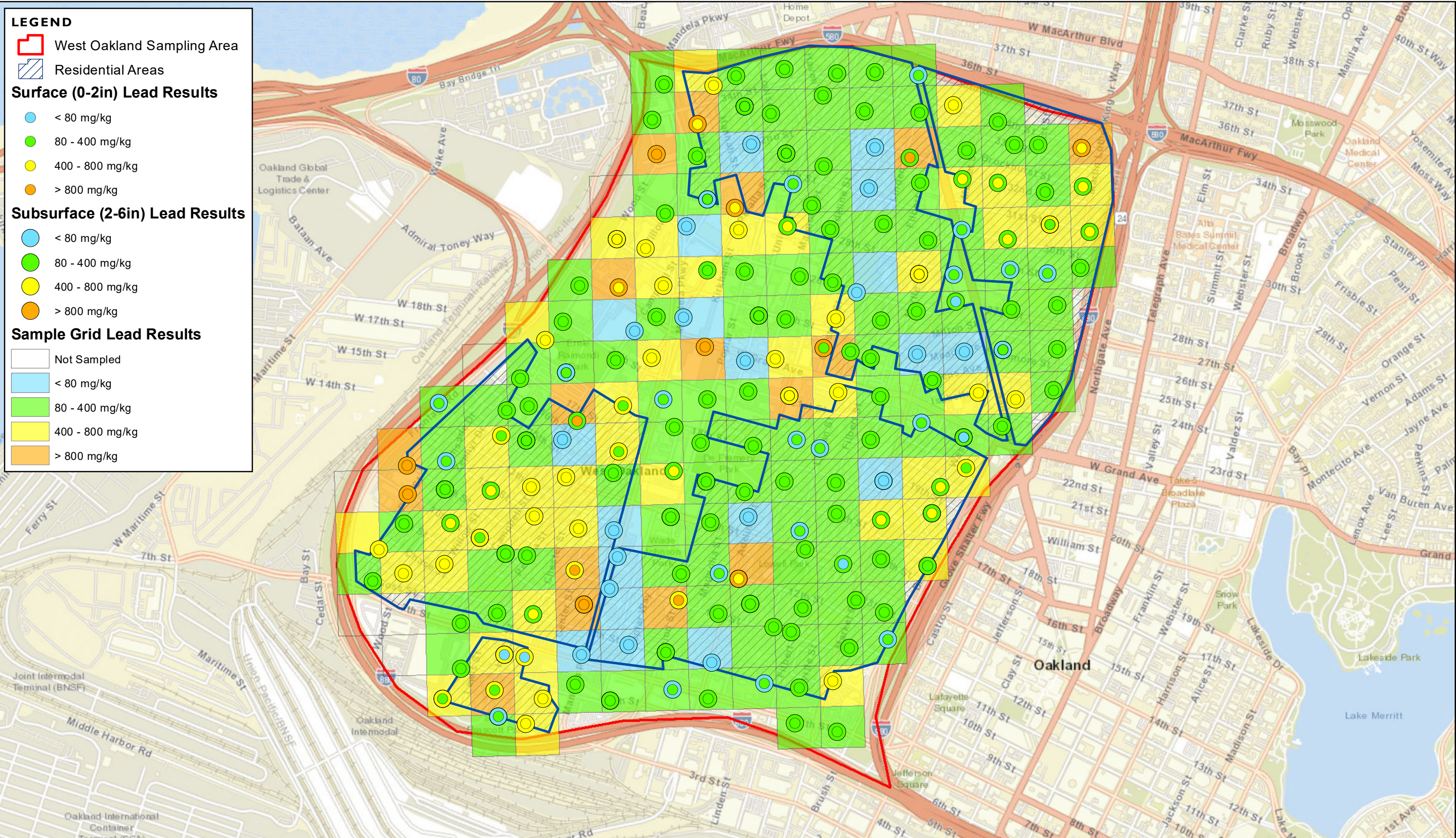
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FIGURE 4
LEAD SAMPLING RESULTS
West Oakland Lead Sampling Report
Oakland, Alameda County, CA

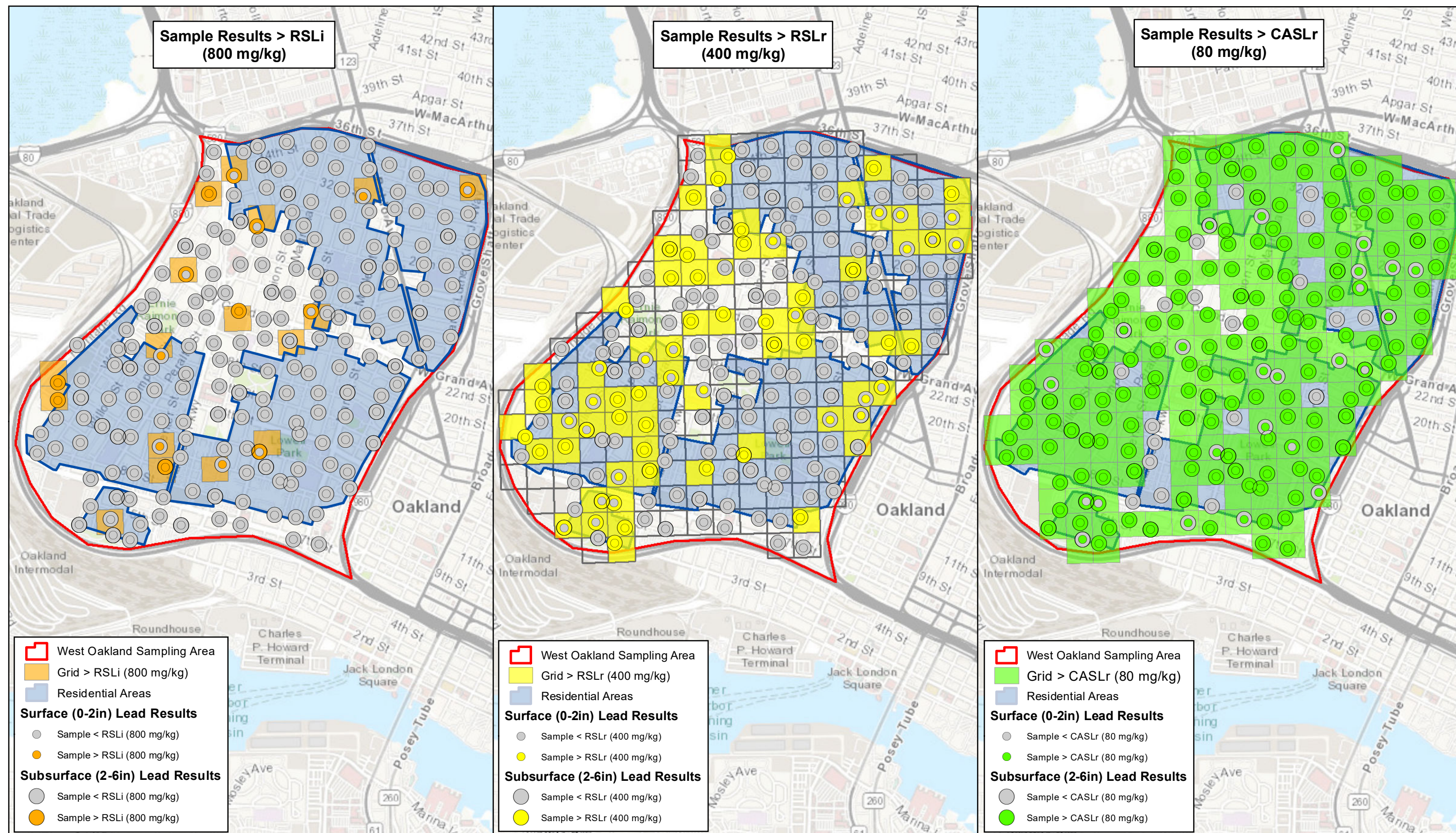


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FIGURE 5
ALL LEAD SAMPLING RESULTS
West Oakland Lead Sampling Report
Oakland, Alameda County, CA



RSLi = EPA Regional Screening Level (Industrial Soil)
 RSLr = EPA Regional Screening Level (Residential Soil)
 CASLr = DTSC California Screening Level (Residential Soil)



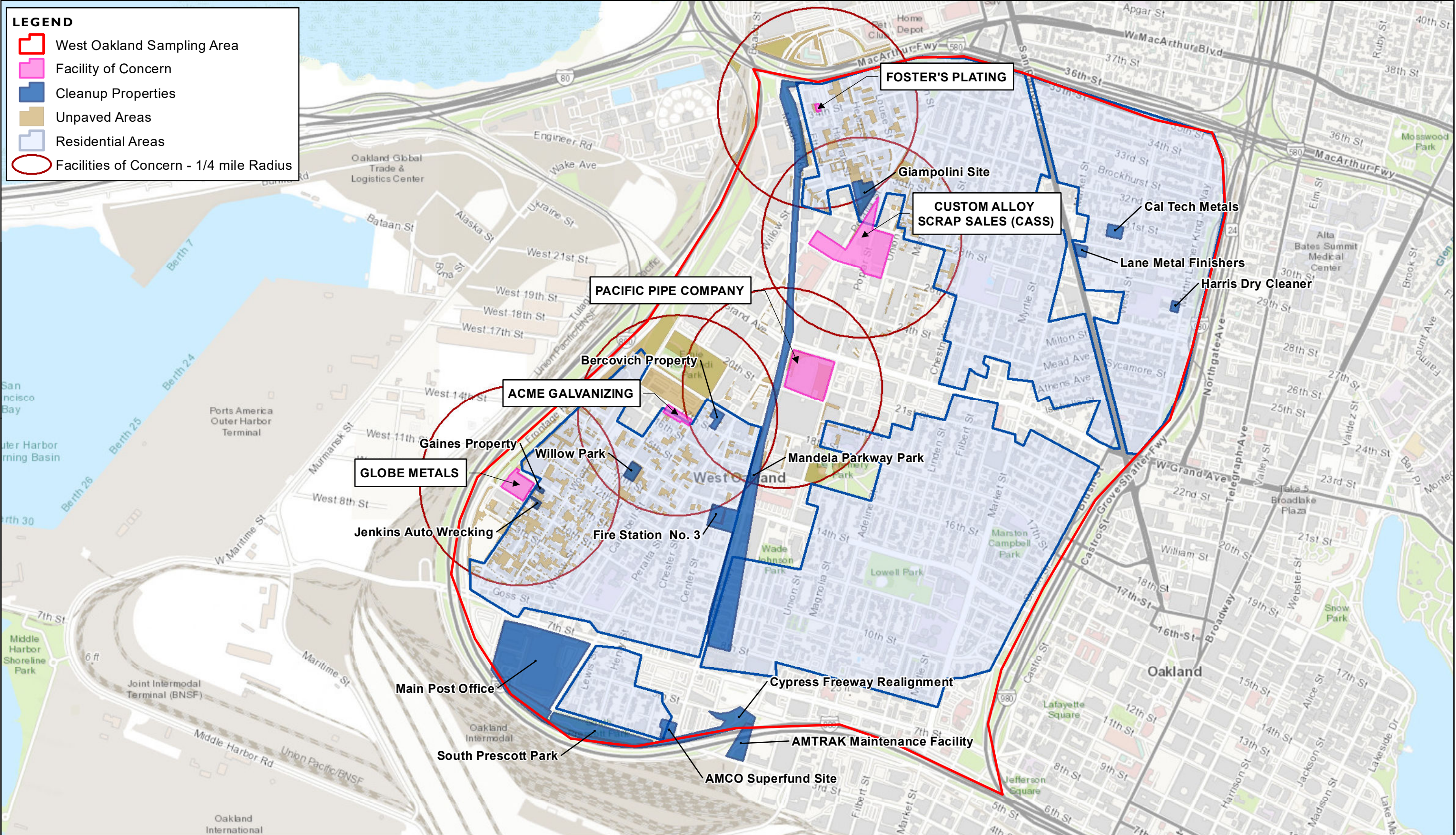
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FIGURE 6
LEAD SAMPLING RESULTS
EXCEEDING SCREENING LEVELS
 West Oakland Lead Sampling Report, Oakland, Alameda County, CA



0 Scale in Miles 0.5

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FIGURE 7
FACILITIES OF CONCERN
West Oakland Lead Sampling Report
Oakland, Alameda County, CA

Tables

Table A-1
Lead Sampling Results
West Oakland Lead Sampling Study

Location	Sample ID	Date Collected	Sample Type	Sample Depth (in bgs)	Lead Result (mg/kg)
OUM001	OUM001-SM02-180604	6/4/2018	Field Sample	0 - 2	140
OUM001	OUM001-SM06-180604	6/4/2018	Field Sample	2 - 6	120
OUM002	OUM002-SM02-180604	6/4/2018	Field Sample	0 - 2	590
OUM002	OUM002-SM06-180604	6/4/2018	Field Sample	2 - 6	670
OUM003	OUM003-SM02-180604	6/4/2018	Field Sample	0 - 2	210
OUM003	OUM003-SM06-180604	6/4/2018	Field Sample	2 - 6	100
OUM004	OUM004-SM02-180604	6/4/2018	Field Sample	0 - 2	200
OUM004	OUM004-SM06-180604	6/4/2018	Field Sample	2 - 6	250
OUM005	OUM005-SM02-180604	6/4/2018	Field Sample	0 - 2	140
OUM005	OUM005-SM06-180604	6/4/2018	Field Sample	2 - 6	170
OUM006	OUM006-SM02-180604	6/4/2018	Field Sample	0 - 2	300
OUM006	OUM006-SM06-180604	6/4/2018	Field Sample	2 - 6	280
OUM007	OUM007-SM02-180604	6/4/2018	Field Sample	0 - 2	110
OUM007	OUM007-SM06-180604	6/4/2018	Field Sample	2 - 6	73
OUM008	OUM008-SM02-180604	6/4/2018	Field Sample	0 - 2	180
OUM008	OUM008-SM06-180604	6/4/2018	Field Sample	2 - 6	190
OUM009	OUM009-SM02-180605	6/5/2018	Field Sample	0 - 2	730
OUM009	OUM009-SM06-180605	6/5/2018	Field Sample	2 - 6	870
OUM010	OUM010-SM02-180604	6/4/2018	Field Sample	0 - 2	81
OUM010	OUM204-SM02-180604	6/4/2018	Field Duplicate	0 - 2	87
OUM010	OUM010-SM06-180604	6/4/2018	Field Sample	2 - 6	130
OUM010	OUM205-SM06-180604	6/4/2018	Field Duplicate	2 - 6	120
OUM011	OUM011-SM02-180605	6/5/2018	Field Sample	0 - 2	92
OUM011	OUM011-SM06-180605	6/5/2018	Field Sample	2 - 6	90
OUM012	OUM012-SM02-180605	6/5/2018	Field Sample	0 - 2	100
OUM012	OUM012-SM06-180605	6/5/2018	Field Sample	2 - 6	110
OUM013	OUM013-SM02-180605	6/5/2018	Field Sample	0 - 2	370
OUM013	OUM013-SM06-180605	6/5/2018	Field Sample	2 - 6	380
OUM014	OUM014-SM02-180605	6/5/2018	Field Sample	0 - 2	170
OUM014	OUM014-SM06-180605	6/5/2018	Field Sample	2 - 6	210
OUM015	OUM015-SM02-180606	6/6/2018	Field Sample	0 - 2	530
OUM015	OUM015-SM06-180606	6/6/2018	Field Sample	2 - 6	750
OUM016	OUM016-SM02-180605	6/5/2018	Field Sample	0 - 2	210
OUM016	OUM016-SM06-180605	6/5/2018	Field Sample	2 - 6	190
OUM017	OUM017-SM02-180606	6/6/2018	Field Sample	0 - 2	1200
OUM017	OUM017-SM06-180606	6/6/2018	Field Sample	2 - 6	1700
OUM018	OUM018-SM02-180605	6/5/2018	Field Sample	0 - 2	280
OUM018	OUM018-SM06-180605	6/5/2018	Field Sample	2 - 6	370
OUM019	OUM019-SM02-180605	6/5/2018	Field Sample	0 - 2	51
OUM019	OUM019-SM06-180605	6/5/2018	Field Sample	2 - 6	67
OUM020	OUM020-SM02-180605	6/5/2018	Field Sample	0 - 2	250
OUM020	OUM206-SM02-180605	6/5/2018	Field Duplicate	0 - 2	280
OUM020	OUM020-SM06-180605	6/5/2018	Field Sample	2 - 6	350
OUM020	OUM207-SM06-180605	6/5/2018	Field Duplicate	2 - 6	320
OUM021	OUM021-SM02-180605	6/5/2018	Field Sample	0 - 2	190
OUM021	OUM021-SM06-180605	6/5/2018	Field Sample	2 - 6	170

Table A-1
Lead Sampling Results
West Oakland Lead Sampling Study

Location	Sample ID	Date Collected	Sample Type	Sample Depth (in bgs)	Lead Result (mg/kg)
OUM022	OUM022-SM02-180605	6/5/2018	Field Sample	0 - 2	76
OUM022	OUM022-SM06-180605	6/5/2018	Field Sample	2 - 6	63
OUM023	OUM023-SM02-180606	6/6/2018	Field Sample	0 - 2	1900
OUM023	OUM023-SM06-180606	6/6/2018	Field Sample	2 - 6	110
OUM024	OUM024-SM02-180605	6/5/2018	Field Sample	0 - 2	99
OUM024	OUM024-SM06-180605	6/5/2018	Field Sample	2 - 6	99
OUM025	OUM025-SM02-180606	6/6/2018	Field Sample	0 - 2	300
OUM025	OUM025-SM06-180606	6/6/2018	Field Sample	2 - 6	320
OUM026	OUM026-SM02-180605	6/5/2018	Field Sample	0 - 2	100
OUM026	OUM026-SM06-180605	6/5/2018	Field Sample	2 - 6	94
OUM027	OUM027-SM02-180606	6/6/2018	Field Sample	0 - 2	570
OUM027	OUM027-SM06-180606	6/6/2018	Field Sample	2 - 6	880
OUM029	OUM029-SM02-180606	6/6/2018	Field Sample	0 - 2	330
OUM029	OUM029-SM06-180606	6/6/2018	Field Sample	2 - 6	250
OUM030	OUM030-SM02-180606	6/6/2018	Field Sample	0 - 2	120
OUM030	OUM208-SM02-180606	6/6/2018	Field Duplicate	0 - 2	130
OUM030	OUM030-SM06-180606	6/6/2018	Field Sample	2 - 6	41
OUM030	OUM209-SM06-180606	6/6/2018	Field Duplicate	2 - 6	47
OUM031	OUM031-SM02-180606	6/6/2018	Field Sample	0 - 2	730
OUM031	OUM031-SM06-180606	6/6/2018	Field Sample	2 - 6	1200
OUM032	OUM032-SM02-180606	6/6/2018	Field Sample	0 - 2	130
OUM032	OUM032-SM06-180606	6/6/2018	Field Sample	2 - 6	49
OUM033	OUM033-SM02-180606	6/6/2018	Field Sample	0 - 2	230
OUM033	OUM033-SM06-180606	6/6/2018	Field Sample	2 - 6	280
OUM034	OUM034-SM02-180606	6/6/2018	Field Sample	0 - 2	57
OUM034	OUM034-SM06-180606	6/6/2018	Field Sample	2 - 6	62
OUM035	OUM035-SM02-180606	6/6/2018	Field Sample	0 - 2	110
OUM035	OUM035-SM06-180606	6/6/2018	Field Sample	2 - 6	190
OUM036	OUM036-SM02-180606	6/6/2018	Field Sample	0 - 2	590
OUM036	OUM036-SM06-180606	6/6/2018	Field Sample	2 - 6	200
OUM037	OUM037-SM02-180606	6/6/2018	Field Sample	0 - 2	440
OUM037	OUM037-SM06-180606	6/6/2018	Field Sample	2 - 6	390
OUM038	OUM038-SM02-180606	6/6/2018	Field Sample	0 - 2	120
OUM038	OUM038-SM06-180606	6/6/2018	Field Sample	2 - 6	95
OUM039	OUM039-SM02-180606	6/6/2018	Field Sample	0 - 2	790
OUM039	OUM039-SM06-180606	6/6/2018	Field Sample	2 - 6	400
OUM040	OUM040-SM02-180606	6/6/2018	Field Sample	0 - 2	600
OUM040	OUM210-SM02-180606	6/6/2018	Field Duplicate	0 - 2	610
OUM040	OUM040-SM06-180606	6/6/2018	Field Sample	2 - 6	720
OUM040	OUM211-SM06-180606	6/6/2018	Field Duplicate	2 - 6	710
OUM041	OUM041-SM02-180607	6/7/2018	Field Sample	0 - 2	540
OUM041	OUM041-SM06-180607	6/7/2018	Field Sample	2 - 6	460
OUM042	OUM042-SM02-180606	6/6/2018	Field Sample	0 - 2	55
OUM042	OUM042-SM06-180606	6/6/2018	Field Sample	2 - 6	12
OUM043	OUM043-SM02-180607	6/7/2018	Field Sample	0 - 2	460
OUM043	OUM043-SM06-180607	6/7/2018	Field Sample	2 - 6	480

Table A-1
Lead Sampling Results
West Oakland Lead Sampling Study

Location	Sample ID	Date Collected	Sample Type	Sample Depth (in bgs)	Lead Result (mg/kg)
OUM044	OUM044-SM02-180606	6/6/2018	Field Sample	0 - 2	500
OUM044	OUM044-SM06-180606	6/6/2018	Field Sample	2 - 6	260
OUM045	OUM045-SM02-180607	6/7/2018	Field Sample	0 - 2	140
OUM045	OUM045-SM06-180607	6/7/2018	Field Sample	2 - 6	95
OUM046	OUM046-SM02-180606	6/6/2018	Field Sample	0 - 2	170
OUM046	OUM046-SM06-180606	6/6/2018	Field Sample	2 - 6	290
OUM047	OUM047-SM02-180607	6/7/2018	Field Sample	0 - 2	91
OUM047	OUM047-SM06-180607	6/7/2018	Field Sample	2 - 6	150
OUM048	OUM048-SM02-180606	6/6/2018	Field Sample	0 - 2	82
OUM048	OUM048-SM06-180606	6/6/2018	Field Sample	2 - 6	13
OUM049	OUM049-SM02-180607	6/7/2018	Field Sample	0 - 2	420
OUM049	OUM049-SM06-180607	6/7/2018	Field Sample	2 - 6	210
OUM050	OUM050-SM02-180607	6/7/2018	Field Sample	0 - 2	440
OUM050	OUM212-SM02-180607	6/7/2018	Field Duplicate	0 - 2	390
OUM050	OUM050-SM06-180607	6/7/2018	Field Sample	2 - 6	520
OUM050	OUM213-SM06-180607	6/7/2018	Field Duplicate	2 - 6	510
OUM051	OUM051-SM02-180607	6/7/2018	Field Sample	0 - 2	760
OUM051	OUM051-SM06-180607	6/7/2018	Field Sample	2 - 6	140
OUM052	OUM052-SM02-180607	6/7/2018	Field Sample	0 - 2	93
OUM052	OUM052-SM06-180607	6/7/2018	Field Sample	2 - 6	100
OUM053	OUM053-SM02-180607	6/7/2018	Field Sample	0 - 2	650
OUM053	OUM053-SM06-180607	6/7/2018	Field Sample	2 - 6	970
OUM054	OUM054-SM02-180607	6/7/2018	Field Sample	0 - 2	430
OUM054	OUM054-SM06-180607	6/7/2018	Field Sample	2 - 6	510
OUM055	OUM055-SM02-180607	6/7/2018	Field Sample	0 - 2	210
OUM055	OUM055-SM06-180607	6/7/2018	Field Sample	2 - 6	400
OUM056	OUM056-SM02-180607	6/7/2018	Field Sample	0 - 2	350
OUM056	OUM056-SM06-180607	6/7/2018	Field Sample	2 - 6	390
OUM057	OUM057-SM02-180607	6/7/2018	Field Sample	0 - 2	150
OUM057	OUM057-SM06-180607	6/7/2018	Field Sample	2 - 6	95
OUM058	OUM058-SM02-180607	6/7/2018	Field Sample	0 - 2	270
OUM058	OUM058-SM06-180607	6/7/2018	Field Sample	2 - 6	320
OUM059	OUM059-SM02-180607	6/7/2018	Field Sample	0 - 2	28
OUM059	OUM059-SM06-180607	6/7/2018	Field Sample	2 - 6	38
OUM060	OUM060-SM02-180607	6/7/2018	Field Sample	0 - 2	470
OUM060	OUM214-SM02-180607	6/7/2018	Field Duplicate	0 - 2	460
OUM060	OUM060-SM06-180607	6/7/2018	Field Sample	2 - 6	560
OUM060	OUM215-SM06-180607	6/7/2018	Field Duplicate	2 - 6	550
OUM061	OUM061-SM02-180607	6/7/2018	Field Sample	0 - 2	86
OUM061	OUM061-SM06-180607	6/7/2018	Field Sample	2 - 6	43
OUM062	OUM062-SM02-180607	6/7/2018	Field Sample	0 - 2	120
OUM062	OUM062-SM06-180607	6/7/2018	Field Sample	2 - 6	55
OUM063	OUM063-SM02-180607	6/7/2018	Field Sample	0 - 2	120
OUM063	OUM063-SM06-180607	6/7/2018	Field Sample	2 - 6	76
OUM064	OUM064-SM02-180607	6/7/2018	Field Sample	0 - 2	99
OUM064	OUM064-SM06-180607	6/7/2018	Field Sample	2 - 6	130

Table A-1
Lead Sampling Results
West Oakland Lead Sampling Study

Location	Sample ID	Date Collected	Sample Type	Sample Depth (in bgs)	Lead Result (mg/kg)
OUM065	OUM065-SM02-180608	6/8/2018	Field Sample	0 - 2	440
OUM065	OUM065-SM06-180608	6/8/2018	Field Sample	2 - 6	420
OUM066	OUM066-SM02-180607	6/7/2018	Field Sample	0 - 2	190
OUM066	OUM066-SM06-180607	6/7/2018	Field Sample	2 - 6	160
OUM067	OUM067-SM02-180608	6/8/2018	Field Sample	0 - 2	77
OUM067	OUM067-SM06-180608	6/8/2018	Field Sample	2 - 6	68
OUM068	OUM068-SM02-180607	6/7/2018	Field Sample	0 - 2	170
OUM068	OUM068-SM06-180607	6/7/2018	Field Sample	2 - 6	110
OUM069	OUM069-SM02-180608	6/8/2018	Field Sample	0 - 2	27
OUM069	OUM069-SM06-180608	6/8/2018	Field Sample	2 - 6	28
OUM070	OUM070-SM02-180607	6/7/2018	Field Sample	0 - 2	230
OUM070	OUM216-SM02-180607	6/7/2018	Field Duplicate	0 - 2	240
OUM070	OUM070-SM06-180607	6/7/2018	Field Sample	2 - 6	280
OUM070	OUM217-SM06-180607	6/7/2018	Field Duplicate	2 - 6	280
OUM071	OUM071-SM02-180608	6/8/2018	Field Sample	0 - 2	110
OUM071	OUM071-SM06-180608	6/8/2018	Field Sample	2 - 6	220
OUM072	OUM72-SM02-180608	6/8/2018	Field Sample	0 - 2	450
OUM072	OUM72-SM06-180608	6/8/2018	Field Sample	2 - 6	510
OUM073	OUM073-SM02-180608	6/8/2018	Field Sample	0 - 2	110
OUM073	OUM073-SM06-180608	6/8/2018	Field Sample	2 - 6	190
OUM074	OUM74-SM02-180608	6/8/2018	Field Sample	0 - 2	210
OUM074	OUM74-SM06-180608	6/8/2018	Field Sample	2 - 6	180
OUM075	OUM075-SM02-180608	6/8/2018	Field Sample	0 - 2	68
OUM075	OUM075-SM06-180608	6/8/2018	Field Sample	2 - 6	85
OUM076	OUM76-SM02-180608	6/8/2018	Field Sample	0 - 2	370
OUM076	OUM76-SM06-180608	6/8/2018	Field Sample	2 - 6	360
OUM077	OUM077-SM02-180607	6/7/2018	Field Sample	0 - 2	240
OUM077	OUM077-SM06-180607	6/7/2018	Field Sample	2 - 6	140
OUM079	OUM079-SM02-180608	6/8/2018	Field Sample	0 - 2	160
OUM079	OUM079-SM06-180608	6/8/2018	Field Sample	2 - 6	160
OUM080	OUM218-SM02-180608	6/8/2018	Field Duplicate	0 - 2	88
OUM080	OUM80-SM02-180608	6/8/2018	Field Sample	0 - 2	95
OUM080	OUM219-SM06-180608	6/8/2018	Field Duplicate	2 - 6	45
OUM080	OUM80-SM06-180608	6/8/2018	Field Sample	2 - 6	50
OUM081	OUM081-SM02-180608	6/8/2018	Field Sample	0 - 2	170
OUM081	OUM081-SM06-180608	6/8/2018	Field Sample	2 - 6	160
OUM082	OUM082-SM02-180608	6/8/2018	Field Sample	0 - 2	420
OUM082	OUM082-SM06-180608	6/8/2018	Field Sample	2 - 6	750
OUM083	OUM083-SM02-180608	6/8/2018	Field Sample	0 - 2	1300
OUM083	OUM083-SM06-180608	6/8/2018	Field Sample	2 - 6	3900
OUM084	OUM084-SM02-180608	6/8/2018	Field Sample	0 - 2	53
OUM084	OUM084-SM06-180608	6/8/2018	Field Sample	2 - 6	49
OUM085	OUM085-SM02-180608	6/8/2018	Field Sample	0 - 2	540
OUM085	OUM085-SM06-180608	6/8/2018	Field Sample	2 - 6	530
OUM086	OUM086-SM02-180608	6/8/2018	Field Sample	0 - 2	210
OUM086	OUM086-SM06-180608	6/8/2018	Field Sample	2 - 6	2800

Table A-1
Lead Sampling Results
West Oakland Lead Sampling Study

Location	Sample ID	Date Collected	Sample Type	Sample Depth (in bgs)	Lead Result (mg/kg)
OUM086a	OUM086a-SM02-180608	6/8/2018	Field Sample	0 - 2	170
OUM086a	OUM086a-SM06-180608	6/8/2018	Field Sample	2 - 6	150
OUM087	OUM087-SM02-180608	6/8/2018	Field Sample	0 - 2	110
OUM087	OUM087-SM06-180608	6/8/2018	Field Sample	2 - 6	99
OUM088	OUM088-SM02-180608	6/8/2018	Field Sample	0 - 2	59
OUM088	OUM088-SM06-180608	6/8/2018	Field Sample	2 - 6	24
OUM089	OUM089-SM02-180608	6/8/2018	Field Sample	0 - 2	74
OUM089	OUM089-SM06-180608	6/8/2018	Field Sample	2 - 6	8.7
OUM090	OUM090-SM02-180608	6/8/2018	Field Sample	0 - 2	110
OUM090	OUM220-SM02-180608	6/8/2018	Field Duplicate	0 - 2	150
OUM090	OUM090-SM06-180608	6/8/2018	Field Sample	2 - 6	17
OUM090	OUM221-SM06-180608	6/8/2018	Field Duplicate	2 - 6	29
OUM091	OUM091-SM02-180611	6/11/2018	Field Sample	0 - 2	83
OUM091	OUM091-SM06-180611	6/11/2018	Field Sample	2 - 6	110
OUM092	OUM092-SM02-180608	6/8/2018	Field Sample	0 - 2	180
OUM092	OUM092-SM06-180608	6/8/2018	Field Sample	2 - 6	61
OUM093	OUM093-SM02-180611	6/11/2018	Field Sample	0 - 2	85
OUM093	OUM093-SM06-180611	6/11/2018	Field Sample	2 - 6	130
OUM094	OUM094-SM02-180608	6/8/2018	Field Sample	0 - 2	130
OUM094	OUM094-SM06-180608	6/8/2018	Field Sample	2 - 6	92
OUM095	OUM095-SM02-180611	6/11/2018	Field Sample	0 - 2	1400
OUM095	OUM095-SM06-180611	6/11/2018	Field Sample	2 - 6	140
OUM096	OUM096-SM02-180611	6/11/2018	Field Sample	0 - 2	370
OUM096	OUM096-SM06-180611	6/11/2018	Field Sample	2 - 6	560
OUM097	OUM097-SM02-180611	6/11/2018	Field Sample	0 - 2	210
OUM097	OUM097-SM06-180611	6/11/2018	Field Sample	2 - 6	14
OUM098	OUM098-SM02-180611	6/11/2018	Field Sample	0 - 2	160
OUM098	OUM098-SM06-180611	6/11/2018	Field Sample	2 - 6	110
OUM099	OUM099-SM02-180611	6/11/2018	Field Sample	0 - 2	170
OUM099	OUM099-SM06-180611	6/11/2018	Field Sample	2 - 6	96
OUM100	OUM100-SM02-180611	6/11/2018	Field Sample	0 - 2	810
OUM100	OUM222-SM02-180611	6/11/2018	Field Duplicate	0 - 2	760
OUM100	OUM100-SM06-180611	6/11/2018	Field Sample	2 - 6	490
OUM100	OUM223-SM06-180611	6/11/2018	Field Duplicate	2 - 6	460
OUM101	OUM101-SM02-180611	6/11/2018	Field Sample	0 - 2	730
OUM101	OUM101-SM06-180611	6/11/2018	Field Sample	2 - 6	510
OUM102	OUM102-SM02-180611	6/11/2018	Field Sample	0 - 2	120
OUM102	OUM102-SM06-180611	6/11/2018	Field Sample	2 - 6	130
OUM103	OUM103-SM02-180611	6/11/2018	Field Sample	0 - 2	200
OUM103	OUM103-SM06-180611	6/11/2018	Field Sample	2 - 6	320
OUM104	OUM104-SM02-180611	6/11/2018	Field Sample	0 - 2	520
OUM104	OUM104-SM06-180611	6/11/2018	Field Sample	2 - 6	530
OUM105	OUM105-SM02-180611	6/11/2018	Field Sample	0 - 2	600
OUM105	OUM105-SM06-180611	6/11/2018	Field Sample	2 - 6	520
OUM106	OUM106-SM02-180611	6/11/2018	Field Sample	0 - 2	220
OUM106	OUM106-SM06-180611	6/11/2018	Field Sample	2 - 6	340

Table A-1
Lead Sampling Results
West Oakland Lead Sampling Study

Location	Sample ID	Date Collected	Sample Type	Sample Depth (in bgs)	Lead Result (mg/kg)
OUM107	OUM107-SM02-180611	6/11/2018	Field Sample	0 - 2	1300
OUM107	OUM107-SM06-180611	6/11/2018	Field Sample	2 - 6	1300
OUM108	OUM108-SM02-180611	6/11/2018	Field Sample	0 - 2	140
OUM108	OUM108-SM06-180611	6/11/2018	Field Sample	2 - 6	77
OUM109	OUM109-SM02-180611	6/11/2018	Field Sample	0 - 2	330
OUM109	OUM109-SM06-180611	6/11/2018	Field Sample	2 - 6	450
OUM110	OUM110-SM02-180611	6/11/2018	Field Sample	0 - 2	180
OUM110	OUM224-SM02-180611	6/11/2018	Field Duplicate	0 - 2	200
OUM110	OUM110-SM06-180611	6/11/2018	Field Sample	2 - 6	220
OUM110	OUM225-SM06-180611	6/11/2018	Field Duplicate	2 - 6	210
OUM111	OUM111-SM02-180611	6/11/2018	Field Sample	0 - 2	30
OUM111	OUM111-SM06-180611	6/11/2018	Field Sample	2 - 6	14
OUM112	OUM112-SM02-180611	6/11/2018	Field Sample	0 - 2	290
OUM112	OUM112-SM06-180611	6/11/2018	Field Sample	2 - 6	560
OUM113	OUM113-SM02-180611	6/11/2018	Field Sample	0 - 2	230
OUM113	OUM113-SM06-180611	6/11/2018	Field Sample	2 - 6	230
OUM114	OUM114-SM02-180611	6/11/2018	Field Sample	0 - 2	160
OUM114	OUM114-SM06-180611	6/11/2018	Field Sample	2 - 6	180
OUM115	OUM115-SM02-180611	6/11/2018	Field Sample	0 - 2	180
OUM115	OUM115-SM06-180611	6/11/2018	Field Sample	2 - 6	200
OUM116	OUM116-SM02-180611	6/11/2018	Field Sample	0 - 2	120
OUM116	OUM116-SM06-180611	6/11/2018	Field Sample	2 - 6	48
OUM117	OUM117-SM02-180611	6/11/2018	Field Sample	0 - 2	210
OUM117	OUM117-SM06-180611	6/11/2018	Field Sample	2 - 6	56
OUM118	OUM118-SM02-180611	6/11/2018	Field Sample	0 - 2	130
OUM118	OUM118-SM06-180611	6/11/2018	Field Sample	2 - 6	200
OUM119	OUM119-SM02-180611	6/11/2018	Field Sample	0 - 2	110
OUM119	OUM119-SM06-180611	6/11/2018	Field Sample	2 - 6	74
OUM120	OUM120-SM02-180611	6/11/2018	Field Sample	0 - 2	59
OUM120	OUM226-SM02-180611	6/11/2018	Field Duplicate	0 - 2	57
OUM120	OUM120-SM06-180611	6/11/2018	Field Sample	2 - 6	80
OUM120	OUM227-SM06-180611	6/11/2018	Field Duplicate	2 - 6	94
OUM121	OUM121-SM02-180611	6/11/2018	Field Sample	0 - 2	160
OUM121	OUM121-SM06-180611	6/11/2018	Field Sample	2 - 6	140
OUM123	OUM123-SM02-180612	6/12/2018	Field Sample	0 - 2	980
OUM123	OUM123-SM06-180612	6/12/2018	Field Sample	2 - 6	910
OUM124	OUM124-SM02-180612	6/12/2018	Field Sample	0 - 2	130
OUM124	OUM124-SM06-180612	6/12/2018	Field Sample	2 - 6	210
OUM124	OUM228-SM06-180612	6/12/2018	Field Duplicate	2 - 6	210
OUM125	OUM125-SM02-180612	6/12/2018	Field Sample	0 - 2	560
OUM125	OUM125-SM06-180612	6/12/2018	Field Sample	2 - 6	160
OUM126	OUM126-SM02-180612	6/12/2018	Field Sample	0 - 2	610
OUM126	OUM126-SM06-180612	6/12/2018	Field Sample	2 - 6	670
OUM127	OUM127-SM02-180612	6/12/2018	Field Sample	0 - 2	600
OUM127	OUM127-SM06-180612	6/12/2018	Field Sample	2 - 6	520
OUM128	OUM128-SM02-180612	6/12/2018	Field Sample	0 - 2	200
OUM128	OUM128-SM06-180612	6/12/2018	Field Sample	2 - 6	250

Table A-1
Lead Sampling Results
West Oakland Lead Sampling Study

Location	Sample ID	Date Collected	Sample Type	Sample Depth (in bgs)	Lead Result (mg/kg)
OUM129	OUM129-SM02-180612	6/12/2018	Field Sample	0 - 2	410
OUM129	OUM129-SM06-180612	6/12/2018	Field Sample	2 - 6	350
OUM130	OUM130-SM02-180612	6/12/2018	Field Sample	0 - 2	230
OUM130	OUM130-SM06-180612	6/12/2018	Field Sample	2 - 6	180
OUM130	OUM229-SM06-180612	6/12/2018	Field Duplicate	2 - 6	170
OUM131	OUM131-SM02-180612	6/12/2018	Field Sample	0 - 2	360
OUM131	OUM131-SM06-180612	6/12/2018	Field Sample	2 - 6	380
OUM132	OUM132-SM02-180612	6/12/2018	Field Sample	0 - 2	120
OUM132	OUM132-SM06-180612	6/12/2018	Field Sample	2 - 6	120
OUM133	OUM133-SM02-180612	6/12/2018	Field Sample	0 - 2	200
OUM133	OUM133-SM06-180612	6/12/2018	Field Sample	2 - 6	180
OUM134	OUM134-SM02-180612	6/12/2018	Field Sample	0 - 2	58
OUM134	OUM134-SM06-180612	6/12/2018	Field Sample	2 - 6	59
OUM134	OUM230-SM06-180612	6/12/2018	Field Duplicate	2 - 6	56
OUM135	OUM135-SM02-180612	6/12/2018	Field Sample	0 - 2	450
OUM135	OUM135-SM06-180612	6/12/2018	Field Sample	2 - 6	290
OUM136	OUM136-SM02-180612	6/12/2018	Field Sample	0 - 2	110
OUM136	OUM136-SM06-180612	6/12/2018	Field Sample	2 - 6	430
OUM137	OUM137-SM02-180612	6/12/2018	Field Sample	0 - 2	690
OUM137	OUM137-SM06-180612	6/12/2018	Field Sample	2 - 6	580
OUM138	OUM138-SM02-180612	6/12/2018	Field Sample	0 - 2	150
OUM138	OUM138-SM06-180612	6/12/2018	Field Sample	2 - 6	190
OUM139	OUM139-SM02-180612	6/12/2018	Field Sample	0 - 2	600
OUM139	OUM139-SM06-180612	6/12/2018	Field Sample	2 - 6	390
OUM140	OUM140-SM02-180612	6/12/2018	Field Sample	0 - 2	380
OUM140	OUM140-SM06-180612	6/12/2018	Field Sample	2 - 6	320
OUM140	OUM231-SM06-180612	6/12/2018	Field Duplicate	2 - 6	430
OUM141	OUM141-SM02-180612	6/12/2018	Field Sample	0 - 2	610
OUM141	OUM141-SM06-180612	6/12/2018	Field Sample	2 - 6	590
OUM142	OUM142-SM02-180612	6/12/2018	Field Sample	0 - 2	700
OUM142	OUM142-SM06-180612	6/12/2018	Field Sample	2 - 6	600
OUM143	OUM143-SM02-180612	6/12/2018	Field Sample	0 - 2	26
OUM143	OUM143-SM06-180612	6/12/2018	Field Sample	2 - 6	11
OUM144	OUM144-SM02-180612	6/12/2018	Field Sample	0 - 2	300
OUM144	OUM144-SM06-180612	6/12/2018	Field Sample	2 - 6	360
OUM144	OUM232-SM06-180612	6/12/2018	Field Duplicate	2 - 6	380
OUM145	OUM145-SM02-180612	6/12/2018	Field Sample	0 - 2	130
OUM145	OUM145-SM06-180612	6/12/2018	Field Sample	2 - 6	100
OUM146	OUM146-SM02-180612	6/12/2018	Field Sample	0 - 2	61
OUM146	OUM146-SM06-180612	6/12/2018	Field Sample	2 - 6	45
OUM147	OUM147-SM02-180612	6/12/2018	Field Sample	0 - 2	140
OUM147	OUM147-SM06-180612	6/12/2018	Field Sample	2 - 6	80
OUM148	OUM148-SM02-180612	6/12/2018	Field Sample	0 - 2	180
OUM148	OUM148-SM06-180612	6/12/2018	Field Sample	2 - 6	180
OUM149	OUM149-SM02-180612	6/12/2018	Field Sample	0 - 2	460
OUM149	OUM149-SM06-180612	6/12/2018	Field Sample	2 - 6	380
OUM150	OUM150-SM02-180613	6/13/2018	Field Sample	0 - 2	440

Table A-1
Lead Sampling Results
West Oakland Lead Sampling Study

Location	Sample ID	Date Collected	Sample Type	Sample Depth (in bgs)	Lead Result (mg/kg)
OUM150	OUM150-SM06-180613	6/13/2018	Field Sample	2 - 6	240
OUM150	OUM233-SM06-180613	6/13/2018	Field Duplicate	2 - 6	220
OUM151	OUM151-SM02-180612	6/12/2018	Field Sample	0 - 2	230
OUM151	OUM151-SM06-180612	6/12/2018	Field Sample	2 - 6	210
OUM152	OUM152-SM02-180613	6/13/2018	Field Sample	0 - 2	440
OUM152	OUM152-SM06-180613	6/13/2018	Field Sample	2 - 6	730
OUM153	OUM153-SM02-180612	6/12/2018	Field Sample	0 - 2	700
OUM153	OUM153-SM06-180612	6/12/2018	Field Sample	2 - 6	430
OUM154	OUM154-SM02-180613	6/13/2018	Field Sample	0 - 2	260
OUM154	OUM154-SM06-180613	6/13/2018	Field Sample	2 - 6	360
OUM154	OUM234-SM06-180613	6/13/2018	Field Duplicate	2 - 6	260
OUM155	OUM155-SM02-180612	6/12/2018	Field Sample	0 - 2	260
OUM155	OUM155-SM06-180612	6/12/2018	Field Sample	2 - 6	210
OUM156	OUM156-SM02-180613	6/13/2018	Field Sample	0 - 2	1000
OUM156	OUM156-SM06-180613	6/13/2018	Field Sample	2 - 6	580
OUM157	OUM157-SM02-180613	6/13/2018	Field Sample	0 - 2	65
OUM157	OUM157-SM06-180613	6/13/2018	Field Sample	2 - 6	12
OUM158	OUM158-SM02-180613	6/13/2018	Field Sample	0 - 2	130
OUM158	OUM158-SM06-180613	6/13/2018	Field Sample	2 - 6	110
OUM159	OUM159-SM02-180613	6/13/2018	Field Sample	0 - 2	88
OUM159	OUM159-SM06-180613	6/13/2018	Field Sample	2 - 6	45
OUM160	OUM160-SM02-180613	6/13/2018	Field Sample	0 - 2	790
OUM160	OUM160-SM06-180613	6/13/2018	Field Sample	2 - 6	1500
OUM160	OUM235-SM06-180613	6/13/2018	Field Duplicate	2 - 6	2100
OUM161	OUM161-SM02-180613	6/13/2018	Field Sample	0 - 2	140
OUM161	OUM161-SM06-180613	6/13/2018	Field Sample	2 - 6	92
OUM162	OUM162-SM02-180613	6/13/2018	Field Sample	0 - 2	64
OUM162	OUM162-SM06-180613	6/13/2018	Field Sample	2 - 6	130
OUM163	OUM163-SM02-180613	6/13/2018	Field Sample	0 - 2	88
OUM163	OUM163-SM06-180613	6/13/2018	Field Sample	2 - 6	91
OUM164	OUM164-SM02-180613	6/13/2018	Field Sample	0 - 2	390
OUM164	OUM164-SM06-180613	6/13/2018	Field Sample	2 - 6	350
OUM164	OUM236-SM06-180613	6/13/2018	Field Duplicate	2 - 6	400
OUM167	OUM167-SM02-180614	6/14/2018	Field Sample	0 - 2	150
OUM167	OUM167-SM06-180614	6/14/2018	Field Sample	2 - 6	130
OUM168	OUM168-SM02-180614	6/14/2018	Field Sample	0 - 2	96
OUM168	OUM168-SM06-180614	6/14/2018	Field Sample	2 - 6	290
OUM169	OUM169-SM02-180614	6/14/2018	Field Sample	0 - 2	430
OUM169	OUM169-SM06-180614	6/14/2018	Field Sample	2 - 6	200
OUM170	OUM170-SM02-180614	6/14/2018	Field Sample	0 - 2	1400
OUM170	OUM170-SM06-180614	6/14/2018	Field Sample	2 - 6	2500
OUM170	OUM237-SM06-180614	6/14/2018	Field Duplicate	2 - 6	1900
OUM171	OUM171-SM02-180613	6/13/2018	Field Sample	0 - 2	57
OUM171	OUM171-SM06-180613	6/13/2018	Field Sample	2 - 6	29
OUM172	OUM172-SM02-180613	6/13/2018	Field Sample	0 - 2	960
OUM172	OUM172-SM06-180613	6/13/2018	Field Sample	2 - 6	680
OUM173	OUM173-SM02-180613	6/13/2018	Field Sample	0 - 2	270
OUM173	OUM173-SM06-180613	6/13/2018	Field Sample	2 - 6	130

Table A-1
Lead Sampling Results
West Oakland Lead Sampling Study

Location	Sample ID	Date Collected	Sample Type	Sample Depth (in bgs)	Lead Result (mg/kg)
OUM174	OUM174-SM02-180613	6/13/2018	Field Sample	0 - 2	220
OUM174	OUM174-SM06-180613	6/13/2018	Field Sample	2 - 6	200
OUM174	OUM238-SM06-180613	6/13/2018	Field Duplicate	2 - 6	180
OUM175	OUM175-SM02-180613	6/13/2018	Field Sample	0 - 2	240
OUM175	OUM175-SM06-180613	6/13/2018	Field Sample	2 - 6	230
OUM176	OUM176-SM02-180613	6/13/2018	Field Sample	0 - 2	180
OUM176	OUM176-SM06-180613	6/13/2018	Field Sample	2 - 6	370
OUM177	OUM177-SM02-180613	6/13/2018	Field Sample	0 - 2	160
OUM177	OUM177-SM06-180613	6/13/2018	Field Sample	2 - 6	140
OUM179	OUM179-SM02-180614	6/14/2018	Field Sample	0 - 2	340
OUM179	OUM179-SM06-180614	6/14/2018	Field Sample	2 - 6	340
OUM180	OUM180-SM02-180614	6/14/2018	Field Sample	0 - 2	74
OUM180	OUM180-SM06-180614	6/14/2018	Field Sample	2 - 6	590
OUM180	OUM239-SM06-180614	6/14/2018	Field Duplicate	2 - 6	530
OUM181	OUM181-SM02-180614	6/14/2018	Field Sample	0 - 2	56
OUM181	OUM181-SM06-180614	6/14/2018	Field Sample	2 - 6	570
OUM182	OUM182-SM02-180614	6/14/2018	Field Sample	0 - 2	25
OUM182	OUM182-SM06-180614	6/14/2018	Field Sample	2 - 6	37
OUM183	OUM183-SM02-180614	6/14/2018	Field Sample	0 - 2	22
OUM183	OUM183-SM06-180614	6/14/2018	Field Sample	2 - 6	24
OUM184	OUM184-SM02-180614	6/14/2018	Field Sample	0 - 2	110
OUM184	OUM184-SM06-180614	6/14/2018	Field Sample	2 - 6	58
OUM184	OUM240-SM06-180614	6/14/2018	Field Duplicate	2 - 6	83
OUM185	OUM185-SM02-180614	6/14/2018	Field Sample	0 - 2	40
OUM185	OUM185-SM06-180614	6/14/2018	Field Sample	2 - 6	32
OUM186	OUM186-SM02-180614	6/14/2018	Field Sample	0 - 2	370
OUM186	OUM186-SM06-180614	6/14/2018	Field Sample	2 - 6	380
OUM187	OUM187-SM02-180614	6/14/2018	Field Sample	0 - 2	160
OUM187	OUM187-SM06-180614	6/14/2018	Field Sample	2 - 6	200
OUM188	OUM188-SM02-180614	6/14/2018	Field Sample	0 - 2	260
OUM188	OUM188-SM06-180614	6/14/2018	Field Sample	2 - 6	280
OUM189	OUM189-SM02-180614	6/14/2018	Field Sample	0 - 2	130
OUM189	OUM189-SM06-180614	6/14/2018	Field Sample	2 - 6	76
OUM190	OUM190-SM02-180614	6/14/2018	Field Sample	0 - 2	350
OUM190	OUM190-SM06-180614	6/14/2018	Field Sample	2 - 6	470
OUM190	OUM241-SM06-180614	6/14/2018	Field Duplicate	2 - 6	470
OUM191	OUM191-SM02-180614	6/14/2018	Field Sample	0 - 2	260
OUM191	OUM191-SM06-180614	6/14/2018	Field Sample	2 - 6	800
OUM192	OUM192-SM02-180614	6/14/2018	Field Sample	0 - 2	500
OUM192	OUM192-SM06-180614	6/14/2018	Field Sample	2 - 6	690
OUM193	OUM193-SM02-180604	6/4/2018	Field Sample	0 - 2	160
OUM193	OUM193-SM06-180604	6/4/2018	Field Sample	2 - 6	120
OUM194	OUM194-SM02-180614	6/14/2018	Field Sample	0 - 2	140
OUM194	OUM194-SM06-180614	6/14/2018	Field Sample	2 - 6	150
OUM194	OUM242-SM06-180614	6/14/2018	Field Duplicate	2 - 6	130
OUM195	OUM195-SM02-180614	6/14/2018	Field Sample	0 - 2	110
OUM195	OUM195-SM06-180614	6/14/2018	Field Sample	2 - 6	23

Table A-1
Lead Sampling Results
West Oakland Lead Sampling Study

Location	Sample ID	Date Collected	Sample Type	Sample Depth (in bgs)	Lead Result (mg/kg)
OUM196	OUM196-SM02-180614	6/14/2018	Field Sample	0 - 2	320
OUM196	OUM196-SM06-180614	6/14/2018	Field Sample	2 - 6	280
OUM197	OUM197-SM02-180614	6/14/2018	Field Sample	0 - 2	89
OUM197	OUM197-SM06-180614	6/14/2018	Field Sample	2 - 6	77
OUM198	OUM198-SM02-180614	6/14/2018	Field Sample	0 - 2	170
OUM198	OUM198-SM06-180614	6/14/2018	Field Sample	2 - 6	200
OUM199	OUM199-SM02-180614	6/14/2018	Field Sample	0 - 2	630
OUM199	OUM199-SM06-180614	6/14/2018	Field Sample	2 - 6	550
OUM200	OUM200-SM02-180614	6/14/2018	Field Sample	0 - 2	100
OUM200	OUM200-SM06-180614	6/14/2018	Field Sample	2 - 6	85
OUM200	OUM243-SM06-180614	6/14/2018	Field Duplicate	2 - 6	75
OUM201	OUM201-SM02-180614	6/14/2018	Field Sample	0 - 2	540
OUM201	OUM201-SM06-180614	6/14/2018	Field Sample	2 - 6	440
OUM202	OUM202-SM02-180614	6/14/2018	Field Sample	0 - 2	170
OUM202	OUM202-SM06-180614	6/14/2018	Field Sample	2 - 6	130
OUM203	OUM203-SM02-180614	6/14/2018	Field Sample	0 - 2	130
OUM203	OUM203-SM06-180614	6/14/2018	Field Sample	2 - 6	140

in bgs = inches below ground surface

mg/kg = milligrams per kilogram

Appendix A: Photographic Documentation Log

Project Name:
Urban Metals Study: West Oakland

Site Location:
West Oakland, Alameda County, CA

Project No.
20074.067.008.0004.01

Photo No.
1

Date:
June 8,
2018

Direction Photo Taken: N/A

Description:

Driving the original sample collection device used to collect samples into a sample location.

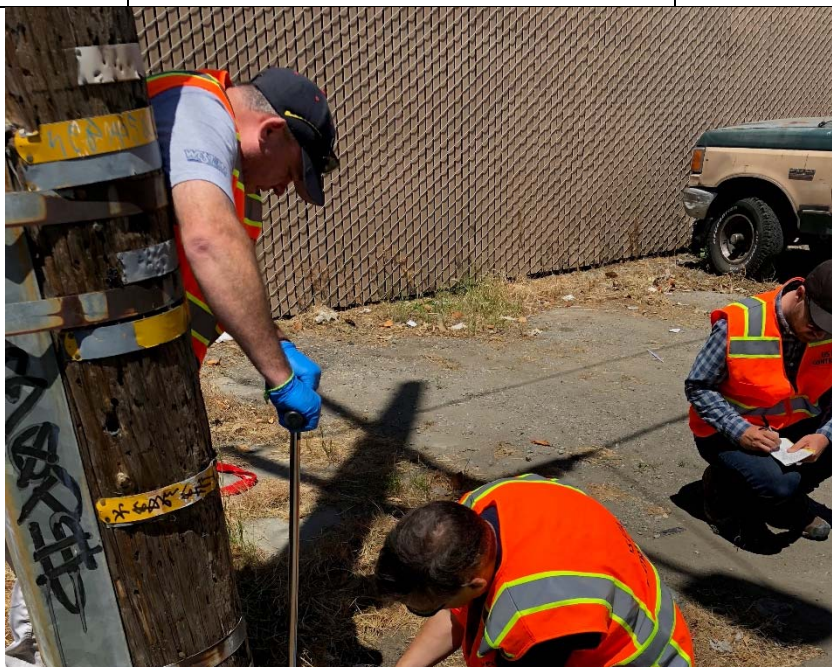
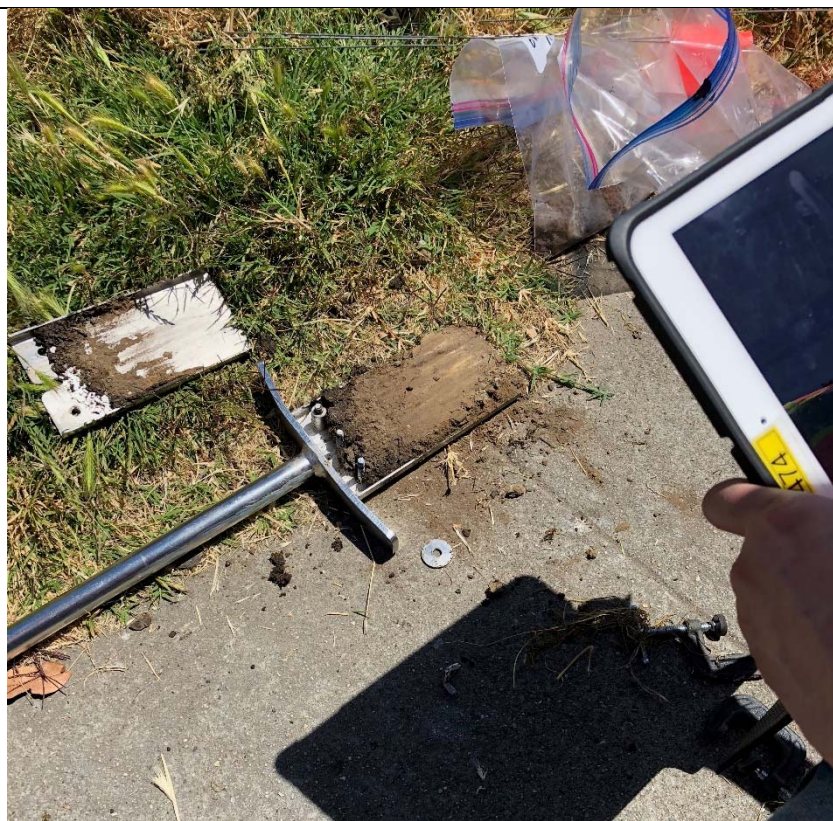


Photo No.
2

Date:
June 5,
2018

Description:

Example of soil aliquot collected one of three soil sample locations for each composite soil sample.



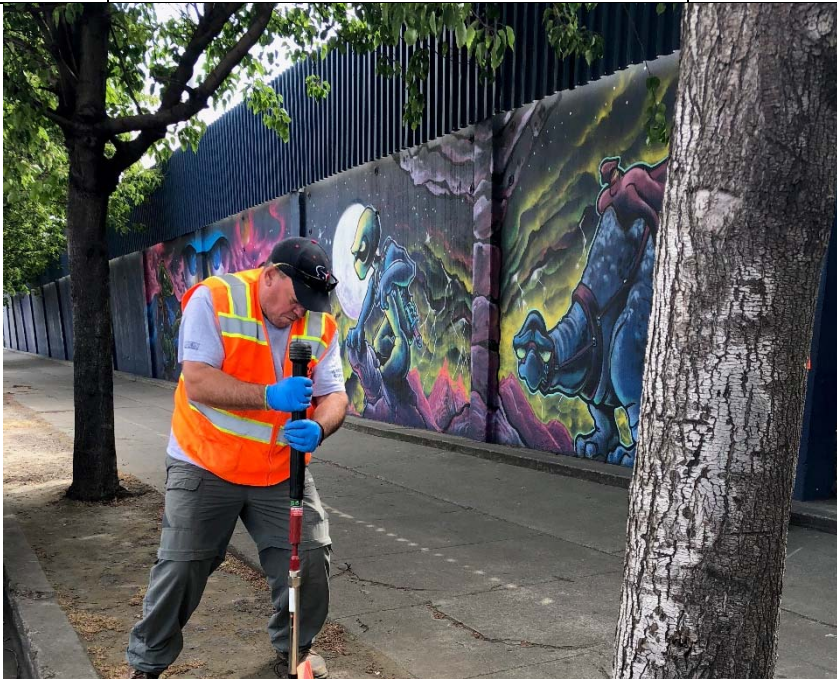
Project Name: Urban Metals Study: West Oakland		Site Location: West Oakland, Alameda County, CA	Project No. 20074.067.008.0004.01
Photo No. 3	Date: June 7, 2018		
Description: Collection of soil core with the second soil collection device used onsite..			

Photo No. 4	Date: June 08, 2018	
Description: Soil boring collected from second collection device used onsite.		

Project Name:
Urban Metals Study: West Oakland

Site Location:
West Oakland, Alameda County, CA

Project No.
20074.067.008.0004.01

Photo No.
6

Date:
June 8,
2018

Description:

Collection of soil core with the second soil collection device used onsite..

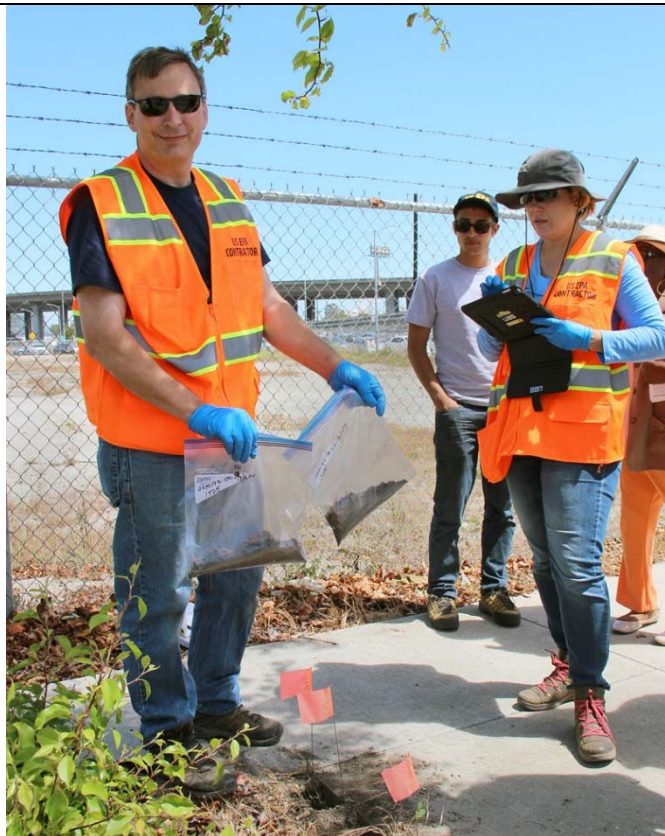


Photo No.
6

Date:
June 08,
2018

Description:

Collection of a surface (0 -2 inches below ground surface) and shallow subsurface (2 to 6 inches below ground surface) into Ziploc bags for laboratory analysis.



Project Name:
Urban Metals Study: West Oakland

Site Location:
West Oakland, Alameda County, CA

Project No.
20074.067.008.0004.01

Photo No.
7

Date:
June 4,
2018

Description:

Collection of data, photograph of the soil core, using the Collector application for ArcGIS.



Photo8
8

Date:
June 08,
2018

Description:

Refilling the soil borings with clean soil.



Appendix B: Sampling and Analysis Plan (SAP)

Sampling and Analysis Plan

Urban Metals Study: West Oakland

USACE Contract Number: W912P7-16-D-0001
Document Control Number: 20074.067.008.0004.01

May 2018

Prepared for:
U.S. Environmental Protection Agency
Region 9


Prepared by:
Weston Solutions, Inc.
2300 Clayton Road, Suite 900
Concord, CA 94520

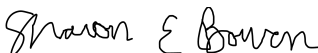
Sampling and Analysis Plan

Urban Metals Study: West Oakland

USACE Contract Number: W912P7-16-D-0001

Document Control Number: 20074.067.008.0004.01

Approved by: 
Amanda K.C. Reilly, Project Manager
WESTON Solutions, Inc.

Approved by: 
Sharon Bowen, Site Assessment Manager
U.S. Environmental Protection Agency, Region 9

Approved by: Signature page attached
Eugenia E. McNaughton, Ph.D., Quality Assurance Manager
U.S. Environmental Protection Agency, Region 9



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

MEMORANDUM

Subject: Urban Metals Study: West Oakland (R9 QA DCN# SPFD0045SV1)

From: Joseph Eidelberg, Chemist and Eugenia McNaughton, QA Section
Manager (EMD 3-2) *Joseph Eidelberg Eugenia McNaughton*

To: Sharon Bowen, Environmental Protection Specialist, Brownfields &
Site Assessment Section (SPFD 6-1)

The Sampling and Analysis Plan (SAP) for the Urban Metals Study: West Oakland, prepared by Weston Solutions and received on May 17, 2018, was reviewed. The review followed *Guidance for Preparing Quality Assurance Project Plans* (EPA/240R-02009 December 2002). Any potential issues were resolved in a series of scoping meetings before the SAP was submitted to the QA Section.

The SAP is approved.

If you have any questions about the review, please contact Eugenia McNaughton at 415-846-4721.

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List of Acronyms

AMCO	AMCO Chemical Corporation
AOC	Analyte of Concern
Bercovich	A. Bercovich/Sunset Smelting and Refining Company
bgs	below ground surface
CASL	California Screening Level
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CIC	Community Involvement Coordinator
CLP	Contract Laboratory Program
Collector	Collector for ArcGIS Application
CRQL	Contract Required Quantitation Limit
DNAPL	dense non-aqueous phase liquid
DTSC	Department of Toxic Substances Control
DQO	Data Quality Objective
EDD	Electronic Data Deliverable
EPA	United States Environmental Protection Agency
FM	Field Manager
HDPE	High-Density Polyethylene
HRS	Hazard Ranking System
ICP-AES	Inductively Coupled Plasma-Optical Emission Spectrometry
IDW	investigation-derived wastes
GIS	geographic information system
LABRIC	Lead-Acid Battery Recycling Facility Investigation and Cleanup
mg/kg	milligrams per kilogram
mL	milliliters
mm	millimeters
MDL	Method Detection Limit
MQO	Measurement Quality Objective
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NPL	National Priorities List
NTCRA	Non-time Critical Removal Action
PM	Project Manager
PPE	personal protective equipment
QA	Quality Assurance
QC	Quality Control
RCRIS	Resource Conservation and Recovery Information System
RPD	Relative Percent Difference
RSCC	Regional Sample Control Coordinator
RSL	Regional Screening Level
SAM	Site Assessment Manager
SAP	Sampling and Analysis Plan
SEMS	Superfund Enterprise Management System
SOP	Standard Operating Procedure
VOC	Volatile Organic Compound
WESTON	Weston Solutions, Inc.
µg/kg	microgram per kilogram
µm	micrometers

1.0 INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), Weston Solutions, Inc. (WESTON®) has been tasked to conduct a sampling investigation for the Urban Metals Study in West Oakland, California. The study has potential to lead to additional Hazard Ranking System (HRS) investigations. The HRS assesses the relative threat associated with actual or potential releases of hazardous substances to the environment, and has been adopted by the United States Environmental Protection Agency (EPA) to assist in setting priorities for further evaluation and potential remedial action. The HRS is the primary method for determining a site's eligibility for placement on the National Priorities List (NPL). The NPL identifies sites where the EPA may conduct remedial actions.

This Sampling and Analysis Plan (SAP) describes the project and data use objectives, data collection rationale, quality assurance goals, and requirements for sampling and analysis activities. The SAP also defines the sampling and data collection methods that will be used for this project. The SAP is intended to accurately reflect the planned data-gathering activities for this investigation; however, conditions and additional EPA direction may warrant modifications. All significant changes will be documented in the final report.

WESTON has been tasked to gather and review existing, available information regarding the area conditions, identify and fill data gaps for the study area.

The specific field sampling and chemical analysis information pertaining to the study area is addressed in this SAP, in accordance with the EPA documents EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations (QA/R-5), March 2001; Guidance on Systematic Planning Using the Data Quality Objectives Process (EPA QA/G-4), February 2006; and Data Quality Objective Process for Superfund (EPA 540/G-93/71), August 1993.

1.1 Project Organization

The following is a list of project personnel and their responsibilities (see Table 1):

Table 1: Organizational Chart

Title/Responsibility	Name	Phone Number
<i>Primary Point of Contact</i>		
EPA Site Assessment Manager	Sharon Bowen	(415) 947-4250
<i>Other Contacts</i>		
EPA Quality Assurance Manager	Eugenia E. McNaughton	(415) 972-3411
WESTON Program Manager and Quality Assurance Coordinator	Christina Marquis	(562) 243-1776
WESTON Project Manager	Amanda Reilly	(541) 508-8550
WESTON Field Manager	Tom Fortner	(925) 948-2624
EPA Chemistry Team Leader	Richard Bauer	(510) 412-2312
EPA Region 9 Sample Control Coordinator	Susan Sturges	(510) 412-2389
EPA Quality Assurance Officer	Joe Eidleberg	(415) 972-3809
Department of Toxic Substances Control (DTSC) Project Manager	Dan Murphy	(510) 540-3772
DTSC Geographic Information System (GIS) Coordinator	Rick Fears	(916) 255-3610
EPA Education/Outreach Coordinator	Eric Canteenwala	(415) 972-3932
EPA Community Involvement Coordinator (CIC)	Jackie Lane	(415) 972-3236
EPA Public Affairs Specialist	Michele Huitric	(415) 972-3165
State Public Engagement Specialist	Thelmy Perez	(323) 807-2356
State Public Engagement Specialist	Johanna Arias-Bhatia	(323) 204-8090
DTSC Lead-Acid Battery Recycling Facility Investigation and Cleanup (LABRIC) Program Lead	Tamara Zielinski	(916) 255-6437
DTSC LABRIC Program	Steve Ross	(916) 255-6648

EPA Site Assessment Manager (SAM) - The EPA SAM is Sharon Bowen. Ms. Bowen is the primary decision maker for this investigation and is the primary contact for the WESTON Project Manager.

EPA Quality Assurance (QA) Manager - The EPA QA Manager is Eugenia E. McNaughton, Ph.D. Ms. McNaughton will be responsible for reviewing the SAP, and arranging for data validation once sampling is completed.

WESTON Program Manager and QA Coordinator - The WESTON Program Manager and QA Coordinator is Christina Marquis. Ms. Marquis is responsible for the overall performance of all tasks assigned to WESTON by the EPA. Ms. Marquis is authorized to approve Sampling Analysis Plans for Southern California sites conducted by WESTON to ensure project quality assurance goals are met.

WESTON Project Manager (PM) - The WESTON PM is Amanda Reilly. Ms. Reilly is responsible for preparing the SAP, working with the laboratories, implementing the sampling design, and working with the WESTON QA Coordinator to ensure project quality assurance goals are met.

WESTON Field Manager (FM) – The WESTON FM is Tom Fortner. Mr. Fortner is responsible for collecting, handling, documenting, and transporting samples, generating field documentation of sampling activities, and working with the WESTON QA Coordinator to ensure project quality assurance goals are met.

EPA Chemistry Team Leader – The EPA Chemistry Team Leader is Richard Bauer. Mr. Bauer will be responsible for the EPA Region 9 Laboratory's performance of all sampling preparations and analytical testing.

EPA Region 9 Sample Control Coordinator (RSCC) – The EPA RSCC is Susan Sturges. Ms. Sturges will determine which laboratories will perform the analyses for the project. If the Contract Laboratory Program (CLP) program will be used, the RSCC will assign CLP numbers. The RSCC will be responsible for delivering the raw data to the EPA SAM.

EPA Quality Assurance Officer – The EPA Quality Assurance Officer is Joe Eidleberg. Mr. Eidleberg will be responsible for reviewing the SAP, and for coordinating the data validation once sampling is completed.

DTSC PM – The DTSC PM is Dan Murphy. Mr. Murphy is a key decision maker for this investigation.

DTSC GIS Coordinator – The DTSC GIS Coordinator is Rick Fears. Mr. Fears is responsible for inputting the field observations and sampling results into a GIS visualization tool.

EPA Education/Outreach Coordinator – The EPA Education/Outreach Coordinator is Eric Canteenwala. Mr. Canteenwala is responsible for preparing the pre-sampling and post-sampling Fact Sheets informing the public about the study.

EPA CIC – The EPA CIC is Jackie Lane. Ms. Lane will be present for the sampling activities and is responsible for interacting and communicating with residents and businesses during and subsequent to the sampling event.

EPA Public Affairs Specialist – The EPA Public Affairs Specialist is Michele Huitric. Ms. Huitric is responsible preparing and submitting the press release once the investigation is complete.

State Public Engagement Specialists – The State Public Engagement Specialists are Thelmy Perez and Johanna Arias-Bhatia. Ms. Perez and Ms. Arias-Bhatia will be present for the sampling activities and are responsible for interacting and communicating with residents and businesses during and subsequent to the sampling event.

DTSC LABRIC Program Staff – DTSC LABRIC Program Staff members are Tamara Zeilinski (lead) and Steve Ross (staff). Ms. Zeilinski and Mr. Ross are responsible for reviewing data, maps, and reports for possible follow up by DTSC's LABRIC Program.

Analytical Laboratory - The EPA RSCC will arrange for laboratory services for metals by ISM02.2 [using Inductively Coupled Plasma Mass Spectrometry (ICP-MS)] or equivalent.

Data Validation – The EPA QA Office will arrange data validation for this investigation.

1.2 Distribution List

Copies of the final SAP will be distributed to the following persons and organizations:

- Sharon Bowen, EPA Region 9
- Eugenia E. McNaughton, Ph.D., EPA QA Manager
- Dan Murphy, DTSC
- Weston Solutions, Inc. files

1.3 Statement of the Specific Problem

The apparent problems in West Oakland, which contributed to EPA's determination that an investigation was necessary, are as follows:

- Urban areas have been heavily impacted by human activity dating back to the late 1800s, resulting in elevated levels of certain contaminants in soil. Soil matrices in any large, long-established city may include elevated metals. This contaminant load may not be easily connected to a specific release or spill from a stationary point source.
- The primary purpose of this study is to survey and analyze metal concentrations in a specific mixed-use (industrial/residential) urban environment.

2.0 STUDY AREA DESCRIPTION

2.1 Location and Description

The urban metals study area is located in West Oakland, Alameda County, California. West Oakland is a neighborhood situated in the northwestern corner of Oakland, west of downtown, south of Emeryville, and north of Alameda. The study area is defined as an approximate 2.26 square-mile area that is bound by the I-880 freeway to the west and south, the I-980 freeway to the east, and the I-580 freeway to the north. The study area includes residential neighborhoods with commercial and industrial areas. The location of the study area is shown in Figure 1.

The West Oakland study area will be divided into a grid for sampling. Each cell of the grid will measure approximately 7.13 acres, resulting in a total of 203 cells. The areas sampled will be in public areas, within city property. A map presenting the study area is shown in Figure 2. The sample grid layout is presented in Figure 3.

2.2 Project Area Land History

In 1854, the city of Oakland was incorporated and rapidly grew becoming a major rail terminal in the late 1860s and 1870s. By 1920, Oakland was the home of numerous manufacturing industries including: metals, canneries, bakeries, internal combustion engines, automobiles, and shipbuilding. As the city's population expanded with the need for factory workers, the number of residential homes being constructed within the city also increased.

Heavy metals have been used in many forms of industrial/manufacturing processes and for everyday consumer applications. Historically, lead was present in "leaded" gasoline until it was phased out in the 1970s. Exhaust from cars using "leaded" gasoline contained particulates, which resulted in the deposition of lead near roadways. Additionally, lead-based paint may have been released into soils near houses, bridges, and other structures that were built before leaded paint was banned in 1978. Arsenic compounds have been widely used in pesticides and wood treating applications. Arsenic and various metals can also be released from coal burning and other metal refinery operations.

2.3 Regulatory Involvement

2.3.1 U. S. Environmental Protection Agency

There are numerous sites listed within the West Oakland Urban Metals study area that are listed in the Superfund Enterprise Management System (SEMS) active and inactive site universe.

South Prescott is a hundred-year-old neighborhood in West Oakland that has a history of industrial activity. The neighborhood is located in the southern portion of the West Oakland Urban Metals study area. In 2009, elevated levels of lead were detected in residential soils at concentrations exceeding the Residential Regional Screening Level (RSL) of 400 milligrams per kilogram (mg/kg). EPA's Removal Program treated the soil with ground fish bone, which reacts with lead to form pyromorphite. The remedial efforts reduced the bioavailability of lead in the treated soil by twenty to seventy percent. The soil was then covered with a green cap, such as sod, clean soil

with mulch, raised garden beds, or gravel. The combination of eight inches of treated soil with four inches of a green cap significantly reduced lead exposure in the upper 12 inches of soil. Of 151 targeted properties in South Prescott, 143 were remediated. In addition, the easements on all of the adjacent streets were treated (EPA, 2018a).

The AMCO Chemical Corporation (AMCO) NPL site (EPA ID: CA0001576081) is located in the southern portion of the West Oakland Urban Metals study area. AMCO operated as a chemical distribution facility from the 1960s to 1989. In 2007, EPA performed an assessment of lead in residential soils at properties located immediately adjacent to the former AMCO property. This investigation revealed concentrations of lead in bordering residential soils up to 2,700 mg/kg and prompted EPA to conduct removal actions at eight residential properties. Currently, EPA is conducting a non-time-critical removal action (NTCRA) at the AMCO site to address the portions of the site with the highest concentrations of volatile organic compounds (VOCs). The final action will address VOC and non-VOC, including lead, contamination pathways remaining on the AMCO site after the completion of the NTCRA (EPA, 2018b).

The A. Bercovich/Sunset Smelting and Refining Company (Bercovich) site (also referred to as the Mark Aboudi property) (EPA ID: CAN000909419) is located in the western portion of the West Oakland Urban Metals study area. The site operated as a paint company and a smelting and refining operation from 1912 to 1962, and a metal salvage business from 1963 to 1988. In 2005, the Department of Toxic Substances Control (DTSC) determined that soil at the site was contaminated with lead up to 1,100 mg/kg and that a remedy was necessary to protect public health and the environment. In April 2018, EPA, with DTSC assistance, conducted soil removal actions on 11 residential properties adjacent to the site.

2.3.2 California Environmental Protection Agency, Department of Toxic Substances Control (DTSC)

DTSC is implementing the Lead-Acid Battery Recycling Facility Investigation and Cleanup Program (LABRIC Program) to identify, characterize, and clean up lead contamination that DTSC believes resulted from the operation of lead-acid battery recycling facilities. The LABRIC Program was established pursuant to Assembly Bill 2153 (Chapter 666, Statutes of 2016), which became the Lead-Acid Battery Recycling Act of 2016 (Act). This Act created the Lead-Acid Battery Cleanup Fund (Fund) to provide resources, upon appropriation by the Legislature, for the investigation and cleanup of areas of the state reasonably suspected of being contaminated by the operation of lead-acid battery recycling facilities.

DTSC is working with U.S. EPA Region 9 to evaluate previous and current lead-acid battery recycling facilities in California. This evaluation is focused on 39 former lead smelter sites identified from a comprehensive review of site investigation and cleanup records maintained by both EPA Region 9 and DTSC, including DTSC's EnviroStor database. The information includes documentation of previous investigations into secondary lead smelting operations, which are smelting operations that use recycled lead metal (e.g. from batteries and other scrap metals) and not pure lead ore.

There are numerous sites listed within the study area that have potential contaminants of concern associated with the West Oakland Urban Metals study area (Envirostor, 2018).

Site Name	Site Address	Envirostor ID	Potential Contaminants of Concern
528 Lewis Street	528 Lewis Street	01880002	Lead
A. Bercovich 2 nd Street	127 2 nd Street	01590002	Metals
Alta Plating & Chemical Corp.	1433 18 th Street	70000088	Nickel, Zinc
AT & SF Railroad Property	Wood & 32 nd Streets	01400005	Arsenic
B & A Auto Dismantlers	1823 Shorey Street	01500106	Lead
B & P Dismantlers	2525 Wood Street	01750017	Arsenic, Lead, Nickel
BNSF Wood Street Yard	Wood Street and West Grand Avenue	01400017	Arsenic
Bobo's Junkyard	1401 Third Street	01400003	Metals
Chang's Automotive	1009 7 th Street	01750019	Lead
Church's Fried Chicken	1766 7 th Street	01540002	Metals
Cole's Brothers Auto Wreckers	1797 12 th Street	60000365	Lead
Cypress Freeway-3 rd Street Soundwall	3 rd Street between Center and Peralta Streets	01400012	Lead
Francis Plating	785 7 th Street	01330049	Metals
Gaines Property	1795 11 th Street	01750030	Lead
General Transportation	3211 Wood Street	01750018	Lead
LDS Trucking	2233 Wood Street	01420127	Lead
Mandela Grand	Mandela Parkway and West Grand	60000433	Cadmium, Lead
Mandela Parkway Corridor	Mandela Parkway between 34 th and 8 th Streets	01410118	Lead
Mandela Parkway Extension Project	Mandela Parkway and 34 th Street	01470006	Lead
Mark Aboudi Property (also known as Bercovich)	1639 18 th Street	01420131	Lead
New Oakland Fire Station #3	Center and 14 th Street	01920063	Lead
Northwestern Venetian Supply Corp. Site	1218 24 th Street	01340123	Lead
Oakland Main Post Office Parking Struct.	1675 7 th Street	01430001	Lead
Phoenix 524 Property	524 Cedar Street	01330038	Arsenic, Cadmium, Lead, Nickel
Phoenix 766 Property	766 Cedar Street	01330036	Antimony, Arsenic, Lead, Thallium
Romak Iron Works	3250 Hollis Street	60000358	Lead
SF Bay Area Rapid Transit District	349 Mandela Parkway	01750021	Lead

Site Name	Site Address	Envirostor ID	Potential Contaminants of Concern
Smilo Chemical Company	500 Kirkham Street	01510022	Lead
Smith's Wrecking Yard	1600 3 rd Street	01990014	Metals
So. Prescott Neighborhood Park	3 rd Street	01990019	Lead
Southern Pacific-Desert Rail Yard	Cypress Corridor	01400009	Lead
Southern Pacific-West Oakland Rail Yard	Cypress Corridor	01400010	Arsenic, Lead
Southern Pacific 3 rd St. Vacant Lot	1509/1513 Third Street	01400013	Lead
Southern Pacific Oakland	1707 Wood Street	01400001	Metals
Sutta Recycling	3401 Wood Street	01280088	Lead
Thomas A. Short Company	3430 Wood Street	01340113	Cadmium, Lead
TKG California Storage	2450 Mandela Parkway	60000712	Metals
West Recycler Bin Storage	1405 Wood Street	01890018	Arsenic, Cadmium, Lead, Molybdenum
Wilfred's Auto Wrecking	1834 7 th Street	01500105	Lead, Nickel

2.4 Soil Characteristics

In West Oakland, several lithological units are present between ground surface and 20 feet below ground surface (bgs). Typically, the first few feet bgs is miscellaneous fill material. The fill ranges from clay to gravel/sand mixtures and is variable in color. Since all of the soil samples collected during the West Oakland Urban Metals event will be from the upper 6 inches of soil, it is likely that glass fragments, debris, and/or other man-made materials will be encountered.

2.5 Waste Characteristics

Potential hazardous substance sources associated with the Urban Metals Study area include, but may not be limited to, soils contaminated with metals.

3.0 PROJECT OBJECTIVES

3.1 Project Task and Problem Definition

WESTON has been tasked to conduct sampling throughout West Oakland in order to characterize soils. To document the background concentrations and distributions of urban contaminants, soil matrix samples will be collected within the 2.26 square mile study area. Soil matrix samples will be submitted for laboratory analysis for selected metals (See Table 2).

Analytical results will be presented in a two-phased study. The first phase will present the raw results and average concentrations of all metals, and include a graphical map showing lead concentrations as identified in the soil samples. WESTON will be reporting Phase I of the study.

Phase II of the study will include further evaluation of the analytical data. This second portion will be done as a separate effort and a SAP addendum will be completed to outline the objectives.

3.2 Data Use Objectives

Data collected during Phase I of the study will be used to:

- Calculate an average concentration for each metal in ICP-AES table using all data, together with following statistics around the mean: mean, median, maximum, minimum, standard deviation (1 and 2 standard deviation lines around the mean), 95th upper and lower percentile for the mean.
- Create a map that presents the concentrations of lead in soil within the defined study area. This map will be the basis for a Conceptual Site Model showing potential industrial sources and other sources of lead.
- Identify samples with lead concentrations above the Residential RSL of 400 mg/kg, which will be provided to EPA's Removal Program for prioritization of further evaluation and response.
- If additional assessment of the study area is warranted, an addendum will be made to this SAP that documents these findings and provides a design and procedures for additional site characterization analysis. The SAP Addendum will be submitted to the EPA QA Manager for approval.
- If additional analysis of the soil samples is warranted, the analyses will be conducted within six months of the sampling event to adhere to the inorganic analytical holding times.

3.3 Action Levels

Soil data collected from the study area can be compared to EPA Region 9 Residential and Industrial RSLs and DTSC's California Screening Levels (CASLs) for Residential and Commercial/Industrial soils. Sample results showing lead levels above the RSL of 400 mg/kg will be provided to EPA Region 9's Removal Program to be prioritized for further evaluation.

3.4 Decision Rules

Decisions will be based primarily on data generated from this SAP. The decision rule is:

- Once the field activities are completed, a comprehensive report will be prepared to compile the analytical results and findings of the study area.

3.5 Data Quality Objectives

3.5.1 Data Quality Objective Process

The DQO process, as set forth in the EPA document, *Guidance for the Data Quality Objectives Process*, EPA QA/G-4, was followed to establish the data quality objectives for this project. An outline of the process and the outputs for this project are included in Appendix A.

3.5.2 DQO Data Categories

This investigation will involve the generation of definitive data for soil (see Section 3.1). The specific requirements for this data category are detailed in Section 9. The data generated under this project will comply with the requirements for that data category as defined in *Data Quality Objective Process for Superfund*, EPA 540/G-93/71, September 1993. All definitive analytical methods employed for this project will be methods approved by the EPA.

3.5.3 Measurement Quality Objectives (MQOs)

Measurement Quality Objective goals (MQOs) for this project were developed following guidelines in *EPA Guidance for Quality Assurance Project Plans*, EPA QA/G-5 Final. All sampling will be guided by procedures detailed in Section 6.2 and standard operating procedures (SOPs) to ensure representativeness of sample results. Table 2 documents the MQOs for this project. As presented in this table, the published reporting limits for the Method Detection Limit (MDL) (including the EPA CLP Contract Required Quantitation Limits, or CRQLs) were determined to be appropriate for this project. The acceptable ranges for Accuracy [percent recovery for Matrix Spike/Matrix Spike Duplicate (MS/MSD) analysis] will fall between 75 and 125 percent for water samples and 65 and 135 percent for soil samples. The threshold of precision [Relative Percent Difference (RPD) for MS/MSD and duplicate sample analysis] will be less than or equal to 35 percent for water samples, and 50 percent for soil samples. The analytical MDLs for each analyte of concern are lower than the RSLs and CASLs for soils, as shown in Table 2. These action levels are only used as risk-based benchmarks for the purposes of validating the appropriateness of the MDLs.

3.6 Sample and Data Management

Samples will be collected and logged on a chain-of-custody form as discussed in Section 8.5. Samples will be kept secure in the custody of the sampler at all times, who will assure that all preservation parameters are being followed. Samples will be transferred to the laboratory via a certified carrier in a properly custody-sealed container with chain-of-custody documentation. The SCRIBE data management system will be used to create chain-of-custody documents. The laboratory should note any evidence of tampering upon receipt.

The completed laboratory data report will be submitted to the EPA QA Manager, who will contract the data validation. The EPA QA Manager will provide the data validation reports to the EPA SAM and DTSC Project Manager with an electronic data deliverable (EDD). The EPA SAM will then provide the data reports to the WESTON PM. The data validation reports and laboratory data summary sheets will be included in the final report to be submitted to the EPA SAM. Before submittal, the final report will undergo a technical review to ensure that all data have been reported and discussed correctly.

The DTSC GIS Coordinator will administer the Collector Application that will be utilized throughout the sampling activities. Further discussion regarding Collector is in Section 6.1.1 and Section 6.2.1.

3.7 Schedule of Sampling Activities

The field sampling work is expected to take 10 days to perform. The work is tentatively scheduled to be begin on June 4th, 2018. Field sampling will occur Monday through Friday between the hours of 8 a.m. and 5 p.m. Two sampling teams will be in the field concurrently during the sampling event. The sampling teams will consist of two WESTON personnel each. In addition, at least one EPA representative and one DTSC representative will be in the field at all times providing oversight and interfacing with the public.

3.8 Special Training Requirements/Certifications

There are no special training or certification requirements specific to this project. Training requirements relevant to WESTON's health and safety program comply with 29 CFR 1910.120. The site-specific Health and Safety Plan is presented in Appendix B.

4.0 SAMPLING RATIONALE

4.1 Sampling Locations and Rationale

The urban metals study area is defined by an approximate 2.26 square mile grid. Each cell of the grid is approximately 7.13 acres, resulting in a total of 203 cells. Soil samples will be collected from all 203 cells within the grid and submitted for laboratory analyses providing each cell has accessible right-of-way that meets sample criteria defined below. The target sample location will be the closest exposed soil, within a City-owned property, to the approximate centroid of each cell. The centroid of each grid was determined by using GIS and presented in Figure 3. The sampling team, in consultation with EPA Region 9, will review each of the target sampling areas prior to field activities to determine their appropriateness. The following criteria will be used to assist in identifying appropriate target sampling locations:

- Representative of the larger urban setting;
- Appears to be undisturbed;
- Public areas, such as along right-of-ways (i.e. on the outer edges of roadways and not the median), within city property, etc.

The following areas will not be sampled:

- Private/residential yards;
- Public parks;
- Areas that have been recently filled with dirt/soil;
- Areas of relatively recent development/redevelopment;
- Low-lying areas where solids from surface runoff could accumulate that may be routinely subjected to flooding or inundation, such as wetlands;
- Paved or built upon areas;
- Discharge points and overflow points for the city's storm water infrastructure.

If the original sampling point is affected by any of these exclusions, the field team will return to the grid centroid and find the next closest location that meets the sampling criteria.

4.1.1 Soil Matrix Sampling

Soil matrix samples will be collected at each of the 203 proposed locations unless one or more of the grid squares does not have an accessible right-of-way that meets the sampling criteria defined in Section 4.1. At each target sampling location, three-point composite soil samples will be collected from two depths; the upper 2 inches of the soil, and at 6 inches depth in the undisturbed soil horizon using a coring device. All soil samples will be analyzed for metals. The sampling grid is presented in Figure 3.

4.2 Analytes of Concern

The specific AOCs for the study area are:

- Metals, including antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, molybdenum, nickel, selenium, silver, thallium, tin, vanadium, and zinc.

5.0 REQUEST FOR ANALYSES

Laboratory services for soil matrix samples will be scheduled and arranged for by the EPA Region 9 RSCC for metals analyses. Samples will be analyzed through EPA's Region 9 Laboratory. Sample containers, preservatives, holding times, and estimated number of field and Quality Control (QC) samples are summarized in Table 3 and Table 4.

As enumerated in Table 3, soil matrix field samples will be collected from two depths (approximately 0-2 inches and 6 inches bgs) at 203 separate locations. In addition, 41 duplicate samples will be collected resulting in a total of 447 soil matrix samples. Additional sample volumes will be collected at a minimum of 21 locations for use as laboratory QC samples. Each soil matrix sample will be analyzed for metals via EPA CLPAS 6010C (using ICP-AES).

Prior to conducting the analyses, the laboratory will homogenize, dry, and sieve each of the soil samples. The samples will be sieved through a No. 100 W.S. Tyler® sieve to collect the 'fine' (<150 micrometers [µm]) fractions for ICP-AES analysis. The remaining bulk soil sample, and both of the remaining sieved fraction samples will be held at the laboratory for up to 180 days to allow for additional analysis. The laboratory will contact the EPA SAM prior to disposing of samples. EPA's Recommendations for Sieving Soil and Dust Samples at Lead Sites for Assessment of Incidental Ingestion is provided in Appendix G.

As enumerated in Table 4, field blank and equipment blanks samples will be collected for QC purposes. Each field blank and equipment blank sample will be analyzed for metals via EPA Method 6010C (using ICP-AES) or equivalent.

To provide analytical quality control for the analytical program, the following measures will be utilized:

- All metals sample analysis will be conducted by the Region 9 laboratory.
- An additional sample volume will be collected for at least one sample per media per each analytical method, to be utilized for MS/MSD analysis.
- A CLP-type data package will be required from the laboratory for all resultant data.
- Holding times will be strictly observed for each analyte type and medium; holding times for each analysis are presented in Table 3 and Table 4.

6.0 METHODS AND PROCEDURES

6.1 Field Equipment

6.1.1 Sampling Equipment

The following equipment will be used to obtain environmental samples:

Equipment	Matrix	Fabrication	Dedicated
Trowel	Soil	Plastic	Yes
Soil Profile Sampler	Soil	Steel	No
Gloves	All Matrices	Nitrile	Yes
Ziploc [®] -style bags	All Matrices	Plastic	Yes

The Collector Application will be utilized for field data collection. Collector allows for data to be captured on a mobile device or an external GPS, and then synced to ArcGIS Online where decision makers can view the data in near real-time. Collector will be used to capture photographs and sample locations. In addition, Collector will be used to identify specific field observations at each sampling location (See Section 6.2). The Standard Operating Procedure for Collector is provided in Appendix F.

6.1.2 Inspection/Acceptance Requirements for Supplies and Consumables

There are no project-specific inspection/acceptance criteria for supplies and consumables. It is standard operating procedure that: personnel will not use broken or defective materials, items will not be used past their expiration date, supplies and consumables will be checked against order and packing slips to verify the correct items were received, and the supplier will be notified of any missing or damaged items.

6.2 Sampling Procedures

At each target sampling location, localized 3-point composite surface soil samples will be collected from two depths: the upper two inches of the soil (0- to 2-inches interval starting below the root zone [if present] and after removal of organic layer [leaves, grass, etc.]), and at a depth of 6 inches in the undisturbed soil horizon using a coring device. For sampling areas supporting plant growth, the initial sample core will be collected to a depth of 4-inches to allow for removal of turf plug and root zone. If coring device refusal occurs before achieving a 4-inch depth, then the sampler should relocate the sample location, within a 2-foot diameter zone around the initial sample core, until the required penetration depth can be achieved. However, as indicated in the permit issued by the City of Oakland, no excursion into soil below six inches bgs will take place. In addition, samples

collected from tree wells should be angled underneath the sidewalk to avoid potting soil. The permit is provided in Appendix H. An example of a localized composite sample is presented in Figure 4.

At each sample location, the three aliquots designated for the 3-point composite sample will be flagged. The three aliquots will not exceed a distance of three feet from each other. The Collector App will capture the GPS measurement of the first aliquot designated for the 3-point composite sample in order to represent the location of the composite sample. In addition, a photograph will be taken using the Collector App showing the three flags that represent the locations of the three aliquots of the composite sample (See Section 8.1.2).

Soil matrix samples will be collected from each of the 203 grids presented in Figure 3. The exact sample location within each grid will be determined in the field. Sample locations will be determined based on the sampling criteria described in Section 4.1. Soil samples will be collected using a steel soil profile sampler, which will be dedicated or appropriately decontaminated between each boring. For each sample, three composite samples will be collected from a localized area and placed into a quart-sized Ziploc®-style bag. The divots created from the soil sampling will be replaced with the surrounding native soil or, if necessary, clean potting soil. Since there is potential for each sample to undergo multiple analyses at the laboratory, at least 8 ounces of soil should be collected per sample. Sample containers will be closed as soon as they are filled, immediately chilled to 4°C, and processed for shipment to the laboratory.

The Collector Application will also be utilized for field data collection. During the sampling event, field personnel will note in Collector if a sample location is within 200 feet of the following:

- Schools;
- Playgrounds;
- Home or commercial daycare centers;
- Residential yards with evidence of children residing in home (i.e., toys, bikes);
- Soil staining;
- Structure with chipping or peeling paint;
- Tent or other temporary residential structure.

Subsequent to the sampling event, additional information regarding the surroundings of each sample location will be entered into Collector, including whether the sample location is within 200 feet of:

- Freeways;
- The former Cypress Mandela freeway;
- EPA removal sites;
- EPA remedial sites;
- DTSC/RWQCB sites.

6.3 Decontamination Procedures

The decontamination procedures that will be followed are in accordance with approved procedures. Decontamination of sampling equipment must be conducted consistently to assure the quality of samples collected. All non-dedicated equipment that comes into contact with potentially

contaminated soil or water will be decontaminated. Disposable equipment intended for one-time use will not be decontaminated, but will be packaged for appropriate disposal. Decontamination will occur prior to and after each use of a piece of non-dedicated equipment. All non-dedicated sampling devices will be steam-cleaned or decontaminated according to EPA Region 9 recommended procedures.

The following, to be carried out in sequence, is an EPA Region 9 recommended procedure for the decontamination of sampling equipment:

- Non-phosphate detergent and tap-water wash, using a brush if necessary
- Tap-water rinse
- Deionized/distilled water rinse (twice)

Equipment will be decontaminated in a pre-designated area on pallets or plastic sheeting, and clean bulky equipment will be stored on plastic sheeting in uncontaminated areas. Cleaned small equipment will be stored in plastic bags. Materials to be stored more than a few hours will also be covered.

7.0 DISPOSAL OF INVESTIGATION - DERIVED WASTE

In the process of collecting environmental samples within the study area, several different types of potentially contaminated investigation-derived wastes (IDW) will be generated, including the following:

- Used personal protective equipment (PPE)
- Disposable sampling equipment
- Decontamination fluids

The EPA's National Contingency Plan requires that management of IDW generated during site investigations comply with all relevant or appropriate requirements to the extent practicable. This sampling plan will follow the *Office of Emergency and Remedial Response (OERR) Directive 9345.3-02 (May 1991)* which provides the guidance for management of IDW during site investigations. Listed below are the procedures that will be followed for handling IDW. The procedures are flexible enough to allow the site investigation team to use its professional judgment on the proper method for the disposal of each type of IDW generated at each sampling location.

- Used PPE and disposable sampling equipment will be double-bagged in plastic refuse bags and disposed outside of the study area within a municipal dumpster at WESTON's office. These wastes are not considered hazardous and can be sent to a municipal landfill. Any PPE or dedicated equipment that is to be disposed of that can still be reused will be rendered inoperable before disposal.
- Decontamination fluids that will be generated in the sampling event will consist of deionized water, residual contaminants, and water with non-phosphate detergent. Decontamination fluids will be drummed and staged at the AMCO NPL site pending laboratory analysis for metals. Subsequent to the analysis, the fluids will be disposed in an appropriate manner.

8.0 SAMPLE IDENTIFICATION, DOCUMENTATION AND SHIPMENT

8.1 Field Notes

8.1.1 Field Logbooks

Field logbooks will be utilized in conjunction with Collector to note field observations. Field logbooks will document where, when, how, and from whom any vital project information was obtained. Logbook entries will be completed and accurate enough to permit reconstruction of field activities. The logbook is bound with consecutively numbered pages. Each page will be dated and the time of entry noted in military time. All entries will be legible, written in ink, and signed by the individual making the entries. Language will be factual, objective, and free of personal opinions. At a minimum, the following information will be recorded, if applicable, during the collection of each sample.

- Sampler's name(s)
- Date and time of sample collection
- Type of sample (e.g., soil)
- Type of sampling equipment used
- Field instrument readings and calibration readings for any equipment used, and equipment model(s) and serial number(s)
- Field observations and details related to analysis or integrity of samples (e.g., weather conditions, noticeable odors, colors, etc.)
- Sample preservation
- Lot numbers of the sample containers, sample identification numbers and any explanatory codes, and chain-of-custody form numbers
- Shipping arrangements (overnight air bill number)
- Name(s) of recipient laboratory(ies)
- The reason why a sample location needs to be relocated due to meeting exclusion criteria

In addition to sampling information, the following specifics may also be recorded in the field logbook for each day of sampling:

- Team members and their responsibilities
- Time of arrival on site and time of site departure
- Other personnel on site
- Summary of any meetings or discussions with any potentially responsible parties, or representatives of any federal, state, or other regulatory agency
- Deviations from sampling plans or site safety plan procedures
- Changes in personnel and responsibilities, as well as reasons for the change
- Levels of safety protection
- Record of photographs

8.1.2 Photographs

Photographs will be taken at all sampling locations and at other areas of interest using Collector. They will verify information entered in the field logbook. Photographs will not be taken of identifiable individuals, residences, and/or license plates. When a photograph is taken, the following information will be written on the logbook or will be recorded in the field photography log:

- Sample location
- Date
- Description of the subject photographed

At each sample location the following photographs will be collected and inputted into Collector:

- Panoramic view from sample location
- Surface view showing the 3 flags representing aliquot locations
- Ground surface at sample location
- Soil profile
- Sample location landmark

8.2 Sample Nomenclature

A unique, identifiable name will be assigned to each sample. The prefix “OUM” will be used to identify the Oakland Urban Metals study area followed by the designated cell number (3-digit). The qualifiers “SM” (soil matrix) will be used to identify the sample medium; followed by either “02” or “06” to represent the sample depths of 0-2 inches or 6 inches bgs, respectively. Finally, a six-digit number corresponding to the year (2-digit), month (2-digit), and day (2-digit) will be appended to finish the sample ID. For example, Sample ID ‘OUM023-SM03-180420’ will apply to a soil sample collected at the depth of between 0 to 6 inches from the 23rd cell of the grid, and collected on April 20, 2018. Duplicate samples will be assigned fictitious names. For equipment blanks and field blanks, the qualifiers “EB” and “FB” will be used respectively in place of the location/depth identification. The EPA RSCC may assign additional sample numbers. See Figure 3, Table 3, and Table 4 for specific nomenclature and location assignments.

8.3 Container, Preservation, and Holding Time Requirements

All sample containers used will have been delivered to WESTON in a pre-cleaned condition. Container, preservation, and holding time requirements are summarized in in Table 3 and Table 4.

8.4 Sample Labeling, Packaging and Shipping

All samples collected will be labeled in a clear and precise way for proper identification in the field and for tracking in the laboratory. Soil matrix sample labels will be created using the SCRIBE data management system. Soil matrix sample labels will be affixed to the sample containers and secured with clear tape. Samples will have preassigned, identifiable and unique numbers in

accordance with Section 8.2. The sample labels will contain the following information where appropriate:

- Sample number
- Sample location
- Date and time of collection
- Site name
- Analytical parameter and method of preservation
- CLP Case Number (if applicable)

Sample coolers will be retained in the custody of site personnel at all times or secured so as to deny access to anyone else. The procedures for shipping samples are as follows:

- The bottom of the cooler will be lined with bubble wrap to prevent breakage during shipment.
- Screw caps will be checked for tightness.
- Containers will have custody seals affixed so as to prevent opening of the container without breaking the seal.
- All containers will be sealed in Ziploc®-style bags.

All samples will be placed in coolers with the appropriate chain-of-custody forms. The SCRIBE data management system will be used to create all chain-of-custody forms. All forms will be enclosed in plastic bags and affixed to the underside of the cooler lid. Empty space in the cooler will be filled with bubble wrap or styrofoam peanuts to prevent movement and breakage during shipment. Each ice chest will be securely taped shut with strapping tape, and custody seals will be affixed to the front, right, and back of each cooler.

Samples will be delivered directly to the Region 9 laboratory. The EPA Region 9 Regional Sample Control Coordinator ((510) 412-2389) will be notified daily of the sample shipment schedule and will be provided with the following information:

- Sampling contractor's name
- The name of the site
- Case number
- Shipment date and expected delivery date
- Total number of samples by matrix, and relative level of contamination (i.e., low, medium, or high)
- Carrier, air bill number(s), and method of shipment (e.g., priority) (if applicable)
- Irregularities or anticipated problems associated with the samples
- Whether additional samples will be sent, if this is the last shipment

8.5 Chain of Custody Forms and QA/QC Summary Forms

A chain of custody form will be maintained for all samples to be submitted for analysis, from the time the sample is collected until its final deposition. All chain of custody forms for the samples will be maintained by WESTON.

Every transfer of custody must be noted and signed for; a copy of this record is kept by each individual who has signed. Corrections on sample paperwork will be made by drawing a single line through the mistake and initialing and dating the change. The correct information will be entered above, below, or after the mistake. When samples are not under the direct control of the individual responsible for them, they must be stored in a locked container sealed with a custody seal. The chain of custody must include the following:

- Sample identification numbers
- Site name
- Sample date
- Number and volume of sample containers
- Required analyses
- Signature and name of samplers
- Signature(s) of any individual(s) with control over samples
- Airbill number (if applicable)
- Note(s) indicating special holding times and/or detection limits

Traffic reports will be used to document sample collection and shipment to the laboratory for analysis. The SCRIBE data management system will be used to generate all traffic reports and chains of custody. One copy will be completed and sent with the samples for each laboratory and each shipment. If multiple coolers are sent to a single laboratory on a single day, only one form will be completed. If all sample information cannot be entered in one form, then multiple forms will be used. One copy of the form will be sent to the EPA RSCC, another copy will be sent to Contract Laboratory Analytical Services Support (if applicable), and one copy will accompany the samples to the laboratory. A photocopy of the original will be made for WESTON's master file. The document titled "*Contract Laboratory Program Guidance for Field Samplers*," EPA Superfund document 540-R-07-06, will be taken to the field as a reference. This document is included in Appendix F.

A QA/QC summary form will be completed for each laboratory and each matrix of the sampling event. The sample number for all blanks, reference samples, laboratory QC samples (MS/MSDs) and duplicates will be documented on this form. This form is not sent to the laboratory. The original form will be sent to the EPA; a photocopy of the original will be made for WESTON's master file.

9.0 QUALITY ASSURANCE AND CONTROL (QA/QC)

9.1 Field Quality Control Samples

The QA/QC samples described in the following subsections, which are also listed in Table 3 and Table 4, will be collected during this investigation.

9.1.1 Assessment of Field Contamination (Blanks)

9.1.1.1 Equipment Blanks

Equipment rinsate blanks will be collected to evaluate field sampling and decontamination procedures by pouring either store-bought distilled water or laboratory-certified ‘clean’ water over the decontaminated sampling equipment. One equipment rinsate blank will be collected per day for each piece of sampling equipment that is decontaminated in the field. Equipment rinsate blanks will be obtained by passing water through or over the decontaminated sampling devices used that day. Equipment blanks will be analyzed for metals (see Table 4).

Once the equipment blank is collected the container will be immediately capped, sealed, chilled on ice, and processed for shipment to the assigned laboratory. A separate sample number will be assigned to each sample as described in Section 8.2.

If any compound is detected in field blanks or equipment blanks, then sample data will be considered acceptable without qualification only if the results are above five times the amount detected in the blank(s) for each respective analyte. If the analyte detected in the blank is a common laboratory contaminate, then the sample results for those analytes would be qualified unless the results are above ten times the amount detected in the blank(s). Sample results that are below five times (ten times for common laboratory contaminants) the amount detected in the blanks, additional evaluation will be required during data validation.

9.1.1.2 Field Blanks

A field blank will be collected from each container of distilled water used to collect the equipment rinsate blanks described in Section 9.1.1.1. In the event that only laboratory-certified ‘clean’ water is used in the collection of equipment blanks, no field blanks will be collected. The field blank sample will consist of filling the appropriate sample container directly from the store-bought distilled water container. Once the field blank is collected the container will be immediately capped, sealed, chilled on ice, and processed for shipment to the assigned laboratory. A separate sample number will be assigned to each sample as described in Section 8.2. Field blanks will be analyzed for metals. If any compound is detected in the field blanks, this information will be considered when evaluating equipment blank samples as described in Section 9.1.1.1.

9.1.1.3 Temperature Blanks

For each cooler that is shipped or transported to an analytical laboratory, a 40-mL vial of store-bought distilled water will be included that is marked “temperature blank.” This blank will be used by the sample custodian to check the temperature of samples upon receipt.

9.1.2 Assessment of Sample Variability (Field Duplicate or Co-located Samples)

Duplicate soil matrix samples will be collected at the sample locations indicated in Table 3. At a minimum, one sample per 10 samples, per matrix, will be designated as a duplicate sample. The acceptance criteria for duplicate samples are presented in Section 3.5.3.

When collecting duplicate soil matrix samples to be analyzed for metals, the samples will be homogenized in a sample-dedicated Ziploc®-style bag. Homogenized materials will then be transferred to the appropriate sample container. These equivalent (co-located) samples will be collected from the sampling tool, alternating with collection of the original samples.

Duplicate samples will be preserved, packaged, and sealed in the same manner described for the soil samples in Section 6.2. A separate sample number will be assigned to each duplicate as described in Section 8.2 and presented in Table 3. All duplicate samples will be submitted blind to the laboratory.

9.2 Laboratory Quality Control (QC) Samples

A laboratory QC sample is not an extra sample; rather, it is a sample that requires additional QC analyses.

For soil matrix samples, double volumes of sample will be provided to the laboratory for its use for QC purposes. When collecting double-volume QC soil matrix samples to be analyzed for metals, the samples will be homogenized in a sample-dedicated Ziploc®-style bag. Homogenized materials will then be transferred to the appropriate sample container. These equivalent (co-located) samples will be collected from the sampling tool, alternating with collection of the original samples.

For this sampling event, the samples collected at the locations indicated in Table 3 will be the designated laboratory QC samples. The sample labels and chain-of-custody records for these samples will identify them as a laboratory QC samples. At a minimum, one sample per 20 samples, per matrix, will be designated as a laboratory QC sample.

9.3 Analytical and Data Package Requirements

It is required that all samples be analyzed in accordance with the methods listed in Table 3 and Table 4. The laboratory is required to supply documentation to demonstrate that their data meet the requirements specified in the contract.

The data validation package shall include all original documentation generated in support of this project. In addition, the laboratory will provide original documentation to support that all requirements of the methods have been met. This includes, but is not limited to, sample tags, custody records, shipping information, sample preparation/extraction records, and instrument printouts such as mass spectra. Copies of information and documentation required in this document are acceptable. CLP methods will follow the contract required data package requirement.

9.4 Data Validation

Validation of analytical data generated by EPA's Region 9 laboratory, or possibly the CLP and contract laboratories, for this investigation will be contracted by the EPA in accordance with the *EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (EPA 540-R-04\001, 10/04)*. Tier 3 validation for 10 percent of the data will be required.

To meet requirements for categorization as definitive data, the following criteria will be evaluated:

- Holding times
- Sampling design approach
- Blank contamination
- Initial and continuing calibration
- Detection limits
- Analyte identification and quantitation
- Matrix spike recoveries
- Performance evaluation samples when specified
- Analytical and total error determination
- Laboratory Control Samples.

Upon completion of validation, data will be classified as one of the following: acceptable for use without qualifications, acceptable for use with qualifications, or unacceptable for use.

9.5 Field Variances

As conditions in the field may vary, it may become necessary to implement minor modifications to this plan. When appropriate, the EPA will be notified of the modifications and a verbal approval obtained before implementing the modifications. Modifications to the original plan will be documented in the final report.

9.6 Assessment of Project Activities

9.6.1 WESTON Assessment Activities

The following assessment activities will be performed by WESTON:

- All project deliverables (SAP, Data Summaries, Data Validation Reports, Investigation Reports) will be peer-reviewed prior to release to the EPA. In time-critical situations, the peer review may be concurrent with the release of a draft document. Errors discovered in the peer review process will be reported by the reviewer to the originator of the document, who will be responsible for corrective action.
- The WESTON QA Officer will review project documentation (logbooks, chain of custody forms, etc.) to ensure the SAP was followed and that sampling activities were adequately documented. The WESTON QA Officer will document deficiencies and the WESTON

Project Manager will be responsible for corrective actions. The WESTON QA Officer is also responsible for review and assessment of the data for data quality issues for the project.

- The WESTON Project Manager is responsible for the review of data, and ensuring that sampling design approach and total error determination meet the DQOs for this project.

9.6.2 Project Status Reports to Management

It is standard procedure for the WESTON PM to report to the EPA SAM any issues, as they occur, that arise during the course of the project that could affect data quality, data use objectives, the project objectives, or project schedules.

9.6.3 Reconciliation of Data with DQOs

Assessment of data quality is an ongoing activity throughout all phases of a project. The following outlines the methods to be used by WESTON for evaluating the results obtained from the project.

- Review of the DQO outputs and the sampling design will be conducted by the WESTON QA Officer and EPA prior to sampling activities. The reviewer will submit comments to the WESTON PM for action, comment, or clarification. This process will be iterative.
- A preliminary data review will be conducted by WESTON. The purpose of this review is to look for problems or anomalies in the implementation of the sample collection and analysis procedures and to examine QC data for information to verify assumptions underlying the DQOs and the SAP. Anomalies may include changes in the MDLs as a result of dilution, sampling, and/or matrix factors across the sample suite; such anomalies will be reported in writing to the SAM when they are confirmed.

10.0 REFERENCES

- Envirostor, 2018 Department of Toxic Substances Control, Envirostor Database, Search Results, Oakland, California
<http://www.envirostor.dtsc.ca.gov/public/search.asp>; data extracted January 16, 2018.
- EPA, 2018a U.S. Environmental Protection Agency, West Oakland Residential Lead, https://response.epa.gov/site/site_profile.aspx?site_id=5604, data extracted March 15, 2018.
- EPA, 2018b U.S. Environmental Protection Agency, AMCO NPL Site, https://response.epa.gov/site/site_profile.aspx?site_id=5215, data extracted March 15, 2018.
- Google, 2018 Google Earth; West Oakland, California, imagery date: 9/1/2017; <http://earth.google.com>; data extracted January 29, 2018.

Figures



0 Scale in Miles 0.5

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PREPARED FOR:
EPA Region 9
Site Assessment
Program



FIGURE 1
STUDY AREA LOCATION
Urban Metals Study: West Oakland
Oakland, Alameda County, California



Legend

Study Area



WESTON
SOLUTIONS

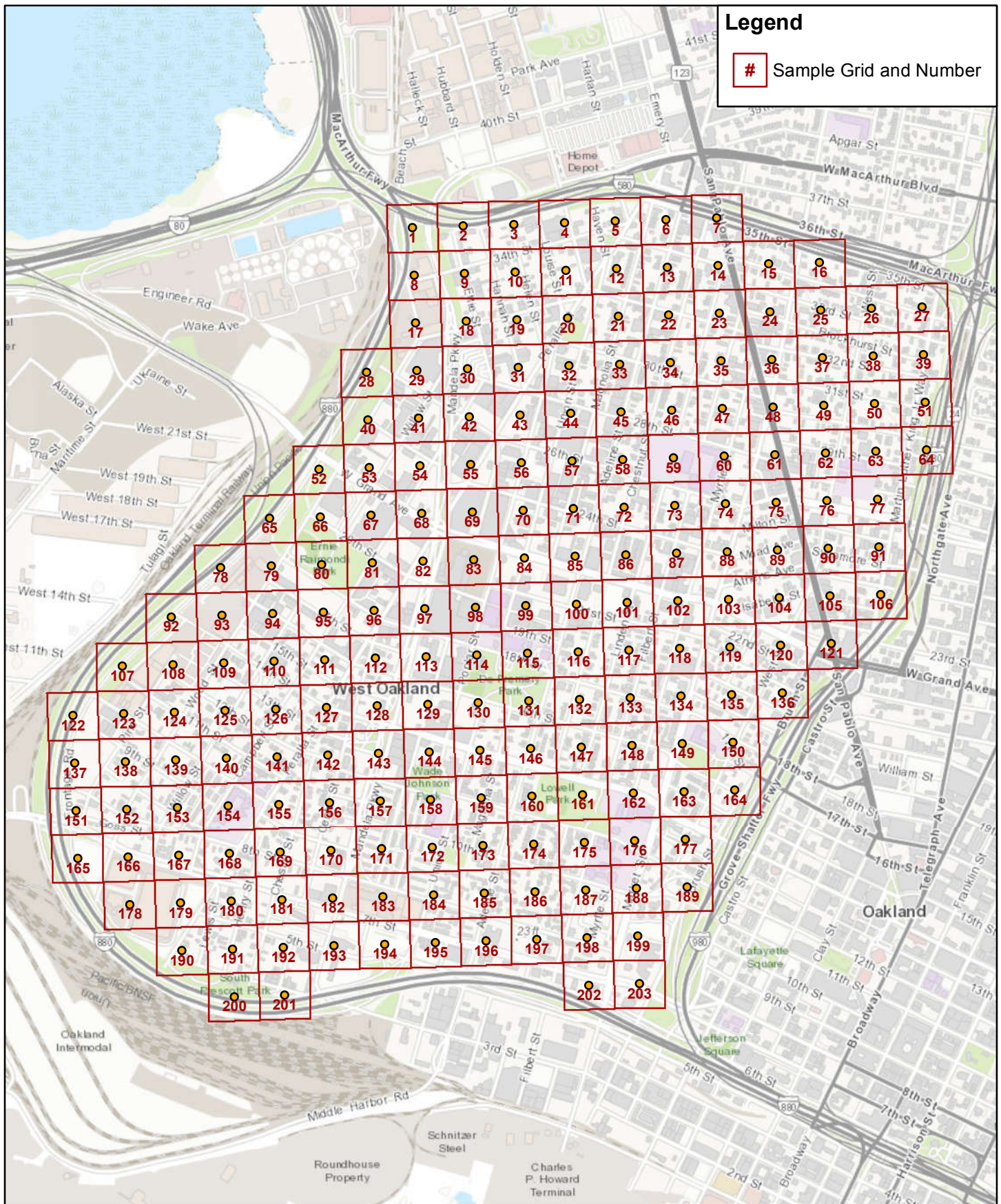
0 Scale in Feet 2,000

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FIGURE 2
STUDY AREA BOUNDARY
Urban Metals Study: West Oakland
Oakland, Alameda County, California





Legend

- # Sample Grid and Number
- Composite Soil Sample Aliquot



0 Scale in Feet 100

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FIGURE 4
COMPOSITE SOIL SAMPLE ALIQUOTS
Urban Metals Study: West Oakland
Oakland, Alameda County, California

Tables

Table 1: Organizational Chart

Title/Responsibility	Name	Phone Number
<i>Primary Point of Contact</i>		
EPA Site Assessment Manager	Sharon Bowen	(415) 947-4250
<i>Other Contacts</i>		
EPA Quality Assurance Manager	Eugenia E. McNaughton	(415) 972-3411
WESTON Program Manager and Quality Assurance	Christina Marquis	(562) 243-1776
WESTON Project Manager	Amanda Reilly	(541) 508-8550
WESTON Field Manager	Tom Fortner	(925) 948-2624
EPA Chemistry Team Leader	Richard Bauer	(510) 412-2312
EPA Region 9 Sample Control Coordinator	Susan Sturges	(510) 412-2389
EPA Quality Assurance Officer	Joe Eidleberg	(415) 972-3809
DTSC Project Manager	Dan Murphy	(510) 540-3772
DTSC GIS Coordinator	Rick Fears	(916) 255-3610
EPA Education/Outreach Coordinator	Eric Canteenwala	(415) 972-3932
EPA Community Involvement Coordinator	Jackie Lane	(415) 972-3236
EPA Public Affairs Specialist	Michele Huitric	(415) 972-3165
State Public Engagement Specialist	Thelmy Perez	(323) 807-2356
State Public Engagement Specialist	Johanna Arias-Bhatia	(323) 204-8090
DTSC LABRIC Program Lead	Tamara Zielinski	(916) 255-6437
DTSC LABRIC Program	Steve Ross	(916) 255-6648

Table 2: Data Quality Indicator Goals - Inorganic Analysis

Analyte:	Method Detection Limits	Action Levels			
		Soil			
	Soil	RSLr	RSLi	CASLr	CASLi
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Metals by 6010C:					
Antimony	1.0	31	470	NA	NA
Arsenic	1.0	0.68	3	0.4	4.2
Barium	2.5	15,000	220,000	NA	NA
Beryllium	0.05	160	2,300	15	210
Cadmium	0.25	71	980	5.2	7.3
Chromium	0.5	0.3	6.3	NA	NA
Cobalt	1.0	23	350	NA	NA
Copper	2.0	3,100	47,000	NA	NA
Lead	1.5	400	800	80	320
Manganese	2.5	1,800	26,000	1,800	6,900
Molybdenum	2.5	390	5,800	NA	NA
Nickel (Soluble Salts)	2.5	1,500	22,000	490	3,100
Selenium	1.0	390	5,800	NA	NA
Silver	0.5	390	5,800	390	1,500
Thallium	2.5	0.78	12	NA	NA
Tin	2.5	47,000	700,000	NA	NA
Vanadium	1.0	390	5,800	390	1,000
Zinc	4.0	23,000	350,000	NA	NA
<p><u>Notes:</u></p> <p>Method Detection Limits are based on the standard Contract Laboratory Program Contract-Required Detection Limit or EPA Method, statement of work.</p> <p>Percent Complete for the project must be $\geq 90\%$.</p> <p>Precision (RPD for MS/MSD and duplicates) should be $\leq 35\%$ for water samples, and $\leq 50\%$ for soil samples.</p> <p>Accuracy for each analyte (Percent Recovery for MS/MSD) should fall between 75 and 125 % for water samples, and 65% and 135% for soil samples.</p> <p>Chromium action levels are for Chromium (VI).</p> <p>mg/kg = milligrams per kilogram</p> <p>RSLr = Regional Screening Level for Residential Soils, THQ=1.0</p> <p>RSLi = Regional Screening Level for Industrial Soils, THQ=1.0</p> <p>CASLr = California Screening Level for Residential Soils, Noncancer Endpoint</p> <p>CASLi = California Screening Level for Commercial/Industrial Soils, Noncancer Endpoint</p> <p>NA = Not Applicable</p>					

Table 3: Request for Analytical Services, Matrix - Soil				
ANALYSES REQUESTED			Inorganic	
ANALYTICAL METHOD			EPA Method 6010C (ICP-AES)	
ANALYTE(S)			Metals	
PRESERVATIVES			Chill to 4±2°C	
ANALYTICAL HOLDING TIME(S)			180 days	
CONTRACT HOLDING TIME(S)			Analyze within 35 days	
CONTAINER VOLUME			1 quart	
SAMPLE CONTAINER			Ziploc-style bag	
NUMBER OF CONTAINERS			1	
SAMPLE VOLUME			At least 8 ounces	
Sample Number	Grid Number	Estimated Sample Depth (inches)	Special Designation	Metals (Sample Volumes)
OUM001-SM02-[insertdate]	1	0-2	Lab QC	2
OUM001-SM06-[insertdate]	1	6		1
OUM002-SM02-[insertdate]	2	0-2		1
OUM002-SM06-[insertdate]	2	6		1
OUM003-SM02-[insertdate]	3	0-2		1
OUM003-SM06-[insertdate]	3	6		1
OUM004-SM02-[insertdate]	4	0-2		1
OUM004-SM06-[insertdate]	4	6		1
OUM005-SM02-[insertdate]	5	0-2		1
OUM005-SM06-[insertdate]	5	6		1
OUM006-SM02-[insertdate]	6	0-2		1
OUM006-SM06-[insertdate]	6	6		1
OUM007-SM02-[insertdate]	7	0-2		1
OUM007-SM06-[insertdate]	7	6		1
OUM008-SM02-[insertdate]	8	0-2		1
OUM008-SM06-[insertdate]	8	6		1
OUM009-SM02-[insertdate]	9	0-2		1
OUM009-SM06-[insertdate]	9	6		1
OUM010-SM02-[insertdate]	10	0-2	Lab QC	2
OUM010-SM06-[insertdate]	10	6		1
OUM011-SM02-[insertdate]	11	0-2		1
OUM011-SM06-[insertdate]	11	6		1
OUM012-SM02-[insertdate]	12	0-2		1
OUM012-SM06-[insertdate]	12	6		1
OUM013-SM02-[insertdate]	13	0-2		1
OUM013-SM06-[insertdate]	13	6		1
OUM014-SM02-[insertdate]	14	0-2		1
OUM014-SM06-[insertdate]	14	6		1
OUM015-SM02-[insertdate]	15	0-2		1
OUM015-SM06-[insertdate]	15	6		1
OUM016-SM02-[insertdate]	16	0-2		1
OUM016-SM06-[insertdate]	16	6		1

Table 3: Request for Analytical Services, Matrix - Soil (continued)				
ANALYSES REQUESTED			Inorganic	
ANALYTICAL METHOD			EPA Method 6010C (ICP-AES)	
ANALYTE(S)			Metals	
PRESERVATIVES			Chill to 4±2°C	
ANALYTICAL HOLDING TIME(S)			180 days	
CONTRACT HOLDING TIME(S)			Analyze within 35 days	
CONTAINER VOLUME			1 quart	
SAMPLE CONTAINER			Ziploc-style bag	
NUMBER OF CONTAINERS			1	
SAMPLE VOLUME			At least 8 ounces	
Sample Number	Grid Number	Estimated Sample Depth (inches)	Special Designation	Metals (Sample Volumes)
OUM017-SM02-[insertdate]	17	0-2		1
OUM017-SM06-[insertdate]	17	6		1
OUM018-SM02-[insertdate]	18	0-2		1
OUM018-SM06-[insertdate]	18	6		1
OUM019-SM02-[insertdate]	19	0-2		1
OUM019-SM06-[insertdate]	19	6		1
OUM020-SM02-[insertdate]	20	0-2	Lab QC	2
OUM020-SM06-[insertdate]	20	6		1
OUM021-SM02-[insertdate]	21	0-2		1
OUM021-SM06-[insertdate]	21	6		1
OUM022-SM02-[insertdate]	22	0-2		1
OUM022-SM06-[insertdate]	22	6		1
OUM023-SM02-[insertdate]	23	0-2		1
OUM023-SM06-[insertdate]	23	6		1
OUM024-SM02-[insertdate]	24	0-2		1
OUM024-SM06-[insertdate]	24	6		1
OUM025-SM02-[insertdate]	25	0-2		1
OUM025-SM06-[insertdate]	25	6		1
OUM026-SM02-[insertdate]	26	0-2		1
OUM026-SM06-[insertdate]	26	6		1
OUM027-SM02-[insertdate]	27	0-2		1
OUM027-SM06-[insertdate]	27	6		1
OUM028-SM02-[insertdate]	28	0-2		1
OUM028-SM06-[insertdate]	28	6		1
OUM029-SM02-[insertdate]	29	0-2		1
OUM029-SM06-[insertdate]	29	6		1
OUM030-SM02-[insertdate]	30	0-2	Lab QC	2
OUM030-SM06-[insertdate]	30	6		1
OUM031-SM02-[insertdate]	31	0-2		1
OUM031-SM06-[insertdate]	31	6		1
OUM032-SM02-[insertdate]	32	0-2		1
OUM032-SM06-[insertdate]	32	6		1

Table 3: Request for Analytical Services, Matrix - Soil (continued)				
ANALYSES REQUESTED			Inorganic	
ANALYTICAL METHOD			EPA Method 6010C (ICP-AES)	
ANALYTE(S)			Metals	
PRESERVATIVES			Chill to 4±2°C	
ANALYTICAL HOLDING TIME(S)			180 days	
CONTRACT HOLDING TIME(S)			Analyze within 35 days	
CONTAINER VOLUME			1 quart	
SAMPLE CONTAINER			Ziploc-style bag	
NUMBER OF CONTAINERS			1	
SAMPLE VOLUME			At least 8 ounces	
Sample Number	Grid Number	Estimated Sample Depth (inches)	Special Designation	Metals (Sample Volumes)
OUM033-SM02-[insertdate]	33	0-2		1
OUM033-SM06-[insertdate]	33	6		1
OUM034-SM02-[insertdate]	34	0-2		1
OUM034-SM06-[insertdate]	34	6		1
OUM035-SM02-[insertdate]	35	0-2		1
OUM035-SM06-[insertdate]	35	6		1
OUM036-SM02-[insertdate]	36	0-2		1
OUM036-SM06-[insertdate]	36	6		1
OUM037-SM02-[insertdate]	37	0-2		1
OUM037-SM06-[insertdate]	37	6		1
OUM038-SM02-[insertdate]	38	0-2		1
OUM038-SM06-[insertdate]	38	6		1
OUM039-SM02-[insertdate]	39	0-2		1
OUM039-SM06-[insertdate]	39	6		1
OUM040-SM02-[insertdate]	40	0-2	Lab QC	2
OUM040-SM06-[insertdate]	40	6		1
OUM041-SM02-[insertdate]	41	0-2		1
OUM041-SM06-[insertdate]	41	6		1
OUM042-SM02-[insertdate]	42	0-2		1
OUM042-SM06-[insertdate]	42	6		1
OUM043-SM02-[insertdate]	43	0-2		1
OUM043-SM06-[insertdate]	43	6		1
OUM044-SM02-[insertdate]	44	0-2		1
OUM044-SM06-[insertdate]	44	6		1
OUM045-SM02-[insertdate]	45	0-2		1
OUM045-SM06-[insertdate]	45	6		1
OUM046-SM02-[insertdate]	46	0-2		1
OUM046-SM06-[insertdate]	46	6		1
OUM047-SM02-[insertdate]	47	0-2		1
OUM047-SM06-[insertdate]	47	6		1
OUM048-SM02-[insertdate]	48	0-2		1
OUM048-SM06-[insertdate]	48	6		1

Table 3: Request for Analytical Services, Matrix - Soil (continued)				
ANALYSES REQUESTED			Inorganic	
ANALYTICAL METHOD			EPA Method 6010C (ICP-AES)	
ANALYTE(S)			Metals	
PRESERVATIVES			Chill to 4±2°C	
ANALYTICAL HOLDING TIME(S)			180 days	
CONTRACT HOLDING TIME(S)			Analyze within 35 days	
CONTAINER VOLUME			1 quart	
SAMPLE CONTAINER			Ziploc-style bag	
NUMBER OF CONTAINERS			1	
SAMPLE VOLUME			At least 8 ounces	
Sample Number	Grid Number	Estimated Sample Depth (inches)	Special Designation	Metals (Sample Volumes)
OUM055-SM02-[insertdate]	55	0-2		1
OUM055-SM06-[insertdate]	55	6		1
OUM056-SM02-[insertdate]	56	0-2		1
OUM056-SM06-[insertdate]	56	6		1
OUM057-SM02-[insertdate]	57	0-2		1
OUM057-SM06-[insertdate]	57	6		1
OUM058-SM02-[insertdate]	58	0-2		1
OUM058-SM06-[insertdate]	58	6		1
OUM059-SM02-[insertdate]	59	0-2		1
OUM059-SM06-[insertdate]	59	6		1
OUM060-SM02-[insertdate]	60	0-2	Lab QC	2
OUM060-SM06-[insertdate]	60	6		1
OUM061-SM02-[insertdate]	61	0-2		1
OUM061-SM06-[insertdate]	61	6		1
OUM062-SM02-[insertdate]	62	0-2		1
OUM062-SM06-[insertdate]	62	6		1
OUM063-SM02-[insertdate]	63	0-2		1
OUM063-SM06-[insertdate]	63	6		1
OUM064-SM02-[insertdate]	64	0-2		1
OUM064-SM06-[insertdate]	64	6		1
OUM065-SM02-[insertdate]	65	0-2		1
OUM065-SM06-[insertdate]	65	6		1
OUM066-SM02-[insertdate]	66	0-2		1
OUM066-SM06-[insertdate]	66	6		1
OUM067-SM02-[insertdate]	67	0-2		1
OUM067-SM06-[insertdate]	67	6		1
OUM068-SM02-[insertdate]	68	0-2		1
OUM068-SM06-[insertdate]	68	6		1
OUM069-SM02-[insertdate]	69	0-2		1
OUM069-SM06-[insertdate]	69	6		1
OUM070-SM02-[insertdate]	70	0-2	Lab QC	2
OUM070-SM06-[insertdate]	70	6		1

Table 3: Request for Analytical Services, Matrix - Soil (continued)				
ANALYSES REQUESTED			Inorganic	
ANALYTICAL METHOD			EPA Method 6010C (ICP-AES)	
ANALYTE(S)			Metals	
PRESERVATIVES			Chill to 4±2°C	
ANALYTICAL HOLDING TIME(S)			180 days	
CONTRACT HOLDING TIME(S)			Analyze within 35 days	
CONTAINER VOLUME			1 quart	
SAMPLE CONTAINER			Ziploc-style bag	
NUMBER OF CONTAINERS			1	
SAMPLE VOLUME			At least 8 ounces	
Sample Number	Grid Number	Estimated Sample Depth (inches)	Special Designation	Metals (Sample Volumes)
OUM077-SM02-[insertdate]	77	0-2		1
OUM077-SM06-[insertdate]	77	6		1
OUM078-SM02-[insertdate]	78	0-2		1
OUM078-SM06-[insertdate]	78	6		1
OUM079-SM02-[insertdate]	79	0-2		1
OUM079-SM06-[insertdate]	79	6		1
OUM080-SM02-[insertdate]	80	0-2	Lab QC	2
OUM080-SM06-[insertdate]	80	6		1
OUM081-SM02-[insertdate]	81	0-2		1
OUM081-SM06-[insertdate]	81	6		1
OUM082-SM02-[insertdate]	82	0-2		1
OUM082-SM06-[insertdate]	82	6		1
OUM083-SM02-[insertdate]	83	0-2		1
OUM083-SM06-[insertdate]	83	6		1
OUM084-SM02-[insertdate]	84	0-2		1
OUM084-SM06-[insertdate]	84	6		1
OUM085-SM02-[insertdate]	85	0-2		1
OUM085-SM06-[insertdate]	85	6		1
OUM086-SM02-[insertdate]	86	0-2		1
OUM086-SM06-[insertdate]	86	6		1
OUM087-SM02-[insertdate]	87	0-2		1
OUM087-SM06-[insertdate]	87	6		1
OUM088-SM02-[insertdate]	88	0-2		1
OUM088-SM06-[insertdate]	88	6		1
OUM089-SM02-[insertdate]	89	0-2		1
OUM089-SM06-[insertdate]	89	6		1
OUM090-SM02-[insertdate]	90	0-2	Lab QC	2
OUM090-SM06-[insertdate]	90	6		1
OUM091-SM02-[insertdate]	91	0-2		1
OUM091-SM06-[insertdate]	91	6		1
OUM092-SM02-[insertdate]	92	0-2		1
OUM092-SM06-[insertdate]	92	6		1

Table 3: Request for Analytical Services, Matrix - Soil (continued)				
ANALYSES REQUESTED			Inorganic	
ANALYTICAL METHOD			EPA Method 6010C (ICP-AES)	
ANALYTE(S)			Metals	
PRESERVATIVES			Chill to 4±2°C	
ANALYTICAL HOLDING TIME(S)			180 days	
CONTRACT HOLDING TIME(S)			Analyze within 35 days	
CONTAINER VOLUME			1 quart	
SAMPLE CONTAINER			Ziploc-style bag	
NUMBER OF CONTAINERS			1	
SAMPLE VOLUME			At least 8 ounces	
Sample Number	Grid Number	Estimated Sample Depth (inches)	Special Designation	Metals (Sample Volumes)
OUM099-SM02-[insertdate]	99	0-2		1
OUM099-SM06-[insertdate]	99	6		1
OUM100-SM02-[insertdate]	100	0-2	Lab QC	2
OUM100-SM06-[insertdate]	100	6		1
OUM101-SM02-[insertdate]	101	0-2		1
OUM101-SM06-[insertdate]	101	6		1
OUM102-SM02-[insertdate]	102	0-2		1
OUM102-SM06-[insertdate]	102	6		1
OUM103-SM02-[insertdate]	103	0-2		1
OUM103-SM06-[insertdate]	103	6		1
OUM104-SM02-[insertdate]	104	0-2		1
OUM104-SM06-[insertdate]	104	6		1
OUM105-SM02-[insertdate]	105	0-2		1
OUM105-SM06-[insertdate]	105	6		1
OUM106-SM02-[insertdate]	106	0-2		1
OUM106-SM06-[insertdate]	106	6		1
OUM107-SM02-[insertdate]	107	0-2		1
OUM107-SM06-[insertdate]	107	6		1
OUM108-SM02-[insertdate]	108	0-2		1
OUM108-SM06-[insertdate]	108	6		1
OUM109-SM02-[insertdate]	109	0-2		1
OUM109-SM06-[insertdate]	109	6		1
OUM110-SM02-[insertdate]	110	0-2	Lab QC	2
OUM110-SM06-[insertdate]	110	6		1
OUM111-SM02-[insertdate]	111	0-2		1
OUM111-SM06-[insertdate]	111	6		1
OUM112-SM02-[insertdate]	112	0-2		1
OUM112-SM06-[insertdate]	112	6		1
OUM113-SM02-[insertdate]	113	0-2		1
OUM113-SM06-[insertdate]	113	6		1
OUM114-SM02-[insertdate]	114	0-2		1
OUM114-SM06-[insertdate]	114	6		1

Table 3: Request for Analytical Services, Matrix - Soil (continued)				
ANALYSES REQUESTED			Inorganic	
ANALYTICAL METHOD			EPA Method 6010C (ICP-AES)	
ANALYTE(S)			Metals	
PRESERVATIVES			Chill to 4±2°C	
ANALYTICAL HOLDING TIME(S)			180 days	
CONTRACT HOLDING TIME(S)			Analyze within 35 days	
CONTAINER VOLUME			1 quart	
SAMPLE CONTAINER			Ziploc-style bag	
NUMBER OF CONTAINERS			1	
SAMPLE VOLUME			At least 8 ounces	
Sample Number	Grid Number	Estimated Sample Depth (inches)	Special Designation	Metals (Sample Volumes)
OUM121-SM02-[insertdate]	121	0-2		1
OUM121-SM06-[insertdate]	121	6		1
OUM122-SM02-[insertdate]	122	0-2		1
OUM122-SM06-[insertdate]	122	6		1
OUM123-SM02-[insertdate]	123	0-2		1
OUM123-SM06-[insertdate]	123	6		1
OUM124-SM02-[insertdate]	124	0-2		1
OUM124-SM06-[insertdate]	124	6		1
OUM125-SM02-[insertdate]	125	0-2		1
OUM125-SM06-[insertdate]	125	6		1
OUM126-SM02-[insertdate]	126	0-2		1
OUM126-SM06-[insertdate]	126	6		1
OUM127-SM02-[insertdate]	127	0-2		1
OUM127-SM06-[insertdate]	127	6		1
OUM128-SM02-[insertdate]	128	0-2		1
OUM128-SM06-[insertdate]	128	6		1
OUM129-SM02-[insertdate]	129	0-2		1
OUM129-SM06-[insertdate]	129	6		1
OUM130-SM02-[insertdate]	130	0-2	Lab QC	2
OUM130-SM06-[insertdate]	130	6		1
OUM131-SM02-[insertdate]	131	0-2		1
OUM131-SM06-[insertdate]	131	6		1
OUM132-SM02-[insertdate]	132	0-2		1
OUM132-SM06-[insertdate]	132	6		1
OUM133-SM02-[insertdate]	133	0-2		1
OUM133-SM06-[insertdate]	133	6		1
OUM134-SM02-[insertdate]	134	0-2		1
OUM134-SM06-[insertdate]	134	6		1
OUM135-SM02-[insertdate]	135	0-2		1
OUM135-SM06-[insertdate]	135	6		1
OUM136-SM02-[insertdate]	136	0-2		1
OUM136-SM06-[insertdate]	136	6		1

Table 3: Request for Analytical Services, Matrix - Soil (continued)				
ANALYSES REQUESTED			Inorganic	
ANALYTICAL METHOD			EPA Method 6010C (ICP-AES)	
ANALYTE(S)			Metals	
PRESERVATIVES			Chill to 4±2°C	
ANALYTICAL HOLDING TIME(S)			180 days	
CONTRACT HOLDING TIME(S)			Analyze within 35 days	
CONTAINER VOLUME			1 quart	
SAMPLE CONTAINER			Ziploc-style bag	
NUMBER OF CONTAINERS			1	
SAMPLE VOLUME			At least 8 ounces	
Sample Number	Grid Number	Estimated Sample Depth (inches)	Special Designation	Metals (Sample Volumes)
OUM143-SM02-[insertdate]	143	0-2		1
OUM143-SM06-[insertdate]	143	6		1
OUM144-SM02-[insertdate]	144	0-2		1
OUM144-SM06-[insertdate]	144	6		1
OUM145-SM02-[insertdate]	145	0-2		1
OUM145-SM06-[insertdate]	145	6		1
OUM146-SM02-[insertdate]	146	0-2		1
OUM146-SM06-[insertdate]	146	6		1
OUM147-SM02-[insertdate]	147	0-2		1
OUM147-SM06-[insertdate]	147	6		1
OUM148-SM02-[insertdate]	148	0-2		1
OUM148-SM06-[insertdate]	148	6		1
OUM149-SM02-[insertdate]	149	0-2		1
OUM149-SM06-[insertdate]	149	6		1
OUM150-SM02-[insertdate]	150	0-2	Lab QC	2
OUM150-SM06-[insertdate]	150	6		1
OUM151-SM02-[insertdate]	151	0-2		1
OUM151-SM06-[insertdate]	151	6		1
OUM152-SM02-[insertdate]	152	0-2		1
OUM152-SM06-[insertdate]	152	6		1
OUM153-SM02-[insertdate]	153	0-2		1
OUM153-SM06-[insertdate]	153	6		1
OUM154-SM02-[insertdate]	154	0-2		1
OUM154-SM06-[insertdate]	154	6		1
OUM155-SM02-[insertdate]	155	0-2		1
OUM155-SM06-[insertdate]	155	6		1
OUM156-SM02-[insertdate]	156	0-2		1
OUM156-SM06-[insertdate]	156	6		1
OUM157-SM02-[insertdate]	157	0-2		1
OUM157-SM06-[insertdate]	157	6		1
OUM158-SM02-[insertdate]	158	0-2		1
OUM158-SM06-[insertdate]	158	6		1

Table 3: Request for Analytical Services, Matrix - Soil (continued)				
ANALYSES REQUESTED			Inorganic	
ANALYTICAL METHOD			EPA Method 6010C (ICP-AES)	
ANALYTE(S)			Metals	
PRESERVATIVES			Chill to 4±2°C	
ANALYTICAL HOLDING TIME(S)			180 days	
CONTRACT HOLDING TIME(S)			Analyze within 35 days	
CONTAINER VOLUME			1 quart	
SAMPLE CONTAINER			Ziploc-style bag	
NUMBER OF CONTAINERS			1	
SAMPLE VOLUME			At least 8 ounces	
Sample Number	Grid Number	Estimated Sample Depth (inches)	Special Designation	Metals (Sample Volumes)
OUM165-SM02-[insertdate]	165	0-2		1
OUM165-SM06-[insertdate]	165	6		1
OUM166-SM02-[insertdate]	166	0-2		1
OUM166-SM06-[insertdate]	166	6		1
OUM167-SM02-[insertdate]	167	0-2		1
OUM167-SM06-[insertdate]	167	6		1
OUM168-SM02-[insertdate]	168	0-2		1
OUM168-SM06-[insertdate]	168	6		1
OUM169-SM02-[insertdate]	169	0-2		1
OUM169-SM06-[insertdate]	169	6		1
OUM170-SM02-[insertdate]	170	0-2	Lab QC	2
OUM170-SM06-[insertdate]	170	6		1
OUM171-SM02-[insertdate]	171	0-2		1
OUM171-SM06-[insertdate]	171	6		1
OUM172-SM02-[insertdate]	172	0-2		1
OUM172-SM06-[insertdate]	172	6		1
OUM173-SM02-[insertdate]	173	0-2		1
OUM173-SM06-[insertdate]	173	6		1
OUM174-SM02-[insertdate]	174	0-2		1
OUM174-SM06-[insertdate]	174	6		1
OUM175-SM02-[insertdate]	175	0-2		1
OUM175-SM06-[insertdate]	175	6		1
OUM176-SM02-[insertdate]	176	0-2		1
OUM176-SM06-[insertdate]	176	6		1
OUM177-SM02-[insertdate]	177	0-2		1
OUM177-SM06-[insertdate]	177	6		1
OUM178-SM02-[insertdate]	178	0-2		1
OUM178-SM06-[insertdate]	178	6		1
OUM179-SM02-[insertdate]	179	0-2		1
OUM179-SM06-[insertdate]	179	6		1
OUM180-SM02-[insertdate]	180	0-2	Lab QC	2
OUM180-SM06-[insertdate]	180	6		1

Table 3: Request for Analytical Services, Matrix - Soil (continued)				
ANALYSES REQUESTED			Inorganic	
ANALYTICAL METHOD			EPA Method 6010C (ICP-AES)	
ANALYTE(S)			Metals	
PRESERVATIVES			Chill to 4±2°C	
ANALYTICAL HOLDING TIME(S)			180 days	
CONTRACT HOLDING TIME(S)			Analyze within 35 days	
CONTAINER VOLUME			1 quart	
SAMPLE CONTAINER			Ziploc-style bag	
NUMBER OF CONTAINERS			1	
SAMPLE VOLUME			At least 8 ounces	
Sample Number	Grid Number	Estimated Sample Depth (inches)	Special Designation	Metals (Sample Volumes)
OUM187-SM02-[insertdate]	187	0-2		1
OUM187-SM06-[insertdate]	187	6		1
OUM188-SM02-[insertdate]	188	0-2		1
OUM188-SM06-[insertdate]	188	6		1
OUM189-SM02-[insertdate]	189	0-2		1
OUM189-SM06-[insertdate]	189	6		1
OUM190-SM02-[insertdate]	190	0-2	Lab QC	2
OUM190-SM06-[insertdate]	190	6		1
OUM191-SM02-[insertdate]	191	0-2		1
OUM191-SM06-[insertdate]	191	6		1
OUM192-SM02-[insertdate]	192	0-2		1
OUM192-SM06-[insertdate]	192	6		1
OUM193-SM02-[insertdate]	193	0-2		1
OUM193-SM06-[insertdate]	193	6		1
OUM194-SM02-[insertdate]	194	0-2		1
OUM194-SM06-[insertdate]	194	6		1
OUM195-SM02-[insertdate]	195	0-2		1
OUM195-SM06-[insertdate]	195	6		1
OUM196-SM02-[insertdate]	196	0-2		1
OUM196-SM06-[insertdate]	196	6		1
OUM197-SM02-[insertdate]	197	0-2		1
OUM197-SM06-[insertdate]	197	6		1
OUM198-SM02-[insertdate]	198	0-2		1
OUM198-SM06-[insertdate]	198	6		1
OUM199-SM02-[insertdate]	199	0-2		1
OUM199-SM06-[insertdate]	199	6		1
OUM200-SM02-[insertdate]	200	0-2	Lab QC	2
OUM200-SM06-[insertdate]	200	6		1
OUM201-SM02-[insertdate]	201	0-2		1
OUM201-SM06-[insertdate]	201	6		1
OUM202-SM02-[insertdate]	202	0-2		1
OUM202-SM06-[insertdate]	202	6		1

Table 3: Request for Analytical Services, Matrix - Soil (continued)				
ANALYSES REQUESTED			Inorganic	
ANALYTICAL METHOD			EPA Method 6010C (ICP-AES)	
ANALYTE(S)			Metals	
PRESERVATIVES			Chill to 4±2°C	
ANALYTICAL HOLDING TIME(S)			180 days	
CONTRACT HOLDING TIME(S)			Analyze within 35 days	
CONTAINER VOLUME			1 quart	
SAMPLE CONTAINER			Ziploc-style bag	
NUMBER OF CONTAINERS			1	
SAMPLE VOLUME			At least 8 ounces	
Sample Number	Grid Number	Estimated Sample Depth (inches)	Special Designation	Metals (Sample Volumes)
OUM214-SM02-[insertdate]	53	0-2	Duplicate	1
OUM215-SM06-[insertdate]	56	6	Duplicate	1
OUM216-SM02-[insertdate]	63	0-2	Duplicate	1
OUM217-SM06-[insertdate]	66	6	Duplicate	1
OUM218-SM02-[insertdate]	73	0-2	Duplicate	1
OUM219-SM06-[insertdate]	76	6	Duplicate	1
OUM220-SM02-[insertdate]	83	0-2	Duplicate	1
OUM221-SM06-[insertdate]	86	6	Duplicate	1
OUM222-SM02-[insertdate]	93	0-2	Duplicate	1
OUM223-SM06-[insertdate]	96	6	Duplicate	1
OUM224-SM02-[insertdate]	103	0-2	Duplicate	1
OUM225-SM06-[insertdate]	106	6	Duplicate	1
OUM226-SM02-[insertdate]	113	0-2	Duplicate	1
OUM227-SM06-[insertdate]	116	6	Duplicate	1
OUM228-SM02-[insertdate]	123	0-2	Duplicate	1
OUM229-SM06-[insertdate]	126	6	Duplicate	1
OUM230-SM02-[insertdate]	133	0-2	Duplicate	1
OUM231-SM06-[insertdate]	136	6	Duplicate	1
OUM232-SM02-[insertdate]	143	0-2	Duplicate	1
OUM233-SM06-[insertdate]	146	6	Duplicate	1
OUM234-SM02-[insertdate]	153	0-2	Duplicate	1
OUM235-SM06-[insertdate]	156	6	Duplicate	1
OUM236-SM02-[insertdate]	163	0-2	Duplicate	1
OUM237-SM06-[insertdate]	166	6	Duplicate	1
OUM238-SM02-[insertdate]	173	0-2	Duplicate	1
OUM239-SM06-[insertdate]	176	6	Duplicate	1
OUM240-SM02-[insertdate]	183	0-2	Duplicate	1
OUM241-SM06-[insertdate]	186	6	Duplicate	1
OUM242-SM02-[insertdate]	193	0-2	Duplicate	1

Table 3: Request for Analytical Services, Matrix - Soil (continued)				
ANALYSES REQUESTED			Inorganic	
ANALYTICAL METHOD			EPA Method 6010C (ICP-AES)	
ANALYTE(S)			Metals	
PRESERVATIVES			Chill to 4±2°C	
ANALYTICAL HOLDING TIME(S)			180 days	
CONTRACT HOLDING TIME(S)			Analyze within 35 days	
CONTAINER VOLUME			1 quart	
SAMPLE CONTAINER			Ziploc-style bag	
NUMBER OF CONTAINERS			1	
SAMPLE VOLUME			At least 8 ounces	
Sample Number	Grid Number	Estimated Sample Depth (inches)	Special Designation	Metals (Sample Volumes)
OUM243-SM06-[insertdate]	196	6	Duplicate	1
OUM244-SM02-[insertdate]	203	0-2	Duplicate	1
Total Number of Soil Matrix Field Samples				406
Total Number of Duplicate Samples				41
Total Number of Soil Matrix Samples				447
Total Number of QC Volumes				21
Total Number of Sample Volumes				468
Total Number of Sample Containers				468
<u>Notes:</u> Stated values for sampling holding times, preservatives, volumes, and containers are preliminary and will be verified with the EPA RSCC prior to sampling. ICP-AES = Inductively Coupled Plasma-Optical Emission Spectrometry QC = Quality Control				

Table 4: Request for Analytical Services, Matrix - Water				
ANALYSES REQUESTED				Inorganic
ANALYTICAL METHOD				EPA Method 6010C (ICP-AES)
ANALYTE(S)				Metals
PRESERVATIVES				Add HNO3 to pH <2; Chill to 4±2°C
ANALYTICAL HOLDING TIME(S)				180 days
CONTRACT HOLDING TIME(S)				Analyze within 35 days
CONTAINER VOLUME				500 mL
SAMPLE CONTAINER				HDPE
NUMBER OF CONTAINERS				1
SAMPLE VOLUME				500 mL
Sample Number	Sample Location	Estimated Sample Depth (feet)	Special Designation	Metals (Sample Volumes)
OUM-FB01-[insertdate]	Field Blank	NA	Field Blank	1
OUM-FB02-[insertdate]	Field Blank	NA	Field Blank	1
OUM-FB03-[insertdate]	Field Blank	NA	Field Blank	1
OUM-FB04-[insertdate]	Field Blank	NA	Field Blank	1
OUM-FB05-[insertdate]	Field Blank	NA	Field Blank	1
OUM-FB06-[insertdate]	Field Blank	NA	Field Blank	1
OUM-FB07-[insertdate]	Field Blank	NA	Field Blank	1
OUM-FB08-[insertdate]	Field Blank	NA	Field Blank	1
OUM-FB09-[insertdate]	Field Blank	NA	Field Blank	1
OUM-FB10-[insertdate]	Field Blank	NA	Field Blank	1
OUM-EB01-[insertdate]	EQ Blank	NA	EQ Blank	1
OUM-EB02-[insertdate]	EQ Blank	NA	EQ Blank	1
OUM-EB03-[insertdate]	EQ Blank	NA	EQ Blank	1
OUM-EB04-[insertdate]	EQ Blank	NA	EQ Blank	1
OUM-EB05-[insertdate]	EQ Blank	NA	EQ Blank	1
OUM-EB06-[insertdate]	EQ Blank	NA	EQ Blank	1
OUM-EB07-[insertdate]	EQ Blank	NA	EQ Blank	1
OUM-EB08-[insertdate]	EQ Blank	NA	EQ Blank	1
OUM-EB09-[insertdate]	EQ Blank	NA	EQ Blank	1
OUM-EB10-[insertdate]	EQ Blank	NA	EQ Blank	1
Total Number of Aqueous Field Samples				0
Total Number of Duplicate Samples				0
Total Number of Aqueous Samples				0
Total Number of QC Volumes				0
Total Number of Field and EQ Blank Volumes				20
Total Number of Sample Volumes				20
Total Number of Sample Containers				20
Notes:				
Stated values for sample holding times, preservatives, volumes, and containers are preliminary and will be verified with the EPA RSCC prior to sampling.				
CLPAS = Contract Laboratory Program Analytical Services				
EQ = equipment				
HDPE = high-density polyethylene				
HNO3 = nitric acid				
ICP-AES = Inductively Coupled Plasma-Optical Emission Spectrometry				
mL = milliliters				
NA = Not Applicable				

APPENDIX A:
DATA QUALITY OBJECTIVE WORKSHEET

Data Quality Objective Process Worksheet

Urban Metals Study: West Oakland

HRS Objectives

1. State the Problem - Summarize the contamination problem that will require new environmental data, and identify the resources available to resolve the problem.

Planning Team:

Sharon Bowen, EPA Site Assessment Manager

Kim Hoang, EPA Site Assessment Manager

Amanda Reilly, Weston Solutions, Inc.

Sharon Murray of EPA is the primary decision maker of the scoping team for this assessment.

Problem: Urban areas have been heavily impacted by human activity dating back to the late 1800s, resulting in elevated levels of certain contaminants in soil. Soil matrices in any large, long-established city may include elevated metals. This contaminant load may not be easily connected to a specific release or spill from a regulated source.

It is anticipated that low levels of metals have been widely deposited in urban areas via aerial deposition and surface runoff to surficial soils over decades of urban land use. This is beyond the more localized impacts attributed to point-source releases from industrial activities and accidents. EPA defines anthropogenic background as “natural and human-made substances present in the environment as a result of human activities (not specifically related to the CERCLA release in questions).”

Since CERCLA cleanup authority depends on connecting exposure to contamination from a specific release, understanding an area’s ambient urban background is critical for purposes of investigation, remediation, and risk management.

The primary purpose of this study is to survey and analyze metal concentrations in a specific mixed-use (industrial/residential) urban environment.

Available Resources:

Use of EPA CLP, Region 9, or private laboratories. All work and reporting should be completed by September 30, 2018. The EPA Quality Assurance Office will provide data validation.

2. Identify the Decision - Identify the decision that requires new environmental data to address the contamination problem.

Principal Study Questions:

- Can the Urban Metals Study calculate an average concentration for each metal in the ICP-AES table using all data, together with following statistics around the mean: mean, median, maximum, minimum, standard deviation (1 and 2 standard deviation lines around the mean), 95th upper and lower percentile for the mean?

- Can the Urban Metals Study create a Conceptual Site Model showing potential industrial and other sources of lead?
- Can the study define lead concentrations above the Residential Regional Screening Level (RSL) of 400 milligrams per kilogram (mg/kg) to be provided to EPA's Removal Program for prioritization for further evaluation and response?

Define the alternative actions that could result from the resolution of the principal study question:

- a) The discovery of "hotspots" may warrant further investigation by federal, state, or local authority, including EPA's Removal Program;
- b) A recommendation for future regulatory actions at the federal, state, or local level.
- c) No further EPA Superfund action could occur in relation to the Urban Metals Study area.

Decision Statement:

If analytical data from soil samples collected within the study area are able to define the anthropogenic background concentrations of metals, then the results will be utilized by EPA and other state and local agencies to develop a set of recommendations for regulators and state, county, and federal agencies for addressing issues of metals in urban soil when multiple sources exist, and cleanup authorities are limited. Additionally, study data will be incorporated into a visualization tool that will allow targeting of appropriate regulatory authorities to address exposure risks.

3. Identify Inputs to the Decision - Identify the information needed to support the decision, and specify which inputs require new environmental data.

Information required to resolve the decision statement: Definitive laboratory analysis of metals soils collected from the study area.

Source(s) for information: Data sources for the study will be limited to this sampling event and GIS-based mapping information.

Information needed to establish action levels: The primary purpose of this study is to understand ambient urban background concentrations for key contaminants, and their distributions in a specific mixed-use (industrial/residential) urban environment. Therefore, the action levels established will be Industrial and Residential RSLs and California Screening Levels (CASL) for Residential and Commercial/Industrial properties.

Confirm that measurement methods exist to provide data:

Metals via EPA Method 6010C [using Inductively Coupled Plasma-Optical Emission Spectrometry (ICP-AES)] or equivalent.

4. Define the Study Boundaries - Specify the spatial and temporal aspects of the environmental media that the data must represent to support the decision.

Specific characteristics that define population being studied: Concentrations of metals in soils within the study boundary.

Spatial boundary of decision statement: Soils within the study boundary.

Temporal boundary of decision statement: The data will represent the conditions of the ambient urban background concentrations for metals, and their distributions in a specific mixed-use urban environment. Data will be useable for comparison to health based action levels based on risk from long term exposure.

When to collect samples: No practical constraints on soil samples.

Practical constraints on data collection: No practical constraints on data collection.

5. Develop a Decision Rule - Develop logical if...then statements that define the conditions that would cause the decision maker to choose among alternative actions.

Statistical parameter that characterizes a population: Each analytical result, not a statistical parameter such as mean concentration, will be evaluated against the action levels.

Specify the action level(s) for the study: Background samples will not be collected during this investigation. Analytical results for soils will be compared to Industrial and Residential RSLs and CASLs for Residential and Commercial/Industrial properties.

Decision Rules:

- If soils within the study area are found to be contaminated by metals, then the presence of metals will be documented and reported.
6. Specify the Limits on Decision Errors - Specify the decision makers acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainty in the data.

Use of biased sampling points precludes statistical determination of limits on decision errors. Measurement error, rather than sampling error, is deemed to be the primary factor affecting any decision error. Validated, definitive data will be required to limit measurement error. Sampling error will be limited to the extent practicable by following approved EPA methods and applicable SOPs. Sampling error and tolerable limits cannot be quantified.

7. Optimize the Design for Obtaining Data - Identify the most resource-effective sampling and analysis design for generating data that are expected to satisfy the DQOs.

The primary purpose of this study is to understand ambient urban background concentrations for metals, and their distributions in a specific mixed-use urban environment. Soils within the study area will be sampled to satisfy this goal.

Appendix C: Laboratory Package



**United States Environmental Protection Agency
Region 9 Laboratory**

1337 S. 46th Street Building 201
Richmond, CA 94804

Date: 6/28/2018

Subject: Analytical Testing Results - Project R18S52
SDG: 18162B

From: Peter Husby, Director
EPA Region 9 Laboratory
EMD-3-1

To: Sharon Bowen
Brownfields and Site Assessment Section
SFD-6-1

Attached are the results from the analysis of samples from the **West Oakland Urban Metals Study** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Electronic CC: Amanda Reilly, Weston Solutions
Tom Fortner, Weston Solutions
Rick Fears, California DTSC

Analyses included in this report:

Metals by ICP



United States Environmental Protection Agency

Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804

Phone:(510) 412-2300

Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18162B

Reported: 06/28/18 18:25

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
OUM72-SM02-180608	1806032-01	Soil	06/08/18 09:43	06/11/18 09:38
OUM72-SM06-180608	1806032-02	Soil	06/08/18 09:43	06/11/18 09:38
OUM74-SM02-180608	1806032-03	Soil	06/08/18 10:19	06/11/18 09:38
OUM74-SM06-180608	1806032-04	Soil	06/08/18 10:19	06/11/18 09:38
OUM76-SM02-180608	1806032-05	Soil	06/08/18 10:56	06/11/18 09:38
OUM76-SM06-180608	1806032-06	Soil	06/08/18 10:56	06/11/18 09:38
OUM80-SM02-180608	1806032-07	Soil	06/08/18 11:37	06/11/18 09:38
OUM80-SM06-180608	1806032-08	Soil	06/08/18 11:37	06/11/18 09:38
OUM218-SM02-180608	1806032-09	Soil	06/08/18 11:37	06/11/18 09:38
OUM219-SM06-180608	1806032-10	Soil	06/08/18 11:37	06/11/18 09:38
OUM082-SM02-180608	1806032-11	Soil	06/08/18 12:10	06/11/18 09:38
OUM082-SM06-180608	1806032-12	Soil	06/08/18 12:10	06/11/18 09:38
OUM084-SM02-180608	1806032-13	Soil	06/08/18 13:35	06/11/18 09:38
OUM084-SM06-180608	1806032-14	Soil	06/08/18 13:35	06/11/18 09:38
OUM086-SM02-180608	1806032-15	Soil	06/08/18 14:12	06/11/18 09:38
OUM086-SM06-180608	1806032-16	Soil	06/08/18 14:12	06/11/18 09:38
OUM088-SM02-180608	1806032-17	Soil	06/08/18 14:39	06/11/18 09:38
OUM088-SM06-180608	1806032-18	Soil	06/08/18 14:39	06/11/18 09:38
OUM090-SM02-180608	1806032-19	Soil	06/08/18 15:23	06/11/18 09:38
OUM090-SM06-180608	1806032-20	Soil	06/08/18 15:23	06/11/18 09:38

Work Order 1806032

Bulk soil samples were received at the EPA Region 9 Laboratory. The soils were thoroughly mixed to homogenize and a portion was removed for drying and sieving. This portion was dried overnight at 37 degrees C (as per EPA method 1340) and sieved through a 150 um sieve. The < 150 um fraction was acid digested and analyzed for metals using ICP/AES. A portion of the sieved sample was retained for possible *in vitro* bioaccessibility assay at a future date.



United States Environmental Protection Agency
Region 9 Laboratory

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Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18162B

Reported: 06/28/18 18:25

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806032-01

Soil - Sampled: 06/08/18 09:43

Sample ID: OUM72-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony		1.8	C1, J	2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic		110		2	"	"	"	"	6010C
Barium		260		5	"	"	"	"	6010C
Beryllium		0.48		0.10	"	"	"	"	6010C
Cadmium		3.1		0.50	"	"	"	"	6010C
Chromium		77		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		110		4	"	"	"	"	6010C
Lead		450		3	"	"	"	"	6010C
Manganese		500		5	"	"	"	"	6010C
Molybdenum		3.3	C1, J	5	"	"	"	"	6010C
Nickel		67		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.51	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		41		5	"	"	"	"	6010C
Vanadium		49		2	"	"	"	"	6010C
Zinc		1,200		8	"	"	"	"	6010C

Lab ID: 1806032-02

Soil - Sampled: 06/08/18 09:43

Sample ID: OUM72-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony		2.0		2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic		180		2	"	"	"	"	6010C
Barium		250		5	"	"	"	"	6010C
Beryllium		0.47		0.10	"	"	"	"	6010C
Cadmium		2.8		0.50	"	"	"	"	6010C
Chromium		73		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		280		4	"	"	"	"	6010C
Lead		510		3	"	"	"	"	6010C
Manganese		510		5	"	"	"	"	6010C
Molybdenum		2.7	C1, J	5	"	"	"	"	6010C
Nickel		76		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		14		5	"	"	"	"	6010C
Vanadium		47		2	"	"	"	"	6010C
Zinc		1,300		8	"	"	"	"	6010C

Lab ID: 1806032-03

Soil - Sampled: 06/08/18 10:19

Sample ID: OUM74-SM02-180608

Metals by EPA 6000/7000 Series Methods



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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18162B

Reported: 06/28/18 18:25

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806032-03

Soil - Sampled: 06/08/18 10:19

Sample ID: OUM74-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony		1.8	C1, J	2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic		5.7		2	"	"	"	"	6010C
Barium		240		5	"	"	"	"	6010C
Beryllium		0.54		0.10	"	"	"	"	6010C
Cadmium		1.0		0.50	"	"	"	"	6010C
Chromium		55		1	"	"	"	"	6010C
Cobalt		13		2	"	"	"	"	6010C
Copper		53		4	"	"	"	"	6010C
Lead		210		3	"	"	"	"	6010C
Manganese		430		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		52		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		2.8	C1, J	5	"	"	"	"	6010C
Vanadium		43		2	"	"	"	"	6010C
Zinc		260		8	"	"	"	"	6010C

Lab ID: 1806032-04

Soil - Sampled: 06/08/18 10:19

Sample ID: OUM74-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic		5.2		2	"	"	"	"	6010C
Barium		230		5	"	"	"	"	6010C
Beryllium		0.52		0.10	"	"	"	"	6010C
Cadmium		0.81		0.50	"	"	"	"	6010C
Chromium		52		1	"	"	"	"	6010C
Cobalt		13		2	"	"	"	"	6010C
Copper		52		4	"	"	"	"	6010C
Lead		180		3	"	"	"	"	6010C
Manganese		450		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		51		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		2.5	C1, J	5	"	"	"	"	6010C
Vanadium		40		2	"	"	"	"	6010C
Zinc		190		8	"	"	"	"	6010C

Lab ID: 1806032-05

Soil - Sampled: 06/08/18 10:56



United States Environmental Protection Agency Region 9 Laboratory

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Project Manager: Sharon Bowen
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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section
75 Hawthorne Street
San Francisco CA, 94105

SDG: 18162B
Reported: 06/28/18 18:25

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806032-05

Soil - Sampled: 06/08/18 10:56

Sample ID: OUM76-SM02-180608

Metals by EPA 6000/7000 Series Methods									
							06/13/18	06/19/18	
Antimony	1.4	C1, J		2	mg/kg	B18F030			6010C
Arsenic	7.3			2	"	"	"	"	6010C
Barium	220			5	"	"	"	"	6010C
Beryllium	0.47			0.10	"	"	"	"	6010C
Cadmium	1.3			0.50	"	"	"	"	6010C
Chromium	61			1	"	"	"	"	6010C
Cobalt	10			2	"	"	"	"	6010C
Copper	80			4	"	"	"	"	6010C
Lead	370			3	"	"	"	"	6010C
Manganese	450			5	"	"	"	"	6010C
Molybdenum	ND	U		5	"	"	"	"	6010C
Nickel	59			5	"	"	"	"	6010C
Selenium	ND	U		2	"	"	"	"	6010C
Silver	ND	U		1	"	"	"	"	6010C
Thallium	ND	U		5	"	"	"	"	6010C
Tin	6.7			5	"	"	"	"	6010C
Vanadium	58			2	"	"	"	"	6010C
Zinc	640			8	"	"	"	"	6010C

Lab ID: 1806032-06

Soil - Sampled: 06/08/18 10:56

Sample ID: OUM76-SM06-180608

Metals by EPA 6000/7000 Series Methods									
							06/13/18	06/19/18	
Antimony	ND	U		2	mg/kg	B18F030			6010C
Arsenic	6.9			2	"	"	"	"	6010C
Barium	250			5	"	"	"	"	6010C
Beryllium	0.55			0.10	"	"	"	"	6010C
Cadmium	2.2			0.50	"	"	"	"	6010C
Chromium	62			1	"	"	"	"	6010C
Cobalt	12			2	"	"	"	"	6010C
Copper	75			4	"	"	"	"	6010C
Lead	360			3	"	"	"	"	6010C
Manganese	540			5	"	"	"	"	6010C
Molybdenum	ND	U		5	"	"	"	"	6010C
Nickel	83			5	"	"	"	"	6010C
Selenium	ND	U		2	"	"	"	"	6010C
Silver	ND	U		1	"	"	"	"	6010C
Thallium	ND	U		5	"	"	"	"	6010C
Tin	6.7			5	"	"	"	"	6010C
Vanadium	66			2	"	"	"	"	6010C
Zinc	730			8	"	"	"	"	6010C

Lab ID: 1806032-07

Soil - Sampled: 06/08/18 11:37



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Project Number: R18S52

Project: West Oakland Urban Metals Study

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75 Hawthorne Street

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SDG: 18162B

Reported: 06/28/18 18:25

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806032-07

Soil - Sampled: 06/08/18 11:37

Sample ID: OUM80-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony	ND	J, Q4, U	2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic	8.8		2	"	"	"	"	6010C
Barium	250		5	"	"	"	"	6010C
Beryllium	0.49		0.10	"	"	"	"	6010C
Cadmium	0.74		0.50	"	"	"	"	6010C
Chromium	49		1	"	"	"	"	6010C
Cobalt	8.8		2	"	"	"	"	6010C
Copper	67		4	"	"	"	"	6010C
Lead	95		3	"	"	"	"	6010C
Manganese	420		5	"	"	"	"	6010C
Molybdenum	ND	U	5	"	"	"	"	6010C
Nickel	47		5	"	"	"	"	6010C
Selenium	ND	U	2	"	"	"	"	6010C
Silver	ND	U	1	"	"	"	"	6010C
Thallium	ND	U	5	"	"	"	"	6010C
Tin	2.7	C1, J	5	"	"	"	"	6010C
Vanadium	46		2	"	"	"	"	6010C
Zinc	450		8	"	"	"	"	6010C

Lab ID: 1806032-08

Soil - Sampled: 06/08/18 11:37

Sample ID: OUM80-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony	ND	U	2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic	9.2		2	"	"	"	"	6010C
Barium	300		5	"	"	"	"	6010C
Beryllium	0.46		0.10	"	"	"	"	6010C
Cadmium	0.48	C1, J	0.50	"	"	"	"	6010C
Chromium	54		1	"	"	"	"	6010C
Cobalt	12		2	"	"	"	"	6010C
Copper	34		4	"	"	"	"	6010C
Lead	50		3	"	"	"	"	6010C
Manganese	600		5	"	"	"	"	6010C
Molybdenum	ND	U	5	"	"	"	"	6010C
Nickel	170		5	"	"	"	"	6010C
Selenium	ND	U	2	"	"	"	"	6010C
Silver	ND	U	1	"	"	"	"	6010C
Thallium	ND	U	5	"	"	"	"	6010C
Tin	ND	U	5	"	"	"	"	6010C
Vanadium	70		2	"	"	"	"	6010C
Zinc	110		8	"	"	"	"	6010C

Lab ID: 1806032-09

Soil - Sampled: 06/08/18 11:37



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Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806032-09

Soil - Sampled: 06/08/18 11:37

Sample ID: OUM218-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic		8.3		2	"	"	"	"	6010C
Barium		230		5	"	"	"	"	6010C
Beryllium		0.46		0.10	"	"	"	"	6010C
Cadmium		0.73		0.50	"	"	"	"	6010C
Chromium		45		1	"	"	"	"	6010C
Cobalt		8.2		2	"	"	"	"	6010C
Copper		58		4	"	"	"	"	6010C
Lead		88		3	"	"	"	"	6010C
Manganese		380		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		45		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		41		2	"	"	"	"	6010C
Zinc		400		8	"	"	"	"	6010C

Lab ID: 1806032-10

Soil - Sampled: 06/08/18 11:37

Sample ID: OUM219-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic		8.5		2	"	"	"	"	6010C
Barium		310		5	"	"	"	"	6010C
Beryllium		0.46		0.10	"	"	"	"	6010C
Cadmium		0.47	C1, J	0.50	"	"	"	"	6010C
Chromium		53		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		37		4	"	"	"	"	6010C
Lead		45		3	"	"	"	"	6010C
Manganese		590		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		210		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		66		2	"	"	"	"	6010C
Zinc		110		8	"	"	"	"	6010C

Lab ID: 1806032-11

Soil - Sampled: 06/08/18 12:10



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Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806032-11

Soil - Sampled: 06/08/18 12:10

Sample ID: OUM082-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony		1.5	C1, J	2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic		9.7		2	"	"	"	"	6010C
Barium		180		5	"	"	"	"	6010C
Beryllium		0.37		0.10	"	"	"	"	6010C
Cadmium		1.4		0.50	"	"	"	"	6010C
Chromium		56		1	"	"	"	"	6010C
Cobalt		10		2	"	"	"	"	6010C
Copper		93		4	"	"	"	"	6010C
Lead		420		3	"	"	"	"	6010C
Manganese		280		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		46		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		6.6		5	"	"	"	"	6010C
Vanadium		55		2	"	"	"	"	6010C
Zinc		580		8	"	"	"	"	6010C

Lab ID: 1806032-12

Soil - Sampled: 06/08/18 12:10

Sample ID: OUM082-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony		3.1		2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic		18		2	"	"	"	"	6010C
Barium		200		5	"	"	"	"	6010C
Beryllium		0.52		0.10	"	"	"	"	6010C
Cadmium		1.8		0.50	"	"	"	"	6010C
Chromium		60		1	"	"	"	"	6010C
Cobalt		9.8		2	"	"	"	"	6010C
Copper		170		4	"	"	"	"	6010C
Lead		750		3	"	"	"	"	6010C
Manganese		290		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		66		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		21		5	"	"	"	"	6010C
Vanadium		54		2	"	"	"	"	6010C
Zinc		620		8	"	"	"	"	6010C

Lab ID: 1806032-13

Soil - Sampled: 06/08/18 13:35



United States Environmental Protection Agency
Region 9 Laboratory

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Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18162B

Reported: 06/28/18 18:25

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806032-13

Soil - Sampled: 06/08/18 13:35

Sample ID: OUM084-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic		5.1		2	"	"	"	"	6010C
Barium		140		5	"	"	"	"	6010C
Beryllium		0.31		0.10	"	"	"	"	6010C
Cadmium		0.95		0.50	"	"	"	"	6010C
Chromium		48		1	"	"	"	"	6010C
Cobalt		14		2	"	"	"	"	6010C
Copper		88		4	"	"	"	"	6010C
Lead		53		3	"	"	"	"	6010C
Manganese		480		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		44		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		2.9	C1, J	5	"	"	"	"	6010C
Vanadium		59		2	"	"	"	"	6010C
Zinc		400		8	"	"	"	"	6010C

Lab ID: 1806032-14

Soil - Sampled: 06/08/18 13:35

Sample ID: OUM084-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic		6.5		2	"	"	"	"	6010C
Barium		130		5	"	"	"	"	6010C
Beryllium		0.33		0.10	"	"	"	"	6010C
Cadmium		0.81		0.50	"	"	"	"	6010C
Chromium		51		1	"	"	"	"	6010C
Cobalt		15		2	"	"	"	"	6010C
Copper		78		4	"	"	"	"	6010C
Lead		49		3	"	"	"	"	6010C
Manganese		450		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		47		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		57		2	"	"	"	"	6010C
Zinc		320		8	"	"	"	"	6010C

Lab ID: 1806032-15

Soil - Sampled: 06/08/18 14:12



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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

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SDG: 18162B

Reported: 06/28/18 18:25

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806032-15

Soil - Sampled: 06/08/18 14:12

Sample ID: OUM086-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic		7.6		2	"	"	"	"	6010C
Barium		220		5	"	"	"	"	6010C
Beryllium		0.40		0.10	"	"	"	"	6010C
Cadmium		1.1		0.50	"	"	"	"	6010C
Chromium		49		1	"	"	"	"	6010C
Cobalt		9.3		2	"	"	"	"	6010C
Copper		71		4	"	"	"	"	6010C
Lead		210		3	"	"	"	"	6010C
Manganese		370		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		54		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		55		2	"	"	"	"	6010C
Zinc		1,700		8	"	"	"	"	6010C

Lab ID: 1806032-16

Soil - Sampled: 06/08/18 14:12

Sample ID: OUM086-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic		9.1		2	"	"	"	"	6010C
Barium		200		5	"	"	"	"	6010C
Beryllium		0.49		0.10	"	"	"	"	6010C
Cadmium		1.2		0.50	"	"	"	"	6010C
Chromium		53		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		81		4	"	"	"	"	6010C
Lead		2,800		3	"	"	"	"	6010C
Manganese		490		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		69		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		59		2	"	"	"	"	6010C
Zinc		1,600		8	"	"	"	"	6010C

Lab ID: 1806032-17

Soil - Sampled: 06/08/18 14:39



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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18162B

Reported: 06/28/18 18:25

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806032-17

Soil - Sampled: 06/08/18 14:39

Sample ID: OUM088-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic		5.3		2	"	"	"	"	6010C
Barium		170		5	"	"	"	"	6010C
Beryllium		0.39		0.10	"	"	"	"	6010C
Cadmium		0.34	C1, J	0.50	"	"	"	"	6010C
Chromium		47		1	"	"	"	"	6010C
Cobalt		8.2		2	"	"	"	"	6010C
Copper		32		4	"	"	"	"	6010C
Lead		59		3	"	"	"	"	6010C
Manganese		420		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		36		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		41		2	"	"	"	"	6010C
Zinc		130		8	"	"	"	"	6010C

Lab ID: 1806032-18

Soil - Sampled: 06/08/18 14:39

Sample ID: OUM088-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic		3.8		2	"	"	"	"	6010C
Barium		240		5	"	"	"	"	6010C
Beryllium		0.45		0.10	"	"	"	"	6010C
Cadmium		ND	U	0.50	"	"	"	"	6010C
Chromium		42		1	"	"	"	"	6010C
Cobalt		10		2	"	"	"	"	6010C
Copper		20		4	"	"	"	"	6010C
Lead		24		3	"	"	"	"	6010C
Manganese		510		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		43		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		41		2	"	"	"	"	6010C
Zinc		49		8	"	"	"	"	6010C

Lab ID: 1806032-19

Soil - Sampled: 06/08/18 15:23



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Region 9 Laboratory

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SDG: 18162B

Reported: 06/28/18 18:25

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806032-19

Soil - Sampled: 06/08/18 15:23

Sample ID: OUM090-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	Q4, J, U	2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic		5.9		2	"	"	"	"	6010C
Barium		200		5	"	"	"	"	6010C
Beryllium		0.69		0.10	"	"	"	"	6010C
Cadmium		0.48	C1, J	0.50	"	"	"	"	6010C
Chromium		59		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		34		4	"	"	"	"	6010C
Lead		110		3	"	"	"	"	6010C
Manganese		430		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		48		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		54		2	"	"	"	"	6010C
Zinc		180		8	"	"	"	"	6010C

Lab ID: 1806032-20

Soil - Sampled: 06/08/18 15:23

Sample ID: OUM090-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F030	06/13/18	06/19/18	6010C
Arsenic		6.0		2	"	"	"	"	6010C
Barium		190		5	"	"	"	"	6010C
Beryllium		0.78		0.10	"	"	"	"	6010C
Cadmium		0.28	C1, J	0.50	"	"	"	"	6010C
Chromium		66		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		20		4	"	"	"	"	6010C
Lead		17		3	"	"	"	"	6010C
Manganese		430		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		50		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		62		2	"	"	"	"	6010C
Zinc		55		8	"	"	"	"	6010C



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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18162B

Reported: 06/28/18 18:25

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F030 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/13/18 Analyzed: 06/19/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Blank (B18F030-BLK1)

Antimony	ND	U		2 mg/kg
Arsenic	ND	U		2 "
Barium	ND	U		5 "
Beryllium	ND	U		0.1 "
Cadmium	ND	U		0.5 "
Chromium	ND	U		1 "
Cobalt	ND	U		2 "
Copper	ND	U		4 "
Lead	ND	U		3 "
Manganese	ND	U		5 "
Molybdenum	ND	U		5 "
Nickel	ND	U		5 "
Selenium	ND	U		2 "
Silver	ND	U		1 "
Thallium	ND	U		5 "
Tin	ND	U		5 "
Vanadium	ND	U		2 "
Zinc	ND	U		8 "

Matrix Spike (B18F030-MS1)

Source: 1806032-07

Antimony	30.2			2 mg/kg	100	ND	30	75-125
Arsenic	417			2 "	400	8.84	102	75-125
Barium	610			5 "	400	245	91	75-125
Beryllium	10.5			0.1 "	10.0	0.491	101	75-125
Cadmium	9.91			0.5 "	10.0	0.743	92	75-125
Chromium	87.1			1 "	40.0	49.3	95	75-125
Cobalt	102			2 "	100	8.81	93	75-125
Copper	114			4 "	50.0	67.2	93	75-125
Lead	186			3 "	100	94.7	91	75-125
Manganese	489	Q10		5 "	100	417	72	75-125
Molybdenum	92.3			5 "	100	ND	92	75-125
Nickel	139			5 "	100	46.7	93	75-125
Selenium	386			2 "	400	ND	96	75-125
Silver	9.85			1 "	10.0	ND	98	75-125
Thallium	374			5 "	400	ND	93	75-125
Tin	81			5 "	100	2.71	78	75-125
Vanadium	146			2 "	100	46	100	75-125
Zinc	506	Q10		8 "	100	446	60	75-125

Matrix Spike (B18F030-MS2)

Source: 1806032-19

Antimony	42.9			2 mg/kg	98.0	ND	44	75-125
Arsenic	391			2 "	392	5.92	98	75-125
Barium	571			5 "	392	203	94	75-125



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Reported: 06/28/18 18:25

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F030 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/13/18 Analyzed: 06/19/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Matrix Spike (B18F030-MS2)

Source: 1806032-19

Beryllium	10.6		0.1	"	98.0	0.685	102	75-125
Cadmium	9.6		0.5	"	98.0	0.48	93	75-125
Chromium	99.6		1	"	39.2	59.1	103	75-125
Cobalt	103		2	"	98.0	10.6	94	75-125
Copper	77.9		4	"	49.0	33.8	90	75-125
Lead	195		3	"	98.0	106	91	75-125
Manganese	529	Q10	5	"	98.0	431	101	75-125
Molybdenum	86.8		5	"	98.0	ND	89	75-125
Nickel	141		5	"	98.0	48.1	94	75-125
Selenium	369		2	"	392	ND	94	75-125
Silver	9.37		1	"	98.0	ND	96	75-125
Thallium	369		5	"	392	ND	94	75-125
Tin	79.3		5	"	98.0	ND	81	75-125
Vanadium	154		2	"	98.0	54	102	75-125
Zinc	267		8	"	98.0	178	91	75-125

Matrix Spike Dup (B18F030-MSD1)

Source: 1806032-07

Antimony	28		2	mg/kg	98.0	ND	29	75-125	8	20
Arsenic	396		2	"	392	8.84	99	75-125	5	20
Barium	579		5	"	392	245	85	75-125	5	20
Beryllium	9.89		0.1	"	98.0	0.491	96	75-125	6	20
Cadmium	9.42		0.5	"	98.0	0.743	88	75-125	5	20
Chromium	81.8		1	"	39.2	49.3	83	75-125	6	20
Cobalt	95.7		2	"	98.0	8.81	89	75-125	6	20
Copper	105		4	"	49.0	67.2	78	75-125	8	20
Lead	172		3	"	98.0	94.7	79	75-125	8	20
Manganese	462	Q10	5	"	98.0	417	45	75-125	6	20
Molybdenum	87.2		5	"	98.0	ND	89	75-125	6	20
Nickel	136		5	"	98.0	46.7	91	75-125	3	20
Selenium	366		2	"	392	ND	93	75-125	5	20
Silver	9.58		1	"	98.0	ND	98	75-125	3	20
Thallium	356		5	"	392	ND	91	75-125	5	20
Tin	76.8		5	"	98.0	2.71	76	75-125	5	20
Vanadium	138		2	"	98.0	46	93	75-125	6	20
Zinc	483	Q10	8	"	98.0	446	37	75-125	5	20

Matrix Spike Dup (B18F030-MSD2)

Source: 1806032-19

Antimony	44.5		2	mg/kg	98.0	ND	45	75-125	4	20
Arsenic	398		2	"	392	5.92	100	75-125	2	20
Barium	567		5	"	392	203	93	75-125	0.8	20
Beryllium	10.7		0.1	"	98.0	0.685	102	75-125	0.4	20
Cadmium	9.69		0.5	"	98.0	0.48	94	75-125	0.9	20
Chromium	100		1	"	39.2	59.1	105	75-125	0.8	20



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SDG: 18162B

Reported: 06/28/18 18:25

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F030 - 3050B Std Acid Dig - Metals by 6010

Prepared: 06/13/18 Analyzed: 06/19/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Matrix Spike Dup (B18F030-MSD2)

Source: 1806032-19

Cobalt	104			2	"	98.0	10.6	95	75-125	0.5	20
Copper	78.1			4	"	49.0	33.8	90	75-125	0.2	20
Lead	195			3	"	98.0	106	91	75-125	0.4	20
Manganese	534	Q10		5	"	98.0	431	105	75-125	0.9	20
Molybdenum	88.1			5	"	98.0	ND	90	75-125	2	20
Nickel	144			5	"	98.0	48.1	98	75-125	3	20
Selenium	374			2	"	392	ND	95	75-125	2	20
Silver	9.54			1	"	9.80	ND	97	75-125	2	20
Thallium	374			5	"	392	ND	95	75-125	1	20
Tin	81.1			5	"	98.0	ND	83	75-125	2	20
Vanadium	156			2	"	98.0	54	104	75-125	1	20
Zinc	267			8	"	98.0	178	91	75-125	0.07	20

Reference (B18F030-SRM1)

Antimony	52.6			2	mg/kg	66.0		80	41.2-158		
Arsenic	256			2	"	253		101	60.9-139		
Barium	ND	U		5	"	1.60			62.5-138		
Beryllium	4.87			0.1	"	4.90		99	61.2-139		
Cadmium	9.87			0.5	"	10.9		91	70.6-128		
Chromium	25.7			1	"	27.1		95	68.3-132		
Cobalt	36.8			2	"	37.4		98	64.7-135		
Copper	1,440			4	"	1770		81	74.6-126		
Lead	49.7			3	"	56.9		87	72.8-127		
Manganese	57.6			5	"	61.0		94	68.2-132		
Nickel	14.6			5	"	16.3		89	55.2-145		
Selenium	8			2	"	10.0		80	41-159		
Silver	5.68			1	"	5.90		96	45.8-154		
Thallium	8.64			5	"	9.50		91	30.5-169		
Vanadium	16.8			2	"	17.6		96	65.9-135		
Zinc	43.2			8	"	47.5		91	43.2-157		



United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18162B

Reported: 06/28/18 18:25

Qualifiers and Comments

Q4 The matrix spike and/or matrix spike duplicate associated with this sample did not meet recovery criteria for this analyte (see MS/MSD results for this batch in QC summary)

Q10 The analyte concentration in the unfortified sample is significantly greater than the concentration spiked into the matrix spike and matrix spike duplicate. The reported spike recovery is not a meaningful measure of the dataset's analytical accuracy.

J The reported result for this analyte should be considered an estimated value.

C1 The reported concentration for this analyte is below the quantitation limit.

U Not Detected

NR Not Reported

RE1, RE2, etc: Result is from a sample re-analysis.



**United States Environmental Protection Agency
Region 9 Laboratory**

1337 S. 46th Street Building 201
Richmond, CA 94804

Date: 6/28/2018

Subject: Analytical Testing Results - Project R18S52
SDG: 18162A

From: Peter Husby, Director
EPA Region 9 Laboratory
EMD-3-1

To: Sharon Bowen
Brownfields and Site Assessment Section
SFD-6-1

Attached are the results from the analysis of samples from the **West Oakland Urban Metals Study** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Electronic CC: Amanda Reilly, Weston Solutions
Tom Fortner, Weston Solutions
Rick Fears, California DTSC

Analyses included in this report:

Metals by ICP



United States Environmental Protection Agency
Region 9 Laboratory

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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18162A

Reported: 06/28/18 18:26

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
OUM071-SM02-180608	1806031-01	Soil	06/08/18 12:24	06/11/18 09:39
OUM071-SM06-180608	1806031-02	Soil	06/08/18 12:24	06/11/18 09:39
OUM073-SM02-180608	1806031-03	Soil	06/08/18 14:55	06/11/18 09:39
OUM073-SM06-180608	1806031-04	Soil	06/08/18 14:55	06/11/18 09:39
OUM075-SM02-180608	1806031-05	Soil	06/08/18 16:21	06/11/18 09:39
OUM075-SM06-180608	1806031-06	Soil	06/08/18 16:21	06/11/18 09:39
OUM079-SM02-180608	1806031-07	Soil	06/08/18 10:10	06/11/18 09:39
OUM079-SM06-180608	1806031-08	Soil	06/08/18 10:10	06/11/18 09:39
OUM081-SM02-180608	1806031-09	Soil	06/08/18 11:14	06/11/18 09:39
OUM081-SM06-180608	1806031-10	Soil	06/08/18 11:14	06/11/18 09:39
OUM083-SM02-180608	1806031-11	Soil	06/08/18 11:42	06/11/18 09:39
OUM083-SM06-180608	1806031-12	Soil	06/08/18 11:42	06/11/18 09:39
OUM085-SM02-180608	1806031-13	Soil	06/08/18 13:07	06/11/18 09:39
OUM085-SM06-180608	1806031-14	Soil	06/08/18 13:07	06/11/18 09:39
OUM087-SM02-180608	1806031-15	Soil	06/08/18 15:44	06/11/18 09:39
OUM087-SM06-180608	1806031-16	Soil	06/08/18 15:44	06/11/18 09:39
OUM089-SM02-180608	1806031-17	Soil	06/08/18 16:46	06/11/18 09:39
OUM089-SM06-180608	1806031-18	Soil	06/08/18 16:46	06/11/18 09:39
OUM086a-SM02-180608	1806031-19	Soil	06/08/18 14:33	06/11/18 09:39
OUM086a-SM06-180608	1806031-20	Soil	06/08/18 14:33	06/11/18 09:39

Work Order 1806031

Bulk soil samples were received at the EPA Region 9 Laboratory. The soils were thoroughly mixed to homogenize and a portion was removed for drying and sieving. This portion was dried overnight at 37 degrees C (as per EPA method 1340) and sieved through a 150 um sieve. The < 150 um fraction was acid digested and analyzed for metals using ICP/AES. A portion of the sieved sample was retained for possible *in vitro* bioaccessibility assay at a future date.



United States Environmental Protection Agency
Region 9 Laboratory

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Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18162A

Reported: 06/28/18 18:26

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806031-01

Soil - Sampled: 06/08/18 12:24

Sample ID: OUM071-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		5.0		2	"	"	"	"	6010C
Barium		180		5	"	"	"	"	6010C
Beryllium		0.47		0.10	"	"	"	"	6010C
Cadmium		0.61		0.50	"	"	"	"	6010C
Chromium		58		1	"	"	"	"	6010C
Cobalt		21		2	"	"	"	"	6010C
Copper		54		4	"	"	"	"	6010C
Lead		110		3	"	"	"	"	6010C
Manganese		380		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		41		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		4.4	C1, J	5	"	"	"	"	6010C
Vanadium		39		2	"	"	"	"	6010C
Zinc		230		8	"	"	"	"	6010C

Lab ID: 1806031-02

Soil - Sampled: 06/08/18 12:24

Sample ID: OUM071-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		6.2		2	"	"	"	"	6010C
Barium		210		5	"	"	"	"	6010C
Beryllium		0.52		0.10	"	"	"	"	6010C
Cadmium		0.94		0.50	"	"	"	"	6010C
Chromium		46		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		62		4	"	"	"	"	6010C
Lead		220		3	"	"	"	"	6010C
Manganese		430		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		45		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		33		5	"	"	"	"	6010C
Vanadium		45		2	"	"	"	"	6010C
Zinc		330		8	"	"	"	"	6010C

Lab ID: 1806031-03

Soil - Sampled: 06/08/18 14:55



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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18162A

Reported: 06/28/18 18:26

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806031-03

Soil - Sampled: 06/08/18 14:55

Sample ID: OUM073-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		4.6		2	"	"	"	"	6010C
Barium		180		5	"	"	"	"	6010C
Beryllium		0.39		0.10	"	"	"	"	6010C
Cadmium		0.44	C1, J	0.50	"	"	"	"	6010C
Chromium		43		1	"	"	"	"	6010C
Cobalt		7.6		2	"	"	"	"	6010C
Copper		33		4	"	"	"	"	6010C
Lead		110		3	"	"	"	"	6010C
Manganese		340		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		34		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		38		2	"	"	"	"	6010C
Zinc		120		8	"	"	"	"	6010C

Lab ID: 1806031-04

Soil - Sampled: 06/08/18 14:55

Sample ID: OUM073-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		5.6		2	"	"	"	"	6010C
Barium		170		5	"	"	"	"	6010C
Beryllium		0.41		0.10	"	"	"	"	6010C
Cadmium		0.59		0.50	"	"	"	"	6010C
Chromium		45		1	"	"	"	"	6010C
Cobalt		8.1		2	"	"	"	"	6010C
Copper		33		4	"	"	"	"	6010C
Lead		190		3	"	"	"	"	6010C
Manganese		330		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		38		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		39		2	"	"	"	"	6010C
Zinc		140		8	"	"	"	"	6010C

Lab ID: 1806031-05

Soil - Sampled: 06/08/18 16:21



United States Environmental Protection Agency
Region 9 Laboratory

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Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18162A

Reported: 06/28/18 18:26

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806031-05

Soil - Sampled: 06/08/18 16:21

Sample ID: OUM075-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	Q4, J, U	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		4.8		2	"	"	"	"	6010C
Barium		170		5	"	"	"	"	6010C
Beryllium		0.40		0.10	"	"	"	"	6010C
Cadmium		1.2		0.50	"	"	"	"	6010C
Chromium		52		1	"	"	"	"	6010C
Cobalt		9.2		2	"	"	"	"	6010C
Copper		53		4	"	"	"	"	6010C
Lead		68		3	"	"	"	"	6010C
Manganese		400		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		49		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		2.5	C1, J	5	"	"	"	"	6010C
Vanadium		45		2	"	"	"	"	6010C
Zinc		160		8	"	"	"	"	6010C

Lab ID: 1806031-06

Soil - Sampled: 06/08/18 16:21

Sample ID: OUM075-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		4.2		2	"	"	"	"	6010C
Barium		220		5	"	"	"	"	6010C
Beryllium		0.40		0.10	"	"	"	"	6010C
Cadmium		1.8		0.50	"	"	"	"	6010C
Chromium		45		1	"	"	"	"	6010C
Cobalt		8.5		2	"	"	"	"	6010C
Copper		47		4	"	"	"	"	6010C
Lead		85		3	"	"	"	"	6010C
Manganese		390		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		47		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		3.8	C1, J	5	"	"	"	"	6010C
Vanadium		36		2	"	"	"	"	6010C
Zinc		120		8	"	"	"	"	6010C

Lab ID: 1806031-07

Soil - Sampled: 06/08/18 10:10



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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18162A

Reported: 06/28/18 18:26

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806031-07

Soil - Sampled: 06/08/18 10:10

Sample ID: OUM079-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		8.2		2	"	"	"	"	6010C
Barium		190		5	"	"	"	"	6010C
Beryllium		0.48		0.10	"	"	"	"	6010C
Cadmium		1.2		0.50	"	"	"	"	6010C
Chromium		66		1	"	"	"	"	6010C
Cobalt		14		2	"	"	"	"	6010C
Copper		65		4	"	"	"	"	6010C
Lead		160		3	"	"	"	"	6010C
Manganese		640		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		68		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		72		2	"	"	"	"	6010C
Zinc		560		8	"	"	"	"	6010C

Lab ID: 1806031-08

Soil - Sampled: 06/08/18 10:10

Sample ID: OUM079-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		8.0		2	"	"	"	"	6010C
Barium		180		5	"	"	"	"	6010C
Beryllium		0.50		0.10	"	"	"	"	6010C
Cadmium		1.1		0.50	"	"	"	"	6010C
Chromium		63		1	"	"	"	"	6010C
Cobalt		13		2	"	"	"	"	6010C
Copper		63		4	"	"	"	"	6010C
Lead		160		3	"	"	"	"	6010C
Manganese		620		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		60		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		70		2	"	"	"	"	6010C
Zinc		550		8	"	"	"	"	6010C

Lab ID: 1806031-09

Soil - Sampled: 06/08/18 11:14



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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18162A

Reported: 06/28/18 18:26

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806031-09

Soil - Sampled: 06/08/18 11:14

Sample ID: OUM081-SM02-180608

Metals by EPA 6000/7000 Series Methods									
Antimony		ND	U	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		14		2	"	"	"	"	6010C
Barium		270		5	"	"	"	"	6010C
Beryllium		0.44		0.10	"	"	"	"	6010C
Cadmium		0.99		0.50	"	"	"	"	6010C
Chromium		76		1	"	"	"	"	6010C
Cobalt		14		2	"	"	"	"	6010C
Copper		73		4	"	"	"	"	6010C
Lead		170		3	"	"	"	"	6010C
Manganese		800		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		67		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.61	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		5.9		5	"	"	"	"	6010C
Vanadium		67		2	"	"	"	"	6010C
Zinc		330		8	"	"	"	"	6010C

Lab ID: 1806031-10

Soil - Sampled: 06/08/18 11:14

Sample ID: OUM081-SM06-180608

Metals by EPA 6000/7000 Series Methods									
Antimony		ND	U	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		20		2	"	"	"	"	6010C
Barium		370		5	"	"	"	"	6010C
Beryllium		0.57		0.10	"	"	"	"	6010C
Cadmium		0.98		0.50	"	"	"	"	6010C
Chromium		63		1	"	"	"	"	6010C
Cobalt		18		2	"	"	"	"	6010C
Copper		68		4	"	"	"	"	6010C
Lead		160		3	"	"	"	"	6010C
Manganese		1,400		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		87		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.54	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		3.1	C1, J	5	"	"	"	"	6010C
Vanadium		82		2	"	"	"	"	6010C
Zinc		240		8	"	"	"	"	6010C

Lab ID: 1806031-11

Soil - Sampled: 06/08/18 11:42



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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18162A

Reported: 06/28/18 18:26

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806031-11

Soil - Sampled: 06/08/18 11:42

Sample ID: OUM083-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony		1.8	C1, J	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		17		2	"	"	"	"	6010C
Barium		290		5	"	"	"	"	6010C
Beryllium		0.31		0.10	"	"	"	"	6010C
Cadmium		3.4		0.50	"	"	"	"	6010C
Chromium		100		1	"	"	"	"	6010C
Cobalt		18		2	"	"	"	"	6010C
Copper		150		4	"	"	"	"	6010C
Lead		1,300		3	"	"	"	"	6010C
Manganese		820		5	"	"	"	"	6010C
Molybdenum		8.1		5	"	"	"	"	6010C
Nickel		82		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.72	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		12		5	"	"	"	"	6010C
Vanadium		68		2	"	"	"	"	6010C
Zinc		1,200		8	"	"	"	"	6010C

Lab ID: 1806031-12

Soil - Sampled: 06/08/18 11:42

Sample ID: OUM083-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony		2.7		2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		25		2	"	"	"	"	6010C
Barium		1,300		5	"	"	"	"	6010C
Beryllium		0.49		0.10	"	"	"	"	6010C
Cadmium		5.0		0.50	"	"	"	"	6010C
Chromium		100		1	"	"	"	"	6010C
Cobalt		14		2	"	"	"	"	6010C
Copper		160		4	"	"	"	"	6010C
Lead		3,900		3	"	"	"	"	6010C
Manganese		780		5	"	"	"	"	6010C
Molybdenum		3.3	C1, J	5	"	"	"	"	6010C
Nickel		76		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.74	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		74		5	"	"	"	"	6010C
Vanadium		57		2	"	"	"	"	6010C
Zinc		1,400		8	"	"	"	"	6010C

Lab ID: 1806031-13

Soil - Sampled: 06/08/18 13:07

Sample ID: OUM085-SM02-180608

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
Region 9 Laboratory

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Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18162A

Reported: 06/28/18 18:26

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806031-13

Soil - Sampled: 06/08/18 13:07

Sample ID: OUM085-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony		1.4	C1, J	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		7.8		2	"	"	"	"	6010C
Barium		330		5	"	"	"	"	6010C
Beryllium		0.54		0.10	"	"	"	"	6010C
Cadmium		1.6		0.50	"	"	"	"	6010C
Chromium		63		1	"	"	"	"	6010C
Cobalt		10		2	"	"	"	"	6010C
Copper		120		4	"	"	"	"	6010C
Lead		540		3	"	"	"	"	6010C
Manganese		500		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		58		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.73	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		13		5	"	"	"	"	6010C
Vanadium		49		2	"	"	"	"	6010C
Zinc		620		8	"	"	"	"	6010C

Lab ID: 1806031-14

Soil - Sampled: 06/08/18 13:07

Sample ID: OUM085-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony		1.5	C1, J	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		11		2	"	"	"	"	6010C
Barium		340		5	"	"	"	"	6010C
Beryllium		0.60		0.10	"	"	"	"	6010C
Cadmium		1.6		0.50	"	"	"	"	6010C
Chromium		70		1	"	"	"	"	6010C
Cobalt		14		2	"	"	"	"	6010C
Copper		150		4	"	"	"	"	6010C
Lead		530		3	"	"	"	"	6010C
Manganese		620		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		71		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		16		5	"	"	"	"	6010C
Vanadium		55		2	"	"	"	"	6010C
Zinc		390		8	"	"	"	"	6010C

Lab ID: 1806031-15

Soil - Sampled: 06/08/18 15:44

Sample ID: OUM087-SM02-180608

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
Region 9 Laboratory

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SDG: 18162A

Reported: 06/28/18 18:26

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806031-15

Soil - Sampled: 06/08/18 15:44

Sample ID: OUM087-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		4.5		2	"	"	"	"	6010C
Barium		170		5	"	"	"	"	6010C
Beryllium		0.35		0.10	"	"	"	"	6010C
Cadmium		0.72		0.50	"	"	"	"	6010C
Chromium		38		1	"	"	"	"	6010C
Cobalt		7.0		2	"	"	"	"	6010C
Copper		29		4	"	"	"	"	6010C
Lead		110		3	"	"	"	"	6010C
Manganese		360		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		30		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		33		2	"	"	"	"	6010C
Zinc		220		8	"	"	"	"	6010C

Lab ID: 1806031-16

Soil - Sampled: 06/08/18 15:44

Sample ID: OUM087-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		4.5		2	"	"	"	"	6010C
Barium		180		5	"	"	"	"	6010C
Beryllium		0.37		0.10	"	"	"	"	6010C
Cadmium		1.0		0.50	"	"	"	"	6010C
Chromium		37		1	"	"	"	"	6010C
Cobalt		6.5		2	"	"	"	"	6010C
Copper		27		4	"	"	"	"	6010C
Lead		99		3	"	"	"	"	6010C
Manganese		360		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		32		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		32		2	"	"	"	"	6010C
Zinc		380		8	"	"	"	"	6010C

Lab ID: 1806031-17

Soil - Sampled: 06/08/18 16:46



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75 Hawthorne Street

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SDG: 18162A

Reported: 06/28/18 18:26

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806031-17

Soil - Sampled: 06/08/18 16:46

Sample ID: OUM089-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		5.5		2	"	"	"	"	6010C
Barium		120		5	"	"	"	"	6010C
Beryllium		0.30		0.10	"	"	"	"	6010C
Cadmium		0.43	C1, J	0.50	"	"	"	"	6010C
Chromium		79		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		34		4	"	"	"	"	6010C
Lead		74		3	"	"	"	"	6010C
Manganese		450		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		60		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		67		2	"	"	"	"	6010C
Zinc		150		8	"	"	"	"	6010C

Lab ID: 1806031-18

Soil - Sampled: 06/08/18 16:46

Sample ID: OUM089-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		5.6		2	"	"	"	"	6010C
Barium		37		5	"	"	"	"	6010C
Beryllium		0.26		0.10	"	"	"	"	6010C
Cadmium		ND	U	0.50	"	"	"	"	6010C
Chromium		77		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		9.2		4	"	"	"	"	6010C
Lead		8.7		3	"	"	"	"	6010C
Manganese		340		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		59		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		66		2	"	"	"	"	6010C
Zinc		46		8	"	"	"	"	6010C

Lab ID: 1806031-19

Soil - Sampled: 06/08/18 14:33



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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18162A

Reported: 06/28/18 18:26

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806031-19

Soil - Sampled: 06/08/18 14:33

Sample ID: OUM086a-SM02-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		4.5		2	"	"	"	"	6010C
Barium		160		5	"	"	"	"	6010C
Beryllium		0.39		0.10	"	"	"	"	6010C
Cadmium		0.71		0.50	"	"	"	"	6010C
Chromium		69		1	"	"	"	"	6010C
Cobalt		8.6		2	"	"	"	"	6010C
Copper		34		4	"	"	"	"	6010C
Lead		170		3	"	"	"	"	6010C
Manganese		280		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		47		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		44		2	"	"	"	"	6010C
Zinc		210		8	"	"	"	"	6010C

Lab ID: 1806031-20

Soil - Sampled: 06/08/18 14:33

Sample ID: OUM086a-SM06-180608

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F029	06/13/18	06/18/18	6010C
Arsenic		5.2		2	"	"	"	"	6010C
Barium		160		5	"	"	"	"	6010C
Beryllium		0.44		0.10	"	"	"	"	6010C
Cadmium		0.63		0.50	"	"	"	"	6010C
Chromium		76		1	"	"	"	"	6010C
Cobalt		9.9		2	"	"	"	"	6010C
Copper		32		4	"	"	"	"	6010C
Lead		150		3	"	"	"	"	6010C
Manganese		310		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		58		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		50		2	"	"	"	"	6010C
Zinc		170		8	"	"	"	"	6010C



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SDG: 18162A

Reported: 06/28/18 18:26

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F029 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/13/18 Analyzed: 06/18/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Blank (B18F029-BLK1)

Antimony	ND	U		2 mg/kg
Arsenic	ND	U		2 "
Barium	ND	U		5 "
Beryllium	ND	U		0.1 "
Cadmium	ND	U		0.5 "
Chromium	ND	U		1 "
Cobalt	ND	U		2 "
Copper	ND	U		4 "
Lead	ND	U		3 "
Manganese	ND	U		5 "
Molybdenum	ND	U		5 "
Nickel	ND	U		5 "
Selenium	ND	U		2 "
Silver	ND	U		1 "
Thallium	ND	U		5 "
Tin	ND	U		5 "
Vanadium	ND	U		2 "
Zinc	ND	U		8 "

Matrix Spike (B18F029-MS1)

Source: 1806031-05

Antimony	30.1			2 mg/kg	100	ND	30	75-125
Arsenic	406			2 "	400	4.79	100	75-125
Barium	559			5 "	400	174	96	75-125
Beryllium	10.1			0.1 "	10.0	0.405	97	75-125
Cadmium	10.6			0.5 "	10.0	1.25	94	75-125
Chromium	90.1			1 "	40.0	51.8	96	75-125
Cobalt	103			2 "	100	9.25	94	75-125
Copper	98.2			4 "	50.0	52.7	91	75-125
Lead	157			3 "	100	67.9	89	75-125
Manganese	504	Q10		5 "	100	400	104	75-125
Molybdenum	87.8			5 "	100	ND	88	75-125
Nickel	143			5 "	100	49.3	94	75-125
Selenium	380			2 "	400	ND	95	75-125
Silver	9.71			1 "	10.0	ND	97	75-125
Thallium	379			5 "	400	ND	95	75-125
Tin	81.3			5 "	100	2.51	79	75-125
Vanadium	142			2 "	100	44.5	98	75-125
Zinc	257			8 "	100	159	98	75-125

Matrix Spike Dup (B18F029-MSD1)

Source: 1806031-05

Antimony	29.2			2 mg/kg	98.0	ND	30	75-125	3	20
Arsenic	398			2 "	392	4.79	100	75-125	2	20
Barium	533			5 "	392	174	91	75-125	5	20



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Reported: 06/28/18 18:26

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F029 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/13/18 Analyzed: 06/18/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Matrix Spike Dup (B18F029-MSD1)

Source: 1806031-05

Beryllium	9.61		0.1	"	9.80	0.405	94	75-125	5	20
Cadmium	10.3		0.5	"	9.80	1.25	92	75-125	3	20
Chromium	89.1		1	"	39.2	51.8	95	75-125	1	20
Cobalt	98.4		2	"	98.0	9.25	91	75-125	4	20
Copper	94.6		4	"	49.0	52.7	86	75-125	4	20
Lead	155		3	"	98.0	67.9	89	75-125	1	20
Manganese	493	Q10	5	"	98.0	400	94	75-125	2	20
Molybdenum	85.5		5	"	98.0	ND	87	75-125	3	20
Nickel	141		5	"	98.0	49.3	94	75-125	1	20
Selenium	370		2	"	392	ND	94	75-125	3	20
Silver	9.54		1	"	9.80	ND	97	75-125	2	20
Thallium	371		5	"	392	ND	95	75-125	2	20
Tin	78.8		5	"	98.0	2.51	78	75-125	3	20
Vanadium	141		2	"	98.0	44.5	98	75-125	1	20
Zinc	249		8	"	98.0	159	91	75-125	3	20

Reference (B18F029-SRM1)

Antimony	55.4		2	mg/kg	66.0		84	41.2-158		
Arsenic	266		2	"	253		105	60.9-139		
Barium	ND	U	5	"	1.60			62.5-138		
Beryllium	4.72		0.1	"	4.90		96	61.2-139		
Cadmium	10.1		0.5	"	10.9		92	70.6-128		
Chromium	26.5		1	"	27.1		98	68.3-132		
Cobalt	36.3		2	"	37.4		97	64.7-135		
Copper	1,490		4	"	1770		84	74.6-126		
Lead	52.2		3	"	56.9		92	72.8-127		
Manganese	58.2		5	"	61.0		95	68.2-132		
Nickel	15.1		5	"	16.3		92	55.2-145		
Selenium	7.81		2	"	10.0		78	41-159		
Silver	5.87		1	"	5.90		99	45.8-154		
Thallium	8.81		5	"	9.50		93	30.5-169		
Vanadium	17.2		2	"	17.6		98	65.9-135		
Zinc	44.9		8	"	47.5		94	43.2-157		



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Qualifiers and Comments

Q4 The matrix spike and/or matrix spike duplicate associated with this sample did not meet recovery criteria for this analyte (see MS/MSD results for this batch in QC summary)

Q10 The analyte concentration in the unfortified sample is significantly greater than the concentration spiked into the matrix spike and matrix spike duplicate. The reported spike recovery is not a meaningful measure of the dataset's analytical accuracy.

J The reported result for this analyte should be considered an estimated value.

C1 The reported concentration for this analyte is below the quantitation limit.

U Not Detected

NR Not Reported

RE1, RE2, etc: Result is from a sample re-analysis.



**United States Environmental Protection Agency
Region 9 Laboratory**

1337 S. 46th Street Building 201
Richmond, CA 94804

Date: 6/28/2018

Subject: Analytical Testing Results - Project R18S52
SDG: 18159B

From: Peter Husby, Director
EPA Region 9 Laboratory
EMD-3-1

To: Sharon Bowen
Brownfields and Site Assessment Section
SFD-6-1

Attached are the results from the analysis of samples from the **West Oakland Urban Metals Study** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Electronic CC: Amanda Reilly, Weston Solutions
Tom Fortner, Weston Solutions
Rick Fears, California DTSC

Analyses included in this report:

Metals by ICP



United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18159B

Reported: 06/28/18 17:49

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
OUM061-SM02-180607	1806026-01	Soil	06/07/18 15:58	06/08/18 08:23
OUM061-SM06-180607	1806026-02	Soil	06/07/18 15:58	06/08/18 08:23
OUM063-SM02-180607	1806026-03	Soil	06/07/18 16:28	06/08/18 08:23
OUM063-SM06-180607	1806026-04	Soil	06/07/18 16:28	06/08/18 08:23
OUM077-SM02-180607	1806026-05	Soil	06/07/18 16:54	06/08/18 08:23
OUM077-SM06-180607	1806026-06	Soil	06/07/18 16:54	06/08/18 08:23
OUM050-SM02-180607	1806026-07	Soil	06/07/18 09:56	06/08/18 08:23
OUM050-SM06-180607	1806026-08	Soil	06/07/18 09:56	06/08/18 08:23
OUM212-SM02-180607	1806026-09	Soil	06/07/18 09:56	06/08/18 08:23
OUM213-SM06-180607	1806026-10	Soil	06/07/18 09:56	06/08/18 08:23
OUM052-SM02-180607	1806026-11	Soil	06/07/18 10:40	06/08/18 08:23
OUM052-SM06-180607	1806026-12	Soil	06/07/18 10:40	06/08/18 08:23
OUM054-SM02-180607	1806026-13	Soil	06/07/18 11:16	06/08/18 08:23
OUM054-SM06-180607	1806026-14	Soil	06/07/18 11:16	06/08/18 08:23
OUM056-SM02-180607	1806026-15	Soil	06/07/18 11:41	06/08/18 08:23
OUM056-SM06-180607	1806026-16	Soil	06/07/18 11:41	06/08/18 08:23
OUM058-SM02-180607	1806026-17	Soil	06/07/18 12:20	06/08/18 08:23
OUM058-SM06-180607	1806026-18	Soil	06/07/18 12:20	06/08/18 08:23
OUM060-SM02-180607	1806026-19	Soil	06/07/18 13:46	06/08/18 08:23
OUM060-SM06-180607	1806026-20	Soil	06/07/18 13:46	06/08/18 08:23

Work Order 1806026

Sample Receiving: The sample collection date on the chain of custody documentation for samples OUM077-SM06-180607 (Laboratory ID 1806026-06) and OUM077-SM02-180607 (Laboratory ID 1806026-05) was identified as 06/08/18. The laboratory used 06/07/18, given the sample nomenclature and sample labels identifying 06/07/18 as sample collection dates.

Homogenization/Drying: Bulk soil samples were received at the EPA Region 9 Laboratory. The soils were thoroughly mixed to homogenize and a portion was removed for drying and sieving. This portion was dried overnight at 37 degrees C (as per EPA method 1340) and sieved through a 150 um sieve. The < 150 um fraction was acid digested and analyzed for metals using ICP/AES. A portion of the sieved sample was retained for possible *in vitro* bioaccessibility assay at a future date. Exceptions noted below:

Laboratory IDs 1806026-07 and 1806026-19 were designated as QC sample. Due to very little soil in sample bag, the entire amount was dried and sieved.

Laboratory IDs 1806026-09, 1806026-10, 1806026-15, and 1806026-18 had very little soil in sample bag. The entire amount was dried and sieved.

By request, additional sample aliquot were dried for Laboratory IDs 1806026-04,1806026 -05, and 1806026- 11. Remaining sample in the bag was used up for Laboratory ID 1806026- 11.

Sample digestion: For Laboratory ID 1806026- 11, an initial weight of 0.5g was used instead of 1g due to limited sample; all reagents and final volume were cut in half.



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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

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Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806026-01

Soil - Sampled: 06/07/18 15:58

Sample ID: OUM061-SM02-180607

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		8.4		2	"	"	"	"	6010C
Barium		130		5	"	"	"	"	6010C
Beryllium		0.37		0.10	"	"	"	"	6010C
Cadmium		2.0		0.50	"	"	"	"	6010C
Chromium		51		1	"	"	"	"	6010C
Cobalt		7.3		2	"	"	"	"	6010C
Copper		39		4	"	"	"	"	6010C
Lead		86		3	"	"	"	"	6010C
Manganese		260		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		44		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		36		2	"	"	"	"	6010C
Zinc		180		8	"	"	"	"	6010C

Lab ID: 1806026-02

Soil - Sampled: 06/07/18 15:58

Sample ID: OUM061-SM06-180607

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		12		2	"	"	"	"	6010C
Barium		160		5	"	"	"	"	6010C
Beryllium		0.35		0.10	"	"	"	"	6010C
Cadmium		1.0		0.50	"	"	"	"	6010C
Chromium		46		1	"	"	"	"	6010C
Cobalt		6.1		2	"	"	"	"	6010C
Copper		32		4	"	"	"	"	6010C
Lead		43		3	"	"	"	"	6010C
Manganese		320		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		38		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		31		2	"	"	"	"	6010C
Zinc		90		8	"	"	"	"	6010C

Lab ID: 1806026-03

Soil - Sampled: 06/07/18 16:28



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Brownfields and Site Assessment Section

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San Francisco CA, 94105

SDG: 18159B

Reported: 06/28/18 17:49

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806026-03

Soil - Sampled: 06/07/18 16:28

Sample ID: OUM063-SM02-180607

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		11		2	"	"	"	"	6010C
Barium		240		5	"	"	"	"	6010C
Beryllium		0.56		0.10	"	"	"	"	6010C
Cadmium		0.80		0.50	"	"	"	"	6010C
Chromium		57		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		61		4	"	"	"	"	6010C
Lead		120		3	"	"	"	"	6010C
Manganese		500		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		77		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		2.7	C1, J	5	"	"	"	"	6010C
Vanadium		51		2	"	"	"	"	6010C
Zinc		240		8	"	"	"	"	6010C

Lab ID: 1806026-04

Soil - Sampled: 06/07/18 16:28

Sample ID: OUM063-SM06-180607

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		13		2	"	"	"	"	6010C
Barium		230		5	"	"	"	"	6010C
Beryllium		0.54		0.10	"	"	"	"	6010C
Cadmium		0.69		0.50	"	"	"	"	6010C
Chromium		52		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		56		4	"	"	"	"	6010C
Lead		76		3	"	"	"	"	6010C
Manganese		650		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		99		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		54		2	"	"	"	"	6010C
Zinc		180		8	"	"	"	"	6010C

Lab ID: 1806026-05

Soil - Sampled: 06/07/18 16:54



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SDG: 18159B

Reported: 06/28/18 17:49

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806026-05

Soil - Sampled: 06/07/18 16:54

Sample ID: OUM077-SM02-180607

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		7.8		2	"	"	"	"	6010C
Barium		250		5	"	"	"	"	6010C
Beryllium		0.54		0.10	"	"	"	"	6010C
Cadmium		0.74		0.50	"	"	"	"	6010C
Chromium		82		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		46		4	"	"	"	"	6010C
Lead		240		3	"	"	"	"	6010C
Manganese		450		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		120		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		2.8	C1, J	5	"	"	"	"	6010C
Vanadium		59		2	"	"	"	"	6010C
Zinc		200		8	"	"	"	"	6010C

Lab ID: 1806026-06

Soil - Sampled: 06/07/18 16:54

Sample ID: OUM077-SM06-180607

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		5.5		2	"	"	"	"	6010C
Barium		210		5	"	"	"	"	6010C
Beryllium		0.39		0.10	"	"	"	"	6010C
Cadmium		0.69		0.50	"	"	"	"	6010C
Chromium		55		1	"	"	"	"	6010C
Cobalt		8.7		2	"	"	"	"	6010C
Copper		45		4	"	"	"	"	6010C
Lead		140		3	"	"	"	"	6010C
Manganese		380		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		76		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		46		2	"	"	"	"	6010C
Zinc		220		8	"	"	"	"	6010C

Lab ID: 1806026-07

Soil - Sampled: 06/07/18 09:56



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Reported: 06/28/18 17:49

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806026-07

Soil - Sampled: 06/07/18 09:56

Sample ID: OUM050-SM02-180607

Metals by EPA 6000/7000 Series Methods

Antimony		ND	J, Q4, U	2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		4.6		2	"	"	"	"	6010C
Barium		230		5	"	"	"	"	6010C
Beryllium		0.36		0.10	"	"	"	"	6010C
Cadmium		1.0		0.50	"	"	"	"	6010C
Chromium		35		1	"	"	"	"	6010C
Cobalt		6.1		2	"	"	"	"	6010C
Copper		50	J, Q4	4	"	"	"	"	6010C
Lead		440		3	"	"	"	"	6010C
Manganese		330		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		36		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		3.7	C1, J	5	"	"	"	"	6010C
Vanadium		30		2	"	"	"	"	6010C
Zinc		300	J, Q4	8	"	"	"	"	6010C

Lab ID: 1806026-08

Soil - Sampled: 06/07/18 09:56

Sample ID: OUM050-SM06-180607

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		5.6		2	"	"	"	"	6010C
Barium		270		5	"	"	"	"	6010C
Beryllium		0.39		0.10	"	"	"	"	6010C
Cadmium		1.1		0.50	"	"	"	"	6010C
Chromium		38		1	"	"	"	"	6010C
Cobalt		6.5		2	"	"	"	"	6010C
Copper		43		4	"	"	"	"	6010C
Lead		520		3	"	"	"	"	6010C
Manganese		370		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		72		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		2.7	C1, J	5	"	"	"	"	6010C
Vanadium		34		2	"	"	"	"	6010C
Zinc		290		8	"	"	"	"	6010C

Lab ID: 1806026-09

Soil - Sampled: 06/07/18 09:56



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Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806026-09

Soil - Sampled: 06/07/18 09:56

Sample ID: OUM212-SM02-180607

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		4.5		2	"	"	"	"	6010C
Barium		220		5	"	"	"	"	6010C
Beryllium		0.34		0.10	"	"	"	"	6010C
Cadmium		0.93		0.50	"	"	"	"	6010C
Chromium		33		1	"	"	"	"	6010C
Cobalt		5.4		2	"	"	"	"	6010C
Copper		38		4	"	"	"	"	6010C
Lead		390		3	"	"	"	"	6010C
Manganese		290		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		39		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		2.6	C1, J	5	"	"	"	"	6010C
Vanadium		29		2	"	"	"	"	6010C
Zinc		260		8	"	"	"	"	6010C

Lab ID: 1806026-10

Soil - Sampled: 06/07/18 09:56

Sample ID: OUM213-SM06-180607

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		5.1		2	"	"	"	"	6010C
Barium		240		5	"	"	"	"	6010C
Beryllium		0.39		0.10	"	"	"	"	6010C
Cadmium		1.1		0.50	"	"	"	"	6010C
Chromium		36		1	"	"	"	"	6010C
Cobalt		6.5		2	"	"	"	"	6010C
Copper		41		4	"	"	"	"	6010C
Lead		510		3	"	"	"	"	6010C
Manganese		350		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		49		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		32		2	"	"	"	"	6010C
Zinc		280		8	"	"	"	"	6010C

Lab ID: 1806026-11

Soil - Sampled: 06/07/18 10:40



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Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806026-11

Soil - Sampled: 06/07/18 10:40

Sample ID: OUM052-SM02-180607

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		7.1		2	"	"	"	"	6010C
Barium		170		5	"	"	"	"	6010C
Beryllium		0.25		0.10	"	"	"	"	6010C
Cadmium		0.70		0.50	"	"	"	"	6010C
Chromium		40		1	"	"	"	"	6010C
Cobalt		5.5		2	"	"	"	"	6010C
Copper		38		4	"	"	"	"	6010C
Lead		93		3	"	"	"	"	6010C
Manganese		410		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		63		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		26		2	"	"	"	"	6010C
Zinc		200		8	"	"	"	"	6010C

Lab ID: 1806026-12

Soil - Sampled: 06/07/18 10:40

Sample ID: OUM052-SM06-180607

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		7.8		2	"	"	"	"	6010C
Barium		200		5	"	"	"	"	6010C
Beryllium		0.32		0.10	"	"	"	"	6010C
Cadmium		0.88		0.50	"	"	"	"	6010C
Chromium		47		1	"	"	"	"	6010C
Cobalt		8.1		2	"	"	"	"	6010C
Copper		44		4	"	"	"	"	6010C
Lead		100		3	"	"	"	"	6010C
Manganese		410		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		66		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		41		2	"	"	"	"	6010C
Zinc		320		8	"	"	"	"	6010C

Lab ID: 1806026-13

Soil - Sampled: 06/07/18 11:16



United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18159B

Reported: 06/28/18 17:49

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806026-13

Soil - Sampled: 06/07/18 11:16

Sample ID: OUM054-SM02-180607

Metals by EPA 6000/7000 Series Methods

Antimony		1.2	C1, J	2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		7.5		2	"	"	"	"	6010C
Barium		220		5	"	"	"	"	6010C
Beryllium		0.35		0.10	"	"	"	"	6010C
Cadmium		2.7		0.50	"	"	"	"	6010C
Chromium		63		1	"	"	"	"	6010C
Cobalt		14		2	"	"	"	"	6010C
Copper		95		4	"	"	"	"	6010C
Lead		430		3	"	"	"	"	6010C
Manganese		580		5	"	"	"	"	6010C
Molybdenum		5.0		5	"	"	"	"	6010C
Nickel		68		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.53	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		5.1		5	"	"	"	"	6010C
Vanadium		83		2	"	"	"	"	6010C
Zinc		760		8	"	"	"	"	6010C

Lab ID: 1806026-14

Soil - Sampled: 06/07/18 11:16

Sample ID: OUM054-SM06-180607

Metals by EPA 6000/7000 Series Methods

Antimony		1.3	C1, J	2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		7.1		2	"	"	"	"	6010C
Barium		220		5	"	"	"	"	6010C
Beryllium		0.37		0.10	"	"	"	"	6010C
Cadmium		3.0		0.50	"	"	"	"	6010C
Chromium		63		1	"	"	"	"	6010C
Cobalt		13		2	"	"	"	"	6010C
Copper		95		4	"	"	"	"	6010C
Lead		510		3	"	"	"	"	6010C
Manganese		590		5	"	"	"	"	6010C
Molybdenum		4.9	C1, J	5	"	"	"	"	6010C
Nickel		72		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.52	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		6.1		5	"	"	"	"	6010C
Vanadium		83		2	"	"	"	"	6010C
Zinc		810		8	"	"	"	"	6010C

Lab ID: 1806026-15

Soil - Sampled: 06/07/18 11:41

Sample ID: OUM056-SM02-180607

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
Region 9 Laboratory

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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

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SDG: 18159B

Reported: 06/28/18 17:49

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806026-15

Soil - Sampled: 06/07/18 11:41

Sample ID: OUM056-SM02-180607

Metals by EPA 6000/7000 Series Methods

Antimony		2.1		2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		8.2		2	"	"	"	"	6010C
Barium		240		5	"	"	"	"	6010C
Beryllium		0.68		0.10	"	"	"	"	6010C
Cadmium		3.3		0.50	"	"	"	"	6010C
Chromium		140		1	"	"	"	"	6010C
Cobalt		15		2	"	"	"	"	6010C
Copper		230		4	"	"	"	"	6010C
Lead		350		3	"	"	"	"	6010C
Manganese		510		5	"	"	"	"	6010C
Molybdenum		7.5		5	"	"	"	"	6010C
Nickel		120		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		1.4		1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		15		5	"	"	"	"	6010C
Vanadium		48		2	"	"	"	"	6010C
Zinc		1,000		8	"	"	"	"	6010C

Lab ID: 1806026-16

Soil - Sampled: 06/07/18 11:41

Sample ID: OUM056-SM06-180607

Metals by EPA 6000/7000 Series Methods

Antimony		1.0	C1, J	2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		7.6		2	"	"	"	"	6010C
Barium		210		5	"	"	"	"	6010C
Beryllium		0.52		0.10	"	"	"	"	6010C
Cadmium		2.3		0.50	"	"	"	"	6010C
Chromium		55		1	"	"	"	"	6010C
Cobalt		13		2	"	"	"	"	6010C
Copper		140		4	"	"	"	"	6010C
Lead		390		3	"	"	"	"	6010C
Manganese		590		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		150		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.54	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		8.1		5	"	"	"	"	6010C
Vanadium		52		2	"	"	"	"	6010C
Zinc		540		8	"	"	"	"	6010C

Lab ID: 1806026-17

Soil - Sampled: 06/07/18 12:20

Sample ID: OUM058-SM02-180607

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
Region 9 Laboratory

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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18159B

Reported: 06/28/18 17:49

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806026-17

Soil - Sampled: 06/07/18 12:20

Sample ID: OUM058-SM02-180607

Metals by EPA 6000/7000 Series Methods

Antimony		1.8	C1, J	2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		14		2	"	"	"	"	6010C
Barium		330		5	"	"	"	"	6010C
Beryllium		0.40		0.10	"	"	"	"	6010C
Cadmium		3.6		0.50	"	"	"	"	6010C
Chromium		73		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		150		4	"	"	"	"	6010C
Lead		270		3	"	"	"	"	6010C
Manganese		520		5	"	"	"	"	6010C
Molybdenum		2.9	C1, J	5	"	"	"	"	6010C
Nickel		64		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		1.1		1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		7.0		5	"	"	"	"	6010C
Vanadium		44		2	"	"	"	"	6010C
Zinc		670		8	"	"	"	"	6010C

Lab ID: 1806026-18

Soil - Sampled: 06/07/18 12:20

Sample ID: OUM058-SM06-180607

Metals by EPA 6000/7000 Series Methods

Antimony		2.0		2	mg/kg	B18F028	06/13/18	06/18/18	6010C
Arsenic		17		2	"	"	"	"	6010C
Barium		990		5	"	"	"	"	6010C
Beryllium		0.45		0.10	"	"	"	"	6010C
Cadmium		3.7		0.50	"	"	"	"	6010C
Chromium		65		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		130		4	"	"	"	"	6010C
Lead		320		3	"	"	"	"	6010C
Manganese		520		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		72		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.52	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		8.7		5	"	"	"	"	6010C
Vanadium		51		2	"	"	"	"	6010C
Zinc		570		8	"	"	"	"	6010C

Lab ID: 1806026-19

Soil - Sampled: 06/07/18 13:46

Sample ID: OUM060-SM02-180607

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18159B

Reported: 06/28/18 17:49

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806026-19

Soil - Sampled: 06/07/18 13:46

Sample ID: OUM060-SM02-180607

Metals by EPA 6000/7000 Series Methods									
Antimony	2.6	J, Q4	2	mg/kg	B18F028	06/13/18	06/18/18	6010C	
Arsenic	32		2	"	"	"	"	6010C	
Barium	240		5	"	"	"	"	6010C	
Beryllium	0.38		0.10	"	"	"	"	6010C	
Cadmium	1.4		0.50	"	"	"	"	6010C	
Chromium	53		1	"	"	"	"	6010C	
Cobalt	8.4		2	"	"	"	"	6010C	
Copper	73		4	"	"	"	"	6010C	
Lead	470		3	"	"	"	"	6010C	
Manganese	460		5	"	"	"	"	6010C	
Molybdenum	ND	U	5	"	"	"	"	6010C	
Nickel	37		5	"	"	"	"	6010C	
Selenium	ND	U	2	"	"	"	"	6010C	
Silver	ND	U	1	"	"	"	"	6010C	
Thallium	ND	U	5	"	"	"	"	6010C	
Tin	12		5	"	"	"	"	6010C	
Vanadium	34		2	"	"	"	"	6010C	
Zinc	380		8	"	"	"	"	6010C	

Lab ID: 1806026-20

Soil - Sampled: 06/07/18 13:46

Sample ID: OUM060-SM06-180607

Metals by EPA 6000/7000 Series Methods									
Antimony	2.6		2	mg/kg	B18F028	06/13/18	06/18/18	6010C	
Arsenic	71		2	"	"	"	"	6010C	
Barium	330		5	"	"	"	"	6010C	
Beryllium	0.55		0.10	"	"	"	"	6010C	
Cadmium	1.2		0.50	"	"	"	"	6010C	
Chromium	49		1	"	"	"	"	6010C	
Cobalt	10		2	"	"	"	"	6010C	
Copper	76		4	"	"	"	"	6010C	
Lead	560		3	"	"	"	"	6010C	
Manganese	580		5	"	"	"	"	6010C	
Molybdenum	ND	U	5	"	"	"	"	6010C	
Nickel	69		5	"	"	"	"	6010C	
Selenium	ND	U	2	"	"	"	"	6010C	
Silver	ND	U	1	"	"	"	"	6010C	
Thallium	ND	U	5	"	"	"	"	6010C	
Tin	18		5	"	"	"	"	6010C	
Vanadium	36		2	"	"	"	"	6010C	
Zinc	380		8	"	"	"	"	6010C	



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SDG: 18159B

Reported: 06/28/18 17:49

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F028 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/13/18 Analyzed: 06/18/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Blank (B18F028-BLK1)

Antimony	ND	U		2 mg/kg
Arsenic	ND	U		2 "
Barium	ND	U		5 "
Beryllium	ND	U		0.1 "
Cadmium	ND	U		0.5 "
Chromium	ND	U		1 "
Cobalt	ND	U		2 "
Copper	ND	U		4 "
Lead	ND	U		3 "
Manganese	ND	U		5 "
Molybdenum	ND	U		5 "
Nickel	ND	U		5 "
Selenium	ND	U		2 "
Silver	ND	U		1 "
Thallium	ND	U		5 "
Tin	ND	U		5 "
Vanadium	ND	U		2 "
Zinc	ND	U		8 "

Matrix Spike (B18F028-MS1)

Source: 1806026-07

Antimony	38.8		2 mg/kg	98.0	ND	40	75-125
Arsenic	399		2 "	392	4.57	101	75-125
Barium	586		5 "	392	231	90	75-125
Beryllium	9.82		0.1 "	9.80	0.357	97	75-125
Cadmium	10.2		0.5 "	9.80	1.05	93	75-125
Chromium	72		1 "	39.2	35.5	93	75-125
Cobalt	97.4		2 "	98.0	6.05	93	75-125
Copper	86.4		4 "	49.0	49.9	74	75-125
Lead	508	Q10	3 "	98.0	437	72	75-125
Manganese	402		5 "	98.0	325	78	75-125
Molybdenum	88.4		5 "	98.0	ND	90	75-125
Nickel	130		5 "	98.0	36	95	75-125
Selenium	372		2 "	392	ND	95	75-125
Silver	9.48		1 "	9.80	ND	97	75-125
Thallium	376		5 "	392	ND	96	75-125
Tin	82.3		5 "	98.0	3.71	80	75-125
Vanadium	125		2 "	98.0	30.1	97	75-125
Zinc	372		8 "	98.0	302	71	75-125

Matrix Spike (B18F028-MS2)

Source: 1806026-19

Antimony	39.6		2 mg/kg	99.0	2.57	37	75-125
Arsenic	431		2 "	396	31.7	101	75-125
Barium	607		5 "	396	237	94	75-125



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Reported: 06/28/18 17:49

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F028 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/13/18 Analyzed: 06/18/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Matrix Spike (B18F028-MS2)

Source: 1806026-19

Beryllium	9.82		0.1	"	9.90	0.377	95	75-125		
Cadmium	10.6		0.5	"	9.90	1.39	93	75-125		
Chromium	91.7		1	"	39.6	52.8	98	75-125		
Cobalt	101		2	"	99.0	8.41	94	75-125		
Copper	116		4	"	49.5	72.5	87	75-125		
Lead	560	Q10	3	"	99.0	468	93	75-125		
Manganese	553	Q10	5	"	99.0	463	91	75-125		
Molybdenum	89.5		5	"	99.0	ND	90	75-125		
Nickel	134		5	"	99.0	37.3	98	75-125		
Selenium	374		2	"	396	ND	94	75-125		
Silver	11.2		1	"	9.90	ND	113	75-125		
Thallium	376		5	"	396	ND	95	75-125		
Tin	93		5	"	99.0	12.5	81	75-125		
Vanadium	129		2	"	99.0	34	96	75-125		
Zinc	467		8	"	99.0	377	91	75-125		

Matrix Spike Dup (B18F028-MSD1)

Source: 1806026-07

Antimony	38.4		2	mg/kg	99.0	ND	39	75-125	0.9	20
Arsenic	409		2	"	396	4.57	102	75-125	2	20
Barium	598		5	"	396	231	93	75-125	2	20
Beryllium	10.1		0.1	"	9.90	0.357	98	75-125	3	20
Cadmium	10.4		0.5	"	9.90	1.05	95	75-125	2	20
Chromium	72.9		1	"	39.6	35.5	95	75-125	1	20
Cobalt	99.8		2	"	99.0	6.05	95	75-125	2	20
Copper	88		4	"	49.5	49.9	77	75-125	2	20
Lead	508	Q10	3	"	99.0	437	72	75-125	0.1	20
Manganese	408		5	"	99.0	325	84	75-125	2	20
Molybdenum	90.1		5	"	99.0	ND	91	75-125	2	20
Nickel	130		5	"	99.0	36	95	75-125	0.5	20
Selenium	380		2	"	396	ND	96	75-125	2	20
Silver	9.65		1	"	9.90	ND	97	75-125	2	20
Thallium	384		5	"	396	ND	97	75-125	2	20
Tin	83.1		5	"	99.0	3.71	80	75-125	1	20
Vanadium	127		2	"	99.0	30.1	98	75-125	2	20
Zinc	379		8	"	99.0	302	78	75-125	2	20

Matrix Spike Dup (B18F028-MSD2)

Source: 1806026-19

Antimony	40.4		2	mg/kg	98.0	2.57	39	75-125	2	20
Arsenic	442		2	"	392	31.7	105	75-125	3	20
Barium	651		5	"	392	237	106	75-125	7	20
Beryllium	10.2		0.1	"	9.80	0.377	100	75-125	4	20
Cadmium	10.8		0.5	"	9.80	1.39	95	75-125	2	20
Chromium	95		1	"	39.2	52.8	108	75-125	4	20



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Reported: 06/28/18 17:49

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F028 - 3050B Sid Acid Dig - Metals by 6010

Prepared: 06/13/18 Analyzed: 06/18/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Matrix Spike Dup (B18F028-MSD2)

Source: 1806026-19

Cobalt	105			2	"	98.0	8.41	99	75-125	4	20
Copper	121			4	"	49.0	72.5	99	75-125	5	20
Lead	574	Q10		3	"	98.0	468	108	75-125	2	20
Manganese	582	Q10		5	"	98.0	463	121	75-125	5	20
Molybdenum	91.9			5	"	98.0	ND	94	75-125	3	20
Nickel	138			5	"	98.0	37.3	102	75-125	2	20
Selenium	385			2	"	392	ND	98	75-125	3	20
Silver	10			1	"	9.80	ND	102	75-125	11	20
Thallium	384			5	"	392	ND	98	75-125	2	20
Tin	95			5	"	98.0	12.5	84	75-125	2	20
Vanadium	135			2	"	98.0	34	103	75-125	4	20
Zinc	491			8	"	98.0	377	116	75-125	5	20

Reference (B18F028-SRM1)

Antimony	52.5			2	mg/kg	66.0		80	41.2-158		
Arsenic	249			2	"	253		99	60.9-139		
Barium	ND	U		5	"	1.60			62.5-138		
Beryllium	4.51			0.1	"	4.90		92	61.2-139		
Cadmium	9.52			0.5	"	10.9		87	70.6-128		
Chromium	25			1	"	27.1		92	68.3-132		
Cobalt	33.3			2	"	37.4		89	64.7-135		
Copper	1,410			4	"	1770		79	74.6-126		
Lead	48.9			3	"	56.9		86	72.8-127		
Manganese	54.6			5	"	61.0		89	68.2-132		
Nickel	14.2			5	"	16.3		87	55.2-145		
Selenium	7.49			2	"	10.0		75	41-159		
Silver	5.41			1	"	5.90		92	45.8-154		
Thallium	8.21			5	"	9.50		86	30.5-169		
Vanadium	16			2	"	17.6		91	65.9-135		
Zinc	42.2			8	"	47.5		89	43.2-157		



United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18159B

Reported: 06/28/18 17:49

Qualifiers and Comments

Q4 The matrix spike and/or matrix spike duplicate associated with this sample did not meet recovery criteria for this analyte (see MS/MSD results for this batch in QC summary)

Q10 The analyte concentration in the unfortified sample is significantly greater than the concentration spiked into the matrix spike and matrix spike duplicate. The reported spike recovery is not a meaningful measure of the dataset's analytical accuracy.

J The reported result for this analyte should be considered an estimated value.

C1 The reported concentration for this analyte is below the quantitation limit.

U Not Detected

NR Not Reported

RE1, RE2, etc: Result is from a sample re-analysis.



**United States Environmental Protection Agency
Region 9 Laboratory**

1337 S. 46th Street Building 201
Richmond, CA 94804

Date: 6/28/2018

Subject: Analytical Testing Results - Project R18S52
SDG: 18159A

From: Peter Husby, Director
EPA Region 9 Laboratory
EMD-3-1

To: Sharon Bowen
Brownfields and Site Assessment Section
SFD-6-1

Attached are the results from the analysis of samples from the **West Oakland Urban Metals Study** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Electronic CC: Amanda Reilly, Weston Solutions
Tom Fortner, Weston Solutions
Rick Fears, California DTSC

Analyses included in this report:

Metals by ICP



United States Environmental Protection Agency
Region 9 Laboratory

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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18159A

Reported: 06/28/18 17:03

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
OUM041-SM02-180607	1806025-01	Soil	06/07/18 10:05	06/08/18 08:23
OUM041-SM06-180607	1806025-02	Soil	06/07/18 10:05	06/08/18 08:23
OUM043-SM02-180607	1806025-03	Soil	06/07/18 10:30	06/08/18 08:23
OUM043-SM06-180607	1806025-04	Soil	06/07/18 10:30	06/08/18 08:23
OUM045-SM02-180607	1806025-05	Soil	06/07/18 10:55	06/08/18 08:23
OUM045-SM06-180607	1806025-06	Soil	06/07/18 10:55	06/08/18 08:23
OUM047-SM02-180607	1806025-07	Soil	06/07/18 11:24	06/08/18 08:23
OUM047-SM06-180607	1806025-08	Soil	06/07/18 11:24	06/08/18 08:23
OUM049-SM02-180607	1806025-09	Soil	06/07/18 11:56	06/08/18 08:23
OUM049-SM06-180607	1806025-10	Soil	06/07/18 11:56	06/08/18 08:23
OUM051-SM02-180607	1806025-11	Soil	06/07/18 12:22	06/08/18 08:23
OUM051-SM06-180607	1806025-12	Soil	06/07/18 12:22	06/08/18 08:23
OUM053-SM02-180607	1806025-13	Soil	06/07/18 13:29	06/08/18 08:23
OUM053-SM06-180607	1806025-14	Soil	06/07/18 13:29	06/08/18 08:23
OUM055-SM02-180607	1806025-15	Soil	06/07/18 14:02	06/08/18 08:23
OUM055-SM06-180607	1806025-16	Soil	06/07/18 14:02	06/08/18 08:23
OUM057-SM02-180607	1806025-17	Soil	06/07/18 14:41	06/08/18 08:23
OUM057-SM06-180607	1806025-18	Soil	06/07/18 14:41	06/08/18 08:23
OUM059-SM02-180607	1806025-19	Soil	06/07/18 15:21	06/08/18 08:23
OUM059-SM06-180607	1806025-20	Soil	06/07/18 15:21	06/08/18 08:23

Work Order 1806025

Bulk soil samples were received at the EPA Region 9 Laboratory. The soils were thoroughly mixed to homogenize and a portion was removed for drying and sieving. This portion was dried overnight at 37 degrees C (as per EPA method 1340) and sieved through a 150 um sieve. The < 150 um fraction was acid digested and analyzed for metals using ICP/AES. A portion of the sieved sample was retained for possible *in vitro* bioaccessibility assay at a future date. Exceptions noted below:

For Laboratory IDs 1806025-03 and 1806025-14, due to very little soil remaining in the sample bag after removal of rocks during homogenization, the entire amount was dried and sieved.

By request, additional sample aliquot were dried for Laboratory IDs 1806025-16, 1806025-19, and 1806025-20.



United States Environmental Protection Agency
Region 9 Laboratory

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Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18159A

Reported: 06/28/18 17:03

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806025-01

Soil - Sampled: 06/07/18 10:05

Sample ID: OUM041-SM02-180607

Metals by EPA 6000/7000 Series Methods

Antimony		1.7	C1, J	2	mg/kg	B18F027	06/13/18	06/15/18	6010C
Arsenic		8.5		2	"	"	"	"	6010C
Barium		250		5	"	"	"	"	6010C
Beryllium		0.53		0.10	"	"	"	"	6010C
Cadmium		2.0		0.50	"	"	"	"	6010C
Chromium		78		1	"	"	"	"	6010C
Cobalt		14		2	"	"	"	"	6010C
Copper		83		4	"	"	"	"	6010C
Lead		540		3	"	"	"	"	6010C
Manganese		540		5	"	"	"	"	6010C
Molybdenum		2.7	C1, J	5	"	"	"	"	6010C
Nickel		120		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		8.9		5	"	"	"	"	6010C
Vanadium		56		2	"	"	"	"	6010C
Zinc		510		8	"	"	"	"	6010C

Lab ID: 1806025-02

Soil - Sampled: 06/07/18 10:05

Sample ID: OUM041-SM06-180607

Metals by EPA 6000/7000 Series Methods

Antimony		11		2	mg/kg	B18F027	06/13/18	06/15/18	6010C
Arsenic		8.7		2	"	"	"	"	6010C
Barium		270		5	"	"	"	"	6010C
Beryllium		0.55		0.10	"	"	"	"	6010C
Cadmium		1.6		0.50	"	"	"	"	6010C
Chromium		61		1	"	"	"	"	6010C
Cobalt		13		2	"	"	"	"	6010C
Copper		88		4	"	"	"	"	6010C
Lead		460		3	"	"	"	"	6010C
Manganese		560		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		120		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		54		5	"	"	"	"	6010C
Vanadium		53		2	"	"	"	"	6010C
Zinc		380		8	"	"	"	"	6010C

Lab ID: 1806025-03

Soil - Sampled: 06/07/18 10:30

Sample ID: OUM043-SM02-180607

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
Region 9 Laboratory

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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18159A

Reported: 06/28/18 17:03

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806025-03

Soil - Sampled: 06/07/18 10:30

Sample ID: OUM043-SM02-180607

Metals by EPA 6000/7000 Series Methods

Antimony		4.0		2	mg/kg	B18F027	06/13/18	06/15/18	6010C
Arsenic		83		2	"	"	"	"	6010C
Barium		270		5	"	"	"	"	6010C
Beryllium		0.57		0.10	"	"	"	"	6010C
Cadmium		4.9		0.50	"	"	"	"	6010C
Chromium		100		1	"	"	"	"	6010C
Cobalt		17		2	"	"	"	"	6010C
Copper		470		4	"	"	"	"	6010C
Lead		460		3	"	"	"	"	6010C
Manganese		550		5	"	"	"	"	6010C
Molybdenum		7.9		5	"	"	"	"	6010C
Nickel		160		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.90	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		24		5	"	"	"	"	6010C
Vanadium		55		2	"	"	"	"	6010C
Zinc		1,400		8	"	"	"	"	6010C

Lab ID: 1806025-04

Soil - Sampled: 06/07/18 10:30

Sample ID: OUM043-SM06-180607

Metals by EPA 6000/7000 Series Methods

Antimony		3.8		2	mg/kg	B18F027	06/13/18	06/15/18	6010C
Arsenic		280		2	"	"	"	"	6010C
Barium		230		5	"	"	"	"	6010C
Beryllium		0.67		0.10	"	"	"	"	6010C
Cadmium		2.7		0.50	"	"	"	"	6010C
Chromium		58		1	"	"	"	"	6010C
Cobalt		13		2	"	"	"	"	6010C
Copper		330		4	"	"	"	"	6010C
Lead		480		3	"	"	"	"	6010C
Manganese		560		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		92		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		29		5	"	"	"	"	6010C
Vanadium		54		2	"	"	"	"	6010C
Zinc		440		8	"	"	"	"	6010C

Lab ID: 1806025-05

Soil - Sampled: 06/07/18 10:55

Sample ID: OUM045-SM02-180607

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
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Project Manager: Sharon Bowen
Project Number: R18S52
Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section
75 Hawthorne Street
San Francisco CA, 94105

SDG: 18159A
Reported: 06/28/18 17:03

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806025-05

Soil - Sampled: 06/07/18 10:55

Sample ID: OUM045-SM02-180607

Metals by EPA 6000/7000 Series Methods									
							06/13/18	06/15/18	6010C
Antimony	1.6	C1, Q4, J	2	mg/kg	B18F027				6010C
Arsenic	7.4		2	"	"	"	"	"	6010C
Barium	210		5	"	"	"	"	"	6010C
Beryllium	0.39		0.10	"	"	"	"	"	6010C
Cadmium	1.0		0.50	"	"	"	"	"	6010C
Chromium	77		1	"	"	"	"	"	6010C
Cobalt	11		2	"	"	"	"	"	6010C
Copper	75		4	"	"	"	"	"	6010C
Lead	140		3	"	"	"	"	"	6010C
Manganese	470		5	"	"	"	"	"	6010C
Molybdenum	ND	U	5	"	"	"	"	"	6010C
Nickel	59		5	"	"	"	"	"	6010C
Selenium	ND	U	2	"	"	"	"	"	6010C
Silver	ND	U	1	"	"	"	"	"	6010C
Thallium	ND	U	5	"	"	"	"	"	6010C
Tin	2.9	C1, J	5	"	"	"	"	"	6010C
Vanadium	52		2	"	"	"	"	"	6010C
Zinc	330		8	"	"	"	"	"	6010C

Lab ID: 1806025-06

Soil - Sampled: 06/07/18 10:55

Sample ID: OUM045-SM06-180607

Metals by EPA 6000/7000 Series Methods									
							06/13/18	06/15/18	6010C
Antimony	ND	U	2	mg/kg	B18F027				6010C
Arsenic	6.9		2	"	"	"	"	"	6010C
Barium	170		5	"	"	"	"	"	6010C
Beryllium	0.41		0.10	"	"	"	"	"	6010C
Cadmium	0.49	C1, J	0.50	"	"	"	"	"	6010C
Chromium	55		1	"	"	"	"	"	6010C
Cobalt	9.4		2	"	"	"	"	"	6010C
Copper	44		4	"	"	"	"	"	6010C
Lead	95		3	"	"	"	"	"	6010C
Manganese	400		5	"	"	"	"	"	6010C
Molybdenum	ND	U	5	"	"	"	"	"	6010C
Nickel	75		5	"	"	"	"	"	6010C
Selenium	ND	U	2	"	"	"	"	"	6010C
Silver	ND	U	1	"	"	"	"	"	6010C
Thallium	ND	U	5	"	"	"	"	"	6010C
Tin	ND	U	5	"	"	"	"	"	6010C
Vanadium	49		2	"	"	"	"	"	6010C
Zinc	140		8	"	"	"	"	"	6010C

Lab ID: 1806025-07

Soil - Sampled: 06/07/18 11:24



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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18159A

Reported: 06/28/18 17:03

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806025-07

Soil - Sampled: 06/07/18 11:24

Sample ID: OUM047-SM02-180607

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F027	06/13/18	06/15/18	6010C
Arsenic		3.6		2	"	"	"	"	6010C
Barium		190		5	"	"	"	"	6010C
Beryllium		0.42		0.10	"	"	"	"	6010C
Cadmium		0.27	C1, J	0.50	"	"	"	"	6010C
Chromium		32		1	"	"	"	"	6010C
Cobalt		6.2		2	"	"	"	"	6010C
Copper		22		4	"	"	"	"	6010C
Lead		91		3	"	"	"	"	6010C
Manganese		310		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		31		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		28		2	"	"	"	"	6010C
Zinc		89		8	"	"	"	"	6010C

Lab ID: 1806025-08

Soil - Sampled: 06/07/18 11:24

Sample ID: OUM047-SM06-180607

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F027	06/13/18	06/15/18	6010C
Arsenic		4.0		2	"	"	"	"	6010C
Barium		220		5	"	"	"	"	6010C
Beryllium		0.44		0.10	"	"	"	"	6010C
Cadmium		0.46	C1, J	0.50	"	"	"	"	6010C
Chromium		34		1	"	"	"	"	6010C
Cobalt		6.8		2	"	"	"	"	6010C
Copper		42		4	"	"	"	"	6010C
Lead		150		3	"	"	"	"	6010C
Manganese		430		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		33		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		3.1	C1, J	5	"	"	"	"	6010C
Vanadium		30		2	"	"	"	"	6010C
Zinc		210		8	"	"	"	"	6010C

Lab ID: 1806025-09

Soil - Sampled: 06/07/18 11:56



United States Environmental Protection Agency
Region 9 Laboratory

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Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18159A

Reported: 06/28/18 17:03

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806025-09

Soil - Sampled: 06/07/18 11:56

Sample ID: OUM049-SM02-180607

Metals by EPA 6000/7000 Series Methods

Antimony		1.7	C1, J	2	mg/kg	B18F027	06/13/18	06/15/18	6010C
Arsenic		5.9		2	"	"	"	"	6010C
Barium		250		5	"	"	"	"	6010C
Beryllium		0.41		0.10	"	"	"	"	6010C
Cadmium		1.7		0.50	"	"	"	"	6010C
Chromium		46		1	"	"	"	"	6010C
Cobalt		7.6		2	"	"	"	"	6010C
Copper		56		4	"	"	"	"	6010C
Lead		420		3	"	"	"	"	6010C
Manganese		390		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		43		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		4.2	C1, J	5	"	"	"	"	6010C
Vanadium		39		2	"	"	"	"	6010C
Zinc		460		8	"	"	"	"	6010C

Lab ID: 1806025-10

Soil - Sampled: 06/07/18 11:56

Sample ID: OUM049-SM06-180607

Metals by EPA 6000/7000 Series Methods

Antimony		1.2	C1, J	2	mg/kg	B18F027	06/13/18	06/15/18	6010C
Arsenic		5.3		2	"	"	"	"	6010C
Barium		190		5	"	"	"	"	6010C
Beryllium		0.46		0.10	"	"	"	"	6010C
Cadmium		0.98		0.50	"	"	"	"	6010C
Chromium		38		1	"	"	"	"	6010C
Cobalt		8.5		2	"	"	"	"	6010C
Copper		49		4	"	"	"	"	6010C
Lead		210		3	"	"	"	"	6010C
Manganese		350		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		37		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		35		2	"	"	"	"	6010C
Zinc		260		8	"	"	"	"	6010C

Lab ID: 1806025-11

Soil - Sampled: 06/07/18 12:22



United States Environmental Protection Agency Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Sharon Bowen
Project Number: R18S52
Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section
75 Hawthorne Street
San Francisco CA, 94105

SDG: 18159A
Reported: 06/28/18 17:03

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806025-11

Soil - Sampled: 06/07/18 12:22

Sample ID: OUM051-SM02-180607

Metals by EPA 6000/7000 Series Methods									
Antimony		2.3		2	mg/kg	B18F027	06/13/18	06/15/18	6010C
Arsenic		8.2		2	"	"	"	"	6010C
Barium		590		5	"	"	"	"	6010C
Beryllium		0.52		0.10	"	"	"	"	6010C
Cadmium		2.0		0.50	"	"	"	"	6010C
Chromium		48		1	"	"	"	"	6010C
Cobalt		13		2	"	"	"	"	6010C
Copper		91		4	"	"	"	"	6010C
Lead		760		3	"	"	"	"	6010C
Manganese		710		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		59		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		13		5	"	"	"	"	6010C
Vanadium		52		2	"	"	"	"	6010C
Zinc		470		8	"	"	"	"	6010C

Lab ID: 1806025-12

Soil - Sampled: 06/07/18 12:22

Sample ID: OUM051-SM06-180607

Metals by EPA 6000/7000 Series Methods									
Antimony		1.2	C1, J	2	mg/kg	B18F027	06/13/18	06/15/18	6010C
Arsenic		6.9		2	"	"	"	"	6010C
Barium		340		5	"	"	"	"	6010C
Beryllium		0.56		0.10	"	"	"	"	6010C
Cadmium		0.69		0.50	"	"	"	"	6010C
Chromium		44		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		50		4	"	"	"	"	6010C
Lead		140		3	"	"	"	"	6010C
Manganese		640		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		68		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		51		2	"	"	"	"	6010C
Zinc		170		8	"	"	"	"	6010C

Lab ID: 1806025-13

Soil - Sampled: 06/07/18 13:29



United States Environmental Protection Agency
Region 9 Laboratory

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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18159A

Reported: 06/28/18 17:03

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806025-13

Soil - Sampled: 06/07/18 13:29

Sample ID: OUM053-SM02-180607

Metals by EPA 6000/7000 Series Methods

Antimony		3.9		2	mg/kg	B18F027	06/13/18	06/15/18	6010C
Arsenic		11		2	"	"	"	"	6010C
Barium		360		5	"	"	"	"	6010C
Beryllium		0.58		0.10	"	"	"	"	6010C
Cadmium		4.9		0.50	"	"	"	"	6010C
Chromium		79		1	"	"	"	"	6010C
Cobalt		15		2	"	"	"	"	6010C
Copper		200		4	"	"	"	"	6010C
Lead		650		3	"	"	"	"	6010C
Manganese		710		5	"	"	"	"	6010C
Molybdenum		11		5	"	"	"	"	6010C
Nickel		87		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.55	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		55		5	"	"	"	"	6010C
Vanadium		59		2	"	"	"	"	6010C
Zinc		1,300		8	"	"	"	"	6010C

Lab ID: 1806025-14

Soil - Sampled: 06/07/18 13:29

Sample ID: OUM053-SM06-180607

Metals by EPA 6000/7000 Series Methods

Antimony		3.9		2	mg/kg	B18F027	06/13/18	06/15/18	6010C
Arsenic		12		2	"	"	"	"	6010C
Barium		470		5	"	"	"	"	6010C
Beryllium		0.59		0.10	"	"	"	"	6010C
Cadmium		5.6		0.50	"	"	"	"	6010C
Chromium		82		1	"	"	"	"	6010C
Cobalt		15		2	"	"	"	"	6010C
Copper		230		4	"	"	"	"	6010C
Lead		970		3	"	"	"	"	6010C
Manganese		680		5	"	"	"	"	6010C
Molybdenum		9.2		5	"	"	"	"	6010C
Nickel		110		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		66		5	"	"	"	"	6010C
Vanadium		59		2	"	"	"	"	6010C
Zinc		1,300		8	"	"	"	"	6010C

Lab ID: 1806025-15

Soil - Sampled: 06/07/18 14:02

Sample ID: OUM055-SM02-180607

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
Region 9 Laboratory

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Project: West Oakland Urban Metals Study

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75 Hawthorne Street

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SDG: 18159A

Reported: 06/28/18 17:03

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806025-15

Soil - Sampled: 06/07/18 14:02

Sample ID: OUM055-SM02-180607

Metals by EPA 6000/7000 Series Methods

Antimony		1.6	C1, J	2	mg/kg	B18F027	06/13/18	06/15/18	6010C
Arsenic		7.4		2	"	"	"	"	6010C
Barium		220		5	"	"	"	"	6010C
Beryllium		0.36		0.10	"	"	"	"	6010C
Cadmium		1.1		0.50	"	"	"	"	6010C
Chromium		58		1	"	"	"	"	6010C
Cobalt		16		2	"	"	"	"	6010C
Copper		140		4	"	"	"	"	6010C
Lead		210		3	"	"	"	"	6010C
Manganese		490		5	"	"	"	"	6010C
Molybdenum		2.7	C1, J	5	"	"	"	"	6010C
Nickel		56		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		5.7		5	"	"	"	"	6010C
Vanadium		50		2	"	"	"	"	6010C
Zinc		300		8	"	"	"	"	6010C

Lab ID: 1806025-16

Soil - Sampled: 06/07/18 14:02

Sample ID: OUM055-SM06-180607

Metals by EPA 6000/7000 Series Methods

Antimony		1.5	C1, J	2	mg/kg	B18F027	06/13/18	06/15/18	6010C
Arsenic		7.6		2	"	"	"	"	6010C
Barium		290		5	"	"	"	"	6010C
Beryllium		0.56		0.10	"	"	"	"	6010C
Cadmium		0.60		0.50	"	"	"	"	6010C
Chromium		40		1	"	"	"	"	6010C
Cobalt		10		2	"	"	"	"	6010C
Copper		280		4	"	"	"	"	6010C
Lead		400		3	"	"	"	"	6010C
Manganese		530		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		65		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		21		5	"	"	"	"	6010C
Vanadium		45		2	"	"	"	"	6010C
Zinc		360		8	"	"	"	"	6010C

Lab ID: 1806025-17

Soil - Sampled: 06/07/18 14:41

Sample ID: OUM057-SM02-180607

Metals by EPA 6000/7000 Series Methods



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Region 9 Laboratory

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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18159A

Reported: 06/28/18 17:03

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806025-17

Soil - Sampled: 06/07/18 14:41

Sample ID: OUM057-SM02-180607

Metals by EPA 6000/7000 Series Methods

Antimony		1.2	C1, J	2	mg/kg	B18F027	06/13/18	06/15/18	6010C
Arsenic		16		2	"	"	"	"	6010C
Barium		150		5	"	"	"	"	6010C
Beryllium		0.38		0.10	"	"	"	"	6010C
Cadmium		2.3		0.50	"	"	"	"	6010C
Chromium		56		1	"	"	"	"	6010C
Cobalt		9.1		2	"	"	"	"	6010C
Copper		85		4	"	"	"	"	6010C
Lead		150		3	"	"	"	"	6010C
Manganese		380		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		43		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.54	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		6.8		5	"	"	"	"	6010C
Vanadium		40		2	"	"	"	"	6010C
Zinc		2,000		8	"	"	"	"	6010C

Lab ID: 1806025-18

Soil - Sampled: 06/07/18 14:41

Sample ID: OUM057-SM06-180607

Metals by EPA 6000/7000 Series Methods

Antimony		1.1	C1, J	2	mg/kg	B18F027	06/13/18	06/15/18	6010C
Arsenic		29		2	"	"	"	"	6010C
Barium		150		5	"	"	"	"	6010C
Beryllium		0.40		0.10	"	"	"	"	6010C
Cadmium		1.0		0.50	"	"	"	"	6010C
Chromium		50		1	"	"	"	"	6010C
Cobalt		9.0		2	"	"	"	"	6010C
Copper		51		4	"	"	"	"	6010C
Lead		95		3	"	"	"	"	6010C
Manganese		440		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		45		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		2.8	C1, J	5	"	"	"	"	6010C
Vanadium		40		2	"	"	"	"	6010C
Zinc		840		8	"	"	"	"	6010C

Lab ID: 1806025-19

Soil - Sampled: 06/07/18 15:21

Sample ID: OUM059-SM02-180607

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency Region 9 Laboratory

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Project Number: R18S52
Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section
75 Hawthorne Street
San Francisco CA, 94105

SDG: 18159A
Reported: 06/28/18 17:03

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806025-19

Soil - Sampled: 06/07/18 15:21

Sample ID: OUM059-SM02-180607

Metals by EPA 6000/7000 Series Methods									
							06/13/18	06/15/18	6010C
Antimony		ND	U	2	mg/kg	B18F027			6010C
Arsenic		4.9		2	"	"	"	"	6010C
Barium		240		5	"	"	"	"	6010C
Beryllium		0.29		0.10	"	"	"	"	6010C
Cadmium		0.45	C1, J	0.50	"	"	"	"	6010C
Chromium		56		1	"	"	"	"	6010C
Cobalt		6.8		2	"	"	"	"	6010C
Copper		66		4	"	"	"	"	6010C
Lead		28		3	"	"	"	"	6010C
Manganese		260		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		39		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		63		2	"	"	"	"	6010C
Zinc		120		8	"	"	"	"	6010C

Lab ID: 1806025-20

Soil - Sampled: 06/07/18 15:21

Sample ID: OUM059-SM06-180607

Metals by EPA 6000/7000 Series Methods									
							06/13/18	06/15/18	6010C
Antimony		1.0	C1, J	2	mg/kg	B18F027			6010C
Arsenic		5.8		2	"	"	"	"	6010C
Barium		120		5	"	"	"	"	6010C
Beryllium		0.37		0.10	"	"	"	"	6010C
Cadmium		0.45	C1, J	0.50	"	"	"	"	6010C
Chromium		96		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		32		4	"	"	"	"	6010C
Lead		38		3	"	"	"	"	6010C
Manganese		410		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		51		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		120		2	"	"	"	"	6010C
Zinc		130		8	"	"	"	"	6010C



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SDG: 18159A

Reported: 06/28/18 17:03

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F027 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/13/18 Analyzed: 06/15/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Blank (B18F027-BLK1)

Antimony	ND	U		2 mg/kg						
Arsenic	ND	U		2 "						
Barium	ND	U		5 "						
Beryllium	ND	U		0.1 "						
Cadmium	ND	U		0.5 "						
Chromium	ND	U		1 "						
Cobalt	ND	U		2 "						
Copper	ND	U		4 "						
Lead	ND	U		3 "						
Manganese	ND	U		5 "						
Molybdenum	ND	U		5 "						
Nickel	ND	U		5 "						
Selenium	ND	U		2 "						
Silver	ND	U		1 "						
Thallium	ND	U		5 "						
Tin	ND	U		5 "						
Vanadium	ND	U		2 "						
Zinc	ND	U		8 "						

Matrix Spike (B18F027-MS1)

Source: 1806025-05

Antimony	37.7			2 mg/kg	98.0	1.64	37	75-125		
Arsenic	425			2 "	392	7.39	106	75-125		
Barium	597			5 "	392	211	99	75-125		
Beryllium	10.8			0.1 "	9.80	0.388	106	75-125		
Cadmium	10.8			0.5 "	9.80	1.02	100	75-125		
Chromium	117			1 "	39.2	77	102	75-125		
Cobalt	110			2 "	98.0	10.6	101	75-125		
Copper	126			4 "	49.0	75.1	104	75-125		
Lead	238			3 "	98.0	141	99	75-125		
Manganese	584	Q10		5 "	98.0	469	118	75-125		
Molybdenum	97.4			5 "	98.0	ND	99	75-125		
Nickel	154			5 "	98.0	58.5	98	75-125		
Selenium	399			2 "	392	ND	102	75-125		
Silver	10.3			1 "	9.80	ND	105	75-125		
Thallium	393			5 "	392	ND	100	75-125		
Tin	85.9			5 "	98.0	2.86	85	75-125		
Vanadium	159			2 "	98.0	52.5	109	75-125		
Zinc	439			8 "	98.0	330	111	75-125		

Matrix Spike Dup (B18F027-MSD1)

Source: 1806025-05

Antimony	36.7			2 mg/kg	98.0	1.64	36	75-125	3	20
Arsenic	412			2 "	392	7.39	103	75-125	3	20
Barium	577			5 "	392	211	93	75-125	3	20



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SDG: 18159A
Reported: 06/28/18 17:03

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F027 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/13/18 Analyzed: 06/15/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Matrix Spike Dup (B18F027-MSD1)

Source: 1806025-05

Beryllium	10.3		0.1	"	9.80	0.388	101	75-125	5	20
Cadmium	10.5		0.5	"	9.80	1.02	96	75-125	3	20
Chromium	115		1	"	39.2	77	96	75-125	2	20
Cobalt	105		2	"	98.0	10.6	96	75-125	4	20
Copper	120		4	"	49.0	75.1	92	75-125	5	20
Lead	237		3	"	98.0	141	98	75-125	0.2	20
Manganese	559	Q10	5	"	98.0	469	92	75-125	4	20
Molybdenum	94.2		5	"	98.0	ND	96	75-125	3	20
Nickel	152		5	"	98.0	58.5	95	75-125	2	20
Selenium	388		2	"	392	ND	99	75-125	3	20
Silver	9.83		1	"	9.80	ND	100	75-125	4	20
Thallium	382		5	"	392	ND	97	75-125	3	20
Tin	84.9		5	"	98.0	2.86	84	75-125	1	20
Vanadium	157		2	"	98.0	52.5	106	75-125	2	20
Zinc	424		8	"	98.0	330	96	75-125	4	20

Reference (B18F027-SRM1)

Antimony	51.8		2	mg/kg	66.0		78	41.2-158		
Arsenic	241		2	"	253		95	60.9-139		
Barium	ND	U	5	"	1.60			62.5-138		
Beryllium	4.48		0.1	"	4.90		91	61.2-139		
Cadmium	9.75		0.5	"	10.9		89	70.6-128		
Chromium	25.4		1	"	27.1		94	68.3-132		
Cobalt	33.1		2	"	37.4		88	64.7-135		
Copper	1,380		4	"	1770		78	74.6-126		
Lead	47.6		3	"	56.9		84	72.8-127		
Manganese	53.5		5	"	61.0		88	68.2-132		
Nickel	13.9		5	"	16.3		85	55.2-145		
Selenium	7.28		2	"	10.0		73	41-159		
Silver	4.79		1	"	5.90		81	45.8-154		
Thallium	7.99		5	"	9.50		84	30.5-169		
Vanadium	16.4		2	"	17.6		93	65.9-135		
Zinc	40.8		8	"	47.5		86	43.2-157		



United States Environmental Protection Agency

Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804

Phone:(510) 412-2300

Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18159A

Reported: 06/28/18 17:03

Qualifiers and Comments

Q4 The matrix spike and/or matrix spike duplicate associated with this sample did not meet recovery criteria for this analyte (see MS/MSD results for this batch in QC summary)

Q10 The analyte concentration in the unfortified sample is significantly greater than the concentration spiked into the matrix spike and matrix spike duplicate. The reported spike recovery is not a meaningful measure of the dataset's analytical accuracy.

J The reported result for this analyte should be considered an estimated value.

C1 The reported concentration for this analyte is below the quantitation limit.

U Not Detected

NR Not Reported

RE1, RE2, etc: Result is from a sample re-analysis.



**United States Environmental Protection Agency
Region 9 Laboratory**

1337 S. 46th Street Building 201
Richmond, CA 94804

Date: 6/26/2018

Subject: Analytical Testing Results - Project R18S52
SDG: 18158D

From: Peter Husby, Director
EPA Region 9 Laboratory
EMD-3-1

To: Sharon Bowen
Brownfields and Site Assessment Section
SFD-6-1

Attached are the results from the analysis of samples from the **West Oakland Urban Metals Study** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Electronic CC: Amanda Reilly, Weston Solutions
Tom Fortner, Weston Solutions
Rick Fears, California DTSC

Analyses included in this report:

Metals by ICP

Percent Solids



United States Environmental Protection Agency
Region 9 Laboratory

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Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18158D

Reported: 06/26/18 12:23

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
OUM025-SM06-180606	1806016-01	Soil	06/06/18 10:51	06/07/18 08:25
OUM027-SM02-180606	1806016-02	Soil	06/06/18 11:23	06/07/18 08:25
OUM027-SM06-180606	1806016-03	Soil	06/06/18 11:23	06/07/18 08:25
OUM029-SM02-180606	1806016-04	Soil	06/06/18 13:45	06/07/18 08:25
OUM029-SM06-180606	1806016-05	Soil	06/06/18 13:45	06/07/18 08:25
OUM015-SM02-180606	1806016-06	Soil	06/06/18 11:54	06/07/18 08:25
OUM015-SM06-180606	1806016-07	Soil	06/06/18 11:54	06/07/18 08:25
OUM017-SM02-180606	1806016-08	Soil	06/06/18 13:08	06/07/18 08:25
OUM017-SM06-180606	1806016-09	Soil	06/06/18 13:08	06/07/18 08:25
OUM211-SM06-180606	1806016-10	Soil	06/06/18 14:20	06/07/18 08:25
OUM040-SM02-180606	1806016-11	Soil	06/06/18 14:20	06/07/18 08:25
OUM040-SM06-180606	1806016-12	Soil	06/06/18 14:20	06/07/18 08:25
OUM042-SM02-180606	1806016-13	Soil	06/06/18 14:55	06/07/18 08:25
OUM042-SM06-180606	1806016-14	Soil	06/06/18 14:55	06/07/18 08:25
OUM044-SM02-180606	1806016-15	Soil	06/06/18 15:30	06/07/18 08:25
OUM044-SM06-180606	1806016-16	Soil	06/06/18 15:30	06/07/18 08:25
OUM046-SM02-180606	1806016-17	Soil	06/06/18 16:00	06/07/18 08:25
OUM046-SM06-180606	1806016-18	Soil	06/06/18 16:00	06/07/18 08:25
OUM048-SM02-180606	1806016-19	Soil	06/06/18 16:38	06/07/18 08:25
OUM048-SM06-180606	1806016-20	Soil	06/06/18 16:38	06/07/18 08:25

Work Order 1806016

Bulk soil samples were received at the EPA Region 9 Laboratory. The soils were thoroughly mixed to homogenize and a portion was removed for drying and sieving. This portion was dried overnight at 37 degrees C (as per EPA method 1340) and sieved through a 150 um sieve. The < 150 um fraction was acid digested and analyzed for metals using ICP/AES. A portion of the sieved sample was retained for possible *in vitro* bioaccessibility assay at a future date.



United States Environmental Protection Agency
Region 9 Laboratory

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Phone:(510) 412-2300

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Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18158D

Reported: 06/26/18 12:23

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806016-01

Soil - Sampled: 06/06/18 10:51

Sample ID: OUM025-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.1	C1, J	2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		6.7		2	"	"	"	"	6010C
Barium		260		5	"	"	"	"	6010C
Beryllium		0.48		0.10	"	"	"	"	6010C
Cadmium		0.86		0.50	"	"	"	"	6010C
Chromium		46		1	"	"	"	"	6010C
Cobalt		8.0		2	"	"	"	"	6010C
Copper		53		4	"	"	"	"	6010C
Lead		320		3	"	"	"	"	6010C
Manganese		390		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		54		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		48		2	"	"	"	"	6010C
Zinc		230		8	"	"	"	"	6010C

Lab ID: 1806016-02

Soil - Sampled: 06/06/18 11:23

Sample ID: OUM027-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		6.6		2	"	"	"	"	6010C
Barium		380		5	"	"	"	"	6010C
Beryllium		0.48		0.10	"	"	"	"	6010C
Cadmium		1.5		0.50	"	"	"	"	6010C
Chromium		39		1	"	"	"	"	6010C
Cobalt		7.8		2	"	"	"	"	6010C
Copper		55		4	"	"	"	"	6010C
Lead		570		3	"	"	"	"	6010C
Manganese		410		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		74		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		4.5	C1, J	5	"	"	"	"	6010C
Vanadium		36		2	"	"	"	"	6010C
Zinc		400		8	"	"	"	"	6010C

Lab ID: 1806016-03

Soil - Sampled: 06/06/18 11:23



United States Environmental Protection Agency
Region 9 Laboratory

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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18158D

Reported: 06/26/18 12:23

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806016-03

Soil - Sampled: 06/06/18 11:23

Sample ID: OUM027-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.2	C1, J	2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		8.6		2	"	"	"	"	6010C
Barium		550		5	"	"	"	"	6010C
Beryllium		0.49		0.10	"	"	"	"	6010C
Cadmium		1.8		0.50	"	"	"	"	6010C
Chromium		42		1	"	"	"	"	6010C
Cobalt		9.2		2	"	"	"	"	6010C
Copper		65		4	"	"	"	"	6010C
Lead		880		3	"	"	"	"	6010C
Manganese		450		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		65		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		5.2		5	"	"	"	"	6010C
Vanadium		39		2	"	"	"	"	6010C
Zinc		540		8	"	"	"	"	6010C

Lab ID: 1806016-04

Soil - Sampled: 06/06/18 13:45

Sample ID: OUM029-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.7	C1, J	2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		11		2	"	"	"	"	6010C
Barium		160		5	"	"	"	"	6010C
Beryllium		0.38		0.10	"	"	"	"	6010C
Cadmium		1.7		0.50	"	"	"	"	6010C
Chromium		75		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		130		4	"	"	"	"	6010C
Lead		330		3	"	"	"	"	6010C
Manganese		470		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		62		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		1.7		1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		14		5	"	"	"	"	6010C
Vanadium		51		2	"	"	"	"	6010C
Zinc		630		8	"	"	"	"	6010C

Lab ID: 1806016-05

Soil - Sampled: 06/06/18 13:45

Sample ID: OUM029-SM06-180606

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
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Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18158D

Reported: 06/26/18 12:23

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806016-05

Soil - Sampled: 06/06/18 13:45

Sample ID: OUM029-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.4	C1, J	2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		9.1		2	"	"	"	"	6010C
Barium		140		5	"	"	"	"	6010C
Beryllium		0.35		0.10	"	"	"	"	6010C
Cadmium		1.4		0.50	"	"	"	"	6010C
Chromium		72		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		120		4	"	"	"	"	6010C
Lead		250		3	"	"	"	"	6010C
Manganese		400		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		65		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.96	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		8.3		5	"	"	"	"	6010C
Vanadium		48		2	"	"	"	"	6010C
Zinc		480		8	"	"	"	"	6010C

Lab ID: 1806016-06

Soil - Sampled: 06/06/18 11:54

Sample ID: OUM015-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		6.3		2	"	"	"	"	6010C
Barium		250		5	"	"	"	"	6010C
Beryllium		0.47		0.10	"	"	"	"	6010C
Cadmium		1.6		0.50	"	"	"	"	6010C
Chromium		41		1	"	"	"	"	6010C
Cobalt		8.4		2	"	"	"	"	6010C
Copper		64		4	"	"	"	"	6010C
Lead		530		3	"	"	"	"	6010C
Manganese		390		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		41		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		4.8	C1, J	5	"	"	"	"	6010C
Vanadium		35		2	"	"	"	"	6010C
Zinc		460		8	"	"	"	"	6010C

Lab ID: 1806016-07

Soil - Sampled: 06/06/18 11:54



United States Environmental Protection Agency
Region 9 Laboratory

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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

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SDG: 18158D

Reported: 06/26/18 12:23

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806016-07

Soil - Sampled: 06/06/18 11:54

Sample ID: OUM015-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.3	C1, J	2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		8.1		2	"	"	"	"	6010C
Barium		370		5	"	"	"	"	6010C
Beryllium		0.55		0.10	"	"	"	"	6010C
Cadmium		2.0		0.50	"	"	"	"	6010C
Chromium		45		1	"	"	"	"	6010C
Cobalt		8.9		2	"	"	"	"	6010C
Copper		76		4	"	"	"	"	6010C
Lead		750		3	"	"	"	"	6010C
Manganese		410		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		62		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		6.3		5	"	"	"	"	6010C
Vanadium		38		2	"	"	"	"	6010C
Zinc		480		8	"	"	"	"	6010C

Lab ID: 1806016-08

Soil - Sampled: 06/06/18 13:08

Sample ID: OUM017-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		2.5		2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		14		2	"	"	"	"	6010C
Barium		440		5	"	"	"	"	6010C
Beryllium		0.54		0.10	"	"	"	"	6010C
Cadmium		1.5		0.50	"	"	"	"	6010C
Chromium		70		1	"	"	"	"	6010C
Cobalt		20		2	"	"	"	"	6010C
Copper		420		4	"	"	"	"	6010C
Lead		1,200		3	"	"	"	"	6010C
Manganese		540		5	"	"	"	"	6010C
Molybdenum		4.8	C1, J	5	"	"	"	"	6010C
Nickel		75		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		1.4		1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		82		5	"	"	"	"	6010C
Vanadium		65		2	"	"	"	"	6010C
Zinc		1,000		8	"	"	"	"	6010C

Lab ID: 1806016-09

Soil - Sampled: 06/06/18 13:08

Sample ID: OUM017-SM06-180606

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
Region 9 Laboratory

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Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18158D

Reported: 06/26/18 12:23

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806016-09

Soil - Sampled: 06/06/18 13:08

Sample ID: OUM017-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		3.0		2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		18		2	"	"	"	"	6010C
Barium		520		5	"	"	"	"	6010C
Beryllium		0.62		0.10	"	"	"	"	6010C
Cadmium		1.8		0.50	"	"	"	"	6010C
Chromium		67		1	"	"	"	"	6010C
Cobalt		15		2	"	"	"	"	6010C
Copper		680		4	"	"	"	"	6010C
Lead		1,700		3	"	"	"	"	6010C
Manganese		530		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		84		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		1.4		1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		110		5	"	"	"	"	6010C
Vanadium		64		2	"	"	"	"	6010C
Zinc		1,100		8	"	"	"	"	6010C

Lab ID: 1806016-10

Soil - Sampled: 06/06/18 14:20

Sample ID: OUM211-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.7	C1, J	2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		11		2	"	"	"	"	6010C
Barium		350		5	"	"	"	"	6010C
Beryllium		0.53		0.10	"	"	"	"	6010C
Cadmium		2.1		0.50	"	"	"	"	6010C
Chromium		71		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		160		4	"	"	"	"	6010C
Lead		710		3	"	"	"	"	6010C
Manganese		600		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		90		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.62	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		41		5	"	"	"	"	6010C
Vanadium		56		2	"	"	"	"	6010C
Zinc		990		8	"	"	"	"	6010C

Lab ID: 1806016-11

Soil - Sampled: 06/06/18 14:20

Sample ID: OUM040-SM02-180606

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18158D

Reported: 06/26/18 12:23

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806016-11

Soil - Sampled: 06/06/18 14:20

Sample ID: OUM040-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.5	C1, Q4, J	2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		9.9		2	"	"	"	"	6010C
Barium		320		5	"	"	"	"	6010C
Beryllium		0.48		0.10	"	"	"	"	6010C
Cadmium		2.2		0.50	"	"	"	"	6010C
Chromium		68		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		110		4	"	"	"	"	6010C
Lead		600		3	"	"	"	"	6010C
Manganese		600		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		77		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.68	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		29		5	"	"	"	"	6010C
Vanadium		53		2	"	"	"	"	6010C
Zinc		1,100		8	"	"	"	"	6010C

Lab ID: 1806016-12

Soil - Sampled: 06/06/18 14:20

Sample ID: OUM040-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.3	C1, J	2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		11		2	"	"	"	"	6010C
Barium		360		5	"	"	"	"	6010C
Beryllium		0.58		0.10	"	"	"	"	6010C
Cadmium		2.1		0.50	"	"	"	"	6010C
Chromium		74		1	"	"	"	"	6010C
Cobalt		13		2	"	"	"	"	6010C
Copper		170		4	"	"	"	"	6010C
Lead		720		3	"	"	"	"	6010C
Manganese		610		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		87		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.65	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		40		5	"	"	"	"	6010C
Vanadium		57		2	"	"	"	"	6010C
Zinc		1,000		8	"	"	"	"	6010C

Lab ID: 1806016-13

Soil - Sampled: 06/06/18 14:55

Sample ID: OUM042-SM02-180606

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
Region 9 Laboratory

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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

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SDG: 18158D

Reported: 06/26/18 12:23

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806016-13

Soil - Sampled: 06/06/18 14:55

Sample ID: OUM042-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		5.2		2	"	"	"	"	6010C
Barium		140		5	"	"	"	"	6010C
Beryllium		0.35		0.10	"	"	"	"	6010C
Cadmium		0.51		0.50	"	"	"	"	6010C
Chromium		40		1	"	"	"	"	6010C
Cobalt		8.0		2	"	"	"	"	6010C
Copper		41		4	"	"	"	"	6010C
Lead		55		3	"	"	"	"	6010C
Manganese		350		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		40		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		37		2	"	"	"	"	6010C
Zinc		240		8	"	"	"	"	6010C

Lab ID: 1806016-14

Soil - Sampled: 06/06/18 14:55

Sample ID: OUM042-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		3.6		2	"	"	"	"	6010C
Barium		110		5	"	"	"	"	6010C
Beryllium		0.45		0.10	"	"	"	"	6010C
Cadmium		ND	U	0.50	"	"	"	"	6010C
Chromium		25		1	"	"	"	"	6010C
Cobalt		6.9		2	"	"	"	"	6010C
Copper		25		4	"	"	"	"	6010C
Lead		12		3	"	"	"	"	6010C
Manganese		340		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		81		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		25		2	"	"	"	"	6010C
Zinc		39		8	"	"	"	"	6010C

Lab ID: 1806016-15

Soil - Sampled: 06/06/18 15:30



United States Environmental Protection Agency
Region 9 Laboratory

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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

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SDG: 18158D

Reported: 06/26/18 12:23

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806016-15

Soil - Sampled: 06/06/18 15:30

Sample ID: OUM044-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		3.5		2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		7.3		2	"	"	"	"	6010C
Barium		240		5	"	"	"	"	6010C
Beryllium		0.59		0.10	"	"	"	"	6010C
Cadmium		4.0		0.50	"	"	"	"	6010C
Chromium		100		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		390		4	"	"	"	"	6010C
Lead		500		3	"	"	"	"	6010C
Manganese		450		5	"	"	"	"	6010C
Molybdenum		7.6		5	"	"	"	"	6010C
Nickel		88		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		1.7		1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		25		5	"	"	"	"	6010C
Vanadium		41		2	"	"	"	"	6010C
Zinc		1,000		8	"	"	"	"	6010C

Lab ID: 1806016-16

Soil - Sampled: 06/06/18 15:30

Sample ID: OUM044-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.4	C1, J	2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		7.8		2	"	"	"	"	6010C
Barium		290		5	"	"	"	"	6010C
Beryllium		0.61		0.10	"	"	"	"	6010C
Cadmium		2.0		0.50	"	"	"	"	6010C
Chromium		59		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		130		4	"	"	"	"	6010C
Lead		260		3	"	"	"	"	6010C
Manganese		500		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		82		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		4.8	C1, J	5	"	"	"	"	6010C
Vanadium		57		2	"	"	"	"	6010C
Zinc		440		8	"	"	"	"	6010C

Lab ID: 1806016-17

Soil - Sampled: 06/06/18 16:00

Sample ID: OUM046-SM02-180606

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
Region 9 Laboratory

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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

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SDG: 18158D

Reported: 06/26/18 12:23

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806016-17

Soil - Sampled: 06/06/18 16:00

Sample ID: OUM046-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		6.7		2	"	"	"	"	6010C
Barium		190		5	"	"	"	"	6010C
Beryllium		0.45		0.10	"	"	"	"	6010C
Cadmium		0.90		0.50	"	"	"	"	6010C
Chromium		48		1	"	"	"	"	6010C
Cobalt		8.9		2	"	"	"	"	6010C
Copper		44		4	"	"	"	"	6010C
Lead		170		3	"	"	"	"	6010C
Manganese		440		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		52		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		38		2	"	"	"	"	6010C
Zinc		480		8	"	"	"	"	6010C

Lab ID: 1806016-18

Soil - Sampled: 06/06/18 16:00

Sample ID: OUM046-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.0	C1, J	2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		7.0		2	"	"	"	"	6010C
Barium		280		5	"	"	"	"	6010C
Beryllium		0.53		0.10	"	"	"	"	6010C
Cadmium		1.3		0.50	"	"	"	"	6010C
Chromium		47		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		47		4	"	"	"	"	6010C
Lead		290		3	"	"	"	"	6010C
Manganese		750		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		78		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		43		2	"	"	"	"	6010C
Zinc		230		8	"	"	"	"	6010C

Lab ID: 1806016-19

Soil - Sampled: 06/06/18 16:38



United States Environmental Protection Agency
Region 9 Laboratory

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Project: West Oakland Urban Metals Study

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SDG: 18158D

Reported: 06/26/18 12:23

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806016-19

Soil - Sampled: 06/06/18 16:38

Sample ID: OUM048-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		4.1		2	"	"	"	"	6010C
Barium		180		5	"	"	"	"	6010C
Beryllium		0.40		0.10	"	"	"	"	6010C
Cadmium		0.35	C1, J	0.50	"	"	"	"	6010C
Chromium		32		1	"	"	"	"	6010C
Cobalt		6.3		2	"	"	"	"	6010C
Copper		25		4	"	"	"	"	6010C
Lead		82		3	"	"	"	"	6010C
Manganese		300		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		39		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		26		2	"	"	"	"	6010C
Zinc		110		8	"	"	"	"	6010C

Lab ID: 1806016-20

Soil - Sampled: 06/06/18 16:38

Sample ID: OUM048-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F024	06/11/18	06/14/18	6010C
Arsenic		2.7		2	"	"	"	"	6010C
Barium		150		5	"	"	"	"	6010C
Beryllium		0.32		0.10	"	"	"	"	6010C
Cadmium		ND	U	0.50	"	"	"	"	6010C
Chromium		26		1	"	"	"	"	6010C
Cobalt		4.7		2	"	"	"	"	6010C
Copper		14		4	"	"	"	"	6010C
Lead		13		3	"	"	"	"	6010C
Manganese		280		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		30		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		22		2	"	"	"	"	6010C
Zinc		30		8	"	"	"	"	6010C



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SDG: 18158D

Reported: 06/26/18 12:23

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F024 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/11/18 **Analyzed:** 06/14/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Blank (B18F024-BLK1)

Antimony	ND	U		2 mg/kg						
Arsenic	ND	U		2 "						
Barium	ND	U		5 "						
Beryllium	ND	U		0.1 "						
Cadmium	ND	U		0.5 "						
Chromium	ND	U		1 "						
Cobalt	ND	U		2 "						
Copper	ND	U		4 "						
Lead	ND	U		3 "						
Manganese	ND	U		5 "						
Molybdenum	ND	U		5 "						
Nickel	ND	U		5 "						
Selenium	ND	U		2 "						
Silver	ND	U		1 "						
Thallium	ND	U		5 "						
Tin	ND	U		5 "						
Vanadium	ND	U		2 "						
Zinc	ND	U		8 "						

Matrix Spike (B18F024-MS1)

Source: 1806016-11

Antimony	22.3			2 mg/kg	100	1.46	21	75-125		
Arsenic	427			2 "	400	9.91	104	75-125		
Barium	722			5 "	400	324	100	75-125		
Beryllium	10.8			0.1 "	10.0	0.483	103	75-125		
Cadmium	11.8			0.5 "	10.0	2.18	96	75-125		
Chromium	113			1 "	40.0	68.1	113	75-125		
Cobalt	112			2 "	100	12.5	99	75-125		
Copper	163			4 "	50.0	109	109	75-125		
Lead	699	Q10		3 "	100	598	101	75-125		
Manganese	698	Q10		5 "	100	602	96	75-125		
Molybdenum	94.6			5 "	100	ND	95	75-125		
Nickel	175			5 "	100	76.8	98	75-125		
Selenium	389			2 "	400	ND	97	75-125		
Silver	10.6			1 "	10.0	0.681	99	75-125		
Thallium	382			5 "	400	ND	96	75-125		
Tin	108			5 "	100	29.5	78	75-125		
Vanadium	161			2 "	100	52.9	108	75-125		
Zinc	1,190	Q10		8 "	100	1,100	88	75-125		

Matrix Spike Dup (B18F024-MSD1)

Source: 1806016-11

Antimony	21.9			2 mg/kg	100	1.46	20	75-125	2	20
Arsenic	434			2 "	400	9.91	106	75-125	1	20
Barium	732			5 "	400	324	102	75-125	1	20



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SDG: 18158D

Reported: 06/26/18 12:23

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F024 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/11/18 Analyzed: 06/14/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Matrix Spike Dup (B18F024-MSD1)

Source: 1806016-11

Beryllium	11.1		0.1	"	10.0	0.483	107	75-125	3	20
Cadmium	11.9		0.5	"	10.0	2.18	97	75-125	1	20
Chromium	112		1	"	40.0	68.1	110	75-125	1	20
Cobalt	115		2	"	100	12.5	102	75-125	3	20
Copper	158		4	"	50.0	109	98	75-125	3	20
Lead	712	Q10	3	"	100	598	114	75-125	2	20
Manganese	714	Q10	5	"	100	602	112	75-125	2	20
Molybdenum	95.2		5	"	100	ND	95	75-125	0.6	20
Nickel	177		5	"	100	76.8	100	75-125	1	20
Selenium	396		2	"	400	ND	99	75-125	2	20
Silver	10.7		1	"	10.0	0.681	100	75-125	0.9	20
Thallium	387		5	"	400	ND	97	75-125	1	20
Tin	107		5	"	100	29.5	77	75-125	0.7	20
Vanadium	162		2	"	100	52.9	109	75-125	0.5	20
Zinc	1,220	Q10	8	"	100	1,100	114	75-125	2	20

Reference (B18F024-SRM1)

Antimony	52		2	mg/kg	66.0		79	41.2-158		
Arsenic	258		2	"	253		102	60.9-139		
Barium	ND	U	5	"	1.60			62.5-138		
Beryllium	4.69		0.1	"	4.90		96	61.2-139		
Cadmium	9.7		0.5	"	10.9		89	70.6-128		
Chromium	25.5		1	"	27.1		94	68.3-132		
Cobalt	35.9		2	"	37.4		96	64.7-135		
Copper	1,470		4	"	1770		83	74.6-126		
Lead	49.5		3	"	56.9		87	72.8-127		
Manganese	55.7		5	"	61.0		91	68.2-132		
Nickel	14.4		5	"	16.3		88	55.2-145		
Selenium	7.65		2	"	10.0		77	41-159		
Silver	5.57		1	"	5.90		94	45.8-154		
Thallium	8.34		5	"	9.50		88	30.5-169		
Vanadium	17		2	"	17.6		97	65.9-135		
Zinc	42.2		8	"	47.5		89	43.2-157		



United States Environmental Protection Agency

Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804

Phone:(510) 412-2300

Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18158D

Reported: 06/26/18 12:23

Qualifiers and Comments

Q4 The matrix spike and/or matrix spike duplicate associated with this sample did not meet recovery criteria for this analyte (see MS/MSD results for this batch in QC summary)

Q10 The analyte concentration in the unfortified sample is significantly greater than the concentration spiked into the matrix spike and matrix spike duplicate. The reported spike recovery is not a meaningful measure of the dataset's analytical accuracy.

J The reported result for this analyte should be considered an estimated value.

C1 The reported concentration for this analyte is below the quantitation limit.

U Not Detected

NR Not Reported

RE1, RE2, etc: Result is from a sample re-analysis.



**United States Environmental Protection Agency
Region 9 Laboratory**

1337 S. 46th Street Building 201
Richmond, CA 94804

Date: 6/26/2018

Subject: Analytical Testing Results - Project R18S52
SDG: 18158C

From: Peter Husby, Director
EPA Region 9 Laboratory
EMD-3-1

To: Sharon Bowen
Brownfields and Site Assessment Section
SFD-6-1

Attached are the results from the analysis of samples from the **West Oakland Urban Metals Study** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Electronic CC: Amanda Reilly, Weston Solutions
Tom Fortner, Weston Solutions
Rick Fears, California DTSC

Analyses included in this report:

Metals by ICP

Percent Solids



United States Environmental Protection Agency
Region 9 Laboratory

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Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18158C

Reported: 06/26/18 12:06

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
OUM034-SM02-180606	1806015-01	Soil	06/06/18 11:56	06/07/18 08:25
OUM034-SM06-180606	1806015-02	Soil	06/06/18 11:56	06/07/18 08:25
OUM036-SM02-180606	1806015-03	Soil	06/06/18 13:11	06/07/18 08:25
OUM036-SM06-180606	1806015-04	Soil	06/06/18 13:11	06/07/18 08:25
OUM038-SM02-180606	1806015-05	Soil	06/06/18 13:47	06/07/18 08:25
OUM038-SM06-180606	1806015-06	Soil	06/06/18 13:47	06/07/18 08:25
OUM210-SM02-180606	1806015-07	Soil	06/06/18 14:20	06/07/18 08:25
OUM031-SM02-180606	1806015-08	Soil	06/06/18 14:11	06/07/18 08:25
OUM031-SM06-180606	1806015-09	Soil	06/06/18 14:11	06/07/18 08:25
OUM033-SM02-180606	1806015-10	Soil	06/06/18 14:40	06/07/18 08:25
OUM033-SM06-180606	1806015-11	Soil	06/06/18 14:40	06/07/18 08:25
OUM035-SM02-180606	1806015-12	Soil	06/06/18 15:50	06/07/18 08:25
OUM035-SM06-180606	1806015-13	Soil	06/06/18 15:50	06/07/18 08:25
OUM037-SM02-180606	1806015-14	Soil	06/06/18 16:11	06/07/18 08:25
OUM037-SM06-180606	1806015-15	Soil	06/06/18 16:11	06/07/18 08:25
OUM039-SM02-180606	1806015-16	Soil	06/06/18 16:35	06/07/18 08:25
OUM039-SM06-180606	1806015-17	Soil	06/06/18 16:35	06/07/18 08:25
OUM023-SM02-180606	1806015-18	Soil	06/06/18 10:05	06/07/18 08:25
OUM023-SM06-180606	1806015-19	Soil	06/06/18 10:05	06/07/18 08:25
OUM025-SM02-180606	1806015-20	Soil	06/06/18 10:51	06/07/18 08:25

Work Order 1806015

Bulk soil samples were received at the EPA Region 9 Laboratory. The soils were thoroughly mixed to homogenize and a portion was removed for drying and sieving. This portion was dried overnight at 37 degrees C (as per EPA method 1340) and sieved through a 150 um sieve. The < 150 um fraction was acid digested and analyzed for metals using ICP/AES. A portion of the sieved sample was retained for possible *in vitro* bioaccessibility assay at a future date.



United States Environmental Protection Agency
Region 9 Laboratory

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Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18158C

Reported: 06/26/18 12:06

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806015-01

Soil - Sampled: 06/06/18 11:56

Sample ID: OUM034-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		ND	J, Q4, U	2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		9.2		2	"	"	"	"	6010C
Barium		200		5	"	"	"	"	6010C
Beryllium	RE1	0.48		0.10	"	"	"	06/15/18	6010C
Cadmium		0.94		0.50	"	"	"	06/14/18	6010C
Chromium		54		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		68		4	"	"	"	"	6010C
Lead		57		3	"	"	"	"	6010C
Manganese		510		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		88		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	J, Q4, U	5	"	"	"	"	6010C
Vanadium		53		2	"	"	"	"	6010C
Zinc		190		8	"	"	"	"	6010C

Lab ID: 1806015-02

Soil - Sampled: 06/06/18 11:56

Sample ID: OUM034-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		9.8		2	"	"	"	"	6010C
Barium		240		5	"	"	"	"	6010C
Beryllium	RE1	0.45		0.10	"	"	"	06/15/18	6010C
Cadmium		1.2		0.50	"	"	"	06/14/18	6010C
Chromium		56		1	"	"	"	"	6010C
Cobalt		13		2	"	"	"	"	6010C
Copper		71		4	"	"	"	"	6010C
Lead		62		3	"	"	"	"	6010C
Manganese		580		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		170		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		59		2	"	"	"	"	6010C
Zinc		180		8	"	"	"	"	6010C

Lab ID: 1806015-03

Soil - Sampled: 06/06/18 13:11



United States Environmental Protection Agency Region 9 Laboratory

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Project Manager: Sharon Bowen
Project Number: R18S52
Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section
75 Hawthorne Street
San Francisco CA, 94105

SDG: 18158C
Reported: 06/26/18 12:06

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806015-03

Soil - Sampled: 06/06/18 13:11

Sample ID: OUM036-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.0	C1, J	2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		6.7		2	"	"	"	"	6010C
Barium		360		5	"	"	"	"	6010C
Beryllium	RE1	0.37		0.10	"	"	"	06/15/18	6010C
Cadmium		1.3		0.50	"	"	"	06/14/18	6010C
Chromium		37		1	"	"	"	"	6010C
Cobalt		5.8		2	"	"	"	"	6010C
Copper		72		4	"	"	"	"	6010C
Lead		590		3	"	"	"	"	6010C
Manganese		270		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		51		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		8.4		5	"	"	"	"	6010C
Vanadium		32		2	"	"	"	"	6010C
Zinc		380		8	"	"	"	"	6010C

Lab ID: 1806015-04

Soil - Sampled: 06/06/18 13:11

Sample ID: OUM036-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		5.0		2	"	"	"	"	6010C
Barium		260		5	"	"	"	"	6010C
Beryllium	RE1	0.42		0.10	"	"	"	06/15/18	6010C
Cadmium		0.71		0.50	"	"	"	06/14/18	6010C
Chromium		37		1	"	"	"	"	6010C
Cobalt		5.6		2	"	"	"	"	6010C
Copper		39		4	"	"	"	"	6010C
Lead		200		3	"	"	"	"	6010C
Manganese		290		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		44		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		34		2	"	"	"	"	6010C
Zinc		160		8	"	"	"	"	6010C

Lab ID: 1806015-05

Soil - Sampled: 06/06/18 13:47



United States Environmental Protection Agency
Region 9 Laboratory

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Project: West Oakland Urban Metals Study

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75 Hawthorne Street

San Francisco CA, 94105

SDG: 18158C

Reported: 06/26/18 12:06

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806015-05

Soil - Sampled: 06/06/18 13:47

Sample ID: OUM038-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.0	C1, J	2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		11		2	"	"	"	"	6010C
Barium		220		5	"	"	"	"	6010C
Beryllium	RE1	0.57		0.10	"	"	"	06/15/18	6010C
Cadmium		0.75		0.50	"	"	"	06/14/18	6010C
Chromium		48		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		50		4	"	"	"	"	6010C
Lead		120		3	"	"	"	"	6010C
Manganese		580		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		250		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		48		2	"	"	"	"	6010C
Zinc		230		8	"	"	"	"	6010C

Lab ID: 1806015-06

Soil - Sampled: 06/06/18 13:47

Sample ID: OUM038-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.1	C1, J	2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		9.7		2	"	"	"	"	6010C
Barium		190		5	"	"	"	"	6010C
Beryllium	RE1	0.48		0.10	"	"	"	06/15/18	6010C
Cadmium		0.49	C1, J	0.50	"	"	"	06/14/18	6010C
Chromium		42		1	"	"	"	"	6010C
Cobalt		10		2	"	"	"	"	6010C
Copper		36		4	"	"	"	"	6010C
Lead		95		3	"	"	"	"	6010C
Manganese		550		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		130		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		42		2	"	"	"	"	6010C
Zinc		150		8	"	"	"	"	6010C

Lab ID: 1806015-07

Soil - Sampled: 06/06/18 14:20



United States Environmental Protection Agency
Region 9 Laboratory

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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

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SDG: 18158C

Reported: 06/26/18 12:06

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806015-07

Soil - Sampled: 06/06/18 14:20

Sample ID: OUM210-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.5	C1, J	2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		11		2	"	"	"	"	6010C
Barium		330		5	"	"	"	"	6010C
Beryllium	RE1	0.55		0.10	"	"	"	06/15/18	6010C
Cadmium		2.2		0.50	"	"	"	06/14/18	6010C
Chromium		77		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		110		4	"	"	"	"	6010C
Lead		610		3	"	"	"	"	6010C
Manganese		600		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		81		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.50	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		29		5	"	"	"	"	6010C
Vanadium		59		2	"	"	"	"	6010C
Zinc		1,100		8	"	"	"	"	6010C

Lab ID: 1806015-08

Soil - Sampled: 06/06/18 14:11

Sample ID: OUM031-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		2.5		2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		12		2	"	"	"	"	6010C
Barium		380		5	"	"	"	"	6010C
Beryllium	RE1	0.46		0.10	"	"	"	06/15/18	6010C
Cadmium		4.0		0.50	"	"	"	06/14/18	6010C
Chromium		130		1	"	"	"	"	6010C
Cobalt		14		2	"	"	"	"	6010C
Copper		310		4	"	"	"	"	6010C
Lead		730		3	"	"	"	"	6010C
Manganese		650		5	"	"	"	"	6010C
Molybdenum		9.2		5	"	"	"	"	6010C
Nickel		270		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		1.8		1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		14		5	"	"	"	"	6010C
Vanadium		49		2	"	"	"	"	6010C
Zinc		2,500		8	"	"	"	"	6010C

Lab ID: 1806015-09

Soil - Sampled: 06/06/18 14:11

Sample ID: OUM031-SM06-180606

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
Region 9 Laboratory

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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18158C

Reported: 06/26/18 12:06

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806015-09

Soil - Sampled: 06/06/18 14:11

Sample ID: OUM031-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		2.9		2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		13		2	"	"	"	"	6010C
Barium		610		5	"	"	"	"	6010C
Beryllium	RE1	0.53		0.10	"	"	"	06/15/18	6010C
Cadmium		6.0		0.50	"	"	"	06/14/18	6010C
Chromium		82		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		290		4	"	"	"	"	6010C
Lead		1,200		3	"	"	"	"	6010C
Manganese		680		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		150		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.52	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		43		5	"	"	"	"	6010C
Vanadium		53		2	"	"	"	"	6010C
Zinc		1,800		8	"	"	"	"	6010C

Lab ID: 1806015-10

Soil - Sampled: 06/06/18 14:40

Sample ID: OUM033-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.3	C1, J	2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		6.8		2	"	"	"	"	6010C
Barium		190		5	"	"	"	"	6010C
Beryllium	RE1	0.50		0.10	"	"	"	06/15/18	6010C
Cadmium		1.2		0.50	"	"	"	06/14/18	6010C
Chromium		51		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		75		4	"	"	"	"	6010C
Lead		230		3	"	"	"	"	6010C
Manganese		440		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		50		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		3.2	C1, J	5	"	"	"	"	6010C
Vanadium		42		2	"	"	"	"	6010C
Zinc		240		8	"	"	"	"	6010C

Lab ID: 1806015-11

Soil - Sampled: 06/06/18 14:40

Sample ID: OUM033-SM06-180606

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
Region 9 Laboratory

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Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18158C

Reported: 06/26/18 12:06

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806015-11

Soil - Sampled: 06/06/18 14:40

Sample ID: OUM033-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.2	C1, J	2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		8.6		2	"	"	"	"	6010C
Barium		260		5	"	"	"	"	6010C
Beryllium	RE1	0.58		0.10	"	"	"	06/15/18	6010C
Cadmium		1.8		0.50	"	"	"	06/14/18	6010C
Chromium		58		1	"	"	"	"	6010C
Cobalt		14		2	"	"	"	"	6010C
Copper		110		4	"	"	"	"	6010C
Lead		280		3	"	"	"	"	6010C
Manganese		570		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		78		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		13		5	"	"	"	"	6010C
Vanadium		51		2	"	"	"	"	6010C
Zinc		280		8	"	"	"	"	6010C

Lab ID: 1806015-12

Soil - Sampled: 06/06/18 15:50

Sample ID: OUM035-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		5.8		2	"	"	"	"	6010C
Barium		180		5	"	"	"	"	6010C
Beryllium	RE1	0.31		0.10	"	"	"	06/15/18	6010C
Cadmium		0.55		0.50	"	"	"	06/14/18	6010C
Chromium		49		1	"	"	"	"	6010C
Cobalt		8.4		2	"	"	"	"	6010C
Copper		36		4	"	"	"	"	6010C
Lead		110		3	"	"	"	"	6010C
Manganese		360		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		43		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		37		2	"	"	"	"	6010C
Zinc		160		8	"	"	"	"	6010C

Lab ID: 1806015-13

Soil - Sampled: 06/06/18 15:50



United States Environmental Protection Agency Region 9 Laboratory

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Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Sharon Bowen
Project Number: R18S52
Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section
75 Hawthorne Street
San Francisco CA, 94105

SDG: 18158C
Reported: 06/26/18 12:06

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806015-13

Soil - Sampled: 06/06/18 15:50

Sample ID: OUM035-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2.1	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		7.2		2.1	"	"	"	"	6010C
Barium		230		5.3	"	"	"	"	6010C
Beryllium	RE1	0.34		0.11	"	"	"	06/15/18	6010C
Cadmium		0.87		0.53	"	"	"	06/14/18	6010C
Chromium		56		1.1	"	"	"	"	6010C
Cobalt		7.6		2.1	"	"	"	"	6010C
Copper		43		4.2	"	"	"	"	6010C
Lead		190		3.2	"	"	"	"	6010C
Manganese		390		5.3	"	"	"	"	6010C
Molybdenum		ND	U	5.3	"	"	"	"	6010C
Nickel		52		5.3	"	"	"	"	6010C
Selenium		ND	U	2.1	"	"	"	"	6010C
Silver		ND	U	1.1	"	"	"	"	6010C
Thallium		ND	U	5.3	"	"	"	"	6010C
Tin		ND	U	5.3	"	"	"	"	6010C
Vanadium		35		2.1	"	"	"	"	6010C
Zinc		220		8.4	"	"	"	"	6010C

Lab ID: 1806015-14

Soil - Sampled: 06/06/18 16:11

Sample ID: OUM037-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		8.9		2	"	"	"	"	6010C
Barium		230		5	"	"	"	"	6010C
Beryllium	RE1	0.43		0.10	"	"	"	06/15/18	6010C
Cadmium		1.3		0.50	"	"	"	06/14/18	6010C
Chromium		41		1	"	"	"	"	6010C
Cobalt		8.0		2	"	"	"	"	6010C
Copper		60		4	"	"	"	"	6010C
Lead		440		3	"	"	"	"	6010C
Manganese		400		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		37		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		3.7	C1, J	5	"	"	"	"	6010C
Vanadium		39		2	"	"	"	"	6010C
Zinc		310		8	"	"	"	"	6010C

Lab ID: 1806015-15

Soil - Sampled: 06/06/18 16:11



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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

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San Francisco CA, 94105

SDG: 18158C

Reported: 06/26/18 12:06

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806015-15

Soil - Sampled: 06/06/18 16:11

Sample ID: OUM037-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.1	C1, J	2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		9.5		2	"	"	"	"	6010C
Barium		230		5	"	"	"	"	6010C
Beryllium	RE1	0.50		0.10	"	"	"	06/15/18	6010C
Cadmium		1.1		0.50	"	"	"	06/14/18	6010C
Chromium		38		1	"	"	"	"	6010C
Cobalt		8.1		2	"	"	"	"	6010C
Copper		54		4	"	"	"	"	6010C
Lead		390		3	"	"	"	"	6010C
Manganese		460		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		38		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		5.0		5	"	"	"	"	6010C
Vanadium		37		2	"	"	"	"	6010C
Zinc		280		8	"	"	"	"	6010C

Lab ID: 1806015-16

Soil - Sampled: 06/06/18 16:35

Sample ID: OUM039-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.1	C1, J	2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		7.9		2	"	"	"	"	6010C
Barium		470		5	"	"	"	"	6010C
Beryllium	RE1	0.48		0.10	"	"	"	06/15/18	6010C
Cadmium		1.8		0.50	"	"	"	06/14/18	6010C
Chromium		42		1	"	"	"	"	6010C
Cobalt		10		2	"	"	"	"	6010C
Copper		59		4	"	"	"	"	6010C
Lead		790		3	"	"	"	"	6010C
Manganese		530		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		51		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		6.4		5	"	"	"	"	6010C
Vanadium		40		2	"	"	"	"	6010C
Zinc		490		8	"	"	"	"	6010C

Lab ID: 1806015-17

Soil - Sampled: 06/06/18 16:35



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Brownfields and Site Assessment Section

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SDG: 18158C

Reported: 06/26/18 12:06

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806015-17

Soil - Sampled: 06/06/18 16:35

Sample ID: OUM039-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.1	C1, J	2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		9.8		2	"	"	"	"	6010C
Barium		330		5	"	"	"	"	6010C
Beryllium	RE1	0.53		0.10	"	"	"	06/15/18	6010C
Cadmium		0.96		0.50	"	"	"	06/14/18	6010C
Chromium		49		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		52		4	"	"	"	"	6010C
Lead		400		3	"	"	"	"	6010C
Manganese		600		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		57		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		3.4	C1, J	5	"	"	"	"	6010C
Vanadium		54		2	"	"	"	"	6010C
Zinc		310		8	"	"	"	"	6010C

Lab ID: 1806015-18

Soil - Sampled: 06/06/18 10:05

Sample ID: OUM023-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.1	C1, J	2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		7.4		2	"	"	"	"	6010C
Barium		250		5	"	"	"	"	6010C
Beryllium	RE1	0.39		0.10	"	"	"	06/15/18	6010C
Cadmium		48		0.50	"	"	"	06/14/18	6010C
Chromium		53		1	"	"	"	"	6010C
Cobalt		9.0		2	"	"	"	"	6010C
Copper		93		4	"	"	"	"	6010C
Lead		1,900		3	"	"	"	"	6010C
Manganese		610		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		100		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.98	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		27		5	"	"	"	"	6010C
Vanadium		48		2	"	"	"	"	6010C
Zinc		270		8	"	"	"	"	6010C

Lab ID: 1806015-19

Soil - Sampled: 06/06/18 10:05

Sample ID: OUM023-SM06-180606

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency Region 9 Laboratory

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Project: West Oakland Urban Metals Study

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SDG: 18158C

Reported: 06/26/18 12:06

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806015-19

Soil - Sampled: 06/06/18 10:05

Sample ID: OUM023-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.7	C1, J	2	mg/kg	B18F032	06/13/18	06/14/18	6010C
Arsenic		13		2	"	"	"	"	6010C
Barium		260		5	"	"	"	"	6010C
Beryllium	RE1	0.49		0.10	"	"	"	06/15/18	6010C
Cadmium		2.5		0.50	"	"	"	06/14/18	6010C
Chromium		81		1	"	"	"	"	6010C
Cobalt		15		2	"	"	"	"	6010C
Copper		130		4	"	"	"	"	6010C
Lead		110		3	"	"	"	"	6010C
Manganese		1,100		5	"	"	"	"	6010C
Molybdenum		2.5	C1, J	5	"	"	"	"	6010C
Nickel		54		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.68	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		61		5	"	"	"	"	6010C
Vanadium		68		2	"	"	"	"	6010C
Zinc		240		8	"	"	"	"	6010C

Lab ID: 1806015-20

Soil - Sampled: 06/06/18 10:51

Sample ID: OUM025-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.0	C1, J	2	mg/kg	B18F022	06/11/18	06/14/18	6010C
Arsenic		6.8		2	"	"	"	"	6010C
Barium		250		5	"	"	"	"	6010C
Beryllium	RE1	0.46		0.10	"	"	"	06/15/18	6010C
Cadmium		0.88		0.50	"	"	"	06/14/18	6010C
Chromium		45		1	"	"	"	"	6010C
Cobalt		7.2		2	"	"	"	"	6010C
Copper		48		4	"	"	"	"	6010C
Lead		300		3	"	"	"	"	6010C
Manganese		390		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		44		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		45		2	"	"	"	"	6010C
Zinc		270		8	"	"	"	"	6010C



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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18158C

Reported: 06/26/18 12:06

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F022 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/11/18 Analyzed: 06/14/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Blank (B18F022-BLK1)

Antimony	ND	U		2 mg/kg
Arsenic	ND	U		2 "
Barium	ND	U		5 "
Beryllium	ND	U		0.1 "
Cadmium	ND	U		0.5 "
Chromium	ND	U		1 "
Cobalt	ND	U		2 "
Copper	ND	U		4 "
Lead	ND	U		3 "
Manganese	ND	U		5 "
Molybdenum	ND	U		5 "
Nickel	ND	U		5 "
Selenium	ND	U		2 "
Silver	ND	U		1 "
Thallium	ND	U		5 "
Tin	ND	U		5 "
Vanadium	ND	U		2 "
Zinc	ND	U		8 "

Blank (B18F022-BLK2)

Antimony	ND	U		2 mg/kg
Arsenic	ND	U		2 "
Barium	ND	U		5 "
Beryllium	ND	U		0.1 "
Cadmium	ND	U		0.5 "
Chromium	ND	U		1 "
Cobalt	ND	U		2 "
Copper	ND	U		4 "
Lead	ND	U		3 "
Manganese	ND	U		5 "
Molybdenum	ND	U		5 "
Nickel	ND	U		5 "
Selenium	ND	U		2 "
Silver	ND	U		1 "
Thallium	ND	U		5 "
Tin	ND	U		5 "
Vanadium	ND	U		2 "
Zinc	ND	U		8 "

Matrix Spike (B18F022-MS1)

Source: 1806015-01

Antimony	18.3		2 mg/kg	97.1	ND	19	75-125
Arsenic	417		2 "	388	9.17	105	75-125
Barium	567		5 "	388	198	95	75-125



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75 Hawthorne Street

San Francisco CA, 94105

SDG: 18158C

Reported: 06/26/18 12:06

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F022 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/11/18 Analyzed: 06/14/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Matrix Spike (B18F022-MS1)

Source: 1806015-01

Cadmium	9.87		0.5	"	9.71	0.937	92	75-125
Chromium	94.3		1	"	38.8	54.3	103	75-125
Cobalt	105		2	"	97.1	11.8	96	75-125
Copper	111		4	"	48.5	68	90	75-125
Lead	147		3	"	97.1	57.4	92	75-125
Manganese	610	Q10	5	"	97.1	509	104	75-125
Molybdenum	88.6		5	"	97.1	ND	91	75-125
Nickel	179		5	"	97.1	87.6	94	75-125
Selenium	382		2	"	388	ND	98	75-125
Silver	9.9		1	"	9.71	ND	102	75-125
Thallium	366		5	"	388	ND	94	75-125
Tin	67.4		5	"	97.1	ND	69	75-125
Vanadium	155		2	"	97.1	53.3	105	75-125
Zinc	279		8	"	97.1	185	97	75-125

Matrix Spike (B18F022-MS2)

Source: 1806015-01RE1

Beryllium	10.2		0.1	mg/kg	9.71	0.477	100	75-125
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Matrix Spike Dup (B18F022-MSD1)

Source: 1806015-01

Antimony	18		2	mg/kg	97.1	ND	19	75-125	2	20
Arsenic	425		2	"	388	9.17	107	75-125	2	20
Barium	592		5	"	388	198	101	75-125	4	20
Cadmium	10.1		0.5	"	9.71	0.937	94	75-125	2	20
Chromium	93.9		1	"	38.8	54.3	102	75-125	0.4	20
Cobalt	108		2	"	97.1	11.8	99	75-125	3	20
Copper	116		4	"	48.5	68	100	75-125	4	20
Lead	149		3	"	97.1	57.4	94	75-125	1	20
Manganese	623	Q10	5	"	97.1	509	118	75-125	2	20
Molybdenum	89.3		5	"	97.1	ND	92	75-125	0.8	20
Nickel	183		5	"	97.1	87.6	98	75-125	2	20
Selenium	389		2	"	388	ND	100	75-125	2	20
Silver	10.1		1	"	9.71	ND	104	75-125	2	20
Thallium	373		5	"	388	ND	96	75-125	2	20
Tin	66.6		5	"	97.1	ND	69	75-125	1	20
Vanadium	155		2	"	97.1	53.3	105	75-125	0.1	20
Zinc	288		8	"	97.1	185	106	75-125	3	20

Matrix Spike Dup (B18F022-MSD2)

Source: 1806015-01RE1

Beryllium	9.8		0.1	mg/kg	9.71	0.477	96	75-125	4	20
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Reference (B18F022-SRM1)

Antimony	49.3		2	mg/kg	66.0		75	41.2-158
Arsenic	238		2	"	253		94	60.9-139
Barium	ND	U	5	"	1.60			62.5-138
Cadmium	9.22		0.5	"	10.9		85	70.6-128



United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18158C

Reported: 06/26/18 12:06

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F022 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/11/18 Analyzed: 06/14/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Reference (B18F022-SRM1)

Chromium	24.4		1	"	27.1		90	68.3-132		
Cobalt	33.2		2	"	37.4		89	64.7-135		
Copper	1,380		4	"	1770		78	74.6-126		
Lead	47.9		3	"	56.9		84	72.8-127		
Manganese	54.1		5	"	61.0		89	68.2-132		
Nickel	13.8		5	"	16.3		85	55.2-145		
Selenium	6.62		2	"	10.0		66	41-159		
Silver	4.84		1	"	5.90		82	45.8-154		
Thallium	7.84		5	"	9.50		83	30.5-169		
Vanadium	16.3		2	"	17.6		93	65.9-135		
Zinc	40.2		8	"	47.5		85	43.2-157		

Reference (B18F022-SRM2)

Beryllium	4.27		0.1	mg/kg	4.90		87	61.2-139		
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Batch B18F032 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/13/18 Analyzed: 06/14/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Blank (B18F032-BLK1)

Antimony	ND	U	2	mg/kg						
Arsenic	ND	U	2	"						
Barium	ND	U	5	"						
Beryllium	ND	U	0.1	"						
Cadmium	ND	U	0.5	"						
Chromium	ND	U	1	"						
Cobalt	ND	U	2	"						
Copper	ND	U	4	"						
Lead	ND	U	3	"						
Manganese	ND	U	5	"						
Molybdenum	ND	U	5	"						
Nickel	ND	U	5	"						
Selenium	ND	U	2	"						
Silver	ND	U	1	"						
Thallium	ND	U	5	"						
Tin	ND	U	5	"						
Vanadium	ND	U	2	"						
Zinc	ND	U	8	"						

Blank (B18F032-BLK2)

Antimony	ND	U	2	mg/kg						
Arsenic	ND	U	2	"						
Barium	ND	U	5	"						
Beryllium	ND	U	0.1	"						
Cadmium	ND	U	0.5	"						
Chromium	ND	U	1	"						



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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18158C

Reported: 06/26/18 12:06

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F032 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/13/18 Analyzed: 06/15/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Blank (B18F032-BLK2)

Cobalt	ND	U		2 "						
Copper	ND	U		4 "						
Lead	ND	U		3 "						
Manganese	ND	U		5 "						
Molybdenum	ND	U		5 "						
Nickel	ND	U		5 "						
Selenium	ND	U		2 "						
Silver	ND	U		1 "						
Thallium	ND	U		5 "						
Tin	ND	U		5 "						
Vanadium	ND	U		2 "						
Zinc	ND	U		8 "						

Reference (B18F032-SRM1)

Antimony	60.6			2 mg/kg	66.0		92	41.2-158		
Arsenic	277			2 "	253		109	60.9-139		
Barium	ND	U		5 "	1.60			62.5-138		
Cadmium	10.6			0.5 "	10.9		97	70.6-128		
Chromium	28			1 "	27.1		103	68.3-132		
Cobalt	37.5			2 "	37.4		100	64.7-135		
Copper	1,610			4 "	1770		91	74.6-126		
Lead	55.6			3 "	56.9		98	72.8-127		
Manganese	62.3			5 "	61.0		102	68.2-132		
Nickel	15.7			5 "	16.3		96	55.2-145		
Selenium	8.25			2 "	10.0		82	41-159		
Silver	5.81			1 "	5.90		99	45.8-154		
Thallium	9.15			5 "	9.50		96	30.5-169		
Vanadium	18.9			2 "	17.6		108	65.9-135		
Zinc	45.9			8 "	47.5		97	43.2-157		

Reference (B18F032-SRM2)

Beryllium	5.08			0.1 mg/kg	4.90		104	61.2-139		
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75 Hawthorne Street

San Francisco CA, 94105

SDG: 18158C

Reported: 06/26/18 12:06

Qualifiers and Comments

Q4 The matrix spike and/or matrix spike duplicate associated with this sample did not meet recovery criteria for this analyte (see MS/MSD results for this batch in QC summary)

Q10 The analyte concentration in the unfortified sample is significantly greater than the concentration spiked into the matrix spike and matrix spike duplicate. The reported spike recovery is not a meaningful measure of the dataset's analytical accuracy.

J The reported result for this analyte should be considered an estimated value.

C1 The reported concentration for this analyte is below the quantitation limit.

U Not Detected

NR Not Reported

RE1, RE2, etc: Result is from a sample re-analysis.



**United States Environmental Protection Agency
Region 9 Laboratory**

1337 S. 46th Street Building 201
Richmond, CA 94804

Date: 6/21/2018

Subject: Analytical Testing Results - Project R18S52
SDG: 18157C

From: Peter Husby, Director
EPA Region 9 Laboratory
EMD-3-1

To: Sharon Bowen
Brownfields and Site Assessment Section
SFD-6-1

Attached are the results from the analysis of samples from the **West Oakland Urban Metals Study** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Electronic CC: Amanda Reilly, Weston Solutions
Tom Fortner, Weston Solutions
Rick Fears, California DTSC

Analyses included in this report:

Metals by ICP

Percent Solids



United States Environmental Protection Agency

Region 9 Laboratory

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Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157C

Reported: 06/21/18 10:21

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
OUM020-SM02-180605	1806011-01	Soil	06/05/18 13:51	06/06/18 08:25
OUM020-SM06-180605	1806011-02	Soil	06/05/18 13:51	06/06/18 08:25
OUM021-SM02-180605	1806011-03	Soil	06/05/18 15:30	06/06/18 08:25
OUM021-SM06-180605	1806011-04	Soil	06/05/18 15:30	06/06/18 08:25
OUM022-SM02-180605	1806011-05	Soil	06/05/18 14:46	06/06/18 08:25
OUM022-SM06-180605	1806011-06	Soil	06/05/18 14:46	06/06/18 08:25
OUM024-SM02-180605	1806011-07	Soil	06/05/18 15:25	06/06/18 08:25
OUM024-SM06-180605	1806011-08	Soil	06/05/18 15:25	06/06/18 08:25
OUM026-SM02-180605	1806011-09	Soil	06/05/18 16:10	06/06/18 08:25
OUM026-SM06-180605	1806011-10	Soil	06/05/18 16:10	06/06/18 08:25
OUM204-SM02-180604	1806011-11	Soil	06/04/18 16:20	06/06/18 08:25
OUM205-SM06-180604	1806011-12	Soil	06/04/18 16:20	06/06/18 08:25
OUM206-SM02-180605	1806011-13	Soil	06/05/18 13:51	06/06/18 08:25
OUM207-SM06-180605	1806011-14	Soil	06/05/18 13:51	06/06/18 08:25
OUM030-SM02-180606	1806011-15	Soil	06/06/18 10:28	06/07/18 08:25
OUM030-SM06-180606	1806011-16	Soil	06/06/18 10:28	06/07/18 08:25
OUM208-SM02-180606	1806011-17	Soil	06/06/18 10:28	06/07/18 08:25
OUM209-SM06-180606	1806011-18	Soil	06/06/18 10:28	06/07/18 08:25
OUM032-SM02-180606	1806011-19	Soil	06/06/18 11:26	06/07/18 08:25
OUM032-SM06-180606	1806011-20	Soil	06/06/18 11:26	06/07/18 08:25

Work Order 1806011

Bulk soil samples were received at the EPA Region 9 Laboratory. The soils were thoroughly mixed to homogenize and a portion was removed for drying and sieving. This portion was dried overnight at 37 degrees C (as per EPA method 1340) and sieved through a 150 um sieve. The < 150 um fraction was acid digested and analyzed for metals using ICP/AES. A portion of the sieved sample was retained for possible *in vitro* bioaccessibility assay at a future date.



United States Environmental Protection Agency
Region 9 Laboratory

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Phone:(510) 412-2300

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Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157C

Reported: 06/21/18 10:21

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806011-01

Soil - Sampled: 06/05/18 13:51

Sample ID: OUM020-SM02-180605

Metals by EPA 6000/7000 Series Methods

Antimony	1.9	C1, Q4, J	2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic	11		2	"	"	"	"	6010C
Barium	250		5	"	"	"	"	6010C
Beryllium	0.64		0.10	"	"	"	"	6010C
Cadmium	1.9		0.50	"	"	"	"	6010C
Chromium	84		1	"	"	"	"	6010C
Cobalt	10		2	"	"	"	"	6010C
Copper	130		4	"	"	"	"	6010C
Lead	250		3	"	"	"	"	6010C
Manganese	490		5	"	"	"	"	6010C
Molybdenum	3.9	C1, J	5	"	"	"	"	6010C
Nickel	65		5	"	"	"	"	6010C
Selenium	ND	U	2	"	"	"	"	6010C
Silver	ND	U	1	"	"	"	"	6010C
Thallium	ND	U	5	"	"	"	"	6010C
Tin	4.1	C1, J	5	"	"	"	"	6010C
Vanadium	57		2	"	"	"	"	6010C
Zinc	530		8	"	"	"	"	6010C

Lab ID: 1806011-02

Soil - Sampled: 06/05/18 13:51

Sample ID: OUM020-SM06-180605

Metals by EPA 6000/7000 Series Methods

Antimony	2.1		2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic	12		2	"	"	"	"	6010C
Barium	240		5	"	"	"	"	6010C
Beryllium	0.61		0.10	"	"	"	"	6010C
Cadmium	2.2		0.50	"	"	"	"	6010C
Chromium	80		1	"	"	"	"	6010C
Cobalt	9.4		2	"	"	"	"	6010C
Copper	150		4	"	"	"	"	6010C
Lead	350		3	"	"	"	"	6010C
Manganese	400		5	"	"	"	"	6010C
Molybdenum	2.9	C1, J	5	"	"	"	"	6010C
Nickel	64		5	"	"	"	"	6010C
Selenium	ND	U	2	"	"	"	"	6010C
Silver	1.1		1	"	"	"	"	6010C
Thallium	ND	U	5	"	"	"	"	6010C
Tin	8.9		5	"	"	"	"	6010C
Vanadium	56		2	"	"	"	"	6010C
Zinc	650		8	"	"	"	"	6010C

Lab ID: 1806011-03

Soil - Sampled: 06/05/18 15:30

Sample ID: OUM021-SM02-180605

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
Region 9 Laboratory

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Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157C

Reported: 06/21/18 10:21

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806011-03

Soil - Sampled: 06/05/18 15:30

Sample ID: OUM021-SM02-180605

Metals by EPA 6000/7000 Series Methods

Antimony		1.2	C1, J	2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic		6.0		2	"	"	"	"	6010C
Barium		210		5	"	"	"	"	6010C
Beryllium		0.46		0.10	"	"	"	"	6010C
Cadmium		0.97		0.50	"	"	"	"	6010C
Chromium		51		1	"	"	"	"	6010C
Cobalt		8.5		2	"	"	"	"	6010C
Copper		68		4	"	"	"	"	6010C
Lead		190		3	"	"	"	"	6010C
Manganese		380		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		36		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		4.1	C1, J	5	"	"	"	"	6010C
Vanadium		41		2	"	"	"	"	6010C
Zinc		250		8	"	"	"	"	6010C

Lab ID: 1806011-04

Soil - Sampled: 06/05/18 15:30

Sample ID: OUM021-SM06-180605

Metals by EPA 6000/7000 Series Methods

Antimony		1.1	C1, J	2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic		6.0		2	"	"	"	"	6010C
Barium		210		5	"	"	"	"	6010C
Beryllium		0.51		0.10	"	"	"	"	6010C
Cadmium		1.2		0.50	"	"	"	"	6010C
Chromium		49		1	"	"	"	"	6010C
Cobalt		8.3		2	"	"	"	"	6010C
Copper		140		4	"	"	"	"	6010C
Lead		170		3	"	"	"	"	6010C
Manganese		410		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		34		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		5.9		5	"	"	"	"	6010C
Vanadium		41		2	"	"	"	"	6010C
Zinc		220		8	"	"	"	"	6010C

Lab ID: 1806011-05

Soil - Sampled: 06/05/18 14:46



United States Environmental Protection Agency
Region 9 Laboratory

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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157C

Reported: 06/21/18 10:21

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806011-05

Soil - Sampled: 06/05/18 14:46

Sample ID: OUM022-SM02-180605

Metals by EPA 6000/7000 Series Methods

Antimony	1.4	C1, J	2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic	9.4		2	"	"	"	"	6010C
Barium	250		5	"	"	"	"	6010C
Beryllium	0.58		0.10	"	"	"	"	6010C
Cadmium	1.0		0.50	"	"	"	"	6010C
Chromium	62		1	"	"	"	"	6010C
Cobalt	11		2	"	"	"	"	6010C
Copper	59		4	"	"	"	"	6010C
Lead	76		3	"	"	"	"	6010C
Manganese	470		5	"	"	"	"	6010C
Molybdenum	ND	U	5	"	"	"	"	6010C
Nickel	54		5	"	"	"	"	6010C
Selenium	ND	U	2	"	"	"	"	6010C
Silver	ND	U	1	"	"	"	"	6010C
Thallium	ND	U	5	"	"	"	"	6010C
Tin	ND	U	5	"	"	"	"	6010C
Vanadium	50		2	"	"	"	"	6010C
Zinc	200		8	"	"	"	"	6010C

Lab ID: 1806011-06

Soil - Sampled: 06/05/18 14:46

Sample ID: OUM022-SM06-180605

Metals by EPA 6000/7000 Series Methods

Antimony	1.4	C1, J	2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic	9.5		2	"	"	"	"	6010C
Barium	260		5	"	"	"	"	6010C
Beryllium	0.59		0.10	"	"	"	"	6010C
Cadmium	1.2		0.50	"	"	"	"	6010C
Chromium	62		1	"	"	"	"	6010C
Cobalt	12		2	"	"	"	"	6010C
Copper	210		4	"	"	"	"	6010C
Lead	63		3	"	"	"	"	6010C
Manganese	560		5	"	"	"	"	6010C
Molybdenum	ND	U	5	"	"	"	"	6010C
Nickel	56		5	"	"	"	"	6010C
Selenium	ND	U	2	"	"	"	"	6010C
Silver	ND	U	1	"	"	"	"	6010C
Thallium	ND	U	5	"	"	"	"	6010C
Tin	ND	U	5	"	"	"	"	6010C
Vanadium	52		2	"	"	"	"	6010C
Zinc	200		8	"	"	"	"	6010C

Lab ID: 1806011-07

Soil - Sampled: 06/05/18 15:25



United States Environmental Protection Agency Region 9 Laboratory

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Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157C

Reported: 06/21/18 10:21

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806011-07

Soil - Sampled: 06/05/18 15:25

Sample ID: OUM024-SM02-180605

Metals by EPA 6000/7000 Series Methods									
Antimony	1.3	C1, J	2	mg/kg	B18F023	06/11/18	06/13/18	6010C	
Arsenic	12		2	"	"	"	"	6010C	
Barium	250		5	"	"	"	"	6010C	
Beryllium	0.43		0.10	"	"	"	"	6010C	
Cadmium	1.4		0.50	"	"	"	"	6010C	
Chromium	56		1	"	"	"	"	6010C	
Cobalt	8.3		2	"	"	"	"	6010C	
Copper	81		4	"	"	"	"	6010C	
Lead	99		3	"	"	"	"	6010C	
Manganese	350		5	"	"	"	"	6010C	
Molybdenum	ND	U	5	"	"	"	"	6010C	
Nickel	42		5	"	"	"	"	6010C	
Selenium	ND	U	2	"	"	"	"	6010C	
Silver	1.4		1	"	"	"	"	6010C	
Thallium	ND	U	5	"	"	"	"	6010C	
Tin	ND	U	5	"	"	"	"	6010C	
Vanadium	40		2	"	"	"	"	6010C	
Zinc	590		8	"	"	"	"	6010C	

Lab ID: 1806011-08

Soil - Sampled: 06/05/18 15:25

Sample ID: OUM024-SM06-180605

Metals by EPA 6000/7000 Series Methods									
Antimony	ND	U	2	mg/kg	B18F023	06/11/18	06/13/18	6010C	
Arsenic	19		2	"	"	"	"	6010C	
Barium	240		5	"	"	"	"	6010C	
Beryllium	0.48		0.10	"	"	"	"	6010C	
Cadmium	0.77		0.50	"	"	"	"	6010C	
Chromium	44		1	"	"	"	"	6010C	
Cobalt	8.5		2	"	"	"	"	6010C	
Copper	54		4	"	"	"	"	6010C	
Lead	99		3	"	"	"	"	6010C	
Manganese	390		5	"	"	"	"	6010C	
Molybdenum	ND	U	5	"	"	"	"	6010C	
Nickel	33		5	"	"	"	"	6010C	
Selenium	ND	U	2	"	"	"	"	6010C	
Silver	0.58	C1, J	1	"	"	"	"	6010C	
Thallium	ND	U	5	"	"	"	"	6010C	
Tin	ND	U	5	"	"	"	"	6010C	
Vanadium	37		2	"	"	"	"	6010C	
Zinc	310		8	"	"	"	"	6010C	

Lab ID: 1806011-09

Soil - Sampled: 06/05/18 16:10



United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157C

Reported: 06/21/18 10:21

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806011-09

Soil - Sampled: 06/05/18 16:10

Sample ID: OUM026-SM02-180605

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic		4.7		2	"	"	"	"	6010C
Barium		230		5	"	"	"	"	6010C
Beryllium		0.36		0.10	"	"	"	"	6010C
Cadmium		0.68		0.50	"	"	"	"	6010C
Chromium		50		1	"	"	"	"	6010C
Cobalt		13		2	"	"	"	"	6010C
Copper		61		4	"	"	"	"	6010C
Lead		100		3	"	"	"	"	6010C
Manganese		430		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		40		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		38		2	"	"	"	"	6010C
Zinc		270		8	"	"	"	"	6010C

Lab ID: 1806011-10

Soil - Sampled: 06/05/18 16:10

Sample ID: OUM026-SM06-180605

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic		5.0		2	"	"	"	"	6010C
Barium		240		5	"	"	"	"	6010C
Beryllium		0.42		0.10	"	"	"	"	6010C
Cadmium		0.58		0.50	"	"	"	"	6010C
Chromium		63		1	"	"	"	"	6010C
Cobalt		15		2	"	"	"	"	6010C
Copper		53		4	"	"	"	"	6010C
Lead		94		3	"	"	"	"	6010C
Manganese		490		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		52		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		43		2	"	"	"	"	6010C
Zinc		220		8	"	"	"	"	6010C

Lab ID: 1806011-11

Soil - Sampled: 06/04/18 16:20



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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

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SDG: 18157C

Reported: 06/21/18 10:21

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806011-11

Soil - Sampled: 06/04/18 16:20

Sample ID: OUM204-SM02-180604

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic		9.9		2	"	"	"	"	6010C
Barium		240		5	"	"	"	"	6010C
Beryllium		0.53		0.10	"	"	"	"	6010C
Cadmium		0.60		0.50	"	"	"	"	6010C
Chromium		96		1	"	"	"	"	6010C
Cobalt		16		2	"	"	"	"	6010C
Copper		61		4	"	"	"	"	6010C
Lead		87		3	"	"	"	"	6010C
Manganese		630		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		85		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		68		2	"	"	"	"	6010C
Zinc		210		8	"	"	"	"	6010C

Lab ID: 1806011-12

Soil - Sampled: 06/04/18 16:20

Sample ID: OUM205-SM06-180604

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic		8.6		2	"	"	"	"	6010C
Barium		180		5	"	"	"	"	6010C
Beryllium		0.44		0.10	"	"	"	"	6010C
Cadmium		0.68		0.50	"	"	"	"	6010C
Chromium		72		1	"	"	"	"	6010C
Cobalt		13		2	"	"	"	"	6010C
Copper		46		4	"	"	"	"	6010C
Lead		120		3	"	"	"	"	6010C
Manganese		610		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		57		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		62		2	"	"	"	"	6010C
Zinc		170		8	"	"	"	"	6010C

Lab ID: 1806011-13

Soil - Sampled: 06/05/18 13:51



United States Environmental Protection Agency
Region 9 Laboratory

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SDG: 18157C

Reported: 06/21/18 10:21

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806011-13

Soil - Sampled: 06/05/18 13:51

Sample ID: OUM206-SM02-180605

Metals by EPA 6000/7000 Series Methods

Antimony		1.7	C1, J	2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic		11		2	"	"	"	"	6010C
Barium		230		5	"	"	"	"	6010C
Beryllium		0.55		0.10	"	"	"	"	6010C
Cadmium		1.9		0.50	"	"	"	"	6010C
Chromium		80		1	"	"	"	"	6010C
Cobalt		9.0		2	"	"	"	"	6010C
Copper		140		4	"	"	"	"	6010C
Lead		280		3	"	"	"	"	6010C
Manganese		430		5	"	"	"	"	6010C
Molybdenum		3.5	C1, J	5	"	"	"	"	6010C
Nickel		66		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		5.4		5	"	"	"	"	6010C
Vanadium		54		2	"	"	"	"	6010C
Zinc		570		8	"	"	"	"	6010C

Lab ID: 1806011-14

Soil - Sampled: 06/05/18 13:51

Sample ID: OUM207-SM06-180605

Metals by EPA 6000/7000 Series Methods

Antimony		2.2		2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic		12		2	"	"	"	"	6010C
Barium		230		5	"	"	"	"	6010C
Beryllium		0.60		0.10	"	"	"	"	6010C
Cadmium		2.1		0.50	"	"	"	"	6010C
Chromium		82		1	"	"	"	"	6010C
Cobalt		8.9		2	"	"	"	"	6010C
Copper		140		4	"	"	"	"	6010C
Lead		320		3	"	"	"	"	6010C
Manganese		390		5	"	"	"	"	6010C
Molybdenum		3.2	C1, J	5	"	"	"	"	6010C
Nickel		63		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		8.0		5	"	"	"	"	6010C
Vanadium		55		2	"	"	"	"	6010C
Zinc		610		8	"	"	"	"	6010C

Lab ID: 1806011-15

Soil - Sampled: 06/06/18 10:28

Sample ID: OUM030-SM02-180606

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

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SDG: 18157C

Reported: 06/21/18 10:21

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806011-15

Soil - Sampled: 06/06/18 10:28

Sample ID: OUM030-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.5	C1, Q4, J	2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic		9.6		2	"	"	"	"	6010C
Barium		210		5	"	"	"	"	6010C
Beryllium		0.46		0.10	"	"	"	"	6010C
Cadmium		1.1		0.50	"	"	"	"	6010C
Chromium		71		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		120		4	"	"	"	"	6010C
Lead		120		3	"	"	"	"	6010C
Manganese		540		5	"	"	"	"	6010C
Molybdenum		3.6	C1, J	5	"	"	"	"	6010C
Nickel		88		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		39		2	"	"	"	"	6010C
Zinc		610		8	"	"	"	"	6010C

Lab ID: 1806011-16

Soil - Sampled: 06/06/18 10:28

Sample ID: OUM030-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic		9.5		2	"	"	"	"	6010C
Barium		190		5	"	"	"	"	6010C
Beryllium		0.47		0.10	"	"	"	"	6010C
Cadmium		0.45	C1, J	0.50	"	"	"	"	6010C
Chromium		47		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		61		4	"	"	"	"	6010C
Lead		41		3	"	"	"	"	6010C
Manganese		560		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		100		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		39		2	"	"	"	"	6010C
Zinc		170		8	"	"	"	"	6010C

Lab ID: 1806011-17

Soil - Sampled: 06/06/18 10:28



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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

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SDG: 18157C

Reported: 06/21/18 10:21

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806011-17

Soil - Sampled: 06/06/18 10:28

Sample ID: OUM208-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.6	C1, J	2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic		8.7		2	"	"	"	"	6010C
Barium		200		5	"	"	"	"	6010C
Beryllium		0.42		0.10	"	"	"	"	6010C
Cadmium		1.1		0.50	"	"	"	"	6010C
Chromium		69		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		120		4	"	"	"	"	6010C
Lead		130		3	"	"	"	"	6010C
Manganese		530		5	"	"	"	"	6010C
Molybdenum		3.7	C1, J	5	"	"	"	"	6010C
Nickel		77		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		37		2	"	"	"	"	6010C
Zinc		570		8	"	"	"	"	6010C

Lab ID: 1806011-18

Soil - Sampled: 06/06/18 10:28

Sample ID: OUM209-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.2	C1, J	2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic		9.6		2	"	"	"	"	6010C
Barium		190		5	"	"	"	"	6010C
Beryllium		0.49		0.10	"	"	"	"	6010C
Cadmium		0.52		0.50	"	"	"	"	6010C
Chromium		47		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		67		4	"	"	"	"	6010C
Lead		47		3	"	"	"	"	6010C
Manganese		560		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		95		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		39		2	"	"	"	"	6010C
Zinc		190		8	"	"	"	"	6010C

Lab ID: 1806011-19

Soil - Sampled: 06/06/18 11:26



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SDG: 18157C

Reported: 06/21/18 10:21

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806011-19

Soil - Sampled: 06/06/18 11:26

Sample ID: OUM032-SM02-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.7	C1, J	2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic		7.4		2	"	"	"	"	6010C
Barium		220		5	"	"	"	"	6010C
Beryllium		0.57		0.10	"	"	"	"	6010C
Cadmium		0.99		0.50	"	"	"	"	6010C
Chromium		77		1	"	"	"	"	6010C
Cobalt		16		2	"	"	"	"	6010C
Copper		80		4	"	"	"	"	6010C
Lead		130		3	"	"	"	"	6010C
Manganese		670		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		110		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		26		1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		57		2	"	"	"	"	6010C
Zinc		370		8	"	"	"	"	6010C

Lab ID: 1806011-20

Soil - Sampled: 06/06/18 11:26

Sample ID: OUM032-SM06-180606

Metals by EPA 6000/7000 Series Methods

Antimony		1.1	C1, J	2	mg/kg	B18F023	06/11/18	06/13/18	6010C
Arsenic		8.0		2	"	"	"	"	6010C
Barium		200		5	"	"	"	"	6010C
Beryllium		0.62		0.10	"	"	"	"	6010C
Cadmium		0.50		0.50	"	"	"	"	6010C
Chromium		74		1	"	"	"	"	6010C
Cobalt		18		2	"	"	"	"	6010C
Copper		47		4	"	"	"	"	6010C
Lead		49		3	"	"	"	"	6010C
Manganese		750		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		160		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		4.4		1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		61		2	"	"	"	"	6010C
Zinc		130		8	"	"	"	"	6010C



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SDG: 18157C

Reported: 06/21/18 10:21

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F023 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/11/18 Analyzed: 06/13/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Blank (B18F023-BLK1)

Antimony	ND	U		2 mg/kg
Arsenic	ND	U		2 "
Barium	ND	U		5 "
Beryllium	ND	U		0.1 "
Cadmium	ND	U		0.5 "
Chromium	ND	U		1 "
Cobalt	ND	U		2 "
Copper	ND	U		4 "
Lead	ND	U		3 "
Manganese	ND	U		5 "
Molybdenum	ND	U		5 "
Nickel	ND	U		5 "
Selenium	ND	U		2 "
Silver	ND	U		1 "
Thallium	ND	U		5 "
Tin	ND	U		5 "
Vanadium	ND	U		2 "
Zinc	ND	U		8 "

Matrix Spike (B18F023-MS1)

Source: 1806011-01

Antimony	25		2 mg/kg	97.1	1.88	24	75-125
Arsenic	420		2 "	388	10.8	105	75-125
Barium	666		5 "	388	254	106	75-125
Beryllium	10.6		0.1 "	9.71	0.638	103	75-125
Cadmium	11.4		0.5 "	9.71	1.88	98	75-125
Chromium	127		1 "	38.8	83.7	111	75-125
Cobalt	107		2 "	97.1	10.1	99	75-125
Copper	182		4 "	48.5	135	98	75-125
Lead	350		3 "	97.1	255	98	75-125
Manganese	589	Q10	5 "	97.1	485	107	75-125
Molybdenum	90.9		5 "	97.1	3.9	90	75-125
Nickel	161		5 "	97.1	64.9	99	75-125
Selenium	387		2 "	388	ND	100	75-125
Silver	10.2		1 "	9.71	ND	105	75-125
Thallium	371		5 "	388	ND	96	75-125
Tin	79.8		5 "	97.1	4.11	78	75-125
Vanadium	159		2 "	97.1	56.6	106	75-125
Zinc	628	Q10	8 "	97.1	533	98	75-125

Matrix Spike (B18F023-MS2)

Source: 1806011-15

Antimony	23.6		2 mg/kg	98.0	1.52	22	75-125
Arsenic	413		2 "	392	9.59	103	75-125
Barium	570		5 "	392	206	93	75-125



United States Environmental Protection Agency Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157C

Reported: 06/21/18 10:21

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F023 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/11/18 Analyzed: 06/13/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Matrix Spike (B18F023-MS2)

Source: 1806011-15

Beryllium	9.92		0.1	"	9.80	0.46	96	75-125		
Cadmium	10.2		0.5	"	9.80	1.09	93	75-125		
Chromium	105		1	"	39.2	70.9	87	75-125		
Cobalt	104		2	"	98.0	11.7	95	75-125		
Copper	165		4	"	49.0	120	91	75-125		
Lead	213		3	"	98.0	120	94	75-125		
Manganese	620	Q10	5	"	98.0	545	77	75-125		
Molybdenum	90.5		5	"	98.0	3.62	89	75-125		
Nickel	176		5	"	98.0	88.2	90	75-125		
Selenium	379		2	"	392	ND	97	75-125		
Silver	10.1		1	"	9.80	ND	103	75-125		
Thallium	363		5	"	392	ND	92	75-125		
Tin	73.4		5	"	98.0	ND	75	75-125		
Vanadium	136		2	"	98.0	39.5	98	75-125		
Zinc	676	Q10	8	"	98.0	607	70	75-125		

Matrix Spike Dup (B18F023-MSD1)

Source: 1806011-01

Antimony	24.9		2	mg/kg	98.0	1.88	23	75-125	0.3	20
Arsenic	411		2	"	392	10.8	102	75-125	2	20
Barium	658		5	"	392	254	103	75-125	1	20
Beryllium	10.5		0.1	"	9.80	0.638	101	75-125	0.7	20
Cadmium	11		0.5	"	9.80	1.88	93	75-125	3	20
Chromium	121		1	"	39.2	83.7	95	75-125	5	20
Cobalt	106		2	"	98.0	10.1	98	75-125	0.3	20
Copper	177		4	"	49.0	135	86	75-125	3	20
Lead	342		3	"	98.0	255	89	75-125	2	20
Manganese	581	Q10	5	"	98.0	485	98	75-125	1	20
Molybdenum	89		5	"	98.0	3.9	87	75-125	2	20
Nickel	156		5	"	98.0	64.9	93	75-125	3	20
Selenium	377		2	"	392	ND	96	75-125	3	20
Silver	9.89		1	"	9.80	ND	101	75-125	3	20
Thallium	364		5	"	392	ND	93	75-125	2	20
Tin	79.5		5	"	98.0	4.11	77	75-125	0.4	20
Vanadium	155		2	"	98.0	56.6	100	75-125	3	20
Zinc	621	Q10	8	"	98.0	533	90	75-125	1	20

Matrix Spike Dup (B18F023-MSD2)

Source: 1806011-15

Antimony	24.4		2	mg/kg	99.0	1.52	23	75-125	4	20
Arsenic	414		2	"	396	9.59	102	75-125	0.4	20
Barium	576		5	"	396	206	93	75-125	1	20
Beryllium	9.98		0.1	"	9.90	0.46	96	75-125	0.6	20
Cadmium	10.3		0.5	"	9.90	1.09	93	75-125	0.8	20
Chromium	105		1	"	39.6	70.9	85	75-125	0.4	20



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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157C

Reported: 06/21/18 10:21

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F023 - 3050B Sid Acid Dig - Metals by 6010

Prepared: 06/11/18 Analyzed: 06/13/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Matrix Spike Dup (B18F023-MSD2)

Source: 1806011-15

Cobalt	105			2 "	99.0	11.7	94	75-125	0.5	20
Copper	165			4 "	49.5	120	91	75-125	0.1	20
Lead	221			3 "	99.0	120	102	75-125	4	20
Manganese	625	Q10		5 "	99.0	545	81	75-125	0.9	20
Molybdenum	91.2			5 "	99.0	3.62	88	75-125	0.7	20
Nickel	165			5 "	99.0	88.2	77	75-125	7	20
Selenium	381			2 "	396	ND	96	75-125	0.6	20
Silver	10.2			1 "	9.90	ND	103	75-125	1	20
Thallium	366			5 "	396	ND	92	75-125	0.8	20
Tin	76.2			5 "	99.0	ND	77	75-125	4	20
Vanadium	135			2 "	99.0	39.5	97	75-125	0.4	20
Zinc	683	Q10		8 "	99.0	607	77	75-125	1	20

Reference (B18F023-SRM1)

Antimony	56.7			2 mg/kg	66.0		86	41.2-158		
Arsenic	276			2 "	253		109	60.9-139		
Barium	ND	U		5 "	1.60			62.5-138		
Beryllium	5.1			0.1 "	4.90		104	61.2-139		
Cadmium	10.3			0.5 "	10.9		94	70.6-128		
Chromium	27.3			1 "	27.1		101	68.3-132		
Cobalt	39.4			2 "	37.4		105	64.7-135		
Copper	1,600			4 "	1770		90	74.6-126		
Lead	51.5			3 "	56.9		90	72.8-127		
Manganese	63.3			5 "	61.0		104	68.2-132		
Nickel	15.4			5 "	16.3		95	55.2-145		
Selenium	8.11			2 "	10.0		81	41-159		
Silver	5.84			1 "	5.90		99	45.8-154		
Thallium	8.84			5 "	9.50		93	30.5-169		
Vanadium	17.5			2 "	17.6		100	65.9-135		
Zinc	47.2			8 "	47.5		99	43.2-157		



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Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157C

Reported: 06/21/18 10:21

Qualifiers and Comments

Q4 The matrix spike and/or matrix spike duplicate associated with this sample did not meet recovery criteria for this analyte (see MS/MSD results for this batch in QC summary)

Q10 The analyte concentration in the unfortified sample is significantly greater than the concentration spiked into the matrix spike and matrix spike duplicate. The reported spike recovery is not a meaningful measure of the dataset's analytical accuracy.

J The reported result for this analyte should be considered an estimated value.

C1 The reported concentration for this analyte is below the quantitation limit.

U Not Detected

NR Not Reported

RE1, RE2, etc: Result is from a sample re-analysis.



**United States Environmental Protection Agency
Region 9 Laboratory**

1337 S. 46th Street Building 201
Richmond, CA 94804

Date: 6/21/2018

Subject: Analytical Testing Results - Project R18S52
SDG: 18157B

From: Peter Husby, Director
EPA Region 9 Laboratory
EMD-3-1

To: Sharon Bowen
Brownfields and Site Assessment Section
SFD-6-1

Attached are the results from the analysis of samples from the **West Oakland Urban Metals Study** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Electronic CC: Amanda Reilly, Weston Solutions
Tom Fortner, Weston Solutions
Rick Fears, California DTSC

Analyses included in this report:

Metals by ICP

Percent Solids



United States Environmental Protection Agency

Region 9 Laboratory

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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157B

Reported: 06/21/18 10:04

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
OUM010-SM02-180604	1806010-01	Soil	06/04/18 16:20	06/06/18 08:25
OUM010-SM06-180604	1806010-02	Soil	06/04/18 16:20	06/06/18 08:25
OUM011-SM02-180605	1806010-03	Soil	06/05/18 10:45	06/06/18 08:25
OUM011-SM06-180605	1806010-04	Soil	06/05/18 10:45	06/06/18 08:25
OUM012-SM02-180605	1806010-05	Soil	06/05/18 09:56	06/06/18 08:25
OUM012-SM06-180605	1806010-06	Soil	06/05/18 09:56	06/06/18 08:25
OUM013-SM02-180605	1806010-07	Soil	06/05/18 11:35	06/06/18 08:25
OUM013-SM06-180605	1806010-08	Soil	06/05/18 11:35	06/06/18 08:25
OUM014-SM02-180605	1806010-09	Soil	06/05/18 10:33	06/06/18 08:25
OUM014-SM06-180605	1806010-10	Soil	06/05/18 10:33	06/06/18 08:25
OUM016-SM02-180605	1806010-13	Soil	06/05/18 11:19	06/06/18 08:25
OUM016-SM06-180605	1806010-14	Soil	06/05/18 11:19	06/06/18 08:25
OUM018-SM02-180605	1806010-17	Soil	06/05/18 12:02	06/06/18 08:25
OUM018-SM06-180605	1806010-18	Soil	06/05/18 12:02	06/06/18 08:25
OUM019-SM02-180605	1806010-19	Soil	06/05/18 15:00	06/06/18 08:25
OUM019-SM06-180605	1806010-20	Soil	06/05/18 15:00	06/06/18 08:25

Work Order 1806010

Bulk soil samples were received at the EPA Region 9 Laboratory. The soils were thoroughly mixed to homogenize and a portion was removed for drying and sieving. This portion was dried overnight at 37 degrees C (as per EPA method 1340) and sieved through a 150 um sieve. The < 150 um fraction was acid digested and analyzed for metals using ICP/AES. A portion of the sieved sample was retained for possible *in vitro* bioaccessibility assay at a future date.

Samples OUM015-SM02-180605, OUM015-SM06-180605, OUM017-SM02-180605, and OUM017-SM06-180605 were cancelled due to labelling inconsistencies. These sample locations were resampled at a later date (see work order 1806016).



United States Environmental Protection Agency
Region 9 Laboratory

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Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157B

Reported: 06/21/18 10:04

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806010-01

Soil - Sampled: 06/04/18 16:20

Sample ID: OUM010-SM02-180604

Metals by EPA 6000/7000 Series Methods

Antimony		ND	Q4, J, U	2	mg/kg	B18F020	06/11/18	06/13/18	6010C
Arsenic		9.2		2	"	"	"	"	6010C
Barium		220		5	"	"	"	"	6010C
Beryllium		0.50		0.10	"	"	"	"	6010C
Cadmium		0.53		0.50	"	"	"	"	6010C
Chromium		95		1	"	"	"	"	6010C
Cobalt		15		2	"	"	"	"	6010C
Copper		62		4	"	"	"	"	6010C
Lead		81		3	"	"	"	"	6010C
Manganese		590		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		90		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	Q4, J, U	5	"	"	"	"	6010C
Vanadium		57		2	"	"	"	"	6010C
Zinc		190		8	"	"	"	"	6010C

Lab ID: 1806010-02

Soil - Sampled: 06/04/18 16:20

Sample ID: OUM010-SM06-180604

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F020	06/11/18	06/13/18	6010C
Arsenic		8.7		2	"	"	"	"	6010C
Barium		190		5	"	"	"	"	6010C
Beryllium		0.45		0.10	"	"	"	"	6010C
Cadmium		0.71		0.50	"	"	"	"	6010C
Chromium		71		1	"	"	"	"	6010C
Cobalt		13		2	"	"	"	"	6010C
Copper		52		4	"	"	"	"	6010C
Lead		130		3	"	"	"	"	6010C
Manganese		640		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		59		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		58		2	"	"	"	"	6010C
Zinc		180		8	"	"	"	"	6010C

Lab ID: 1806010-03

Soil - Sampled: 06/05/18 10:45



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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157B

Reported: 06/21/18 10:04

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806010-03

Soil - Sampled: 06/05/18 10:45

Sample ID: OUM011-SM02-180605

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F020	06/11/18	06/13/18	6010C
Arsenic		6.1		2	"	"	"	"	6010C
Barium		200		5	"	"	"	"	6010C
Beryllium		0.45		0.10	"	"	"	"	6010C
Cadmium		0.61		0.50	"	"	"	"	6010C
Chromium		77		1	"	"	"	"	6010C
Cobalt		25		2	"	"	"	"	6010C
Copper		86		4	"	"	"	"	6010C
Lead		92		3	"	"	"	"	6010C
Manganese		540		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		110		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		51		2	"	"	"	"	6010C
Zinc		230		8	"	"	"	"	6010C

Lab ID: 1806010-04

Soil - Sampled: 06/05/18 10:45

Sample ID: OUM011-SM06-180605

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F020	06/11/18	06/13/18	6010C
Arsenic		7.3		2	"	"	"	"	6010C
Barium		210		5	"	"	"	"	6010C
Beryllium		0.49		0.10	"	"	"	"	6010C
Cadmium		0.59		0.50	"	"	"	"	6010C
Chromium		76		1	"	"	"	"	6010C
Cobalt		19		2	"	"	"	"	6010C
Copper		66		4	"	"	"	"	6010C
Lead		90		3	"	"	"	"	6010C
Manganese		720		5	"	"	"	"	6010C
Molybdenum		3.0	C1, J	5	"	"	"	"	6010C
Nickel		75		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		54		2	"	"	"	"	6010C
Zinc		140		8	"	"	"	"	6010C

Lab ID: 1806010-05

Soil - Sampled: 06/05/18 09:56



United States Environmental Protection Agency
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Project: West Oakland Urban Metals Study

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SDG: 18157B

Reported: 06/21/18 10:04

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806010-05

Soil - Sampled: 06/05/18 09:56

Sample ID: OUM012-SM02-180605

Metals by EPA 6000/7000 Series Methods

Antimony		1.1	C1, J	2	mg/kg	B18F020	06/11/18	06/13/18	6010C
Arsenic		7.6		2	"	"	"	"	6010C
Barium		190		5	"	"	"	"	6010C
Beryllium		0.48		0.10	"	"	"	"	6010C
Cadmium		0.56		0.50	"	"	"	"	6010C
Chromium		60		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		64		4	"	"	"	"	6010C
Lead		100		3	"	"	"	"	6010C
Manganese		470		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		60		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		44		2	"	"	"	"	6010C
Zinc		220		8	"	"	"	"	6010C

Lab ID: 1806010-06

Soil - Sampled: 06/05/18 09:56

Sample ID: OUM012-SM06-180605

Metals by EPA 6000/7000 Series Methods

Antimony		1.1	C1, J	2	mg/kg	B18F020	06/11/18	06/13/18	6010C
Arsenic		9.7		2	"	"	"	"	6010C
Barium		220		5	"	"	"	"	6010C
Beryllium		0.57		0.10	"	"	"	"	6010C
Cadmium		0.58		0.50	"	"	"	"	6010C
Chromium		63		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		52		4	"	"	"	"	6010C
Lead		110		3	"	"	"	"	6010C
Manganese		560		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		65		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		52		2	"	"	"	"	6010C
Zinc		150		8	"	"	"	"	6010C

Lab ID: 1806010-07

Soil - Sampled: 06/05/18 11:35



United States Environmental Protection Agency
Region 9 Laboratory

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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157B

Reported: 06/21/18 10:04

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806010-07

Soil - Sampled: 06/05/18 11:35

Sample ID: OUM013-SM02-180605

Metals by EPA 6000/7000 Series Methods									
Antimony	1.2	C1, J	2	mg/kg	B18F020	06/11/18	06/13/18	6010C	
Arsenic	5.3		2	"	"	"	"	6010C	
Barium	260		5	"	"	"	"	6010C	
Beryllium	0.37		0.10	"	"	"	"	6010C	
Cadmium	1.0		0.50	"	"	"	"	6010C	
Chromium	46		1	"	"	"	"	6010C	
Cobalt	7.1		2	"	"	"	"	6010C	
Copper	89		4	"	"	"	"	6010C	
Lead	370		3	"	"	"	"	6010C	
Manganese	380		5	"	"	"	"	6010C	
Molybdenum	ND	U	5	"	"	"	"	6010C	
Nickel	32		5	"	"	"	"	6010C	
Selenium	ND	U	2	"	"	"	"	6010C	
Silver	ND	U	1	"	"	"	"	6010C	
Thallium	ND	U	5	"	"	"	"	6010C	
Tin	3.0	C1, J	5	"	"	"	"	6010C	
Vanadium	35		2	"	"	"	"	6010C	
Zinc	440		8	"	"	"	"	6010C	

Lab ID: 1806010-08

Soil - Sampled: 06/05/18 11:35

Sample ID: OUM013-SM06-180605

Metals by EPA 6000/7000 Series Methods									
Antimony	ND	U	2	mg/kg	B18F020	06/11/18	06/13/18	6010C	
Arsenic	5.5		2	"	"	"	"	6010C	
Barium	240		5	"	"	"	"	6010C	
Beryllium	0.44		0.10	"	"	"	"	6010C	
Cadmium	0.90		0.50	"	"	"	"	6010C	
Chromium	49		1	"	"	"	"	6010C	
Cobalt	8.3		2	"	"	"	"	6010C	
Copper	73		4	"	"	"	"	6010C	
Lead	380		3	"	"	"	"	6010C	
Manganese	390		5	"	"	"	"	6010C	
Molybdenum	ND	U	5	"	"	"	"	6010C	
Nickel	33		5	"	"	"	"	6010C	
Selenium	ND	U	2	"	"	"	"	6010C	
Silver	ND	U	1	"	"	"	"	6010C	
Thallium	ND	U	5	"	"	"	"	6010C	
Tin	3.9	C1, J	5	"	"	"	"	6010C	
Vanadium	38		2	"	"	"	"	6010C	
Zinc	350		8	"	"	"	"	6010C	

Lab ID: 1806010-09

Soil - Sampled: 06/05/18 10:33



United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157B

Reported: 06/21/18 10:04

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806010-09

Soil - Sampled: 06/05/18 10:33

Sample ID: OUM014-SM02-180605

Metals by EPA 6000/7000 Series Methods

Antimony		1.1	C1, J	2	mg/kg	B18F020	06/11/18	06/13/18	6010C
Arsenic		43		2	"	"	"	"	6010C
Barium		310		5	"	"	"	"	6010C
Beryllium		0.46		0.10	"	"	"	"	6010C
Cadmium		0.92		0.50	"	"	"	"	6010C
Chromium		58		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		72		4	"	"	"	"	6010C
Lead		170		3	"	"	"	"	6010C
Manganese		710		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		52		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.56	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		7.1		5	"	"	"	"	6010C
Vanadium		47		2	"	"	"	"	6010C
Zinc		280		8	"	"	"	"	6010C

Lab ID: 1806010-10

Soil - Sampled: 06/05/18 10:33

Sample ID: OUM014-SM06-180605

Metals by EPA 6000/7000 Series Methods

Antimony		1.5	C1, J	2	mg/kg	B18F020	06/11/18	06/13/18	6010C
Arsenic		67		2	"	"	"	"	6010C
Barium		340		5	"	"	"	"	6010C
Beryllium		0.50		0.10	"	"	"	"	6010C
Cadmium		1.2		0.50	"	"	"	"	6010C
Chromium		62		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		73		4	"	"	"	"	6010C
Lead		210		3	"	"	"	"	6010C
Manganese		960		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		57		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.69	C1, J	1	"	"	"	"	6010C
Thallium		2.5	C1, J	5	"	"	"	"	6010C
Tin		6.7		5	"	"	"	"	6010C
Vanadium		52		2	"	"	"	"	6010C
Zinc		270		8	"	"	"	"	6010C

Lab ID: 1806010-13

Soil - Sampled: 06/05/18 11:19

Sample ID: OUM016-SM02-180605

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
Region 9 Laboratory

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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

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SDG: 18157B

Reported: 06/21/18 10:04

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806010-13

Soil - Sampled: 06/05/18 11:19

Sample ID: OUM016-SM02-180605

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F020	06/11/18	06/13/18	6010C
Arsenic		6.1		2	"	"	"	"	6010C
Barium		210		5	"	"	"	"	6010C
Beryllium		0.49		0.10	"	"	"	"	6010C
Cadmium		0.86		0.50	"	"	"	"	6010C
Chromium		50		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		53		4	"	"	"	"	6010C
Lead		210		3	"	"	"	"	6010C
Manganese		540		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		51		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		41		2	"	"	"	"	6010C
Zinc		280		8	"	"	"	"	6010C

Lab ID: 1806010-14

Soil - Sampled: 06/05/18 11:19

Sample ID: OUM016-SM06-180605

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F020	06/11/18	06/13/18	6010C
Arsenic		6.8		2	"	"	"	"	6010C
Barium		200		5	"	"	"	"	6010C
Beryllium		0.54		0.10	"	"	"	"	6010C
Cadmium		0.83		0.50	"	"	"	"	6010C
Chromium		54		1	"	"	"	"	6010C
Cobalt		13		2	"	"	"	"	6010C
Copper		58		4	"	"	"	"	6010C
Lead		190		3	"	"	"	"	6010C
Manganese		590		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		53		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		45		2	"	"	"	"	6010C
Zinc		240		8	"	"	"	"	6010C

Lab ID: 1806010-17

Soil - Sampled: 06/05/18 12:02



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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157B

Reported: 06/21/18 10:04

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806010-17

Soil - Sampled: 06/05/18 12:02

Sample ID: OUM018-SM02-180605

Metals by EPA 6000/7000 Series Methods

Antimony	1.2	C1, J	2	mg/kg	B18F020	06/11/18	06/13/18	6010C
Arsenic	7.5		2	"	"	"	"	6010C
Barium	200		5	"	"	"	"	6010C
Beryllium	0.43		0.10	"	"	"	"	6010C
Cadmium	1.8		0.50	"	"	"	"	6010C
Chromium	64		1	"	"	"	"	6010C
Cobalt	10		2	"	"	"	"	6010C
Copper	62		4	"	"	"	"	6010C
Lead	280		3	"	"	"	"	6010C
Manganese	460		5	"	"	"	"	6010C
Molybdenum	2.7	C1, J	5	"	"	"	"	6010C
Nickel	51		5	"	"	"	"	6010C
Selenium	ND	U	2	"	"	"	"	6010C
Silver	ND	U	1	"	"	"	"	6010C
Thallium	ND	U	5	"	"	"	"	6010C
Tin	ND	U	5	"	"	"	"	6010C
Vanadium	44		2	"	"	"	"	6010C
Zinc	500		8	"	"	"	"	6010C

Lab ID: 1806010-18

Soil - Sampled: 06/05/18 12:02

Sample ID: OUM018-SM06-180605

Metals by EPA 6000/7000 Series Methods

Antimony	1.2	C1, J	2	mg/kg	B18F020	06/11/18	06/13/18	6010C
Arsenic	7.7		2	"	"	"	"	6010C
Barium	200		5	"	"	"	"	6010C
Beryllium	0.48		0.10	"	"	"	"	6010C
Cadmium	1.4		0.50	"	"	"	"	6010C
Chromium	63		1	"	"	"	"	6010C
Cobalt	11		2	"	"	"	"	6010C
Copper	60		4	"	"	"	"	6010C
Lead	370		3	"	"	"	"	6010C
Manganese	500		5	"	"	"	"	6010C
Molybdenum	ND	U	5	"	"	"	"	6010C
Nickel	46		5	"	"	"	"	6010C
Selenium	ND	U	2	"	"	"	"	6010C
Silver	ND	U	1	"	"	"	"	6010C
Thallium	ND	U	5	"	"	"	"	6010C
Tin	ND	U	5	"	"	"	"	6010C
Vanadium	47		2	"	"	"	"	6010C
Zinc	410		8	"	"	"	"	6010C

Lab ID: 1806010-19

Soil - Sampled: 06/05/18 15:00



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Region 9 Laboratory

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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157B

Reported: 06/21/18 10:04

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806010-19

Soil - Sampled: 06/05/18 15:00

Sample ID: OUM019-SM02-180605

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F020	06/11/18	06/13/18	6010C
Arsenic		5.0		2	"	"	"	"	6010C
Barium		140		5	"	"	"	"	6010C
Beryllium		0.40		0.10	"	"	"	"	6010C
Cadmium		0.37	C1, J	0.50	"	"	"	"	6010C
Chromium		73		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		53		4	"	"	"	"	6010C
Lead		51		3	"	"	"	"	6010C
Manganese		510		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		49		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		55		2	"	"	"	"	6010C
Zinc		130		8	"	"	"	"	6010C

Lab ID: 1806010-20

Soil - Sampled: 06/05/18 15:00

Sample ID: OUM019-SM06-180605

Metals by EPA 6000/7000 Series Methods

Antimony		ND	U	2	mg/kg	B18F020	06/11/18	06/13/18	6010C
Arsenic		6.3		2	"	"	"	"	6010C
Barium		160		5	"	"	"	"	6010C
Beryllium		0.44		0.10	"	"	"	"	6010C
Cadmium		0.43	C1, J	0.50	"	"	"	"	6010C
Chromium		80		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		54		4	"	"	"	"	6010C
Lead		67		3	"	"	"	"	6010C
Manganese		560		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		59		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		62		2	"	"	"	"	6010C
Zinc		120		8	"	"	"	"	6010C



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75 Hawthorne Street

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SDG: 18157B

Reported: 06/21/18 10:04

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F020 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/11/18 Analyzed: 06/13/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Blank (B18F020-BLK1)

Antimony	ND	U		2 mg/kg
Arsenic	ND	U		2 "
Barium	ND	U		5 "
Beryllium	ND	U		0.1 "
Cadmium	ND	U		0.5 "
Chromium	ND	U		1 "
Cobalt	ND	U		2 "
Copper	ND	U		4 "
Lead	ND	U		3 "
Manganese	ND	U		5 "
Molybdenum	ND	U		5 "
Nickel	ND	U		5 "
Selenium	ND	U		2 "
Silver	ND	U		1 "
Thallium	ND	U		5 "
Tin	ND	U		5 "
Vanadium	ND	U		2 "
Zinc	ND	U		8 "

Matrix Spike (B18F020-MS1)

Source: 1806010-01

Antimony	16.8		2 mg/kg	98.0	ND	17	75-125
Arsenic	428		2 "	392	9.17	107	75-125
Barium	616		5 "	392	223	100	75-125
Beryllium	10.4		0.1 "	9.80	0.496	101	75-125
Cadmium	10		0.5 "	9.80	0.528	97	75-125
Chromium	137		1 "	39.2	95.1	106	75-125
Cobalt	110		2 "	98.0	14.8	97	75-125
Copper	107		4 "	49.0	62	91	75-125
Lead	178		3 "	98.0	80.9	99	75-125
Manganese	694	Q10	5 "	98.0	587	110	75-125
Molybdenum	89.4		5 "	98.0	ND	91	75-125
Nickel	186		5 "	98.0	89.9	98	75-125
Selenium	394		2 "	392	ND	101	75-125
Silver	9.97		1 "	9.80	ND	102	75-125
Thallium	373		5 "	392	ND	95	75-125
Tin	70.7		5 "	98.0	ND	72	75-125
Vanadium	159		2 "	98.0	56.8	104	75-125
Zinc	292		8 "	98.0	195	99	75-125

Matrix Spike Dup (B18F020-MSD1)

Source: 1806010-01

Antimony	17.9		2 mg/kg	100	ND	18	75-125	6	20
Arsenic	436		2 "	400	9.17	107	75-125	2	20
Barium	648		5 "	400	223	106	75-125	5	20



United States Environmental Protection Agency Region 9 Laboratory

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75 Hawthorne Street
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SDG: 18157B
Reported: 06/21/18 10:04

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F020 - 3050B Sid Acid Dig - Metals by 6010

Prepared: 06/11/18 Analyzed: 06/13/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Matrix Spike Dup (B18F020-MSD1)

Source: 1806010-01

Beryllium	10.7		0.1	"	10.0	0.496	103	75-125	3	20
Boron	397		10	"	400	8.2	97	75-125	5	20
Cadmium	10		0.5	"	10.0	0.528	95	75-125	0.3	20
Chromium	141		1	"	40.0	95.1	114	75-125	3	20
Cobalt	114		2	"	100	14.8	99	75-125	4	20
Copper	108		4	"	50.0	62	93	75-125	2	20
Lead	179		3	"	100	80.9	99	75-125	1	20
Manganese	718	Q10	5	"	100	587	131	75-125	3	20
Molybdenum	90.8		5	"	100	ND	91	75-125	2	20
Nickel	187		5	"	100	89.9	97	75-125	0.7	20
Selenium	400		2	"	400	ND	100	75-125	1	20
Silver	10.2		1	"	10.0	ND	102	75-125	2	20
Thallium	377		5	"	400	ND	94	75-125	1	20
Tin	74		5	"	100	ND	74	75-125	4	20
Vanadium	164		2	"	100	56.8	107	75-125	3	20
Zinc	299		8	"	100	195	105	75-125	3	20

Reference (B18F020-SRM1)

Antimony	54		2	mg/kg	66.0		82	41.2-158		
Arsenic	265		2	"	253		105	60.9-139		
Barium	ND	U	5	"	1.60			62.5-138		
Beryllium	4.81		0.1	"	4.90		98	61.2-139		
Cadmium	10.1		0.5	"	10.9		92	70.6-128		
Chromium	26.6		1	"	27.1		98	68.3-132		
Cobalt	36.7		2	"	37.4		98	64.7-135		
Copper	1,550		4	"	1770		87	74.6-126		
Lead	51		3	"	56.9		90	72.8-127		
Manganese	59.5		5	"	61.0		98	68.2-132		
Nickel	14.8		5	"	16.3		91	55.2-145		
Selenium	7.99		2	"	10.0		80	41-159		
Silver	6.68		1	"	5.90		113	45.8-154		
Thallium	8.67		5	"	9.50		91	30.5-169		
Vanadium	17.3		2	"	17.6		98	65.9-135		
Zinc	43.6		8	"	47.5		92	43.2-157		



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SDG: 18157B

Reported: 06/21/18 10:04

Qualifiers and Comments

Q4 The matrix spike and/or matrix spike duplicate associated with this sample did not meet recovery criteria for this analyte (see MS/MSD results for this batch in QC summary)

Q10 The analyte concentration in the unfortified sample is significantly greater than the concentration spiked into the matrix spike and matrix spike duplicate. The reported spike recovery is not a meaningful measure of the dataset's analytical accuracy.

J The reported result for this analyte should be considered an estimated value.

C1 The reported concentration for this analyte is below the quantitation limit.

U Not Detected

NR Not Reported

RE1, RE2, etc: Result is from a sample re-analysis.



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Region 9 Laboratory**

**1337 S. 46th Street Building 201
Richmond, CA 94804**

Date: 6/21/2018

Subject: Analytical Testing Results - Project R18S52
SDG: 18157A

From: Peter Husby, Director
EPA Region 9 Laboratory
EMD-3-1

To: Sharon Bowen
Brownfields and Site Assessment Section
SFD-6-1

Attached are the results from the analysis of samples from the **West Oakland Urban Metals Study** project. These data have been reviewed in accordance with EPA Region 9 Laboratory policy.

A full documentation package for these data, including raw data and sample custody documentation, is on file at the EPA Region 9 Laboratory. If you would like to request additional review and/or validation of the data, please contact Eugenia McNaughton at the Region 9 Quality Assurance Office.

If you have any questions, please ask for Richard Bauer, the Lab Project Manager at (510)412-2300.

Electronic CC: Amanda Reilly, Weston Solutions
Tom Fortner, Weston Solutions
Rick Fears, California DTSC

Analyses included in this report:

Metals by ICP

Percent Solids



United States Environmental Protection Agency

Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804

Phone:(510) 412-2300

Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157A

Reported: 06/21/18 09:28

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Collected	Date Received
OUM001-SM02-180604	1806009-01	Soil	06/04/18 10:40	06/06/18 08:25
OUM001-SM06-180604	1806009-02	Soil	06/04/18 10:40	06/06/18 08:25
OUM002-SM02-180604	1806009-03	Soil	06/04/18 12:02	06/06/18 08:25
OUM002-SM06-180604	1806009-04	Soil	06/04/18 12:02	06/06/18 08:25
OUM003-SM02-180604	1806009-05	Soil	06/04/18 13:15	06/06/18 08:25
OUM003-SM06-180604	1806009-06	Soil	06/04/18 13:15	06/06/18 08:25
OUM004-SM02-180604	1806009-07	Soil	06/04/18 13:21	06/06/18 08:25
OUM004-SM06-180604	1806009-08	Soil	06/04/18 13:21	06/06/18 08:25
OUM193-SM02-180604	1806009-09	Soil	06/04/18 14:25	06/06/18 08:25
OUM193-SM06-180604	1806009-10	Soil	06/04/18 14:25	06/06/18 08:25
OUM005-SM02-180604	1806009-11	Soil	06/04/18 15:40	06/06/18 08:25
OUM005-SM06-180604	1806009-12	Soil	06/04/18 15:40	06/06/18 08:25
OUM007-SM02-180604	1806009-13	Soil	06/04/18 17:00	06/06/18 08:25
OUM007-SM06-180604	1806009-14	Soil	06/04/18 17:00	06/06/18 08:25
OUM008-SM02-180604	1806009-15	Soil	06/04/18 15:46	06/06/18 08:25
OUM008-SM06-180604	1806009-16	Soil	06/04/18 15:46	06/06/18 08:25
OUM006-SM02-180604	1806009-17	Soil	06/04/18 15:09	06/06/18 08:25
OUM006-SM06-180604	1806009-18	Soil	06/04/18 15:09	06/06/18 08:25
OUM009-SM02-180605	1806009-19	Soil	06/05/18 09:45	06/06/18 08:25
OUM009-SM06-180605	1806009-20	Soil	06/05/18 09:45	06/06/18 08:25

Work Order 1806009

Bulk soil samples were received at the EPA Region 9 Laboratory. The soils were thoroughly mixed to homogenize and a portion was removed for drying and sieving. This portion was dried overnight at 37 degrees C (as per EPA method 1340) and sieved through a 150 um sieve. The < 150 um fraction was acid digested and analyzed for metals using ICP/AES. A portion of the sieved sample was retained for possible *in vitro* bioaccessibility assay at a future date.



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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157A

Reported: 06/21/18 09:28

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806009-01

Soil - Sampled: 06/04/18 10:40

Sample ID: OUM001-SM02-180604

Metals by EPA 6000/7000 Series Methods

Antimony	1.2	C1, Q4, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic	8.1		2	"	"	"	"	6010C
Barium	190		5	"	"	"	"	6010C
Beryllium	0.41		0.10	"	"	"	"	6010C
Cadmium	0.78		0.50	"	"	"	"	6010C
Chromium	67		1	"	"	"	"	6010C
Cobalt	14		2	"	"	"	"	6010C
Copper	120		4	"	"	"	"	6010C
Lead	140		3	"	"	"	"	6010C
Manganese	460		5	"	"	"	"	6010C
Molybdenum	3.3	C1, J	5	"	"	"	"	6010C
Nickel	52		5	"	"	"	"	6010C
Selenium	ND	U	2	"	"	"	"	6010C
Silver	ND	U	1	"	"	"	"	6010C
Thallium	ND	U	5	"	"	"	"	6010C
Tin	4.0	C1, Q4, J	5	"	"	"	"	6010C
Vanadium	47		2	"	"	"	"	6010C
Zinc	510		8	"	"	"	"	6010C

Lab ID: 1806009-02

Soil - Sampled: 06/04/18 10:40

Sample ID: OUM001-SM06-180604

Metals by EPA 6000/7000 Series Methods

Antimony	1.2	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic	11		2	"	"	"	"	6010C
Barium	190		5	"	"	"	"	6010C
Beryllium	0.47		0.10	"	"	"	"	6010C
Cadmium	0.65		0.50	"	"	"	"	6010C
Chromium	69		1	"	"	"	"	6010C
Cobalt	13		2	"	"	"	"	6010C
Copper	87		4	"	"	"	"	6010C
Lead	120		3	"	"	"	"	6010C
Manganese	510		5	"	"	"	"	6010C
Molybdenum	2.5	C1, J	5	"	"	"	"	6010C
Nickel	54		5	"	"	"	"	6010C
Selenium	ND	U	2	"	"	"	"	6010C
Silver	ND	U	1	"	"	"	"	6010C
Thallium	ND	U	5	"	"	"	"	6010C
Tin	ND	U	5	"	"	"	"	6010C
Vanadium	52		2	"	"	"	"	6010C
Zinc	330		8	"	"	"	"	6010C

Lab ID: 1806009-03

Soil - Sampled: 06/04/18 12:02

Sample ID: OUM002-SM02-180604

Metals by EPA 6000/7000 Series Methods



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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157A

Reported: 06/21/18 09:28

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806009-03

Soil - Sampled: 06/04/18 12:02

Sample ID: OUM002-SM02-180604

Metals by EPA 6000/7000 Series Methods									
Antimony	1.6	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C	
Arsenic	8.3		2	"	"	"	"	6010C	
Barium	220		5	"	"	"	"	6010C	
Beryllium	0.56		0.10	"	"	"	"	6010C	
Cadmium	1.7		0.50	"	"	"	"	6010C	
Chromium	86		1	"	"	"	"	6010C	
Cobalt	11		2	"	"	"	"	6010C	
Copper	170		4	"	"	"	"	6010C	
Lead	590		3	"	"	"	"	6010C	
Manganese	410		5	"	"	"	"	6010C	
Molybdenum	ND	U	5	"	"	"	"	6010C	
Nickel	50		5	"	"	"	"	6010C	
Selenium	ND	U	2	"	"	"	"	6010C	
Silver	ND	U	1	"	"	"	"	6010C	
Thallium	ND	U	5	"	"	"	"	6010C	
Tin	5.6		5	"	"	"	"	6010C	
Vanadium	54		2	"	"	"	"	6010C	
Zinc	1,100		8	"	"	"	"	6010C	

Lab ID: 1806009-04

Soil - Sampled: 06/04/18 12:02

Sample ID: OUM002-SM06-180604

Metals by EPA 6000/7000 Series Methods									
Antimony	1.7	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C	
Arsenic	9.3		2	"	"	"	"	6010C	
Barium	250		5	"	"	"	"	6010C	
Beryllium	0.60		0.10	"	"	"	"	6010C	
Cadmium	2.0		0.50	"	"	"	"	6010C	
Chromium	96		1	"	"	"	"	6010C	
Cobalt	11		2	"	"	"	"	6010C	
Copper	200		4	"	"	"	"	6010C	
Lead	670		3	"	"	"	"	6010C	
Manganese	450		5	"	"	"	"	6010C	
Molybdenum	ND	U	5	"	"	"	"	6010C	
Nickel	56		5	"	"	"	"	6010C	
Selenium	ND	U	2	"	"	"	"	6010C	
Silver	ND	U	1	"	"	"	"	6010C	
Thallium	ND	U	5	"	"	"	"	6010C	
Tin	7.5		5	"	"	"	"	6010C	
Vanadium	55		2	"	"	"	"	6010C	
Zinc	940		8	"	"	"	"	6010C	

Lab ID: 1806009-05

Soil - Sampled: 06/04/18 13:15



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Project: West Oakland Urban Metals Study

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Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806009-05

Soil - Sampled: 06/04/18 13:15

Sample ID: OUM003-SM02-180604

Metals by EPA 6000/7000 Series Methods

Antimony		3.9		2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic		8.4		2	"	"	"	"	6010C
Barium		210		5	"	"	"	"	6010C
Beryllium		0.57		0.10	"	"	"	"	6010C
Cadmium		0.81		0.50	"	"	"	"	6010C
Chromium		67		1	"	"	"	"	6010C
Cobalt		13		2	"	"	"	"	6010C
Copper		93		4	"	"	"	"	6010C
Lead		210		3	"	"	"	"	6010C
Manganese		420		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		57		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		46		2	"	"	"	"	6010C
Zinc		200		8	"	"	"	"	6010C

Lab ID: 1806009-06

Soil - Sampled: 06/04/18 13:15

Sample ID: OUM003-SM06-180604

Metals by EPA 6000/7000 Series Methods

Antimony		1.1	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic		8.9		2	"	"	"	"	6010C
Barium		230		5	"	"	"	"	6010C
Beryllium		0.57		0.10	"	"	"	"	6010C
Cadmium		1.0		0.50	"	"	"	"	6010C
Chromium		64		1	"	"	"	"	6010C
Cobalt		15		2	"	"	"	"	6010C
Copper		77		4	"	"	"	"	6010C
Lead		100		3	"	"	"	"	6010C
Manganese		530		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		61		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		52		2	"	"	"	"	6010C
Zinc		170		8	"	"	"	"	6010C

Lab ID: 1806009-07

Soil - Sampled: 06/04/18 13:21



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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

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SDG: 18157A

Reported: 06/21/18 09:28

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806009-07

Soil - Sampled: 06/04/18 13:21

Sample ID: OUM004-SM02-180604

Metals by EPA 6000/7000 Series Methods

Antimony		1.5	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic		19		2	"	"	"	"	6010C
Barium		250		5	"	"	"	"	6010C
Beryllium		0.51		0.10	"	"	"	"	6010C
Cadmium		1.2		0.50	"	"	"	"	6010C
Chromium		87		1	"	"	"	"	6010C
Cobalt		13		2	"	"	"	"	6010C
Copper		140		4	"	"	"	"	6010C
Lead		200		3	"	"	"	"	6010C
Manganese		500		5	"	"	"	"	6010C
Molybdenum		3.9	C1, J	5	"	"	"	"	6010C
Nickel		79		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		5.5		5	"	"	"	"	6010C
Vanadium		52		2	"	"	"	"	6010C
Zinc		460		8	"	"	"	"	6010C

Lab ID: 1806009-08

Soil - Sampled: 06/04/18 13:21

Sample ID: OUM004-SM06-180604

Metals by EPA 6000/7000 Series Methods

Antimony		1.3	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic		15		2	"	"	"	"	6010C
Barium		210		5	"	"	"	"	6010C
Beryllium		0.54		0.10	"	"	"	"	6010C
Cadmium		1.3		0.50	"	"	"	"	6010C
Chromium		92		1	"	"	"	"	6010C
Cobalt		15		2	"	"	"	"	6010C
Copper		190		4	"	"	"	"	6010C
Lead		250		3	"	"	"	"	6010C
Manganese		520		5	"	"	"	"	6010C
Molybdenum		5.7		5	"	"	"	"	6010C
Nickel		95		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		4.4	C1, J	5	"	"	"	"	6010C
Vanadium		53		2	"	"	"	"	6010C
Zinc		360		8	"	"	"	"	6010C

Lab ID: 1806009-09

Soil - Sampled: 06/04/18 14:25

Sample ID: OUM193-SM02-180604

Metals by EPA 6000/7000 Series Methods



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Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806009-09

Soil - Sampled: 06/04/18 14:25

Sample ID: OUM193-SM02-180604

Metals by EPA 6000/7000 Series Methods

Antimony		1.9	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic		6.4		2	"	"	"	"	6010C
Barium		250		5	"	"	"	"	6010C
Beryllium		0.33		0.10	"	"	"	"	6010C
Cadmium		1.5		0.50	"	"	"	"	6010C
Chromium		85		1	"	"	"	"	6010C
Cobalt		15		2	"	"	"	"	6010C
Copper		180		4	"	"	"	"	6010C
Lead		160		3	"	"	"	"	6010C
Manganese		590		5	"	"	"	"	6010C
Molybdenum		7.2		5	"	"	"	"	6010C
Nickel		74		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		5.0		5	"	"	"	"	6010C
Vanadium		54		2	"	"	"	"	6010C
Zinc		990		8	"	"	"	"	6010C

Lab ID: 1806009-10

Soil - Sampled: 06/04/18 14:25

Sample ID: OUM193-SM06-180604

Metals by EPA 6000/7000 Series Methods

Antimony		1.4	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic		7.1		2	"	"	"	"	6010C
Barium		230		5	"	"	"	"	6010C
Beryllium		0.43		0.10	"	"	"	"	6010C
Cadmium		1.4		0.50	"	"	"	"	6010C
Chromium		81		1	"	"	"	"	6010C
Cobalt		15		2	"	"	"	"	6010C
Copper		120		4	"	"	"	"	6010C
Lead		120		3	"	"	"	"	6010C
Manganese		520		5	"	"	"	"	6010C
Molybdenum		4.6	C1, J	5	"	"	"	"	6010C
Nickel		68		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		51		2	"	"	"	"	6010C
Zinc		760		8	"	"	"	"	6010C

Lab ID: 1806009-11

Soil - Sampled: 06/04/18 15:40

Sample ID: OUM005-SM02-180604

Metals by EPA 6000/7000 Series Methods



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Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806009-11

Soil - Sampled: 06/04/18 15:40

Sample ID: OUM005-SM02-180604

Metals by EPA 6000/7000 Series Methods

Antimony		1.4	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic		5.2		2	"	"	"	"	6010C
Barium		220		5	"	"	"	"	6010C
Beryllium		0.44		0.10	"	"	"	"	6010C
Cadmium		1.1		0.50	"	"	"	"	6010C
Chromium		59		1	"	"	"	"	6010C
Cobalt		15		2	"	"	"	"	6010C
Copper		170		4	"	"	"	"	6010C
Lead		140		3	"	"	"	"	6010C
Manganese		500		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		49		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		4.5	C1, J	5	"	"	"	"	6010C
Vanadium		53		2	"	"	"	"	6010C
Zinc		330		8	"	"	"	"	6010C

Lab ID: 1806009-12

Soil - Sampled: 06/04/18 15:40

Sample ID: OUM005-SM06-180604

Metals by EPA 6000/7000 Series Methods

Antimony		1.2	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic		7.9		2	"	"	"	"	6010C
Barium		320		5	"	"	"	"	6010C
Beryllium		0.61		0.10	"	"	"	"	6010C
Cadmium		1.1		0.50	"	"	"	"	6010C
Chromium		70		1	"	"	"	"	6010C
Cobalt		9.1		2	"	"	"	"	6010C
Copper		120		4	"	"	"	"	6010C
Lead		170		3	"	"	"	"	6010C
Manganese		400		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		53		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.66	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		48		2	"	"	"	"	6010C
Zinc		330		8	"	"	"	"	6010C

Lab ID: 1806009-13

Soil - Sampled: 06/04/18 17:00



United States Environmental Protection Agency
Region 9 Laboratory

1337 S. 46th Street, Building 201, Richmond, CA 94804
Phone:(510) 412-2300 Fax:(510) 412-2302

Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157A

Reported: 06/21/18 09:28

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806009-13

Soil - Sampled: 06/04/18 17:00

Sample ID: OUM007-SM02-180604

Metals by EPA 6000/7000 Series Methods

Antimony		1.9	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic		7.7		2	"	"	"	"	6010C
Barium		250		5	"	"	"	"	6010C
Beryllium		0.37		0.10	"	"	"	"	6010C
Cadmium		1.1		0.50	"	"	"	"	6010C
Chromium		74		1	"	"	"	"	6010C
Cobalt		14		2	"	"	"	"	6010C
Copper		120		4	"	"	"	"	6010C
Lead		110		3	"	"	"	"	6010C
Manganese		510		5	"	"	"	"	6010C
Molybdenum		3.5	C1, J	5	"	"	"	"	6010C
Nickel		56		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		4.3		1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		2.5	C1, J	5	"	"	"	"	6010C
Vanadium		46		2	"	"	"	"	6010C
Zinc		470		8	"	"	"	"	6010C

Lab ID: 1806009-14

Soil - Sampled: 06/04/18 17:00

Sample ID: OUM007-SM06-180604

Metals by EPA 6000/7000 Series Methods

Antimony		1.5	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic		7.7		2	"	"	"	"	6010C
Barium		210		5	"	"	"	"	6010C
Beryllium		0.40		0.10	"	"	"	"	6010C
Cadmium		1.1		0.50	"	"	"	"	6010C
Chromium		70		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		81		4	"	"	"	"	6010C
Lead		73		3	"	"	"	"	6010C
Manganese		600		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		54		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		ND	U	5	"	"	"	"	6010C
Vanadium		51		2	"	"	"	"	6010C
Zinc		300		8	"	"	"	"	6010C

Lab ID: 1806009-15

Soil - Sampled: 06/04/18 15:46

Sample ID: OUM008-SM02-180604

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157A

Reported: 06/21/18 09:28

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806009-15

Soil - Sampled: 06/04/18 15:46

Sample ID: OUM008-SM02-180604

Metals by EPA 6000/7000 Series Methods

Antimony		1.3	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic		8.0		2	"	"	"	"	6010C
Barium		190		5	"	"	"	"	6010C
Beryllium		0.40		0.10	"	"	"	"	6010C
Cadmium		0.88		0.50	"	"	"	"	6010C
Chromium		63		1	"	"	"	"	6010C
Cobalt		14		2	"	"	"	"	6010C
Copper		100		4	"	"	"	"	6010C
Lead		180		3	"	"	"	"	6010C
Manganese		390		5	"	"	"	"	6010C
Molybdenum		3.2	C1, J	5	"	"	"	"	6010C
Nickel		47		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		3.4	C1, J	5	"	"	"	"	6010C
Vanadium		53		2	"	"	"	"	6010C
Zinc		720		8	"	"	"	"	6010C

Lab ID: 1806009-16

Soil - Sampled: 06/04/18 15:46

Sample ID: OUM008-SM06-180604

Metals by EPA 6000/7000 Series Methods

Antimony		1.2	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic		8.4		2	"	"	"	"	6010C
Barium		170		5	"	"	"	"	6010C
Beryllium		0.46		0.10	"	"	"	"	6010C
Cadmium		0.66		0.50	"	"	"	"	6010C
Chromium		69		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		97		4	"	"	"	"	6010C
Lead		190		3	"	"	"	"	6010C
Manganese		380		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		45		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		6.0		5	"	"	"	"	6010C
Vanadium		55		2	"	"	"	"	6010C
Zinc		380		8	"	"	"	"	6010C

Lab ID: 1806009-17

Soil - Sampled: 06/04/18 15:09

Sample ID: OUM006-SM02-180604

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
Region 9 Laboratory

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Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157A

Reported: 06/21/18 09:28

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806009-17

Soil - Sampled: 06/04/18 15:09

Sample ID: OUM006-SM02-180604

Metals by EPA 6000/7000 Series Methods

Antimony		1.6	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic		5.6		2	"	"	"	"	6010C
Barium		260		5	"	"	"	"	6010C
Beryllium		0.44		0.10	"	"	"	"	6010C
Cadmium		1.7		0.50	"	"	"	"	6010C
Chromium		55		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		130		4	"	"	"	"	6010C
Lead		300		3	"	"	"	"	6010C
Manganese		510		5	"	"	"	"	6010C
Molybdenum		2.5	C1, J	5	"	"	"	"	6010C
Nickel		47		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		5.8		5	"	"	"	"	6010C
Vanadium		39		2	"	"	"	"	6010C
Zinc		560		8	"	"	"	"	6010C

Lab ID: 1806009-18

Soil - Sampled: 06/04/18 15:09

Sample ID: OUM006-SM06-180604

Metals by EPA 6000/7000 Series Methods

Antimony		1.4	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic		6.0		2	"	"	"	"	6010C
Barium		250		5	"	"	"	"	6010C
Beryllium		0.50		0.10	"	"	"	"	6010C
Cadmium		1.8		0.50	"	"	"	"	6010C
Chromium		54		1	"	"	"	"	6010C
Cobalt		12		2	"	"	"	"	6010C
Copper		110		4	"	"	"	"	6010C
Lead		280		3	"	"	"	"	6010C
Manganese		580		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		48		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		5.5		5	"	"	"	"	6010C
Vanadium		39		2	"	"	"	"	6010C
Zinc		460		8	"	"	"	"	6010C

Lab ID: 1806009-19

Soil - Sampled: 06/05/18 09:45

Sample ID: OUM009-SM02-180605

Metals by EPA 6000/7000 Series Methods



United States Environmental Protection Agency
Region 9 Laboratory

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Project Manager: Sharon Bowen

Project Number: R18S52

Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157A

Reported: 06/21/18 09:28

Sample Results

Analyte	Reanalysis / Extract	Result	Qualifiers / Comments	Quantitation Limit	Units	Batch	Prepared	Analyzed	Method
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Lab ID: 1806009-19

Soil - Sampled: 06/05/18 09:45

Sample ID: OUM009-SM02-180605

Metals by EPA 6000/7000 Series Methods

Antimony		1.3	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic		6.4		2	"	"	"	"	6010C
Barium		270		5	"	"	"	"	6010C
Beryllium		0.47		0.10	"	"	"	"	6010C
Cadmium		2.2		0.50	"	"	"	"	6010C
Chromium		55		1	"	"	"	"	6010C
Cobalt		9.2		2	"	"	"	"	6010C
Copper		88		4	"	"	"	"	6010C
Lead		730		3	"	"	"	"	6010C
Manganese		380		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		46		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		0.50	C1, J	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		13		5	"	"	"	"	6010C
Vanadium		39		2	"	"	"	"	6010C
Zinc		550		8	"	"	"	"	6010C

Lab ID: 1806009-20

Soil - Sampled: 06/05/18 09:45

Sample ID: OUM009-SM06-180605

Metals by EPA 6000/7000 Series Methods

Antimony		1.6	C1, J	2	mg/kg	B18F019	06/11/18	06/13/18	6010C
Arsenic		7.4		2	"	"	"	"	6010C
Barium		400		5	"	"	"	"	6010C
Beryllium		0.60		0.10	"	"	"	"	6010C
Cadmium		2.1		0.50	"	"	"	"	6010C
Chromium		62		1	"	"	"	"	6010C
Cobalt		11		2	"	"	"	"	6010C
Copper		130		4	"	"	"	"	6010C
Lead		870		3	"	"	"	"	6010C
Manganese		500		5	"	"	"	"	6010C
Molybdenum		ND	U	5	"	"	"	"	6010C
Nickel		51		5	"	"	"	"	6010C
Selenium		ND	U	2	"	"	"	"	6010C
Silver		ND	U	1	"	"	"	"	6010C
Thallium		ND	U	5	"	"	"	"	6010C
Tin		37		5	"	"	"	"	6010C
Vanadium		46		2	"	"	"	"	6010C
Zinc		770		8	"	"	"	"	6010C



United States Environmental Protection Agency Region 9 Laboratory

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Project: West Oakland Urban Metals Study

Brownfields and Site Assessment Section

75 Hawthorne Street

San Francisco CA, 94105

SDG: 18157A

Reported: 06/21/18 09:28

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F019 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/11/18 **Analyzed:** 06/13/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Blank (B18F019-BLK1)

Antimony	ND	U		2 mg/kg						
Arsenic	ND	U		2 "						
Barium	ND	U		5 "						
Beryllium	ND	U		0.1 "						
Cadmium	ND	U		0.5 "						
Chromium	ND	U		1 "						
Cobalt	ND	U		2 "						
Copper	ND	U		4 "						
Lead	ND	U		3 "						
Manganese	ND	U		5 "						
Molybdenum	ND	U		5 "						
Nickel	ND	U		5 "						
Selenium	ND	U		2 "						
Silver	ND	U		1 "						
Thallium	ND	U		5 "						
Tin	ND	U		5 "						
Vanadium	ND	U		2 "						
Zinc	ND	U		8 "						

Matrix Spike (B18F019-MS1)

Source: 1806009-01

Antimony	22.9			2 mg/kg	98.0	1.24	22	75-125		
Arsenic	403			2 "	392	8.09	101	75-125		
Barium	563			5 "	392	188	96	75-125		
Beryllium	10.8			0.1 "	9.80	0.407	106	75-125		
Cadmium	10.2			0.5 "	9.80	0.781	96	75-125		
Chromium	106			1 "	39.2	67.5	97	75-125		
Cobalt	111			2 "	98.0	14.3	99	75-125		
Copper	154			4 "	49.0	116	79	75-125		
Lead	249			3 "	98.0	142	109	75-125		
Manganese	566	Q10		5 "	98.0	455	114	75-125		
Molybdenum	93			5 "	98.0	3.26	92	75-125		
Nickel	144			5 "	98.0	51.7	94	75-125		
Selenium	375			2 "	392	ND	96	75-125		
Silver	9.43			1 "	9.80	ND	96	75-125		
Thallium	366			5 "	392	ND	93	75-125		
Tin	70.8			5 "	98.0	3.97	68	75-125		
Vanadium	149			2 "	98.0	47.1	104	75-125		
Zinc	603	Q10		8 "	98.0	510	94	75-125		

Matrix Spike Dup (B18F019-MSD1)

Source: 1806009-01

Antimony	22.7			2 mg/kg	99.0	1.24	22	75-125	0.9	20
Arsenic	397			2 "	396	8.09	98	75-125	2	20
Barium	539			5 "	396	188	89	75-125	4	20



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Reported: 06/21/18 09:28

Quality Control

Analyte	Result	Qualifiers / Comments	Quantitation Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Batch B18F019 - 3050B Sld Acid Dig - Metals by 6010

Prepared: 06/11/18 Analyzed: 06/13/18

Metals by EPA 6000/7000 Series Methods - Quality Control

Matrix Spike Dup (B18F019-MSD1)

Source: 1806009-01

Beryllium	10.4		0.1	"	9.90	0.407	101	75-125	3	20
Cadmium	10.1		0.5	"	9.90	0.781	94	75-125	1	20
Chromium	105		1	"	39.6	67.5	94	75-125	0.8	20
Cobalt	108		2	"	99.0	14.3	94	75-125	4	20
Copper	158		4	"	49.5	116	85	75-125	2	20
Lead	247		3	"	99.0	142	106	75-125	0.6	20
Manganese	535	Q10	5	"	99.0	455	81	75-125	6	20
Molybdenum	91.4		5	"	99.0	3.26	89	75-125	2	20
Nickel	144		5	"	99.0	51.7	93	75-125	0.2	20
Selenium	369		2	"	396	ND	93	75-125	2	20
Silver	9.27		1	"	9.90	ND	94	75-125	2	20
Thallium	362		5	"	396	ND	91	75-125	1	20
Tin	71.2		5	"	99.0	3.97	68	75-125	0.6	20
Vanadium	148		2	"	99.0	47.1	102	75-125	0.2	20
Zinc	583	Q10	8	"	99.0	510	73	75-125	3	20

Reference (B18F019-SRM1)

Antimony	50.4		2	mg/kg	66.0		76	41.2-158		
Arsenic	248		2	"	253		98	60.9-139		
Barium	ND	U	5	"	1.60			62.5-138		
Beryllium	4.71		0.1	"	4.90		96	61.2-139		
Cadmium	9.84		0.5	"	10.9		90	70.6-128		
Chromium	25.5		1	"	27.1		94	68.3-132		
Cobalt	35.8		2	"	37.4		96	64.7-135		
Copper	1,480		4	"	1770		83	74.6-126		
Lead	48.4		3	"	56.9		85	72.8-127		
Manganese	55.6		5	"	61.0		91	68.2-132		
Nickel	14.2		5	"	16.3		87	55.2-145		
Selenium	7.63		2	"	10.0		76	41-159		
Silver	5.58		1	"	5.90		95	45.8-154		
Thallium	7.8		5	"	9.50		82	30.5-169		
Vanadium	16.9		2	"	17.6		96	65.9-135		
Zinc	42		8	"	47.5		88	43.2-157		



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Reported: 06/21/18 09:28

Qualifiers and Comments

Q4 The matrix spike and/or matrix spike duplicate associated with this sample did not meet recovery criteria for this analyte (see MS/MSD results for this batch in QC summary)

Q10 The analyte concentration in the unfortified sample is significantly greater than the concentration spiked into the matrix spike and matrix spike duplicate. The reported spike recovery is not a meaningful measure of the dataset's analytical accuracy.

J The reported result for this analyte should be considered an estimated value.

C1 The reported concentration for this analyte is below the quantitation limit.

U Not Detected

NR Not Reported

RE1, RE2, etc: Result is from a sample re-analysis.

Appendix D: Data Validation Reports



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

September 21, 2018

MEMORANDUM

SUBJECT: Review of EPA Region 9 Laboratory Data for June 2018 Samples Collected under the Sampling and Analysis Plan for Urban Metals Study: West Oakland, Weston Solutions, Inc., May 2018, Oakland, CA, QA Section Document Control Number [DCN] SPFD0073OV1

FROM: Joe Eidelberg, Chemist
Quality Assurance Section, EMD3-2

THROUGH: Audrey L. Johnson, Manager
Quality Assurance Section, EMD3-2

TO: Sharon Bowen, Site Assessment Manager
Brownsfields & Site Assessment Section, SFD6-1

A Tier 2 Data Validation was performed for soil samples analyzed by the US EPA Region 9 Laboratory under the *Sampling and Analysis Plan for Urban Metals Study: West Oakland, Weston Solutions, Inc., May 2018* using professional judgment and guidance provided in the document *National Functional Guidelines for Inorganic Superfund Methods Data Review (ISM02.4)*, January 2017, EPA-540-R-2017-001.

This review included evaluation of all quality control sample results, spot checks of a subset of the documentation (calibration data, chain of custody documentation, transcription and processing of raw data, calibration traceability), and an assessment of the field quality control sample results.

The laboratory data reviewed included the following sample delivery groups (SDGs) provided by the US EPA Region 9 laboratory as data packages typically referred to as Level IV data packages.

<u>SDG</u>	<u>Laboratory Report Date</u>	<u>Sample Collection Date</u>
18157A	June 21, 2018	June 4 and 5, 2018
18157B	June 21, 2018	June 4, and 5, 2018
18157C	June 21, 2018	June 4 through 6, 2018
18157D	July 10, 2018	June 4 through 6, 2018
18158C	June 26, 2018	June 6, 2018
15158D	June 26, 2018	June 6, 2018
18159A	June 28, 2018	June 7, 2018
18159B	June 28, 2018	June 7, 2018
18159C	July 10, 2018	June 7 and 8, 2018
18162A	June 28, 2018	June 8, 2018
18162B	June 28, 2018	June 8, 2018
18162C	July 10, 2018	June 8 and 11, 2018

There were chain-of-custody errors (documentation consistency errors) which were generally minor, however, some of the errors could not be corrected and required resampling. These errors are documented in every relevant data package. For the minor inconsistencies, judgment was applied by the Region 9 Laboratory to interpret the sample information such as sample numbers, dates, and time; and in most instances, there is documentation that the field samplers agreed with Region 9 Laboratory corrections. In the opinion of this reviewer, the frequency of errors and types of errors were atypical, however, for the relevant data quality objectives, no qualification of the data is necessary.

All Antimony (Sb) soils sample results should be "J" flagged as estimated data and considered biased low by 80% due to consistently low matrix spike recoveries (a type of quality control sample).

Field quality control (QC) samples (equipment blanks and field duplicates) were evaluated. Due to the large number of field QC duplicate samples, a table of field duplicate evaluations has been attached as spreadsheet *Field_Duplicate_Evaluations_WestOakland.xls*. The equipment blanks samples evaluated are listed in the attached spreadsheet *QC_Summary_Form_West Oakland.xls* but a formal analysis of the acceptability of the blank results is not provided as there were no exceedances or concerns.

The field duplicate results in general show remarkably good agreement (within error of the laboratory method). A few samples showed disagreement larger than could be explained by laboratory variability and indicates sample heterogeneity. The disagreements of concern are highlighted in yellow on the attached spreadsheet. For the project data quality objectives, no flagging of the data was warranted.

The laboratory data qualifiers ("J" flags), already documented in the data reports transmitted to you, have not been modified as they are consistent with this review.

In summary, the data covered by this scope of this review are usable for your project data quality objectives without qualification other than described above

If you have any questions or concerns, please contact me at 415-972-3809 or by email at eidlberg.joseph@epa.gov.

Appendix E: Field Sampling Logbooks

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Oakland Urban Metals

June 4 - 2018

Weston Team #1



Rite in the Rain

ALL-WEATHER
JOURNAL

No 391FX



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Project Oakland Urban Metals



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CONTENTS

PAGE	REFERENCE	DATE
	Weston me	
0955	START Safety tailgate	<u>6-4-18</u>
	Meeting w/ DTSC & EPA present.	
Weston me	STARTS Burckle, Conway,	
	Fortner, & Frey. EPA	
	Sharon Bowen, Eric Canteenwala.	
	DTSC Thelma Perez, Dan Murphy.	
	Discuss sampling and data	
	collection procedures. START	
Weston me	team 2 (Conway & Frey) to	
	take samples at odd grids.	
Weston me	START team 2 (Burckle & Fortner)	
	to collect duplicate samples	
	at grids ending in -0, & even grids.	
1020	Prepare to start sampling at	
	grid 1.	
1040	Move to other area in Grid 1	
	for softer soil - first attempt	
	was too much rock under soil.	
	Samples 001 taken at West	
	side of Mandela Pkwy north	
	of Granite Expo. @ 2nd tree well.	
	Coordinates recorded as:	
	37.82580007, -122.28986765	
1115	Finish packing up & go to Grid 2.	

1120 Arrive at Grid 2. Team 2 —
collecting data with Team 1 —
as support and to ensure —
consistent data collection practices. —
EPA & DTSC observing. Sample —
taken at fence line on east —
side of Hannah Street —

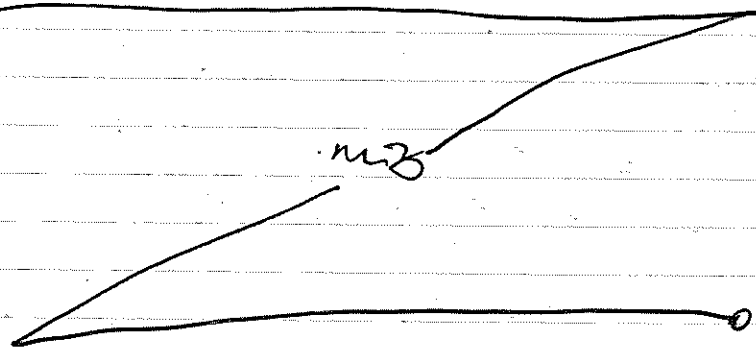
at dead end under I-580, —
north of 34th Street. Soil —
Conditions require selection of —
an alternate location in Grid 2. —

1140 arrive at new location in Grid 2. —

1150 arrive at new location in Grid 2. —

tree well on west side of —
Hannah Street north of 34th St. —

Too rocky at the tree well. Sample —
taken from utility pole well 10415. —
across from 3428/3426 Hannah St. —



1315 Arrive at Grid 3 for sampling. —
Sample taken on west side of —
Helen Street at first tree well, —
north of 34th St. in front of —
3435 Helen St. Likely informal —
daycare and residences with —
children on block. —

1405 Arrive at Grid 5. —

1420 Instructed by EPA to proceed —
to purchase C clamps for sampling —
device. —

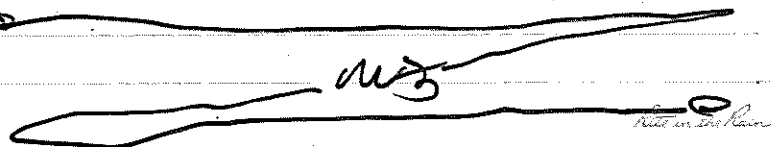
1540 ^{not} 1340 Finish sampling Grid 35 at —
2nd tree well on east side of —
Peralta, north of 34th St, across —
from 3401 Peralta and Fitzgerald (Harlan)

1350 Arrive at Grid 7. Sample taken —
1550 ^{not} on San Pablo Ave at north end of —
median due south of 35th St. between —
multiunit dwelling and gas station. —

1700 Complete sampling Grid 7. —

1725 Decon & collect equipment blank —
Sample EB01 (OUM-EB01-180604). —

1800 Return to rendezvous point & off. —



~~Grays~~

6-5-18 0900 Meet. Safety meeting.
Discuss data collection, sampling protocol,
and equipment. Weston Conway & Frey
and DTSC Perez & Murphy go to
Grid 9 for sampling.

0945 Arrive at Grid 9. Sample taken
in soil area in front of empty fenced
lot on Ettie St. (west side) south of
34th St. Coordinates recorded as:

37.82437535, -122.28835120.

1045 Arrive at Grid 11. Sample taken
in tree well in front of 3243
Louise St. between 32nd & 34th St.
Resident with child likely @
home with clipping paint nearby.
Coordinates recorded as:

37.82474524, -122.28499061

1135 Arrive at Grid 13. Sample
collected in tree well in front of
3311 Adeline St on west side of
street south of 34th St. Coordinates:
37.82483503, -122.28072681.

ms

1315 Arrive at Grid 15. Sampled
in front of 937 34th St at west
side of soil strip by curb, across
from Oakland Fire Department Engine
Number 5. Coordinates:

37.828112, 37.82481590,

-122.27637350. Collector app
crashed and did not save photos
from aliquots 1 & 2.

1410 Arrive at Grid 17. Sample
taken at utility pole on east
side of Wood St. north of
34th St. Coordinates recorded as:
37.8238708, -122.29022668.

1500 Arrive at Grid 19. Sample
in front of 1503 32nd St. by
Helen St. Coordinates recorded as:
37.82368575, -122.28587730.

1530 Arrive at Grid 21. Sample
in front of residence, who stated to
DTSC they had their backyard
sampled and found elevated lead levels.
Coordinates recorded as:
37.82284426, -122.28254028. In front

of 3033 Magnolia St.

ms

1745 Finish decon & equipment
blanks. Complete & load coolers/
chain of custody forms. Leave
for rendezvous point / Pretty Lady.

mz

6-6-18 0915 Arrive to meeting point
with coolers & ice. Teams preparing
equipment for the day. Days 1-2 samples
dropped at EPA R9 lab at 0825.

0945 Depart to Grid 23.

0950 Arrive at Grid 23:

Sample IDs: OUM023-SM02-180606 —
— — — — — SM06 — — — — —

Latitude: 37.82315827 — — — — —

Longitude: -122.27867005 — — — — —

Sample location: 1031 32nd St. — — — — —

Landmark: N. Oak Missionary Baptist Church

Other remarks: Nearby paint issues. — — — — —

Sample time: 1005 — — — — —

Sample Date: 6-6-18 — — — — —

1015 EPA Bowen & DTSC Murphy arrive
with new sampling device and to speak
with resident.

1030 Depart to Grid 25. — — — — —

1035 Arrive at Grid 25: — — — — —

Sample IDs: OUM025-SM02-180606 (1 SM06)

Sample date/time: 6-6-18 1051 — — — — —

Lat/long: 37.8362525, -122.27389134 — — — — —

Location: 832-836 33rd St. — — — — —

Landmark: Hoover Elementary School. ←

Remarks: No photo of aliquot 2. — — — — —

101540 Arrive at Grid 35; —
Sample IDs: OUMØ35-SMØ2-180606 (ASMØ6)
Date/Time: 6-6-18 1550 —
Lat/long: 37.82225465, -122.27818410
Location: 3115 Filbert St. —
Landmark: Vacant lot across the street
w/ large plants and const. equipment.
1605 Depart Grid 35 for Grid 37. —
1608 Arrive Grid 37 —
Sample IDs: OUMØ37-SMØ2-180606 (ASMØ6)
Date/Time: 6-6-18 1611 —
Lat/long: 37.82224290, -122.27465083
Location: 852 32nd St. —
Landmark: Empty lot due east of 852 32nd St.
1630 Depart Grid 37 for Grid 39. —
1634 Arrive at Grid 39: —
Sample IDs: OUMØ39-SMØ2-180606 (ASMØ6)
Date/Time: 6-6-18 1635 —
Lat/long: 37.82211776, -122.27077760 —
Location: 3251 MLK Jr. Way along 32nd St.
Landmark: S & N Market on MLK. —
1655 Depart Grid 39 to rendezvous
at Amco site & dispose of rinse
water, refill, decon, equipment blanks,
etc. Sample OUMEBØ5-180606 @ 1737.
1800 Depart rendezvous @ Amco site. —

mz

[6-7-18] 0810 Head to EPA R9 Lab ¹¹
to drop samples. —
0825 Deliver samples, sign over COCs, etc.
and go to get cooler ice. —
0905 Arrive at meeting point for
setup & safety meeting. —
0945 Depart for Grid 41. —
0950 Arrive Grid 41: —
Sample IDs: OUMØ41-SMØ2-180607 (ASMØ6)
Date/Time: 6-7-18 1005 —
Lat/long: 37.82071279, -122.29115453 —
Location: E. side of Willow N. of 24th St. —
Landmark: Construction supply warehouse
yard @ SW corner of Willow & 24th
1022 Depart Grid 41 for Grid 43.
1025 Arrive at Grid 43: —
Sample IDs: OUMØ43-SMØ2-180607 (ASMØ6)
Date/Time: 6-7-18 1030 —
Lat/long: 37.82055944, -122.28647527
Location: E. side Peralta St. N. of 26th.
2nd tree well strip b/w trees 2-3.
Landmark: Black Panther mural & doorway.
1049 Depart Grid 43 for 45. —

⊗

mz

Kite in the sky

1051 Arrive Grid 45. —————

Sample IDs: OUMØ45-SMØ2-18Ø6Ø7 (2SMØ6)

Date/Time: 6-7-18 1055 —————

Lat/long: 37.82056606, -122.28226986

Location: 2811 Adeline St. 2nd tree N. of 28th

Landmark: Murals at 2811 Adeline St. —

Remarks: Construction and paint issue

on other side of st. 2818/2826. —

1118 Depart for Grid 47. —————

1121 Arrive at Grid 47: —————

Sample IDs: OUMØ47-SMØ2-18Ø6Ø7 —

Date/Time: 6-7-18 1124 —————

Lat/long: 37.82017314, -122.27784132

Location: 2841 Myrtle St. —————

Landmark: Open lot @ 2914 Myrtle St.

1150 Depart Grid 47 for 49, —————

1152 Arrive Grid 49: —————

Sample IDs: OUMØ49-SMØ2-18Ø6Ø7 (2SMØ6)

Date/Time: 6-7-18 1156 —————

Lat/long: 37.82022684, -122.27419017.

Location: 818 30th St by water meter/

speed bump due west of West. Street.

Landmark: Mural @ SE corner West/30th

Remarks: Paint issues on block.

Application crashed and did not save

photos of aliquots 2-3. —————

1216 Depart to Grid 51. —————

1219 Arrive at Grid 51: —————

Sample IDs: OUMØ51-SMØ2-18Ø6Ø7 (2SMØ6)

Date/Time: 6-7-18 1222 —————

Lat/long: 37.82049856, -122.27049441

Location: 31st St. east of MLK Jr Hwy.

South side of street b/w light pole

& last tree in the tree well.

Landmark: Building @ SW corner MLK & 31st

Remarks: Paint issues. —————

1248 Depart Grid 51 for lunch/gas/S3

1321 Arrive at Grid 53: —————

Sample IDs: OUMØ53-SMØ2-18Ø6Ø7 (2SMØ6)

Date/Time: 6-7-18 1229m, 1329

Lat/long: 37.81849233, -122.29195541

Location: W. side of Willow St. N. of

W. Grand Ave near utility pole

Stabilizing wire. —————

Landmark: W. Grand Ave elevated road.

1355 Depart to Grid 55. —————

1400 Arrive Grid 55: —————

Sample IDs: OUMØ55-SMØ2-18Ø6Ø7 (2SMØ6)

Date/Time: 6-7-18 1402 —————

Lat/long: 37.81910775, -122.28788983

Location: Tree well b/w 2451-2461 Peralta

Landmark: Building on W. side Peralta. —

Landmark: Lone Star Industries. —————

1434 Depart Grid 55 for 57. *It's raining*

1438 Arrive Grid 57: —

Sample IDs: OUMØ57-SMØ2-180607 (ASMØ6)

Date/Time: 6-7-18 142m 1441 —

Lat/long: 37.81887337, -122.28362511 —

Location: S. side 26th St. E. of Magnolia

b/w 2-3rd trees / entry doors for

2534 & 2534 B Magnolia St. —

Landmark: ~~Mural across st. on 26th~~ —

Landmark: Magnolia / 26th / Deli. —

1315 Depart for Grid 59. —

1515 Arrive Grid 59. —

Sample IDs: OUMØ59-SMØ2-180607 (ASMØ6)

Date/Time: 6-7-18 1521 —

Lat/long: 37.81829844, -122.28110231 —

Location: S. side 26th St. E. of Chestnut.

Corner of 2nd grass/tree area in front

of entry gate at 1089 26th St.

Landmark: Football stadium across st.

Remarks: Children likely present. School.

1549 Depart Grid 59 for 61. —

1554 Arrive at Grid 61: —

Sample IDs: OUMØ61-SMØ2-180607 (ASMØ6)

Date/Time: 6-7-18 1558 —

Lat/long: 37.81893987, -122.27666623 —

Location: 875-28th St. 2nd tree well S. side. E. of Mark

Landmark: Rubenstein Supply Company.

1620 Depart Grid 61 to 63. —

1625 Arrive Grid 63: —

Sample IDs: OUMØ63-SMØ2-180607 (ASMØ6)

Date/Time: 6-7-18 1628 —

Lat/long: 37.81899347, -122.27239164 —

Location: 700 29th St. —

Landmark: Church(?) / Calous Linen Service

Remarks: Playground, paint issues,

and construction. —

1648 Depart Grid 77. —

1651 Arrive Grid 77: —

Sample IDs: OUMØ77-SMØ2-180607 (ASMØ6)

Date/Time: 6-7-18 1654 —

Lat/long: 37.81784564, -122.27193361 —

Location: 663/665 28th St. b/w 2 trees

Landmark: Abandoned building at

corner (NW) of 28th & MLK Jr. —

1700 Rendezvous @ Grid 77 to decon

& take equipment blank samples.

1718 Sample ~~EB~~ —

OUMEBØ7-180607-1718 —

1737 Return to meeting point for

vehicle swap. —

1750 Leave meeting point toward

morning sample dropoff.

⊗ —

Urg —

—

6-8-18 0805 Depart to lab.

0820 Arrive at EPA R9 Laboratory.

0827 Finish at lab, go for ice & meeting pt.

0900 Arrive at meeting point to prep coolers, safety meeting, etc.

0915 Safety meeting.

0925 Report meeting record.

0930 Arrive Grid 65:

Sample IDs: OUMØ65-SMØ2-180608 (4SMØ6)

Date/Time: 6-8-18 0943

Lat/long: 37.81658463, -122.29529137

Location: West side of Wood Street
across from football field / 5th fence-
post of field fence.

Landmark: Football field.

~~123 Depart Grid 65 for Grid 79.~~

~~Remarks: Comm 123~~

1008 Depart for Grid 79.

1010 Arrive Grid 79:

Sample IDs: OUMØ79-SMØ2-180608 (4SMØ6)

Date/Time: 6-8-18 1010

Lat/long: 37.81520506, -122.29643075

Location: West side of Wood Street.
South of 17th St, just north of garden
and across from N. side of gate @ Wood/17th SE.

Landmark: Garden / former train? station

Remarks: Garden is used by local students

1030 Depart Grid 79 for 67.

1039 Arrive Grid 67:

Sample IDs: OUMØ67-SMØ2-180608 (4SMØ6)

Date/Time: 6-8-18 1050

Lat/long: 37.81692753, -122.29122657

Location: Campbell St. S. of W Grand Ave
ex 10 feet south of 2nd Light utility
pole on east side of street.

Landmark: SF Enterprises sign as seen
from sample location looking across W Grand

1111 Depart Grid 67 for 81

1112 Arrive Grid 81

Sample IDs: OUMØ81-SMØ2-180608 (4SMØ6)

Date/Time: 6-8-18 1115

Lat/long: 37.81586206, -122.29207590

Location: Campbell St, W side south of 20th

Location: W side Campbell St. S. of 20th
2nd tree well.

Landmark: Baseball field.

Remarks: Paint issues @ warehouse, field.

~~123 Depart for Grid 69.~~

Also encampment along 20th St.

1134 Depart to Grid 83.

⊗

~~123~~

1139 Arrive at Grid 83:
Sample IDs: OUMØ83-SMØ2-180608
and SMØ6.

Date/time: 6-8-18 1142
Lat/long: 37.8163 5531, -122.28801678
Location: W Grand Ave. near NE Pacific Pipe Blk.
Landmark: Pacific Pipe Company.
Landmark: Large sculptures.
Location addendum: S side of W Grand Ave. approx 3 ft east of 2nd parking sign.
1157 Depart to Grid 69.

1200 Arrive at Grid 69:
Sample IDs: OUMØ69-SMØ2-180608 (SMØ6)
Date/time: 6-8-18 1202
Lat/long: 37.81751008, -122.28897099
Location: SE corner of Mandela & Pers. Hts.
Landmark: Buchanan Auto Electric.

1218 Depart to Grid 71.

1221 Arrive Grid 71.

Sample IDs: OUMØ71-SMØ2-180608 (SMØ6)
Date/time: 6-8-18 1224

Lat/long: 37.81733394, -122.2843291
Location: Tree well SE corner 24th @ Magnolia.
Landmark: NW corner 24th @ Magnolia.
Remarks: Paint issues, child likely.

1302 Depart for Grid

1304 Arrive at Grid 85:
Sample IDs: OUMØ85-SMØ2-180608 (SMØ6)
Date/time: 6-8-18 1307

Lat/long: 37.81590932, -122.28480986
Location: W Grand Ave @ NE corner
with Magnolia approx 6 ft east of 1st tree
Landmark: EBMUD building.

1327 Break for lunch & break.

1430 Arrive at Grid 73:

Sample IDs: OUMØ86(a)-SMØ2-180608 86 and 85
Date/time: 6-8-18 1433

Lat/long: 37.81617897, -122.28136717
Location: 10 ft north of light pole
across from 2241 Linden St.

Remarks: Paint, construction, children.
Landmark: Linden facing south/palm trees

1452 Depart to grid 73

1454 Arrive Grid 73:

Sample IDs: OUMØ73-SMØ2-180608 (SMØ6)
Date/time: 6-8-18 1455

Lat/long: 37.81728775, -122.27998013
Location: 2431 Filbert St. 10 ft. from tree
to the north in front of vacant lot
Landmark: School @ Filbert & 26th St.

1538 Depart to Grid 87.

⊗ ——— MZ ——— ⊗

1540 Arrive Grid 87: ———

Sample IDs: OUMØ87-SMØ2-180608

Date/time: 6-8-18 1544 ———

Lat/long: 37.81593555, -122.28046070

Location: 2315 Filbert, west side of street.

Landmark: Anderson Carpet shop/receive.

1611 Depart to Grid 75. ———

1619 Arrive at Grid 75: ———

Sample IDs: OUMØ75-SMØ2-180608 (ØSMØ6)

Date/time: 6-8-18 1621 ———

Lat/long: 37.81796724, -122.27658117

Location: Alicia St. n. of 27th @ 3rd tree

on east side of street. ———

Landmark: Berry Bros towing Alicia / Market.

1440 Depart to Grid 89. ———

1644 Arrive at Grid 89: ———

Sample IDs: OUMØ89-SMØ2-180608 (ØSMØ6)

Date/time: 6-8-18 1646 ———

Lat/long: 37.81617720, -122.27617207

Location: 827 Mead Ave. ———

Remarks: Paint issues & children nearby.

Note: Weston Roussos joined at ~1530.

~~1301 Depart to Grid 91~~ ———

1711 Meet w/ team 2, head to AMCO

site to decon / equipment blanks.

1720 Arrive @ AMCO. OUMØ89-180608

1747 Depart AMCO. Frey to deliver samples Monday

6/11/18 W. OAKLAND METALS G. ROUSSOS

0830 meet Weston team at 18th +

Peralta - Kim, Chad, Brandon, +
Tom. ———

Set up equipment & prepare for
the day. ———

0918 Arrive in grid 93, will select
location

Lat: 37.81406046

Long: -122.29705273

Sample ID: OUM-093-SMØ2-180611

Landmark: no parking sign along
Wood St. At 1500 Wood.

0950 Arrive at Grid 95

Sample ID: OUM-095-SMØ2-180611

Time: 0955

37.81368219°, -122.29383438°

Landmark: Front door, lampwork lot #5
1614 Campbell St.

1025 Arrive at Grid 97

37.81444204, -122.28989489

Sample ID: OUM-097-SMØ2-180611

Sample time 6/11/18, 1030

Landmark: Bay Door 4, only
building E side of Mandela Pkwy

Note: Very tough / sticky soil / material
encountered at 5-6" bgs. *Rate in the Rain*

6/11/18 OAKLAND Urban METALS G. ROUSSE

1107 Arrive At Grid 99

ID: OUM-099-SM02-180611

37.81424501°, -122.28682792°

6/11/18, 1110

Landmark: No parking sign near
1220 21st St., S. side of road

1127 Arrive At Grid 101

ID: OUM-101-SM02-180611

37.81470060°, -122.28191666°

6/11/18, 1130

directly in front of
2130 Linden St. (Landmark)

1220 Arrive At Grid 103

ID: OUM-103-SM02-180611

37.81513340°, -122.27762527°

6/11/18, 1225

Landmark: W. of 881 Athens
At tree in front of vacant lot

1245 Arrive At Grid 105

ID: OUM-105-SM02-180611

37.81444131°, -122.27384195°

6/11/18 1245

Landmark: directly in front of
699 24th St.

13N Arrive At Grid 91

6/11/18 OAKLAND Urban METALS G. ROUSSE²³

ID: OUM-091-SM02-180611

37.81626352°, -122.27193796°

6/11/18, 1315

Landmark: K+S Convenience store,
SW corner of MLK + 26th St.

1345 Arrive At Grid 121

Sample ID: OUM-121-SM02-180611

37.81350218°, -122.2744638°

6/11/18, 1350

Landmark: intersection of
Grand & brush (NW), across
street from 2290 San Pablo
NOTE - collector crashed, had
to retake all photos, unable
to recreate soil core pics.

1424 Arrive At Grid 119

Sample ID: OUM-119-SM02-180611

37.81361889°, -122.27814389°

6/11/18 1430

Landmark: across fence, East
of OAK WASH entrance. West of
870 22nd St.

1457 Arrive At Grid 117

Sample ID: OUM-117-SM02-180611

37.81267697°, -122.28276537°

6/11/18 1500

24 6/11/18 OAKLAND urban metals G. LOUSSO

Landmark: Tree in front of
1837 Linden St. ————

1523 Arrive At Grid 115

Sample ID OUM-115-SM02-180611

37.81277205°, -112.28579858°

6/11/18; 1530

Landmark: Across 18th from park

1543 Arrive At Grid 113

Sample ID: OUM-113-SM02-180611

6/11/18; 1550

Landmark: street sign at Kirkham
And 18th, sample collected to
the west along 18th ————

1606 Arrive At Grid 111

Sample ID OUM-111-SM02-180611

37.81294049°, -122.29459977°

6/11/18 1615

Landmark, in front of 151

Campbell, west side of St.

1629 Arrive At Grid 109

Sample ID OUM-109-SM02-180611

37.81314402°, -122.29730195°

6/11/18, 1635

Landmark: in front of 1738

13th St. ————

6/11/18 OAKLAND urban metals G. LOUSSO²⁵

1649 Arrive At Grid 107

Sample ID OUM-115-SM02-180611

37.81207130°, -122.30159783°

6/11/18; 1655

Landmark: just before entrance
to BERRY Transfer Station.

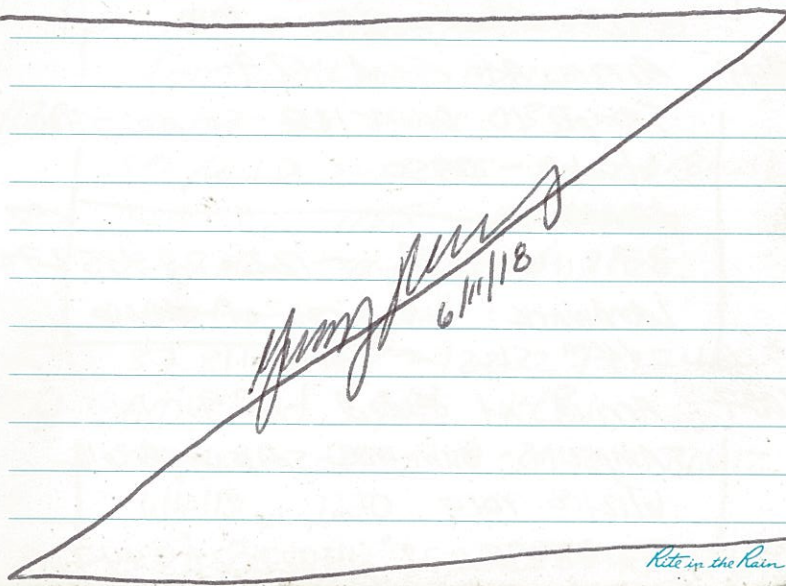
Collector crashed, lost 2 pics
of soil core ————

1710 meet w/ Weston-2, collect

Equipment blank samples,

pick up all equipment. will
meet at 0815 tomorrow.

1750 WESTON offsite ————



6/12/18 OAKLAND URBAN METALS G-ROUSSES

0815 Arrive At 1733 RIVINGTON. AL
 distribute equipment. HAS
 briefing.

0850 Arrive At Grid 123 180612

Sample ID: OUM-123-SM02-06218

6/12/18 0855

37.81103267°, -122.30158096°

Landmark: Across 10th St.
 from CALIFORNIA WASTE SOLUTIONS

0923 Arrive At Grid 125 180612

Sample ID: OUM-125-SM02-06218

6/12/18 0925

37.8116156°, -122.29778318°

Landmark: SW corner of
 12th + Willow

0943 Arrive At Grid 127

Sample ID: OUM-127-SM02-180612

6/12/18 0950

~~0943~~
 37.81164739°, -122.29435270°

Landmark: Just west of 1600
 14th St.

1007 Arrive At Grid 129

Sample ID: OUM-129-SM02-180612

6/12/18 1010

37.81186607°, -122.28944721°

6/12/18 OAKLAND URBAN METALS G-ROUSSES

Landmark: East of entrance
 to 'Every dog day care'

1030 Relinquished yesterday's
 samples to MARK FROY.

1036 Arrived At Grid 131

Sample ID OUM-131-SM02-180612

1040 6/12/18

37.8111978°, -122.28619770°

Landmark: Tree in front of
 1169 16th St.

1054 Arrived At Grid 133

Sample ID OUM-133-SM02-180612

6/12/18 1100

Landmark SW corner of
 18th + Filbert, Across 18th
 from OAKLAND MARKET.

1128 Arrive At Grid 135

Sample ID OUM-135-SM02-180612

6/12/18 1135

Landmark: in front of 1529
 West St.

37.81130141°, -122.27727486°

1221 Arrive At Grid 149

Sample ID OUM-149-SM02-180612

6/12/18 1230

37.81010116°, -122.27995776°

6/12/18 OAKLAND URBAN METALS G. ROUSSES

Landmark: south of Kipp Bridge
Sign. —————

1249 Arrive At grid 147

Sample ID: OUM-147-SMB2-061218

1255 6/12/18

37.80971270°, -122.28367541°

Landmark: Tree in front of
1428 Linden St. —————1305 Arrive At grid 145, while
stopping to park Chad (driver)
brushed a parked car's mirror
(BLACK KIA CAR 76CF258)
mirror in good working order
potential small Scott. photos
collected by Chad Joannat
w/ DTBC knocked on front
door to know it was parked
in front of. NO ANSWER.

Chad left a note on car.

Sample ID: OUM-145-SMB2-180612

6/12/18 1320

1344 Arrive At Grid 143

Sample ID OUM-143-SMB2-180612

6/12/18 1350

37.80969569°, -122.29216359°

Landmark: south of 13th

6/12/18 OAKLAND URBAN METALS G. ROUSSES

Landmark: on W. side of
Mandela. —————

1420 Arrive At Grid 141

Sample ID OUM-141-SMB2-180612

6/12/18 1430

37.81023378°, -122.2580522°

Landmark: in front of 1627
12th Street. —————

1447 Arrive At Grid 139

Sample ID OUM-139-SMB2-180612

6/12/18 1455

37.81000618°, -122.25962511°

Landmark: in front of 1725
10th St. —————

1510 Arrive At Grid 137

Sample ID OUM-137-SMB2-180612

6/12/18 1520

37.80905954°, -122.30289126°

Landmark: in front of 818
Pine St. —————

1536 Arrive At Grid 151 —————

Sample ID OUM-151-SMB2-180612

37.80790398°, -122.5035028°

Landmark: tree in front of unit B.

6/12/18; 1545 —————

6/12/18 Oakland Urban Metals G. Roussos
1610 Arrive at Grid 153

Sample ID OUM-153-SM02-180612

6/12/18 1615

37.80851743° , -122.29789775°

Landmark: Infront of

867 Willow St. in

1630 Arrived at Grid 155

Sample ID OUM-155-SM02-180612

6/12/18 1640

37.80882564° , -122.29611799°

Landmark: tree cast of 1023 peratka

1640 Team 2 Arrives to park

equipment & take equipment
planks. in

1650 equipment blank collected,
recorded on Team 2 CEC.

1715 off site in

[Signature]
6/12/18

2 June 4, 2018 Urban Metal

Project Name: Urban Metal

Study-West Oakland

Location: West Oakland,

Alameda County, CA.

Weather: Clear skies, ~70°

0900-Weston Solutions & USEPA

meet at the Pretty Lady Cafe

for project kick-off and

meet & greet.

STAFF: Mark Frey-Weston, Kim

Burckle-Weston, Tom Fortner-

Weston, Chad Conway-Weston.

Sharon Brown-EPA, Eric

Canteennala-EPA, and Yhelma

Perez-DTSC, and Dan

Murphy-DTSC

0930 - All depart cafe & drive

to Grid #1 to split apart the

sampling equipment among the

two sampling teams (odd & ~~even~~ even

Grid #s)

1000 Tom Fortner conducts

Health & Safety meeting covering

main topics such as PPE, route

to hospital, traffic caution, etc.

June 4, 2018

K. Burckle

3

1015-Tom Fortner reviews

the sampling plan objectives

with the group. Plan will be

~~to go~~ to collect a couple of

samples today to review the

protocols and for teams to

be consistent. At 2pm, the plan

is to meet with community

1030 The odd # team (Mark Frey

& Chad Conway) start to sample

but unable to gather soil due

to compaction. Move to Mandela

Parkway to try another location

1118 Arrive at Grid ~~#1~~ 2

1200 Start sample collection on

Hannah Street in telephone

box well. 82576526

GPS @ 37.82617570 Lat

... -122.78810191 Long

28761994

Sample ID - CM002-SM-02-180604

1220 Break for lunch

1315 Arrive at Grid #4

1321 Sample CM004-SM-02-180604

Lat: 37.82577010°

4 June 4, 2018 K. Buckle

Long: -122.2876231°

Sample taken on the west side
of Hollis in tree well.

Landmark: ExtraSpace Storage
Building

1345 Complete sampling, bag samples
& ice, all depart site

1425 Arrive Grid #193 to

sample FD OUM 193-SM-02-180604

Sample taken at tree well located
on Mandela Pkwy on east side
of street lat: ~~37.86421418~~^{OPS}

Long: -122.29389063 ~~or~~ 29391573°

Lat: 37.80417116° Bant landmark

1456 Finish sampling and ^{depart} ~~say over~~
~~to~~ Miss Margaret

1505 Arrive at Grid #6 to

sample FD OUM 06-SM-02-180604

Lat: 37.82638956°

Long: 122.28070236°

Sample time: 1509

Location: tree well on west side Adeline

Landmark: Ultimate Sports Academy

Note several residential houses
have peeling paint (suspect lead

June 4, 2018

K. Buckle

5

containing

1531 Finish at #6

1543 Arrive at Grid #8 to

sample FD OUM 08-SM-02-180604

Lat: 37.82453447 ~~or~~ 137°

Long: -122.29041278 ~~or~~ 684°

Sample time: 1546

Location: south side of 34th St. in wire well

Landmark: corner of 34th & Wood: Streets

Note: surface color gray color.

1610 leave Grid #6

*1618 Arrive at Grid #10 to

sample FD OUM 10-SM-02-180604

Lat: 37.8249936°

Long: -122.28619976°

Sample time: 1620

Location: west side of Helen St. inside -

Landmark: Burned, unoccupied ^{work} ~~well~~
house on corner of 34th (west corner)

~~Arr~~ 1652 arrive at Grid #12

to sample FD OUM 12-SM-06-180604

Lat: _____

Long: _____

Sample time: 1654

Location: _____

June 4, 2018 K. Bruckner
Hit refusal at most tree wells. no time to mob to Union St. ; Sharon departs site. Weston Team #2 also departs to meet up w/ Team #1 to p+B for equipment Blank Deleted Grid #12 info in collector as we were unable to sample.

1725 sample & collect decon equipment Blank sample TD

* OUM-EB02-180604

Late entry - Duplicate sample of Grid #10 taken at 1620 for sample ID OUM204-SM02-180604 for 0-2" & OUM205-SM06-180604 for 6"

1800 Depart location & head to BART for Dropoff.

~~6/4/2018~~

~~K. Bruckner~~

June 5, 2018 K. Bruckner
0900 EPA & Weston staff (same as yesterday) meet at the Pretty Girl Cafe

0930 Have Health & safety meeting emphasizing traffic and sharp objects.

0950 Arrive at Grid #12 to sample ID OUM-012-SM-02-180605

Lat.: 37.82540129°

Long.: -122.28262638°

sample time: 0956

Landmark: city slicker garden

Location: tree well on east side of Union Street.

1015 finish at Grid #12 and leave for Grid #14

1025 Arrive at Grid #14 to sample ID OUM-014-SM-02-180605

Lat.: 37.82478484°

Long.: -122.27821312°

sample time: 1033

Landmark: EZ Smog test only

Location: east side of Linden St. at the corner of 34th in tree well.

8 June 5, 2018 K. Bunckle
1053 leave Grid #14 for #16
1103 Arrive at Grid #16 to
sample ID OUM-016-SM-02-
180605

Lat. ~~37.82443973°~~ ^{KB} 82441011°
Long. ~~-122.27468813°~~ ^{KB} -122.27458708°

Sample time: 1119

Landmark: telephone pole with wires
Location: south side of 34th street
in sidewalk laneway

Note: Lost all profile photos when
~~the~~ ^{KB} taking a photograph of flags
due to collector crash. Sharon
Bowen took photo of one profile
(3 of 3) and ~~to~~ ^{KB} has emailed Tom
Fortner.

1157 Arrive at Grid #18 to
sample at UOM-018-SM-02-180605

Lat.: 37.82325309°

Long.: -122.28837697°

Sample time: 1202

Location: North side of 32nd St. in pole boxway

Landmark: Eucalyptus tree on vacant

lot

1344 After stop at Home Depot

June 5, 2018 K. Bunckle 9
mob to Grid #20 to collect
sample ID OUM-020-SM-02-
180605 & Duplicate Sample
IDs. OUM206-SM02-180605 & OUM207-SM06-18
0605

Lat.: 37.82330739°

Long.: -122.28429598°

sample time: 1351

Location: southeast side in laneway off
Landmark: electrical ^{open area}

enclosure for Baseball field

1410 Arrive at Grid #22 to

sample ID OUM-022-SM-02-180605

Lat. 37.82353389°

Long. -122.28025674°

Sample time: 1446

Landmark: corner of 32nd & Chestnut

Location: tree well on west side of
32nd St.

1515 Arrive at Grid #24 to sample
ID OUM-024-SM-02-180604

Lat.: 37.82341458°

Long.: -122.27606558°

Sampling time: 1525

Landmark: YMCA orange shed

Location: north side of Brockhurst St

June 5, 2018 K. Burklee

in tree well

1605 arrive at Grid 26 to
collect sample ID OUM-026-SM-
02-180605

Lat.: 37.82361191°

Long.: -122.2727970°

Sample ID time: 1610

Landmark: 33rd + West Street corner

Location: west side of West St.

in tree well.

Note: tree is dead; unusual
Black glassy cinder-like rock

1629 collect geo location to
not Harriet Tubman center
for afterschool program
children 6 and under present

1800 Finish equipment + blanks
and chain of custody; leave

6/5/18

Kimberly Burklee

June 6, 2018 K. Burklee

0845 Chad picks up Kim

0900 meet Tom & Mark, Thelma,
and Dan.

0930 After packing ice Bags &
preparing truck, all depart
Cafe and leave for grids.

1000 Arrive at Grid #28; unable
to find any penetrable ground.
all areas have railroad gravel.
meet with Sharon and get to
pick up new drilling device;
Sharon advises us to call it
and move on to the next one.

1015 Arrive at Grid 30 to collect
sample ID OUM-030-SM-02-
180606

Lat.: 37.82165641°

Long.: -122.28788732°

Sample time: ~~sun~~ 1028

Location: southside of 28th Street
in tree well

Landmark: No parking sign

Note: Homeless tents on northside
of 28th Street

1050 leave Grid 30 and meet

June 6, 2018 K. Buncle
 other team to show them how
 to use sampler

1115 Arrive at Grid #32 to
 collect sample ID OUM032-SM-02-
 180606

Lat.: 37.82221514°

Long.: -122.78398443°

Sample time: 1126

Landmark: street cleaning sign
 Location: north side of union street
 in tree well

Note photo of the handcopy map
 was taken last, when it should
 have been first photo.

1152 Arrive at Grid #34 to collect
 sample ID OUM034-SM-02-180606

Lat.: 37.82207502°

Long.: -122.78052323°

Sample time: 1156

Landmark: Handicap sign
 Location: west side of Chestnut
 street in tree well near 30th St.

1304 Arrive at Grid #36 to
¹³⁰sample collect sample at
 OUM036-SM-02-180606

June 6, 2018 K. Buncle

Lat.: 37.82223082°

Long.: -122.77591660°

Sample time: 1311

Landmark: stop sign at 32nd & Market
 Location: east side of 32nd St.
 at the corner of Market.

1344 Arrive at Grid #38 to
 collect sample ID OUM038-SM-
 02-180606

Lat.: 37.82191053°

Long.: -122.77248642°

Sample time: 1347

Landmark: No parking street sign
 Location: tree well located on
 the north side of 32nd St near
 corner of West St.

1416 Arrive at Grid #40 to
 collect sample ID OUM040-SM-02-
 180606

Lat.: 37.82021323°

Long.: -122.77203247°

Sample time: 1420

Landmark: stop sign at corner
 Location: tree box on north side of 24th St.
 Also collect duplicate sample

June 6, 2018 K. Burckle

Run 210-SM02-180606 and

Run 211-SM06-180606

Note - missing first profile photo of soil as iPad collection app stopped working.

Arrive at Grid #42 to sample 1450 at OUM042-SM-02-180606

Lat.: ~~37.865~~^{KB} 82062793°

Long.: -122.28935316°

Sample time: 1455

Landmark: 26th Street Sign east of ^{East} Hwy

Location: East side of Mandela Pkwy in tree box near corner of 26th St.

1526 Arrive at Grid 44 to collect sample ID OUM044-SM-02-180606

Lat.: 37.82068300°

Long.: -122.28425277°

Sample time: 1530

Landmark: 28th & Union Street Sign

Location: treebox on southside of 28th Street near Union St.

1556 Arrive at Grid 44 to collect sample ID OUM046-

June 6, 2018 K. Burckle

SM-02-180606

Lat.: 37.82077732°

Long.: -122.27987025°

Sample time: 1600

Landmark: Linden Street Art Studio

Location: tree well on west side of Linden St.

1636 Arrive at Grid 48 to collect sample at OUM048-SM-02-180606

Lat.: 37.82055839°

Long.: -122.27678118°

Sample Time: 1638

Landmark: Dimensional outlet on thing

Location: Northside of 30th St.

in tree box near corner of San Pablo Ave. & Market.

1739 collect equipment Blank

Run EB06-180606 at Environmental Indicator's site. Also we dropped off the 55 gallon non-haz.

Opium for decon water and adhere non-haz label.

6/6/2018

Kim Burckle

16 June 7, 2018

K. Burckle

0845 Chad picks up Kim at Bart

0900 All teams meet at cafe

0935 Tom conducts H&S meeting
emphasizing the use of safety cones.

1037 All depart cafe to sites

0950 Arrive at Grid #50 to collect
sample ID OUM050-SM-02-180607
and ~~collect~~^{FB} duplicate sample IDs
OUM012-SM02-180607 & OUM013-
SM06-180607.

Lat.: 37.82076142°

Long.: -122.27226434°

Sample time: 0956

Landmark: No parking street sign

Location: outside of 31st Street
on lawnstrip with small tree &
street sign (No parking)

~~At~~^{FB} 1035 Arrive at Grid #52
to collect sample ID OUM052-
SM-02-180607

Lat.: 37.815^{FB} 81855968°

Long.: -122.29373716°

Sample time: 1040

Landmark: W. Grand Street sign
Location: Northwest side of

June 7, 2018

K. Burckle 17

Wood Street shoulder. Note

lots of fill & debris.

1112 Arrive at Grid #54 to
collect sample ID OUM054-SM-
02-180607

Lat.: 37.81855399°

Long.: -122.28991792°

Sample Time: 1116

Landmark: Telephone Pole

Location: East side shoulder of
Campbell St. North of telephone
pole approximately 5 ft.

1139 Arrive at Grid #56 to collect
sample at OUM056-SM-02-180607

Lat.: 37.81906212°

Long.: -122.28621804°

Sample time: 1141

Landmark: telephone pole

Location: West side of Poplar St.
in telephone pole Box

1214 Arrive at Grid #58 to
collect sample ID OUM058-SM-
02-180607

Lat.: 37.81864802°

Long.: -122.28218481°

June 7, 2018 K. Burckle

Sample time: 1220

Landmark: Vincent Elementary School

Location: Northside of 26th St.
in lawn strip.

Across 26th sampling location.

At 1342 Arrive at Grid #60
to collect sample ID OUM060-SM-
02-180607 & duplicates OUM214-
SM02-180607 & OUM215-SM06-1806

07

Lat.: 37.8197597°

Long.: -122.27825314°

Sample time: 1346

Landmark: Door of McClymonds High School

Location: West side of Myrtle Street
in 2nd tree box south of of
28th St.

Arrive at ^{FB}

1410 Arrive at Grid #62 to
collect sample ID OUM062-SM-
02-180607

Lat. 37.81912756°

Long. -122.27410097°

Sample time: 1412

Landmark: ^{FB} No parking sign

June 7, 2018 K. Burckle

Location: Tree well Box on

Southside of 29th Street.

1500 Arrive at Grid #64 to
collect sample ID OUM064-SM-
02-180607

Lat. 37.81916096°

Long. -122.27090818°

Sample time: 1502

Landmark: Stop sign, ^{FB} 29th, MLK signs

Location: Northside of 29th St.
in tree Box well near corner
of MLKth St.

Arrive ^{FB}

^{FB}

1534 Arrive at Grid #66 to
collect sample ID OUM066-SM-
02-180607

Lat.: 37.81724024°

Long.: -122.29448647°

Sample time: 1537

Landmark: 20th & Wood St signs

Location: Southside of 20th Street
shoulder four ft. east of the
1st tree from the corner.

1600 Arrive at Grid #68
to ~~sample~~ ^{FB} collect sample ID

June 7, 2018 K. Buckle

OUM068-SM-02-180607

Lat.: 37.81741673°

Long.: -122.79023322°

Sample time: 1605

Landmark: Pacific Pipe Company

Location: north side of west Grand

Ave in tree box well

Note: Collector crashed and
the third photo of the soil
was lost.

1629 Arrive at Grid #70 to
collect Sample IDs OUM070-
SM-02-180607 & Duplicates
OUM216-SM02-180607 & OUM217-
SM06-180607

Lat.: 37.81745994°

Long.: -122.28554187°

Sample Time: 1634

Landmark: J & D's Tires

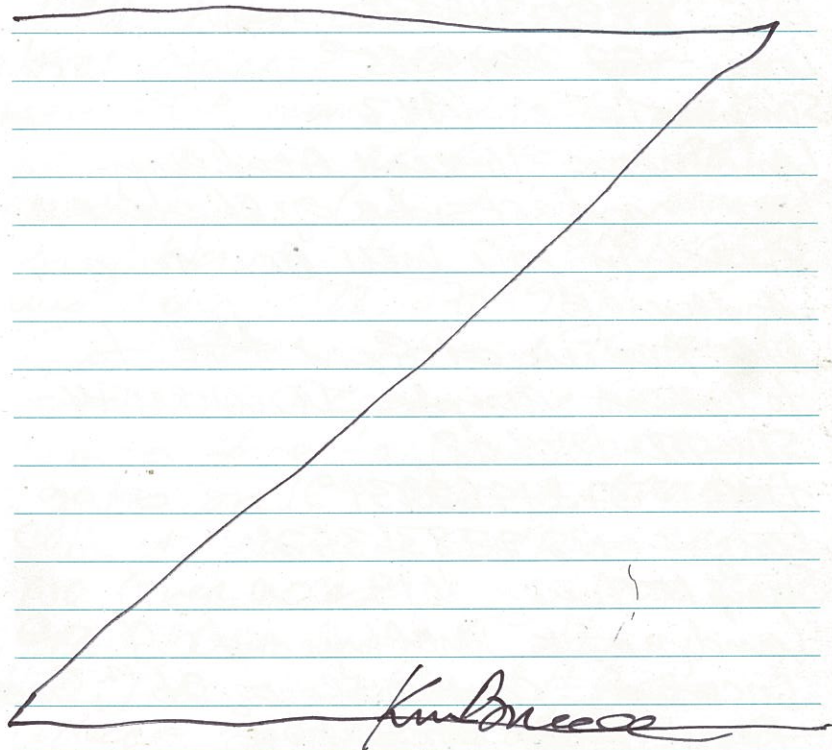
Location: East side of Union Street
in tree Box well second one
South from corner of 24th St.

Latitude: Moved the location
for #42 from #41 back to
42nd due to mistake, so

June 7, 2018 K. Buckle

The lat. and long. will have
changed from the noted
entry on June 6, 2018.

1700 Meet with Weston Team
1 to exchange soil samples
and collect equipment Blanks
1712 collect equipment Blank
Sample ID OUM08-180607 at
1712.



22 June 8, 2018 K. Buncke
0845 Kim and Chad meet at
Bart.

0900 meet EPA and DTSC at
the Cafe.

0930 All depart Cafe to start
work.

0941 Arrive at Grid #72 to
collect sample ID OUM072-
SM-02-180608

Lat.: 37.81734933°

Long.: -122.28204385°

Sample Time: 0943

Landmark: Vincent Academy

Location: East side of Chestnut
Street in pole well Box on
sidewalk.

017 Arrive at Grid #74 to
to collect sample ID OUM074-
SM-02-180608

Lat.: 37.81762934°

Long.: -122.27836352°

Sample Time: 1019

Landmark: McElmonds H.S.

Location: Southside of 26th Street
from lawn strip box.

June 8 2018 K. Buncke 23
1054 Arrive at Grid 76

to collect sample ID

OUM076-SM-02-180608

Lat.: 37.81767912°

Long.: -122.27804020

Sample Time: 1056

Landmark: AntiZone

Location: ~~West St.~~ East side
of West Street in the box
well. near corner of 27th St.

Note: Stopped location at
Grid #64 from yesterday was
missing, so re-entered GPS
point, thus Lat. & Long. changed
slightly to: Lat.: 37.81918068°
and Long.: -122.27689511°

1130 Arrive at Grid 76 and
unable to access the Grid
area due to construction
gates on 16th Street. Cannot
collect sample as there are
no other access points into the
Grid other than 16th St.

1135 Arrive at Grid #80 to
collect sample OUM080-SM-02-

June 8, 2018 K. Burckle

180608

Lat.: 37.81541989°

Long.: -122.29430363°

Sample time: 1137

Landmark: ~~Ray~~^{KP} Raymond ParkLocation: Northside 18th in lawn strip

Collect duplicate sample IDs

OUM218-SM02-180608 and

OUM219-SM06-180608 at 1137

1207 Arrive at Grid #82 to
collect sample ID OUM082-SM-

02-180608

Lat.: 37.81594448°

Long.: -122.29043014°

Sample time: 1210

Landmark: Happy House (red Building)

Location: west side of lawn strip
on Peralta St. (2nd tree in strip
north of 20th St.)1328 Arrive at Grid #84 to
collect sample ID OUM084-SM-

02-180608

Lat.: 37.81583055°

Long.: -122.28615812°

Sample Time: ~~1535~~ 1335

June 8, 2018 K. Burckle

Landmark: Autoglass Building

Location: East side of Union
Street in tree box well (first
one south of W. Grand Ave.)1410 Arrive at Grid #86 to
collect sample ID OUM086-

SM-02-180608

Lat.: 37.81841529°

Long.: -122.27685279°

Sample time: 1412

Landmark: No parking street sign

Location: west side of Chestnut
Street in tree well1436 Arrive at Grid #88 to
collect sample ID OUM088-

SM02-180608

Lat.: 37.81608587°

Long.: -122.27828334°

Sample time: 1439

Landmark: Boy & Girls Club

Location: north side of 2nd St. in tree
BoxNote: Appears the photos
associated with Grid #86 are
lost & Not in Collector. Also #88
soil photos are lost.

June 8, 2018 K. Bruncle

1512 Return to Grid #86 to
retake photos of sampling
location since data was lost.

1519 Arrive at Grid #90 to
collect sample ID OUM090-SM-
02-180608 and duplicates
OUM220-SM02-180608 &
OUM201-SM06-180608.

Lat.: 37.81622850°

Long.: -122.27441784°

Sample time: 1523

Landmark: Ant trees Rael's

Location: east side West street
in tree well box.

Note: started taking Back-up
photos on iPad with 1 of 3
soil photos for #90.

1608 Arrive at Grid #92 to
collect sample ID OUM092-SM-
02-180608

Lat.: 37.81432181431261°

Long.: -122.30014523

Sample time: 1611

Landmark: didn't take

Location: Northside of frontage

June 8, 2018

K. Bruncle

pd on shoulder

1635 Arrive at Grid #94 to
collect sample ID # OUM094-
SM-02-180608

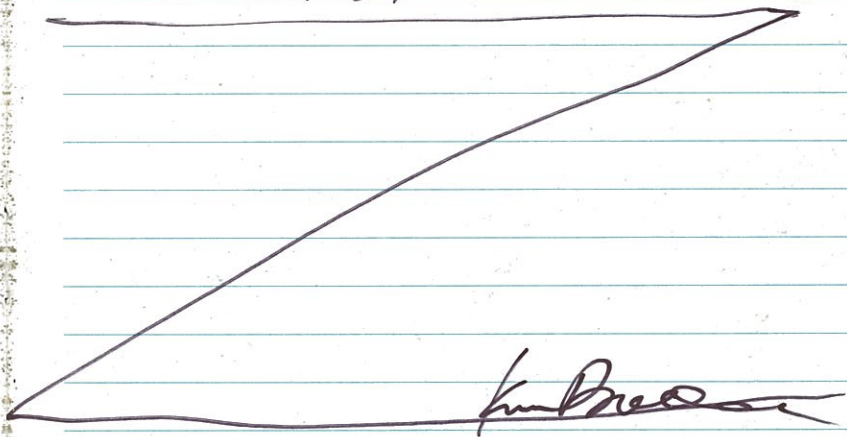
Lat.: 37.81420398°

Long.: -122.29603807°

Sample Time: 1640

Landmark: Mean Marshall's Motorcycle
Location: Southside of 16th Street
in tree well box.

1715 Arrive at Environmental
Indicators to unload decon
water and take equipment
banks sample IDs: OUM09-
180608 at 1728 and OUM10-
180608 at 1724



June 11, 2018 K. Buncle

0800 Chad picks up two at Bant

0830 Arrive at cafe to meet DTSC & EPA.

Weather: sunny, clear skies
170s

Conduct H&S meeting emphasizing traffic, sharp objects, unsafe area.

0900 Depart cafe and go to Grid #93 to watch team 4)

collect sample so that Brandon Benzen can understand process and get training.

0955 Arrive at Grid #96 to collect sample ID OUM096-SM02-180611

Lat.: 37.81473821°

Long.: -122.29175595

Sample time: 1001

Landmark: Pretty Pine Cafe

Location: East side of Penalta Street in Lower Strip near corner of 18th in between fire hydrant and telephone pole

June 11, 2018

K. Buncle

1012 Arrive at Grid #98 to collect sample ID OUM098-SM02-180611

Lat. 37.81445313°

Long.: -122.28788671°

Sample time: 1020

Landmark: Railroad sign across st.

Location: West side in tree box well on Poplar near centroid

1043 Arrive at Grid #100 to collect sample ID OUM098-SM02-180611 & duplicates 100

Lat.: 37.81458243°

Long.: -122.78417221°

Sample time: 1045

Landmark: Ghost Town Brewing

Location: East side of Adeline St. in Box without tree near corner of 21st.

Duplicates OUM222-SM02-180611 and OUM223-SM06-180611

1103 Arrive at Grid #102 to collect sample ID OUM098-SM02-180611

Lat.: 37.81456544°

June 11, 2018 K. Buncle

Long.: -122.27999049°

Sample Time: 1/06

Landmark: Exit^{to} Enthean CCC

Location: Southside of West Grand Ave. in tree box well at corner of Maple St.

1126 Arrive at Grid #104 to collect sample ID OUM104-SM02-180611

Lat.: 37.81469204°

Long.: -122.27554441°

Sample Time: 1/29

Landmark: Isabella Motel

Location: Southside of Isabella Street in tree box well

Note: Evidence (toys) of children at residence.

Arrive at Grid #106 to collect sample ID OUM106-SM02-180611

Lat.: 37.81484762°

Long.: -122.2709887° ^{66°} ~~272~~ 10683°

Sample Time: 1/58

Landmark: Welcome to West Oak sign

Location: West side of MLK

June 11, 2018 K. Buncle

in tree box well (1st one)

at corner of 25th

Note: Despite uploading photos appears we lost all data, so re-took photos of location, landmark, etc., but no soil photos.

1235 Arrive at Grid #108 to collect sample ID OUM108-SM02-180611

Lat.: 37.81222214°

Long.: -122.29980663°

Sample Time: 1246

Landmark: Car parts entrance

Location: Southside of 12th Street in tree box well.

1415 Arrive at Grid #110 to sample ID OUM110-SM-02-180611 and duplicates

OUM224-SM02-180611 &

OUM225-SM02-180611

Lat.: 37.81296822°

Long.: -122.29616708°

Sample Time: 1420

Landmark: corner of Willow & 15th Sts.

June 11, 2018 E. Burekce
Location: east side of willow
street in lawn strip with
trees

1452 Arrive at Grid #112 to
collect sample ID OUM112-
SM-02-180611

Lat. 37.81257606°

Long. -122.29195654°

Sample Time 1459

Landmark: no parking sign in well

Location: North side of 16th Street
in tree Box well

1519 Arrive at Grid #114 to
sample ID OUM114-SM02-180611

Lat. : 37.81788226°

Long. : -122.78821223°

Sample Time: 1522

Landmark: public swimming pool

Location: West side of poplar st.
in tree Box well

Note: RVs, schools

~~1555~~ 1544 Arrive at ¹⁰⁵ Grid #
116 to collect sample ID

OUM116-SM02-180611

Lat. : 37.81299507°

June 11, 2018 E. Burekce
Long: -122.28381695°
Sample time: 1547
Landmark:

Location: west side of chestnut
in tree box well

Note: nearby residence
with peeling paint.

1600 Arrive at OUM to Grid
#118 to collect sample ID
OUM118-SM02-180611

Lat. : 37.81294443°

Long. : -122.28043339°

Sample Time: 1611

Landmark: orange/blue warehouse

Location: West side of Myrtle
Street in tree Box well

~~Arrive~~ Arrive at Grid #120
to collect sample ID
OUM120-SM02-180611 and
duplicates OUM226-SM02-180611
& OUM227-SM06-180611

Lat. : 37.81307359°

Long. : -122.27621736°

Sample Time: 1643

Landmark: Church on corner of
West Grand & Grand Streets

June 11, 2018 K. Burchle

Location: west side of West Street in tree Box well

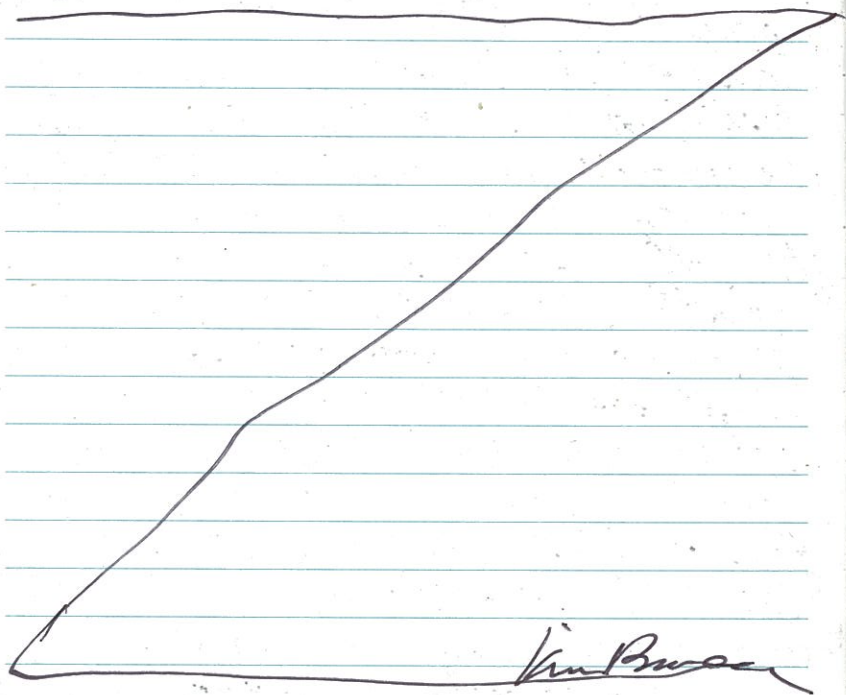
Note: sampler was too bent so switched to alternate sampler, but threads were not a good fit. The tip of the sampler was lost.

1732 Collect Sample 1D

ONM-EB11-180611

1736 Collect sample 7D

ONM-EB12-180611



June 12, 2018 K. Burchle

0800 Arrive at Bank for pickup

0815 Arrive at cafe to meet DTSC and Weston.

0830 Conduct safety meeting emphasizing double checking the street before crossing and slowing down to take breaks more often as it will be warmer today (high 70's)

0900 all Depart site, Team 1 goes to Grid #121 and Team 2 to Grid #122.

0915 Arrive at #122 and unable to collect sample ONM122-SM02-180612 due to no locations available on public right of way.

0930 Arrive at Grid #124 to collect sample 1D ONM124-SM02-180612 and duplicate ONM229-SM06-180612

Lat. : 37.81120223°

Long : -122.29988034°

Sample time : 0927

June 12, 2018 Kimbree
 Landmark: no parking St. sign
 Location: southside of 11th Street
 in side box lawn well (no tree).

* Note: Lab does not have enough soil to analyze duplicates. Phone call among Sharon Bowen (EPA), Dan Murphy (DTSC), Tom Fortner (Weston) to discuss sampling plan. Temporary decision is to collect duplicates with TDR ending in #4 and to split the 6" depth only on to take fourth sample to collect additional sample material. EPA will call EPA SC to discuss aug KB and get back to us.

1006 Arrive at Grid #126 to collect sample 4D OUM 126 - SM02-180612

Lat.: 37.81128775°

Long.: -122.29593642°

Sample Time: 1010

June 12, 2018 K. Bunker
 Landmark: 13th & Campbell St. sign
 Location: 101st west side of Campbell Street in tree box well. Note: point & children
 1030 Arrive at Grid #128 to collect sample 4D OUM 128 - SM02-180612

Lat.: 37.81181270°

Long.: -122.29220265°

Sample Time: 1034

Landmark: Johnstone Supply on
 Location: northside of 15th Street in lawn strip box
 1056 Arrive at Grid #130 to collect sample 4D OUM 130 - SM02-180612

Lat.: 37.81149558°

Long.: -122.28796563

Sample Time: 1059

Landmark: Detemey Park
 Location: southside of sidewalk box lawn (no tree) on 16th St
 near corner of Union St

Note: playground

1125 Arrive at Grid #132 to

Mandela

June 12, 2018 K. Burckle
 collect sample ID OUM132-
 SM02-180612
 Lat.: 37.81148957
 Long.: -122.29438165°
 Sample time: 1127
 Landmark: No parking sign to north
 Location: west side of Chestnut
 street in tree box well
 1150 Arrive at Grid #134 to
 collect sample ID OUM134-SM02-
 180612
 Lat.: 37.81154600¹⁸ 1091°
 Long.: -122.27984218¹⁸ 5782°
 Sample Time: 1153
 Landmark: Anderson Youth & Lot Center
 Location: west side of market
 street in tree box well
 Note: youth center / playground
 on market street.
 1215 Arrive at Grid #136 to
 collect sample ID OUM136-
 SM02-180612
 Lat.: 37.81198974°
 Long.: -122.2760955°
 Sample Time: 1218

June 12, 2018 K. Burckle
 Landmark: YMCA school
 Location: Northside of 21st
 Street in tree box well.
 Note: orange reddish clay-
 like soil in the 4-6" range
 Also YMCA youth center &
 playground on 21st & Brush St.
 Arr 1246 Arrive at Grid #138
 to collect sample ID OUM138-
 SM02-180618
 Lat.: 37.80994275°
 Long.: -122.30173882
 Sample Time: 1249
 Landmark: Street sign (No parking)
 Location: Southside of 7th Street
 in tree well box
 Arr 1350 Arrive at Grid #
 140 to collect sample ID
 OUM140-SM02-180612
 Lat.: 37.80947663°
 Long.: -122.2982704°
 Sample Time: 1355
 Landmark: Campbell Residences
 Location: Northside of 10th Street
 in tree box well.

June 12, 2018 K. Burckle
 1444 Arrive at Grid #142 to
 collect sample ID OUM/42-
 SM02-180612

Lat.: 37.80980783°

Long.: -122.29379291°

Sample Time: 1446

Landmark: palm trees on island

Location: north side of 12th Street
 in tree box well

1505 Arrive at Grid #144 to
 collect sample ID OUM/44-
 SM02-180612

Lat.: 37.81021925°

Long.: -122.28936081°

Sample Time: 1508

Landmark: Postcard & Lincoln Building

Location: South side of 14th Street
 in tree box well.

1530 Arrive at Grid #146 to
 collect sample ID OUM/46-SM02-
 180618

Lat.: 37.81022121°

Long.: -122.28602304°

Sample Time: 1535

Landmark: street market corner
 store at 14th & Adeline

June 12, 2018 K. Burckle
 Location: west side of Adeline
 Street in tree box well

Note: Residences with children
 and peeling paint; Dancare
 1600 Arrive at Grid #148 to
 collect sample ID OUM/48-SM02-
 180612

Lat.: 37.81031903°

Long.: -122.28201629°

Sample Time: 1603

Landmark: The Hardware Store

Location: North side of 16th Street
 in tree box well.

Note: peeling paint, houses
 with potential children

1641 Collect equipment Blank
 sample OUM/EB/4-180612

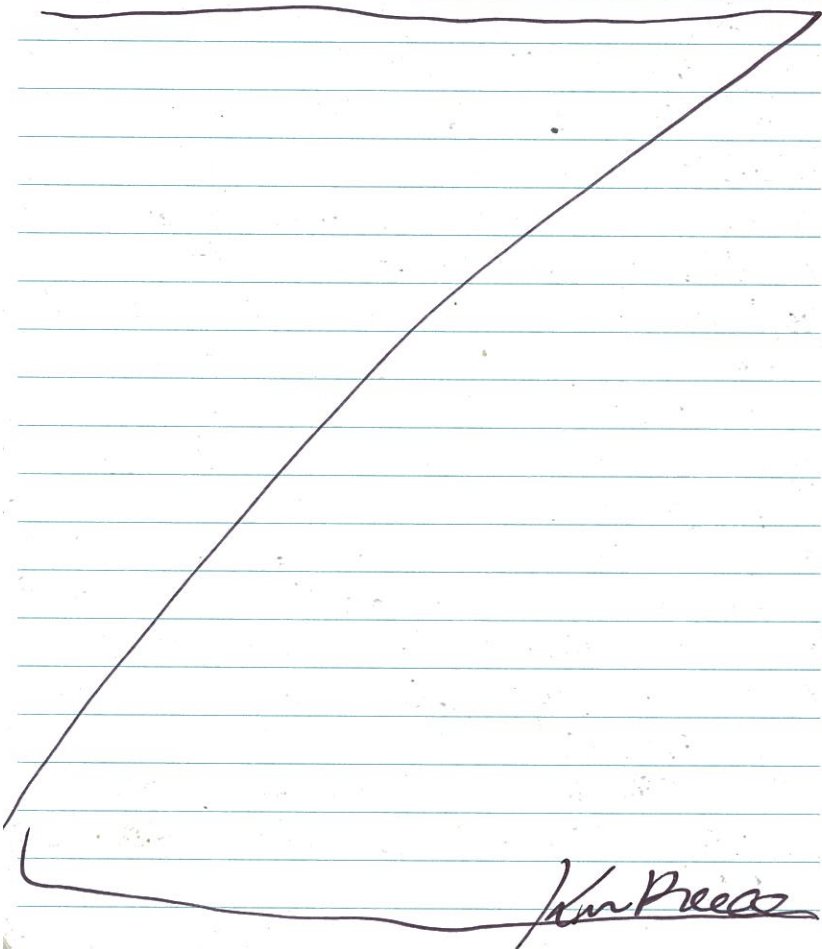
1644 Collect equipment Blank
 sample OUM/EB/3-180612

1650 Late entry * Added the
 following duplicates to the
 chair of study:

OUM 228-SM06-180612 (Grid 124)

OUM 229-SM06-180612 (Grid 130 @
 1039)

June 12, 2018 K. Buncke
 OUM230-SM06-180612 (Grid #134
 @ 1153)
 OUM231-SM06-180612 (Grid #140
 @ 1355)
 OUM232-SM06-180612 (Grid #144
 @ 1508



June 13, 2018 K. Buncke
 0830 meet at Bart station
 0900 meet at cafe to start
 work. Note. Chad Conway
 reported injury (back) and
 won't be able to work, so
~~the~~ the plan is to work one
 team with Brandon, Greg,
 and myself.
 0930 Arrive at Grid #150 + K5
 150 to collect sample ID
 OUM150-SM02-180613 and
 duplicate OUM150 OUM233-
 SM06-180613
 Lat.: 37.81035475°
 Long.: -122.27764761
 Sample Time: 0935
 Landmark: 18th & West Street
 signs
 Location: east side of West
 Street in lawn strip (No
 trees)
 1002 Arrive at Grid #K52
 to collect sample ID OUM152-
 SM02-180613
 Lat.: 37.80819851°

June 13, 2018

K. Bunckle

Long.: -122.30177670

Sample Time: 1002

Landmark: No parking sign North of

Location: east side of sample
of Wood Street in tree box well1025 Arrive at Grid #154 to
collect sample ID OUM154-

SM02-180613 and OUM234-SM06-180613

Lat.: ~~37.80889586~~¹⁰ 37.80889586

Long.: -122.79710305°

Sample Time: 1027

Landmark: St. Patrick's Campus

Location: North side of 10th Street
in lawn strip (No trees)1102 Arrive at Grid #156 to
collect sample ID OUM156-
SM02-180613

Lat.: 37.80829844

Long.: -122.79394957

Sample Time: 1106

Landmark: Center St. Missionary Church

Location: West side of Center St.

1122 Arrive at Grid #157 to
collect sample ID OUM157-
SM02-180613

June 13, 2018

K. Bunckle

Lat.: 37.80878646°

Long.: -122.79198659°

Sample Time: 1125

Landmark: Penasta Village

Location: east side of Mandela
Parkway in lawn strip with
trees in between 10th & 12th Streets1150 Arrive at Grid #158 to
collect sample ID OUM158-SM02-
180613

Lat.: 37.80816710

Long.: -122.78907889

Sample Time: 1152

Landmark: Oakland School Police

Location: West side of Union St in ^{tree} box1205 Arrive Grid #159 to collect
sample ID OUM159-SM02-1806
13

Lat.: 37.80819317°

Long.: -122.78736118°

Sample Time: 1208

Landmark: Taylor Memorial Church

Location: east side of Magnolia
Street in tree box well

1225 Arrive Grid #160 to collect

June 13, 2018 K. Bunnick
Sample ID OUM 160-SM02-180613
13th & Duplicate OUM 235-SM06-180613

Lat.: 37.8079835°

Long.: -122.2864684°

Sample Time: 1227

Landmark: Taylor United Church

Location: Southside of 12th Street
in tree box well near corner
of Adeline.

1319 Arrive at Grid #161 to
collect sample ID OUM 161-
SM02-180613

Lat.: 37.80905706°

Long.: -122.28344868°

Sample Time: 1321

Landmark: Antioch Missionary Church

Location: Northside of 14th St
in tree box well near Gilbert St.

Arrive at Grid #162 to
sample ID OUM 162-SM-02-
180613

Lat.: 37.8052025

Long.: -122.28170302

Landmark: West Oakland Middle

Location: Southside 14th School
in tree box well

June 13, 2018 K. Bunnick
Sample time: 1334
1344 Arrive to Grid #163

to collect sample ID OUM 163-
180613

Lat.: 37.80870178

Long.: -122.27996465

Sample Time: 1346

Landmark: 15th & Market Signs

Location: Northside of 15th in tree
Box

1400 Arrive Grid #164 to
collect sample ID OUM 164-
SM02-180613 and duplicate

Lat.: 37.80846514° OUM 236-SM06-
180613

Long.: -122.27786989°

Sample Time: 1404

Landmark: Fire hydrant on Brush

Location: West Side Brush

Street in tree Box well

1424 Arrive at Grid #177 to
collect sample ID OUM 177-SM02-
180613

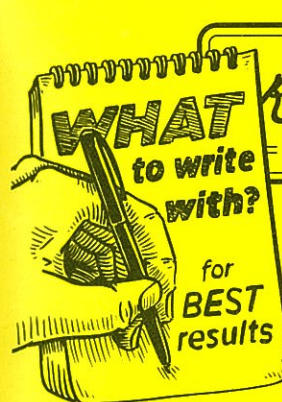
Lat.: 37.80678332°

Long.: -122.27983346°

Sample Time: 1426

Landmark: 13th and West St. Signs

48 June 13, 2018 K. Burkette
 Location: southside of 13th Street
 in the Box well
 1438 Arrive at Grid #176 to
 collect sample ID OUM 176-
 SMO2-180613
 Lat.: 37.80722206°
 Long.: -122.28111541°
 Sample Time: 1440
 Landmark: 13th & Market St signs
 Location: east side of tree box
 well on Market Street @ corner
 of 13th
 1453 Arrive at Grid #175 to
 collect sample ID OUM 175-
 SMO2-180613
 Lat.: 37.80690842°
 Long.: -122.28356769°
 Sample Time: 1455
 Landmark: MCK Community Garden
 Location: east side of Filbert ^{tree} Box well
 1520 Arrive at Grid #174 to
 sample ID OUM 174-SMO2-180613
 and duplicate OUM 238-SMO6-180613
 Lat.: 37.80708521°
 Long.: -122.28593391°



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No 391FX

June 13, 2018 K. Bureklee

Sample time: 1521

Landmark: No parking sign

Location: west side of Chestnut Street in tree Box well

542 Arrive at Grid #173 to collect sample ID OUM173-SM02-180613

Lat.: 37.80673793°

Long.: 122.28739334°

Sample time: 1544

Landmark: Beth Eden Baptist Church

Location: Northside of 10th St. in tree Box well

1607 Arrive at Grid #172 to collect sample ID OUM172-SM02-180613

Lat.: 37.80721747

Long.: 122.28921853°

Sample time: 1609

Landmark: Oakland School Police Dept.

Location: Northside of 10th St. in tree Box

Plate outcrop: 1604-sample FD

OUM173; unable to take all three samples in 3 ft. radius due to compact soil.

— Arrive at Grid #171

June 13, 2018

K. Bureklee ³

to collect sample ID OUM171-SM02-180613

Lat.: 37.80764612°

Long.: 122.29237597°

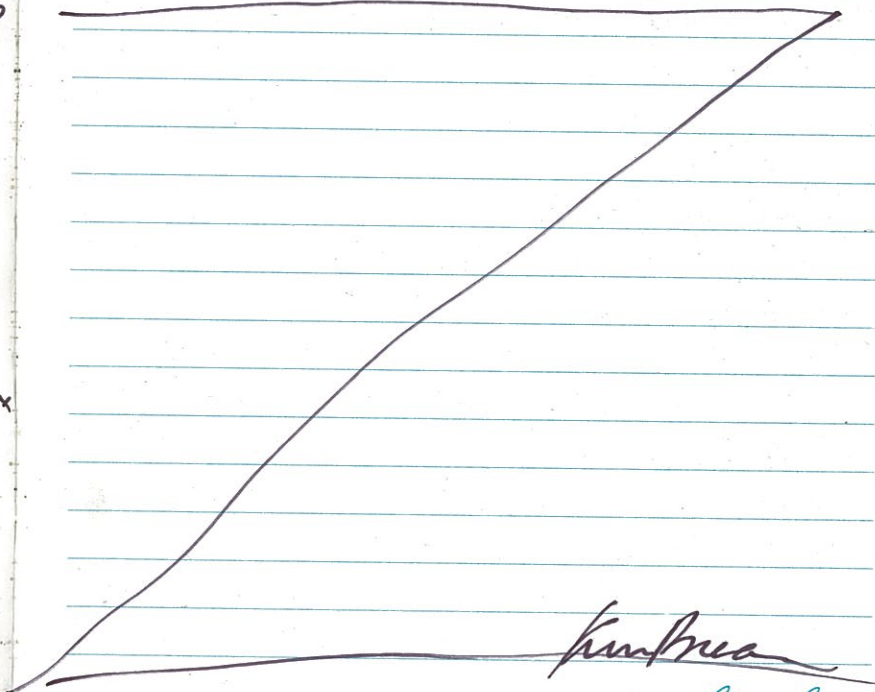
Sample time: 1631

Landmark: 10th & Mandela St. Signs

Location: east side of Mandela

PKing in tree Box strip near KB at corner of 10th Street.

[70] took collect equipment Blank on MEB15-180613



K. Bureklee

June 14, 2018 K. Bunnelle

0645 meet Brandon at Bant
0708 meet Greg, Dan, Joana
at cafe

0722 Conduct Health & Safety
meeting - emphasizing traffic;
depart site

0726 Arrive at Grid 170. Resident
greet us and asks us to be
quiet, despite none of the
equipment having been setup.

Dan advises us to move to
industrial area. Drive to Grid
#165 but unable to find any
sample collection location
due to pavement on Hwy &
Frontage road. Next drive
to Grid #178, but also unable
to find any sample location

0748 Arrive at Grid #190 to
collect sample ID OUM190-SM02-
180614 and duplicate OUM241-
SM06-180614

Lat.: 37.80366862°

Long.: -122.79999158°

Sample Time: 0750

June 14, 2018

K. Bunnelle

Landmark: U.S. post office

Location: Northside of 3rd
Street, in lawn strip with

tree at corner of 3rd Street

0812 Arrive at Grid #200 to collect
sample ID OUM200-SM02-180614

Lat.: 37.80304137°

Long.: -122.79747842°

Sample Time: 0814

Landmark: Chester & 3rd Street Signs

Location: Northside of 3rd Street
in tree box well.

* Note duplicate sample ID

OUM243-SM06-180614 @ 0814

0834 Arrive at Grid #201

to collect sample ID OUM201-
SM02-180614

Lat.: 37.80276817°

Long.: -122.79618925°

Sample Time: 0836

Landmark: Cherry Arts Center

Location: Northside of 3rd St.

in lawn strip (notice)

0854 Arrive at Grid #191 to
collect sample ID OUM191-

June 14, 2018 K. Bunekke

SM02-180614

Lat.: 37.80398429°

Long.: -122.29761321°

Sample Time: 0856

Landmark: Telephone pole #15906

Location: east side of Henry Street in tree box well

0910 Arrive at Grid #192 to collect sample ID OUM192-SM02-180614.

Lat.: 37.80367814°

Long.: -122.29540666°

Sample Time: 0912

Landmark: West Oakland Bart

Location: east side of lawn strip box

0930 Arrive at Grid #194 to collect sample ID OUM194-SM02-180614 and duplicate OUM194-¹⁹⁵242 SM06-180614

Lat.: 37.80360246°

Long.: -122.29232997°

Sample Time: 0933

Landmark: Bart tracks

Location: Northside of 5th Street

June 14, 2018 K. Bunekke

in lawn Box without a tree

0951 Arrive at Grid #196¹⁹⁵ to collect sample 195

OUM195-SM02-180614

Lat.: 37.80399216°

Long.: -122.28947722°

Sample Time: 0953

Landmark: Willie Everidge Service

Location: Southside of 7th Street at magnolia in tree box well

1015 Arrive at Grid #196 to

collect sample ID OUM196-

SM02-180614

Lat.: ~~37.80399216~~¹⁹⁵ 37.8036138°

Long.: ~~-122.28947722~~¹⁹⁵ -122.2878585

Sample Time: 1017

Landmark: #62 Bus stop

Location: Southside of 4th Street at of Adeline corner in tree box

1045 Arrive at Grid #197 to

collect sample ID OUM197-

SM02-180614

Lat.: 37.80422637°

Long.: -122.28530662

Sample Time: 1048

June 14, 2018 K. Brueckle
 project to fly Back to L.A.
 1256 Arrive at Grid #188 to
 collect sample ID onm188-SM02-
 180614

Lat.: 37.80549609°

Long.: -122.78143324°

Sample Time: 1258

Landmark: St. Mary's Garden

Location: east side of Market
 Street & south of Bus lane in
 tree Box.

1312 Arrive at Grid #187 to
 collect sample ID onm187-
 SM02-180614

Lat.: 37.80606902°

Long.: -122.78407241°

Sample Time: 1315

Landmark: MLK Elementary School

Location: ^{west} North side of 10th St
 Filbert Street in lawn Box
 without a tree near corner

of 10th Street

1394 Arrive at Grid #186 to
 collect sample ID onm186-
 SM02-180614

June 14, 2018 K. Brueckle

Lat.: 37.80624020°

Long.: -122.78439871°

Sample Time: 1326

Landmark: Town center at Acorn

Location: east side of Linden
 Street in tree Box at corner
 of 10th St.

1339 Arrive at Grid #185 to
 collect sample ID onm185-
 SM02-180614

Lat.: 37.8042682°

Long.: -122.78769942°

Sample Time: 1341

Landmark: Green Valley Foods

Location: east side of Adeline
 St. in tree Box at corner of 8th St.

1353 Arrive at Grid #184 to
 collect sample ID onm184-SM02-
 180614 and duplicate onm240-
 SM06-180614

Lat.: 37.80535710°

Long.: -122.78980420°

Sample Time: 1355

Landmark: The Crucible Bike Shop

Location: Northside ^{North} ~~East~~ side

June 14, 2018

K. Bunckle

Union Street + 8th Street

in lawn strip w/ fig tree

1410 Arrive at Grid #183 to

collect sample ID OUM183-

SM02-180614

Lat.: 37.80561712°

Long.: -122.29149606

Sample Time: 1413

Landmark: CrossFit PowerGrid

Location: Southside of 8th Street
in tree box

1430 Arrive at Grid #182 to

collect sample ID OUM182-SM02-
180614

Lat.: 37.80526226°

Long.: -122.29364219°

Sample Time: 1437

Landmark: BART Station

Location: West side of Mandela
in planter box at corner of
7th Street.

1452 Arrive at Grid #181 to

collect sample ID OUM181-

SM02-180614

Lat.: 37.80515982°

June 14, 2018

K. Bunckle

Long.: -122.29672646

Sample Time: 1454

Landmark: BART (West Oakland)

Location: Westside cluster in lawn strip

1502 Arrive at Grid #180 to

collect sample ID OUM180-SM02-

180614 and duplicate OUM239-

SM06-180614

Lat.: 37.80525863°

Long.: -122.29715585°

Sample Time: 1505

Landmark: BART Tracks

Location: east side of Henry
Street in lawn strip with
telephone pole. #TV536

1526 Arrive at Grid #179 to

collect sample ID OUM179-

SM02-180614

Lat.: 37.80477490° ^{K3} 80474869°

Long.: -122.29909157° 29913764°

Sample Time: 1524

Landmark: U.S. Post Office

Location: East side of Pearlman
Street in tree box near 5th
Street.

June 14, 2018 K. Burkette

1546 Arrive at Grid #170 to
collect sample ID OUM/170-
SM02-180614 and duplicate
OUM 237-SM06-180614

Lat.: 37.80707101°

Long.: -122.29353458°

Landmark: Church

Location: Northside of 9th Street
Sample in tree box

Sample Time: 1548

1603 Arrive at Grid #169 to
collect sample ID OUM/169-
SM02-180614

Lat.: 37.80671943°

Long.: -122.29586170°

Sample Time: 1605

Landmark: Church

Location: Northside of 9th Street
in tree box near Clester St.

1618 Arrive at Grid #168 to
collect sample ID OUM/168-
SM02-180614

Lat.: 37.80676210

Long.: -122.29749922

Sample Time: 1620

June 14, 2018 K. Burkette

Landmark: Olivet Baptist Church

Location: east side of Peapack
St. in tree box near 8th Street

1632 Arrive at Grid #167 to
collect sample ID OUM/167-
SM02-180614

Lat.: 37.80639093°

Long.: -122.29913343°

Sample Time: 1634

Landmark: USPS & BART Tracks

Location: North side of 7th Street
in tree box.

~~Arrive at Grid #166 to~~ KB
~~collect sample ID OUM/166~~ KB
~~SM02-180614~~ KB

~~Lat.:~~ KB

~~Long.:~~ KB

~~Sample time:~~ KB

~~Landmark:~~ KB

~~Location:~~ KB

* Unable to locate any lawn
strips on tree boxes on public
right of ways. Potential
tree wells on 7th Street on KB
in front of the U.S. Post office

June 14, 2018 K. Burekka
 Building, but Dan Murphy
 felt it was private property
 * All Drive over to Grid #29
 to see if we can try to
 Resample with different
 sampler. Unable to penetrate
 to 6 inches due to compaction
 and large gravel.

1735 Collect Equipment

Blank OUMEB 16-180614

16 KB 1805: Drop off all waste
 water - non haz. into 55-
 gallon drum located at the
 Environmental Indicators
 yard. Pack-truck up and
 all depart site.

Kim Burekka

Appendix F: Facilities of Concern Summary

Appendix F

Follow-Up Facilities of Concern Summary

Following the results of the West Oakland Lead Sampling Report, EPA initiated Preliminary Assessments (PAs) at Globe Metals Company (Globe Metals) and Custom Alloy Scrap Sales (CASS), and desktop Pre-CERCLA Screenings (PCSs) at Acme Galvanizing (Acme), Foster's Plating, and Pacific Pipe in order to determine if any of the facilities of concern may be identified as potential sources of the lead contamination. The PA and PCS sites were selected based the proximity of elevated lead sample results, as well as historic operations conducted at each facility.

Sample results collected within 0.25 miles of the follow up facilities of concern were analyzed to determine if lead concentrations could be correlated to their proximity to the facilities. As shown on Table F-1, results were evaluated separately using all known sample data within a 0.25 mile radius, as well as data focusing on historically downwind/crosswind areas, where airborne migration of the lead contamination may have occurred. Approximate areas of paved (capped), and unpaved (uncapped) soil were calculated as part of the EPA's Hazard Ranking System (HRS) criteria, assessing the potential exposure to contaminated soil. The lead concentrations appeared to show trends of reducing as the distance from the facilities increased in all surface and shallow subsurface samples, with the exception of Acme Galvanizing, where shallow subsurface results showed the opposite trend, however Acme Galvanizing is located downwind of Globe, which may account for the trend variation.

Based on the findings of the PA, CASS and Globe Metals were identified as potential lead sources due to historical operations, however, the only documented lead-contaminated soils have been excavated and removed and both facilities are entirely paved, preventing any residual on-site soil contamination from impacting the surrounding area. Based on those factors, along with the other potential stationary and non-stationary sources in the area, including industrial facilities, residential leaded paint, and historical auto emissions, Globe Metals and CASS did not meet the criteria for further assessment after completion of the PA. Based on the findings of the PCSs, Acme, Pacific Pipe, and Fosters Plating were found not eligible for further investigation under PAs. No definitive documented source of contamination was identified at these sites, so further efforts under Superfund are not warranted.

Table F-1. Summary of EPA Follow-Up Facilities of Concern

Facility Name	CASS	Globe Metals	Foster's Plating	Acme Galvanizing	Pacific Pipe Company
Address	2601 Peralta St	1820 10th Street	1570 34th Street	1655 17th Street	2000 Mandela Parkway
Current Operator	Cass Recycling / NKP Sulprizio	California Waste Solutions	Possible Residence	Bailey Property Investments	Pacific Pile Co
Follow Up EPA Action Taken	PA	PA	PCS	PCS	PCS
Justification	Historic Lead Smelter	Historic Lead Smelter	Historic Lead Smelter	Metal Plating /Processing	Metal Pipe Manufacturing
Nearby Lead Result	1,200 mg/kg, 249-ft North	1,300 mg/kg, 5-ft Northeast	1,700 mg/kg, 1,227-ft Southwest	1,400 mg/kg, 75-ft Southeast	3,900 mg/kg, 16-ft Northeast
Most Recent Agency Involvement	DTSC PCS - 2019, PA - 2007	DTSC Site Screen - 2019	EPA Removal - 2009	DTSC Site Screen - 2018	Unknown
Wind Direction	West (77%), North (23%)	West (77%), North (23%)	West (77%), North (23%)	West (77%), North (23%)	West (77%), North (23%)
Paved Area (acres) w/in 0.25 mi	112.9	103.9	109.6	96.7	106.9
Unpaved Area¹ (acres) w/in 0.25 mi	9.8	14.5	15.1	25.6	14.4
Percent Unpaved¹	8%	12%	12%	20%	11%
¹ = Does not include unpaved area with known fill material along I-880 or Mandela Parkway PA = Preliminary Assessment PCS = Pre-CERCLA Screening					

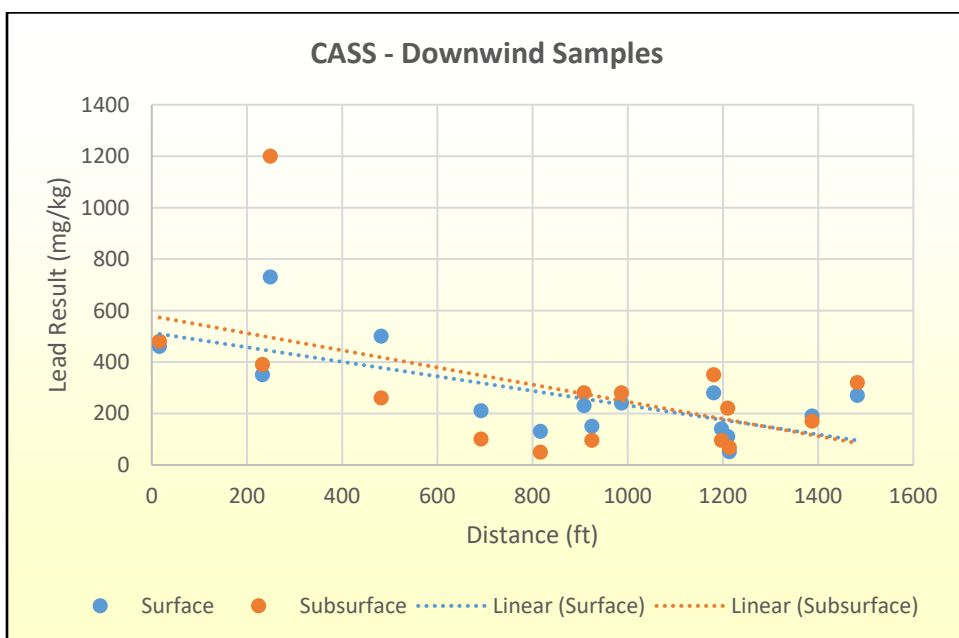
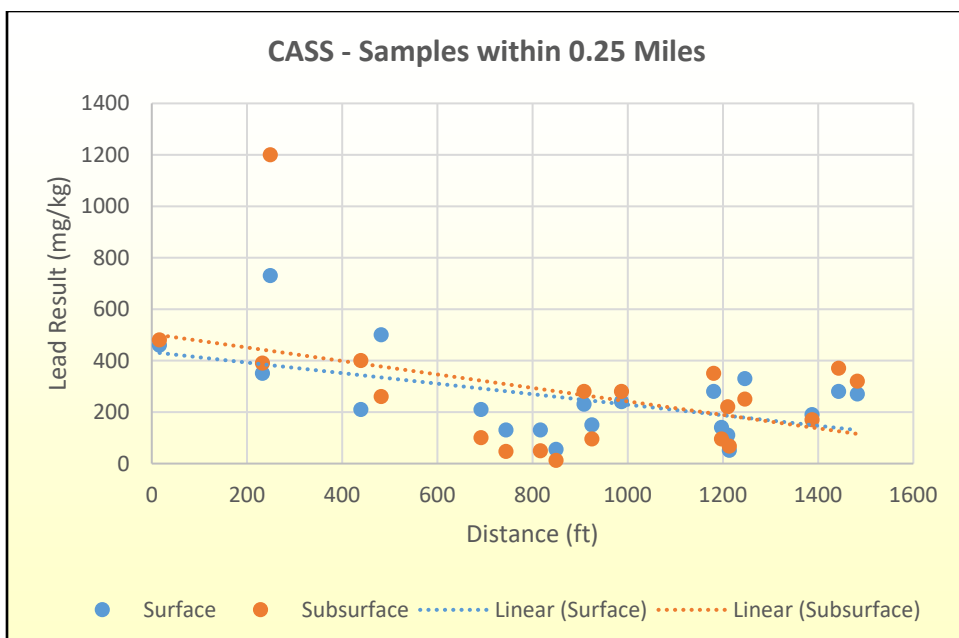
Custom Alloy Scrap Sales (CASS)

The CASS Site is a scrap metal recycling operation and aluminum smelting facility that includes nine parcels, with the main facility located at 2730 Peralta Street in Oakland, California. CASS has operated at the main facility since at least 1979. The Site was owned and operated by an aluminum smelting company from 1951 to 1979. The aluminum smelting operation was located on the southern edge of the property. The aluminum smelting operation reportedly ceased in approximately 1970. A lead and zinc smelter was located on the eastern parcel at 2628 Poplar Street that operated until approximately 1959. The Site is entirely paved and fenced and is found within a mixed use and industrial area. Residential single-family homes are located directly adjacent to the northeast to the eastern portion of the Site and a community garden is located adjacent to the northern portion of the Site.

Since 1988, the Alameda County Department of Environmental Health (ACDEH) has been overseeing site activities, including the removal of underground storage tanks in addition to soil and groundwater investigations. Elevated levels of petroleum hydrocarbons, volatile organic compounds, lead, and other compounds have been documented in the site groundwater and soil, including free product. Additional groundwater monitoring and a subsurface investigation was conducted under the supervision of the Regional Water Quality Control Board (RWQCB). A Risk Management Plan was submitted for the residual free product and petroleum contaminated soil and groundwater, and No Further Action was determined for the Site by RWQCB in 2019. Site Screening Assessments were conducted by DTSC) in 2006 and 2007, which concluded that concentrations of polychlorinated biphenyls, petroleum hydrocarbons, and VOCs were detected in soil and groundwater above regulatory screening levels. DTSC determined that further assessment of the Site was warranted to determine whether it is a source of elevated metals, including lead, in offsite soil.

Table F-2. CASS Sample Proximity Analysis

Distance (ft)	Surface Result (mg/kg)	Subsurface Result (mg/kg)	Direction from Site	Wind Direction
16	460	480	North	Downwind
233	350	390	South	Downwind
249	730	1200	North	Downwind
440	210	400	Southwest	Upwind
482	500	260	East	Downwind
692	210	100	South	Downwind
745	130	47	Northwest	Upwind
817	130	49	Northeast	Downwind
850	55	12	West	Upwind
909	230	280	Northeast	Downwind
925	150	95	Southeast	Downwind
987	240	280	South	Downwind
1181	280	350	North	Downwind
1197	140	95	East	Downwind
1210	110	220	Southeast	Downwind
1214	51	67	North	Downwind
1246	330	250	West	Upwind
1387	190	170	Northeast	Downwind
1443	280	370	Northwest	Upwind
1483	270	320	Southeast	Downwind



Globe Metals

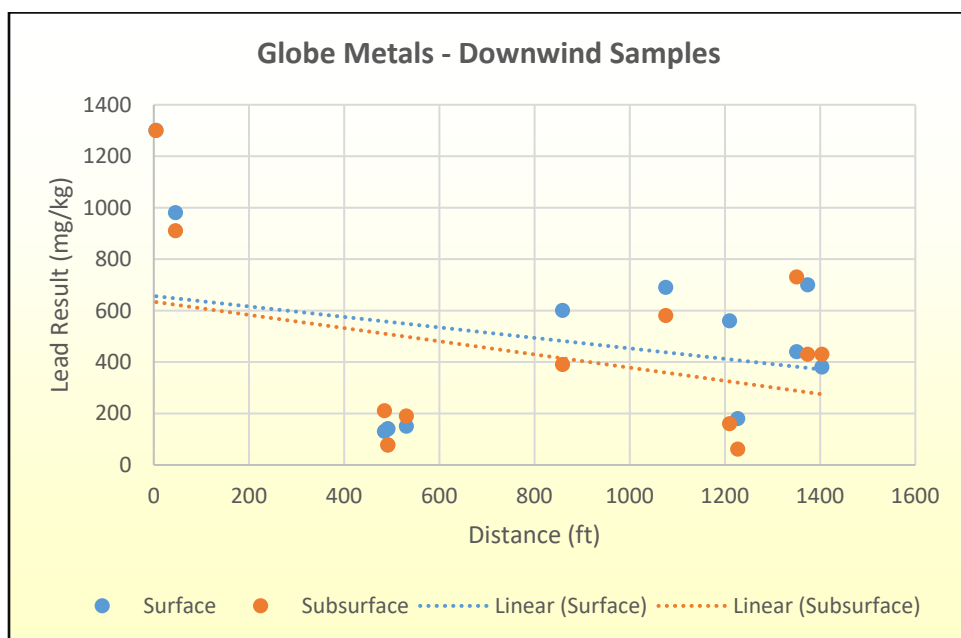
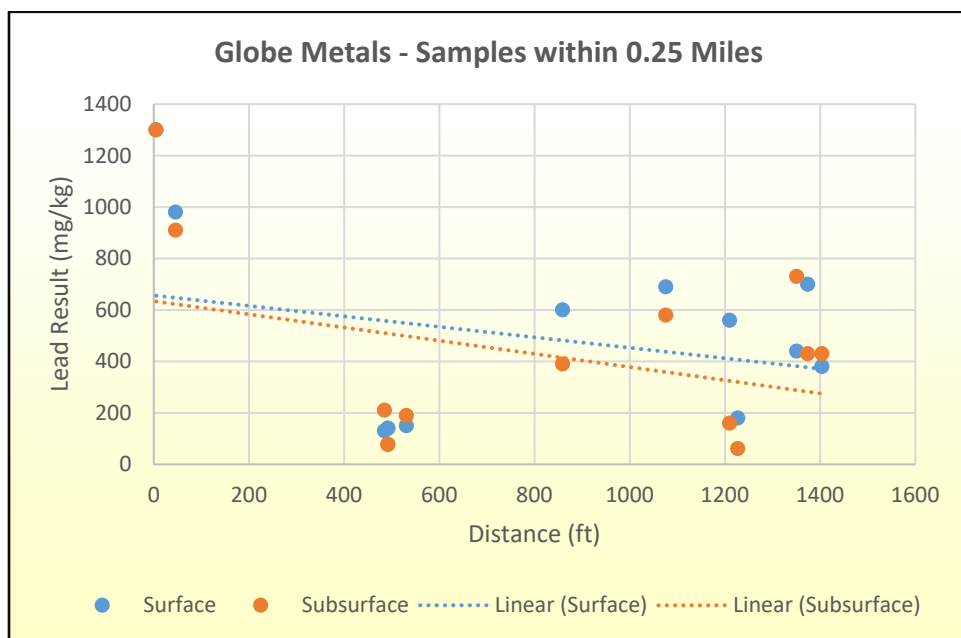
The former Globe Metals Company was located at 1820 10th Street, where California Waste Solutions, a commercial and residential recycling center, currently owns and operates the site. The site was owned by Globe Metals from 1969 to 1993, and their operations included secondary smelting and alloying of aluminum, lead, and other metals. The Site is entirely paved, contains at least three industrial buildings, and is found within a mixed use and industrial area. Residential single-family homes are located directly adjacent to the east and southeast of the Site, and newly constructed condominiums are located immediately northwest of the Site.

In the 1990s, ACDEH oversaw the excavation of lead-contaminated soil from the northeastern portion of the site, where lead was found at levels as great as 2,200 mg/kg, and soluble lead was found at levels as great as 350 mg/kg. In 1993, ACDEH requested the RWQCB assess the site for lead issues remaining in soils that could potentially threaten the groundwater. RWQCB reported that 425 yards of lead-contaminated soil with concentrations greater than 200 mg/kg were excavated down to approximately 6 ft bgs.

Elevated lead concentrations in soil have also been documented at two properties approximately 50 feet east and southeast of the Site. The Gaines property, a vacant lot and former wood palette manufacturing company located at 1795 11th Street, was found to have surface soil with a lead concentrations as great as 28,000 mg/kg, and the former Jenkins Auto Wreckers property located at 1014 Pine Street was found to contain lead concentrations of 1,200 mg/kg in stockpiled soil and 530 mg/kg in shallow soil. Excavation and removal of contaminated soil have been conducted at both off-site properties.

Table F-3 Globe Metals Sample Proximity Analysis

Distance (ft)	Surface Result (mg/kg)	Subsurface Result (mg/kg)	Direction from Site	Wind Direction
5	1300	1300	Northeast	Downwind
46	980	910	Southeast	Downwind
485	130	210	East	Downwind
492	140	77	East	Downwind
492	140	77	Northeast	Downwind
531	150	190	Southeast	Downwind
859	600	390	Southeast	Downwind
1076	690	580	South	Downwind
1210	560	160	East	Downwind
1227	180	61	Northeast	Downwind
1351	440	730	South	Downwind
1374	700	430	Southeast	Downwind
1404	380	430	Southeast	Downwind



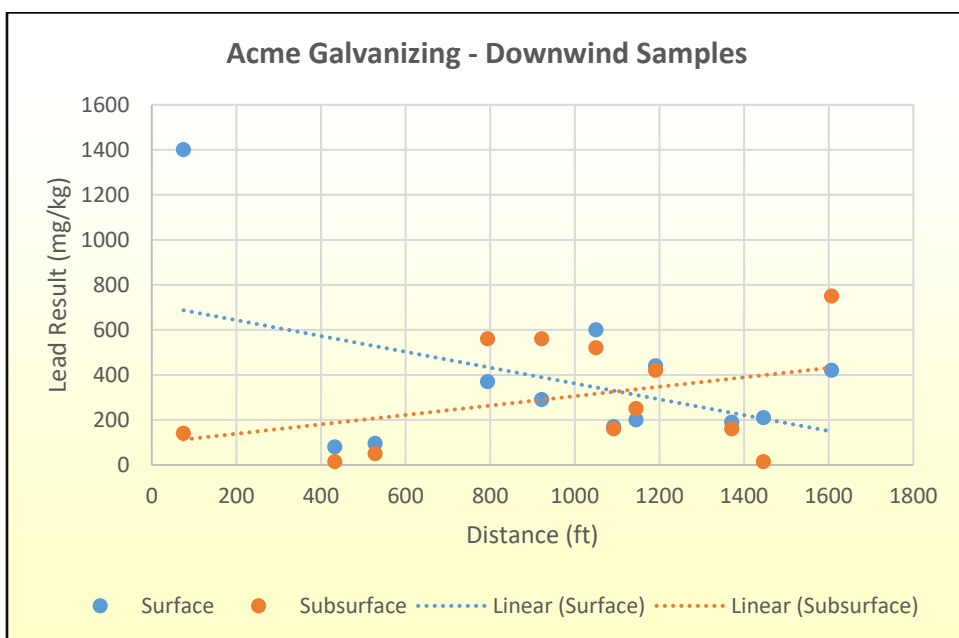
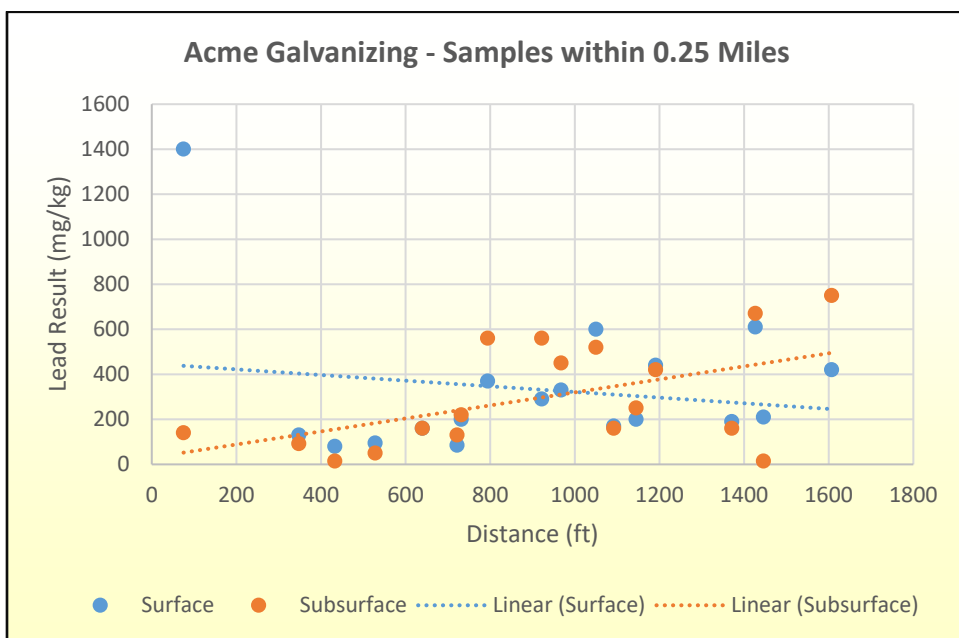
Acme Galvanizing

The Acme Galvanizing site, located at 1655 17th Street, was first developed prior to the 1930s as a mixture of residential and smaller industrial facilities and, in approximately 1958, was redeveloped into the current manufacturing facility. Between approximately 1958 and 2000, the site was used for zinc-plating operations. These operations utilized ‘hot dip’ galvanizing procedures for the purposes of plating various fabricated-steel items with a zinc alloy, which is reported to have contained up to 10 percent lead and up to 0.2 percent cadmium. Prior to plating, items were cleaned in acid and caustic baths. Specific on-site operations since 2000 are not known.

In 1983, the facility was issued a Notice of Violation from the Bay Area Air Quality Management District (BAAQMD) due to operating multiple potential air pollution sources without a permit. Between approximately 1985 and the 2000, the facility was issued numerous violations by City and County regulatory agencies due to poor hazardous waste management practices. By 1994, DTSC became involved with the facility due to the on-site operation of a fixed treatment unit, which was used to treat spent acids, and was illegally closed in the late 1990s. In the early 2000s, under an EPA enforcement order, Acme completed a cleanup involving removal of all existing surface waste, drums, tanks, vaults, and other structures, including all metal plating process equipment, conducted surface and subsurface soil sampling, testing, analysis, and installed groundwater monitoring wells and provided water sampling reports. In 2007, the City of Oakland recorded a Land Use Covenant (LUC) that restricts the property to commercial and industrial use.

Table F-4 Acme Galvanizing Sample Proximity Analysis

Distance (ft)	Surface Result (mg/kg)	Subsurface Result (mg/kg)	Direction from Site	Wind Direction
75	1400	140	Southeast	Downwind
348	130	92	West	Upwind
433	80	14	South	Downwind
528	95	50	North	Downwind
640	160	160	Northwest	Upwind
722	85	130	West	Upwind
731	200	220	Southwest	Upwind
794	370	560	East	Downwind
922	290	560	Southeast	Downwind
968	330	450	Southwest	Upwind
1050	600	520	South	Downwind
1092	170	160	Northeast	Downwind
1145	200	250	Southeast	Downwind
1191	440	420	North	Downwind
1371	190	160	North	Downwind
1427	610	670	Southwest	Upwind
1446	210	14	East	Downwind



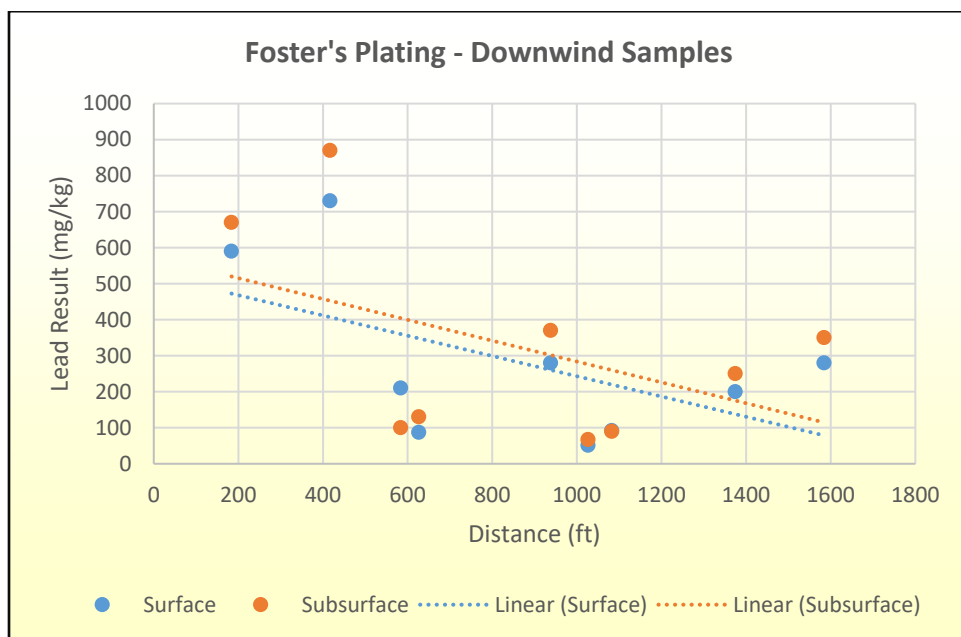
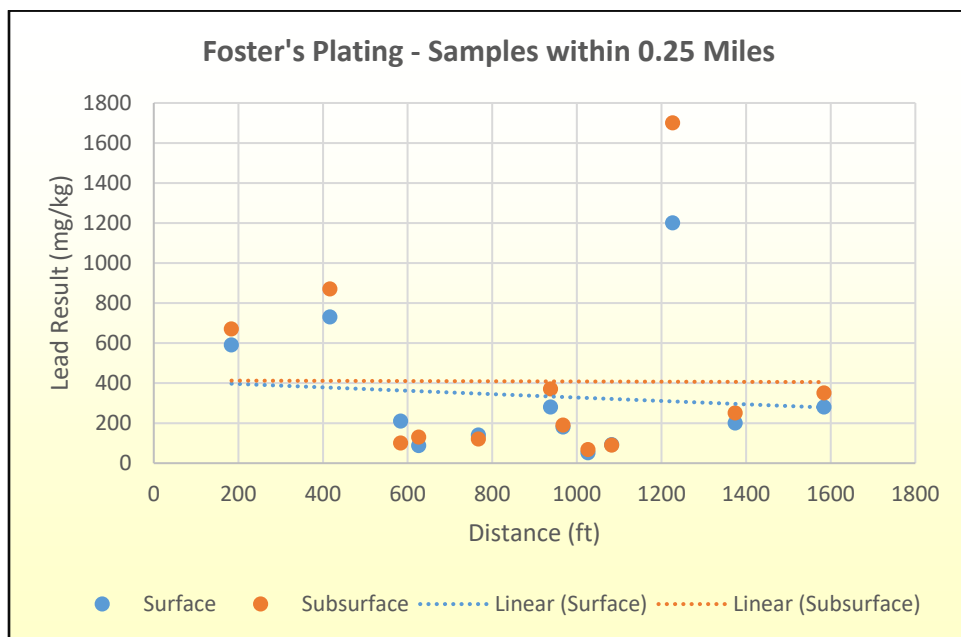
Foster's Plating

The Foster's Plating site is located at 1570 34th Street, where the site is zoned as industrial with a use description as a warehouse; however, the street-facing portion of the site is used as a single-family residence. The site was first developed prior to the 1930s and in approximately 1966 at least some portion of the property was converted into a small electroplating and metal polishing facility, which operated through approximately 2000. The specific time period of residential use on the property is not known, although it is suspected that at least some portion of the property was in continual residential use. During operations, various plating processes were conducted on-site including chrome, aluminum, nickel, tin, cadmium, brass, copper, zinc, and silver. Plating operations included the use of cyanide-containing solutions and various acid and caustic solutions were also used for metal cleaning activities.

In 2009, EPA conducted a joint inspection of the facility with the Oakland Fire Department and DTSC, during which numerous deteriorating and fluid-filled vats (open-topped plating tanks), drums, and other bulk storage containers were observed to be densely-packed within the former plating building at the rear of the property. The plating portion of the facility was noted to be covered by up to 2 inches of solidified plating wastes. Subsequent sampling of the containerized fluids indicated significant quantities of strong acids, caustic solutions, and cyanide-containing solutions. During the initial response, approximately 4,000 gallons of acid, caustic, and cyanide solutions were removed from facility containers and disposed off site. Samples were also reportedly collected from solidified wastes, sludges, and underlying soils during the response; however, sample analytical results are not known. A subsequent response removed all vats, drums, and other containers from the property.

Table F-5. Foster's Plating Sample Proximity Analysis

Distance (ft)	Surface Result (mg/kg)	Subsurface Result (mg/kg)	Direction from Site	Wind Direction
184	590	670	North	Downwind
417	730	870	Southeast	Downwind
584	210	100	Northeast	Downwind
626	87	130	East	Downwind
768	140	120	Northwest	Upwind
938	280	370	Southeast	Downwind
968	180	190	Southwest	Upwind
1027	51	67	Southeast	Downwind
1082	92	90	East	Downwind
1227	1200	1700	Southwest	Upwind
1374	200	250	Northeast	Downwind
1584	280	350	Southeast	Downwind



Pacific Pipe

The Pacific Tank and Pipe Company (Pacific Pipe), located at 2140 Mandela Parkway was first developed in approximately the early 1920s on the western parcel of the site as a manufacturing facility and by the late 1950s the facility was expanded to include the two eastern site parcels. The facility initially manufactured and refurbished steel-banded wood log piping and in later years shifted to metal pipe, valve, and fitting manufacturing. The facility included railroad spurs for the purposes of transporting manufacturing materials and finished product. Additional large-scale industrial metal manufacturing was also conducted on site, including the fabrication of portions of the Bay Bridge. The facility was shuttered in approximately the early 2000s. No known significant operations have been conducted on site since manufacturing operations ceased, although the facility has been proposed for several large-scale community redevelopment projects. The site is currently being remodeled into a recreational indoor climbing facility. There has been no known significant environmental regulatory involvement with the site and no known environmental investigations conducted at the site. The site is listed in the DTSC's Envirostor Database as part of the Voluntary Cleanup Program with a status as "Inactive – Needs Evaluation as of 8/5/2009.

Table F-6. Pacific Pipe Sample Proximity Analysis

Distance (ft)	Surface Result (mg/kg)	Subsurface Result (mg/kg)	Direction from Site	Wind Direction
16	1300	3900	Northeast	Downwind
118	160	110	Southeast	Downwind
400	27	28	North	Downwind
430	53	49	East	Downwind
492	210	14	South	Downwind
613	170	96	East	Downwind
692	230	230	South	Downwind
768	170	110	Northwest	Upwind
797	420	750	West	Upwind
833	77	68	Northwest	Upwind
876	240	280	Northeast	Downwind
905	540	530	East	Downwind
912	160	180	South	Downwind
987	430	510	North	Downwind
1000	170	160	West	Upwind
1151	180	200	Southeast	Downwind
1174	370	560	Southwest	Upwind
1289	810	490	East	Downwind
1371	410	350	South	Downwind
1814	290	560	Southwest	Upwind

