

April 28, 2025

Engineering Evaluation/Cost Analysis

Highway 24 Mill Site
1025 Garner Street
Colorado Springs, Colorado

Prepared for:
Colorado Department of Environmental Health and Environment
4300 Cherry Creek Drive South
Denver, Colorado

Pinyon Project No.:
124026802

CDPHE Project No.:
2025-HWY24MS



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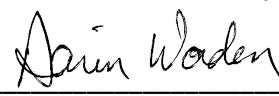
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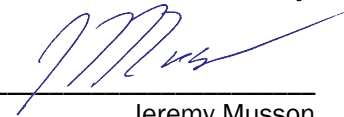

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List of Acryonyms

%	percent
ARAR	applicable or relevant and appropriate requirement
BLL	blood lead level
CCR	Code of Colorado Regulations
CDPHE	Colorado Department of Public Health and Environment
CDPS	Colorado Discharge Permit System
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
COC	contaminant of concern
COPC	contaminants of potential concern
CRS	Colorado Revised Statutes
db(A)	A-weighted decibels
EE/CA	Engineering Evaluation/Cost Analysis
EPA	United States Environmental Protection Agency
IEUBK	Integrated Exposure Uptake Biokinetic
IRIS	Integrated Risk Information System
IVBA	in vitro bioaccessibility assay
mg/kg	milligrams per kilogram
NAAQS	National Ambient Air Quality Standards
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NTCRA	non-time-critical removal action
O&M	operation and maintenance
PA	Preliminary Assessment

Pinyon	Pinyon Environmental, Inc.
PM10	inhalable particles, with diameters that are generally 10 micrometers and smaller
PRG	Preliminary Remediation Goal
RA	Removal Assessment
RAO	removal action objective
RBA	relative bioavailability
SI	Site Inspection
Site	A-1 Mobile Village, as illustrated in Figure 1: Site Location
TBC	to-be-considered
UCL	Upper Confidence Limit
µg/dL	micrograms per deciliter
VCUP	Voluntary Cleanup Program

Executive Summary

Pinyon Environmental, Inc. (Pinyon), has completed an Engineering Evaluation/Cost Analysis (EE/CA) of the property known as A-1 Mobile Village located at 1025 Garner Street, Colorado Springs, Colorado (the Site; Figure 1). The Colorado Department of Public Health and Environment (CDPHE) drafted and the United States Environmental Protection Agency (EPA) approved the EE/CA Approval Memo prompting the completion of the EE/CA (CDPHE, 2024a). The Approval Memo stated the Site meets the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) criteria for and recommended completion of an EE/CA as part of a non-time-critical removal action (NTCRA).

The purpose of this EE/CA is to develop removal action objectives (RAOs) and evaluate appropriate removal action alternatives to address soil contamination at the Site, primarily focusing on arsenic and lead which are present due to the Site's proximity to a former heavy metal ore processing tailings pile associated with the Golden Cycle Mill. Previous investigations have confirmed elevated levels of arsenic and lead in the soil at the A-1 Mobile Village.

The RAOs for the Site are to minimize human exposure, particularly to residents and children of A-1 Mobile Village, through dermal contact, accidental ingestion of soil, and inhalation of dust containing arsenic and lead in Site soil. The final cleanup levels consider risk-based Preliminary Remediation Goals (PRGs), the criteria in the NCP, and background concentrations of soil lead and arsenic. Cleanup action levels were established at 11 milligrams per kilogram (mg/kg) for arsenic and 142 mg/kg for lead.

The report evaluates four removal action alternatives:

- ▶ Alternative 1: No action
- ▶ Alternative 2: Excavation to 6-inches and off-Site disposal
- ▶ Alternative 3: Excavation to 12-inches and off-Site disposal
- ▶ Alternative 4: Excavation to 18-inches and off-Site disposal

Each alternative was evaluated based on effectiveness, implementability, and cost. Alternative 3, excavation to 12-inches and off-site disposal, is the recommended removal action. In areas where excavation to 12-inches is not possible or practical due to access restrictions ground cover may be placed with a minimum thickness of 2-inches to limit potential exposure. This alternative is considered to balance effective removal of impacted soil with reasonable implementability and cost, meeting Colorado and federal Applicable or Relevant and Appropriate Requirements (ARARs) and achieving the RAOs.

1.0 Introduction

Pinyon Environmental, Inc. (Pinyon), has completed an Engineering Evaluation/Cost Analysis (EE/CA) of the property known as A-1 Mobile Village located at 1025 Garner Street, Colorado Springs, Colorado (the Site; Figure 1). The Colorado Department of Public Health and Environment (CDPHE) drafted and the United States Environmental Protection Agency (EPA) approved the EE/CA Approval Memo prompting the completion of the EE/CA (CDPHE, 2024a). The Approval Memo stated the Site meets the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) criteria for and recommended completion of an EE/CA as part of a non-time-critical removal action (NTCRA).

A NTCRA was selected due to lead and arsenic concentrations in soils at the Site. Based on recent updates to the regional screening level (RSL) for lead and toxicity values for arsenic, CDPHE and EPA reevaluated Site conditions regarding lead and arsenic exposure. Using specific factors listed in the NCP, CDPHE and EPA determined a NTCRA was appropriate to decrease the threat to public health, welfare, or the environment. Development of the EE/CA is a statutorily required step of the NTCRA process.

The purpose of this EE/CA is to develop removal action objectives (RAOs) and evaluate appropriate removal action alternatives. Removal action alternatives will be evaluated based on effectiveness, implementability, cost, and ability to meet applicable or relevant and appropriate requirements (ARARs). Based on previous investigations and a streamlined risk evaluation, soil cleanup at the site will be primarily focused on removal of arsenic and lead containing soil to minimize human exposure.

2.0 Site Characterization

The Site consists of an 82-lot mobile home park constructed adjacent to a former heavy metal ore processing tailings pile associated with the Golden Cycle Mill and Gold Hill Tailings Site. Operation of the mill and migration of tailings containing arsenic and lead impacted soils throughout the Site.

2.1 Site Description and Background

The Golden Cycle Mill facility, also known as the Telluride Mill, was built in 1902 adjacent to the Site and operated until approximately 1949. The Mill processed telluride gold ore from mines in the Cripple Creek and Victor, Colorado areas and generated approximately 12.5 million tons of tailings during operation covering approximately 170-acres (Tetra Tech, 2024a).

The Site is located on 11.24-acres adjacent to the reclaimed tailings pile underlain by Cretaceous Pierre Shale. Locally, the Pierre Shale is a gray shale with occasional interbeds of bentonite typically 1 to 3 inches thick (Tetra Tech, 2024b). The Site was developed for use as a manufactured home park known as the A-1 Mobile Village between 1937 and 1960. In addition to the mobile homes, the Site includes an office, garage, common areas, paved roads, and many large trees (Figure 2; Tetra Tech, 2024a)

The sources of arsenic and lead identified at the Site include the adjacent tailings pile and historical air emissions from the former Golden Cycle Mill smokestack. The Site and other area features are identified on Figure 1.

2.2 Previous Removal Actions

Previous removal actions have not been completed at the Site.

In 2000 and 2002, the Gold Hill Mesa development, adjacent to the Site, enrolled in the CDPHE Voluntary Cleanup Program (VCUP). Since 2000, cleanup and redevelopment of the Golden Cycle Mill and associated tailings (Figure 1) has proceeded under multiple VCUP applications and CDPHE has issued No Action determinations for the redeveloped areas of the site. Work completed has included design and installation of an engineered soil cap or capping with hardscape (i.e., sidewalks, streets, buildings, driveways, concrete patios) (Tetra Tech, 2024b). Limited portions of the development are ongoing under VCUP.

2.3 Source, Nature, and Extent of Contamination

As outlined in the Site Investigation Report (Tetra Tech, 2024b), there are two sources of contamination in the area which include the tailings pile associated with the Golden Cycle Mill and historical emissions from the former Golden Cycle Mill smokestack. Tailings impacted soil likely migrated to the Site via air dispersion such as windblown soil, smoke, and dust or from surface water runoff due to erosion.

Multiple previous investigations have been completed at the former Golden Cycle Mill and the Site. In 1994, the EPA conducted a Site Inspection (SI) of the Gold Hill Tailings site. The investigation

included collection of soil samples from the Site, mill area, the tailings impacted soils, and background soil samples. Concentrations of arsenic and lead were “significantly above background” in samples collected from the mill, tailings pile, and the Site. In 1995, the EPA conducted a Preliminary Assessment (PA) of the Gold Hill Tailing site, including the 170-acre tailings pile. During the PA, it was noted that the tailings pile sloped steeply towards Fountain Creek and the Site (Tetra Tech, 2024b).

Metals, including arsenic and lead, occur naturally in the soil in many places. The concentration of metals that occur naturally or are not related to a specific release is often referred to as the background concentration. At times, the background concentration of metals can exceed screening levels used for risk assessment, indicating that there is some potential risk related to the level of metals found naturally in the environment. However, most regulatory agencies do not require a response action for levels of metals found at background concentrations.

The current residential screening level for arsenic in soil is 0.68 milligrams per kilogram (mg/kg). Arsenic is a site-related contaminant that also occurs naturally in the environment. The screening level is lower than the concentration typically found in soils throughout Colorado. As such, the Hazardous Materials and Waste Management Division (Division) at the CDPHE has developed guidance for risk management of arsenic in soils at hazardous waste sites (CDPHE, 2014).

This guidance was prepared by the division using a data set of background arsenic concentrations developed by the EPA Region 8. The data set includes over 2,700 samples from 44 counties in Colorado. The areas sampled included: native grasslands; agricultural areas; urban mixed land use; and mining (Table 2-1).

Table 2-1. Region 8 U.S. EPA 95% Upper Confidence Limit on the Mean Background Soil Arsenic Concentrations in Colorado

Land Use	Concentration (mg/kg)
Native Grassland, Rangeland, or Agriculture	3-14
Urban Mixed Use	6-19
Mining	10
Average of all land uses	11

Notes:

mg/kg – milligrams per kilogram

In 1995, the EPA Region 8 Emergency Response Branch investigated the Gold Hill Tailings site. This included collection of soil samples from the Site and the tailings pile as well as interior dust samples from 12 mobile homes. The soil samples from the Site reported concentrations of arsenic between 19 mg/kg to 80 mg/kg, lead between 94 mg/kg to 527 mg/kg, and cyanide between less than detection limit to 1.8 mg/kg and the dust samples reported concentrations of arsenic up to 65.9 mg/kg and lead up to 432 mg/kg (Ecology and Environment, Inc., 1995)).

In May 2022, EPA conducted a Removal Assessment (RA) and PA of the Site focused on metals in surface and subsurface soils (Tetra Tech, 2024a). Arsenic and lead concentrations in soil samples collected at the Site were consistently higher than background concentrations (Section 2.4). In

2022, a SI was conducted to evaluate whether arsenic or lead from the Golden Cycle Mill area extended beyond the Site (Tetra Tech, 2024b). The SI sampling focused on openly accessible public parks and city properties that are interspersed within private residential properties within 3 miles of the former Golden Cycle Mill. Public property sampling was intended to approximate residential soil conditions and help refine the preliminary investigation boundary for more detailed sampling of residential properties, if warranted. Based on sampling completed, the contamination from aerial deposition from the Golden Cycle Mill and tailings pile may be present in two locations along the north side of Fountain Creek in addition to the Site (Tetra Tech, 2024b). These locations and the Site are less than one mile from the former Golden Cycle Mill smokestack indicating that a widespread area of contamination from aerial deposition is unlikely.

2.4 Analytical Data

In May 2022, EPA conducted an RA and PA of the Site focused on metals in surface and subsurface soils (Tetra Tech, 2024a). Field activities included collecting soil samples from a total of 97 decision units using incremental sampling methodology. The decision units included 81 tenant lots, one house/office lot, one vacant lot, and 14 common areas (Figure 3), in addition to 3 off-Site units at Sondermann Park (Figure 1) to evaluate background concentrations. Soil samples were also collected at 5 locations from the berm along the western and southern portion of the Site (Figure 3; Tetra Tech, 2024a). In November 2022, additional bioavailability analyses for arsenic and lead were performed on the May 2022 samples (Section 2.5).

Arsenic and lead concentrations in soil samples collected at the Site were consistently higher than background concentrations (Appendix A). Soil in the 0- to 1-inch depth ranged from 19 to 100 mg/kg arsenic and 50 to 640 mg/kg lead. Concentrations in background soil in the 0- to 1-inch depth averaged 9.7 mg/kg arsenic and 32 mg/kg lead. Soil in the 1- to 6-inch depth interval ranged from 15 to 140 mg/kg arsenic and 48 to 700 mg/kg lead. Concentrations in background soil in the 1- to 6-inch depth averaged 9.5 mg/kg arsenic and 29 mg/kg lead (Tetra Tech, 2024a).

2.5 Streamlined Risk Evaluation

In December 2024, CDPHE completed a Site-specific Streamlined Risk Evaluation (CDPHE, 2024b, Appendix B). The risk evaluation identified contaminants of potential concern (COPC) and assessed the reasonable maximum exposure to residents based on a hazard quotient of 0.1 and cancer risk level of 1×10^{-6} or 1 excess cancer case per 1,000,000 people exposed. The hazard quotient is a ratio of exposure dose to a reference dose for each specific contaminant and if the hazard quotient is greater than 0.1 there may be a higher risk of negative health effects. Through this evaluation, 12 COPCs were identified including aluminum, arsenic, cadmium, hexavalent chromium, cobalt, iron, lead, manganese, nickel, thallium, vanadium, and zinc. The primary COCs were identified as arsenic, lead, cadmium, and manganese.

The evaluation calculated non-cancer and cancer risks based on default residential assumptions, maximum measured concentrations for each COPC, a blood lead concentration of 3.5 or 5 micrograms per deciliter ($\mu\text{g}/\text{dL}$), and a site-wide relative bioavailability (RBA). RBA refers to the amount of lead and arsenic absorbed into the body from soil exposure. The default RBA is 60%, but site-specific RBA evaluations can improve PRG calculation accuracy. Soil samples underwent in vitro

bioaccessibility assay (IVBA) to predict RBA. Based on the IVBA results, the RBA for lead was set at 15.5%, and for arsenic, 14.3% (CDPHE, 2024b).

The EPA uses a different approach for evaluating lead risks compared to other COPCs. Lead exposure is assessed by comparing a model-calculated blood lead level (BLL) for hypothetical populations to BLL targets. The Integrated Exposure Uptake Biokinetic (IEUBK) model Version 2, Build 1.72 was used to evaluate lead exposures for children in a residential setting. The current blood lead reference value is 3.5 µg/dL (CDPHE, 2024b).

A total of 68 tenant lots were identified where 5% or more of children were predicted to have blood lead levels of 3.5 µg/dL or higher. A total of 20 tenant lots were identified where more than 5% of children would have predicted blood lead levels of 5 µg/dL or higher. One tenant lot had a total hazard quotient greater than three for cadmium. Six tenant lots for arsenic, five tenant lots for cadmium, and four tenant lots for manganese exceeded a hazard quotient of one. The excess risk of developing cancer exceeded 1×10^{-6} at all 93 tenant lots but did not exceed 1×10^{-4} at any tenant lot. Tenant lots with elevated risk from cadmium or manganese also had elevated risk from arsenic or lead. Based on the conclusions of the Site-specific Streamlined Risk Evaluation, cleanup will be driven by concentrations of arsenic and lead identified as the COCs for the Site (CDPHE, 2024b).

Based on updated Toxicological Review for inorganic arsenic published by Integrated Risk Information System (IRIS) in January 2025 (EPA, 2025), an addendum was included in the risk evaluation. The new toxicity values for arsenic resulted in 91 tenant lots or common areas exceeding a target hazard quotient of one, 26 tenant lots exceeding a hazard quotient of 3, and all tenant lots exceeding a cancer risk level of 1×10^{-4} (CDPHE, 2024b).

In December 2024, CDPHE issued Highway 24 Mill Preliminary Remediation Goals (PRGs) Memorandum with an addendum added in early 2025 (CDPHE, 2024c; Appendix B). The PRGs in the memo incorporate updated residential lead guidance from the EPA. Site screening levels were calculated and a concentration of lead above 142 mg/kg results in a target blood lead level exceeding 3.5 µg/dL and a concentration of lead above 333 mg/kg results in a target blood lead level exceeding 5.0 µg/dL. For arsenic, a concentration above 22 mg/kg results in the non-cancer child hazard quotient exceeding 1, a concentration above 66 mg/kg results in a non-cancer child hazard quotient exceeding 3, and a concentration above 9.6 mg/kg results in a cancer risk exceeding 1×10^{-4} theoretical risk. The PRG was calculated as 142 mg/kg for lead and 9.6 mg/kg for arsenic.

2.6 Applicable or Relevant and Appropriate Requirements (ARARs)

The NCP requires removal actions to meet ARARs to the extent practicable considering the exigencies of the situation. State and federal ARARs are developed to define remedy protectiveness and ensure the response is performed in accordance with regulations. Selected alternatives should fulfill the requirements of the ARARs.

The EPA and CDPHE jointly identified ARARs that pertain to this removal action as defined in the Guidance on Consideration of ARARs During Removal Actions (EPA, 1991):

“Applicable requirements are cleanup standards, standards of control, and other substantive requirements, criteria or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location or other circumstances found at a CERCLA site.

Relevant and appropriate requirements are cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not “applicable” to a hazardous substance, pollutant, contaminant, remedial action, location or other circumstances at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site and are well-suited to the particular site.

Other information To Be Considered (TBC) generally falls within three categories: health effects information with a high degree of credibility; technical information on how to perform or evaluate site investigations or response actions; and policy.”

The ARARs for the Site include location, action, and chemical-specific requirements and are presented in Appendix C.

3.0 Identification of Removal Action Objectives

EPA's *Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA* (EPA, 1993) states specific RAOs should be developed for the site. The RAOs should be medium-specific goals for protecting human health and the environment that identify the contaminants of concern (COCs) and exposure routes and receptors.

3.1 Statutory Limits of Removal Actions

Statutory limits on removal actions were established in 1987 and set at \$2 million in cost and 12 months in duration. Section 104(e) of the Superfund Amendments and Reauthorization Act of 1986 (SARA) amended section 104(c) of CERCLA to establish an exemption from those limits.

As presented in subsequent sections of this EE/CA, the cost estimate for the recommended removal action alternative exceeds the \$2 million statutory limit; however, this Site qualifies for an exemption to this limit based on the following:

- ▶ Consistency: The removal does not foreclose a remedial action.
- ▶ The removal action is necessary for the following reasons:
 - To avoid a foreseeable threat – the action permanently abates a threat, as opposed to a temporary measure that, of necessity, will have to be repeated periodically, until the permanent remedy is performed.
 - To prevent further migration of contaminants – the action is taken to minimize the scope of the cleanup and the potential for harm to human health and the environment.
 - To comply with the Off-site Policy – the action involves disposal at an off-site facility.

3.2 Determination of Removal Scope

Results of the risk evaluation indicate that lead and arsenic in Site soils are the primary COCs. For the Site, RAOs are defined as follows:

- ▶ Medium: Site soil
- ▶ COCs: Arsenic and lead
- ▶ Exposure Routes: Dermal contact or accidental ingestion of soil and inhalation of dust
- ▶ Exposure Receptors: Residents of A-1 Mobile Village, especially children

The final cleanup levels consider risk-based PRGs, the criteria in the NCP, and background concentrations of soil lead and arsenic. The criteria presented in the NCP include:

- ▶ Overall protection of human health and the environment
- ▶ Compliance with ARARs

- ▶ Long-term effectiveness and permanence, including magnitude of residual risk remaining from untreated waste remaining at the Site and adequacy and reliability of institutional controls to manage residuals or untreated waste
- ▶ Reduction of toxicity, mobility, or volume through treatment
- ▶ Short-term effectiveness, including short-term risk during implementation of an alternative, impacts on workers and the environment during remedial actions, and time until protection is achieved
- ▶ Implementability, including technical feasibility, administrative feasibility, and availability of services and materials
- ▶ Cost, including capital costs, annual operation and maintenance (O&M) costs, and net present value of capital and O&M costs
- ▶ State acceptance
- ▶ Community acceptance

3.2.1 Cleanup Action Levels

The Arsenic Concentrations in Soil guidance (CDPHE, 2014) states if arsenic concentrations at a site are lower than 0.68 mg/kg, the division will require no further action to address arsenic in soil. “If arsenic concentrations are lower than 11 mg/kg, and releases of arsenic could not have occurred at the site, based on historical data or process knowledge, the division will require no further action to address arsenic in soil.” If arsenic concentrations are greater than 0.68 mg/kg, and the available information suggests that a release of arsenic could have occurred at the site, the division will require additional evaluation of the data and possibly additional sampling to determine whether corrective measures for arsenic are required. “This evaluation may include a site-specific background study with sampling from offsite locations, and/or additional sampling in areas of the site where activities that could have contributed to environmental contamination never occurred.”

In May 2022, EPA conducted a Removal Assessment of the A-1 Mobile Village (Tetra Tech, 2024a). Three background samples were collected from Sondermann Park, which is approximately 2 miles north of the A-1 Mobile Village. Average background soil concentrations for the 0- to 1-inch depth interval were 9.7 mg/kg for arsenic. Average background soil concentrations for the 1- to 6-inch depth interval were 9.5 mg/kg for arsenic.

In June 2023, EPA returned to the site to collect additional soil samples as part of the Site Inspection (Tetra Tech, 2024b). Nine soil samples were determined to be background through statistical analysis of the data at varying distances from the site. The 95% Upper Confidence Limit (UCL) of the mean concentration of arsenic is 9.1 mg/kg in the 0-1 inch interval and 9.4 mg/kg in the 1-6 inch interval.

The data collected from these two sampling events suggests that the background concentration of arsenic in soil near the site is consistent with the data that was collected statewide. Because of these background concentrations, this EE/CA includes an arsenic removal concentration in soil using the state background level of 11 mg/kg.

Soil cleanup at the site will be focused on removal the identified COCs. Cleanup action levels have been developed for the Site based on ARARs and the PRGs (Table 3-1).

Table 3-1. Cleanup Action Levels

COC	Cleanup Level (mg/kg)	Driver of Risk	Basis of Cleanup Level
Arsenic	11	Human Health	State Background Levels
Lead	142	Human Health	Risk Assessment

Notes:

mg/kg – milligrams per kilogram

3.2.2 Removal Scope

The analytical results for arsenic and lead in Site soil (Section 2.4) were compared to the corresponding cleanup level based on each decision unit (Appendix A). Soil removal will occur on decision units where concentrations of either arsenic or lead in either the 0- to 1-inch depth or the 1- to 6-inch depth are above the cleanup level. Of the 93 decision units sampled at the Site, 93 had concentrations of arsenic above the cleanup level and 67 had concentrations of lead above the cleanup level within the 0- to 6-inch depth.

The removal action will focus on exposed soil in Site areas that are generally accessible to the residents and have documented lead or arsenic concentrations above the cleanup action levels (Table 3-1). This will result in cleanup on each tenant lot and common area present within the Site. Soil beneath roadways, soil beneath other hard cover currently in place (i.e., concrete, asphalt, etc.), and soils that are unlikely to come in contact with residents such as beneath homes, sheds, or decks will be excluded from the removal action.

3.3 Determination of Removal Schedule

A specific schedule for the removal action will be established once the EE/CA is approved and an Action Memorandum is issued. However, the removal action should be started during fall 2025 with completion end of 2025 or early 2026. The removal schedule will be agreed to by EPA and CDPHE and coordinated with Site tenants.

The removal action could commence within 6 to 12 months following approval of this EE/CA. Based on past experience with the implementation of removal action technologies similar to those proposed in this EE/CA, it is estimated that any removal action undertaken can be completed within 12 months, assuming funding is available.

3.4 Planned Remedial Activities

There are no planned remedial activities scheduled.

4.0 Identification and Analysis of Removal Action Alternatives

As outlined in the *Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA* (EPA, 1993), the purpose of an EE/CA is to satisfy environmental review requirements for the removal action, improve documentation of removal action selection, and provide a framework for evaluating and selecting alternative technologies. The alternatives for this EE/CA were developed based on the information from previous site investigations.

4.1 Evaluation Criteria

The evaluation criteria outlined in the *Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA* (EPA, 1993) are effectiveness, implementability, and cost.

Effectiveness evaluates the protectiveness and ability to achieve the removal objectives for each alternative. This includes evaluating whether the alternative is protective of public health and community, workers during implementation, and the environment. In addition, the selected alternative should comply with the ARARs and meet the RAOs within the scope of the removal action.

Implementability evaluates the technical and administrative feasibility of each alternative. Technical feasibility includes construction and operational considerations, performance and useful life, adaptability to environmental conditions, remedial performance, and implementability within one year. Administration feasibility includes permit requirements, easement or right-of-way requirements, impact on adjoining properties, and ability to impose institutional controls. In addition, general availability of equipment, personnel, services, outside laboratories, and disposal facilities is also evaluated as part of the implementability of each alternative.

Cost evaluates the life-cycle costs of the project, including capital costs and annual O&M costs. Capital costs may include costs for construction, equipment and materials, land and site acquisition, buildings and services, relocation, transportation and disposal, and analytical services. Annual costs may include costs for operations, maintenance, on-going monitoring, and general administrative support. Cost calculations have assumed the ongoing annual costs are consistent between each solution and therefore have not been included.

4.2 Common Activities

Select activities will be completed for each alternative presented (excluding the no action alternative). These common activities include:

- ▶ Remove available impacted soil. Available soils are those that are not located beneath homes, roadways, paved areas, other structures, surrounding large trees or underground utilities.
- ▶ Replace excavated soil with clean fill from an off-site source.
- ▶ Install a visual barrier at the vertical extent of excavation.
- ▶ Install a cover over clean fill to protect the fill from runoff and wind.
- ▶ Collect confirmation samples at excavation depth for documentation purposes.

- ▶ Dispose of excavated soil at an appropriate off-site disposal facility.
- ▶ Record a Notice of Environmental Use Restrictions on the Site property as an institutional control to protect the clean fill and cover and prevent exposure to COCs in soil beneath the visual barrier.

The amount of impacted soil removed and requiring disposal as well as the amount of soil imported will vary between each alternative. The variability in cost between alternatives is primarily from the variation in the amount of soil for disposal and import as well as the increase in time to complete deeper excavations. Each alternative will include the same aerial extent resulting in consistent costs for the visual barrier, cover over the clean fill, and confirmation sampling. For cost estimating purposes, three cover options have been included with mulch and gravel each being applied to 45% of the excavated area and artificial turf being installed at 10% of the excavated area (Appendix D).

The disposal of soil will be completed at a permitted landfill that can accept non-hazardous arsenic- and lead-containing soil waste. For cost estimating, it is assumed that soil will be transported to the Waste Management Midway Landfill (8925 Rancho Colorado Boulevard, Fountain, CO 80817) for disposal.

4.3 Alternative 1: No Action

The No Action alternative leaves the Site in its current condition. There would be no soil removed and no cover installed. This alternative is required to be included in the EE/CA per NCP requirement.

4.3.1 Effectiveness

With this alternative, the concentrations of COCs in soil would not change. This alternative does not reduce the potential human exposure to COCs and does not reduce the toxicity, mobility, or volume of the COCs. This alternative does not meet the RAOs.

4.3.2 Implementability

This alternative is technically and administratively feasible; however, State and community acceptance of this alternative is not likely.

4.3.3 Cost

The cost associated with this alternative is \$0 (Appendix D).

4.4 Alternative 2: Excavation to 6-inches

Alternative 2 includes those common activities described in Section 4.2 with excavation of available soils within the Site to a depth of 6-inches. The 6-inch depth was selected as that is the depth of soil characterized for the Site (Tetra Tech, 2024a) and to focus mitigation on the soil most likely for human exposure.

4.4.1 Effectiveness

This alternative would be effective in limiting the exposure to impacted soil throughout the Site in the short-term as humans are typically exposed to the top 2 inches of soil. Excavation will reduce the volume of impacted soil at the Site. In the long-term, institutional controls in the form of a recorded Notice of Environmental Use Restrictions will prevent activities disturbing the clean fill and cover, such as installing gardens or modifying landscaping, without CDPHE approval. The visual barrier will likewise provide long-term effectiveness as a reminder to limit excavation depths; however, the barrier may degrade over time.

4.4.2 Implementability

Because of the depth of excavation, including areas that cannot be excavated, may not remove all impacted soil, institutional controls would be required. The institutional controls will require monitoring by CDPHE through a Notice of Environmental Use Restrictions, limiting future soil excavation or construction at the Site. The confirmation soil samples collected at the depth of excavation would provide CDPHE with details of where impacted soils remain in place for documentation as part of the environmental covenant.

In areas where excavation to 6-inches is not possible or practical due to access restrictions, ground cover may be placed with a minimum thickness of 2-inches to limit potential exposure. This may include areas beneath homes, decks, or other obstacles; structural concerns; land slope; or presence of large trees/roots.

During construction, multiple engineered controls must be in place to meet the ARARs. These may include noxious weed control; limiting noise levels; appropriate characterization, handling, and disposal of generated waste soil; developing a fugitive dust control plan; limiting emissions of lead and PM10; and comply with substantive requirements from Colorado's stormwater discharge program.

Excluding the no action alternative, this alternative results in the smallest volume of soil removed for disposal and the smallest volume of soil required for import/backfilling. Soil imported to the Site must be characterized to verify that it meets the cleanup levels prior to placement. This alternative is also the quickest to implement due to the shortest duration required for soil removal.

4.4.3 Cost

The estimated cost to implement this alternative is \$2,180,000 (Appendix D).

4.5 Alternative 3: Excavation to 12-inches

Alternative 3 includes those common activities described in Section 4.2 with excavation of available soils within the Site to a depth of 12-inches. A removal depth of 12-inches is recommended by the *Superfund Lead-Contaminated Residential Sites Handbook* (EPA, 2003).

4.5.1 Effectiveness

This alternative would be effective in limiting the exposure to impacted soil throughout the Site in the short-term as the top 2 inches of soil are typically most likely to be exposed to humans. Excavation of impacted soil will reduce the volume of impacted soil at the Site. In the long-term, institutional controls in the form of a Notice of Environmental Use Restrictions will prevent activities disturbing the clean fill and cover, such as installing gardens or modifying landscaping, without CDPHE approval. The visual barrier will provide long-term effectiveness as a reminder to limit excavation depths; however, the barrier may degrade over time.

4.5.2 Implementability

Because of the depth of excavation, including areas that cannot be excavated, may not remove all impacted soil, institutional controls would be required. The institutional controls will require monitoring by CDPHE through a Notice of Environmental Use Restrictions, limiting future soil excavation or construction at the Site. The confirmation soil samples collected at the depth of excavation would provide CDPHE with details of where impacted soils remain in place for documentation as part of the environmental covenant.

In areas where excavation to 12-inches is not possible or practical due to access restrictions, ground cover may be placed with a minimum thickness of 2-inches to limit potential exposure. This may include areas beneath homes, decks, or other obstacles; structural concerns; land slope; or presence of large trees/roots.

During construction, multiple engineered controls must be in place to meet the ARARs. These may include noxious weed control; limiting noise levels; appropriate characterization, handling, and disposal of generated waste soil; developing a fugitive dust control plan; limiting emissions of lead and PM10; and comply with substantive requirements from Colorado's stormwater discharge program. Soil imported to the Site will need to be characterized and meet the cleanup levels prior to placement on Site.

4.5.3 Cost

The estimated cost to implement this alternative is \$3,435,000 (Appendix D).

4.6 Alternative 4: Excavation to 18-inches

Alternative 4 includes those common activities described in Section 4.2 with excavation of soils within the Site to a depth of 18-inches. A depth of 18-inches was selected as a consistent excavation depth based on the Site use and a balance between the recommendation of 12-inches for general use and 24-inches for gardening areas.

4.6.1 Effectiveness

This alternative would be effective in limiting the exposure to impacted soil throughout the Site in the short-term as the top 2 inches of soil are typically most likely to be exposed to humans. Excavation

will reduce the volume of impacted soil at the Site. In the long-term, institutional controls in the form of a recorded Notice of Environmental Use Restrictions will prevent activities disturbing the clean fill and cover, such as installing gardens or modify landscaping, without CDPHE approval. The visual barrier would provide long-term effectiveness as a reminder to limit excavation depths; however, the barrier may degrade over time.

4.6.2 Implementability

Because of the depth of excavation, including areas that cannot be excavated, may not remove all impacted soil, institutional controls would be required. The institutional controls will require monitoring by CDPHE through a Notice of Environmental Use Restrictions, limiting future soil excavation or construction at the Site. The confirmation soil samples collected at the depth of excavation would provide CDPHE with details of where impacted soils remain in place for documentation as part of the environmental covenant.

In areas where excavation to 18-inches is not possible or practical due to access restrictions, ground cover may be placed with a minimum thickness of 2-inches to limit potential exposure. This may include areas beneath homes, decks, or other obstacles; structural concerns; land slope; or presence of large trees/roots.

During construction, multiple engineered controls must be in place to meet the ARARs. These may include noxious weed control; limiting noise levels; appropriate characterization, handling, and disposal of generated waste soil; developing a fugitive dust control plan; limiting emissions of lead and PM10; and comply with substantive requirements from Colorado's stormwater discharge program.

This alternative results in the largest volume of soil removed for disposal and the largest volume of soil required for import. Soil imported to the Site will need to be characterized and meet the cleanup levels prior to placement on Site. This alternative is also the most time-consuming to implement. As the excavation depth increases, the implementability becomes more time consuming. Each 6-inches takes increasingly longer to remove as the depth increases as there are additional obstacles such as roots, utilities, rocks and the digging conditions are harder.

4.6.3 Cost

The estimated cost to implement this alternative is \$4,790,000 (Appendix D).

5.0 Comparative Analysis of Removal Action Alternatives

Each of the alternatives was evaluated based on effectiveness, implementability, and cost (Table 5-1). Alternative 1 is the lowest cost but does not reduce the potential human exposure to COCs, does not meet the RAOs, and would likely not be accepted by the State and community. Generally, each of the soil removal alternatives (Alternative 2, Alternative 3, and Alternative 4) reduces the potential human exposure to COCs in the short-term. Alternative 2 is the most likely to result in an inadvertent exposure to the impacted soil since excavation is the shallowest. Long-term exposure to COCs would be managed through engineering controls and an environmental covenant; however, human exposure to COCs in the long-term is possible if the Site conditions change, such as relocation of a mobile home or shed or installation of a garden. Of the soil removal alternatives, Alternative 2 is the most easily implementable while Alternative 4 is the least implementable. Alternative 3 is consistent with EPA guidance and is likely to be accepted by the State and community.

Table 5-1. Summary Comparison of Removal Action Alternatives

Alternative	Effectiveness	Implementability	Cost
Alternative 1: No Action	Low	Low	Lowest
Alternative 2: Excavation to 6-inches and off-Site Disposal	Low	High	Low
Alternative 2: Excavation to 12-inches and off-Site Disposal	Moderate	Moderate	Moderate
Alternative 2: Excavation to 18-inches and off-Site Disposal	High	Low	High

6.0 Recommended Removal Action Alternative

The alternatives evaluated for the Site include:

- ▶ Alternative 1: No action
- ▶ Alternative 2: Excavation to 6-inches and off-Site disposal
- ▶ Alternative 3: Excavation to 12-inches and off-Site disposal
- ▶ Alternative 4: Excavation to 18-inches and off-Site disposal

Alternative 3, excavation to 12-inches and off-Site disposal is the recommended removal action. This alternative meets Colorado and federal ARARs and will achieve the RAOs. This alternative balances an effective removal action with reasonable implementability and cost. Alternative 2 removes less volume of impacted materials which leaves a higher risk for incidental exposure in the long-term and Alternative 4 is less implementable with a higher cost based on the additional time required for deeper soil removal.

Scope variations that may be considered with the implementation of Alternative 3 are listed below. The cost of these variations have not been included and may present a change in cost to the selected alternative.

- ▶ In areas under temporary or movable structures, soil is less likely to be encountered by most residents and presents a lower risk so soil removal may not be needed. However, placement of a cover or barrier may be completed to reduce the chance for accidental exposure. In addition, the skirt on the mobile homes may be replaced or installed to limit accidental exposure to soil beneath the mobile home by children.
- ▶ Excavation may not be completed within 1 foot of a structure or sidewalk to maintain structural safety of the structure.
- ▶ Excavation may not be completed within 1-2 feet of underground utilities to maintain safety for excavation workers and limit potential damage to existing utility lines.
- ▶ Engineering of a retaining wall may be required to safely remove soil from steep slopes. Soil removal from steep slopes presents a potential structural risk to roadways or structures both above and below the slope.
- ▶ In areas where a structure is planned to be removed or relocated, such as moving a shed or demolishing a mobile home, the removal or relocation may be completed prior to soil removal. This would allow the soil removal activities to be more effective to be completed over the full tenant lot and more implementable because of the lack of access restrictions around the mobile home.
- ▶ In areas where gardening takes place, a raised garden bed may be installed to provide 24-inches of clean soil as recommended in *Superfund Lead-Contaminated Residential Sites Handbook* (EPA, 2003).

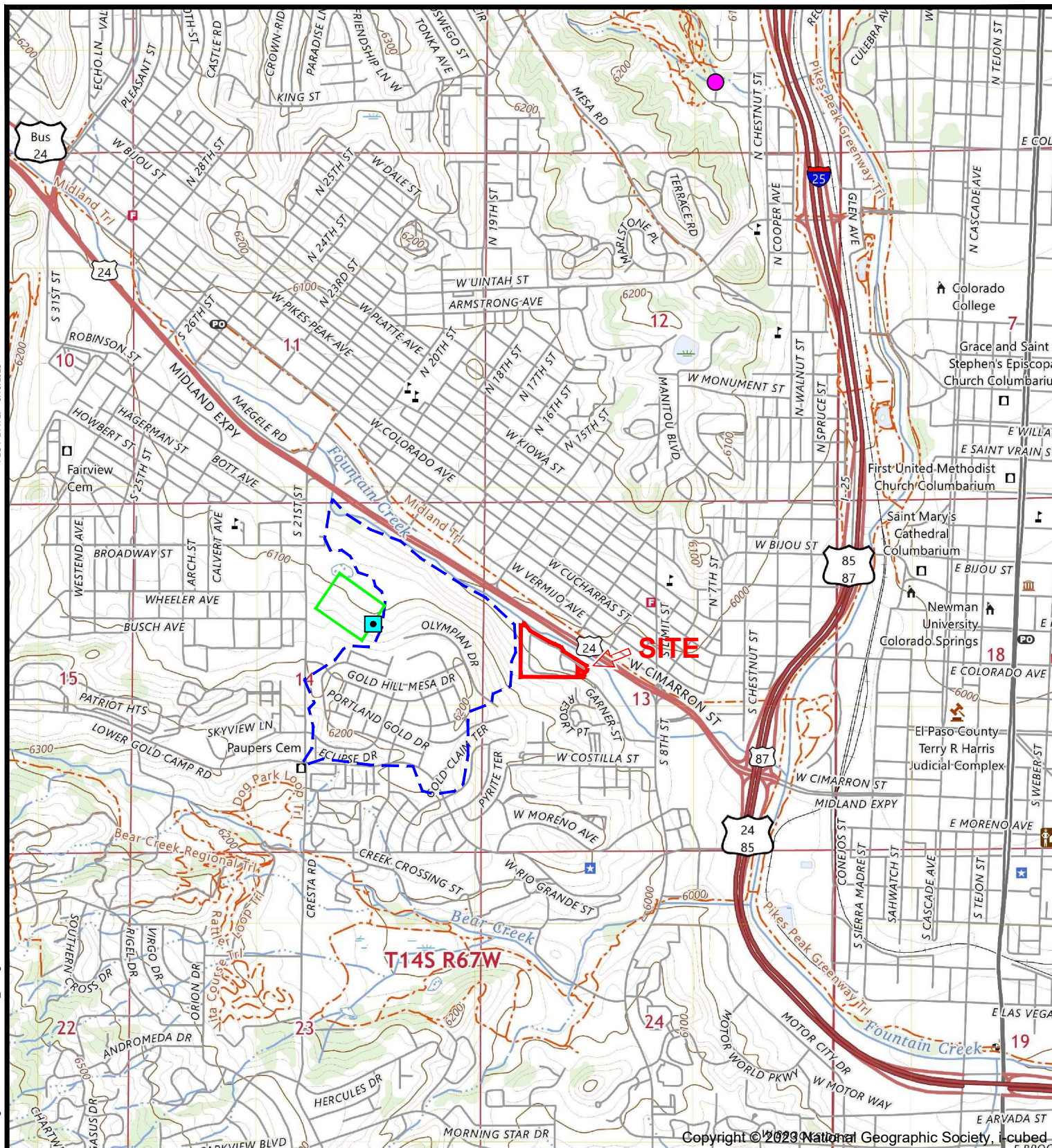
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- Tetra Tech, 2024b. “Site Inspection Report, Highway 24 Mill Site, Colorado Springs, El Paso County, Colorado”, June 11, 2024.

Figures

PLOT DATE: 3/13/2025

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LEGEND

Site Boundary

Golden Cycle Mill Area

USGS 7.5' Topographic Map Quad

Colorado Springs, Colorado, 2023

Approximate Historical Tailings Boundary

Smoke Stack

Sondermann Park

0

2000'

4000'

SCALE: 1" = 2000'

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SITE LOCATION

Garner Street Soils Site

1025 1/2 Garner Street

Colorado Springs, Colorado

Site Location: Section 13, T 14S, R 67W, 6th Principal Meridian	Drawn By: SJA	Figure: 1
Pinyon Project Number: 1/24-0268-02.REM001.1a	Reviewed By: AMG	Date: 3/13/2025



Coordinate System: NAD83 COLORADO STATE PLANES, CENTRAL ZONE, US FOOT - CO83-CF

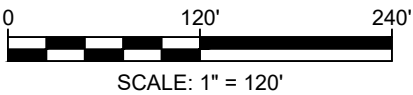
PLOT DATE: 3/13/2025

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LEGEND

-  Site Boundary
-  Site Buildings



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SITE MAP

*Garner Street Soils Site
1025 1/2 Garner Street
Colorado Springs, Colorado*

Site Location: Section 13, T 14S, R 67W, 6th Principal Meridian

Pinyon Project Number: 1/24-0268-02.REM001.1a

Drawn By: SJA

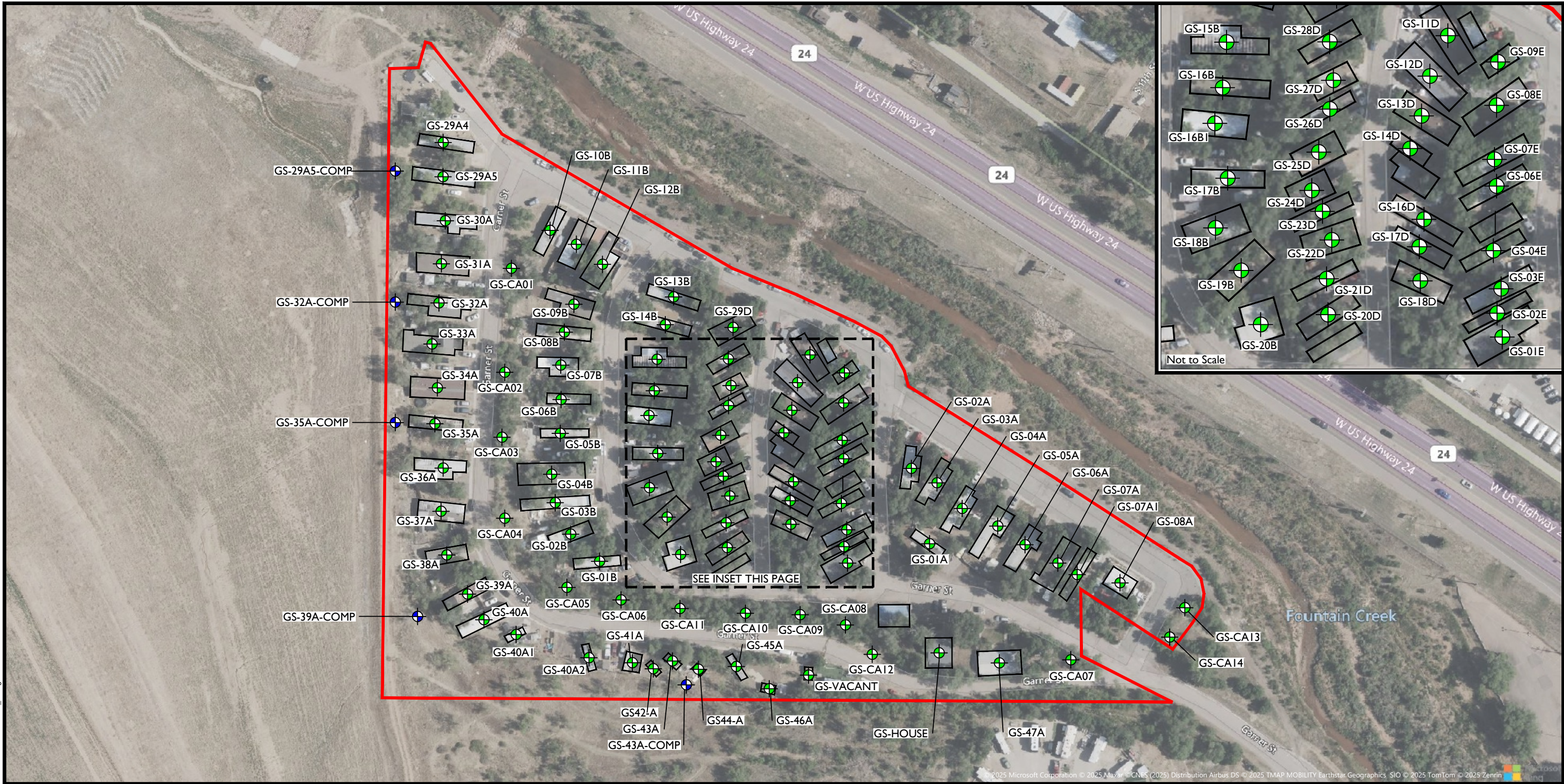
Figure: 2

Reviewed By: AMG

Date: 3/13/2025

PLOT DATE: 3/31/2025

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LEGEND



Site Boundary



2022 Garner Street Soil Sampling Locations



2022 Garner Street Berm Soil Sample Locations (Estimated)



SCALE: 1" = 120'

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SOIL SAMPLE LOCATIONS

Highway 24 Mill Site
1025 Garner Street
Colorado Springs, Colorado

Site Location: Section 13, T 14S, R 67W, 6th Principal Meridian

Pinyon Project Number: 1/24-0268-02.REM001.1a

Drawn By: SJA

Figure: 3

Reviewed By: AMG

Date: 3/31/2025

Coordinate System: NAD83 COLORADO STATE PLANES, CENTRAL ZONE, US FOOT - CO83-CF

Appendices

Appendix A Analytical Data

Site Inspection Report

Highway 24 Mill Site

Colorado Springs, El Paso County, Colorado

Prepared By: Tetra Tech, Inc.

Date Prepared: June 11, 2024

Tables

Table 1 Analytical Results - Metals in Surface Water Samples

Table 2 Analytical Results - Metals in Sediment Samples

Table 3 Garner Street Soils Analytical Results – Metals in Soil (0-1 in. bgs)

Table 4 Garner Street Soils Analytical Results – Metals in Soil (1-6 in. bgs)

Table 5 Analytical Results - Metals in Soil Samples (0-1 in. bgs)

Table 6 Analytical Results - Metals in Soil Samples (1-6 in. bgs)

Table 7 Analytical Results - Mercury in Soil

Table 1
Analytical Results - Metals in Surface Water Samples

Sample Location ID	Field Sample ID	CLP Sample ID	Matrix	Sample Date	Analyte Units	Hardness ^(a) (mg/L)	Aluminum (µg/L)	Antimony (µg/L)	Arsenic (µg/L)	Barium (µg/L)	Beryllium (µg/L)	Cadmium (µg/L)	Calcium (µg/L)	Chromium ^(a) (µg/L)	Cobalt (µg/L)	Copper (µg/L)	Iron (µg/L)	Lead (µg/L)	Magnesium (µg/L)	Manganese (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Potassium (µg/L)	Selenium (µg/L)	Silver (µg/L)	Sodium (µg/L)	Thallium (µg/L)	Vanadium (µg/L)	Zinc (µg/L)	
Agriculture ^{(a)(1)}						--	--	--	100	--	100	10	--	100	200	200	--	100	--	200	--	200	--	20	--	--	--	--	--	2,000
Domestic Water Supply ^{(a)(1)}						--	--	6	0.02	490	4	5	--	50	--	1,000	300 ⁽¹⁾	50	--	50 ⁽¹⁾	2.0	100	--	50	100	--	0.5	--	5,000	
Aquatic Life - Acute ^{(a)(1)}						TRM	--	CALC	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
						DM	--	--	340	--	--	CALC	--	16	--	CALC	--	CALC	--	CALC	--	CALC	--	18.4	CALC	--	--	--	--	CALC
Aquatic Life - Chronic ^{(a)(1)}						TRM	--	CALC	--	--	--	--	--	--	--	1,000 ⁽¹⁾	--	--	--	--	0.01 ⁽¹⁾	--	--	--	--	--	--	--	--	--
						DM	--	--	150	--	--	CALC	--	11	--	CALC	--	CALC	--	CALC	--	CALC	--	4.6	CALC	--	--	15	--	CALC
06 ⁽¹⁾	HWY-SW-06 ⁽¹⁾	MHOF91	SW	6/13/2023	TRM	49	1,600	2.0 U	0.84 J	66	1.0 U	1.0 U	25,000	1.7 J	0.45 J	2.2	2,100	2.6	5,100	110	0.20 U	1.3	2,800	5.0 U	1.0 U	16,000	1.0 U	2.7 J	33	
06 ⁽¹⁾		MHOF96			DM	--	38	J+	2.0 U	0.19 J	28	1.0 U	15,000	4.2	0.23 J	2.0 U	360	1.0 U	2,900	12	0.20 U	1.7	1,700	5.0 U	1.0 U	11,000	1.0 U	0.44 J	17	
08	HWY-SW-08	MHOF93	SW	6/13/2023	TRM	110	970 J	2.0 U	0.96 J	58	1.0 U	1.0 U	29,000	1.3 J	0.68 J	1.7 J	1,400 J	2.2 J+	7,200	120	0.20 U	1.2	3,000	5.0 U	1.0 U	20,000	1.0 U	1.6 J	54	
08		MHOF97			DM	--	46	J+	2.0 U	0.42 J	48	1.0 U	31,000	1.9 J	0.55 J	0.97 J	900 J	1.0 U	7,300	60	0.20 U	0.87 J	2,900	5.0 U	1.0 U	21,000	1.0 U	0.36 J	43	
08	HWY-SW-08-DUP	MHOF92	SW	6/13/2023	TRM	110	320 J	2.0 U	0.81 J	55	1.0 U	1.0 U	30,000	0.41 J	0.58 J	1.4 J	650 J	1.6 J+	7,200	120	0.20 U	0.62 J	2,700	5.0 U	1.0 U	20,000	1.0 U	0.81 J	46	
08		MHOF98			DM	--	51	J+	2.0 U	0.52 J	48	1.0 U	31,000	2.4	0.71 J	1.1 J	190 J	1.0 U	7,200	59	0.20 U	1.4	2,800	5.0 U	1.0 U	21,000	1.0 U	0.50 J	46	
09	HWY-SW-09	MHOF94	SW	6/13/2023	TRM	110	310	2.0 U	0.77 J	56	1.0 U	1.0 U	32,000	0.51 J	0.57 J	1.2 J	650 J	1.7 J+	8,100	120	0.20 U	0.71 J	2,800	5.0 U	1.0 U	21,000	1.0 U	0.75 J	49	
09		MHOF99			DM	--	44	J+	2.0 U	0.39 J	46	1.0 U	32,000	0.48 J	0.58 J	2.0 U	110 J	1.0 U	7,900	59	0.20 U	0.64 J	2,700	5.0 U	1.0 U	21,000	1.0 U	0.34 J	33	
--	HWY-SS-FB-1	MHOF89	EB	6/13/2023	TRM	--	24	2.0 U	1.0 U	0.81 J	1.0 U	1.0 U	500 U	2.7	0.08 J	2.0 U	200 U	1.0 U	500 U	2.9	0.20 U	3.4	500 U	5.0 U	1.0 U	500 U	1.0 U	5.0 U	17 U	0.0
--	HWY-SS-FB-2	MHOF90	EB	6/13/2023	TRM	--	9.7 J	2.0 U	1.0 U	10 U	1.0 U	1.0 U	500 U	2.0 U	1.0 U	2.0 U	200 U	1.0 U	500 U	0.92 J	0.20 U	1.0	500 U	5.0 U	1.0 U	500 U	1.0 U	5.0 U	14 U	0.0
--	HWY-SW-FB-1	MHOF40	FB	6/13/2023	TRM	3.3	20 U	2.0 U	1.0 U	10 U	1.0 U	1.0 U	500 U	2.0 U	1.0 U	2.0 U	200 U	1.0 U	500 U	1.0 U	0.20 U	1.0 U	500 U	5.0 U	1.0 U	500 U	1.0 U	5.0 U	5.0 U	5.0 U

Notes:

-- Not established or not applicable

(1) Screening levels apply to DM unless otherwise stated

(1) Screening level applies to TRM only

(a) Regulation No. 32 - Classifications and Numeric Standards for Arkansas River Basin, Colorado Department of Public Health and Environment (CDPHE)

(b) Laboratory calculated sample-specific harness value used to determine analyte-specific screening levels

(c) Upstream sample location used as background concentrations for the purpose of documenting a significant increase under Hazard Ranking System rules

(d) Per CDPHE Regulation No. 31, the screening value for Chromium VI was used. Unless the stable forms of chromium in a water body have been characterized and shown not to be predominantly chromium VI, data reported as the measurement of all valence states of chromium combined should be treated as chromium VI. In addition, in no case can the sum of the concentrations of chromium III and chromium VI or data reported as the measurement of all valence states of chromium combined exceed the water supply standards of 50 µg/L chromium in those waters classified for domestic water use

µg/L Micrograms per liter

CALC Calculated Sample-Specific Water Quality Standard (CO Regulation No. 31), see Table 8 in Appendix B

CLP US EPA Superfund Contract Laboratory Program

DM Dissolved Metals

DUP Field duplicate

EB Equipment blank

FB Field blank

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample

J+ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high

mg/L Milligrams per liter

SW Surface Water

TRM Total Recoverable Metals

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit)

Indicates concentration that exceeds three times background concentration, documenting a significant increase

BOLD Exceeds one or more Water Quality Standard or benchmark

Table 2
Analytical Results - Metals in Sediment Samples

Sample Location ID	Field Sample ID	CLP Sample ID	Matrix	Sample Date	Analyte Units	Antimony (mg/kg)	Arsenic (mg/kg)	Barium (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Cobalt (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Thallium (mg/kg)	Vanadium (mg/kg)	Zinc (mg/kg)
					Consensus-Based PEC ^a	--	33	--	--	4.98	111	--	149	128	--	1.06	48.6	--	--	--	--	459
06 ^b	HWY-SD-06 ^b	MHOF05	SD	6/13/2023	TRM	0.72 U	2.9	65	0.58	0.094 J	7.2	1.8	4.5	9.5	240	-- R	3.1	2.4 U	0.042 J	0.36 U	6.9	39
08	HWY-SD-08	MHOF01	SD	6/13/2023	TRM	0.78 U	3.5	70	0.59 J+	0.13 J	7.2	1.8	4.7	11	220	-- R	3.2	2.5 U	0.06 J	0.39 U	7.3	53
08	HWY-SD-08-DUP	MHOF80	SD	6/13/2023	TRM	0.68 U	3.3	70	0.62	0.14 J	6.1	1.7	7.4	12	230	-- R	3.5	2.0 U	0.056 J	0.33 U	7.1	55
09	HWY-SD-09	MHOF06	SD	6/13/2023	TRM	1.1 U	1.1	18	0.24	0.53 U	0.8 J	0.53	1.3 J+	2.1	150	-- R	0.68	2.6 U	0.53 U	0.53 U	1.7 J	24

- Notes:
- Not established or not applicable
 - ^a "Prediction of Sediment Toxicity Using Consensus-based Freshwater Sediment Quality Guidelines," United States Geological Survey (USGS) EPA 905/R-00/007 June 2000.
 - ^b Upstream sample location used as background concentrations for the purpose of documenting a significant increase under Hazard Ranking System rules
 - CLP U.S. EPA Contract Laboratory Program
 - DUP Field Duplicate
 - J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample
 - J+ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high
 - mg/kg Milligrams per kilogram
 - PEC Probable Effect Concentration
 - R The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
 - SD Sediment
 - TRM Total Recoverable Metals
 - U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit)

Table 3
2022 Garner Street Soils Analytical Results - Metals in Soils (0-1 in. bgs)

Analyte Units			Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc
CAS No.			7429-90-5	7440-36-0	7440-38-2	7440-39-3	7440-41-7	7440-43-9	7440-70-2	7440-47-3	7440-48-4	7440-50-8	7439-89-6	7439-92-1	7439-95-4	7439-96-5	7440-02-0	7440-09-7	7782-49-2	7440-22-4	7440-23-5	7440-28-0	7440-62-2	7440-66-6
Residential Screening Level (mg/kg)			77,000 ^a	31 ^a	0.68 ^a	15,000 ^a	160 ^a	7.1 ^a	--	--	23 ^a	3,100 ^a	55,000 ^a	100/200 ^a	--	1,800 ^a	1,400 ^a	--	390 ^a	390 ^a	--	0.78 ^a	390 ^a	23,000 ^a
Industrial Screening Level (mg/kg)			1,100,000 ^b	470 ^b	3 ^b	220,000 ^b	2,300 ^b	100 ^b	--	--	350 ^b	47,000 ^b	820,000 ^b	800 ^b	--	26,000 ^b	18,000 ^b	--	5,800 ^b	5,800 ^b	--	12 ^b	5,800 ^b	350,000 ^b
3x background			--	2.79	45	690	4.8	3.6	--	57	36	81	--	255	--	3,300	87	--	6.3	3.3	--	1.38	117	480
Field Sample ID	Sample Date	Sample Depth Interval (in. bgs)																						
GS-01A-00-01	5/17/2022	0-1	7,100	0.69	29	160	1	1.2	11,000	28	5.8	36	19,000	110	4,000	580	18	3,200	2.3	0.78	150 J+	0.28	27	320
GS-01B-00-01	5/18/2022	0-1	8,000	1	46	210	0.7	1.7	15,000	14	6.7	47	25,000	230	3,000	560	23	2,800	2.5	1.5	410	0.3	34	390
GS-01E-00-01	5/19/2022	0-1	6,500	1.2	54	180	0.88	1.9	15,000	16	6.3	63	26,000	180	4,400	850	14	2,900	2.7	1.3	170 J+	0.31	35	460
GS-02A-00-01	5/17/2022	0-1	7,300	0.56	24	170	0.83	1.2	11,000	13	5.7	28	18,000	91	3,300	630	13	3,000	2.1	0.59	120 J+	0.25	25	310
GS-02B-00-01	5/18/2022	0-1	8,000	0.76	43	150	0.76	1.5	22,000	13	12	41	31,000	130	4,400	840	29	2,300	3.6	0.87	190 J+	0.39	34	270
GS-02E-00-01	5/19/2022	0-1	7,700	1.2	47	200	0.94	2.1	12,000	14	8	46	26,000	170	3,300	790	19	3,200	2.7	1.1	130 J+	0.34	36	470
GS-03A-00-01	5/17/2022	0-1	7,800	0.9	35	180	0.86	1.4	11,000	15	7.5	34	21,000	120	3,500	690	25	3,100	2.2	0.83	140 J+	0.31	30	420
GS-03B-00-01	5/18/2022	0-1	7,600	0.91	44	220	0.75	2.2	12,000	14	8.7	60	29,000	160	2,700	830	21	2,200	3.1	3.5	130 J+	0.32	34	360
GS-03E-00-01	5/19/2022	0-1	8,000	1.2	44	200	1	2.1	10,000	21	7.2	41	25,000	160	3,300	720	16	3,500	2.6	1.3	150 J+	0.32	35	450
GS-03E-00-01-DUP	5/19/2022	0-1	7,700	1.1	39	210	0.99	2.2	10,000	22	6.9	40	24,000	170	3,100	670	17	3,800	2.6	1.5	140 J+	0.32	33	420
GS-03E-00-01-TRI	5/19/2022	0-1	7,500	1.3	42	200	1	2.3	12,000	21	7	39	24,000	180	3,400	660	15	3,900	2.7	1.5	140 J+	0.33	34	470
GS-04A-00-01	5/17/2022	0-1	7,800	0.57	29	210	0.77	1.3	9,500	13	7.9	41	20,000	100	3,700	620	17	3,000	1.9	0.68	98 U	0.27	27	320
GS-04A-00-01-DUP	5/17/2022	0-1	7,500	0.74	28	180	0.77	3.1	10,000	12	8	35	20,000	94	3,600	620	18	2,900	1.9	0.66	100 U	0.27	26	340
GS-04A-00-01-TRI	5/17/2022	0-1	7,700	0.69	30	200	0.77	1.4	10,000	13	7.8	36	21,000	100	3,700	660	21	3,200	1.9	0.7	100 J+	0.27	28	340
GS-04B-00-01	5/18/2022	0-1	8,100	1.4	75	180	0.95	9.6	13,000	12	9.8	58	30,000	250	6,000	2,200	19	3,700	2.7	1.6	500	0.41	41	2,400
GS-04E-00-01	5/19/2022	0-1	8,100	0.96	46	250	0.99	2.2	10,000	18	7.5	44	27,000	180	3,600	740	16	3,200	2.6	1.3	200 J+	0.34	36	510
GS-05A-00-01	5/17/2022	0-1	7,100	0.67	31	200	0.73	1.4	11,000	11	6.8	31	21,000	120	4,000	570	15	3,200	1.9	0.79	130 J+	0.24	28	360
GS-05B-00-01	5/18/2022	0-1	10,000	0.96	53	110	1.2	16	22,000	14	12	86	30,000	190	4,200	4,800	42	2,600	3.3	1.3	310	0.38	39	2,900
GS-06A-00-01	5/17/2022	0-1	7,300	0.47	19	190	0.64	0.91	7,500	9.1	6.3	25	17,000	61	2,500	480	15	2,600	1.8	0.41	100 U	0.22	23	230
GS-06B-00-01	5/18/2022	0-1	7,500	1	50	130	0.79	23	12,000	12	8.2	41	25,000	180	6,100	2,200	33	2,700	2.3	1.4	1,000	0.3	34	5,500
GS-06E-00-01	5/19/2022	0-1	7,800	0.71	37	230	1	2.1	9,500	13	6.6	36	25,000	140	2,800	660	16	3,200	2.5	0.96	200 J+	0.31	30	370
GS-07A-00-01	5/17/2022	0-1	7,400	0.47	22	200	0.73	1	9,900	11	8.1	32	20,000	80	3,400	610	19	2,500	2	0.46	120 J+	0.24	27	290
GS-07A1-00-01	5/17/2022	0-1	7,500	0.35	22	200	0.59	1	7,200	12	6.4	30	19,000	88	2,300	420	15	2,800	1.7	0.47	170 J+	0.23	26	240
GS-07B-00-01	5/18/2022	0-1	7,100	0.97	56	180	0.75	6.6	7,800	11	7.8	43	26,000	210	3,600	1,600	20	3,000	2.4	2	230	0.33	36	1,900
GS-07E-00-01	5/19/2022	0-1	7,400	1.1	54	200	1	2.6	8,800	13	7	47	28,000	240	3,000	850	16	3,200	2.6	1.7	170 J+	0.35	34	500
GS-08A-00-01	5/17/2022	0-1	7,000	0.44	25	190	0.61	1.1	7,200	12	5.9	25	18,000	100	2,500	490	12	2,400	1.6	0.72	99 U	0.23	27	210
GS-08B-00-01	5/18/2022	0-1	7,900	1.1	79	140	0.79	3.7	14,000	12	6.8	120	42,000	440	2,700	770	21	3,000	2.8	3	490	0.49	39	820
GS-08E-00-01	5/19/2022	0-1	7,100	1.1	48	220	1.1	2.7	14,000	16	6.1	47	26,000	190	4,400	870	15	4,200	2.6	1.3	340	0.33	34	580
GS-09B-00-01	5/18/2022	0-1	8,300	1.1	79	250	0.94	5.9	9,500	13	7.5	73	34,000	360	3,200	1,000	20	3,200	2.8	2.5	370	0.45	43	1,200
GS-09E-00-01	5/19/2022	0-1	7,400	0.9	53	220	1.2	3.7	17,000	13	6.2	42	27,000	260	7,000	1,000	15	3,000	2.7	1.6	110 J+	0.36	32	700
GS-10B-00-01	5/17/2022	0-1	7,200	1.4	99	280	0.83	4.8	8,500	14	7.7	64	36,000	430	2,900	1,300	16	3,400	2.4	3.2	200 J+	0.5	46	1,000
GS-11B-00-01	5/17/2022	0-1	6,400	1.6	95	270	0.79	4.3	8,300	11	6.2	73	35,000	490	2,600	960	15	3,100	2.4	3.4	220	0.51	40	910
GS-11B-00-01-DUP	5/17/2022	0-1	6,300	1.8	96	260	0.79	4.2	8,200	11	6.2	72	35,000	490	2,600	940	14	3,100	2.3	3.4	220	0.51	40	930
GS-11B-00-01-TRI	5/17/2022	0-1	6,400	2	96	260	0.79	4.3	8,200	12	6.4	74	36,000	490	2,700	940	14	3,100	2.4	3.4	220	0.51	40	940
GS-11D-00-01	5/18/2022	0-1	6,000	0.9	25	160	0.85	1.1	12,000	9.3	4.7	33	16,000	92	4,200	510	16	1,800	2.1	0.64	100 U	0.24	22	470
GS-12B-00-01	5/17/2022	0-1	6,500	1.3	63	240	0.84	2.5	8,300	12	5.7	49	28,000	340	2,500	710	13	3,300	2.4	2.4	170 J+	0.41	34	600
GS-12D-00-01	5/18/2022	0-1	9,800	0.87	37	250	1.2	4.3	14,000	15	5.2	39	31,000	180	3,800	820	29	3,400	4.6	1.2	210 J+	0.44	33	420
GS-13B-00-01	5/18/2022	0-1	6,400	1.5	60	200	0.67	2.3	11,000	12	7	46	28,000	290	3,100	730	17	3,300	2.1	1.9	160 J+	0.35	38	630
GS-13D-00-01	5/18/2022	0-1	7,500	1.3	61	250	0.96	2.3	20,000	16	6.8	55	29,000	290	4,200	690	19	3,000	2.6	2	250	0.38	35	520
GS-14B-00-01	5/18/2022	0-1	6,000	1.4	68																			

Table 3
2022 Garner Street Soils Analytical Results - Metals in Soils (0-1 in. bgs)

Analyte Units	Aluminum mg/kg	Antimony mg/kg	Arsenic mg/kg	Barium mg/kg	Beryllium mg/kg	Cadmium mg/kg	Calcium mg/kg	Chromium mg/kg	Cobalt mg/kg	Copper mg/kg	Iron mg/kg	Lead mg/kg	Magnesium mg/kg	Manganese mg/kg	Nickel mg/kg	Potassium mg/kg	Selenium mg/kg	Silver mg/kg	Sodium mg/kg	Thallium mg/kg	Vanadium mg/kg	Zinc mg/kg		
CAS No.	7429-90-5	7440-36-0	7440-38-2	7440-39-3	7440-41-7	7440-43-9	7440-70-2	7440-47-3	7440-48-4	7440-50-8	7439-89-6	7439-92-1	7439-95-4	7439-96-5	7440-02-0	7440-09-7	7782-49-2	7440-22-4	7440-23-5	7440-28-0	7440-62-2	7440-66-6		
Residential Screening Level (mg/kg)	77,000 ^a	31 ^a	0.68 ^a	15,000 ^a	160 ^a	7.1 ^a	--	--	23 ^a	3,100 ^a	55,000 ^a	100/200 ^a	--	1,800 ^a	1,400 ^a	--	390 ^a	390 ^a	--	0.78 ^a	390 ^a	23,000 ^a		
Industrial Screening Level (mg/kg)	1,100,000 ^b	470 ^b	3 ^b	220,000 ^b	2,300 ^b	100 ^b	--	--	350 ^b	47,000 ^b	820,000 ^b	800 ^b	--	26,000 ^b	18,000 ^b	--	5,800 ^b	5,800 ^b	--	12 ^b	5,800 ^b	350,000 ^b		
3x background	--	2.79	45	690	4.8	3.6	--	57	36	81	--	255	--	3,300	87	--	6.3	3.3	--	1.38	117	480		
Field Sample ID	Sample Date	Sample Depth Interval (in. bgs)																						
GS-29D-00-01-DUP	5/18/2022	0-1	7,200	1.6	75	190	1.4	4.4	10,000	13	7	50	31,000	370	3,800	1,100	15	3,300	2.5	2.5	220	0.43	38	780
GS-29D-00-01-TRI	5/18/2022	0-1	7,300	1.7	78	180	1.3	4.3	10,000	13	7.2	52	31,000	370	3,800	1,100	16	3,300	2.4	2.5	220	0.42	39	770
GS-30A-00-01	5/16/2022	0-1	5,600	2.2	92	160	0.66	2.3	7,100	17	7.3	59	38,000	480	2,300	760	17	3,100	2.2	3.2	270	0.48	41	450
GS-31A-00-01	5/18/2022	0-1	5,400	2.1	100	200	0.75	3	5,900	20	6	69	38,000	500	2,000	740	12	3,300	2.1	3.7	190	0.51	41	550
GS-32A-00-01	5/16/2022	0-1	5,900	1.7	88	200	0.7	2	6,900	20	7.2	65	38,000	440	2,200	660	17	2,900	2.4	3.3	280	0.47	37	480
GS-33A-00-01	5/16/2022	0-1	7,200	1.1	83	260	0.75	2.5	9,600	24	8.9	55	37,000	390	2,900	850	23	2,900	2.6	2.7	260	0.47	39	450
GS-34A-00-01	5/16/2022	0-1	6,200	1.7	89	190	0.71	2.6	6,300	21	7.3	64	40,000	450	2,100	710	18	3,000	2.5	3.1	230	0.49	37	540
GS-35A-00-01	5/16/2022	0-1	6,800	1.4	74	230	0.77	2.3	7,300	27	7.7	52	34,000	320	2,300	750	22	3,500	2.6	2.6	220	0.45	37	440
GS-36A-00-01	5/16/2022	0-1	6,800	1.7	96	220	0.82	3	8,100	20	7.7	57	36,000	350	2,500	900	18	3,300	2.6	2.7	180	0.5	44	550
GS-37A-00-01	5/16/2022	0-1	7,700	1.1	61	210	0.83	3.4	8,200	22	8.4	48	29,000	240	2,600	1,100	21	3,000	2.7	1.9	190	0.41	36	550
GS-38A-00-01	5/16/2022	0-1	8,400	0.71	50	170	0.94	6	13,000	28	8.4	55	30,000	160	3,800	1,000	24	3,000	3.6	1.2	370	0.36	33	1,200
GS-39A-00-01	5/16/2022	0-1	9,400	1.3	84	220	0.96	7.6	13,000	22	10	72	33,000	250	4,000	1,200	25	3,400	3	2	370	0.44	41	1,600
GS-40A-00-01	5/16/2022	0-1	8,700	1.2	64	180	0.81	4.8	17,000	21	12	54	36,000	190	3,800	1,100	28	2,900	3.2	1.4	270	0.43	38	690
GS-40A1-00-01	5/16/2022	0-1	7,500	0.59	36	180	0.69	1.3	11,000	16	9.3	36	25,000	95	3,400	640	20	2,400	2.9	0.76	330	0.3	28	230
GS-40A1-00-01-DUP	5/16/2022	0-1	7,600	0.63	38	180	0.72	1.6	10,000	18	9.5	37	25,000	100	3,500	670	22	2,500	3	1.1	380	0.31	28	260
GS-40A1-00-01-TRI	5/16/2022	0-1	7,400	0.58	34	190	0.69	1.3	9,700	18	8.6	33	24,000	92	3,200	600	20	2,400	2.8	0.84	300	0.29	28	230
GS-40A2-00-01	5/16/2022	0-1	7,800	0.59	34	180	0.8	1.4	12,000	28	10	39	28,000	71	4,200	670	28	2,600	3.3	0.6	440	0.34	30	240
GS-41A-00-01	5/17/2022	0-1	8,900	0.51	35	190	0.78	1.5	13,000	41	12	40	31,000	77	4,500	660	36	2,500	3.6	0.7	300	0.36	33	210
GS-42A-00-01	5/17/2022	0-1	8,500	0.52	29	170	0.8	1.1	15,000	38	13	39	30,000	60	4,500	740	35	2,400	3.6	0.46	200	0.33	30	180
GS-43A-00-01	5/17/2022	0-1	8,500	0.42	29	170	0.75	1.2	13,000	15	14	40	29,000	53	4,300	730	29	2,200	3.9	0.39	220	0.33	29	170
GS-44A-00-01	5/17/2022	0-1	6,800	0.44	21	190	0.66	0.83	11,000	22	7	26	19,000	50	3,200	480	20	1,900	2.1	0.45	170	0.22	25	160
GS-45A-00-01	5/17/2022	0-1	7,100	0.65	32	190	0.72	1.3	7,800	13	9.7	45	24,000	86	3,200	580	21	2,900	3	0.67	550	0.31	27	260
GS-46A-00-01	5/17/2022	0-1	7,900	0.61	31	200	0.79	1.4	12,000	19	12	43	27,000	84	4,400	780	26	2,400	3.1	0.62	390	0.34	29	250
GS-47A-00-01	5/17/2022	0-1	7,000	0.67	27	180	0.75	1.2	16,000	32	7.1	30	19,000	94	5,700	570	23	2,100	2.2	0.63	160	0.27	27	230
GS-BG01-00-01	5/17/2022	0-1	6,700	0.24	11	96	0.7	0.39	6,400	36	7	17	17,000	36	3,200	450	27	2,400	2.7	0.09	100	0.17	18	75
GS-BG02-00-01	5/17/2022	0-1	8,300	0.25	11	98	0.65	0.35	6,000	23	7.1	18	17,000	29	3,300	390	22	2,200	2	0.085	100	0.18	20	72
GS-BG03-00-01	5/17/2022	0-1	5,500	0.21	7.1	91	0.57	0.38	5,300	15	4.6	12	12,000	30	1,900	300	11	2,100	1.8	0.063	100	0.14	17	63
GS-CA01-00-01	5/16/2022	0-1	6,100	1.5	64	150	0.81	1.8	9,200	13	9.1	52	32,000	290	2,900	740	17	2,800	2.9	2	160	0.4	35	370
GS-CA02-00-01	5/16/2022	0-1	7,900	1.1	51	170	0.76	1.7	15,000	14	12	44	34,000	160	3,600	850	25	4,000	3.8	1.1	170	0.4	37	290
GS-CA03-00-01	5/16/2022	0-1	6,900	1.3	62	170	0.83	2.1	20,000	16	10	240	31,000	230	5,200	870	23	2,400	2.9	1.6	180	0.39	38	500
GS-CA04-00-01	5/16/2022	0-1	6,100	1.5	73	170	0.72	2.5	13,000	19	8.1	46	29,000	250	3,600	880	20	2,800	2.5	2.1	150	0.4	42	510
GS-CA04-00-01-DUP	5/16/2022	0-1	5,900	1.7	84	160	0.73	2.7	12,000	19	7.4	48	31,000	310	3,600	880	18	3,000	2.5	2.3	160	0.41	43	560
GS-CA04-00-01-TRI	5/16/2022	0-1	5,800	1.7	84	170	0.74	2.5	12,000	16	7.1	48	28,000	270	3,700	900	16	3,000	2.4	2	160	0.41	43	520
GS-CA05-00-01	5/16/2022	0-1	6,600	1.3	69	170	0.73	2.2	15,000	19	8.7	47	30,000	230	4,800	820	22	2,700	2.8	1.8	200	0.39	41	390
GS-CA06-00-01	5/16/2022	0-1	7,500	1.3	69	190	0.74	2.1	11,000	15	9.8	44	32,000	190	3,800	870	21	3,300	3.2	1.6	160	0.39	41	390
GS-CA07-00-01	5/17/2022	0-1	6,700	0.52	23	180	0.66	0.79	15,000	17	6.1	23	18,000	74	5,200	500	15	2,600	2.1	0.49	100	0.22	26	190
GS-CA08-00-01	5/19/2022	0-1	7,400	0.91	44	180	0.77	1.7	22,000	12	8.3	37	26,000	160	5,100	760	20	2,900	2.6	1.2	150	0.34	33	280
GS-CA09-00-01	5/19/2022	0-1	7,000	0.93	51	200	0.8	1.8	16,000	12	8.8	41	27,000	180	5,100	810	20	3,000	2.5	1.3	120	0.36	33	340
GS-CA10-00-01	5/19/2022	0-1	8,000	0.87	48	210	0.75	1.8	13,000	12	12	41	31,000	160	4,200	870	25	2,700	2.8	1.3	140	0.39	33	300
GS-CA11-00-01	5/19/2022	0-1	7,300	1.1	54	190	0.72	1.7	13,000	12	11	44	31,000	200	4,000	870	22	2,900	3.1	1.5	150	0.38	35	310
GS-CA12-00-01	5/19/2022	0-1	7,600	1.2	69	160	0.78	2.4	12,000	13	11	49	31,000	210	4,600	980	22	3,000	2.9	1.6	160	0.39	39	400
GS-CA12-00-01-DUP	5/19/2022	0-1	7,400	1.2	59	170	0.78	1.8	16,000	13	11	43	30,000	180	5,200	860	24	2,700	2.9	1.3	170	0.37	38	330
GS-CA12-00-01-TRI	5/19/2022	0-1	7,300	1.3	68	160	0.77	2.3	13,000	13	10	48	30,000	190	4,700	950	21	3,000	2.8	1.5	150	0.37	39	390
GS-CA13-00-01	5/19/2022	0-1	8,200	0.77	43	200	0.88	1.5	16,000	14	9.6	41	27,000	130	5,200	800	21	2,900	2.8	0.93	140	0.33	34	300
GS-CA13-00-01-DUP	5/19/2022	0-1	7,100	0.75	42	150	0.76	1.4	17,000	18	8.4	41	25,000	130	4,800	700	20	2,400	2.5	0.98	160	0.31	33	330
GS-CA13-00-01-TRI	5/19/2022	0-1	7,400	1.2	70	160	0.78	2.3	14,000	14	8.7	45	28,000	190	4,300	870	20	2,500	2.7	1.5	160	0.36	38	470
GS-CA14-00-01	5/19/2022	0-1	6,500	0.45	52	150	0.66	0.76	8,000	22	5.2	22	14,000	68	2,600	370	11	2,300	2.1	0.35	100	0.2	21	120
GS-CA14-00-01-DUP	5/19/2022	0-1	7,500	0.53	27	180	0.81	0.83	12															

Table 4
2022 Garner Street Soils Analytical Results - Metals in Soils (1-6 in. bgs)

Analyte Units		Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc		
CAS No.		7429-90-5	7440-36-0	7440-38-2	7440-39-3	7440-41-7	7440-43-9	7440-70-2	7440-47-3	7440-48-4	7440-50-8	7439-89-6	7439-92-1	7439-95-4	7439-96-5	7440-02-0	7440-09-7	7782-49-2	7440-22-4	7440-23-5	7440-28-0	7440-62-2	7440-66-6		
Residential Screening Level (mg/kg)		77,000 ^a	31 ^a	0.68 ^a	15,000 ^a	160 ^a	7.1 ^a	--	--	23 ^a	3,100 ^a	55,000 ^a	100/200 ^a	--	1,800 ^a	1,400 ^a	--	390 ^a	390 ^a	--	0.78 ^a	390 ^a	23,000 ^a		
Industrial Screening Level (mg/kg)		1,100,000 ^b	470 ^b	3 ^b	220,000 ^b	2,300 ^b	100 ^b	--	--	350 ^b	47,000 ^b	820,000 ^b	800 ^b	--	26,000 ^b	18,000 ^b	--	5,800 ^b	5,800 ^b	--	12 ^b	5,800 ^b	350,000 ^b		
3x background		--	2.79	45	690	4.8	3.6	--	57	36	81	--	255	--	3,300	87	--	6.3	3.3	--	1.38	117	480		
Field Sample ID	Sample Date	Sample Depth Interval (in. bgs)																							
GS-01A-01-06	5/17/2022	1-6	6,800	0.62	24	150	1	1.1	11,000	23	5.6	33	18,000	97	3,900	540	18	2,700	2.2	0.65	130	J+	0.26	25	230
GS-01B-01-06	5/18/2022	1-6	9,100	0.51	25	230	0.84	1.1	11,000	11	7.5	33	25,000	110	3,100	610	46	2,500	3.1	0.65	280		0.26	31	230
GS-01E-01-06	5/19/2022	1-6	7,100	0.99	45	180	1	2	18,000	13	6.7	40	25,000	180	6,000	900	23	2,400	2.9	1.2	140	J+	0.33	30	390
GS-02A-01-06	5/17/2022	1-6	7,900	0.55	26	180	1.1	1.4	11,000	16	6.6	30	20,000	110	3,900	690	15	3,000	2.4	0.58	120	J+	0.28	26	320
GS-02B-01-06	5/18/2022	1-6	7,400	0.67	37	110	0.83	1.2	23,000	11	12	37	29,000	110	4,000	740	28	2,100	3.8	0.75	200	J+	0.32	31	220
GS-02E-01-06	5/19/2022	1-6	7,500	1.8	79	160	0.97	2.7	16,000	13	8.6	46	33,000	280	2,900	1,100	22	2,700	2.9	1.9	130	J+	0.41	41	480
GS-03A-01-06	5/17/2022	1-6	8,900	0.95	41	240	0.98	1.3	11,000	23	9.2	40	26,000	120	4,200	790	140	2,500	2.7	1	150	J+	0.33	34	260
GS-03B-01-06	5/18/2022	1-6	8,400	1.1	56	210	0.84	3.1	13,000	13	10	55	34,000	240	3,000	1,100	24	2,400	3.5	2.6	150	J+	0.41	37	600
GS-03E-01-06	5/19/2022	1-6	8,400	1.3	44	220	1.2	2.7	12,000	28	6.9	47	25,000	210	4,000	770	26	2,900	2.9	2.9	130	J+	0.34	36	490
GS-03E-01-06-DUP	5/19/2022	1-6	8,900	0.92	43	240	1.2	2.5	10,000	23	7.4	45	27,000	190	3,700	760	31	3,100	2.8	1.9	160	J+	0.32	40	490
GS-03E-01-06-TRI	5/19/2022	1-6	8,800	1	48	330	1.2	2.9	13,000	24	8.7	53	28,000	270	4,800	870	27	3,200	3.1	2.3	170	J+	0.36	36	570
GS-04A-01-06	5/17/2022	1-6	8,100	0.54	26	240	0.8	2	9,600	12	9.9	33	25,000	79	3,900	710	35	2,300	2.3	0.47	140	J+	0.28	27	200
GS-04A-01-06-DUP	5/17/2022	1-6	8,800	0.54	27	250	0.88	1.3	11,000	12	11	36	26,000	70	4,500	770	52	2,300	2.6	0.43	150	J+	0.32	28	200
GS-04A-01-06-TRI	5/17/2022	1-6	8,600	0.44	27	250	0.88	1.2	11,000	13	11	38	24,000	76	4,600	760	50	2,400	2.5	0.53	140	J+	0.3	28	220
GS-04B-01-06	5/18/2022	1-6	8,200	1	55	160	1.1	9.4	32,000	12	12	62	28,000	220	5,800	3,100	36	2,800	3.2	1.5	350		0.37	36	1,700
GS-04E-01-06	5/19/2022	1-6	8,300	1.1	44	240	1.2	2.4	8,800	16	8.8	42	29,000	190	3,400	900	27	2,900	3.3	1.3	160	J+	0.36	34	480
GS-05A-01-06	5/17/2022	1-6	8,100	0.49	24	210	0.81	1.1	10,000	11	8.1	32	21,000	100	4,200	550	49	2,300	2.1	0.57	120	J+	0.26	25	200
GS-05B-01-06	5/18/2022	1-6	9,900	1.2	55	150	1	11	13,000	15	11	76	29,000	190	4,600	2,800	25	2,900	2.9	1.3	510		0.34	40	2,600
GS-06A-01-06	5/17/2022	1-6	8,700	0.39	17	210	0.86	0.77	7,300	11	7.5	27	20,000	60	3,000	480	63	2,300	2.3	0.3	110	J+	0.26	25	180
GS-06B-01-06	5/18/2022	1-6	8,700	0.65	56	130	0.96	2.1	22,000	14	10	52	29,000	220	5,700	4,000	40	2,400	2.8	1.4	440		0.31	35	5,100
GS-06E-01-06	5/19/2022	1-6	8,200	1.2	70	310	1.2	2.7	7,500	14	9.6	44	35,000	260	2,900	1,000	25	2,700	3.5	1.9	150	J+	0.4	39	400
GS-07A-01-06	5/17/2022	1-6	7,900	0.34	19	200	0.75	0.9	11,000	11	7.9	30	21,000	77	3,400	590	46	2,100	2.1	0.43	120	J+	0.24	27	210
GS-07A1-01-06	5/17/2022	1-6	7,900	0.29	18	180	0.59	0.71	6,000	11	6.4	26	18,000	63	2,200	400	30	2,200	1.7	0.37	240		0.22	25	160
GS-07B-01-06	5/18/2022	1-6	8,400	0.94	60	140	0.98	16	21,000	12	12	56	30,000	250	4,400	3,600	35	2,500	2.6	1.8	240		0.38	38	3,700
GS-07E-01-06	5/19/2022	1-6	7,500	1.9	110	290	0.96	2.8	7,500	14	8.6	55	41,000	430	2,900	1,200	21	2,700	3.3	3.2	130	J+	0.43	45	530
GS-08A-01-06	5/17/2022	1-6	7,700	0.25	15	200	0.55	0.64	5,800	9.9	5.5	18	17,000	54	2,300	370	31	1,800	1.6	0.37	100	U	0.2	25	120
GS-08B-01-06	5/18/2022	1-6	11,000	1.7	97	130	1	7	22,000	14	7.9	88	41,000	460	2,700	1,800	35	3,000	3	3.2	400		0.5	49	1,500
GS-08E-01-06	5/19/2022	1-6	8,200	1.3	68	280	1.3	2.6	8,900	15	7.7	41	32,000	240	3,600	980	25	3,400	3.2	1.8	210	J+	0.4	40	470
GS-09B-01-06	5/18/2022	1-6	8,200	1.1	99	270	0.93	5.1	7,500	13	10	83	38,000	460	2,900	1,400	36	2,900	2.7	3.3	270		0.52	45	950
GS-09E-01-06	5/19/2022	1-6	7,500	1.3	79	260	1.4	4.6	21,000	15	6.5	53	34,000	380	8,900	1,300	18	2,800	2.9	2.6	120	J+	0.39	35	760
GS-10B-01-06	5/17/2022	1-6	7,400	1.6	110	270	1	6.5	8,600	12	7.2	86	45,000	580	2,800	1,500	35	3,300	2.9	4.3	260		0.59	43	1,300
GS-11B-01-06	5/17/2022	1-6	7,500	2.1	120	290	0.97	5.2	8,700	12	6.8	87	44,000	610	3,200	1,100	45	3,200	3	4.5	290		0.62	43	1,100
GS-11B-01-06-DUP	5/17/2022	1-6	7,300	1.5	110	310	0.93	5	8,500	12	6.7	90	43,000	590	3,100	1,000	47	3,100	2.7	4.3	280		0.59	43	1,000
GS-11B-01-06-TRI	5/17/2022	1-6	7,100	2.1	110	290	0.92	5.1	8,500	11	6.6	84	43,000	600	3,100	1,000	48	3,100	2.9	4.3	280		0.58	42	1,100
GS-11D-01-06	5/18/2022	1-6	6,400	1.1	33	180	1	1.5	19,000	11	5.2	37	20,000	150	6,800	620	29	1,900	2.4	2.1	130	J+	0.28	27	400
GS-12B-01-06	5/17/2022	1-6	6,900	1.4	92	290	0.84	3.2	7,900	12	6.2	64	39,000	570	2,700	860	30	3,100	2.6	4.1	240		0.55	40	680
GS-12D-01-06	5/18/2022	1-6	8,300	1	43	240	1.1	2.7	14,000	14	6.5	45	27,000	240	4,700	720	35	3,000	2.9	2.4	220		0.38	35	370
GS-13B-01-06	5/18/2022	1-6	7,200	1	72	290	0.74	2.8	8,800	12	7.8	60	37,000	490	3,400	890	72	3,200	2.4	3.1	180	J+	0.47	40	590
GS-13D-01-06	5/18/2022	1-6	7,3,																						

Table 4
2022 Garner Street Soils Analytical Results - Metals in Soils (1-6 in. bgs)

Analyte	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Calcium	Chromium	Cobalt	Copper	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Selenium	Silver	Sodium	Thallium	Vanadium	Zinc		
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
CAS No.	7429-90-5	7440-36-0	7440-38-2	7440-39-3	7440-41-7	7440-43-9	7440-70-2	7440-47-3	7440-48-4	7440-50-8	7439-89-6	7439-92-1	7439-95-4	7439-96-5	7440-02-0	7440-09-7	7782-49-2	7440-22-4	7440-23-5	7440-28-0	7440-52-2	7440-66-6		
Residential Screening Level (mg/kg)	77,000 ^a	31 ^a	0.68 ^a	15,000 ^a	160 ^a	7.1 ^a	--	--	23 ^a	3,100 ^a	55,000 ^a	100/200 ^a	--	1,800 ^a	1,400 ^a	--	390 ^a	390 ^a	--	0.78 ^a	390 ^a	23,000 ^a		
Industrial Screening Level (mg/kg)	1,100,000 ^b	470 ^b	3 ^b	220,000 ^b	2,300 ^b	100 ^b	--	--	350 ^b	47,000 ^b	820,000 ^b	800 ^b	--	26,000 ^b	18,000 ^b	--	5,800 ^b	5,800 ^b	--	12 ^b	5,800 ^b	350,000 ^b		
3x background	--	2.79	45	690	4.8	3.6	--	57	36	81	--	255	--	3,300	87	--	6.3	3.3	--	1.38	117	480		
Field Sample ID	Sample Date	Sample Depth Interval (in. bgs)																						
GS-31A-01-06	5/18/2022	1-6	5,200	2	100	220	0.67	2.2	4,500	9.9	4.8	75	43,000	650	1,500	520	20	3,100	2.4	4.5	220	0.57	38	470
GS-32A-01-06	5/16/2022	1-6	5,300	1.9	96	210	0.6	1.9	6,000	19	5.4	71	42,000	570	1,700	450	14	2,700	2.4	4.1	260	0.52	36	420
GS-33A-01-06	5/16/2022	1-6	6,900	1.6	96	220	0.75	2.9	7,800	18	9	60	41,000	450	2,400	880	20	2,900	2.7	3.3	260	0.54	40	500
GS-34A-01-06	5/16/2022	1-6	6,800	1.4	77	180	0.73	3.4	6,700	20	8.7	57	39,000	410	2,300	770	20	2,700	2.8	2.8	240	0.47	35	520
GS-35A-01-06	5/16/2022	1-6	6,800	1.3	75	210	0.8	2.9	7,000	22	8.2	56	36,000	370	2,200	890	19	3,400	2.7	2.7	220	0.48	36	490
GS-36A-01-06	5/16/2022	1-6	7,200	1.3	80	240	0.85	2.6	8,000	20	7.9	52	35,000	320	2,500	780	19	2,800	2.8	2.3	170 J+	0.48	39	490
GS-37A-01-06	5/16/2022	1-6	7,900	0.99	65	260	0.87	3.8	8,400	24	8.9	50	30,000	270	2,500	1,300	22	3,000	2.8	2.1	200 J+	0.44	39	570
GS-38A-01-06	5/16/2022	1-6	8,500	0.86	63	180	1	5.6	10,000	19	8.1	63	34,000	240	3,400	940	19	2,800	3.8	2.1	330	0.42	35	1,200
GS-39A-01-06	5/16/2022	1-6	9,700	1.2	84	250	0.96	6.8	14,000	25	10	71	35,000	270	4,200	1,200	25	3,600	3.1	2	390	0.45	42	1,500
GS-40A-01-06	5/16/2022	1-6	9,000	0.91	58	180	0.82	5.3	19,000	15	13	52	38,000	200	3,700	1,200	27	2,600	3.6	1.5	260	0.43	39	730
GS-40A1-01-06	5/16/2022	1-6	7,700	0.58	37	180	0.71	1.3	12,000	24	10	36	27,000	98	3,800	670	26	2,400	3.1	0.82	320	0.32	29	240
GS-40A1-01-06-DUP	5/16/2022	1-6	8,300	0.59	43	190	0.76	1.6	12,000	25	11	43	30,000	110	4,300	760	27	2,600	3.3	0.96	390	0.34	31	280
GS-40A1-01-06-TRI	5/16/2022	1-6	8,300	0.52	37	200	0.73	1.4	12,000	24	9.9	36	27,000	100	3,900	670	25	2,400	3	0.81	310	0.31	30	240
GS-40A2-01-06	5/16/2022	1-6	8,600	0.52	29	180	0.78	1.5	13,000	34	12	41	30,000	61	4,400	650	33	2,500	3.9	0.49	380	0.38	30	200
GS-41A-01-06	5/17/2022	1-6	8,800	0.48	32	190	0.75	1.4	12,000	30	11	43	31,000	68	4,400	610	32	2,600	3.8	0.53	290	0.37	31	200
GS-42A-01-06	5/17/2022	1-6	8,700	0.54	29	190	0.8	1.1	16,000	48	13	38	31,000	54	4,700	720	39	2,400	3.6	0.45	220	0.34	31	180
GS-43A-01-06	5/17/2022	1-6	8,900	0.39 J	28	170	0.78	1.2	14,000	20	15	41	32,000	50	4,500	750	33	2,300	4.1	0.35	250	0.36	30 J	180
GS-44A-01-06	5/17/2022	1-6	6,600	0.45	20	170	0.65	0.79	10,000	34	6.7	24	18,000	48	2,900	470	25	1,800	2	0.37	170 J+	0.22	24	140
GS-45A-01-06	5/17/2022	1-6	8,000	0.41	23	200	0.79	1.1	12,000	12	11	38	25,000	61	3,900	670	39	2,000	3.3	0.45	410	0.32	26	180
GS-46A-01-06	5/17/2022	1-6	8,300	0.56	29	220	0.83	1.4	11,000	28	12	41	29,000	71	4,600	790	31	2,400	3.4	0.78	450	0.35	29	230
GS-47A-01-06	5/17/2022	1-6	7,100	0.61	26	180	0.78	1.2	16,000	27	7.5	29	20,000	86	5,400	600	22	2,000	2.4	0.61	170 J+	0.27	27	210
GS-BG01-01-06	5/17/2022	1-6	6,600	0.25	10	93	0.68	0.39	5,800	35	6.9	18	17,000	37	3,000	430	26	2,400	2.6	0.08 J	100 U	0.17	18	77
GS-BG02-01-06	5/17/2022	1-6	8,800	0.24	11	100	0.69	0.35	6,600	46	7.6	20	18,000	29	3,500	400	34	2,200	2.1	0.098 J	100 U	0.19	21	74
GS-BG03-01-06	5/17/2022	1-6	5,500	0.2	7.4	84	0.58	0.29	4,100	31	4.8	12	13,000	22	1,800	310	20	1,900	1.9	0.11 U	100 U	0.14	17	54
GS-CA01-01-06	5/16/2022	1-6	6,700	1.3	60	170	0.78	1.7	11,000	22	10	57	36,000	290	3,000	710	25	2,500	3.3	1.9	180 J+	0.42	36	340
GS-CA02-01-06	5/16/2022	1-6	8,300	0.76	39	160	0.76	1.5	19,000	15	14	45	36,000	120	3,700	770	28	2,800	4.5	0.83	200 J+	0.38	34	240
GS-CA03-01-06	5/16/2022	1-6	8,000	1	52	180	0.83	2	20,000	19	12	51	34,000	180	4,300	850	28	2,200	3.6	1.3	190 J+	0.44	38	320
GS-CA04-01-06	5/16/2022	1-6	6,200	1.3	63	170	0.79	2.3	14,000	24	7.7	44	28,000	260	4,000	800	22	2,800	2.7	1.8	140 J+	0.39	38	440
GS-CA04-01-06-DUP	5/16/2022	1-6	6,300	1.2	63	180	0.78	2.2	13,000	26	8.1	44	29,000	260	3,900	770	24	2,800	2.6	1.8	140 J+	0.4	39	420
GS-CA04-01-06-TRI	5/16/2022	1-6	5,900	1.3	62	150	0.71	2	15,000	23	7.7	44	28,000	250	3,800	730	21	2,600	2.4	1.8	130 J+	0.38	37	380
GS-CA05-01-06	5/16/2022	1-6	7,000	1.2	67	200	0.74	2.3	14,000	21	9.4	46	31,000	220	4,200	840	23	2,700	2.7	1.7	190 J+	0.39	40	410
GS-CA06-01-06	5/16/2022	1-6	7,700	1.1	60	190	0.77	1.8	12,000	17	10	45	33,000	180	4,000	830	22	3,600	3.5	1.4	170 J+	0.37	39	350
GS-CA07-01-06	5/17/2022	1-6	6,900	0.47	21	170	0.7	0.81	15,000	24	6.9	25	19,000	64	4,900	520	20	2,600	2.1	0.47	100 J+	0.23	25	180
GS-CA08-01-06	5/19/2022	1-6	7,700	0.81	42	180	0.89	1.8	24,000	12	8.7	41	27,000	190	6,700	830	25	2,400	2.7	1.3	170 J+	0.35	32	290
GS-CA09-01-06	5/19/2022	1-6	7,500	0.83	47	180	0.81	2.1	17,000	11	12	38	29,000	170	4,600	1,000	28	2,400	2.8	1.3	120 J+	0.35	31	320
GS-CA10-01-06	5/19/2022	1-6	7,800	0.8	49	170	0.83	1.8	18,000	12	11	44	33,000	210	5,000	970	27	2,200	3.1	1.3	160 J+	0.43	32	310
GS-CA11-01-06	5/19/2022	1-6	7,200	1.3 J	68	160	0.76	2.3	15,000	11	12	50	36,000	300	4,000	1,100	28	2,300	3.1	2.1 J	170 J+	0.48	35	360
GS-CA12-01-06	5/19/2022	1-6	7,700	0.9	53	130	0.83	1.8	19,000	12	10	43	29,000	170	6,100	840	26	2,200	2.9	1.9	270	0.35	34	300
GS-CA12-01-06-DUP	5/19/2022	1-6	7,700	0.85	44	130	0.84	1.5	25,000	12	11	43	30,000	140	6,500	830	31	2,100	3.2	0.93	280	0.35	32	240
GS-CA12-01-06-TRI	5/19/2022	1-6	8,200	0.93	57	130	0.85	2.2	18,000	13	11	48	32,000	190	5,600	940	31	2,300	3	1.2	250	0.38	35	340
GS-CA13-01-06	5/19/2022	1-6	8,100	0.85	46	200	0.96	1.1	16,000	15	8.7	31	24,000	110	4,700	640	35	2,400	2.8	0.76	130 J+	0.33	38	210
GS-CA13-01-06-DUP	5/19/2022	1-6	7,100	0.73	33	160	0.84	1.2	24,000	13	8.4	36	24,000	120	7,000	680	25	2,100	2.5	0.68	180 J+	0.29	29	300
GS-CA13-01-06-TRI	5/19/2022	1-6	7,300	0.77	42	180	0.81	1.5	19,000	13	8.9	41	25,000	130	5,600	730	28	2,200	2.6	0.93	200 J+	0.33	32	410
GS-CA14-01-06	5/19/2022	1-6	6,600	0.33	18	140	0.59	0.64	10,000	9.7	6.8	21	17,000	58	3,400	440	14	2,100	1.9	0.25	110 J+	0.21	22	120
GS-CA14-01-06-DUP	5/19/2022	1-6	7,900	0.53	25	190	0.91	0.94	16,000	13	8	31	22,000	83	5,600	630	22	2,100	2.6	0.47	110 J+	0.28	27	170
GS-CA14-01-06-TRI	5/19/2022	1-6	7,900	0.5	27	190	0.93	0.91	15,000	14	7.6	26	20,000	72	5,500	600	18	2,100	2.6	0.42	100 J+	0.27	26	160
GS-HOUSE-01-06	5/17/2022	1-6	8,600	1.2	52	210	0.87	2.2	8,200	26	8	40	28,000	210	2,800</									

Table 5
2023 SI - Surface Soil Analytical Results - Metals in Soil Samples (0-1 in. bgs)

Analyte						Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc								
Units						(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)							
CAS No.						7440-36-0	7440-38-2	7440-39-3	7440-41-7	7440-43-9	7440-47-3	7440-48-4	7440-50-8	7439-92-1	7439-96-5	7440-02-0	7782-49-2	7440-22-4	7440-28-0	7440-62-2	7440-66-6								
Residential Screening Level (mg/kg)						31 ^a	0.68 ^a	15,000 ^a	160 ^a	7.1 ^a	--	23 ^a	3,100 ^a	100/200 ^c	1,800 ^a	1,500 ^a	390 ^a	390 ^a	0.78 ^a	390 ^a	23,000 ^a								
Industrial Screening Level (mg/kg)						470 ^b	3 ^b	220,000 ^b	2,300 ^b	100 ^b	--	350 ^b	47,000 ^b	800 ^b	26,000 ^b	18,000 ^b	5,800 ^b	5,800 ^b	12 ^b	5,800 ^b	350,000 ^b								
3x Background ^d						2.79	45	690	4.8	3.6	57	36	81	255	3,300	87	6.3	3.3	1.38	117	480								
Distance from Smokestack (mi)	Sample Location ID	Field Sample ID	CLP Sample ID	Sample Date	Sample Depth Interval (in. bgs)																								
0 - 0.5 mi from Smokestack																													
0.303	13	HWY-SS13-0-1	MHOF27	6/12/2023	0-1	1.1	22	300	1.5	1.6	16	6.0	45	280	580	13	0.79	J	0.54	0.49	U	30	470						
		HWY-SS13-0-1-DUP	MHOF83		0-1	1.2	24	310	1.6	1.7	19	6.7	55	280	640	15	0.67	J	0.52	0.42	U	34	520						
0.387	34	HWY-SS34-0-1	MHOF70	6/13/2023	0-1	0.80	U	28	190	1.5	1.3	10	6.3	24	100	810	12	0.67	J	0.71	0.40	U	26	260					
0.5 - 1.0 mi from Smokestack																													
0.731	01	HWY-SS01-0-1	MHOF02	6/13/2023	0-1	0.82	U	11	J-	160	0.75	0.63	9.1	6.8	31	35	410	13	0.71	J	0.15	J	0.41	U	24	130			
		HWY-SS01-0-1-DUP	MHOF81		0-1	0.89	U	12	180	J+	0.79	0.76	J	10	7.4	36	39	430	15	0.70	J	0.19	J	0.44	U	26	140		
0.543	03	HWY-SS03-0-1	MHOF09	6/13/2023	0-1	0.76	U	26	170	0.80	1.1	8.4	5.2	18	75	490	10	0.42	J	0.46	0.38	U	24	140					
0.840	04	HWY-SS04-0-1	MHOF11	6/13/2023	0-1	0.78	U	4.6	130	0.76	0.37	J	6.0	3.6	9.1	22	330	5.8	0.43	J	0.093	J	0.39	U	14	57			
0.641	05	HWY-SS05-0-1	MHOF13	6/13/2023	0-1	0.92	U	5.1	140	0.98	0.62	8.1	5.5	13	28	440	16	J+	0.69	J	0.11	J	0.46	U	19	96			
0.937	07	HWY-SS07-0-1	MHOF17	6/13/2023	0-1	0.89	U	7.6	260	2.2	0.63	6.6	5.9	13	34	1,500	10	1.3	J	0.13	J	0.45	U	18	150				
0.756	10	HWY-SS10-0-1	MHOF21	6/13/2023	0-1	0.89	U	18	180	0.80	0.89	11	9.8	42	42	680	21	0.83	J	0.25	J	0.45	U	31	160				
0.913	22	HWY-SS22-0-1	MHOF46	6/12/2023	0-1	0.91	U	7.7	83	0.46	U	0.84	10	J+	5.3	15	200	14	0.39	J	0.14	J	0.46	U	23	94	J+		
		HWY-SS22-0-1-DUP	MHOF85		0-1	0.89	U	6.6	83	0.45	U	0.71	8.3	J+	4.3	12	14	170	12	J+	0.46	J	0.14	J	0.45	U	20	83	
0.730	23	HWY-SS23-0-1	MHOF48	6/13/2023	0-1	0.86	U	17	210	0.84	1.3	13	6.3	31	160	520	13	J+	0.43	J	0.44	0.43	U	26	260				
0.879	24	HWY-SS24-0-1	MHOF50	6/13/2023	0-1	0.86	U	28	190	0.89	1.0	11	J+	5.7	41	94	570	14	J+	0.65	J	0.45	0.43	U	25	230			
0.579	29	HWY-SS29-0-1	MHOF60	6/12/2023	0-1	0.91	U	10	130	1.4	0.71	7.8	4.8	17	46	400	8.2	0.76	J	0.80	0.46	U	20	140					
		HWY-SS29-0-1-DUP	MHOF87		0-1	0.67	U	7.9	110	1.2	0.60	6.5	4.0	14	40	350	6.9	0.54	J	0.70	0.34	U	17	110					
0.576	33	HWY-SS33-0-1	MHOF68	6/12/2023	0-1	0.75	U	6.7	120	0.73	0.42	9.9	J+	5.7	15	21	350	15	0.76	J	0.12	J	0.37	U	25	96			
0.636	35	HWY-SS35-0-1	MHOF72	6/13/2023	0-1	1.4	35	190	0.91	3.8	13	5.5	62	640	730	12	0.60	J	3.7	0.36	U	26	660						
1.0 - 1.5 mi from Smokestack																													
1.231	02	HWY-SS02-0-1	MHOF07	6/13/2023	0-1	0.85	U	17	170	0.89	0.67	14	8.7	24	28	900	19	0.90	J	0.20	J	0.42	U	30	160				
1.094	06	HWY-SS06-0-1	MHOF15	6/12/2023	0-1	0.68	U	6.4	130	0.43	0.27	J	7.9	J+	4.6	11	18	230	9.3	J+	1.7	U	0.095	J	0.34	U	19	57	J+
1.162	14	HWY-SS14-0-1	MHOF29	6/12/2023	0-1	0.83	U	6.5	130	0.87	0.34	J	8.1	5.3	12	33	290	12	0.36	J	0.23	J	0.42	U	24	66			
1.458	15	HWY-SS15-0-1	MHOF31	6/13/2023	0-1	0.80	U	4.2	88	0.59	0.52	5.5	J+	2.7	16	52	180	4.2	J+	0.32	J	0.22	J	0.4	U	11	89		
1.288	16*	HWY-SS-16-0-1	MHOF33	6/13/2023	0-1	0.85	U	4.9	110	0.90	0.34	J	6.6	J+	4.8	14	27	330	8.1	J+	0.46	J	0.089	J	0.42	U	13	93	
1.151	17^	HWY-SS-17-0-1	MHOF35	6/13/2023	0-1	14	260	620	1.3	3.6	15	--	8.8	48	240	2,400	13	1.7	U	4.1	1.1	130	720						
1.106	28	HWY-SS28-0-1	MHOF58	6/12/2023	0-1	0.86	U	9.8	110	0.65	0.81	12	J+	5.4	17	29	270	13	0.65	J	0.20	J	0.43	U	25	120	J+		
1.081	30	HWY-SS30-0-1	MHOF62	6/13/2023	0-1	0.67	U	14	150	0.97	0.41	12	7.9	18	25	690	18	0.62	J	0.17	J	0.34	U	28	110				
1.5 - 2.0 mi from Smokestack																													
1.515	11	HWY-SS11-0-1	MHOF23	6/13/2023	0-1	0.88	U	6.8	130	1.1	0.61	6.2	J+	4.5	12	40	240	9.0	0.57	J	0.23	J	0.44	U	17	100	J+		
2.0 - 2.5 mi from Smokestack																													
2.075	12	HWY-SS12-0-1	MHOF25	6/12/2023	0-1	0.89	U	5.5	140	0.65	1.2	12	3.8	18	85	330	7.2	J+	0.44	J	1.1	0.44	U	20	160				
2.097	21	HWY-SS21-0-1	MHOF75	6/12/2023	0-1	0.68	U	2.9	130	0.52	0.18	J	5.7	J+	3.2	8.1	12	230	5.1	J+	0.35	J	0.047	J	0.34	U	18	54	J+
2.164	26	HWY-SS26-0-1	MHOF54	6/12/2023	0-1	0.74	U	4.9	190	0.56	0.51	9.1	J+	5.1	15	30	270	9.2	J+	0.29	J	0.096	J	0.37	U	23	110	J+	
2.079	27	HWY-SS27-0-1	MHOF56	6/12/2023	0-1	0.79	U	15	160	0.68	0.40	19	12	27	22	930	29	1.1	J	0.12	J	0.4	U	39	110				
2.5 - 3.0+ mi from Smokestack																													
2.880	18	HWY-SS18-0-1	MHOF37	6/12/2023	0-1	0.81	U	3.7	96	0.46	0.63	9.4	3.3	12	28	170	6.9	0.35	J	0.19	J	0.4	U	13	71				
2.605	19	HWY-SS19-0-1	MHOF39	6/12/2023	0-1	0.83	U	6.4	80	0.46	0.82	9.0	4.7	15	13	270	11	0.84	J	0.10	J	0.42	U	18	110				
3.102	20	HWY-SS20-0-1	MHOF74	6/12/2023	0-1	0.89	U	3.0	230	0.84	0.44	J	7.3	J+	4.9	14	18	270	5.8	J+	0.44	J	0.098	J	0.45	U	23	91	J+

Notes:

--	Not established or not applicable
*	Sample material was non-native soils
^	Sample material appeared to be tailings
^a	EPA Regional Screening Level (RSL) for Residential Soil (TR=1E-06, THQ=1.0)
^b	EPA RSL for Industrial Soil (TR=1E-06, THQ=1.0)
^c	EPA Office of Land and Emergency Management Updated Residential Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities, 2024: EPA Regions should use a screening level of 200 mg/kg for residential soil lead and 100 mg/kg if an additional source of lead (such as lead water service lines, lead-based paint, etc.) is identified. It is unknown at this time whether an additional source of lead is present at this site and both screening levels are presented as a conservative measure
^d	Background concentration is maximum concentration for the analyte from both depth intervals (0-1-in. bgs and 1-6-in. bgs) for the samples > 1.45 mi from the smokestack. See Appendix X.
BOLD	Indicates concentration that exceeds EPA Screening Level for Residential Soil
BOLD	Indicates concentration that exceeds EPA Screening Level for Residential and Industrial Soil
BOLD	Indicates concentration that exceeds three times background concentration, documenting an observed release.
CAS No.	Chemical Abstracts Service Number
CLP	U.S. EPA Contract Laboratory Program
^d	EPA Regional Removal Management Level (RML) for Composite Worker Soil (TR=1E-06, THQ=3.0)
DUP	Field Duplicate
EPA	U.S. Environmental Protection Agency
in. bgs	inches below ground surface
J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high
mg/kg	milligram per kilogram
mi	miles
SS	Surface Soil
THQ	Target Hazard Quotient
TR	Target Cancer Risk
TRM	Total Recoverable Metals
U	The analyte was analyzed for, but was not detected at or above the associated value (reporting limit)

Table 6
2023 SI - Subsurface Soil Analytical Results - Metals in Soil Samples (1-6 in. bgs)

Analyte						Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	
Units						(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	
CAS No.						7440-36-0	7440-38-2	7440-39-3	7440-41-7	7440-43-9	7440-47-3	7440-48-4	7440-50-8	7439-92-1	7439-96-5	7440-02-0	7782-49-2	7440-22-4	7440-28-0	7440-62-2	7440-66-6	
Residential Screening Level (mg/kg)						31 ^a	0.68 ^a	15,000 ^a	160 ^a	7.1 ^a	--	23 ^a	3,100 ^a	100/200 ^c	1,800 ^a	1,500 ^a	390 ^a	390 ^a	0.78 ^a	390 ^a	23,000 ^a	
Industrial Screening Level (mg/kg)						470 ^b	3 ^b	220,000 ^b	2,300 ^b	100 ^b	--	350 ^b	47,000 ^b	800 ^b	26,000 ^b	18,000 ^b	5,800 ^b	5,800 ^b	12 ^b	5,800 ^b	350,000 ^b	
3x Background ^d						2.79	45	690	4.8	3.6	57	36	81	255	3,300	87	6.3	3.3	1.38	117	480	
Distance from Smokestack (mi)	Sample Location ID	Field Sample ID	CLP Sample ID	Sample Date	Sample Depth Interval (in. bgs)																	
0 - 0.5 mi from Smokestack																						
0.303	13	HWY-SS13-1-6	MHOF28	6/12/2023	1-6	0.85	U	20	210	1.0	0.80	12	6.6	30	87	490	16	0.67	J	0.3	J	
		HWY-SS13-1-6-DUP	MHOF84		1-6	0.91	U	20	220	1.0	0.77	13	6.8	31	84	490	16	0.46	J	0.26	J	
0.387	34	HWY-SS34-1-6	MHOF71	6/13/2023	1-6	0.74	J +	27	180	1.4	1.4	11	7.1	31	89	880	14	0.75	J	0.62	0.34	U
0.5 - 1.0 mi from Smokestack																						
0.731	01	HWY-SS01-1-6	MHOF03	6/13/2023	1-6	0.79	U	12	220	0.82	0.56	12	9	26	37	420	19	0.73	J	0.18	J	
		HWY-SS01-1-6-DUP	MHOF82		1-6	0.88	U	13	200	0.79	0.53	13	9.7	28	34	430	20	0.89	J	0.15	J	
0.543	03	HWY-SS03-1-6	MHOF10	6/13/2023	1-6	0.85	U	25	120	0.61	0.85	6.9	4.1	17	70	360	8.7	J+	0.34	J		
0.840	04	HWY-SS04-1-6	MHOF12	6/13/2023	1-6	0.89	U	5.1	74	0.49	0.24	J	7.3	2.9	6.1	20	200	5.3	2.2	U		
0.641	05	HWY-SS05-1-6	MHOF14	6/13/2023	1-6	0.76	U	4.5	140	1.0	0.45	10	5.7	11	22	490	12	0.55	J			
0.937	07	HWY-SS07-1-6	MHOF18	6/13/2023	1-6	0.78	U	7.6	240	2.0	0.65	5.9	5.1	11	31	1,300	9.1	1.2	J			
0.756	10	HWY-SS10-1-6	MHOF22	6/13/2023	1-6	0.81	U	18	120	0.65	0.69	7.9	10	35	37	850	22	0.82	J			
0.913	22	HWY-SS22-1-6	MHOF47	6/12/2023	1-6	0.78	U	8.3	100	0.43	0.73	8.5	J+	5.5	13	15	200	14	0.39	J		
		HWY-SS22-1-6-DUP	MHOF86		1-6	0.67	U	9.6	120	0.51	0.91	12	6.5	15	18	240	17	0.44	J			
0.730	23	HWY-SS23-1-6	MHOF49	6/13/2023	1-6	0.92	U	16	180	0.78	1.2	8.9	J+	6.6	25	130	470	13	J+			
0.879	24	HWY-SS24-1-6	MHOF51	6/13/2023	1-6	0.93	U	24	200	1.1	1.3	21	J+	6.5	40	110	650	17	J+			
0.579	29	HWY-SS29-1-6	MHOF61	6/12/2023	1-6	1.5	U	27	200	1.4	0.84	13	5.3	29	110	520	11	0.6	J			
		HWY-SS29-1-6-DUP	MHOF88		1-6	0.92	J	20	130	0.93	0.61	9.9	4.4	20	65	480	13	2.1	U			
0.576	33	HWY-SS33-1-6	MHOF69	6/12/2023	1-6	0.67	U	8.8	150	0.92	0.53	14	7.4	17	25	380	20	0.89	0.11			
0.636	35	HWY-SS35-1-6	MHOF73	6/13/2023	1-6	1.5	U	43	200	1.0	7.2	11	5.2	65	390	750	12	0.47	J			
1.0 - 1.5 mi from Smokestack																						
1.231	02	HWY-SS02-1-6	MHOF08	6/13/2023	1-6	0.89	U	13	120	0.71	0.77	9.6	5.5	16	19	590	13	0.78	U			
		HWY-SS06-1-6	MHOF16		6/12/2023	1-6	0.83	U	8.8	140	0.45	0.33	J	8.1	J+	5.3	11	21	250	11	J+	
1.162	14	HWY-SS14-1-6	MHOF30	6/12/2023	1-6	0.78	U	5.3	140	1.1	0.18	J	10	5.5	10	14	260	13	0.41	J		
1.458	15	HWY-SS15-1-6	MHOF32	6/13/2023	1-6	0.82	U	3.5	58	0.48	0.38	J	4.6	J+	2.4	11	31	180	3.3	J+		
1.288	16 ^a	HWY-SS16-1-6	MHOF34	6/13/2023	1-6	0.84	U	4.1	110	0.59	0.22	J	15	4.8	13	58	860	7.6	J+			
1.151	17 ^a	HWY-SS17-1-6	MHOF36	6/13/2023	1-6	14		250	250	1.3	3.6	10	7.5	53	200	2,100	12	0.29	J			
1.106	28	HWY-SS28-1-6	MHOF59	6/12/2023	1-6	0.81	U	11	120	0.76	0.97	13	6.7	16	33	380	15	0.62	J			
1.081	30	HWY-SS30-1-6	MHOF63	6/13/2023	1-6	0.92	U	19	130	0.81	0.47	20	9.1	20	23	920	21	1.1	J			
1.5 - 2.0 mi from Smokestack																						
1.515	11	HWY-SS11-1-6	MHOF24	6/13/2023	1-6	0.93	U	6.5	140	1.6	0.50	8.8	J+	6.0	17	40	290	11	0.57	J		
2.0 - 2.5 mi from Smokestack																						
2.075	12	HWY-SS12-1-6	MHOF26	6/12/2023	1-6	0.86	U	4.6	93	0.46	0.95	9.8	J+	3.1	13	68	330	6.6	0.33	J		
2.097	21	HWY-SS21-1-6	MHOF45	6/12/2023	1-6	0.76	U	2.9	76	0.49	0.13	J	7.9	J+	2.7	7.9	9.5	180	6.1	J+		
2.164	26	HWY-SS26-1-6	MHOF55	6/12/2023	1-6	0.77	U	3.8	120	0.40	0.19	J	5.9	J+	3.6	8.5	14	190	7.2	J+		
2.079	27	HWY-SS27-1-6	MHOF57	6/12/2023	1-6	0.88	U	14	190	0.82	0.48	16	J+	12	24	26	1,100	28	1.6	J		
2.5 - 3.0+ mi from Smokestack																						
2.880	18	HWY-SS18-1-6	MHOF38	6/12/2023	1-6	0.78	U	4.0	94	0.45	0.52	7.5	3.1	9.4	24	160	5.7	1.9	U			
2.605	19	HWY-SS19-1-6	MHOF40	6/12/2023	1-6	0.90	U	10	76	0.65	J	0.55	8.8	6.5	16	20	160	17	0.83	J		
3.102	20	HWY-SS20-1-6	MHOF76	6/12/2023	1-6	0.79	U	2.9	170	0.84	0.34	J	6.5	J+	5.6	13	14	340	5.9	J+		

Notes:

- Not established or not applicable
- * Sample material was non-native soils
- ^A Sample material appeared to be tailings
- ^a EPA Regional Screening Level (RSL) for Residential Soil (TR=1E-06, THQ=1.0)
- ^b EPA RSL for Industrial Soil (TR=1E-06, THQ=1.0)
- ^c EPA Office of Land and Emergency Management Updated Residential Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities, 2024: EPA Regions should use a screening level of 200 mg/kg for residential soil lead and 100 mg/kg if an additional source of lead (such as lead water service lines, lead-based paint, etc.) is identified. It is unknown at this time whether an additional source of lead is present at this site and both screening levels are presented as a conservative measure
- ^d Background concentration is maximum concentration for the analyte from both depth intervals (0-1-in. bgs and 1-6-in. bgs) for the samples > 1.45 mi from the smokestack. See Appendix A.
- BOLD** Exceeds EPA Screening Level for Residential Soil
- BOLD** Exceeds EPA Screening Level for Residential and Industrial Soil
- Indicates concentration that exceeds three times background concentration, documenting an observed release
- CAS No. Chemical Abstracts Service Number
- CLP U.S. EPA Contract Laboratory Program
- ^d EPA Regional Removal Management Level (RML) for Composite Worker Soil (TR=1E-06, THQ=3.0)
- DUP Field Duplicate
- EPA U.S. Environmental Protection Agency
- in. bgs inches below ground surface
- J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample
- J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low
- J+ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high
- mg/kg milligram per kilogram
- mi miles
- SS Surface Soil
- THQ Target Hazard Quotient
- TR Target Cancer Risk
- TRM Total Recoverable Metals
- U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit)

Table 7
Analytical Results - Mercury in Soil

Analyte						Mercury
Units						(mg/kg)
CAS No.						7439-97-6
EPA Residential RSL ^a (mg/kg)						11
EPA Industrial RSL ^b (mg/kg)						46
3x Background ^c						0.36
Distance from Smokestack (mi)	Sample Location ID	Sample Date	Field Sample ID	CLP Sample ID	Sample Depth Interval (in. bgs)	
0 - 0.5 mi from Smokestack						
0.303	13	6/12/2023	HWY-SS13-0-1HG	MH0FE7	0-1	0.22 J-
			HWY-SS13-0-1-DUPHG	MH0FE6	0-1	0.11 J-
			HWY-SS13-1-6HG	MH0FE9	1-6	0.058 J-
			HWY-SS13-1-6-DUPHG	MH0FE8	1-6	0.17 J-
0.387	34	6/13/2023	HWY-SS34-0-1HG	MH0FJ8	0-1	0.053 J-
			HWY-SS34-1-6HG	MH0FJ9	1-6	0.15 J-
0.5 - 1.0 mi from Smokestack						
0.731	01	6/13/2023	HWY-SS01-0-1HG	MH0FC4	0-1	0.035 J-
			HWY-SS01-0-1-DUPHG	MH0FC6	0-1	0.036 J-
			HWY-SS01-1-6HG	MH0FC7	1-6	0.047 J-
			HWY-SS01-1-6-DUPHG	MH0FC5	1-6	0.088 J-
0.543	03	6/13/2023	HWY-SS03-0-1HG	MH0FD0	0-1	0.42 J-
			HWY-SS03-1-6HG	MH0FD1	1-6	0.079 J-
0.840	04	6/13/2023	HWY-SS04-0-1HG	MH0FD2	0-1	-- R
			HWY-SS04-1-6HG	MH0FD3	1-6	-- R
0.641	05	6/13/2023	HWY-SS05-0-1HG	MH0FD4	0-1	0.069 J-
			HWY-SS05-1-6HG	MH0FD5	1-6	0.064 J-
0.937	07	6/13/2023	HWY-SS07-0-1HG	MH0FD8	0-1	0.098 J-
			HWY-SS07-1-6HG	MH0FD9	1-6	0.11 J-
0.756	10	6/13/2023	HWY-SS10-0-1HG	MH0FE0	0-1	0.082 J-
			HWY-SS10-1-6HG	MH0FE1	1-6	0.062 J-
0.913	22	6/12/2023	HWY-SS22-0-1HG	MH0FG7	0-1	0.067 J-
			HWY-SS22-0-1-DUPHG	MH0FG6	0-1	0.092 J-
			HWY-SS22-1-6HG	MH0FG9	1-6	0.068 J-
			HWY-SS22-1-6-DUPHG	MH0FG8	1-6	0.068 J-
0.730	23	6/13/2023	HWY-SS23-0-1HG	MH0FH0	0-1	0.17 J-
			HWY-SS23-1-6HG	MH0FH1	1-6	0.36 J-
0.879	24	6/13/2023	HWY-SS24-0-1HG	MH0FH2	0-1	0.10 J-
			HWY-SS24-1-6HG	MH0FH3	1-6	0.056 J-
0.579	29	6/12/2023	HWY-SS29-0-1HG	MH0FJ1	0-1	0.05 J-
			HWY-SS29-0-1-DUPHG	MH0FJ0	0-1	0.21 J-
			HWY-SS29-1-6HG	MH0FJ3	1-6	0.12 J-
			HWY-SS29-1-6-DUPHG	MH0FJ2	1-6	1.7 J-
0.576	33	6/12/2023	HWY-SS33-0-1HG	MH0FJ6	0-1	0.053 J-
			HWY-SS33-1-6HG	MH0FJ7	1-6	11 J-
0.636	35	6/13/2023	HWY-SS35-0-1HG	MH0FK0	0-1	0.20 J-
			HWY-SS35-1-6HG	MH0FK1	1-6	0.24 J-
1.0 - 1.5 mi from Smokestack						
1.231	02	6/13/2023	HWY-SS02-0-1HG	MH0FC8	0-1	0.035 J-
			HWY-SS02-1-6HG	MH0FC9	1-6	0.046 J-
1.094	06	6/12/2023	HWY-SS06-0-1HG	MH0FD6	0-1	0.069 J-
			HWY-SS06-1-6HG	MH0FD7	1-6	0.081 J-
1.162	14	6/12/2023	HWY-SS14-0-1HG	MH0FF0	0-1	0.03 J-
			HWY-SS14-1-6HG	MH0FF1	1-6	0.02 J-
1.458	15	6/13/2023	HWY-SS15-0-1HG	MH0FF2	0-1	0.11 J-
			HWY-SS15-1-6HG	MH0FF3	1-6	0.053 J-
1.288	16*	6/13/2023	HWY-SS16-0-1HG	MH0FF4	0-1	0.062 J-
			HWY-SS16-1-6HG	MH0FF5	1-6	1.1 J-
1.151	17^	6/13/2023	HWY-SS17-0-1HG	MH0FF6	0-1	-- R
			HWY-SS17-1-6HG	MH0FF7	1-6	0.031 J-

Analyte						Mercury
Units						(mg/kg)
CAS No.						7439-97-6
EPA Residential RSL ^a (mg/kg)						11
EPA Industrial RSL ^b (mg/kg)						46
3x Background ^c						0.36
Distance from Smokestack (mi)	Sample Location ID	Sample Date	Field Sample ID	CLP Sample ID	Sample Depth Interval (in. bgs)	
1.106	28	6/12/2023	HWY-SS28-0-1HG	MH0FH8	0-1	0.082 J-
			HWY-SS28-1-6HG	MH0FH9	1-6	0.091 J-
1.081	30	6/13/2023	HWY-SS30-0-1HG	MH0FJ4	0-1	0.074 J-
			HWY-SS30-1-6HG	MH0FJ5	1-6	0.028 J-
1.5 - 2.0 mi from Smokestack						
1.515	11	6/13/2023	HWY-SS11-0-1HG	MH0FE2	0-1	0.11 J-
			HWY-SS11-1-6HG	MH0FE3	1-6	0.12 J-
2.0 - 2.5 mi from Smokestack						
2.075	12	6/12/2023	HWY-SS12-0-1HG	MH0FE4	0-1	0.11 J-
			HWY-SS12-1-6HG	MH0FE5	1-6	0.11 J-
2.097	21	6/12/2023	HWY-SS21-0-1HG	MH0FG4	0-1	-- R
			HWY-SS21-1-6HG	MH0FG5	1-6	0.041 J-
2.164	26	6/12/2023	HWY-SS26-0-1HG	MH0FH4	0-1	0.043 J-
			HWY-SS26-1-6HG	MH0FH5	1-6	0.039 J-
2.079	27	6/12/2023	HWY-SS27-0-1HG	MH0FH6	0-1	0.046 J-
			HWY-SS27-1-6HG	MH0FH7	1-6	0.063 J-
2.5 - 3.0+ mi from Smokestack						
2.880	18	6/12/2023	HWY-SS18-0-1HG	MH0FF8	0-1	0.079 J-
			HWY-SS18-1-6HG	MH0FF9	1-6	0.065 J-
2.605	19	6/12/2023	HWY-SS19-0-1HG	MH0FG0	0-1	0.055 J-
			HWY-SS19-1-6HG	MH0FG1	1-6	0.057 J-
3.102	20	6/12/2023	HWY-SS20-0-1HG	MH0FG2	0-1	0.044 J-
			HWY-SS20-1-6HG	MH0FG3	1-6	0.031 J-

Notes:

- No value available
- * Sample material was non-native soils
- ^ Sample material appeared to be tailings
- ^a EPA Regional Screening Level (RSL) for Residential Soil (Target Cancer Risk [TR]=1E-06, Target Hazard Quotient [THQ]=1)
- ^b EPA RSL for Industrial Soil (TR=1E-06, THQ=1.0)
- ^c Background concentration is maximum concentration for the analyte from both depth intervals (0-1-in. bgs and 1-6-in. bgs) for the samples > 1.45 mi from the smokestack. See Appendix A.
- Indicates concentration that exceeds three times background concentration, documenting an observed release
- CAS No. Chemical Abstracts Service Number
- CLP U.S. EPA Contract Laboratory Program
- DUP Field Duplicate
- EPA U.S. Environmental Protection Agency
- in. bgs Inches below ground surface
- J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low
- mg/kg milligram per kilogram
- mi miles
- R The sample result is rejected as unusable based on serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
- SS Surface Soil

Garner Street Soils Letter Report – Final (Revision 3)

Colorado Springs, El Paso County, Colorado

Prepared By: Tetra Tech

Date Prepared: May 13, 2024

Tables

Table 1 Analytical Results Summary (Background Samples)

Table 2 Analytical Results Summary (DU Samples [0 to 1 inch bgs])

Table 3 Analytical Results Summary (DU Samples [1 to 6 inches bgs])

Table 4 Analytical Results Summary (Mercury)

Table 5 Analytical Results Summary (Berm Characterization Samples)

Table 6 Analytical Results Summary (Bioavailability Testing)

Table 7 Analytical Results Summary (Bioavailability Testing – Arsenic)

Table 8 Analytical Results Summary (TCLP Results)

Table 9 Field Precision Evaluation

ENCLOSURE 2: TABLES

Table 1
Analytical Results Summary
(Background Samples)

Analyte	GS-BG01-00-01	GS-BG02-00-01	GS-BG03-00-01	0 to 1 Inch Average ^a	GS-BG01-01-06	GS-BG02-01-06	GS-BG03-01-06	1 to 6 Inch Average ^a	GS-BG01-00-06	GS-BG02-00-06	GS-BG03-00-06	0 to 6 Inch Average ^a
Aluminum	6700	8300	5500	6800	6600	8800	5500	7000	--	--	--	--
Antimony	0.24	0.25	0.21	0.23	0.25	0.24	0.2	0.23	--	--	--	--
Arsenic	11	11	7.1	9.7	10	11	7.4	9.5	--	--	--	--
Barium	96	98	91	95	93	100	84	92	--	--	--	--
Beryllium	0.7	0.65	0.57	0.64	0.68	0.69	0.58	0.65	--	--	--	--
Cadmium	0.39	0.35	0.38	0.37	0.39	0.35	0.29	0.34	--	--	--	--
Calcium	6400	6000	5300	5900	5800	6600	4100	5500	--	--	--	--
Chromium	36	23	15	25	35	46	31	37	--	--	--	--
Cobalt	7	7.1	4.6	6.2	6.9	7.6	4.8	6.4	--	--	--	--
Copper	17	18	12	16	18	20	12	17	--	--	--	--
Iron	17000	17000	12000	15000	17000	18000	13000	16000	--	--	--	--
Lead	36	29	30	32	37	29	22	29	--	--	--	--
Magnesium	3200	3300	1900	2800	3000	3500	1800	2800	--	--	--	--
Manganese	450	390	300	380	430	400	310	380	--	--	--	--
Mercury	--	--	--	--	--	--	--	--	0.014 J-	0.041 J-	0.012 J-	0.022
Nickel	27	22	11	20	26	34	20	27	--	--	--	--
Potassium	2400	2200	2100	2200	2400	2200	1900	2200	--	--	--	--
Selenium	2.7	2	1.8	2.2	2.6	2.1	1.9	2.2	--	--	--	--
Silver	0.09 J	0.085 J	0.063 J	0.08	0.08 J	0.098 J	0.11 U	0.10	--	--	--	--
Sodium	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	--	--	--	--
Thallium	0.17	0.18	0.14	0.16	0.17	0.19	0.14	0.17	--	--	--	--
Vanadium	18	20	17	18	18	21	17	19	--	--	--	--
Zinc	75	72	63	70	77	74	54	68	--	--	--	--

Notes:

All concentrations in milligrams per kilogram (mg/kg)

^a Average concentration calculated from three corresponding background samples, rounded to two significant figures

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

U The analyte was analyzed for, but was not detected above the associated value (reporting limit).

Table 2
Analytical Results Summary
(DU Samples [0 to 1 inch bgs])

Analyte	RBSL ^a	GS-01A-00-01	GS-01B-00-01	GS-01E-00-01	GS-02A-00-01	GS-02B-00-01	GS-02E-00-01	GS-03A-00-01	GS-03B-00-01	GS-03E-00-01	GS-03E-00-01-DUP	GS-03E-00-01-TRI	GS-04A-00-01
Aluminum	77000	7100	8000	6500	7300	8000	7700	7800	7600	8000	7700	7500	7800
Antimony	31	0.69	1	1.2	0.56	0.76	1.2	0.9	0.91	1.2	1.1	1.3	0.57
Arsenic	110 ^b	29	46	54	24	43	47	35	44	44	39	42	29
Barium	15000	160	210	180	170	150	200	180	220	200	210	200	210
Beryllium	160	1	0.7	0.88	0.83	0.76	0.94	0.86	0.75	1	0.99	1	0.77
Cadmium	7.1	1.2	1.7	1.9	1.2	1.5	2.1	1.4	2.2	2.1	2.2	2.3	1.3
Calcium	NE	11000	15000	15000	11000	22000	12000	11000	12000	10000	10000	12000	9500
Chromium	120000	28	14	16	13	13	14	15	14	21	22	21	13
Cobalt	23	5.8	6.7	6.3	5.7	12	8	7.5	8.7	7.2	6.9	7	7.9
Copper	3100	36	47	63	28	41	46	34	60	41	40	39	41
Iron	55000	19000	25000	26000	18000	31000	26000	21000	29000	25000	24000	24000	20000
Lead	336 ^b	110	230	180	91	130	170	120	160	160	170	180	100
Magnesium	NE	4000	3000	4400	3300	4400	3300	3500	2700	3300	3100	3400	3700
Manganese	1800	580	560	850	630	840	790	690	830	720	670	660	620
Nickel	1500	18	23	14	13	29	19	25	21	16	17	15	17
Potassium	NE	3200	2800	2900	3000	2300	3200	3100	2200	3500	3800	3900	3000
Selenium	390	2.3	2.5	2.7	2.1	3.6	2.7	2.2	3.1	2.6	2.6	2.7	1.9
Silver	390	0.78	1.5	1.3	0.59	0.87	1.1	0.83	3.5	1.3	1.5	1.5	0.68
Sodium	NE	150 J+	410	170 J+	120 J+	190 J+	130 J+	140 J+	130 J+	150 J+	140 J+	140 J+	98 U
Thallium	0.78	0.28	0.3	0.31	0.25	0.39	0.34	0.31	0.32	0.32	0.32	0.33	0.27
Vanadium	390	27	34	35	25	34	36	30	34	35	33	34	27
Zinc	23000	320	390	460	310	270	470	420	360	450	420	470	320

Notes:

All concentrations in milligrams per kilogram (mg/kg)

Screening levels are generic levels considered by EPA to be protective for humans over a lifetime. They are not cleanup levels. Soil levels over the screening level mean further study may be appropriate.

bold Indicates concentration that equals or exceeds the RBSL for residential soil

^a The RBSL is the default EPA RSL for residential soil (target risk 1E-06, target hazard quotient 1) except where noted.

^b Site-specific RBSL as documented in Enclosure 3.

bgs Below ground surface

DU Decision unit

EPA Environmental Protection Agency

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.

NE None established

RBSL Risk-based screening level

RSL Regional Screening Level

Table 2
Analytical Results Summary
(DU Samples [0 to 1 inch bgs])

Analyte	RBSL ^a	GS-04A-00-01-DUP	GS-04A-00-01-TRI	GS-04B-00-01	GS-04E-00-01	GS-05A-00-01	GS-05B-00-01	GS-06A-00-01	GS-06B-00-01	GS-06E-00-01	GS-07A-00-01	GS-07A1-00-01	GS-07B-00-01
Aluminum	77000	7500	7700	8100	8100	7100	10000	7300	7500	7800	7400	7500	7100
Antimony	31	0.74	0.69	1.4	0.96	0.67	0.96	0.47	1 J	0.71	0.47	0.35	0.97
Arsenic	110 ^b	28	30	75	46	31	53	19	50 J	37	22	22	56
Barium	15000	180	200	180	250	200	110	190	130	230	200	200	180
Beryllium	160	0.77	0.77	0.95	0.99	0.73	1.2	0.64	0.79	1	0.73	0.59	0.75
Cadmium	7.1	3.1	1.4	9.6	2.2	1.4	16	0.91	23	2.1	1	1	6.6
Calcium	NE	10000	10000	13000	10000	11000	22000	7500	12000	9500	9900	7200	7800
Chromium	120000	12	13	12	18	11	14	9.1	12	13	11	12	11
Cobalt	23	8	7.8	9.8	7.5	6.8	12	6.3	8.2	6.6	8.1	6.4	7.8
Copper	3100	35	36	58	44	31	86	25	41	36	32	30	43
Iron	55000	20000	21000	30000	27000	21000	30000	17000	25000	25000	20000	19000	26000
Lead	336 ^b	94	100	250	180	120	190	61	180	140	80	88	210
Magnesium	NE	3600	3700	6000	3600	4000	4200	2500	6100	2800	3400	2300	3600
Manganese	1800	620	660	2200	740	570	4800	480	2200	660	610	420	1600
Nickel	1500	18	21	19	16	15	42	15	33	16	19	15	20
Potassium	NE	2900	3200	3700	3200	3200	2600	2600	2700	3200	2500	2800	3000
Selenium	390	1.9	1.9	2.7	2.6	1.9	3.3	1.8	2.3	2.5	2	1.7	2.4
Silver	390	0.66	0.7	1.6	1.3	0.79	1.3	0.41	1.4	0.96	0.46	0.47	2
Sodium	NE	100 U	100 J+	500	200 J+	130 J+	310	89 U	1000	200 J+	120 J+	170 J+	230
Thallium	0.78	0.27	0.27	0.41	0.34	0.24	0.38	0.22	0.3	0.31	0.24	0.23	0.33
Vanadium	390	26	28	41	36	28	39	23	34	30	27	26	36
Zinc	23000	340	340	2400	510	360	2900	230	5500	370	290	240	1900

Notes

All concentrations in milligrams per kilogram (mg/kg)

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^b Site-specific RBSL as documented in Enclosure 3.

bgs Below ground surface

DU Decision unit

EPA Environmental Protection Agency

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NE None established

RBSL Risk-based screening level

RSL Regional Screening Level

Table 2
Analytical Results Summary
(DU Samples [0 to 1 inch bgs])

Analyte	RBSL ^a	GS-07E-00-01	GS-08A-00-01	GS-08B-00-01	GS-08E-00-01	GS-09B-00-01	GS-09E-00-01	GS-10B-00-01	GS-11B-00-01	GS-11B-00-01-DUP	GS-11B-00-01-TRI	GS-11D-00-01	GS-12B-00-01
Aluminum	77000	7400	7000	7900	7100	8300	7400	7200	6400	6300	6400	6000	6500
Antimony	31	1.1	0.44	1.1	1.1	1.1	0.9	1.4	1.6	1.8	2	0.9	1.3
Arsenic	110 ^b	54	25	79	48	79	53	99	95	96	96	25	63
Barium	15000	200	190	140	220	250	220	280	270	260	260	160	240
Beryllium	160	1	0.61	0.79	1.1	0.94	1.2	0.83	0.79	0.79	0.79	0.85	0.84
Cadmium	7.1	2.6	1.1	3.7	2.7	5.9	3.7	4.8	4.3	4.2	4.3	1.1	2.5
Calcium	NE	8800	7200	14000	14000	9500	17000	8500	8300	8200	8200	12000	8300
Chromium	120000	13	12	12	16	13	13	14	11	11	12	9.3	12
Cobalt	23	7	5.9	6.8	6.1	7.5	6.2	7.7	6.2	6.2	6.4	4.7	5.7
Copper	3100	47	25	120	47	73	42	64	73	72	74	33	49
Iron	55000	28000	18000	42000	26000	34000	27000	36000	35000	35000	36000	16000	28000
Lead	336 ^b	240	100	440	190	360	260	430	490	490	490	92	340
Magnesium	NE	3000	2500	2700	4400	3200	7000	2900	2600	2600	2700	4200	2500
Manganese	1800	850	490	770	870	1000	1000	1300	960	940	940	510	710
Nickel	1500	16	12	21	15	20	15	16	15	14	14	16	13
Potassium	NE	3200	2400	3000	4200	3200	3000	3400	3100	3100	3100	1800	3300
Selenium	390	2.6	1.6	2.8	2.6	2.8	2.7	2.4	2.4	2.3	2.4	2.1	2.4
Silver	390	1.7	0.72	3	1.3	2.5	1.6	3.2	3.4	3.4	3.4	0.64	2.4
Sodium	NE	170 J+	99 U	490	340	370	110 J+	200 J+	220	220	220	95 U	170 J+
Thallium	0.78	0.35	0.23	0.49	0.33	0.45	0.36	0.5	0.51	0.51	0.51	0.24	0.41
Vanadium	390	34	27	39	34	43	32	46	40	40	40	22	34
Zinc	23000	500	210	820	580	1200	700	1000	910	930	940	470	600

Notes

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bgs Below ground surface

DU Decision unit

EPA Environmental Protection Agency

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NE None established

RBSL Risk-based screening level

RSL Regional Screening Level

Table 2
Analytical Results Summary
(DU Samples [0 to 1 inch bgs])

Analyte	RBSL ^a	GS-12D-00-01	GS-13B-00-01	GS-13D-00-01	GS-14B-00-01	GS-14B-00-01-DUP	GS-14B-00-01-TRI	GS-14D-00-01	GS-15B-00-01	GS-16B-00-01	GS-16B1-00-01	GS-16D-00-01	GS-17B-00-01
Aluminum	77000	9800	6400	7500	6000	6600	6700	5500	5700	6600	7200	7800	6900
Antimony	31	0.87	1.5	1.3 J	1.4	1.4	1.4	0.95 J	1.1	1.1	0.67	0.82	1
Arsenic	110 ^b	37	60	61	68	72	72	42	44	46	35	35	47
Barium	15000	250	200	250	180	200	200	170	150	170	200	180	190
Beryllium	160	1.2	0.67	0.96	0.7	0.71	0.72	0.81	0.57	0.75	0.69	0.71	0.69
Cadmium	7.1	4.3	2.3	2.3	2.3	2.4	2.5	1.6	1.8	1.6	1.1	1.8	1.6
Calcium	NE	14000	11000	20000	9400	8700	8800	31000	7500	9300	10000	12000	15000
Chromium	120000	15	12	16	11	12	12	12	10	11	13	13	13
Cobalt	23	5.2	7	6.8	6.5	7	7.2	5.4	5.6	8	6.5	5.9	8.1
Copper	3100	39	46	55	56	64	60	49	40	42	43	37	41
Iron	55000	31000	28000	29000	29000	34000	35000	21000	22000	25000	19000	22000	24000
Lead	336 ^b	180	290	290	330	450	460	190	200	180	92	150	160
Magnesium	NE	3800	3100	4200	3300	3100	3200	6500	2300	3100	2900	3600	3400
Manganese	1800	820	730	690	750	780	800	630	570	680	520	560	700
Nickel	1500	29	17	19	18	29	25	19	14	20	17	18	20
Potassium	NE	3400	3300	3000	3200	3000	3000	2100	2500	2600	2700	3300	2900
Selenium	390	4.6	2.1	2.6	2.2	2.5	2.6	1.8	1.8	2.5	2.1	2	2.3
Silver	390	1.2	1.9	2	2.4	3	3	1.3 J	1.4	1.3	0.68	1.1	1.1
Sodium	NE	210 J+	160 J+	250	180 J+	200 J+	200 J+	260	160 J+	170 J+	240	620	190 J+
Thallium	0.78	0.44	0.35	0.38	0.38	0.45	0.45	0.28	0.27	0.31	0.23	0.28	0.29
Vanadium	390	33	38	35	35	36	36	27	30	31	27	32	33
Zinc	23000	420	630	520	530	520	520	450	450	390	290	340	350

Notes

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bgs Below ground surface

DU Decision unit

EPA Environmental Protection Agency

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NE None established

RBSL Risk-based screening level

RSL Regional Screening Level

Table 2
Analytical Results Summary
(DU Samples [0 to 1 inch bgs])

Analyte	RBSL ^a	GS-17D-00-01	GS-18B-00-01	GS-18D-00-01	GS-19B-00-01	GS-20B-00-01	GS-20D-00-01	GS-21D-00-01	GS-22D-00-01	GS-23D-00-01	GS-24D-00-01	GS-25D-00-01	GS-26D-00-01
Aluminum	77000	7500	7100	7000	7100	6900	7800	7700	7300	7700	7000	6800	7300
Antimony	31	1.2	1.2	1.1	1.4	0.54	1.1	1.4	1.2	1.5	1.1	1.2	1
Arsenic	110 ^b	44	32	43	49	24	48	65	49	58	48	50	47
Barium	15000	210	180	190	180	170	210	220	190	190	190	200	190
Beryllium	160	0.87	0.73	0.72	0.77	0.63	0.76	0.77	0.7	0.75	0.74	0.82	0.85
Cadmium	7.1	2.3	1.1	1.9	1.9	1.2	2.5	2.9	1.8	1.4	2	2.2	2
Calcium	NE	15000	11000	12000	10000	6900	13000	8900	13000	14000	13000	14000	13000
Chromium	120000	13	13	11	14	8.7	24	13	14	13	13	12	14
Cobalt	23	8.1	6.7	6.6	7.9	6	8.2	8.4	8.6	11	7.9	7.7	7
Copper	3100	44	32	34	48	24	46	47	53	42	46	45	66
Iron	55000	26000	21000	23000	27000	17000	29000	32000	27000	31000	25000	26000	24000
Lead	336 ^b	160	110	170	190	85	200	640	160	260	140	200	190
Magnesium	NE	4500	2900	4000	3000	2200	3500	2900	4000	4400	3400	4200	3900
Manganese	1800	810	530	690	680	480	940	930	800	840	790	840	760
Nickel	1500	19	18	15	22	14	46	23	18	23	18	19	16
Potassium	NE	3300	2300	2600	2600	2100	2300	2900	3300	2200	2600	3700	3200
Selenium	390	2.8	2.3	2.3	2.6	1.7	2.6	2.6	2.4	2.7	2.5	2.3	2.2
Silver	390	1.4	0.87	1.3	1.2	0.83	1.4	1.8	1.3	1.6	1.2	1.3	1.2
Sodium	NE	210 J+	120 J+	120 J+	170 J+	90 U	170 J+	180 J+	570	240	130 J+	300	440
Thallium	0.78	0.34	0.26	0.29	0.31	0.23	0.33	0.36	0.31	0.36	0.32	0.32	0.31
Vanadium	390	33	28	31	34	25	34	36	35	39	34	34	32
Zinc	23000	420	260	380	430	200	470	540	460	280	510	410	500

Notes

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RBSL Risk-based screening level

RSL Regional Screening Level

Table 2
Analytical Results Summary
(DU Samples [0 to 1 inch bgs])

Analyte	RBSL ^a	GS-27D-00-01	GS-28D-00-01	GS-29A4-00-01	GS-29A5-00-01	GS-29D-00-01	GS-29D-00-01-DUP	GS-29D-00-01-TRI	GS-30A-00-01	GS-31A-00-01	GS-32A-00-01	GS-33A-00-01	GS-34A-00-01
Aluminum	77000	7300	6800	5400	4900	7200	7200	7300	5600	5400	5900	7200	6200
Antimony	31	0.69	1.2	2	2.2	1.6	1.6	1.7	2.2	2.1	1.7	1.1	1.7
Arsenic	110 ^b	30	49	94	95	75	75	78	92	100	88	83	89
Barium	15000	200	170	190	160	190	190	180	160	200	200	260	190
Beryllium	160	0.72	1.1	0.86	0.65	1.4	1.4	1.3	0.66	0.75	0.7	0.75	0.71
Cadmium	7.1	1.4	2.2	1.6	2.5	4.4	4.4	4.3	2.3	3	2	2.5	2.6
Calcium	NE	9500	9300	14000	7200	9800	10000	10000	7100	5900	6900	9600	6300
Chromium	120000	11	13	28	11	13	13	13	17	20	20	24	21
Cobalt	23	6.8	6	6.5	6.5	6.9	7	7.2	7.3	6	7.2	8.9	7.3
Copper	3100	27	39	61	61	50	50	52	59	69	65	55	64
Iron	55000	20000	23000	38000	37000	30000	31000	31000	38000	38000	38000	37000	40000
Lead	336 ^b	110	180	550	500	370	370	370	480	500	440	390	450
Magnesium	NE	2700	2800	4700	2100	3700	3800	3800	2300	2000	2200	2900	2100
Manganese	1800	520	760	590	650	1100	1100	1100	760	740	660	850	710
Nickel	1500	13	15	20	12	16	15	16	17	12	17	23	18
Potassium	NE	2900	2800	2700	2600	3300	3300	3300	3100	3300	2900	2900	3000
Selenium	390	2.1	2.4	2.1	2.1	2.5	2.5	2.4	2.2	2.1	2.4	2.6	2.5
Silver	390	0.77	1.3	3.6	3.3	2.4	2.5	2.5	3.2	3.7	3.3	2.7	3.1
Sodium	NE	340	240	260	210 J+	210	220	220	270	190 J+	280	260	230
Thallium	0.78	0.25	0.34	0.52	0.47	0.42	0.43	0.42	0.48	0.51	0.47	0.47	0.49
Vanadium	390	27	33	37	38	38	38	39	41	41	37	39	37
Zinc	23000	270	430	370	460	760	780	770	450	550	450	480	540

Notes

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RBSL Risk-based screening level

RSL Regional Screening Level

Table 2
Analytical Results Summary
(DU Samples [0 to 1 inch bgs])

Analyte	RBSL ^a	GS-35A-00-01	GS-36A-00-01	GS-37A-00-01	GS-38A-00-01	GS-39A-00-01	GS-40A-00-01	GS-40A1-00-01	GS-40A1-00-01-DUP	GS-40A1-00-01-TRI	GS-40A2-00-01	GS-41A-00-01	GS-42A-00-01
Aluminum	77000	6800	6800	7700	8400	9400	8700	7500	7600	7400	7800	8900	8500
Antimony	31	1.4	1.7	1.1	0.71	1.3	1.2	0.59	0.63	0.58	0.59	0.51	0.52
Arsenic	110 ^b	74	96	61	50	84	64	36	38	34	34	35	29
Barium	15000	230	220	210	170	220	180	180	180	190	180	190	170
Beryllium	160	0.77	0.82	0.83	0.94	0.96	0.81	0.69	0.72	0.69	0.8	0.78	0.8
Cadmium	7.1	2.3	3	3.4	6	7.6	4.8	1.3	1.6	1.3	1.4	1.5	1.1
Calcium	NE	7300	8100	8200	13000	13000	17000	11000	10000	9700	12000	13000	15000
Chromium	120000	27	20	22	28	22	21	16	18	18	28	41	38
Cobalt	23	7.7	7.7	8.4	8.4	10	12	9.3	9.5	8.6	10	12	13
Copper	3100	52	57	48	55	72	54	36	37	33	39	40	39
Iron	55000	34000	36000	29000	30000	33000	36000	25000	25000	24000	28000	31000	30000
Lead	336 ^b	320	350	240	160	250	190	95	100	92	71	77	60
Magnesium	NE	2300	2500	2600	3800	4000	3800	3400	3500	3200	4200	4500	4500
Manganese	1800	750	900	1100	1000	1200	1100	640	670	600	670	660	740
Nickel	1500	22	18	21	24	25	28	20	22	20	28	36	35
Potassium	NE	3500	3300	3000	3000	3400	2900	2400	2500	2400	2600	2500	2400
Selenium	390	2.6	2.6	2.7	3.6	3	3.2	2.9	3	2.8	3.3	3.6	3.6
Silver	390	2.6	2.7	1.9	1.2	2	1.4	0.76	1.1	0.84	0.6	0.7	0.46
Sodium	NE	220	180 J+	190 J+	370	370	270	330	380	300	440	300	200 J+
Thallium	0.78	0.45	0.5	0.41	0.36	0.44	0.43	0.3	0.31	0.29	0.34	0.36	0.33
Vanadium	390	37	44	36	33	41	38	28	28	28	30	33	30
Zinc	23000	440	550	550	1200	1600	690	230	260	230	240	210	180

Notes

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RBSL Risk-based screening level

RSL Regional Screening Level

Table 2
Analytical Results Summary
(DU Samples [0 to 1 inch bgs])

Analyte	RBSL ^a	GS-43A-00-01	GS-44A-00-01	GS-45A-00-01	GS-46A-00-01	GS-47A-00-01	GS-HOUSE-00-01	GS-VACANT-00-01	GS-CA01-00-01	GS-CA02-00-01	GS-CA03-00-01	GS-CA04-00-01	GS-CA04-00-01-DUP
Aluminum	77000	8500	6800	7100	7900	7000	8100	8600	6100	7900	6900	6100	5900
Antimony	31	0.42 J	0.44	0.65	0.61	0.67	1.1	1.1	1.5	1.1	1.3	1.5	1.7
Arsenic	110 ^b	29	21	32	31	27	49	60	64	51	62	73	84
Barium	15000	170	190	190	200	180	210	210	150	170	170	170	160
Beryllium	160	0.75	0.66	0.72	0.79	0.75	0.84	0.98	0.81	0.76	0.83	0.72	0.73
Cadmium	7.1	1.2	0.83	1.3	1.4	1.2	2.2	2.3	1.8	1.7	2.1	2.5	2.7
Calcium	NE	13000	11000	7800	12000	16000	9100	10000	9200	15000	20000	13000	12000
Chromium	120000	15	22	13	19	32	21	33	13	14	16	19	19
Cobalt	23	14	7	9.7	12	7.1	7.7	8.6	9.1	12	10	8.1	7.4
Copper	3100	40	26	45	43	30	40	40	52	44	240	46	48
Iron	55000	29000	19000	24000	27000	19000	26000	30000	32000	34000	31000	29000	31000
Lead	336 ^b	53	50	86	84	94	210	210	290	160	230	250	310
Magnesium	NE	4300	3200	3200	4400	5700	2800	3700	2900	3600	5200	3600	3600
Manganese	1800	730	480	580	780	570	850	870	740	850	870	880	880
Nickel	1500	29	20	21	26	23	18	29	17	25	23	20	18
Potassium	NE	2200	1900	2900	2400	2100	4600	3000	2800	4000	2400	2800	3000
Selenium	390	3.9	2.1	3	3.1	2.2	2.7	3.2	2.9	3.8	2.9	2.5	2.5
Silver	390	0.39	0.45	0.67	0.62	0.63	1.3	1.6	2	1.1	1.6	2.1	2.3
Sodium	NE	220	170 J+	550	390	160 J+	170 J+	120 J+	160 J+	170 J+	180 J+	150 J+	160 J+
Thallium	0.78	0.33	0.22	0.31	0.34	0.27	0.34	0.45	0.4	0.4	0.39	0.4	0.41
Vanadium	390	29	25	27	29	27	37	35	35	37	38	42	43
Zinc	23000	170	160	260	250	230	410	390	370	290	500	510	560

Notes

All concentrations in milligrams per kilogram (mg/kg)

Screening levels are generic levels considered by EPA to be protective for humans over a lifetime. They are not cleanup levels. Soil levels over the screening level mean further study may be appropriate.

bold Indicates concentration that equals or exceeds the RBSL for residential soil

^a The RBSL is the default EPA RSL for residential soil (target risk 1E-06, target hazard quotient 1) except where noted.

^b Site-specific RBSL as documented in Enclosure 3.

bgs Below ground surface

DU Decision unit

EPA Environmental Protection Agency

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.

NE None established

RBSL Risk-based screening level

RSL Regional Screening Level

Table 2
Analytical Results Summary
(DU Samples [0 to 1 inch bgs])

Analyte	RBSL ^a	GS-CA04-00-01-TRI	GS-CA05-00-01	GS-CA06-00-01	GS-CA07-00-01	GS-CA08-00-01	GS-CA09-00-01	GS-CA10-00-01	GS-CA11-00-01	GS-CA12-00-01	GS-CA12-00-01-DUP	GS-CA12-00-01-TRI	GS-CA13-00-01
Aluminum	77000	5800	6600	7500	6700	7400	7000	8000	7300	7600	7400	7300	8200
Antimony	31	1.7	1.3	1.3	0.52	0.91	0.93	0.87	1.1 J	1.2	1.2	1.3	0.77
Arsenic	110 ^b	84	69	69	23	44	51	48	54	69	59	68	43
Barium	15000	170	170	190	180	180	200	210	190	160	170	160	200
Beryllium	160	0.74	0.73	0.74	0.66	0.77	0.8	0.75	0.72	0.78	0.78	0.77	0.88
Cadmium	7.1	2.5	2.2	2.1	0.79	1.7	1.8	1.8	1.7	2.4	1.8	2.3	1.5
Calcium	NE	12000	15000	11000	15000	22000	16000	13000	13000	12000	16000	13000	16000
Chromium	120000	16	19	15	17	12	12	12	12	13	13	13	14
Cobalt	23	7.1	8.7	9.8	6.1	8.3	8.8	12	11	11	11	10	9.6
Copper	3100	48	47	44	23	37	41	41	44	49	43	48	41
Iron	55000	28000	30000	32000	18000	26000	27000	31000	31000	31000	30000	30000	27000
Lead	336 ^b	270	230	190	74	160	180	160	200	210	180	190	130
Magnesium	NE	3700	4800	3800	5200	5100	5100	4200	4000	4600	5200	4700	5200
Manganese	1800	900	820	870	500	760	810	870	870	980	860	950	800
Nickel	1500	16	22	21	15	20	20	25	22	22	24	21	21
Potassium	NE	3000	2700	3300	2600	2900	3000	2700	2900	3000	2700	3000	2900
Selenium	390	2.4	2.8	3.2	2.1	2.6	2.5	2.8	3.1	2.9	2.9	2.8	2.8
Silver	390	2	1.8	1.6	0.49	1.2	1.3	1.3	1.5	1.6	1.3	1.5	0.93
Sodium	NE	160 J+	200 J+	160 J+	99 U	150 J+	120 J+	140 J+	150 J+	160 J+	170 J+	150 J+	140 J+
Thallium	0.78	0.41	0.39	0.39	0.22	0.34	0.36	0.39	0.38	0.39	0.37	0.37	0.33
Vanadium	390	43	41	41	26	33	33	33	35	39	38	39	34
Zinc	23000	520	390	390	190	280	340	300	310	400	330	390	300

Notes

All concentrations in milligrams per kilogram (mg/kg)

Screening levels are generic levels considered by EPA to be protective for humans over a lifetime. They are not cleanup levels. Soil levels over the screening level mean further study may be appropriate.

bold Indicates concentration that equals or exceeds the RBSL for residential soil

^a The RBSL is the default EPA RSL for residential soil (target risk 1E-06, target hazard quotient 1) except where noted.

^b Site-specific RBSL as documented in Enclosure 3.

bgs Below ground surface

DU Decision unit

EPA Environmental Protection Agency

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.

NE None established

RBSL Risk-based screening level

RSL Regional Screening Level

Table 2
Analytical Results Summary
(DU Samples [0 to 1 inch bgs])

Analyte	RBSL^a	GS-CA13- 00-01-DUP	GS-CA13- 00-01-TRI	GS-CA14- 00-01	GS-CA14- 00-01-DUP	GS-CA14- 00-01-TRI
Aluminum	77000	7100	7400	6500	7500	6800
Antimony	31	0.75	1.2	0.45	0.53	0.57
Arsenic	110 ^b	42	70	52	27	59
Barium	15000	150	160	150	180	160
Beryllium	160	0.76	0.78	0.66	0.81	0.66
Cadmium	7.1	1.4	2.3	0.76	0.83	0.83
Calcium	NE	17000	14000	8000	12000	8500
Chromium	120000	18	14	22	14	23
Cobalt	23	8.4	8.7	5.2	6.7	5.5
Copper	3100	41	45	22	25	23
Iron	55000	25000	28000	14000	19000	15000
Lead	336 ^b	130	190	68	68	75
Magnesium	NE	4800	4300	2600	4300	2800
Manganese	1800	700	870	370	520	400
Nickel	1500	20	20	11 J+	15	11 J+
Potassium	NE	2400	2500	2300	2700	2300
Selenium	390	2.5	2.7	2.1	2.4	2
Silver	390	0.98	1.5	0.35	0.42	0.39
Sodium	NE	160 J+	160 J+	100 U	100 U	100 U
Thallium	0.78	0.31	0.36	0.2	0.25	0.2
Vanadium	390	33	38	21	25	23
Zinc	23000	330	470	120	160	140

Notes

All concentrations in milligrams per kilogram (mg/kg)

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^b Site-specific RBSL as documented in Enclosure 3.

bgs Below ground surface

DU Decision unit

EPA Environmental Protection Agency

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NE None established

RBSL Risk-based screening level

RSL Regional Screening Level

Table 3
Analytical Results Summary
(DU Samples [1 to 6 inches bgs])

Analyte	RBSL ^a	GS-01A-01-06	GS-01B-01-06	GS-01E-01-06	GS-02A-01-06	GS-02B-01-06	GS-02E-01-06	GS-03A-01-06	GS-03B-01-06	GS-03E-01-06	GS-03E-01-06-DUP	GS-03E-01-06-TRI	GS-04A-01-06
Aluminum	77000	6800	9100	7100	7900	7400	7500	8900	8400	8400	8900	8800	8100
Antimony	31	0.62	0.51	0.99	0.55	0.67	1.8	0.95	1.1	1.3	0.92	1	0.54
Arsenic	110 ^b	24	25	45	26	37	79	41	56	44	43	48	26
Barium	15000	150	230	180	180	110	160	240	210	220	240	330	240
Beryllium	160	1	0.84	1	1.1	0.83	0.97	0.98	0.84	1.2	1.2	1.2	0.8
Cadmium	7.1	1.1	1.1	2	1.4	1.2	2.7	1.3	3.1	2.7	2.5	2.9	2
Calcium	NE	11000	11000	18000	11000	23000	16000	11000	13000	12000	10000	13000	9600
Chromium	120000	23	11	13	16	11	13	23	13	28	23	24	12
Cobalt	23	5.6	7.5	6.7	6.6	12	8.6	9.2	10	6.9	7.4	8.7	9.9
Copper	3100	33	33	40	30	37	46	40	55	47	45	53	33
Iron	55000	18000	25000	25000	20000	29000	33000	26000	34000	25000	27000	28000	25000
Lead	336 ^b	97	110	180	110	110	280	120	240	210	190	270	79
Magnesium	NE	3900	3100	6000	3900	4000	2900	4200	3000	4000	3700	4800	3900
Manganese	1800	540	610	900	690	740	1100	790	1100	770	760	870	710
Nickel	1500	18	46	23	15	28	22	140	24	26	31	27	35
Potassium	NE	2700	2500	2400	3000	2100	2700	2500	2400	2900	3100	3200	2300
Selenium	390	2.2	3.1	2.9	2.4	3.8	2.9	2.7	3.5	2.9	2.8	3.1	2.3
Silver	390	0.65	0.65	1.2	0.58	0.75	1.9	1	2.6	2.9	1.9	2.3	0.47
Sodium	NE	130 J+	280	140 J+	120 J+	200 J+	130 J+	150 J+	150 J+	130 J+	160 J+	170 J+	140 J+
Thallium	0.78	0.26	0.26	0.33	0.28	0.32	0.41	0.33	0.41	0.34	0.32	0.36	0.28
Vanadium	390	25	31	30	26	31	41	34	37	36	40	36	27
Zinc	23000	230	230	390	320	220	480	260	600	490	490	570	200

Notes:

All concentrations in milligrams per kilogram (mg/kg)

Screening levels are generic levels considered by EPA to be protective for humans over a lifetime. They are not cleanup levels. Soil levels over the screening level mean further study may be appropriate.

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^b Site-specific RBSL as documented in Enclosure 3.

bgs Below ground surface

DU Decision unit

EPA Environmental Protection Agency

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J+ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.

NE None established

RBSL Risk-based screening level

RSL Regional Screening Level

Table 3
Analytical Results Summary
(DU Samples [1 to 6 inches bgs])

Analyte	RBSL ^a	GS-04A-01-06-DUP	GS-04A-01-06-TRI	GS-04B-01-06	GS-04E-01-06	GS-05A-01-06	GS-05B-01-06	GS-06A-01-06	GS-06B-01-06	GS-06E-01-06	GS-07A-01-06	GS-07A1-01-06	GS-07B-01-06
Aluminum	77000	8800	8600	8200	8300	8100	9900	8700	8700	8200	7900	7900	8400
Antimony	31	0.54	0.44	1	1.1	0.49	1.2	0.39	0.65 J	1.2	0.34	0.29	0.94
Arsenic	110 ^b	27	27	55	44	24	55	17	56	70	19	18	60
Barium	15000	250	250	160	240	210	150	210	130	310	200	180	140
Beryllium	160	0.88	0.88	1.1	1.2	0.81	1	0.86	0.96	1.2	0.75	0.59	0.98
Cadmium	7.1	1.3	1.2	9.4	2.4	1.1	11	0.77	21	2.7	0.9	0.71	16
Calcium	NE	11000	11000	32000	8800	10000	13000	7300	22000	7500	11000	6000	21000
Chromium	120000	12	13	12	16	11	15	11	14	14	11	11	12
Cobalt	23	11	11	12	8.8	8.1	11	7.5	10	9.6	7.9	6.4	12
Copper	3100	36	38	62	42	32	76	27	52	44	30	26	56
Iron	55000	26000	24000	28000	29000	21000	29000	20000	29000	35000	21000	18000	30000
Lead	336 ^b	70	76	220	190	100	190	60	220	260	77	63	250
Magnesium	NE	4500	4600	5800	3400	4200	4600	3000	5700	2900	3400	2200	4400
Manganese	1800	770	760	3100	900	550	2800	480	4000	1000	590	400	3600
Nickel	1500	52	50	36	27	49	25	63	40	25	46	30	35
Potassium	NE	2300	2400	2800	2900	2300	2900	2300	2400	2700	2100	2200	2500
Selenium	390	2.6	2.5	3.2	3.3	2.1	2.9	2.3	2.8	3.5	2.1	1.7	2.6
Silver	390	0.43	0.53	1.5	1.3	0.57	1.3	0.3	1.4	1.9	0.43	0.37	1.8
Sodium	NE	150 J+	140 J+	350	160 J+	120 J+	510	110 J+	440	150 J+	120 J+	240	240
Thallium	0.78	0.32	0.3	0.37	0.36	0.26	0.34	0.26	0.31	0.4	0.24	0.22	0.38
Vanadium	390	28	28	36	34	25	40	25	35	39	27	25	38
Zinc	23000	200	220	1700	480	200	2600	180	5100	400	210	160	3700

Notes

All concentrations in milligrams per kilogram (mg/kg)

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^b Site-specific RBSL as documented in Enclosure 3.

bgs Below ground surface

DU Decision unit

EPA Environmental Protection Agency

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NE None established

RBSL Risk-based screening level

RSL Regional Screening Level

Table 3
Analytical Results Summary
(DU Samples [1 to 6 inches bgs])

Analyte	RBSL ^a	GS-07E-01-06	GS-08A-01-06	GS-08B-01-06	GS-08E-01-06	GS-09B-01-06	GS-09E-01-06	GS-10B-01-06	GS-11B-01-06	GS-11B-01-06-DUP	GS-11B-01-06-TRI	GS-11D-01-06	GS-12B-01-06
Aluminum	77000	7500	7700	11000	8200	8200	7500	7400	7500	7300	7100	6400	6900
Antimony	31	1.9	0.25	1.7	1.3	1.1	1.3	1.6	2.1	1.5	2.1	1.1	1.4
Arsenic	110 ^b	110	15	97	68	99	79	110	120	110	110	33	92
Barium	15000	290	200	130	280	270	260	270	290	310	290	180	290
Beryllium	160	0.96	0.55	1	1.3	0.93	1.4	1	0.97	0.93	0.92	1	0.84
Cadmium	7.1	2.8	0.64	7	2.6	5.1	4.6	6.5	5.2	5	5.1	1.5	3.2
Calcium	NE	7500	5800	22000	8900	7500	21000	8600	8700	8500	8500	19000	7900
Chromium	120000	14	9.9	14	15	13	15	12	12	12	11	11	12
Cobalt	23	8.6	5.5	7.9	7.7	10	6.5	7.2	6.8	6.7	6.6	5.2	6.2
Copper	3100	55	18	88	41	83	53	86	87	90	84	37	64
Iron	55000	41000	17000	41000	32000	38000	34000	45000	44000	43000	43000	20000	39000
Lead	336 ^b	430	54	460	240	460	380	580	610	590	600	150	570
Magnesium	NE	2900	2300	2700	3600	2900	8900	2800	3200	3100	3100	6800	2700
Manganese	1800	1200	370	1800	980	1400	1300	1500	1100	1000	1000	620	860
Nickel	1500	21	31	35	25	36	18	35	45	47	48	29	30
Potassium	NE	2700	1800	3000	3400	2900	2800	3300	3200	3100	3100	1900	3100
Selenium	390	3.3	1.6	3	3.2	2.7	2.9	2.9	3	2.7	2.9	2.4	2.6
Silver	390	3.2	0.37	3.2	1.8	3.3	2.6	4.3	4.5	4.3	4.3	2.1	4.1
Sodium	NE	130 J+	100 U	400	210 J+	270	120 j+	260	290	280	280	130 J+	240
Thallium	0.78	0.43	0.2	0.5	0.4	0.52	0.39	0.59	0.62	0.59	0.58	0.28	0.55
Vanadium	390	45	25	49	40	45	35	43	43	43	42	27	40
Zinc	23000	530	120	1500	470	950	760	1300	1100	1000	1100	400	680

Notes

All concentrations in milligrams per kilogram (mg/kg)

Screening levels are generic levels considered by EPA to be protective for humans over a lifetime. They are not cleanup levels. Soil levels over the screening level mean further study may be appropriate.

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^b Site-specific RBSL as documented in Enclosure 3.

bgs Below ground surface

DU Decision unit

EPA Environmental Protection Agency

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NE None established

RBSL Risk-based screening level

RSL Regional Screening Level

Table 3
Analytical Results Summary
(DU Samples [1 to 6 inches bgs])

Analyte	RBSL ^a	GS-12D-01-06	GS-13B-01-06	GS-13D-01-06	GS-14B-01-06	GS-14B-01-06-DUP	GS-14B-01-06-TRI	GS-14D-01-06	GS-15B-01-06	GS-16B-01-06	GS-16B1-01-06	GS-16D-01-06	GS-17B-01-06
Aluminum	77000	8300	7200	7300	6800	6800	6600	6300	7700	7800	7900	8600	8400
Antimony	31	1	1	1 J	1.4	1.4	1.4	0.88 J	1.2	1.2	0.5	0.85	0.8
Arsenic	110 ^b	43	72	52	72	73	71	42	56	65	24	37	42
Barium	15000	240	290	200	210	200	210	170	200	210	210	210	240
Beryllium	160	1.1	0.74	1.2	0.74	0.74	0.73	0.97	0.76	0.85	0.75	0.8	0.81
Cadmium	7.1	2.7	2.8	2	2.5	2.4	2.5	1.7	4.3	2	1.2	1.8	1.5
Calcium	NE	14000	8800	13000	9000	8900	8800	22000	11000	11000	7900	14000	14000
Chromium	120000	14	12	14	12	12	12	12	12	14	9.3	11	15
Cobalt	23	6.5	7.8	7.1	7.2	7.2	7.1	5.9	8.7	9.7	7.4	6.6	10
Copper	3100	45	60	45	57	59	57	40	46	49	31	42	44
Iron	55000	27000	37000	29000	35000	35000	35000	24000	28000	34000	20000	25000	29000
Lead	336 ^b	240	490	230	460	460	460	200	220	250	79	180	150
Magnesium	NE	4700	3400	3800	3300	3200	3200	6000	3900	3700	2800	4000	4200
Manganese	1800	720	890	800	790	780	790	640	1400	930	510	630	750
Nickel	1500	35	72	23	28	29	28	26	27	42	25	35	35
Potassium	NE	3000	3200	2600	3000	3000	3000	2200	2400	2700	2000	2800	2300
Selenium	390	2.9	2.4	2.9	2.6	2.6	2.5	2.2	2.6	3.2	2.3	2.4	3.1
Silver	390	2.4	3.1	1.5	2.9	3	3.1	1.4	1.6	1.8	0.53	1.1	1
Sodium	NE	220	180 J+	170 J+	200 J+	200 J+	200 J+	160 J+	170 J+	170 J+	160 J+	570	180 J+
Thallium	0.78	0.38	0.47	0.38	0.44	0.46	0.45	0.31	0.35	0.37	0.23	0.31	0.32
Vanadium	390	35	40	31	37	36	36	26	37	38	25	35	36
Zinc	23000	370	590	400	510	510	510	340	880	400	260	320	290

Notes

All concentrations in milligrams per kilogram (mg/kg)

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bgs Below ground surface

DU Decision unit

EPA Environmental Protection Agency

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NE None established

RBSL Risk-based screening level

RSL Regional Screening Level

Table 3
Analytical Results Summary
(DU Samples [1 to 6 inches bgs])

Analyte	RBSL ^a	GS-17D-01-06	GS-18B-01-06	GS-18D-01-06	GS-19B-01-06	GS-20B-01-06	GS-20D-01-06	GS-21D-01-06	GS-22D-01-06	GS-23D-01-06	GS-24D-01-06	GS-25D-01-06	GS-26D-01-06
Aluminum	77000	9600	8100	7800	7500	7700	6900	6900	8000	8400	7900	7700	7000
Antimony	31	1.4	0.84	0.78	0.67	0.69	0.78	2.6	1.2	1	1.2	1.2	1
Arsenic	110 ^b	55	36	28	30	33	34	140	47	48	46	58	46
Barium	15000	270	230	200	190	200	190	260	210	170	200	200	180
Beryllium	160	1.1	0.83	0.97	0.85	0.79	0.73	0.66	0.78	0.83	0.9	0.95	0.87
Cadmium	7.1	2.6	1.5	2	1.3	1.8	1.6	2.5	2.1	2.7	2.3	2.5	2.3
Calcium	NE	20000	11000	12000	10000	8200	11000	7100	11000	17000	11000	16000	14000
Chromium	120000	17	15	11	11	9.8	14	12	12	13	13	12	11
Cobalt	23	9.9	9.7	5.9	8.6	7.4	6.6	8.1	9.4	11	8.2	8.5	6.6
Copper	3100	56	37	31	41	33	31	57	45	45	42	44	47
Iron	55000	34000	27000	22000	25000	23000	22000	46000	29000	31000	28000	31000	25000
Lead	336 ^b	210	120	130	110	130	120	500	180	190	180	240	200
Magnesium	NE	5700	3900	4400	4200	3300	3800	2700	3500	5100	3900	5800	4700
Manganese	1800	1000	740	640	600	700	720	1100	850	1000	840	980	850
Nickel	1500	37	40	37	44	34	24	26	23	27	28	25	21
Potassium	NE	3100	2100	1800	1900	1900	1700	2700	2600	2100	2600	3100	2300
Selenium	390	3.5	2.9	2.7	2.9	2.3	2.3	3	2.8	3.1	3	2.8	2.3
Silver	390	1.6	0.89	0.88	0.73	0.9	0.89	3.9	1.2	1.3	1.2	1.6	1.4
Sodium	NE	200 J+	160 J+	160 J+	140 J+	110 J+	140 J+	180 J+	180 J+	160 J+	120 J+	240	250
Thallium	0.78	0.42	0.32	0.28	0.28	0.28	0.26	0.48	0.33	0.35	0.35	0.37	0.31
Vanadium	390	42	32	26	27	28	27	48	36	36	33	36	31
Zinc	23000	470	270	320	230	260	280	520	410	380	440	410	590

Notes

All concentrations in milligrams per kilogram (mg/kg)

Screening levels are generic levels considered by EPA to be protective for humans over a lifetime. They are not cleanup levels. Soil levels over the screening level mean further study may be appropriate.

bold Indicates concentration that equals or exceeds the RBSL for residential soil

^a The RBSL is the default EPA RSL for residential soil (target risk 1E-06, target hazard quotient 1) except where noted.

^b Site-specific RBSL as documented in Enclosure 3.

bgs Below ground surface

DU Decision unit

EPA Environmental Protection Agency

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.

NE None established

RBSL Risk-based screening level

RSL Regional Screening Level

Table 3
Analytical Results Summary
(DU Samples [1 to 6 inches bgs])

Analyte	RBSL ^a	GS-27D-01-06	GS-28D-01-06	GS-29A4-01-06	GS-29A5-01-06	GS-29D-01-06	GS-29D-01-06-DUP	GS-29D-01-06-TRI	GS-30A-01-06	GS-31A-01-06	GS-32A-01-06	GS-33A-01-06	GS-34A-01-06
Aluminum	77000	7600	7700	4400	4100	8600	8700	9100	4500	5200	5300	6900	6800
Antimony	31	0.65	1.3	2.4	2.6	1.8	1.8	1.7	1.8	2	1.9	1.6	1.4
Arsenic	110 ^b	33	58	100	110	79	78	79	110	100	96	96	77
Barium	15000	190	180	160	170	220	220	250	190	220	210	220	180
Beryllium	160	0.79	1.5	0.78	0.55	1.7	1.8	1.8	0.5	0.67	0.6	0.75	0.73
Cadmium	7.1	1.5	2.5	1.8	2	3.8	3.8	3.9	1.9	2.2	1.9	2.9	3.4
Calcium	NE	11000	9200	16000	7600	8100	8100	8200	7500	4500	6000	7800	6700
Chromium	120000	10	14	27	19	14	14	15	16	9.9	19	18	20
Cobalt	23	6.1	6.6	5.8	5.6	7.3	7.3	7.6	6	4.8	5.4	9	8.7
Copper	3100	26	39	66	70	43	48	46	77	75	71	60	57
Iron	55000	22000	26000	40000	42000	30000	30000	31000	46000	43000	42000	41000	39000
Lead	336 ^b	130	200	610	700	280	280	290	650	650	570	450	410
Magnesium	NE	2500	3200	4800	2000	3300	3400	3400	1700	1500	1700	2400	2300
Manganese	1800	640	880	560	560	1100	1100	1200	580	520	450	880	770
Nickel	1500	16	19	19	16	26	25	23	15	20	14	20	20
Potassium	NE	2100	2600	2400	2600	3000	3000	3100	2900	3100	2700	2900	2700
Selenium	390	2.1	2.6	2	2	2.9	2.9	3	2.1	2.4	2.4	2.7	2.8
Silver	390	0.95	1.3	4.1	4.4	2	2	2.2	4.2	4.5	4.1	3.3	2.8
Sodium	NE	280	240	250	240	160 J+	170 J+	170 J+	280	220	260	260	240
Thallium	0.78	0.24	0.37	0.51	0.54	0.45	0.44	0.45	0.53	0.57	0.52	0.54	0.47
Vanadium	390	26	37	37	38	45	45	47	39	38	36	40	35
Zinc	23000	260	430	390	420	590	600	620	460	470	420	500	520

Notes

All concentrations in milligrams per kilogram (mg/kg)

Screening levels are generic levels considered by EPA to be protective for humans over a lifetime. They are not cleanup levels. Soil levels over the screening level mean further study may be appropriate.

bold Indicates concentration that equals or exceeds the RBSL for residential soil

^a The RBSL is the default EPA RSL for residential soil (target risk 1E-06, target hazard quotient 1) except where noted.

^b Site-specific RBSL as documented in Enclosure 3.

bgs Below ground surface

DU Decision unit

GS Garner Street

J+ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.

NE None established

RSL Regional Screening Level

Table 3
Analytical Results Summary
(DU Samples [1 to 6 inches bgs])

Analyte	RBSL ^a	GS-35A-01-06	GS-36A-01-06	GS-37A-01-06	GS-38A-01-06	GS-39A-01-06	GS-40A-01-06	GS-40A1-01-06	GS-40A1-01-06-DUP	GS-40A1-01-06-TRI	GS-40A2-01-06	GS-41A-01-06	GS-42A-01-06
Aluminum	77000	6800	7200	7900	8500	9700	9000	7700	8300	8300	8600	8800	8700
Antimony	31	1.3	1.3	0.99	0.86	1.2	0.91	0.58	0.59	0.52	0.52	0.48	0.54
Arsenic	110 ^b	75	80	65	63	84	58	37	43	37	29	32	29
Barium	15000	210	240	260	180	250	180	180	190	200	180	190	190
Beryllium	160	0.8	0.85	0.87	1	0.96	0.82	0.71	0.76	0.73	0.78	0.75	0.8
Cadmium	7.1	2.9	2.6	3.8	5.6	6.8	5.3	1.3	1.6	1.4	1.5	1.4	1.1
Calcium	NE	7000	8000	8400	10000	14000	19000	12000	12000	12000	13000	12000	16000
Chromium	120000	22	20	24	19	25	15	24	25	24	34	30	48
Cobalt	23	8.2	7.9	8.9	8.1	10	13	10	11	9.9	12	11	13
Copper	3100	56	52	50	63	71	52	36	43	36	41	43	38
Iron	55000	36000	35000	30000	34000	35000	38000	27000	30000	27000	30000	31000	31000
Lead	336 ^b	370	320	270	240	270	200	98	110	100	61	68	54
Magnesium	NE	2200	2500	2500	3400	4200	3700	3800	4300	3900	4400	4400	4700
Manganese	1800	890	780	1300	940	1200	1200	670	760	670	650	610	720
Nickel	1500	19	19	22	19	25	27	26	27	25	33	32	39
Potassium	NE	3400	2800	3000	2800	3600	2600	2400	2600	2400	2500	2600	2400
Selenium	390	2.7	2.8	2.8	3.8	3.1	3.6	3.1	3.3	3	3.9	3.8	3.6
Silver	390	2.7	2.3	2.1	2.1	2	1.5	0.82	0.96	0.81	0.49	0.53	0.45
Sodium	NE	220	170 J+	200 J+	330	390	260	320	390	310	380	290	220
Thallium	0.78	0.48	0.48	0.44	0.42	0.45	0.43	0.32	0.34	0.31	0.38	0.37	0.34
Vanadium	390	36	39	39	35	42	39	29	31	30	30	31	31
Zinc	23000	490	490	570	1200	1500	730	240	280	240	200	200	180

Notes

All concentrations in milligrams per kilogram (mg/kg)

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^b Site-specific RBSL as documented in Enclosure 3.

bgs Below ground surface

DU Decision unit

EPA Environmental Protection Agency

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J+ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.

NE None established

RBSL Risk-based screening level

RSL Regional Screening Level

Table 3
Analytical Results Summary
(DU Samples [1 to 6 inches bgs])

Analyte	RBSL^a	GS-43A-01-06	GS-44A-01-06	GS-45A-01-06	GS-46A-01-06	GS-47A-01-06	GS-HOUSE-01-06	GS-VACANT-01-06	GS-CA01-01-06	GS-CA02-01-06	GS-CA03-01-06	GS-CA04-01-06	GS-CA04-01-06-DUP
Aluminum	77000	8900	6600	8000	8300	7100	8600	8400	6700	8300	8000	6200	6300
Antimony	31	0.39 J	0.45	0.41	0.56	0.61	1.2	1	1.3	0.76	1	1.3	1.2
Arsenic	110 ^b	28	20	23	29	26	52	58	60	39	52	63	63
Barium	15000	170	170	200	220	180	210	210	170	160	180	170	180
Beryllium	160	0.78	0.65	0.79	0.83	0.78	0.87	0.97	0.78	0.76	0.83	0.79	0.78
Cadmium	7.1	1.2	0.79	1.1	1.4	1.2	2.2	2.3	1.7	1.5	2	2.3	2.2
Calcium	NE	14000	10000	12000	11000	16000	8200	9900	11000	19000	20000	14000	13000
Chromium	120000	20	34	12	28	27	26	35	22	15	19	24	26
Cobalt	23	15	6.7	11	12	7.5	8	8.6	10	14	12	7.7	8.1
Copper	3100	41	24	38	41	29	40	40	57	45	51	44	44
Iron	55000	32000	18000	25000	29000	20000	28000	29000	36000	36000	34000	28000	29000
Lead	336 ^b	50	48	61	71	86	210	210	290	120	180	260	260
Magnesium	NE	4500	2900	3900	4600	5400	2800	3600	3000	3700	4300	4000	3900
Manganese	1800	750	470	670	790	600	890	870	710	770	850	800	770
Nickel	1500	33	25	39	31	22	21	30	25	28	28	22	24
Potassium	NE	2300	1800	2000	2400	2000	4400	2900	2500	2800	2200	2800	2800
Selenium	390	4.1	2	3.3	3.4	2.4	2.7	3.2	3.3	4.5	3.6	2.7	2.6
Silver	390	0.35	0.37	0.45	0.78	0.61	1.2	1.5	1.9	0.83	1.3	1.8	1.8
Sodium	NE	250	170 J+	410	450	170 J+	180 J+	120 J+	180 J+	200 J+	190 J+	140 J+	140 J+
Thallium	0.78	0.36	0.22	0.32	0.35	0.27	0.34	0.44	0.42	0.38	0.44	0.39	0.4
Vanadium	390	30 J	24	26	29	27	39	35	36	34	38	38	39
Zinc	23000	180	140	180	230	210	420	380	340	240	320	440	420

Notes

All concentrations in milligrams per kilogram (mg/kg)

Screening levels are generic levels considered by EPA to be protective for humans over a lifetime. They are not cleanup levels. Soil levels over the screening level mean further study may be appropriate.

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^b Site-specific RBSL as documented in Enclosure 3.

bgs Below ground surface

DU Decision unit

GS Garner Street

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NE None established

RSL Regional Screening Level

Table 3
Analytical Results Summary
(DU Samples [1 to 6 inches bgs])

Analyte	RBSL ^a	GS-CA04-01-06-TRI	GS-CA05-01-06	GS-CA06-01-06	GS-CA07-01-06	GS-CA08-01-06	GS-CA09-01-06	GS-CA10-01-06	GS-CA11-01-06	GS-CA12-01-06	GS-CA12-01-06-DUP	GS-CA12-01-06-TRI	GS-CA13-01-06
Aluminum	77000	5900	7000	7700	6900	7700	7500	7800	7200	7700	7700	8200	8100
Antimony	31	1.3	1.2	1.1	0.47	0.81	0.83	0.8	1.3 J	0.9	0.85	0.93	0.85
Arsenic	110 ^b	62	67	60	21	42	47	49	68	53	44	57	46
Barium	15000	150	200	190	170	180	180	170	160	130	130	130	200
Beryllium	160	0.71	0.74	0.77	0.7	0.89	0.81	0.83	0.76	0.83	0.84	0.85	0.96
Cadmium	7.1	2	2.3	1.8	0.81	1.8	2.1	1.8	2.3	1.8	1.5	2.2	1.1
Calcium	NE	15000	14000	12000	15000	24000	17000	18000	15000	19000	25000	18000	16000
Chromium	120000	23	21	17	24	12	11	12	11	12	12	13	15
Cobalt	23	7.7	9.4	10	6.9	8.7	12	11	12	10	11	11	8.7
Copper	3100	44	46	45	25	41	38	44	50	43	43	48	31
Iron	55000	28000	31000	33000	19000	27000	29000	33000	36000	29000	30000	32000	24000
Lead	336 ^b	250	220	180	64	190	170	210	300	170	140	190	110
Magnesium	NE	3800	4200	4000	4900	6700	4600	5000	4000	6100	6500	5600	4700
Manganese	1800	730	840	830	520	830	1000	970	1100	840	830	940	640
Nickel	1500	21	23	22	20	25	28	27	28	26	31	31	35
Potassium	NE	2600	2700	3600	2600	2400	2400	2200	2300	2200	2100	2300	2400
Selenium	390	2.4	2.7	3.5	2.1	2.7	2.8	3.1	3.1	2.9	3.2	3	2.8
Silver	390	1.8	1.7	1.4	0.47	1.3	1.3	1.3	2.1 J	1.9	0.93	1.2	0.76
Sodium	NE	130 J+	190 J+	170 J+	100 J+	170 J+	120 J+	160 J+	170 J+	270	280	250	130 J+
Thallium	0.78	0.38	0.39	0.37	0.23	0.35	0.35	0.43	0.48	0.35	0.35	0.38	0.33
Vanadium	390	37	40	39	25	32	31	32	35	34	32	35	38
Zinc	23000	380	410	350	180	290	320	310	360	300	240	340	210

Notes

All concentrations in milligrams per kilogram (mg/kg)

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^b Site-specific RBSL as documented in Enclosure 3.

bgs Below ground surface

DU Decision unit

EPA Environmental Protection Agency

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J+ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.

NE None established

RBSL Risk-based screening level

RSL Regional Screening Level

Table 3
Analytical Results Summary
(DU Samples [1 to 6 inches bgs])

Analyte	RBSL^a	GS-CA13-01-06-DUP	GS-CA13-01-06-TRI	GS-CA14-01-06	GS-CA14-01-06-DUP	GS-CA14-01-06-TRI
Aluminum	77000	7100	7300	6600	7900	7900
Antimony	31	0.73	0.77	0.33	0.53	0.5
Arsenic	110 ^b	33	42	18	25	27
Barium	15000	160	180	140	190	190
Beryllium	160	0.84	0.81	0.59	0.91	0.93
Cadmium	7.1	1.2	1.5	0.64	0.94	0.91
Calcium	NE	24000	19000	10000	16000	15000
Chromium	120000	13	13	9.7	13	14
Cobalt	23	8.4	8.9	6.8	8	7.6
Copper	3100	36	41	21	31	26
Iron	55000	24000	25000	17000	22000	20000
Lead	336 ^b	120	130	58	83	72
Magnesium	NE	7000	5600	3400	5600	5500
Manganese	1800	680	730	440	630	600
Nickel	1500	25	28	14	22	18
Potassium	NE	2100	2200	2100	2100	2100
Selenium	390	2.5	2.6	1.9	2.6	2.6
Silver	390	0.68	0.93	0.25	0.47	0.42
Sodium	NE	180 J+	200 J+	110 J+	110 J+	100 J+
Thallium	0.78	0.29	0.33	0.21	0.28	0.27
Vanadium	390	29	32	22	27	26
Zinc	23000	300	410	120	170	160

Notes

All concentrations in milligrams per kilogram (mg/kg)

Screening levels are generic levels considered by EPA to be protective for humans over a lifetime. They are not cleanup levels. Soil levels over the screening level mean further study may be appropriate.

bold Indicates concentration that equals or exceeds the RBSL for residential soil

^a The RBSL is the default EPA RSL for residential soil (target risk 1E-06, target hazard quotient 1) except where noted.

^b Site-specific RBSL as documented in Enclosure 3.

bgs Below ground surface

DU Decision unit

EPA Environmental Protection Agency

J The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.

NE None established

RBSL Risk-based screening level

RSL Regional Screening Level

Table 4
Analytical Results Summary
(Mercury)

Sample ID	Mercury
EPA RSL^a	11
GS-01E-00-06	0.11 J-
GS-09E-00-06	0.18
GS-13B-00-06	0.4
GS-14D-00-06	0.094 J-
GS-21D-00-06	0.14
GS-27D-00-06	0.11 J-
GS-39A-00-06	0.15
GS-CA02-00-06	0.061
GS-CA14-00-06	0.66
GS-HOUSE-00-06	0.12 J-
GS-HOUSE-00-06-DUP	0.081 J-
GS-VACANT-00-06	0.22
GS-VACANT-00-06-DUP	0.27

Notes:

All concentrations in milligrams per kilogram (mg/kg)

^a EPA RSL for residential soil (based on elemental mercury)

J- The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.

Table 5
Analytical Results Summary
(Berm Characterization Samples)

Analyte	RBSL ^a	GS-29A5-COMP	GS-32A-COMP	GS-35A-COMP	GS-39A-COMP	GS-43A-COMP
Aluminum	77000	2900	5300	6200	7300	8700
Antimony	31	1.8	1.1	1.2	1.3	0.27
Arsenic	110 ^b	90	60	69	72	20
Barium	15000	110	120	180	150	130
Beryllium	160	0.41	0.55	0.63	1	0.86
Cadmium	7.1	1.4	1.2	2	4.9	1.5
Calcium	NE	4200	9300	6400	8800	21000
Chromium	120000	5.2	7.8	8.6	10	12
Cobalt	23	3.9	7.9	8.7	9.3	16
Copper	3100	49	42	50	77	35
Iron	55000	29000	33000	35000	38000	40000
Lead	336 ^b	550	350	390	350	30
Magnesium	NE	1200	2500	2200	2900	5300
Manganese	1800	450	510	730	1100	1100
Nickel	1500	6.7 J+	14	15	17	36
Potassium	NE	2300	2300	2600	2400	1900
Selenium	390	1.2	2.4	2.3	3.1	4.3
Silver	390	3.2	2.1	2.3	2.4	0.2
Sodium	NE	180 J+	180 J+	160 J+	390	290
Thallium	0.78	0.44	0.38	0.45	0.49	0.43
Vanadium	390	34	28	32	37	30
Zinc	23000	290	240	380	650	130

Notes:

All concentrations in milligrams per kilogram (mg/kg)

Screening levels are generic levels considered by EPA to be protective for humans over a lifetime. They are not cleanup levels. Soil levels over the screening level mean further study may be appropriate.

bold Indicates concentration that exceeds the RBSL for residential soil

^a EPA RSL for residential soil (target risk 1E-06, target hazard quotient 1) except where noted.

^b Site-specific RBSL as documented in Enclosure 3.

EPA Environmental Protection Agency

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RBSL Risk-based screening level

RSL Regional Screening Level

Table 6
Analytical Results Summary
(Bioavailability Testing)

Analyte	Analyte		IVBA Percent	Relative Bioavailability (RBA)
	Total Lead (mg/kg)	IVBA Lead (mg/kg)		
GS-06E-00-01	140	58.1	42%	34%
GS-07E-00-01	240	57.1	24%	18%
GS-08A-00-01	100	28.4	28%	22%
GS-08B-00-01	440	22.3	5.1%	1.7%
GS-12B-00-01	340	21.8	6.4%	2.8%
GS-21D-00-01	640	83.9	13%	8.7%
GS-23D-00-01	260	41.2	16%	11%
GS-27D-00-01	110	20.9	19%	14%
GS-29A4-00-01	550	13.7	2.5%	-0.61%
GS-29D-00-01	370	65.7	18%	13%
GS-34A-00-01	450	11.8	2.6%	-0.49%
GS-36A-00-01	350	25.2	7.2%	3.5%
GS-40A-00-01	190	14.1	7.4%	3.7%
GS-CA10-00-01	160	49.2	31%	24%
GS-HOUSE-00-01	210	22.7	11%	6.7%
Average			15%	11%
95% UCL (EPA 2022)			21%	15%

Notes:

Lead bioavailability is calculated using the equation from EPA 2021:

$$\text{RBA} = (87.8\% \times \text{IVBA Percent}) - 2.8\%$$

IVBA In Vitro Bioaccessibility Assay

mg/kg milligrams per kilogram

RBA Relative Bioavailability

EPA. 2021. Guidance for Sample Collection for In Vitro Bioaccessibility Assay for Arsenic and Lead in Soil and Applications of Relative Bioavailability Data in Human Health Risk Assessment. January 4.

EPA. 2022. Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations.

Table 7
Analytical Results Summary
(Bioavailability Testing - Arsenic)

Sample ID	Analyte		IVBA Percent	Relative Bioavailability (RBA)
	Total Arsenic (mg/kg)	IVBA Arsenic (mg/kg)		
GS-04A-00-01	31.6	4.89	15%	15%
GS-04B-00-01	96.3	13.9	14%	14%
GS-05B-00-01	62.7	9.25	15%	15%
GS-08E-00-01	46.7	8.53	18%	17%
GS-09B-00-01	109	8.85	8.1%	9%
GS-10B-00-01	120	10.8	9.0%	10%
GS-11D-00-01	34.1	5.87	17%	17%
GS-16B1-00-01	35.5	4.38	12%	13%
GS-28D-00-01	48.2	7.29	15%	15%
GS-29A5-00-01	109	7.55	6.9%	8.5%
GS-33A-00-01	106	10.4	10%	11%
GS-38A-00-01	64.7	5.27	8.1%	9.4%
GS-40A1-00-01	39	4.52	12%	12%
GS-44A-00-01	25.6	4	16%	15%
GS-HOUSE-00-01	58.2	8.02	14%	14%
Average			13%	13%
95% UCL (EPA 2022)			14%	14%

Notes:

Lead bioavailability is calculated using the equation from EPA 2021:

$$RBA = (79\% \times IVBA) + 3\%$$

IVBA In Vitro Bioaccessibility Assay

mg/kg milligrams per kilogram

RBA Relative Bioavailability

EPA. 2021. Guidance for Sample Collection for In Vitro Bioaccessibility Assay for Arsenic and Lead in Soil and Applications of Relative Bioavailability Data in Human Health Risk Assessment. January 4.

EPA. 2022. Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations.

Table 8
Analytical Results Summary
(TCLP Results)

Analyte	RCRA Allowable Limit	GS-TCLP-01
Arsenic	5	0.10 U
Barium	100	0.20 U
Cadmium	1	0.010
Chromium	5	0.010 U
Lead	5	0.10 U
Mercury	0.2	R
Selenium	1	0.10 U
Silver	5	0.010 U

Notes:

All concentrations in milligrams per liter (mg/L)

R The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.

RCRA Resource Conservation and Recovery Act

TCLP Toxicity Characteristic Leaching Procedure

U The analyte was analyzed for, but was not detected at or above the associated value (reporting limit).

Table 9
Field Precision Evaluation

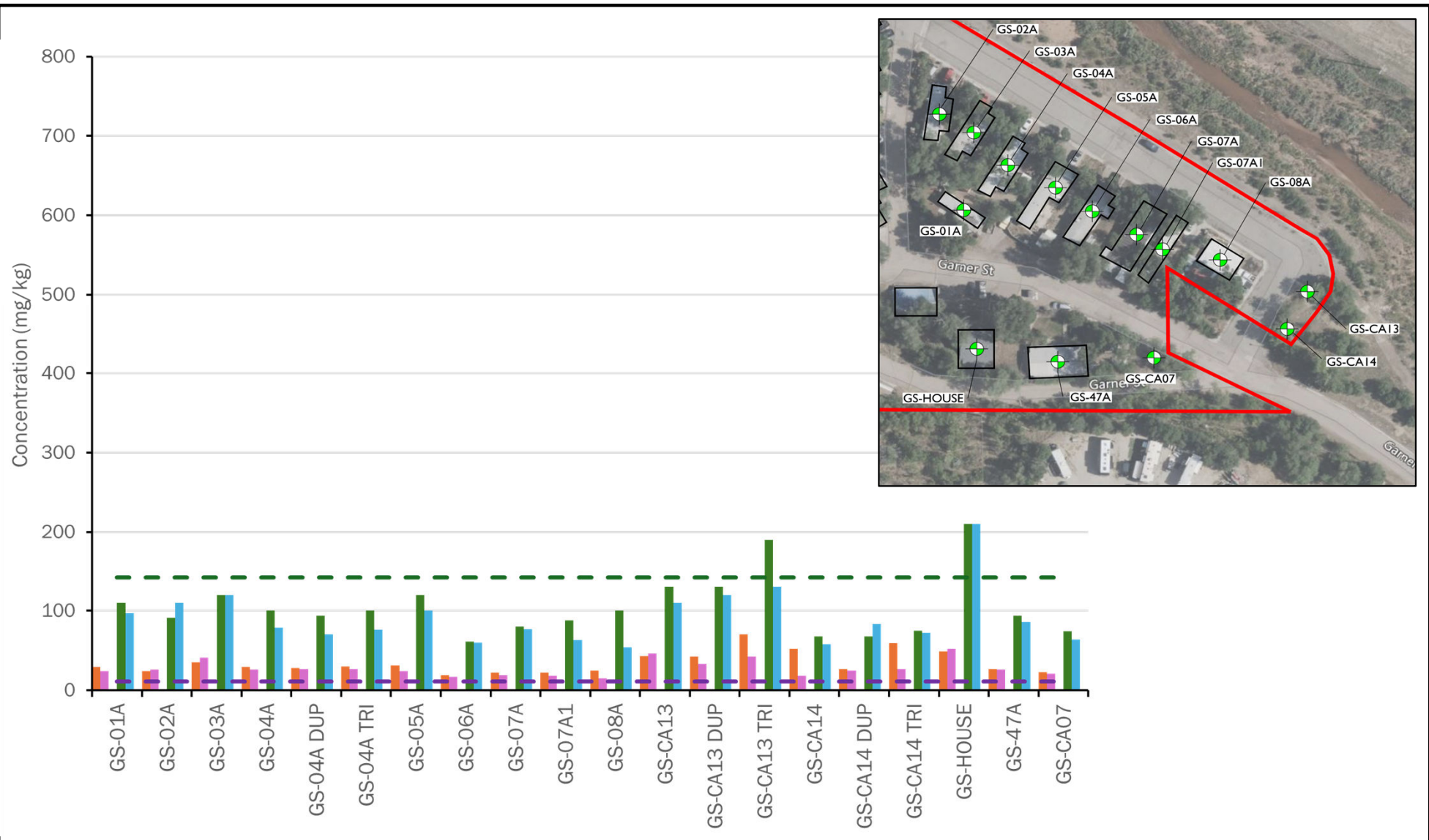
Analyte	Count of RSD	Minimum of RSD	Average of RSD	Max of RSD
Aluminum	20	0.80%	3.8%	10%
Antimony	20	0.0%	9.6%	28%
Arsenic	20	0.60%	9.0%	37%
Barium	20	0.0%	6.9%	22%
Beryllium	20	0.0%	4.3%	24%
Cadmium	20	1.3%	12%	52%
Calcium	20	0.0%	8.6%	24%
Chromium	20	0.0%	6.9%	25%
Cobalt	20	0.81%	4.9%	14%
Copper	20	0.0%	6.3%	19%
Iron	20	0.0%	4.6%	17%
Lead	20	0.0%	7.8%	23%
Magnesium	20	1.5%	7.7%	29%
Manganese	20	0.0%	6.1%	18%
Nickel	20	2.0%	9.7%	23%
Potassium	20	0.0%	3.9%	10%
Selenium	20	0.0%	4.9%	17%
Silver	20	0.0%	12%	37%
Sodium	20	0.0%	6.9%	22%
Thallium	20	0.0%	4.8%	15%
Vanadium	20	0.0%	3.9%	14%
Zinc	20	0.0%	9.0%	33%
Grand Total	440	0.0%	7.0%	52%

Notes:

RSD Relative standard deviation

Analytical Results Figures

Based on data presented in Garner Street Soils Letter Report – Final (Revision 3) (Tetra Tech, 2024a)



Legend

- Arsenic 0-1 in bgs
- Arsenic 1-6 in bgs
- Lead 0-1 in bgs
- Lead 1-6 in bgs

- Arsenic Cleanup Level (11 mg/kg)
- Lead Cleanup Level (142 mg/kg)

Notes:

in bgs – inches below ground surface
 mg/kg – milligrams per kilograms
 Map inset from Figure 3

Data from Garner Street Soil Letter Report (Tetra Tech, 2024a)

Pinyon
 Environmental, Inc.

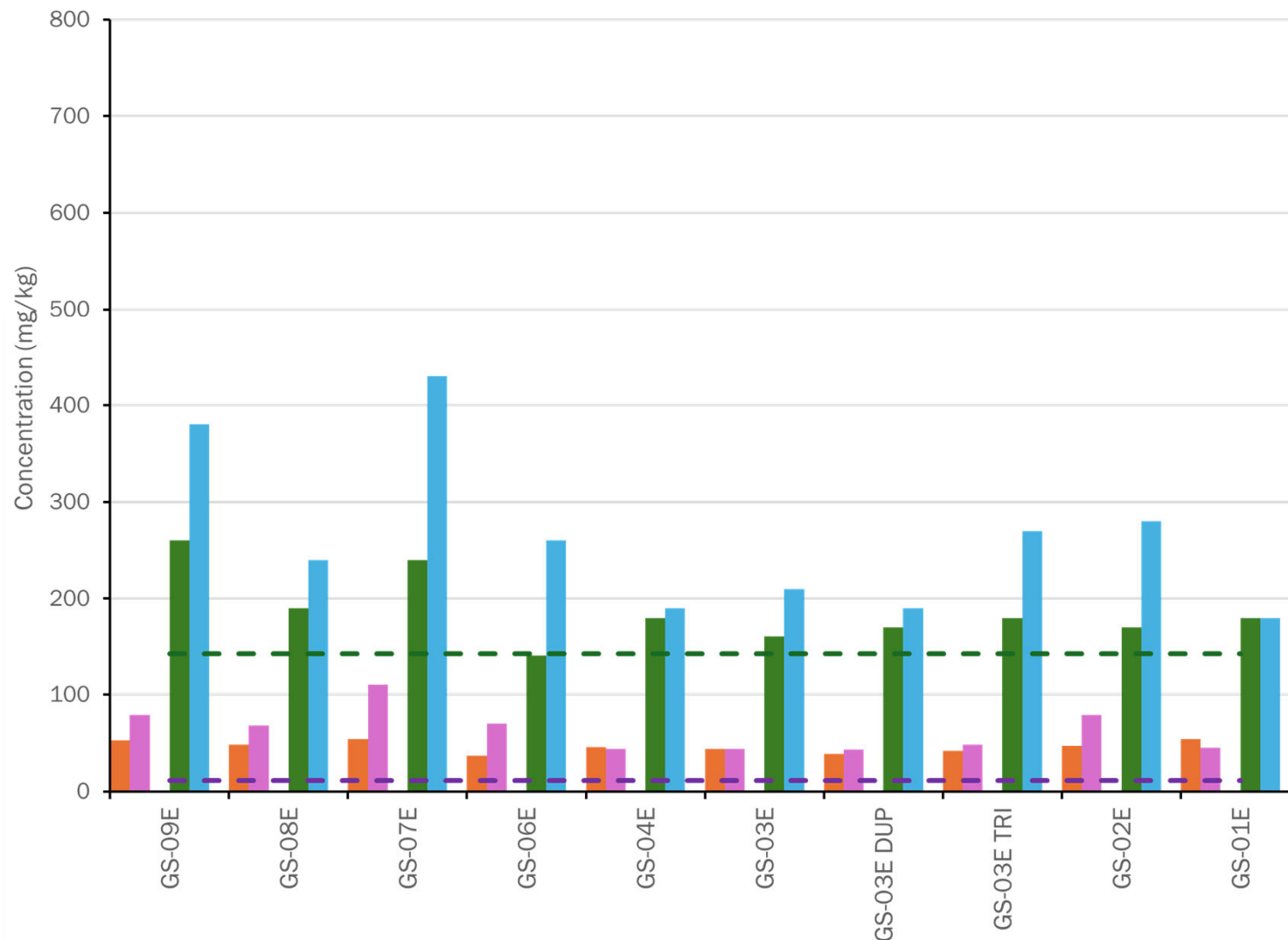
Analytical Results

Garner Street Soils Site
 1025 1/2 Garner Street
 Colorado Springs, Colorado

Drawn By: AMG

Figure A-I

Date: March 28, 2025



Legend

- Arsenic 0-1 in bgs
- Arsenic 1-6 in bgs
- Lead 0-1 in bgs
- Lead 1-6 in bgs

- Arsenic Cleanup Level (11 mg/kg)
- Lead Cleanup Level (142 mg/kg)

Notes:

in bgs – inches below ground surface
 mg/kg – milligrams per kilograms
 Map inset from Figure 3

Data from Garner Street Soil Letter Report (Tetra Tech, 2024a)



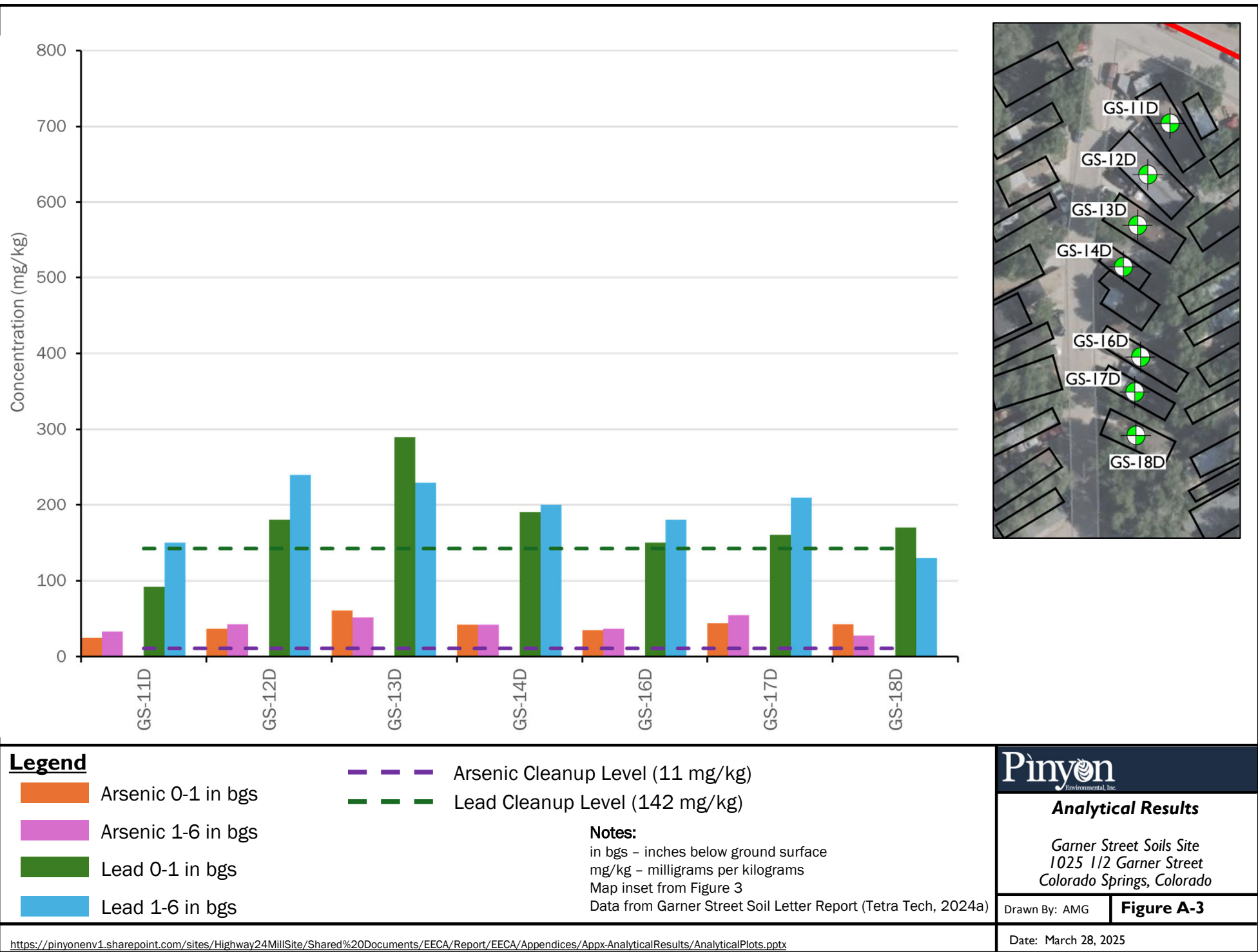
Analytical Results

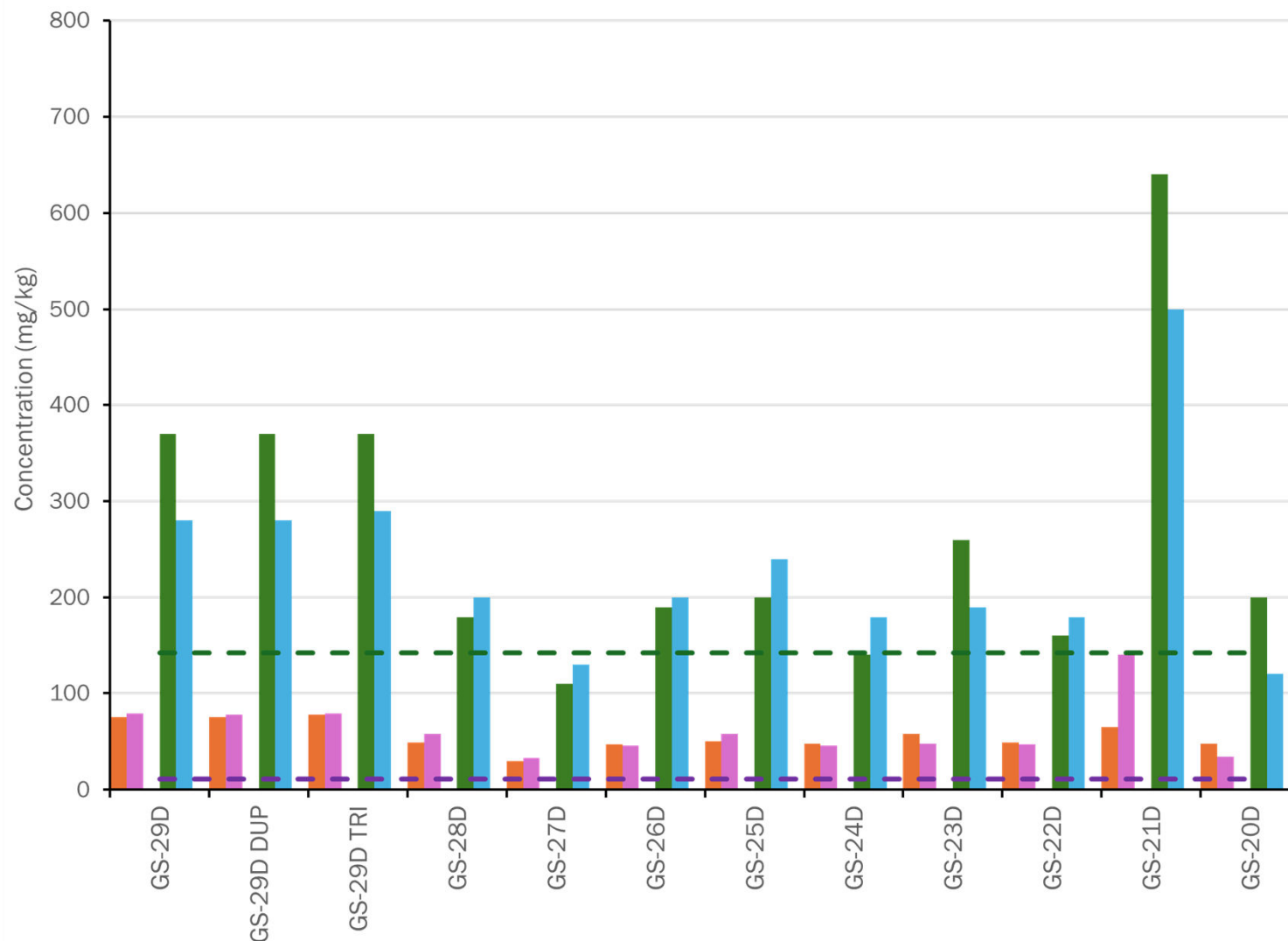
Garner Street Soils Site
 1025 1/2 Garner Street
 Colorado Springs, Colorado

Drawn By: AMG

Figure A-2

Date: March 28, 2025





Legend

- Arsenic 0-1 in bgs
- Arsenic 1-6 in bgs
- Lead 0-1 in bgs
- Lead 1-6 in bgs

- Arsenic Cleanup Level (11 mg/kg)
- Lead Cleanup Level (142 mg/kg)

Notes:

in bgs – inches below ground surface
 mg/kg – milligrams per kilograms
 Map inset from Figure 3

Data from Garner Street Soil Letter Report (Tetra Tech, 2024a)



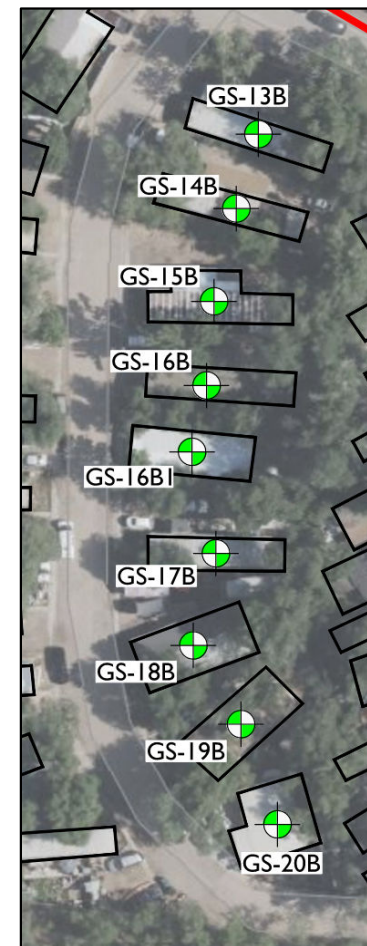
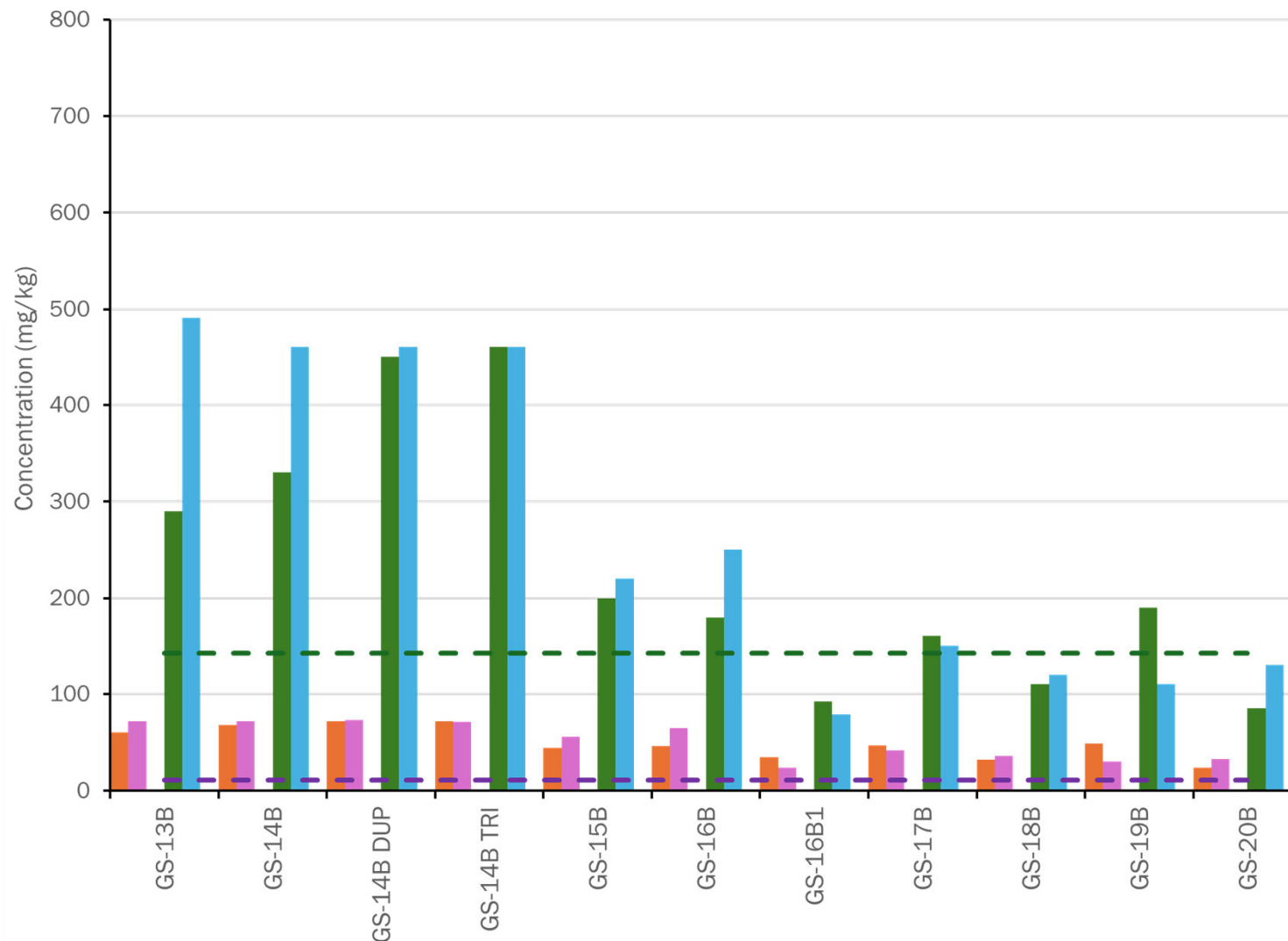
Analytical Results

Garner Street Soils Site
 1025 1/2 Garner Street
 Colorado Springs, Colorado

Drawn By: AMG

Figure A-4

Date: March 28, 2025



Legend

- Arsenic 0-1 in bgs
- Arsenic 1-6 in bgs
- Lead 0-1 in bgs
- Lead 1-6 in bgs

- Arsenic Cleanup Level (11 mg/kg)
- Lead Cleanup Level (142 mg/kg)

Notes:

in bgs – inches below ground surface
 mg/kg – milligrams per kilograms
 Map inset from Figure 3

Data from Garner Street Soil Letter Report (Tetra Tech, 2024a)



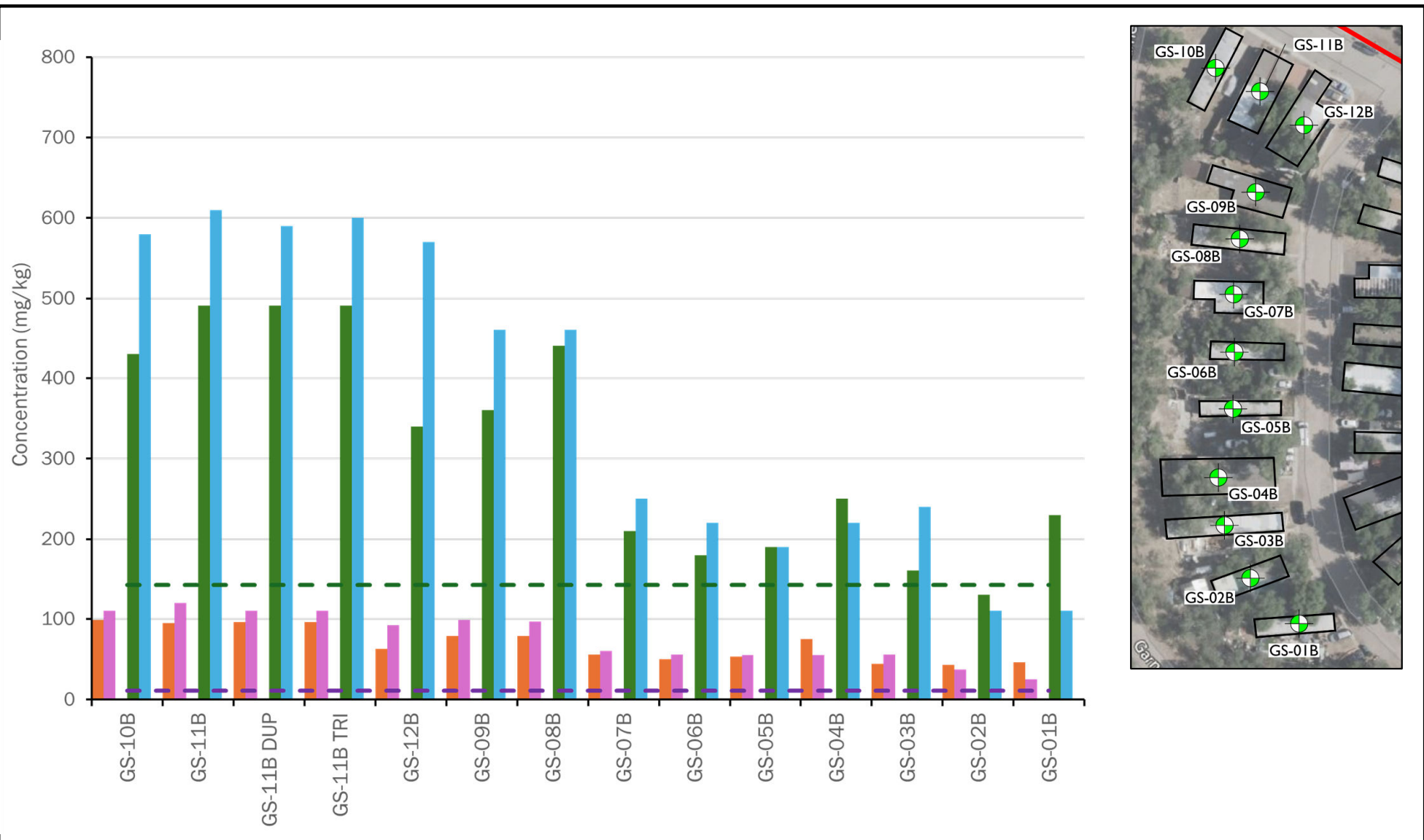
Analytical Results

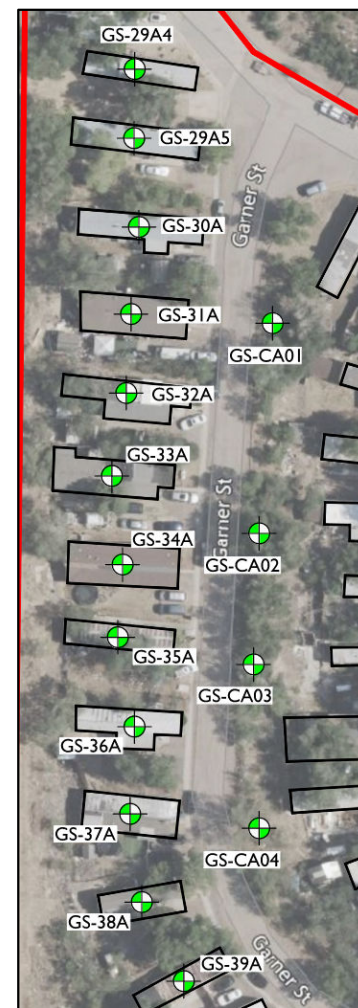
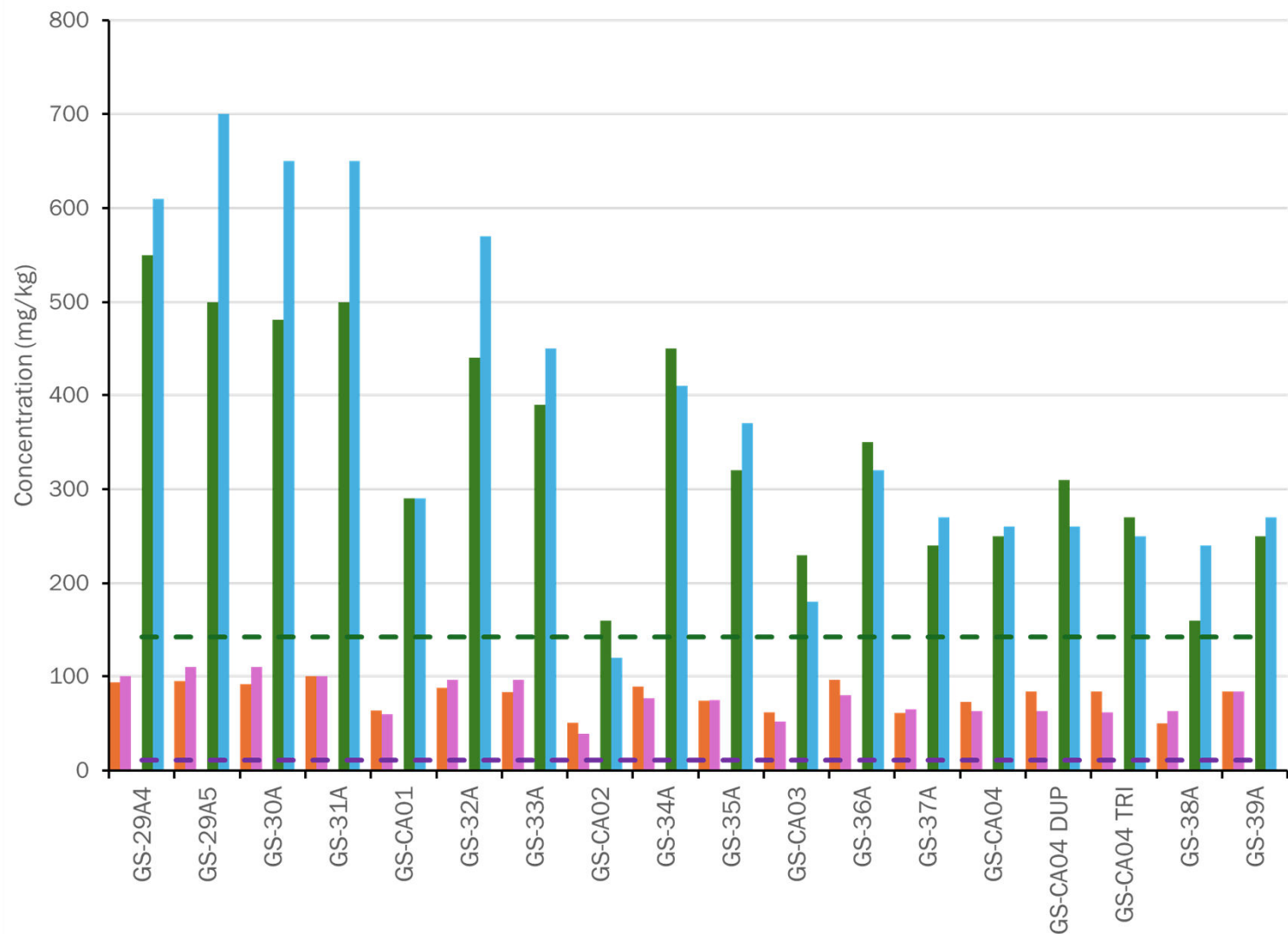
Garner Street Soils Site
 1025 1/2 Garner Street
 Colorado Springs, Colorado

Drawn By: AMG

Figure A-5

Date: March 28, 2025





Legend

- Arsenic 0-1 in bgs
- Arsenic 1-6 in bgs
- Lead 0-1 in bgs
- Lead 1-6 in bgs

- Arsenic Cleanup Level (11 mg/kg)
- Lead Cleanup Level (142 mg/kg)

Notes:

in bgs – inches below ground surface
 mg/kg – milligrams per kilograms
 Map inset from Figure 3

Data from Garner Street Soil Letter Report (Tetra Tech, 2024a)



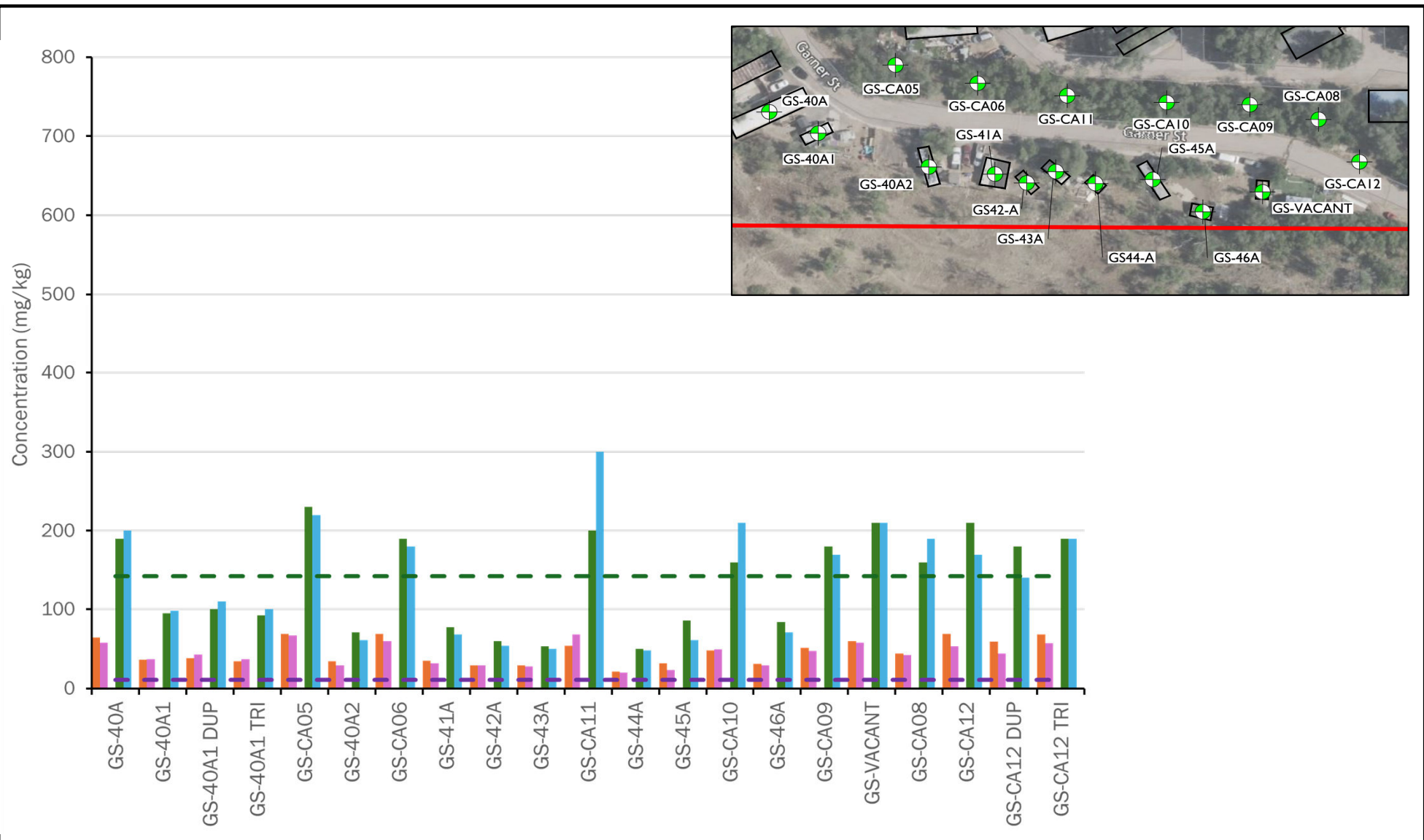
Analytical Results

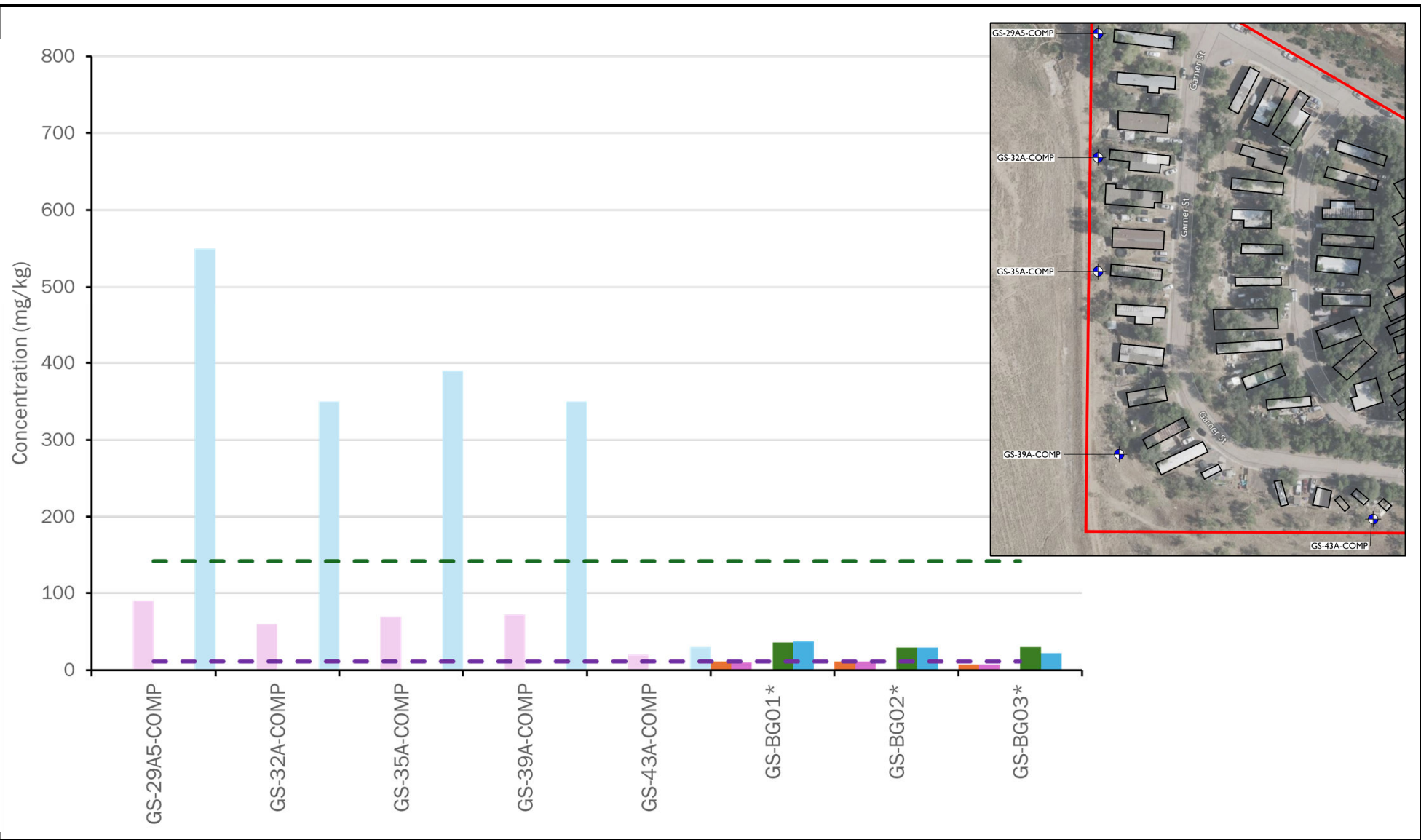
Garner Street Soils Site
 1025 1/2 Garner Street
 Colorado Springs, Colorado

Drawn By: AMG

Figure A-7

Date: March 28, 2025





Legend <div style="display: flex; justify-content: space-between;"> <div> <div style="background-color: orange; width: 20px; height: 10px; display: inline-block;"></div> Arsenic 0-1 in bgs <div style="background-color: pink; width: 20px; height: 10px; display: inline-block;"></div> Arsenic 1-6 in bgs <div style="background-color: green; width: 20px; height: 10px; display: inline-block;"></div> Lead 0-1 in bgs <div style="background-color: blue; width: 20px; height: 10px; display: inline-block;"></div> Lead 1-6 in bgs </div> <div> <div style="background-color: lightblue; width: 20px; height: 10px; display: inline-block;"></div> Lead 0-6 in bgs <div style="border-top: 1px dashed purple; width: 20px; height: 10px; display: inline-block;"></div> Arsenic Cleanup Level (11 mg/kg) <div style="border-top: 1px dashed green; width: 20px; height: 10px; display: inline-block;"></div> Lead Cleanup Level (142 mg/kg) </div> </div>		Notes: in bgs – inches below ground surface mg/kg – milligrams per kilograms Map inset from Figure 3 * BG Samples collected from Sondermann Park (Figure 1) Data from Garner Street Soil Letter Report (Tetra Tech, 2024a)	 Analytical Results Garner Street Soils Site 1025 1/2 Garner Street Colorado Springs, Colorado
<div style="display: flex; justify-content: space-between;"> <div>Drawn By: AMG</div> <div>Figure A-9</div> </div>			
Date: March 28, 2025			

Appendix B Streamlined Risk Evaluation and Preliminary Remediation Goals



MEMORANDUM

To: Patrick Medland, Project Manager
Hazardous Materials and Waste Management Division

From: Andrea Kingcade, Risk Assessor
Tom Simmons, Senior Risk Assessor
Toxicology and Environmental Epidemiology Office (TEEO)

CC: Kelsey Schreiber, Toxicology and Risk Assessment Unit Manager
Toxicology and Environmental Epidemiology Office (TEEO)

Re: Highway 24 Mill - Streamlined Risk Evaluation

Date: December 18, 2024

Purpose and Background:

This document is a streamlined risk evaluation on the Highway 24 Mill site located in Colorado Springs (Site). The Site consists of a mobile home park constructed adjacent to a former tailings pile associated with the Golden Cycle Mill and Gold Hill Tailings Site. The evaluation was conducted using the latest EPA guidance on risk assessment.

In 2022, the Superfund Technical Assessment and Response Team (START) collected samples from the mobile home park to assess the levels of metals in soil. Soil from 93 lots within the mobile home park (including 77 mobile homes, 1 office, 14 common areas, and one vacant lot) were collected at two depths: the top 0 to 1 inches and 1 to 6 inches below ground surface. Samples were analyzed for 23 Target Analyte List metals including mercury (Tetra Tech 2024).

In 2023, the START team conducted additional sampling to assess whether historical contamination from the former Golden Cycle Mill smokestack emissions and associated tailings pile extend beyond the mobile home park and to identify background levels of metals for the site. Sampling activities were conducted at 32 locations within 3 miles of the former Golden Cycle Mill. Samples were taken at 31 public properties (such as parks, open spaces, and recreational areas) and one commercial property. Soil samples were collected at two depth intervals: the top 0 to 1 inches and 1 to 6 inches below ground surface. Samples were analyzed for total recoverable metals (TRM) and mercury (Tetra Tech 2024).

What we did:

TEEO assessed the reasonable maximum exposure to residents of the mobile home park based on the measured concentrations in soil. We identified contaminants of potential concern (COPC) based on a hazard quotient of 0.1 and cancer risk level of $1E-06$ or 1 excess cancer case per million people exposed. We identified 12 contaminants of potential concern based on the maximum measured concentration of each metal throughout the Site (Table 1). We identified arsenic, lead, cadmium, and manganese as the primary contaminants of concern.



MEMORANDUM

We then calculated non-cancer and cancer risks based on default residential assumptions^{1,2}, maximum measured concentrations for each COPC at each site, a blood lead concentration of 3.5 micrograms per deciliter (ug/dL) or 5 ug/dL, and a site-wide relative bioavailability of 15.5% (lead) and 14.3% (arsenic) (CDPHE 2024). Table 2 shows the number of lots impacted by contaminant and Table 3 displays results by site.

Conclusions:

- We identified 68 lots where 5% or more of children were predicted to have blood lead levels of 3.5 ug/dL or higher based on the measured lead concentrations in soil. We identified 20 lots where more than 5% of children would have predicted blood lead levels of 5 ug/dL or higher.
- We identified one parcel (GS-06B) with a total hazard quotient greater than three for cadmium.
- We identified six lots for arsenic, five lots for cadmium, and four lots for manganese that exceed a hazard quotient of one.
- The excess risk of developing cancer exceeded 1E-6 at all 93 lots but did not exceed 1E-4 at any lot.

Table 1. COPC selection

Metal	Max Measured Concentration (mg/kg)	Screening Level (mg/kg, THQ=0.1, CR=1E-6)	COPC?
Aluminum	11000	7700	YES
Antimony	2.6	3.1	no
Arsenic	140	0.68	YES
Barium	330	1500	no
Beryllium	1.8	16	no
Cadmium	23	0.71	YES
Calcium	32000	NE	no
Chromium(VI)	48	0.3	YES
Cobalt	15	2.3	YES
Copper	240	310	no
Iron	46000	5500	YES
Lead	700	100	YES
Magnesium	8900	NE	no
Manganese	4800	180	YES
Mercury	0.66	1.1	no
Nickel	140	140	YES
Potassium	4600	NE	no
Selenium	4.6	39	no
Silver	4.5	39	no
Sodium	1000	NE	no
Thallium	0.62	0.078	YES
Vanadium	49	39	YES
Zinc	5500	2300	YES

Note: mg/kg = milligram per kilogram, THQ = total hazard quotient based on EPA regional screening levels, CR = cancer risk, COPC = contaminant of potential concern, NE = not evaluated/no screening level available

¹ EPA RSL: <https://www.epa.gov/risk/regional-screening-levels-rsls-equations>

² EPA IEUBK: <https://www.epa.gov/superfund/lead-superfund-sites-software-and-users-manuals>



MEMORANDUM

Table 2. Summary of hazard characterization by contaminant

Metal	# lots > THQ=1	# lots > THQ=3	# lots > CR=1E-6	# lots > 5% above 3.5 ug/dL cutoff	# lots > 5% above 5 ug/dL cutoff
Aluminum	0	-	-	-	-
Arsenic	6	-	93	-	-
Cadmium	5	1	0	-	-
Chromium(III)	0	-	-	-	-
Cobalt	0	-	0	-	-
Iron	0	-	-	-	-
Lead	-	-	-	68	20
Manganese	4	-	-	-	-
Nickel	0	-	0	-	-
Thallium	0	-	-	-	-
Vanadium	0	-	-	-	-
Zinc	0	-	-	-	-

Note: Due to lack of evidence that sources of hexavalent chromium exist at this site, hazard characterization for chromium was based on trivalent chromium. THQ = total hazard quotient, CR = cancer risk, - = not applicable, blood lead cutoff = 3.5 micrograms per deciliter

Table 3. Hazard characterization by lot

Lot	Arsenic THQ	Arsenic CR	Cadmium HQ	Percent of Population exceeding Blood Lead Level of 3.5 ug/dL	Percent of Population exceeding Blood Lead Level of 5 ug/dL	Manganese HQ
GS-01A	0.2	1.4E-05	0.2	3.6	0.5	0.3
GS-01B	0.4	2.3E-05	0.2	10.5	2.2	0.3
GS-01E	0.5	2.7E-05	0.3	7.2	1.3	0.5
GS-02A	0.2	1.3E-05	0.2	3.6	0.5	0.4
GS-02B	0.4	2.1E-05	0.2	4.5	0.7	0.5
GS-02E	0.7	3.9E-05	0.4	14.3	3.4	0.6
GS-03A	0.4	2.0E-05	0.2	4.1	0.6	0.4
GS-03B	0.5	2.8E-05	0.4	11.2	2.4	0.6
GS-03E	0.4	2.4E-05	0.4	13.5	3.1	0.5
GS-04A	0.3	1.5E-05	0.4	3.2	0.5	0.4
GS-04B	0.7	3.7E-05	1.4	11.9	2.6	1.7
GS-04E	0.4	2.3E-05	0.3	7.8	1.5	0.5
GS-05A	0.3	1.5E-05	0.2	4.1	0.6	0.3
GS-05B	0.5	2.7E-05	2.2	7.8	1.5	2.6
GS-06A	0.2	9.4E-06	0.1	1.9	0.2	0.3
GS-06B	0.5	2.8E-05	3.2	9.8	2	2.2
GS-06E	0.6	3.4E-05	0.4	12.7	2.9	0.6



MEMORANDUM

Lot	Arsenic THQ	Arsenic CR	Cadmium HQ	Percent of Population exceeding Blood Lead Level of 3.5 ug/dL	Percent of Population exceeding Blood Lead Level of 5 ug/dL	Manganese HQ
GS-07A	0.2	1.1E-05	0.1	2.5	0.3	0.3
GS-07A1	0.2	1.1E-05	0.1	2.8	0.4	0.2
GS-07B	0.6	3.0E-05	2.2	11.9	2.6	2.0
GS-07E	1.0	5.4E-05	0.4	27.6	8.8	0.7
GS-08A	0.2	1.2E-05	0.2	3.2	0.5	0.3
GS-08B	0.9	4.8E-05	1.0	30.4	10.2	1.0
GS-08E	0.6	3.4E-05	0.4	11.2	2.4	0.5
GS-09B	0.9	4.9E-05	0.8	30.4	10.2	0.8
GS-09E	0.7	3.9E-05	0.6	23.0	6.7	0.7
GS-10B	1.0	5.4E-05	0.9	41.4	16.5	0.8
GS-11B	1.1	5.9E-05	0.7	44.1	18.2	0.6
GS-11D	0.3	1.6E-05	0.2	5.5	0.9	0.3
GS-12B	0.8	4.5E-05	0.5	40.5	15.9	0.5
GS-12D	0.4	2.1E-05	0.6	11.2	2.4	0.5
GS-13B	0.7	3.5E-05	0.4	33.2	11.6	0.5
GS-13D	0.6	3.0E-05	0.3	15.1	3.7	0.4
GS-14B	0.7	3.6E-05	0.4	30.4	10.2	0.4
GS-14D	0.4	2.1E-05	0.2	8.4	1.6	0.4
GS-15B	0.5	2.8E-05	0.6	9.8	2.0	0.8
GS-16B	0.6	3.2E-05	0.3	11.9	2.6	0.5
GS-16B1	0.3	1.7E-05	0.2	2.9	0.4	0.3
GS-16D	0.3	1.8E-05	0.3	7.2	1.3	0.3
GS-17B	0.4	2.3E-05	0.2	6.0	1.0	0.4
GS-17D	0.5	2.7E-05	0.4	9.1	1.8	0.6
GS-18B	0.3	1.8E-05	0.2	4.1	0.6	0.4
GS-18D	0.4	2.1E-05	0.3	6.6	1.2	0.4
GS-19B	0.5	2.4E-05	0.3	7.8	1.5	0.4
GS-20B	0.3	1.6E-05	0.3	4.5	0.7	0.4
GS-20D	0.4	2.4E-05	0.4	8.4	1.6	0.5
GS-21D	1.3	6.9E-05	0.4	46.6	20.0	0.6
GS-22D	0.5	2.4E-05	0.3	7.2	1.3	0.5
GS-23D	0.5	2.9E-05	0.4	12.7	2.9	0.6
GS-24D	0.4	2.4E-05	0.3	7.2	1.3	0.5
GS-25D	0.5	2.9E-05	0.4	11.2	2.4	0.5
GS-26D	0.4	2.3E-05	0.3	8.4	1.6	0.5
GS-27D	0.3	1.6E-05	0.2	4.5	0.7	0.4
GS-28D	0.5	2.9E-05	0.4	8.4	1.6	0.5
GS-29A4	0.9	4.9E-05	0.3	44.1	18.2	0.3



MEMORANDUM

Lot	Arsenic THQ	Arsenic CR	Cadmium HQ	Percent of Population exceeding Blood Lead Level of 3.5 ug/dL	Percent of Population exceeding Blood Lead Level of 5 ug/dL	Manganese HQ
GS-29A5	1.0	5.4E-05	0.4	51.6	23.6	0.4
GS-29D	0.7	3.9E-05	0.6	22.1	6.3	0.7
GS-30A	1.0	5.4E-05	0.3	47.5	20.6	0.4
GS-31A	0.9	4.9E-05	0.4	47.5	20.6	0.4
GS-32A	0.9	4.7E-05	0.3	40.5	15.9	0.4
GS-33A	0.9	4.7E-05	0.4	29.5	9.7	0.5
GS-34A	0.8	4.4E-05	0.5	29.5	9.7	0.4
GS-35A	0.7	3.7E-05	0.4	22.1	6.3	0.5
GS-36A	0.9	4.7E-05	0.4	20.3	5.6	0.5
GS-37A	0.6	3.2E-05	0.5	13.5	3.1	0.7
GS-38A	0.6	3.1E-05	0.8	11.2	2.4	0.6
GS-39A	0.8	4.1E-05	1.1	13.5	3.1	0.7
GS-40A	0.6	3.2E-05	0.7	8.4	1.6	0.7
GS-40A1	0.4	2.1E-05	0.2	3.6	0.5	0.4
GS-40A2	0.3	1.7E-05	0.2	2.2	0.3	0.4
GS-41A	0.3	1.7E-05	0.2	2.4	0.3	0.4
GS-42A	0.3	1.4E-05	0.2	1.9	0.2	0.4
GS-43A	0.3	1.4E-05	0.2	1.7	0.2	0.4
GS-44A	0.2	1.0E-05	0.1	1.6	0.2	0.3
GS-45A	0.3	1.6E-05	0.2	2.7	0.4	0.4
GS-46A	0.3	1.6E-05	0.2	2.7	0.4	0.4
GS-47A	0.3	1.3E-05	0.2	3.0	0.4	0.3
GS-CA01	0.6	3.2E-05	0.3	15.1	3.7	0.4
GS-CA02	0.5	2.5E-05	0.2	6.0	1.0	0.5
GS-CA03	0.6	3.1E-05	0.3	10.5	2.2	0.5
GS-CA04	0.8	4.1E-05	0.4	16.8	4.2	0.5
GS-CA05	0.6	3.4E-05	0.3	10.5	2.2	0.5
GS-CA06	0.6	3.4E-05	0.3	7.8	1.5	0.5
GS-CA07	0.2	1.1E-05	0.1	2.3	0.3	0.3
GS-CA08	0.4	2.2E-05	0.3	7.8	1.5	0.5
GS-CA09	0.5	2.5E-05	0.3	6.6	1.2	0.6
GS-CA10	0.5	2.4E-05	0.3	9.1	1.8	0.5
GS-CA11	0.6	3.4E-05	0.3	15.9	4.0	0.6
GS-CA12	0.6	3.4E-05	0.3	9.1	1.8	0.5
GS-CA13	0.6	3.4E-05	0.3	7.8	1.5	0.5
GS-CA14	0.5	2.9E-05	0.1	2.6	0.4	0.3
GS-HOUSE	0.5	2.6E-05	0.3	9.1	1.8	0.5
GS-VACANT	0.6	3.0E-05	0.3	9.1	1.8	0.5



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Note: THQ = total hazard quotient, CR = cancer risk, - = not applicable, lead results display predicted percentage of a population expected to have a blood lead level greater than either 3.5 or 5 micrograms per deciliter (ug/dL)



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References

Colorado Department of Public Health and Environment (CDPHE). 2024. Highway 24 Mill Preliminary Remediation Goals. December.

Tetra Tech 2024. Site Inspection Report, Highway 24 Mill Site, Colorado Springs, El Paso County, Colorado. U.S. EPA ID NO. CON000821192. June.



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To: Patrick Medland, Site Lead
Hazardous Materials and Waste Management Division

From: Stacey Mulka, Risk Assessor
Tom Simmons, Senior Risk Assessor
Toxicology and Environmental Epidemiology Office (TEEO)

CC: Kelsey Schreiber, Toxicology and Risk Assessment Unit Manager
Toxicology and Environmental Epidemiology Office (TEEO)

Re: Highway 24 Mill Preliminary Remediation Goals

Date: December 18, 2024

Executive Summary

This technical memorandum documents the calculation of site-specific residential risk-based Preliminary Remediation Goals (PRGs) for lead at the Highway 24 Mill site in Colorado Springs (Site). The calculation of lead PRGs was triggered by sampling events in 2022 and 2023 which found that unacceptable risks to lead are present at the Site. These PRGs incorporate recently updated residential lead guidance from the U.S. Environmental Protection Agency (USEPA 2024a).

Final cleanup levels take into account not only risk-based PRGs to assess protectiveness, but also the remaining eight criteria contained in the National Contingency Plan (40 CFR 300.430(e)(9)). Background concentrations of soil lead, both geogenic and anthropogenic, may also impact achievable cleanup levels. Therefore, the final selected cleanup level may differ from the PRGs documented in this technical memorandum.

Purpose and Background:

The purpose of this document is to derive site-specific PRGs for arsenic and lead at the Site. The Site consists of a mobile home park constructed adjacent to a former tailings pile associated with the Golden Cycle Mill and Gold Hill Tailings Site.

In 2022, the Superfund Technical Assessment and Response Team (START) collected samples from the mobile home park to assess the levels of metals in soil. Soil from 93 lots within the mobile home park (including 77 mobile homes, 1 office, 14 common areas, and one vacant lot) were collected at two depths: the top 0 to 1 inches and 1 to 6 inches below ground surface. Samples were analyzed for 23 Target Analyte List metals including mercury (Tetra Tech 2024).

In 2023, the START team conducted additional sampling to assess whether historical contamination from the former Golden Cycle Mill smokestack emissions and associated tailings pile extend beyond the



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mobile home park and to identify background levels of metals for the site. Sampling activities were conducted at 32 locations within 3 miles of the former Golden Cycle Mill. Samples were taken at 31 public properties (such as parks, open spaces, and recreational areas) and one commercial property. Soil samples were collected at two depth intervals: the top 0 to 1 inches and 1 to 6 inches below ground surface. Samples were analyzed for total recoverable metals (TRM) and mercury (Tetra Tech 2024).

A screening level assessment of site data identified lead and arsenic as the primary risk drivers at the site. The PRGs for arsenic and lead were derived for reasonable maximum exposures for residents of the mobile home park using site-specific bioavailability data.

Sampling Results Summary:

Summary statistics on the concentrations of arsenic and lead from samples taken during the 2022 sampling event at lots within the mobile home park are shown below in Table 1. The concentrations of arsenic in all samples ranged from 15 mg/kg to 140 mg/kg with an average concentration of 53.8 mg/kg. The concentrations of lead in all samples ranged from 48 mg/kg to 700 mg/kg with an average concentration of 224.5 mg/kg.

Table 1. A-1 Site Sampling Results for Arsenic and Lead

Analyte	Depth (in inches)	Number of samples	Minimum (in mg/kg)	Mean (in mg/kg)	Maximum (in mg/kg)
Arsenic	All	186	15	53.8	140
	0-1	93	19	52.6	100
	1-6	93	15	54.9	140
Lead	All	186	48	224.5	700
	0-1	93	50	213.3	640
	1-6	93	48	235.6	700

Note: For lots with duplicate or triplicate samples, the maximum value was used to calculate statistics. mg/kg = milligram per kilogram

Relative Bioavailability for Lead and Arsenic:

Relative bioavailability (RBA) is the amount of lead and arsenic that is absorbed into the body from exposure to contaminated soil. The default RBA value for both contaminants is 60%, meaning that 60% of arsenic and lead are assumed to be absorbed into the body from incidental ingestion of soil.

However, the RBA values of arsenic and lead in soil at many sites across Colorado are highly variable depending on the geology and source of contamination. Site-specific RBA evaluations can be used to



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improve the accuracy of the PRG calculations at a site. The *in vitro* bioaccessibility assay (IVBA) provides a rapid and relatively inexpensive alternative to *in vivo* assays for predicting relative bioavailability (RBA) (USEPA 2007). Once the site-specific IVBA has been determined, a conversion factor is used to calculate the RBA.

Soil samples from 15 lots were selected for IVBA to predict RBA at the site. These samples were submitted to ALS Environmental in Kelso, Washington for bioavailability testing in accordance with EPA Method 1340/6020A (Tetra Tech 2023). The currently preferred models for predicting RBA from IVBA for lead (USEPA 2007) and arsenic (Diamond et al., 2016; USEPA 2017) are:

Equation 1. $RBA_{\text{lead}} = (0.88 \cdot IVBA) - 0.028$ ($R^2 = 0.92$)

Equation 2. $RBA_{\text{arsenic}} = (0.79 \cdot IVBA) + 0.03$ ($R^2 = 0.87$)

where RBA and IVBA are expressed as fractions (not percentages).

The bioaccessibility of lead from the site soil samples ranged from 3-42% with a mean IVBA of 15%. This corresponds to a calculated RBA of <1-34%. The 95% upper confidence level (UCL) on the mean IVBA results is 21% with a corresponding RBA of 15.5%. Due to the large variance in the IVBA results, the 95% UCL value of 15.5% RBA was selected for use in the PRG calculation for lead.

The bioaccessibility of arsenic from the site soil samples ranged from 7-18% with a mean IVBA of 13%. This corresponds to a calculated RBA of 8-17%. The 95% upper confidence level (UCL) on the mean IVBA results is 14.3% with a corresponding RBA of 14%. Due to the large variance in the IVBA results, the 95% UCL value of 14.3% RBA was selected for use in the PRG calculation for arsenic.

Integrated Exposure Uptake Biokinetic Modeling for Lead PRGs:

The EPA evaluates risks from lead using a different approach than for other contaminants. Lead exposure can cause a range of adverse health effects in humans. Studies of lead exposures and resultant health effects in humans have traditionally been described in terms of blood lead levels (BLL). Effects on the nervous system are well documented even at very low BLL (ATSDR 2020). Lead is widespread in the environment and exposure can occur from many different sources. Thus, PRGs based upon lead risks usually consider total exposure from all sources rather than just Site-related sources. Lead exposures and risks are typically assessed by comparing a model-calculated BLL for hypothetical populations to policy-based BLL targets of potential health concern.

The EPA recommends the use of the Integrated Exposure Uptake Biokinetic (IEUBK) model to evaluate exposures from lead-contaminated media for children in a residential setting (USEPA 1994a,b; 1998). The IEUBK model is updated periodically as new information and data about the toxicokinetics of lead and input parameters become available. The model available at the time of this memorandum is [Version 2, Build 1.72](#). The IEUBK model can be used to predict blood lead concentrations in exposed individuals and to estimate the probability of a blood lead concentration exceeding a target BLL.

The current blood lead reference value is 3.5 micrograms per deciliter ($\mu\text{g}/\text{dL}$), which was updated from 5 $\mu\text{g}/\text{dL}$ in 2021 (CDC 2024). The PRGs shown in Table 2 are based on the probability of no more than a 5% of children at the site exceeding a target BLL of 3.5 or 5 $\mu\text{g}/\text{dL}$.



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Table 2. Site Screening Level Values for Lead (RBA set at 15.5%)

Target Blood Lead Level	Screening Level for 12-72 month age group (in mg/kg)
3.5 µg/dL	142 (68)
5 µg/dL	333 (20)

NOTE: number in (**Bold**) indicates the number of lots with sample data exceeding the site screening level value for lead. RBA = Relative Bioavailability, BLL = Blood Lead Level in children ages 12-72 months, mg/kg = milligram per kilogram, µg/dL= micrograms per deciliter

Arsenic Preliminary Remediation Goals

Site specific RBA values were inserted into the EPA RSL calculator to derive the PRGs for arsenic. Arsenic is a carcinogen, and the estimated screening levels are based on the target cancer risk level of 1E-04, a non-cancer Hazard Quotient (HQ) of 1, and a non-cancer HQ of 3 (Table 3).

Table 3. Site Soil Screening Level Values for Arsenic (RBA set at 14.3%)

Arsenic Screening Level based on Non-cancer Child HQ = 1 (in mg/kg)	Arsenic Screening Level based on Non-cancer Child HQ = 3 (in mg/kg)	Arsenic Screening Level based on Cancer Risk at 1E-04 Theoretical Risk (in mg/kg)
109 (6)	327 (0)	203 (0)

NOTE: number in (**Bold**) indicates the number of lots with sample data exceeding the site screening level value for lead. RBA = Relative Bioavailability, HQ = Hazard Quotient, mg/kg = milligram per kilogram

Conclusions:

At a target blood lead level of 3.5 µg/dL, removal actions would be advised at 68 of the 93 lots. At a target blood lead level of 5 µg/dL, removal actions would be advised at 20 of the 93 lots. For arsenic at the non-cancer Hazard Quotient of 1, removal actions would be advised at 6 of the 93 lots. At these six lots, clean up would also be necessary for lead at both target blood lead levels, and it is assumed that remedial action for lead would also address arsenic contamination. In addition, no action is necessary for arsenic at the non-cancer Hazard Quotient of 3 or cancer risk level of E-04 as no lots had arsenic levels above those PRGs.



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Attachment Table 1. Decision Unit Comparison of Selected PRGs

Lot	Arsenic		Lead		
	Concentration (mg/kg)	HQ= 1	Concentration (mg/kg)	TBLL of 3.5 (ug/dL)	TBLL of 5 (ug/dL)
GS-01A-00-01	29		110		
GS-01A-01-06	24		97		
GS-01B-00-01	46		230	X	
GS-01B-01-06	25		110		
GS-01E-00-01	54		180	X	
GS-01E-01-06	45		180	X	
GS-02A-00-01	24		91		
GS-02A-01-06	26		110		
GS-02B-00-01	43		130		
GS-02B-01-06	37		110		
GS-02E-00-01	47		170	X	
GS-02E-01-06	79		280	X	
GS-03A-00-01	35		120		
GS-03A-01-06	41		120		
GS-03B-00-01	44		160	X	
GS-03B-01-06	56		240	X	
GS-03E-00-01	44		180	X	
GS-03E-01-06	48		270	X	
GS-04A-00-01	30		100		
GS-04A-01-06	27		79		
GS-04B-00-01	75		250	X	
GS-04B-01-06	55		220	X	
GS-04E-00-01	46		180	X	



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Lot	Arsenic		Lead		
	Concentration (mg/kg)	HQ= 1	Concentration (mg/kg)	TBLL of 3.5 (ug/dL)	TBLL of 5 (ug/dL)
GS-04E-01-06	44		190	X	
GS-05A-00-01	31		120		
GS-05A-01-06	24		100		
GS-05B-00-01	53		190	X	
GS-05B-01-06	55		190	X	
GS-06A-00-01	19		61		
GS-06A-01-06	17		60		
GS-06B-00-01	50		180	X	
GS-06B-01-06	56		220	X	
GS-06E-00-01	37		140		
GS-06E-01-06	70		260	X	
GS-07A-00-01	22		80		
GS-07A-01-06	19		77		
GS-07A1-00-01	22		88		
GS-07A1-01-06	18		63		
GS-07B-00-01	56		210	X	
GS-07B-01-06	60		250	X	
GS-07E-00-01	54		240	X	
GS-07E-01-06	110	X	430	X	X
GS-08A-00-01	25		100		
GS-08A-01-06	15		54		
GS-08B-00-01	79		440	X	X
GS-08B-01-06	97		460	X	X
GS-08E-00-01	48		190	X	



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Lot	Arsenic		Lead		
	Concentration (mg/kg)	HQ= 1	Concentration (mg/kg)	TBLL of 3.5 (ug/dL)	TBLL of 5 (ug/dL)
GS-08E-01-06	68		240	X	
GS-09B-00-01	79		360	X	X
GS-09B-01-06	99		460	X	X
GS-09E-00-01	53		260	X	
GS-09E-01-06	79		380	X	X
GS-10B-00-01	99		430	X	X
GS-10B-01-06	110	X	580	X	X
GS-11B-00-01	96		490	X	X
GS-11B-01-06	120	X	610	X	X
GS-11D-00-01	25		92		
GS-11D-01-06	33		150	X	
GS-12B-00-01	63		340	X	X
GS-12B-01-06	92		570	X	X
GS-12D-00-01	37		180	X	
GS-12D-01-06	43		240	X	
GS-13B-00-01	60		290	X	
GS-13B-01-06	72		490	X	X
GS-13D-00-01	61		290	X	
GS-13D-01-06	52		230	X	
GS-14B-00-01	72		460	X	X
GS-14B-01-06	73		460	X	X
GS-14D-00-01	42		190	X	
GS-14D-01-06	42		200	X	
GS-15B-00-01	44		200	X	



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Lot	Arsenic		Lead		
	Concentration (mg/kg)	HQ= 1	Concentration (mg/kg)	TBLL of 3.5 (ug/dL)	TBLL of 5 (ug/dL)
GS-15B-01-06	56		220	X	
GS-16B-00-01	46		180	X	
GS-16B-01-06	65		250	X	
GS-16B1-00-01	35		92		
GS-16B1-01-06	24		79		
GS-16D-00-01	35		150	X	
GS-16D-01-06	37		180	X	
GS-17B-00-01	47		160	X	
GS-17B-01-06	42		150	X	
GS-17D-00-01	44		160	X	
GS-17D-01-06	55		210	X	
GS-18B-00-01	32		110		
GS-18B-01-06	36		120		
GS-18D-00-01	43		170	X	
GS-18D-01-06	28		130		
GS-19B-00-01	49		190	X	
GS-19B-01-06	30		110		
GS-20B-00-01	24		85		
GS-20B-01-06	33		130		
GS-20D-00-01	48		200	X	
GS-20D-01-06	34		120		
GS-21D-00-01	65		640	X	X
GS-21D-01-06	140	X	500	X	X
GS-22D-00-01	49		160	X	



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Lot	Arsenic		Lead		
	Concentration (mg/kg)	HQ= 1	Concentration (mg/kg)	TBLL of 3.5 (ug/dL)	TBLL of 5 (ug/dL)
GS-22D-01-06	47		180	X	
GS-23D-00-01	58		260	X	
GS-23D-01-06	48		190	X	
GS-24D-00-01	48		140		
GS-24D-01-06	46		180	X	
GS-25D-00-01	50		200	X	
GS-25D-01-06	58		240	X	
GS-26D-00-01	47		190	X	
GS-26D-01-06	46		200	X	
GS-27D-00-01	30		110		
GS-27D-01-06	33		130		
GS-28D-00-01	49		180	X	
GS-28D-01-06	58		200	X	
GS-29A4-00-01	94		550	X	X
GS-29A4-01-06	100		610	X	X
GS-29A5-00-01	95		500	X	X
GS-29A5-01-06	110	X	700	X	X
GS-29D-00-01	78		370	X	X
GS-29D-01-06	79		290	X	
GS-30A-00-01	92		480	X	X
GS-30A-01-06	110	X	650	X	X
GS-31A-00-01	100		500	X	X
GS-31A-01-06	100		650	X	X
GS-32A-00-01	88		440	X	X



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Lot	Arsenic		Lead		
	Concentration (mg/kg)	HQ= 1	Concentration (mg/kg)	TBLL of 3.5 (ug/dL)	TBLL of 5 (ug/dL)
GS-32A-01-06	96		570	X	X
GS-33A-00-01	83		390	X	X
GS-33A-01-06	96		450	X	X
GS-34A-00-01	89		450	X	X
GS-34A-01-06	77		410	X	X
GS-35A-00-01	74		320	X	
GS-35A-01-06	75		370	X	X
GS-36A-00-01	96		350	X	X
GS-36A-01-06	80		320	X	
GS-37A-00-01	61		240	X	
GS-37A-01-06	65		270	X	
GS-38A-00-01	50		160	X	
GS-38A-01-06	63		240	X	
GS-39A-00-01	84		250	X	
GS-39A-01-06	84		270	X	
GS-40A-00-01	64		190	X	
GS-40A-01-06	58		200	X	
GS-40A1-00-01	38		100		
GS-40A1-01-06	43		110		
GS-40A2-00-01	34		71		
GS-40A2-01-06	29		61		
GS-41A-00-01	35		77		
GS-41A-01-06	32		68		
GS-42A-00-01	29		60		



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Lot	Arsenic		Lead		
	Concentration (mg/kg)	HQ= 1	Concentration (mg/kg)	TBLL of 3.5 (ug/dL)	TBLL of 5 (ug/dL)
GS-42A-01-06	29		54		
GS-43A-00-01	29		53		
GS-43A-01-06	28		50		
GS-44A-00-01	21		50		
GS-44A-01-06	20		48		
GS-45A-00-01	32		86		
GS-45A-01-06	23		61		
GS-46A-00-01	31		84		
GS-46A-01-06	29		71		
GS-47A-00-01	27		94		
GS-47A-01-06	26		86		
GS-CA01-00-01	64		290	X	
GS-CA01-01-06	60		290	X	
GS-CA02-00-01	51		160	X	
GS-CA02-01-06	39		120		
GS-CA03-00-01	62		230	X	
GS-CA03-01-06	52		180	X	
GS-CA04-00-01	84		310	X	
GS-CA04-01-06	63		260	X	
GS-CA05-00-01	69		230	X	
GS-CA05-01-06	67		220	X	
GS-CA06-00-01	69		190	X	
GS-CA06-01-06	60		180	X	
GS-CA07-00-01	23		74		



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Lot	Arsenic		Lead		
	Concentration (mg/kg)	HQ= 1	Concentration (mg/kg)	TBLL of 3.5 (ug/dL)	TBLL of 5 (ug/dL)
GS-CA07-01-06	21		64		
GS-CA08-00-01	44		160	X	
GS-CA08-01-06	42		190	X	
GS-CA09-00-01	51		180	X	
GS-CA09-01-06	47		170	X	
GS-CA10-00-01	48		160	X	
GS-CA10-01-06	49		210	X	
GS-CA11-00-01	54		200	X	
GS-CA11-01-06	68		300	X	
GS-CA12-00-01	69		210	X	
GS-CA12-01-06	57		190	X	
GS-CA13-00-01	70		190	X	
GS-CA13-01-06	46		130		
GS-CA14-00-01	59		75		
GS-CA14-01-06	27		83		
GS-HOUSE-00-01	49		210	X	
GS-HOUSE-01-06	52		210	X	
GS-VACANT-00-01	60		210	X	
GS-VACANT-01-06	58		210	X	

NOTE: For lots with duplicate or triplicate samples the maximum value is shown, lot nomenclature: GS=Garner Street, DU= decision unit, sample depth at intervals of 00-01 or 01-06 inches, mg/kg = milligram per kilogram, HQ = Hazard Quotient, TBLL= target blood lead level, ug/dL = micrograms per deciliter



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Attachment Table 2. Lead *In vitro* Bioaccessability Assay (IVBA) and Relative Bioavailability (RBA)

Sample ID	Analyte		IVBA Percent	Relative Bioavailability (RBA)
	Total Lead (mg/kg)	IVBA Lead (mg/kg)		
GS-06E-00-01	140	58.1	42%	34%
GS-07E-00-01	240	57.1	24%	18%
GS-08A-00-01	100	28.4	28%	22%
GS-08B-00-01	440	22.3	5.1%	1.7%
GS-12B-00-01	340	21.8	6.4%	2.8%
GS-21D-00-01	640	83.9	13%	8.7%
GS-23D-00-01	260	41.2	16%	11%
GS-27D-00-01	110	20.9	19%	14%
GS-29A4-00-01	550	13.7	2.5%	-0.61%
GS-29D-00-01	370	65.7	18%	13%
GS-34A-00-01	450	11.8	2.6%	-0.49%
GS-36A-00-01	350	25.2	7.2%	3.5%
GS-40A-00-01	190	14.1	7.4%	3.7%
GS-CA10-00-01	160	49.2	31%	24%
GS-HOUSE-00-01	210	22.7	11%	6.7%
95% UCL			20.8%	15.5%

Note: mg/kg= milligrams per kilogram.

Attachment Table 3. Arsenic *In vitro* Bioaccessability Assay (IVBA) and Relative Bioavailability (RBA)

Sample ID	Analyte		IVBA Percent	Relative Bioavailability (RBA)
	Total Arsenic (mg/kg)	IVBA Arsenic (mg/kg)		
GS-04A-00-01	31.6	4.89	15%	15%
GS-04B-00-01	96.3	13.9	14%	14%
GS-05B-00-01	62.7	9.25	15%	15%
GS-08E-00-01	46.7	8.53	18%	17%
GS-09B-00-01	109	8.85	8.1%	9%
GS-10B-00-01	120	10.8	9.0%	10%
GS-11D-00-01	34.1	5.87	17%	17%
GS-16B1-00-01	35.5	4.38	12%	13%
GS-28D-00-01	48.2	7.29	15%	15%
GS-29A5-00-01	109	7.55	6.9%	8.5%
GS-33A-00-01	106	10.4	10%	11%
GS-38A-00-01	64.7	5.27	8.1%	9.4%
GS-40A1-00-01	39	4.52	12%	12%



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GS-44A-00-01	25.6	4	16%	15%
GS-HOUSE-00-01	58.2	8.02	14%	14%
95% UCL			14.3%	14.3%

Note: mg/kg= milligrams per kilogram.

Attachment Table 4. IEUBK output at blood lead cutoff value of 3.5 µg/dL and lead concentration at soil depth of 0-1 inches

ID	FA M	BL K	AGE (mon)	SOIL (µg/g)	DUST (µg/g)	WATE R (µg/L)	AIR (µg/m ³)	Other (µg/day)	ABSSoi l (%)	ABSDus t (%)	PBB (µg/dL)	PRED (µg/dL)	P(PbB>C) (%)
GS-01A	0	0	32	110	87	0.9	0.1	0	7.75	30	---	1.51	3.629
GS-01B	0	0	32	230	171	0.9	0.1	0	7.75	30	---	1.94	10.473
GS-01E	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	7.18
GS-02A	0	0	32	91	73.7	0.9	0.1	0	7.75	30	---	1.44	2.895
GS-02B	0	0	32	130	101	0.9	0.1	0	7.75	30	---	1.58	4.509
GS-02E	0	0	32	170	129	0.9	0.1	0	7.75	30	---	1.72	6.593
GS-03A	0	0	32	120	94	0.9	0.1	0	7.75	30	---	1.54	4.055
GS-03B	0	0	32	160	122	0.9	0.1	0	7.75	30	---	1.69	6.032
GS-03E	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	7.18
GS-04A	0	0	32	100	80	0.9	0.1	0	7.75	30	---	1.47	3.231
GS-04B	0	0	32	250	185	0.9	0.1	0	7.75	30	---	2.01	11.943
GS-04E	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	7.18
GS-05A	0	0	32	120	94	0.9	0.1	0	7.75	30	---	1.54	4.055
GS-05B	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	7.792
GS-06A	0	0	32	61	52.7	0.9	0.1	0	7.75	30	---	1.32	1.937
GS-06B	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	7.18
GS-06E	0	0	32	140	108	0.9	0.1	0	7.75	30	---	1.61	4.99
GS-07A	0	0	32	80	66	0.9	0.1	0	7.75	30	---	1.39	2.516
GS-07A1	0	0	32	88	71.6	0.9	0.1	0	7.75	30	---	1.42	2.789
GS-07B	0	0	32	210	157	0.9	0.1	0	7.75	30	---	1.87	9.087
GS-07E	0	0	32	240	178	0.9	0.1	0	7.75	30	---	1.98	11.198
GS-08A	0	0	32	100	80	0.9	0.1	0	7.75	30	---	1.47	3.231
GS-08B	0	0	32	440	318	0.9	0.1	0	7.75	30	---	2.68	28.544
GS-08E	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	7.792
GS-09B	0	0	32	360	262	0.9	0.1	0	7.75	30	---	2.4	21.162
GS-09E	0	0	32	260	192	0.9	0.1	0	7.75	30	---	2.05	12.707
GS-10B	0	0	32	430	311	0.9	0.1	0	7.75	30	---	2.65	27.61
GS-11B	0	0	32	490	353	0.9	0.1	0	7.75	30	---	2.85	33.218
GS-11D	0	0	32	92	74.4	0.9	0.1	0	7.75	30	---	1.44	2.932
GS-12B	0	0	32	340	248	0.9	0.1	0	7.75	30	---	2.33	19.377
GS-12D	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	7.18



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GS-13B	0	0	32	290	213	0.9	0.1	0	7.75	30	---	2.15	15.102
GS-13D	0	0	32	290	213	0.9	0.1	0	7.75	30	---	2.15	15.102
GS-14B	0	0	32	460	332	0.9	0.1	0	7.75	30	---	2.75	30.416
GS-14D	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	7.792
GS-15B	0	0	32	200	150	0.9	0.1	0	7.75	30	---	1.83	8.428
GS-16B	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	7.18
GS-16B1	0	0	32	92	74.4	0.9	0.1	0	7.75	30	---	1.44	2.932
GS-16D	0	0	32	150	115	0.9	0.1	0	7.75	30	---	1.65	5.498
GS-17B	0	0	32	160	122	0.9	0.1	0	7.75	30	---	1.69	6.032
GS-17D	0	0	32	160	122	0.9	0.1	0	7.75	30	---	1.69	6.032
GS-18B	0	0	32	110	87	0.9	0.1	0	7.75	30	---	1.51	3.629
GS-18D	0	0	32	170	129	0.9	0.1	0	7.75	30	---	1.72	6.593
GS-19B	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	7.792
GS-20B	0	0	32	85	69.5	0.9	0.1	0	7.75	30	---	1.41	2.684
GS-20D	0	0	32	200	150	0.9	0.1	0	7.75	30	---	1.83	8.428
GS-21D	0	0	32	640	458	0.9	0.1	0	7.75	30	---	3.36	46.649
GS-22D	0	0	32	160	122	0.9	0.1	0	7.75	30	---	1.69	6.032
GS-23D	0	0	32	260	192	0.9	0.1	0	7.75	30	---	2.05	12.707
GS-24D	0	0	32	140	108	0.9	0.1	0	7.75	30	---	1.61	4.99
GS-25D	0	0	32	200	150	0.9	0.1	0	7.75	30	---	1.83	8.428
GS-26D	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	7.792
GS-27D	0	0	32	110	87	0.9	0.1	0	7.75	30	---	1.51	3.629
GS-28D	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	7.18
GS-29A4	0	0	32	550	395	0.9	0.1	0	7.75	30	---	3.06	38.744
GS-29A5	0	0	32	500	360	0.9	0.1	0	7.75	30	---	2.89	34.148
GS-29D	0	0	32	370	269	0.9	0.1	0	7.75	30	---	2.44	22.067
GS-30A	0	0	32	480	346	0.9	0.1	0	7.75	30	---	2.82	32.285
GS-31A	0	0	32	500	360	0.9	0.1	0	7.75	30	---	2.89	34.148
GS-32A	0	0	32	440	318	0.9	0.1	0	7.75	30	---	2.68	28.544
GS-33A	0	0	32	390	283	0.9	0.1	0	7.75	30	---	2.51	23.897
GS-34A	0	0	32	450	325	0.9	0.1	0	7.75	30	---	2.72	29.48
GS-35A	0	0	32	320	234	0.9	0.1	0	7.75	30	---	2.26	17.631
GS-36A	0	0	32	350	255	0.9	0.1	0	7.75	30	---	2.37	20.265
GS-37A	0	0	32	240	178	0.9	0.1	0	7.75	30	---	1.98	11.198
GS-38A	0	0	32	160	122	0.9	0.1	0	7.75	30	---	1.69	6.032
GS-39A	0	0	32	250	185	0.9	0.1	0	7.75	30	---	2.01	11.943
GS-40A	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	7.792
GS-40A1	0	0	32	100	80	0.9	0.1	0	7.75	30	---	1.47	3.231



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GS-40A2	0	0	32	71	59.7	0.9	0.1	0	7.75	30	---	1.36	2.23
GS-41A	0	0	32	77	63.9	0.9	0.1	0	7.75	30	---	1.38	2.418
GS-42A	0	0	32	60	52	0.9	0.1	0	7.75	30	---	1.32	1.909
GS-43A	0	0	32	53	47.1	0.9	0.1	0	7.75	30	---	1.3	1.722
GS-44A	0	0	32	50	45	0.9	0.1	0	7.75	30	---	1.28	1.645
GS-45A	0	0	32	86	70.2	0.9	0.1	0	7.75	30	---	1.42	2.719
GS-46A	0	0	32	84	68.8	0.9	0.1	0	7.75	30	---	1.41	2.65
GS-47A	0	0	32	94	75.8	0.9	0.1	0	7.75	30	---	1.45	3.005
GS-CA01	0	0	32	290	213	0.9	0.1	0	7.75	30	---	2.15	15.102
GS-CA02	0	0	32	160	122	0.9	0.1	0	7.75	30	---	1.69	6.032
GS-CA03	0	0	32	230	171	0.9	0.1	0	7.75	30	---	1.94	10.473
GS-CA04	0	0	32	310	227	0.9	0.1	0	7.75	30	---	2.23	16.775
GS-CA05	0	0	32	230	171	0.9	0.1	0	7.75	30	---	1.94	10.473
GS-CA06	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	7.792
GS-CA07	0	0	32	74	61.8	0.9	0.1	0	7.75	30	---	1.37	2.323
GS-CA08	0	0	32	160	122	0.9	0.1	0	7.75	30	---	1.69	6.032
GS-CA09	0	0	32	170	129	0.9	0.1	0	7.75	30	---	1.72	6.593
GS-CA10	0	0	32	160	122	0.9	0.1	0	7.75	30	---	1.69	6.032
GS-CA11	0	0	32	200	150	0.9	0.1	0	7.75	30	---	1.83	8.428
GS-CA12	0	0	32	210	157	0.9	0.1	0	7.75	30	---	1.87	9.087
GS-CA13	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	7.792
GS-CA14	0	0	32	75	62.5	0.9	0.1	0	7.75	30	---	1.38	2.354
GS-HOUSE	0	0	32	210	157	0.9	0.1	0	7.75	30	---	1.87	9.087
GS-VACANT	0	0	32	210	157	0.9	0.1	0	7.75	30	---	1.87	9.087

Note: Percent exceedance was calculated using values of the geometric standard deviation (GSD) of the distribution of 1.6 and the blood lead cutoff value of 3.5 micrograms per deciliter ($\mu\text{g}/\text{dL}$), ID= lot identifier code, FAM= family or residence unit identifier, BLK= area or neighborhood identifier code, AGE= child's age in months, SOIL= soil lead concentration in microgram per gram ($\mu\text{g}/\text{g}$), DUST= dust lead concentration in $\mu\text{g}/\text{g}$, WATER= drinking water lead concentration in $\mu\text{g}/\text{dL}$, AIR= air lead concentration in microgram per cubic meter ($\mu\text{g}/\text{m}^3$), Other= daily intake of lead from alternate



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source, ABSSoil= bioavailability of lead in soil expressed as a percentage, ABDust= bioavailability of lead in dust expressed as a percentage, PBB= observed child blood lead level in $\mu\text{g}/\text{dL}$, PRED= predicted blood lead concentration in $\mu\text{g}/\text{dL}$, $P(\text{PbB}>\text{C})$ = the estimated probability of exceeding the specified blood lead level of concern expressed as a percentage, --- = missing value.

Attachment Table 5. IEUBK output at blood lead cutoff value of 3.5 $\mu\text{g}/\text{dL}$ and lead concentration at soil depth of 1-6 inches

ID	FAM	BLK	AGE (mon)	SOIL ($\mu\text{g}/\text{g}$)	DUST ($\mu\text{g}/\text{g}$)	WATER ($\mu\text{g}/\text{L}$)	AIR ($\mu\text{g}/\text{m}^3$)	Other ($\mu\text{g}/\text{day}$)	ABSSoil (%)	ABSDust (%)	PBB ($\mu\text{g}/\text{dL}$)	PRED ($\mu\text{g}/\text{dL}$)	$P(\text{PbB}>\text{C})$ (%)
GS-01A	0	0	32	97	77.9	0.9	0.1	0	7.75	30	---	1.46	3.116
GS-01B	0	0	32	110	87	0.9	0.1	0	7.75	30	---	1.51	3.629
GS-01E	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	7.18
GS-02A	0	0	32	110	87	0.9	0.1	0	7.75	30	---	1.51	3.629
GS-02B	0	0	32	110	87	0.9	0.1	0	7.75	30	---	1.51	3.629
GS-02E	0	0	32	280	206	0.9	0.1	0	7.75	30	---	2.12	14.287
GS-03A	0	0	32	120	94	0.9	0.1	0	7.75	30	---	1.54	4.055
GS-03B	0	0	32	240	178	0.9	0.1	0	7.75	30	---	1.98	11.198
GS-03E	0	0	32	270	199	0.9	0.1	0	7.75	30	---	2.08	13.489
GS-04A	0	0	32	79	65.3	0.9	0.1	0	7.75	30	---	1.39	2.483
GS-04B	0	0	32	220	164	0.9	0.1	0	7.75	30	---	1.9	9.769
GS-04E	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	7.792
GS-05A	0	0	32	100	80	0.9	0.1	0	7.75	30	---	1.47	3.231
GS-05B	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	7.792
GS-06A	0	0	32	60	52	0.9	0.1	0	7.75	30	---	1.32	1.909
GS-06B	0	0	32	220	164	0.9	0.1	0	7.75	30	---	1.9	9.769
GS-06E	0	0	32	260	192	0.9	0.1	0	7.75	30	---	2.05	12.707
GS-07A	0	0	32	77	63.9	0.9	0.1	0	7.75	30	---	1.38	2.418
GS-07A1	0	0	32	63	54.1	0.9	0.1	0	7.75	30	---	1.33	1.994
GS-07B	0	0	32	250	185	0.9	0.1	0	7.75	30	---	2.01	11.943
GS-07E	0	0	32	430	311	0.9	0.1	0	7.75	30	---	2.65	27.61
GS-08A	0	0	32	54	47.8	0.9	0.1	0	7.75	30	---	1.3	1.748
GS-08B	0	0	32	460	332	0.9	0.1	0	7.75	30	---	2.75	30.416
GS-08E	0	0	32	240	178	0.9	0.1	0	7.75	30	---	1.98	11.198
GS-09B	0	0	32	460	332	0.9	0.1	0	7.75	30	---	2.75	30.416
GS-09E	0	0	32	380	276	0.9	0.1	0	7.75	30	---	2.47	22.979
GS-10B	0	0	32	580	416	0.9	0.1	0	7.75	30	---	3.16	41.441
GS-11B	0	0	32	610	437	0.9	0.1	0	7.75	30	---	3.26	44.079
GS-11D	0	0	32	150	115	0.9	0.1	0	7.75	30	---	1.65	5.498
GS-12B	0	0	32	570	409	0.9	0.1	0	7.75	30	---	3.13	40.548
GS-12D	0	0	32	240	178	0.9	0.1	0	7.75	30	---	1.98	11.198



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GS-13B	0	0	32	490	353	0.9	0.1	0	7.75	30	---	2.85	33.218
GS-13D	0	0	32	230	171	0.9	0.1	0	7.75	30	---	1.94	10.473
GS-14B	0	0	32	460	332	0.9	0.1	0	7.75	30	---	2.75	30.416
GS-14D	0	0	32	200	150	0.9	0.1	0	7.75	30	---	1.83	8.428
GS-15B	0	0	32	220	164	0.9	0.1	0	7.75	30	---	1.9	9.769
GS-16B	0	0	32	250	185	0.9	0.1	0	7.75	30	---	2.01	11.943
GS-16B1	0	0	32	79	65.3	0.9	0.1	0	7.75	30	---	1.39	2.483
GS-16D	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	7.18
GS-17B	0	0	32	150	115	0.9	0.1	0	7.75	30	---	1.65	5.498
GS-17D	0	0	32	210	157	0.9	0.1	0	7.75	30	---	1.87	9.087
GS-18B	0	0	32	120	94	0.9	0.1	0	7.75	30	---	1.54	4.055
GS-18D	0	0	32	130	101	0.9	0.1	0	7.75	30	---	1.58	4.509
GS-19B	0	0	32	110	87	0.9	0.1	0	7.75	30	---	1.51	3.629
GS-20B	0	0	32	130	101	0.9	0.1	0	7.75	30	---	1.58	4.509
GS-20D	0	0	32	120	94	0.9	0.1	0	7.75	30	---	1.54	4.055
GS-21D	0	0	32	500	360	0.9	0.1	0	7.75	30	---	2.89	34.148
GS-22D	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	7.18
GS-23D	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	7.792
GS-24D	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	7.18
GS-25D	0	0	32	240	178	0.9	0.1	0	7.75	30	---	1.98	11.198
GS-26D	0	0	32	200	150	0.9	0.1	0	7.75	30	---	1.83	8.428
GS-27D	0	0	32	130	101	0.9	0.1	0	7.75	30	---	1.58	4.509
GS-28D	0	0	32	200	150	0.9	0.1	0	7.75	30	---	1.83	8.428
GS-29A4	0	0	32	610	437	0.9	0.1	0	7.75	30	---	3.26	44.079
GS-29A5	0	0	32	700	500	0.9	0.1	0	7.75	30	---	3.57	51.563
GS-29D	0	0	32	290	213	0.9	0.1	0	7.75	30	---	2.15	15.102
GS-30A	0	0	32	650	465	0.9	0.1	0	7.75	30	---	3.4	47.49
GS-31A	0	0	32	650	465	0.9	0.1	0	7.75	30	---	3.4	47.49
GS-32A	0	0	32	570	409	0.9	0.1	0	7.75	30	---	3.13	40.548
GS-33A	0	0	32	450	325	0.9	0.1	0	7.75	30	---	2.72	29.48
GS-34A	0	0	32	410	297	0.9	0.1	0	7.75	30	---	2.58	25.747
GS-35A	0	0	32	370	269	0.9	0.1	0	7.75	30	---	2.44	22.067
GS-36A	0	0	32	320	234	0.9	0.1	0	7.75	30	---	2.26	17.631
GS-37A	0	0	32	270	199	0.9	0.1	0	7.75	30	---	2.08	13.489
GS-38A	0	0	32	240	178	0.9	0.1	0	7.75	30	---	1.98	11.198
GS-39A	0	0	32	270	199	0.9	0.1	0	7.75	30	---	2.08	13.489
GS-40A	0	0	32	200	150	0.9	0.1	0	7.75	30	---	1.83	8.428



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GS-40A1	0	0	32	110	87	0.9	0.1	0	7.75	30	---	1.51	3.629
GS-40A2	0	0	32	61	52.7	0.9	0.1	0	7.75	30	---	1.32	1.937
GS-41A	0	0	32	68	57.6	0.9	0.1	0	7.75	30	---	1.35	2.139
GS-42A	0	0	32	54	47.8	0.9	0.1	0	7.75	30	---	1.3	1.748
GS-43A	0	0	32	50	45	0.9	0.1	0	7.75	30	---	1.28	1.645
GS-44A	0	0	32	48	43.6	0.9	0.1	0	7.75	30	---	1.28	1.595
GS-45A	0	0	32	61	52.7	0.9	0.1	0	7.75	30	---	1.32	1.937
GS-46A	0	0	32	71	59.7	0.9	0.1	0	7.75	30	---	1.36	2.23
GS-47A	0	0	32	86	70.2	0.9	0.1	0	7.75	30	---	1.42	2.719
GS-CA01	0	0	32	290	213	0.9	0.1	0	7.75	30	---	2.15	15.102
GS-CA02	0	0	32	120	94	0.9	0.1	0	7.75	30	---	1.54	4.055
GS-CA03	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	7.18
GS-CA04	0	0	32	260	192	0.9	0.1	0	7.75	30	---	2.05	12.707
GS-CA05	0	0	32	220	164	0.9	0.1	0	7.75	30	---	1.9	9.769
GS-CA06	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	7.18
GS-CA07	0	0	32	64	54.8	0.9	0.1	0	7.75	30	---	1.34	2.022
GS-CA08	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	7.792
GS-CA09	0	0	32	170	129	0.9	0.1	0	7.75	30	---	1.72	6.593
GS-CA10	0	0	32	210	157	0.9	0.1	0	7.75	30	---	1.87	9.087
GS-CA11	0	0	32	300	220	0.9	0.1	0	7.75	30	---	2.19	15.931
GS-CA12	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	7.792
GS-CA13	0	0	32	130	101	0.9	0.1	0	7.75	30	---	1.58	4.509
GS-CA14	0	0	32	83	68.1	0.9	0.1	0	7.75	30	---	1.41	2.616
GS-HOUSE	0	0	32	210	157	0.9	0.1	0	7.75	30	---	1.87	9.087



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GS-VACANT	0	0	32	210	157	0.9	0.1	0	7.75	30	---	1.87	9.087
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Note: Percent exceedance was calculated using values of the geometric standard deviation (GSD) of the distribution of 1.6 and the blood lead cutoff value of 3.5 micrograms per deciliter ($\mu\text{g}/\text{dL}$), ID= lot identifier code, FAM= family or residence unit identifier, BLK= area or neighborhood identifier code, AGE= child's age in months, SOIL= soil lead concentration in microgram per gram ($\mu\text{g}/\text{g}$), DUST= dust lead concentration in $\mu\text{g}/\text{g}$, WATER= drinking water lead concentration in $\mu\text{g}/\text{dL}$, AIR= air lead concentration in microgram per cubic meter ($\mu\text{g}/\text{m}^3$), Other= daily intake of lead from alternate source, ABSSoil= bioavailability of lead in soil expressed as a percentage, ABSDust= bioavailability of lead in dust expressed as a percentage, PBB= observed child blood lead level in $\mu\text{g}/\text{dL}$, PRED= predicted blood lead concentration in $\mu\text{g}/\text{dL}$, $P(\text{PbB}>\text{C})$ = the estimated probability of exceeding the specified blood lead level of concern expressed as a percentage, --- = missing value.

Attachment Table 6. IEUBK output at blood lead cutoff value of 5 $\mu\text{g}/\text{dL}$ and lead concentration at soil depth of 0-1 inches

ID	FAM	BLK	AGE (mon)	SOIL ($\mu\text{g}/\text{g}$)	DUST ($\mu\text{g}/\text{g}$)	WATER ($\mu\text{g}/\text{L}$)	AIR ($\mu\text{g}/\text{m}^3$)	Other ($\mu\text{g}/\text{day}$)	ABSSoil (%)	ABSDust (%)	PBB ($\mu\text{g}/\text{dL}$)	PRED ($\mu\text{g}/\text{dL}$)	$P(\text{PbB}>\text{C})$ (%)
GS-01A	0	0	32	110	87	0.9	0.1	0	7.75	30	---	1.51	0.532
GS-01B	0	0	32	230	171	0.9	0.1	0	7.75	30	---	1.94	2.201
GS-01E	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	1.316
GS-02A	0	0	32	91	73.7	0.9	0.1	0	7.75	30	---	1.44	0.396
GS-02B	0	0	32	130	101	0.9	0.1	0	7.75	30	---	1.58	0.708
GS-02E	0	0	32	170	129	0.9	0.1	0	7.75	30	---	1.72	1.174
GS-03A	0	0	32	120	94	0.9	0.1	0	7.75	30	---	1.54	0.615
GS-03B	0	0	32	160	122	0.9	0.1	0	7.75	30	---	1.69	1.042
GS-03E	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	1.316
GS-04A	0	0	32	100	80	0.9	0.1	0	7.75	30	---	1.47	0.457
GS-04B	0	0	32	250	185	0.9	0.1	0	7.75	30	---	2.01	2.639
GS-04E	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	1.316
GS-05A	0	0	32	120	94	0.9	0.1	0	7.75	30	---	1.54	0.615
GS-05B	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	1.47
GS-06A	0	0	32	61	52.7	0.9	0.1	0	7.75	30	---	1.32	0.236
GS-06B	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	1.316
GS-06E	0	0	32	140	108	0.9	0.1	0	7.75	30	---	1.61	0.809
GS-07A	0	0	32	80	66	0.9	0.1	0	7.75	30	---	1.39	0.33
GS-07A1	0	0	32	88	71.6	0.9	0.1	0	7.75	30	---	1.42	0.377
GS-07B	0	0	32	210	157	0.9	0.1	0	7.75	30	---	1.87	1.812
GS-07E	0	0	32	240	178	0.9	0.1	0	7.75	30	---	1.98	2.414
GS-08A	0	0	32	100	80	0.9	0.1	0	7.75	30	---	1.47	0.457



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GS-08B	0	0	32	440	318	0.9	0.1	0	7.75	30	---	2.68	9.248
GS-08E	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	1.47
GS-09B	0	0	32	360	262	0.9	0.1	0	7.75	30	---	2.4	5.942
GS-09E	0	0	32	260	192	0.9	0.1	0	7.75	30	---	2.05	2.877
GS-10B	0	0	32	430	311	0.9	0.1	0	7.75	30	---	2.65	8.797
GS-11B	0	0	32	490	353	0.9	0.1	0	7.75	30	---	2.85	11.648
GS-11D	0	0	32	92	74.4	0.9	0.1	0	7.75	30	---	1.44	0.403
GS-12B	0	0	32	340	248	0.9	0.1	0	7.75	30	---	2.33	5.23
GS-12D	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	1.316
GS-13B	0	0	32	290	213	0.9	0.1	0	7.75	30	---	2.15	3.665
GS-13D	0	0	32	290	213	0.9	0.1	0	7.75	30	---	2.15	3.665
GS-14B	0	0	32	460	332	0.9	0.1	0	7.75	30	---	2.75	10.18
GS-14D	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	1.47
GS-15B	0	0	32	200	150	0.9	0.1	0	7.75	30	---	1.83	1.635
GS-16B	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	1.316
GS-16B1	0	0	32	92	74.4	0.9	0.1	0	7.75	30	---	1.44	0.403
GS-16D	0	0	32	150	115	0.9	0.1	0	7.75	30	---	1.65	0.92
GS-17B	0	0	32	160	122	0.9	0.1	0	7.75	30	---	1.69	1.042
GS-17D	0	0	32	160	122	0.9	0.1	0	7.75	30	---	1.69	1.042
GS-18B	0	0	32	110	87	0.9	0.1	0	7.75	30	---	1.51	0.532
GS-18D	0	0	32	170	129	0.9	0.1	0	7.75	30	---	1.72	1.174
GS-19B	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	1.47
GS-20B	0	0	32	85	69.5	0.9	0.1	0	7.75	30	---	1.41	0.359
GS-20D	0	0	32	200	150	0.9	0.1	0	7.75	30	---	1.83	1.635
GS-21D	0	0	32	640	458	0.9	0.1	0	7.75	30	---	3.36	19.963
GS-22D	0	0	32	160	122	0.9	0.1	0	7.75	30	---	1.69	1.042
GS-23D	0	0	32	260	192	0.9	0.1	0	7.75	30	---	2.05	2.877
GS-24D	0	0	32	140	108	0.9	0.1	0	7.75	30	---	1.61	0.809
GS-25D	0	0	32	200	150	0.9	0.1	0	7.75	30	---	1.83	1.635
GS-26D	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	1.47
GS-27D	0	0	32	110	87	0.9	0.1	0	7.75	30	---	1.51	0.532
GS-28D	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	1.316
GS-29A4	0	0	32	550	395	0.9	0.1	0	7.75	30	---	3.06	14.804
GS-29A5	0	0	32	500	360	0.9	0.1	0	7.75	30	---	2.89	12.154
GS-29D	0	0	32	370	269	0.9	0.1	0	7.75	30	---	2.44	6.316
GS-30A	0	0	32	480	346	0.9	0.1	0	7.75	30	---	2.82	11.15
GS-31A	0	0	32	500	360	0.9	0.1	0	7.75	30	---	2.89	12.154
GS-32A	0	0	32	440	318	0.9	0.1	0	7.75	30	---	2.68	9.248



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GS-33A	0	0	32	390	283	0.9	0.1	0	7.75	30	---	2.51	7.098
GS-34A	0	0	32	450	325	0.9	0.1	0	7.75	30	---	2.72	9.709
GS-35A	0	0	32	320	234	0.9	0.1	0	7.75	30	---	2.26	4.567
GS-36A	0	0	32	350	255	0.9	0.1	0	7.75	30	---	2.37	5.58
GS-37A	0	0	32	240	178	0.9	0.1	0	7.75	30	---	1.98	2.414
GS-38A	0	0	32	160	122	0.9	0.1	0	7.75	30	---	1.69	1.042
GS-39A	0	0	32	250	185	0.9	0.1	0	7.75	30	---	2.01	2.639
GS-40A	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	1.47
GS-40A1	0	0	32	100	80	0.9	0.1	0	7.75	30	---	1.47	0.457
GS-40A2	0	0	32	71	59.7	0.9	0.1	0	7.75	30	---	1.36	0.283
GS-41A	0	0	32	77	63.9	0.9	0.1	0	7.75	30	---	1.38	0.314
GS-42A	0	0	32	60	52	0.9	0.1	0	7.75	30	---	1.32	0.231
GS-43A	0	0	32	53	47.1	0.9	0.1	0	7.75	30	---	1.3	0.203
GS-44A	0	0	32	50	45	0.9	0.1	0	7.75	30	---	1.28	0.191
GS-45A	0	0	32	86	70.2	0.9	0.1	0	7.75	30	---	1.42	0.365
GS-46A	0	0	32	84	68.8	0.9	0.1	0	7.75	30	---	1.41	0.353
GS-47A	0	0	32	94	75.8	0.9	0.1	0	7.75	30	---	1.45	0.416
GS-CA01	0	0	32	290	213	0.9	0.1	0	7.75	30	---	2.15	3.665
GS-CA02	0	0	32	160	122	0.9	0.1	0	7.75	30	---	1.69	1.042
GS-CA03	0	0	32	230	171	0.9	0.1	0	7.75	30	---	1.94	2.201
GS-CA04	0	0	32	310	227	0.9	0.1	0	7.75	30	---	2.23	4.254
GS-CA05	0	0	32	230	171	0.9	0.1	0	7.75	30	---	1.94	2.201
GS-CA06	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	1.47
GS-CA07	0	0	32	74	61.8	0.9	0.1	0	7.75	30	---	1.37	0.298
GS-CA08	0	0	32	160	122	0.9	0.1	0	7.75	30	---	1.69	1.042
GS-CA09	0	0	32	170	129	0.9	0.1	0	7.75	30	---	1.72	1.174
GS-CA10	0	0	32	160	122	0.9	0.1	0	7.75	30	---	1.69	1.042
GS-CA11	0	0	32	200	150	0.9	0.1	0	7.75	30	---	1.83	1.635
GS-CA12	0	0	32	210	157	0.9	0.1	0	7.75	30	---	1.87	1.812



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GS-CA13	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	1.47
GS-CA14	0	0	32	75	62.5	0.9	0.1	0	7.75	30	---	1.38	0.303
GS-HOUSE	0	0	32	210	157	0.9	0.1	0	7.75	30	---	1.87	1.812
GS-VACANT	0	0	32	210	157	0.9	0.1	0	7.75	30	---	1.87	1.812

Note: Percent exceedance was calculated using values of the geometric standard deviation (GSD) of the distribution of 1.6 and the blood lead cutoff value of 5 micrograms per deciliter ($\mu\text{g}/\text{dL}$), ID= lot identifier code, FAM= family or residence unit identifier, BLK= area or neighborhood identifier code, AGE= child's age in months, SOIL= soil lead concentration in microgram per gram ($\mu\text{g}/\text{g}$), DUST= dust lead concentration in $\mu\text{g}/\text{g}$, WATER= drinking water lead concentration in $\mu\text{g}/\text{dL}$, AIR= air lead concentration in microgram per cubic meter ($\mu\text{g}/\text{m}^3$), Other= daily intake of lead from alternate source, ABSSoil= bioavailability of lead in soil expressed as a percentage, ABSDust= bioavailability of lead in dust expressed as a percentage, PBB= observed child blood lead level in $\mu\text{g}/\text{dL}$, PRED= predicted blood lead concentration in $\mu\text{g}/\text{dL}$, $P(\text{PbB}>\text{C})$ = the estimated probability of exceeding the specified blood lead level of concern expressed as a percentage, --- = missing value.

Attachment Table 7. IEUBK output at blood lead cutoff value of 5 $\mu\text{g}/\text{dL}$ and lead concentration at soil depth of 1-6 inches

ID	FAM	BLK	AGE (mon)	SOIL ($\mu\text{g}/\text{g}$)	DUST ($\mu\text{g}/\text{g}$)	WATER ($\mu\text{g}/\text{L}$)	AIR ($\mu\text{g}/\text{m}^3$)	Other ($\mu\text{g}/\text{day}$)	ABSSoil (%)	ABSDust (%)	PBB ($\mu\text{g}/\text{dL}$)	PRED ($\mu\text{g}/\text{dL}$)	$P(\text{PbB}>\text{C})$ (%)
GS-01A	0	0	32	97	77.9	0.9	0.1	0	7.75	30	---	1.46	0.436
GS-01B	0	0	32	110	87	0.9	0.1	0	7.75	30	---	1.51	0.532
GS-01E	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	1.316
GS-02A	0	0	32	110	87	0.9	0.1	0	7.75	30	---	1.51	0.532
GS-02B	0	0	32	110	87	0.9	0.1	0	7.75	30	---	1.51	0.532
GS-02E	0	0	32	280	206	0.9	0.1	0	7.75	30	---	2.12	3.39
GS-03A	0	0	32	120	94	0.9	0.1	0	7.75	30	---	1.54	0.615
GS-03B	0	0	32	240	178	0.9	0.1	0	7.75	30	---	1.98	2.414
GS-03E	0	0	32	270	199	0.9	0.1	0	7.75	30	---	2.08	3.127
GS-04A	0	0	32	79	65.3	0.9	0.1	0	7.75	30	---	1.39	0.325
GS-04B	0	0	32	220	164	0.9	0.1	0	7.75	30	---	1.9	2
GS-04E	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	1.47
GS-05A	0	0	32	100	80	0.9	0.1	0	7.75	30	---	1.47	0.457
GS-05B	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	1.47
GS-06A	0	0	32	60	52	0.9	0.1	0	7.75	30	---	1.32	0.231
GS-06B	0	0	32	220	164	0.9	0.1	0	7.75	30	---	1.9	2
GS-06E	0	0	32	260	192	0.9	0.1	0	7.75	30	---	2.05	2.877
GS-07A	0	0	32	77	63.9	0.9	0.1	0	7.75	30	---	1.38	0.314



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GS-07A1	0	0	32	63	54.1	0.9	0.1	0	7.75	30	---	1.33	0.245
GS-07B	0	0	32	250	185	0.9	0.1	0	7.75	30	---	2.01	2.639
GS-07E	0	0	32	430	311	0.9	0.1	0	7.75	30	---	2.65	8.797
GS-08A	0	0	32	54	47.8	0.9	0.1	0	7.75	30	---	1.3	0.207
GS-08B	0	0	32	460	332	0.9	0.1	0	7.75	30	---	2.75	10.18
GS-08E	0	0	32	240	178	0.9	0.1	0	7.75	30	---	1.98	2.414
GS-09B	0	0	32	460	332	0.9	0.1	0	7.75	30	---	2.75	10.18
GS-09E	0	0	32	380	276	0.9	0.1	0	7.75	30	---	2.47	6.701
GS-10B	0	0	32	580	416	0.9	0.1	0	7.75	30	---	3.16	16.476
GS-11B	0	0	32	610	437	0.9	0.1	0	7.75	30	---	3.26	18.198
GS-11D	0	0	32	150	115	0.9	0.1	0	7.75	30	---	1.65	0.92
GS-12B	0	0	32	570	409	0.9	0.1	0	7.75	30	---	3.13	15.913
GS-12D	0	0	32	240	178	0.9	0.1	0	7.75	30	---	1.98	2.414
GS-13B	0	0	32	490	353	0.9	0.1	0	7.75	30	---	2.85	11.648
GS-13D	0	0	32	230	171	0.9	0.1	0	7.75	30	---	1.94	2.201
GS-14B	0	0	32	460	332	0.9	0.1	0	7.75	30	---	2.75	10.18
GS-14D	0	0	32	200	150	0.9	0.1	0	7.75	30	---	1.83	1.635
GS-15B	0	0	32	220	164	0.9	0.1	0	7.75	30	---	1.9	2
GS-16B	0	0	32	250	185	0.9	0.1	0	7.75	30	---	2.01	2.639
GS-16B1	0	0	32	79	65.3	0.9	0.1	0	7.75	30	---	1.39	0.325
GS-16D	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	1.316
GS-17B	0	0	32	150	115	0.9	0.1	0	7.75	30	---	1.65	0.92
GS-17D	0	0	32	210	157	0.9	0.1	0	7.75	30	---	1.87	1.812
GS-18B	0	0	32	120	94	0.9	0.1	0	7.75	30	---	1.54	0.615
GS-18D	0	0	32	130	101	0.9	0.1	0	7.75	30	---	1.58	0.708
GS-19B	0	0	32	110	87	0.9	0.1	0	7.75	30	---	1.51	0.532
GS-20B	0	0	32	130	101	0.9	0.1	0	7.75	30	---	1.58	0.708
GS-20D	0	0	32	120	94	0.9	0.1	0	7.75	30	---	1.54	0.615
GS-21D	0	0	32	500	360	0.9	0.1	0	7.75	30	---	2.89	12.154
GS-22D	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	1.316
GS-23D	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	1.47
GS-24D	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	1.316
GS-25D	0	0	32	240	178	0.9	0.1	0	7.75	30	---	1.98	2.414
GS-26D	0	0	32	200	150	0.9	0.1	0	7.75	30	---	1.83	1.635
GS-27D	0	0	32	130	101	0.9	0.1	0	7.75	30	---	1.58	0.708
GS-28D	0	0	32	200	150	0.9	0.1	0	7.75	30	---	1.83	1.635
GS-29A4	0	0	32	610	437	0.9	0.1	0	7.75	30	---	3.26	18.198



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GS-29A5	0	0	32	700	500	0.9	0.1	0	7.75	30	---	3.57	23.586
GS-29D	0	0	32	290	213	0.9	0.1	0	7.75	30	---	2.15	3.665
GS-30A	0	0	32	650	465	0.9	0.1	0	7.75	30	---	3.4	20.559
GS-31A	0	0	32	650	465	0.9	0.1	0	7.75	30	---	3.4	20.559
GS-32A	0	0	32	570	409	0.9	0.1	0	7.75	30	---	3.13	15.913
GS-33A	0	0	32	450	325	0.9	0.1	0	7.75	30	---	2.72	9.709
GS-34A	0	0	32	410	297	0.9	0.1	0	7.75	30	---	2.58	7.926
GS-35A	0	0	32	370	269	0.9	0.1	0	7.75	30	---	2.44	6.316
GS-36A	0	0	32	320	234	0.9	0.1	0	7.75	30	---	2.26	4.567
GS-37A	0	0	32	270	199	0.9	0.1	0	7.75	30	---	2.08	3.127
GS-38A	0	0	32	240	178	0.9	0.1	0	7.75	30	---	1.98	2.414
GS-39A	0	0	32	270	199	0.9	0.1	0	7.75	30	---	2.08	3.127
GS-40A	0	0	32	200	150	0.9	0.1	0	7.75	30	---	1.83	1.635
GS-40A1	0	0	32	110	87	0.9	0.1	0	7.75	30	---	1.51	0.532
GS-40A2	0	0	32	61	52.7	0.9	0.1	0	7.75	30	---	1.32	0.236
GS-41A	0	0	32	68	57.6	0.9	0.1	0	7.75	30	---	1.35	0.268
GS-42A	0	0	32	54	47.8	0.9	0.1	0	7.75	30	---	1.3	0.207
GS-43A	0	0	32	50	45	0.9	0.1	0	7.75	30	---	1.28	0.191
GS-44A	0	0	32	48	43.6	0.9	0.1	0	7.75	30	---	1.28	0.184
GS-45A	0	0	32	61	52.7	0.9	0.1	0	7.75	30	---	1.32	0.236
GS-46A	0	0	32	71	59.7	0.9	0.1	0	7.75	30	---	1.36	0.283
GS-47A	0	0	32	86	70.2	0.9	0.1	0	7.75	30	---	1.42	0.365
GS-CA01	0	0	32	290	213	0.9	0.1	0	7.75	30	---	2.15	3.665
GS-CA02	0	0	32	120	94	0.9	0.1	0	7.75	30	---	1.54	0.615
GS-CA03	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	1.316
GS-CA04	0	0	32	260	192	0.9	0.1	0	7.75	30	---	2.05	2.877
GS-CA05	0	0	32	220	164	0.9	0.1	0	7.75	30	---	1.9	2
GS-CA06	0	0	32	180	136	0.9	0.1	0	7.75	30	---	1.76	1.316
GS-CA07	0	0	32	64	54.8	0.9	0.1	0	7.75	30	---	1.34	0.249
GS-CA08	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	1.47



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GS-CA09	0	0	32	170	129	0.9	0.1	0	7.75	30	---	1.72	1.174
GS-CA10	0	0	32	210	157	0.9	0.1	0	7.75	30	---	1.87	1.812
GS-CA11	0	0	32	300	220	0.9	0.1	0	7.75	30	---	2.19	3.953
GS-CA12	0	0	32	190	143	0.9	0.1	0	7.75	30	---	1.8	1.47
GS-CA13	0	0	32	130	101	0.9	0.1	0	7.75	30	---	1.58	0.708
GS-CA14	0	0	32	83	68.1	0.9	0.1	0	7.75	30	---	1.41	0.347
GS-HOUSE	0	0	32	210	157	0.9	0.1	0	7.75	30	---	1.87	1.812
GS-VACANT	0	0	32	210	157	0.9	0.1	0	7.75	30	---	1.87	1.812

Note: Percent exceedance was calculated using values of the geometric standard deviation (GSD) of the distribution of 1.6 and the blood lead cutoff value of 5 micrograms per deciliter ($\mu\text{g}/\text{dL}$), ID= lot identifier code, FAM= family or residence unit identifier, BLK= area or neighborhood identifier code, AGE= child's age in months, SOIL= soil lead concentration in microgram per gram ($\mu\text{g}/\text{g}$), DUST= dust lead concentration in $\mu\text{g}/\text{g}$, WATER= drinking water lead concentration in $\mu\text{g}/\text{dL}$, AIR= air lead concentration in microgram per cubic meter ($\mu\text{g}/\text{m}^3$), Other= daily intake of lead from alternate source, ABSSoil= bioavailability of lead in soil expressed as a percentage, ABSDust= bioavailability of lead in dust expressed as a percentage, PBB= observed child blood lead level in $\mu\text{g}/\text{dL}$, PRED= predicted blood lead concentration in $\mu\text{g}/\text{dL}$, $P(\text{PbB}>\text{C})$ = the estimated probability of exceeding the specified blood lead level of concern expressed as a percentage, --- = missing value.



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ADDENDUM

Purpose and Background:

The purpose of this addendum is to provide the remedial project managers with additional risk estimates and Preliminary Remediation Goals (PRG) to be considered in the removal action at the Highway 24 Mill Site (Site). On January 13, 2025, the EPA released an updated Toxicological Review for inorganic arsenic in the Integrated Risk Information System (IRIS) <https://iris.epa.gov/document/&deid=363892>. The IRIS program is a primary source of toxicity values that are used to evaluate the potential risks from environmental exposures.

The new toxicity values for arsenic were published after the Streamlined Risk Evaluation and PRG memorandums for the site were finalized in December 2024, but prior to any removal action occurring at the site. This addendum includes the estimated risk and PRGs based on use of the updated IRIS toxicity values for arsenic.

Why the change?

The EPA IRIS program conducts reviews of contaminants and their potential to cause health effects periodically as new information and science becomes available. The update to the arsenic toxicity values was a years-long process that went through multiple layers of review and public comment. The Streamlined Risk Evaluation and PRG memos were written for the site based on the previous toxicity values that were published in 1995. Additional research about the potential for arsenic to cause health effects has increased knowledge over the last 30 years, and the updated toxicity values reflect that increase. This process is not unique for arsenic. The IRIS program conducts these periodic toxicity reviews for several contaminants that people are exposed to in the environment as new science becomes available. To learn more about the IRIS program, please visit <https://www.epa.gov/iris/basic-information-about-integrated-risk-information-system>.

What changed?

Toxicity values can be derived for both cancer and non-cancer endpoints when the available information on a particular contaminant suggests that exposure can lead to cancer and non-cancer health effects. Arsenic is, and has been, considered a known carcinogen. In addition, arsenic has been known to cause non-cancer health effects, such as skin disorders. The updated Toxicological Review for arsenic changed both cancer and non-cancer values, indicating that arsenic is more toxic than previously thought. The net effect of this change is the PRGs will be lower than those that were previously calculated at the Site (approximately 21 times lower for cancer and five times lower for non-cancer health effects).



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What has not changed?

The updated risks and preliminary remediation goals included in this addendum were derived in the same way as described in the previously published memos. The concentrations of arsenic in all samples remains the same. The arsenic concentrations in soil ranged from 15 mg/kg to 140 mg/kg with an average concentration of 53.8 mg/kg. The bioaccessibility of arsenic from the site soil samples ranged from 7-18% with a mean in vitro bioaccessibility assay (IVBA) of 13%. This corresponds to a calculated relative bioavailability (RBA) of 8-17%. The 95% upper confidence level (UCL) on the mean IVBA results is 14.3% with a corresponding RBA of 14%. Due to the large variance in the IVBA results, the 95% UCL value of 14.3% RBA was selected for use in the PRG calculation for arsenic. It should also be noted that the change in arsenic toxicity values does not impact the PRGs that were calculated for lead.

Arsenic Preliminary Remediation Goals

The site wide RBA and updated toxicity values were entered into the Regional Screening Level calculator and the residential PRGs are shown in the table below. The estimated screening levels are based on the target cancer risk level of 1E-04, a non-cancer Hazard Quotient (HQ) of 1, and a non-cancer HQ of 3 (Table 1). Table 2 shows the comparison with the updated PRGs for each property.

Table 1. Updated Site Soil Screening Level Values for Arsenic (RBA set at 14.3%)

Arsenic Screening Level based on Non-cancer Child HQ = 1 (in mg/kg)	Arsenic Screening Level based on Non-cancer Child HQ = 3 (in mg/kg)	Arsenic Screening Level based on Cancer Risk at 1E-04 Theoretical Risk (in mg/kg)
22 (91)	66 (26)	9.6 (93)

NOTE: number in (**Bold**) indicates the number of lots with sample data exceeding the site screening level value for arsenic. RBA = Relative Bioavailability, HQ = Hazard Quotient, mg/kg = milligram per kilogram

How can this change impact the Site?

The PRGs based on the updated IRIS values indicate that removal action may be necessary at many more properties than previously calculated. Ninety-one properties exceed a target hazard quotient of one. Twenty-six properties exceed a HQ of three and all properties exceed a cancer risk level of 1 in 10,000.



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Final cleanup levels consider not only risk-based PRGs to assess protectiveness, but also the remaining eight criteria contained in the National Contingency Plan (40 CFR 300.430(e)(9)). Background concentrations of arsenic in soil, both geogenic and anthropogenic, may also impact achievable cleanup levels. Therefore, the final selected cleanup level may differ from the PRGs documented in this addendum.

Table 2. Decision Unit Comparison of Selected PRGs

Decision Unit	Concentration (mg/kg)	HQ = 1	HQ= 3	CR 1E-04
GS-01A-00-01	29	X		X
GS-01A-01-06	24	X		X
GS-01B-00-01	46	X		X
GS-01B-01-06	25	X		X
GS-01E-00-01	54	X		X
GS-01E-01-06	45	X		X
GS-02A-00-01	24	X		X
GS-02A-01-06	26	X		X
GS-02B-00-01	43	X		X
GS-02B-01-06	37	X		X
GS-02E-00-01	47	X		X
GS-02E-01-06	79	X	X	X
GS-03A-00-01	35	X		X
GS-03A-01-06	41	X		X
GS-03B-00-01	44	X		X
GS-03B-01-06	56	X		X
GS-03E-00-01	44	X		X
GS-03E-01-06	48	X		X
GS-04A-00-01	30	X		X
GS-04A-01-06	27	X		X
GS-04B-00-01	75	X	X	X
GS-04B-01-06	55	X		X
GS-04E-00-01	46	X		X
GS-04E-01-06	44	X		X
GS-05A-00-01	31	X		X
GS-05A-01-06	24	X		X
GS-05B-00-01	53	X		X
GS-05B-01-06	55	X		X
GS-06A-00-01	19			X
GS-06A-01-06	17			X
GS-06B-00-01	50	X		X
GS-06B-01-06	56	X		X
GS-06E-00-01	37	X		X
GS-06E-01-06	70	X	X	X
GS-07A-00-01	22	X		X
GS-07A-01-06	19			X
GS-07A1-00-01	22	X		X



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GS-07A1-01-06	18			X
GS-07B-00-01	56	X		X
GS-07B-01-06	60	X		X
GS-07E-00-01	54	X		X
GS-07E-01-06	110	X	X	X
GS-08A-00-01	25	X		X
GS-08A-01-06	15			X
GS-08B-00-01	79	X	X	X
GS-08B-01-06	97	X	X	X
GS-08E-00-01	48	X		X
GS-08E-01-06	68	X	X	X
GS-09B-00-01	79	X	X	X
GS-09B-01-06	99	X	X	X
GS-09E-00-01	53	X		X
GS-09E-01-06	79	X	X	X
GS-10B-00-01	99	X	X	X
GS-10B-01-06	110	X	X	X
GS-11B-00-01	96	X	X	X
GS-11B-01-06	120	X	X	X
GS-11D-00-01	25	X		X
GS-11D-01-06	33	X		X
GS-12B-00-01	63	X		X
GS-12B-01-06	92	X	X	X
GS-12D-00-01	37	X		X
GS-12D-01-06	43	X		X
GS-13B-00-01	60	X		X
GS-13B-01-06	72	X	X	X
GS-13D-00-01	61	X		X
GS-13D-01-06	52	X		X
GS-14B-00-01	72	X	X	X
GS-14B-01-06	73	X	X	X
GS-14D-00-01	42	X		X
GS-14D-01-06	42	X		X
GS-15B-00-01	44	X		X
GS-15B-01-06	56	X		X
GS-16B-00-01	46	X		X
GS-16B-01-06	65	X		X
GS-16B1-00-01	35	X		X
GS-16B1-01-06	24	X		X
GS-16D-00-01	35	X		X
GS-16D-01-06	37	X		X
GS-17B-00-01	47	X		X
GS-17B-01-06	42	X		X
GS-17D-00-01	44	X		X
GS-17D-01-06	55	X		X
GS-18B-00-01	32	X		X
GS-18B-01-06	36	X		X



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GS-18D-00-01	43	X		X
GS-18D-01-06	28	X		X
GS-19B-00-01	49	X		X
GS-19B-01-06	30	X		X
GS-20B-00-01	24	X		X
GS-20B-01-06	33	X		X
GS-20D-00-01	48	X		X
GS-20D-01-06	34	X		X
GS-21D-00-01	65	X		X
GS-21D-01-06	140	X	X	X
GS-22D-00-01	49	X		X
GS-22D-01-06	47	X		X
GS-23D-00-01	58	X		X
GS-23D-01-06	48	X		X
GS-24D-00-01	48	X		X
GS-24D-01-06	46	X		X
GS-25D-00-01	50	X		X
GS-25D-01-06	58	X		X
GS-26D-00-01	47	X		X
GS-26D-01-06	46	X		X
GS-27D-00-01	30	X		X
GS-27D-01-06	33	X		X
GS-28D-00-01	49	X		X
GS-28D-01-06	58	X		X
GS-29A4-00-01	94	X	X	X
GS-29A4-01-06	100	X	X	X
GS-29A5-00-01	95	X	X	X
GS-29A5-01-06	110	X	X	X
GS-29D-00-01	78	X	X	X
GS-29D-01-06	79	X	X	X
GS-30A-00-01	92	X	X	X
GS-30A-01-06	110	X	X	X
GS-31A-00-01	100	X	X	X
GS-31A-01-06	100	X	X	X
GS-32A-00-01	88	X	X	X
GS-32A-01-06	96	X	X	X
GS-33A-00-01	83	X	X	X
GS-33A-01-06	96	X	X	X
GS-34A-00-01	89	X	X	X
GS-34A-01-06	77	X	X	X
GS-35A-00-01	74	X	X	X
GS-35A-01-06	75	X	X	X
GS-36A-00-01	96	X	X	X
GS-36A-01-06	80	X	X	X
GS-37A-00-01	61	X		X
GS-37A-01-06	65	X		X
GS-38A-00-01	50	X		X



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GS-38A-01-06	63	X		X
GS-39A-00-01	84	X	X	X
GS-39A-01-06	84	X	X	X
GS-40A-00-01	64	X		X
GS-40A-01-06	58	X		X
GS-40A1-00-01	38	X		X
GS-40A1-01-06	43	X		X
GS-40A2-00-01	34	X		X
GS-40A2-01-06	29	X		X
GS-41A-00-01	35	X		X
GS-41A-01-06	32	X		X
GS-42A-00-01	29	X		X
GS-42A-01-06	29	X		X
GS-43A-00-01	29	X		X
GS-43A-01-06	28	X		X
GS-44A-00-01	21			X
GS-44A-01-06	20			X
GS-45A-00-01	32	X		X
GS-45A-01-06	23	X		X
GS-46A-00-01	31	X		X
GS-46A-01-06	29	X		X
GS-47A-00-01	27	X		X
GS-47A-01-06	26	X		X
GS-CA01-00-01	64	X		X
GS-CA01-01-06	60	X		X
GS-CA02-00-01	51	X		X
GS-CA02-01-06	39	X		X
GS-CA03-00-01	62	X		X
GS-CA03-01-06	52	X		X
GS-CA04-00-01	84	X	X	X
GS-CA04-01-06	63	X		X
GS-CA05-00-01	69	X	X	X
GS-CA05-01-06	67	X	X	X
GS-CA06-00-01	69	X	X	X
GS-CA06-01-06	60	X		X
GS-CA07-00-01	23	X		X
GS-CA07-01-06	21			X
GS-CA08-00-01	44	X		X
GS-CA08-01-06	42	X		X
GS-CA09-00-01	51	X		X
GS-CA09-01-06	47	X		X
GS-CA10-00-01	48	X		X
GS-CA10-01-06	49	X		X
GS-CA11-00-01	54	X		X
GS-CA11-01-06	68	X	X	X
GS-CA12-00-01	69	X	X	X
GS-CA12-01-06	57	X		X



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GS-CA13-00-01	70	X	X	X
GS-CA13-01-06	46	X		X
GS-CA14-00-01	59	X		X
GS-CA14-01-06	27	X		X
GS-HOUSE-00-01	49	X		X
GS-HOUSE-01-06	52	X		X
GS-VACANT-00-01	60	X		X
GS-VACANT-01-06	58	X		X

NOTE: For lots with duplicate or triplicate samples the maximum value is shown, lot nomenclature: GS=Garner Street, DU= decision unit, sample depth at intervals of 00-01 or 01-06 inches, mg/kg = milligram per kilogram, HQ = Hazard Quotient, CR = Cancer risk, 1E-04 = 1 excess cancer case per 10,000 people exposed

Appendix C Applicable or Relevant and Appropriate Requirements

**Applicable or Relevant and Appropriate Requirements
Highway 24/A-1 Mobile Home Village
Non-Time Critical Removal Action**

Location/Action	Requirements	Prerequisite	Citation(s)
State Location-Specific ARARs			
Noxious weeds area	Requires use of integrated methods to manage noxious weeds, if noxious weeds are likely to be materially damaging to the land of neighboring landowners. Integrated methods include: biological management, chemical management, cultural management, and mechanical management (as defined in C.R.S. § 35-5.5-103(9)(a-d)).	Performing response activities in an area with noxious weeds.	Colorado Noxious Weed Act, C.R.S. § 35-5.5-104 (Duty to Manage Noxious Weeds) Contact: Colorado Hazardous Materials and Waste Management Division (CDPHE)
Noxious weeds area	Prohibits allowing any plant of any population on "List A" to produce seed or develop other reproductive propagules. (Section 3.1 sets forth "List A.") Prescribed management techniques must be applied to every population of List A noxious weeds including: <ul style="list-style-type: none"> • Elimination of plants of every population of List A prior to seed development. • Once all mature plants are eliminated, appropriate efforts must be made to detect and eliminate new plants arising from seed, reproductive propagule, or root stock for the duration of the seed longevity for the particular species. • Any plant with flowers, seeds, or other reproductive propagules must be placed in sealed plastic bags and disposed of by: <ul style="list-style-type: none"> ○ High intensity burning in a controlled environment that completely destroys seed viability ○ Removal of plant materials to a solid waste landfill which covers refuse daily with six inches of soil or alternative material; or ○ Any other method approved by the Colorado Department of Agriculture Commissioner. 	Performing response activities in an area with "List A" noxious weeds.	Rules Pertaining to the Administration and Enforcement of the Colorado Noxious Weed Act, 8 C.C.R. 1206-2, Sections 3.1, 3.3, and 3.4 Contact: Colorado Hazardous Materials and Waste Management Division (CDPHE)

**Applicable or Relevant and Appropriate Requirements
Highway 24/A-1 Mobile Home Village
Non-Time Critical Removal Action**

Location/Action	Requirements	Prerequisite	Citation(s)
Noxious weeds area	<p>Prohibits allowing any plant of any population on "List B" to produce seed or develop other reproductive propagules after the time specified in the El Paso County Elimination Plan. (Section 4.1 sets forth "List B.")</p> <p>Prescribed management techniques for species on List B include:</p> <ul style="list-style-type: none"> • Elimination prior to seed development in the year specified in the county management plan • Any population that is discovered in areas designated for elimination subsequent to the year specified for elimination must be eliminated prior to the development of viable seed. If the population is discovered after seed development has occurred, then efforts must be made to minimize the dispersion of seed and elimination is required prior to seed development in the following year. • Once all plants are eliminated, appropriate efforts must be made in subsequent years to detect and eliminate new plants arising from seed, reproductive propagule, or root stock prior to seed development for the duration of the seed longevity for the particular species. • In order to ensure that seeds or other reproductive propagules are not produced or spread, any plant with flowers, seeds, or other reproductive propagules must be placed in sealed plastic bags and disposed of by: <ul style="list-style-type: none"> ○ High intensity burning in a controlled environment that completely destroys seed viability; ○ Removal of plant materials to a solid waste landfill which covers refuse daily with six inches of soil or alternative material; or ○ Any other method approved by the Colorado Department of Agriculture Commissioner. <p>Additional species-specific techniques for specified areas in El Paso County detailed in 8 C.C.R. 1206-2-4.8</p>	Performing response activities in an area with noxious weeds.	<p>Colorado Noxious Weed Act and El Paso County Noxious Weed regulations, C.R.S. § 35-5.5-104 (Duty to Manage Noxious Weeds); 8 C.C.R. 1206-2, Sections 4.1, 4.4, and the El Paso County Plan B Species elimination plan, available on December 31, 2024 at:</p> <p>https://docs.google.com/spreadsheets/d/1fHXmYl_VY0MGNqe0ZZzJ8NwXON-Lr3Rs8i_KvBY0Vug/edit?pref=2&pli=1&gid=1859294671#gid=1859294671</p> <p>Contact: Colorado Hazardous Materials and Waste Management Division (CDPHE)</p>

Applicable or Relevant and Appropriate Requirements
Highway 24/A-1 Mobile Home Village
Non-Time Critical Removal Action

Location/Action	Requirements	Prerequisite	Citation(s)
Relevant land use zone	<p>Sound levels that exceed the limits at a distance of 25 feet from the property line or greater are prima facie evidence of a public nuisance.</p> <p>Activities must be conducted in a manner so that any noise produced is not objectionable due to intermittence, beat frequency, or shrillness.</p> <p>For construction projects, maximum noise levels will be those specified for industrial zones for the time period within which construction is to be completed. For industrial zones, the maximum permissible sound level from 7:00 am to the next 7:00 pm is 80 A-weighted decibels (db[A]) and from 7:00 pm to the next 7:00 am is 75 db(A).</p>	Location of response activities is within a designated land use zone subject to noise regulation.	<p>Colorado Noise Abatement Statute, C.R.S. § 25-12-103 (Maximum Permissible Noise Levels)</p> <p>Contact: Colorado Hazardous Materials and Waste Management Division (CDPHE)</p>
Relevant land use zone	<p>Sets forth maximum permissible noise levels specific to off-highway vehicles defined in 25-12-102 (5.6) as a self-propelled vehicle with wheels or tracks in contact with the ground that is designed primarily for use off the public highways:</p> <p>(a) If manufactured before January 1, 1998; 99 db(A);</p> <p>(b) If manufactured on or after January 1, 1998; 96 db(A).</p> <p>Measurements should be conducted using SAE J1287.</p>	Use of off-highway vehicles in response activities	<p>Colorado Noise Abatement Statute, CRS § 25-12-103 (Maximum Permissible Noise Levels) and CRS § 25-12-110 (Off-highway vehicles)</p> <p>Contact: Colorado Hazardous Materials and Waste Management Division (CDPHE)</p>
Area where waste left in place above unrestricted use standards or where engineered features are incorporated into the remedy.	Requires environmental covenants (ECs) or notice of environmental use restrictions (RNs) whenever residual contamination not safe for all uses is left in place or an engineered feature or structure that requires monitoring, maintenance, or operation is included in the remedy. ¹	Performing response activities in locations leaving waste in place above standards for unrestricted use or incorporating engineered features or structures.	<p>Colorado Environmental Covenants Statute C.R.S. § 25-15-317 et seq.</p> <p>Contact: Colorado Hazardous Materials and Waste Management Division (CDPHE)</p>

¹ Clean fill placed over contaminated soils is an area where waste will be left in place, as well as an engineered feature, subject to the Environmental Covenants Statute. Pursuant to C.R.S. § 25-15-320(2), an environmental covenant is required to serve as an institutional control and should be identified as such in the final action memo.

**Applicable or Relevant and Appropriate Requirements
Highway 24/A-1 Mobile Home Village
Non-Time Critical Removal Action**

State Action-Specific ARARs			
Managing soils characterized as Hazardous Waste	. Specific provisions of Section 264.301 concern run-on control, run-off control, management of run-on and run-off control systems, and wind dispersal for hazardous waste disposal activities. Specific provisions of Section 264.310 concern placement of a cover to minimize infiltration, minimize maintenance, promote drainage, minimize erosion and accommodate settling. These requirements are applicable for hazardous waste materials not subject to the RCRA Bevill Amendment. Materials removed during excavation must be characterized and, if hazardous, disposed of in accordance with these regulations. If hazardous waste materials are Bevill exempt, these provisions may be relevant and appropriate in certain circumstances depending on site specific conditions. The determination of whether such requirements will be both relevant and appropriate to the activities to be undertaken will be based on best professional judgment and conducted on a site-specific basis, taking into account the physical nature and location of the media involved, whether the requirements are well suited to the site conditions, and other factors.	Managing soils characterized as Hazardous Waste	Colorado Hazardous Waste Regulations, 6 CCR 1007-3, Part 264: subsections 301, (g), (h), (i) and (j); and subsection 310 (a)(1) through (a)(4), (b)(1) and (b)(5) Contact: Colorado Hazardous Materials and Waste Management Division (CDPHE)
Performing response action generating lead emissions and PM10	Establishes emissions standards for PM10 and lead. Pursuant to the Colorado Air Pollution Prevention and Control Act, proposed construction activities must be evaluated to determine whether the proposed source will exceed NAAQs. Proponents are also required to evaluate whether the proposed activities would cause the Colorado ambient standard for PM10 to be exceeded. Colorado regulates fugitive emissions through Regulation No. 1. Regulation 8 sets emission limits for lead. Proponents are required to evaluate whether the proposed activities would result in the Regulation 8 lead standard being exceeded. Compliance with substantive provisions of the Colorado Air Quality requirements will be achieved by adhering to a fugitive emissions control plan prepared in accordance with Regulation No. 1.	Response activities emitting lead or PM10 in excess of air quality standards.	Colorado Air Quality Control Regulations (5 CCR § 1001-1, 2, 3, 5, 8, 10) Contact: Colorado Air Quality Control Division (CDPHE)
Conducting activities generating dust.	Establishes regulations concerning fugitive emissions from construction activities, storage and stockpiling activities, haul trucks, and depositing of materials on paved roads	Conducting activities generating dust.	Colorado Fugitive Dust Control Plan/Opacity, Regulation No. 1, 5 C.C.R. 1001-3(III)(D)(2)(a)(ii),(b),(c),(f) (Particulate Matter – Construction Activities), pursuant to Colorado Air Pollution Prevention and Control Act, C.R.S. § 25-7-101 <i>et seq.</i> Contact: Colorado Hazardous Materials and Waste Management Division (CDPHE)

**Applicable or Relevant and Appropriate Requirements
Highway 24/A-1 Mobile Home Village
Non-Time Critical Removal Action**

Managing storm water runoff during drill pad and secondary containment construction and reclamation of disturbed areas.	<p>The Colorado Discharge Permit System general permit COR40000 includes the following substantive requirements:</p> <ol style="list-style-type: none"> 1. Control measures must be installed before the commencement of activities at the site that could contribute pollutants to stormwater discharges. Such control measures should minimize the discharge of pollutants at the site. The control measures must meet the following requirements: <ol style="list-style-type: none"> a. Where vehicle tracking occurs, vehicle tracking controls that minimize vehicle tracking of sediment from disturbed areas. b. Containment or filtration of stormwater flows from disturbed areas and soil storage areas, such that flows from such areas must go to at least one control measure. c. Where there are discharges from basins and impoundments, outlets that withdraw water from or near the surface (unless infeasible). d. Maintenance of pre-existing vegetation or equivalent control measures for areas within 50 horizontal feet from receiving waters. e. Minimization of soil compaction where there are infiltration control measures, or final stabilization, from vegetative cover. f. In areas where vegetative final stabilization is utilized, preservation of topsoil (unless infeasible). g. Minimization of soil exposed during construction activity. h. Where there is bulk storage of liquid chemicals (including petroleum products), secondary containment or equivalent protection. i. Concrete washout control measures sufficient to ensure the washing activities do not add pollutants to stormwater runoff or receiving waters. Discharges to the ground of concrete washout waste must go through soil with buffering capacity, and cannot occur in areas near natural drainages, shallow groundwater, springs, or wetlands. j. For earth disturbing activities, temporary stabilization measures such as tarps, soil tackifier, and hydroseed, which must be implemented wherever construction activity disturbed the ground and has ceased for fourteen days or is permanently ceased. k. For all construction sites after all ground surface disturbing activities have ceased, final stabilization that achieves vegetative cover with plant density at least 70% of pre-disturbance levels, or an equivalent stabilization measure. 2. All control measures must remain in effective operating condition and be protected from activities that would make them less effective. 3. The adequacy of control measures must be monitored, and corrective action must be taken when a measure becomes inadequate. 4. Discharges may not cause, have the reasonable potential to cause, or measurably contribute to an exceedance of any applicable water quality standard. 	Discharging storm water from a construction activity.	<p>Colorado Discharge Permit System (CDPS) Regulations 5 C.C.R. 1002-61.3(2)(a) and (f)(ii), and CDPS general permit No. COR400000 (Stormwater discharges associated with construction activity), pursuant to C.R.S. § 25-8-501</p> <p>Permit available (as of December 31, 2024) at:</p> <p>https://drive.google.com/file/d/1Cs_nfVYo-sTVmStX9pwtnpKoN7DYmumYP/view</p> <p>Contact: Colorado Water Quality Control Division (CDPHE)</p>
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Applicable or Relevant and Appropriate Requirements
Highway 24/A-1 Mobile Home Village
Non-Time Critical Removal Action

	<p>5. Site inspections with one of the following minimum frequencies:</p> <ul style="list-style-type: none">a. One per every 7 calendar daysb. One per every 14 calendar days, and post storm event inspections within 24 hours after the end of any precipitation or snowmelt event that causes surface erosion.c. If the two options above are impractical, an alternate schedule.d. If the site is temporarily idle or completed, less frequent inspections depending on the circumstances.		
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Applicable or Relevant and Appropriate Requirements
Highway 24/A-1 Mobile Home Village
Non-Time Critical Removal Action

Location/Action/ Chemical	Requirements	Prerequisite	Citation(s)
Federal Chemical-Specific ARARs			
Hazardous waste	If/where response action involves transportation of hazardous materials, regulations govern packaging, labeling, making, placarding, using proper containers, and reporting discharges of hazardous materials.	Transportation of hazardous materials	Hazardous Materials Transportation Act, 49 USC Section 1801-183; 49 CFR Parts 107, 171-177

Federal Chemical-Specific To-Be-Considered (TBCs)			
Chemical	Requirements	Prerequisite	Citation(s)
Arsenic	Provides toxicity values and risk estimates for exposure scenarios for inorganic arsenic	Remediation of residential soils contaminated with Arsenic	IRIS Toxicological Review of Inorganic Arsenic, CASRN 7440-38-2 (EPA/635/R-25/0005Fa) (January 2025) https://iris.epa.gov/static/pdfs/0278tr.pdf
Lead	Provides guidance for all residential soil/lead sites subject to CERCLA response actions	Remediation of residential soils contaminated with Lead	EPA Updated Residential Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities (January 17, 2024) https://www.epa.gov/superfund/updated-soil-lead-guidance-cercla-sites-and-rcra-corrective-action-facilities

Appendix D Cost Tables

Cost Table

Location	Area	Unit	Area	Unit
Site	11.24	acres	489614	square feet
Site Covered by Structures	2.10	acres	91476	square feet
Site Covered by Roadways	3.11	acres	135472	square feet
Site Covered by Other	6.03	acres	262667	square feet

Alternative 1		Excavation Depth (inches):			0
Item	Amount	Unit	Per Unit Cost	Total	
Soil Excavation	0	cubic yards	\$0.00	\$0.00	
Soil Disposal	0	ton	\$0.00	\$0.00	
Soil Import and Placement	0	cubic yards	\$0.00	\$0.00	
Mulch Installation	0	square feet	\$0.00	\$0.00	
Gravel Installation	0	square feet	\$0.00	\$0.00	
Artificial Turf Installation	0	square feet	\$0.00	\$0.00	
Total				\$0.00	

Alternative 2		Excavation Depth (inches):			6
Item	Amount	Unit	Per Unit Cost	Total	
Soil Excavation	6323	cubic yards	\$32.40	\$204,880.10	
Soil Disposal	8853	ton	\$73.60	\$651,569.32	
Soil Import and Placement	5837	cubic yards	\$51.20	\$298,856.45	
Mulch Installation	118200	square feet	\$2.00	\$236,400.12	
Gravel Installation	118200	square feet	\$4.00	\$472,800.24	
Artificial Turf Installation	26267	square feet	\$12.00	\$315,200.16	
Total				\$2,179,706.39	

Alternative 3		Excavation Depth (inches):			12
Item	Amount	Unit	Per Unit Cost	Total	
Soil Excavation	12647	cubic yards	\$37.80	\$478,053.58	
Soil Disposal	17706	ton	\$73.60	\$1,303,138.64	
Soil Import and Placement	11674	cubic yards	\$53.90	\$629,232.91	
Mulch Installation	118200	square feet	\$2.00	\$236,400.12	
Gravel Installation	118200	square feet	\$4.00	\$472,800.24	
Artificial Turf Installation	26267	square feet	\$12.00	\$315,200.16	
Total				\$3,434,825.64	

Alternative 4		Excavation Depth (inches):			18
Item	Amount	Unit	Per Unit Cost	Total	
Soil Excavation	18970	cubic yards	\$43.20	\$819,520.42	
Soil Disposal	26559	ton	\$73.60	\$1,954,707.96	
Soil Import and Placement	17511	cubic yards	\$56.60	\$991,129.39	
Mulch Installation	118200	square feet	\$2.00	\$236,400.12	
Gravel Installation	118200	square feet	\$4.00	\$472,800.24	
Artificial Turf Installation	26267	square feet	\$12.00	\$315,200.16	
Total				\$4,789,758.28	

Engineering Evaluation/Cost Analysis

Highway 24 Mill Site

1025 Garner Street Colorado Springs, Colorado