EA Engineering, Science, and Technology, Inc., PBC

405 State Highway 121 (Bypass)
Building C Suite 100
Lewisville, TX 75067
Telephone: 972-315-3922
Fax: 972-315-5181
www.eaest.com

15 March 2019

Mr. Kenneth Shewmake
Task Order Monitor
U.S. Environmental Protection Agency (EPA) Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

RE: Conceptual Site Model Technical Memorandum, Final
Remedial Investigation
Lane Plating Works, Inc. Superfund Site
Dallas, Dallas County, Texas
Remedial Action Contract 2
Contract: EP-W-06-004
Task Order: 68HE0618F0309

EA Engineering, Science, and Technology, Inc., PBC (EA) is enclosing one hard copy and two electronic copies on compact disc (CD) of the Final Conceptual Site Model Technical Memorandum (CSMTM) for the above-referenced Task Order. One electronic copy (on CD) has also been submitted to Ms. Rebecca Storms, Texas Commission on Environmental Quality Project Manager. An electronic copy of the Final CSMTM was also submitted to EPA via email on 15 March 2019.

Please do not hesitate to contact me at (972) 315-3922 if you have any questions.

Sincerely,

Mark Paddack
Project Manager

Enclosure

cc: Brian Delaney, EPA Contract Officer (letter only)
Rebecca Storms TCEQ Project Manager (one electronic copy on CD)
Tim Startz, EA Program Manager (letter only)
File

TRANSMITTAL OF DOCUMENTS FOR ACCEPTANCE BY EPA	DATE: **15 March 2019**	TRANSMITTAL NO.: **0007**

TO:	FROM:
Mr. Kenneth Shewmake **U.S. Environmental Protection Agency Region 6**	**Mark Paddack** **EA Engineering, Science, and Technology, Inc., PBC**

SUBTASK NO.	DELIVERABLE	NO. OF COPIES
1.5.1	Conceptual Site Model Technical Memorandum, Final Remedial Investigation Lane Plating Works, Inc. Superfund Site Dallas, Dallas County, Texas	EPA - 1 hard copy, 2 electronic copies on compact disc(CD), and 1 electronic copy via email TCEQ -1 electronic copy on CD

ACCEPTANCE ACTION

DOCUMENTS FOUND ACCEPTABLE (LIST BY SUBTASK NO.)	NAME/TITLE/SIGNATURE OF REVIEWER DATE

Conceptual Site Model
Technical Memorandum
Remedial Investigation

Lane Plating Works, Inc. Superfund Site
Dallas, Dallas County, Texas
EPA Identification No. TXN000605240

Remedial Action Contract 2 Full Service
Contract: EP-W-006-004
Task Order: 68HE0618F0309

Prepared for

U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

Prepared by

EA Engineering, Science, and Technology, Inc. PBC
405 State Highway 121 Bypass
Building C, Suite 100
Lewisville, Texas 75067
(972) 315-3922

March 2019
Final
EA Project No. 14342.168

CONTENTS

Page

1. INTRODUCTION 1

1.1 PURPOSE 1
1.2 SCOPE 1

2. BACKGROUND 1

2.1 SITE DESCRIPTION 2
2.2 SITE HISTORY AND PREVIOUS INVESTIGATIONS 3

3. SITE CHARACTERISTICS 6

3.1 SURFACE FEATURES 6
3.2 DEMOGRAPHICS 6
3.3 METEOROLOGY AND CLIMATE 7
3.4 LAND USE 7
3.5 SOILS 7

3.5.1 Lewisville-Urban Land Complex, 0 to 4 Percent Slopes 8
3.5.2 Frio-Urban Land complex, Frequently Flooded 8
3.5.3 Frio-Silty Clay, 0 to 1 Percent Slopes, Frequently Flooded 9

3.6 SURFACE WATER 9
3.7 GROUNDWATER 10
3.8 GEOLOGY 12
3.9 ECOLOGICAL SETTING 13
3.10 THREATENED AND ENDANGERED SPECIES 14

4. NATURE AND EXTENT OF CONTAMINATION 16

4.1 COMPARISON CRITERIA 17
4.2 CHEMICALS OF POTENTIAL CONCERN 17
4.3 SOURCE 17
4.4 EXTENT OF CONTAMINATION 17

4.4.1 Soil 18
4.4.2 Sediment and Surface Water 18
4.4.3 Waste Samples 18
4.4.4 Groundwater 18

ED_004144A_00003226-00004

5. CONTAMINANT FATE AND TRANSPORT 19

5.1 SURFACE WATER TRANSPORT 19
5.2 LEACHING TO GROUNDWATER 19
5.3 GROUNDWATER TRANSPORT 19
5.4 GROUNDWATER TO SURFACE WATER 19
5.5 AIR PARTICULATE MIGRATION 19
5.6 SOIL VAPOR TO AIR 19

6. DATA GAPS 19

7. HUMAN HEALTH CONCEPTUAL EXPOSURE PATHWAY ANALYSIS 20

7.1 SOURCES OF SITE CHEMICALS 20
7.2 AFFECTED ENVIRONMENTAL MEDIA 20
7.3 CHEMICAL RELEASES AND TRANSPORT MECHANISMS 20
7.4 POTENTIALLY EXPOSED RECEPTORS 20
7.5 POTENTIALLY COMPLETE EXPOSURE PATHWAYS 21

8. ECOLOGICAL CONCEPTUAL EXPOSURE PATHWAY ANALYSIS 23

8.1 IDENTIFICATION OF EXPOSURE PATHWAYS 24

8.1.1 Direct Contact/Dermal Contact 24
8.1.2 Inhalation 25
8.1.3 Ingestion 25
8.1.4 Exposure to Subsurface Soil and Groundwater 25
8.1.5 Media of Concern 26

8.2 ASSESSMENT ENDPOINTS 26
8.3 SELECTION OF REPRESENTATIVE RECEPTORS 27

8.3.1 Aquatic Species 28
8.3.2 Terrestrial Species 29
8.3.3 Reptiles and Amphibians 30

9. REFERENCES 32

APPENDIX A: Response to Comments

ED_004144A_00003226-00005

LIST OF TABLES

Number	Title
1	Soil Sample Results
2	Sediment Sample Results
3	Surface Water Sample Results
4	Waste Sample Results

LIST OF FIGURES

Number	Title
1	Site Location
2	Site Features
3	Soil Sample Locations
4	Sediment and Surface Water Sample Locations
5	Soil Human Health Screening
6	Sediment Ecological Risk Screening
7	Surface Water Human Health Screening
8	Surface Water Ecological Risk Screening
9	Graphical Presentation of the Preliminary Human Health Conceptual Site Model
10	Preliminary Human Health Conceptual Site Model
11	Graphical Presentation of the Preliminary Ecological Conceptual Site Model
12	Preliminary Ecological Conceptual Site Model

ED_004144A_00003226-00006

LIST OF ACRONYMS AND ABBREVIATIONS

bgs	Below ground surface
BTAG	U.S. Army Biological Technical Assistance Group
CHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
CFR	Code of Federal Regulations
COPC	Chemical of Potential Concern
CSM	Conceptual Site Model
EA	EA Engineering, Science, and Technology, Inc. PBC
EPA	U.S. Environmental Protection Agency
HRS	Hazardous Ranking System
HWTB	Hazardous Waste Treatment Building
In.	Inch(es)
MCL	Maximum Contaminant Level
mg/kg	milligram per kilogram
NRCS	Natural Resources Conservation Service
PWS	Public Water Supply
RI	Remedial Investigation
RSL	Regional Screening Level
SCDM	Superfund Chemical Data Matrix
site	Lane Plating Works, Inc. Superfund Site
TCEQ	Texas Commission on Environmental Quality
TXDWW	Texas Drinking Water Watch
USDA	U.S. Department of Agriculture
Weston	Weston Solutions, Inc.

ED_004144A_00003226-00007

1. INTRODUCTION

EA Engineering, Science, and Technology, Inc. PBC (EA) has been authorized by the U.S. Environmental Protection Agency (EPA), under Remedial Action Contract No. EP-W-006-004, Task Order 68HE0618F0309, to conduct a Remedial Investigation (RI) at the Lane Plating Works, Inc. Superfund Site (site).

1.1 PURPOSE

The purpose of the CSM is to answer the principal study questions outlined below:

- What are the possible sources for contamination?
- What is the nature and extent of contamination?
- What are the potential migration pathways for transport of these contaminants?
- Are there complete pathways from areas of contamination to human and ecological receptors?
- What is the potential risk to human health and ecological receptors from exposure to site related chemicals of potential concern (COPCs)?

Principal study questions are used as a part of the Data Quality Objectives process to ensure the goal of the study has been met with defensible products and decisions (EPA 2006). The principal study questions above will be used in development of the Sampling and Analysis Plan.

1.2 SCOPE

The scope of the CSM includes the following:

- Reviewing existing reports.
- Compiling the data sets into a single cogent presentation.
- Evaluating the site geology and hydrogeology, with definition of the various water-bearing zones.
- Detailing the CSM that: (1) describes the source of contamination, (2) describes the nature and extent of contamination, (3) identifies the primary migration transport pathways, (4) identifies likely human health and ecological exposure pathways, and (5) identifies data gaps.

2. BACKGROUND

The site background information presented in this section has been adapted from the January 2018 Hazardous Ranking System (HRS) Documentation Record (EPA 2018a).

ED_004144A_00003226-00008

The site was occupied by a former electroplating facility that conducted primarily hard chromium and cadmium plating for approximately 90 years, until 2015 (EPA 2018a). The site includes four main source areas: (1) contaminated soil currently located underneath and surrounding the facility building, (2) underground sumps located inside the facility building, (3) wastes containerized in tanks and other containers, and (4) wastes containerized in drums (EPA 2018a). These areas have contributed to releases of chromium, copper, cyanide, lead, manganese, mercury, nickel, and zinc to the terrestrial environment in the vicinity of the site facility and to small streams and associated wetlands, making surface water a suspected pathway (EPA 2018a). Therefore, human and ecological receptors are potentially at risk at the site facility as well as downgradient from the site.

Stream 5A2, is located approximately 450 feet east of the facility and flows south into a small pond located southeast of the facility (EPA 2018a). Site and area topography slope gently to the south and southeast (EPA 2018a). Surface water runoff follows two primary overland segments: (1) east along the north side of the facility building and then due south for approximately 500 feet before reaching a wetland, and (2) southeast of the facility across a field for approximately 400 feet before reaching a small pond and Stream 5A2 (EPA 2018a). Stream 5A2 flows south from the small pond for approximately 300 feet before joining an unnamed creek. The merged stream flows east and eventually discharges into the Trinity River (EPA 2018a).

The surface water migration is a concern as there are fisheries located in the Joppa Preserve/Lemmon Lake Park and Trinity River (habitat known to be used by the state-designated endangered or threatened wood stork), white-faced ibis are located in the Joppa Preserve/Lemmon Lake Park, and freshwater forested/shrub wetlands are located in the Joppa Preserve/Lemmon Lake Park, along the Trinity River, and in the general site vicinity.

Cyanide, lead, mercury, chromium, and hexavalent chromium have been identified as COPCs impacting onsite soils, underlying groundwater, and sediments downstream from the site. Contaminant levels in onsite soils exceed the EPA Regional Screening Levels (RSLs) for residential and industrial use (EPA 2018b).

2.1 SITE DESCRIPTION

The site is located at 5322 Bonnie View Road, approximately five miles south of downtown Dallas, Dallas County, Texas (EPA 2018a) (Figure 1). It is situated immediately east of Bonnie View Road on 4.6 acres and is surrounded on all sides by open or wooded land (EPA 2018a). Land use is listed as residential and commercial in the area (EPA 2018a). The original facility building and adjacent structures are still present and include the main facility building where the majority of electroplating operations took place, a shed structure known as the Hazardous Waste Treatment Building (HWTB), a former wastewater treatment building, miscellaneous tractor trailers located south of the facility, and the HWTB (EPA 2018a). A barbed wire and locked chain-link fence surrounds the property. A facility layout map is provided as Figure 2.

Asphalt/concrete cover extends from the facility entrance to the driveway and footprint around the facility building. Soil and vegetation are exposed on all other sides (EPA 2018a). Two old,

ED_004144A_00003226-00009

unused water wells are located on the north side of the facility building (EPA 2018a). Old equipment and trash surround the facility in open and wooded areas located to the east and south (EPA 2018a). According to the Dallas Central Appraisal District, the office building was built in 1950, and the facility property is currently owned by Stag Management, Inc., with John R. Lane listed as president (EPA 2018a). Stag Management, Inc. also owns the adjoining property located east of the facility at 5156 Bonnie View Road, and the Lane residence is located approximately 500 feet north of the facility (EPA 2018a). Bankruptcy schedules show that Lane Plating Works, Inc. owns equipment and accounts receivables and leases the 5322 Bonnie View Road property from Stag Management, Inc. (EPA 2018a). The closest residences are located approximately 200 to 300 feet west of the facility along Bonnie View Road, and a baseball diamond is located approximately 650 feet south of the facility. There are no daycare facilities, schools, or churches located within 200 feet of the facility (EPA 2018a).

2.2 SITE HISTORY AND PREVIOUS INVESTIGATIONS

The site was occupied by a former electroplating facility that conducted primarily hard chromium and cadmium plating for approximately 90 years, until 2015 (EPA 2018a). Additional processes included chromate dips, chromic acid anodize, hard chrome plating using chromic acid, cadmium plating, copper plating using copper cyanide, zinc plating aluminum using nitric acid and zinc cyanide, nickel plating using nickel sulfate, black oxide coating, electroless nickel, passivation, machining and grinding, stripping of metal parts in acid, pretreatment of metal parts using sodium hydroxide and sulfuric acid, operating a lead melting pot to repair anodes used in plating baths, and electroplating wastewater treatment (EPA 2018a). Resource Conservation and Recovery Act and Texas Commission on Environmental Quality (TCEQ) Notice of Registration records document the following waste streams: corrosive and reactive waste, cadmium, chromium, lead, spent chromic acid solution, spent muriatic acid, chromate, metals filings and dust, cyanide waste, caustic waste, caustic soda solid (tank bottoms), and wastewater treatment sludges from electroplating operations (EPA 2018a). Operations ceased in 2015 with numerous violations, investigations, and bankruptcy (EPA 2018a).

The site has been investigated by several state and federal agencies over the past 40 years, and releases of plating wastes to on-site soils have been documented by recent investigations (EPA 2018a). TCEQ conducted investigations at the site in February 2010 and January 2011. Analytical results from soil samples collected from a waste pile and around the facility foundation indicated leachable cadmium, chromium, lead, and mercury concentrations (EPA 2018a). Formal enforcement action was requested based on numerous violations, including the failure to obtain a permit prior to disposal of hazardous waste and to prevent unauthorized discharge of industrial solid waste (EPA 2018a). A Notice of Enforcement letter and a Proposed Agreed Order were transmitted to the facility in April and July 2011, respectively, with a total penalty of $28,350 (EPA 2018a). TCEQ conducted a follow-up investigation in October 2014 and noted several additional issues and alleged violations of waste management, including the failure to install a secondary containment unit for a hazardous waste tank (EPA 2018a). Onsite soil samples indicated total chromium, hexavalent chromium, antimony, arsenic, cadmium, mercury, and nickel detections above the EPA Superfund Chemical Data Matrix (SCDM) soil exposure pathway benchmarks, and lead above the EPA interim screening level (EPA 2018a).

ED_004144A_00003226-00010

The Department of Labor Occupational Safety and Health Administration issued $110,200 of proposed penalties to the facility in January 2015 based on inspections made in 2014. Violations were related to the upkeep, use, and provision of required safety equipment and training for employees, in addition to proper storage and disposal of chemicals. Specific violations of note included storing sodium hydroxide together with sulfuric acid and exposing employees to hexavalent chromium (EPA 2018a). Violations documented hexavalent chromium on surfaces inside the facility building (EPA 2018a). A second Notice of Enforcement letter was transmitted to the facility in March 2015 (EPA 2018a).

TCEQ conducted an investigation in November 2015 to determine if conditions posed an immediate threat to nearby residents and if grinding grit had spread off of the facility property (EPA 2018a). Grinding grit was observed on the ground surface south and southeast of the HWTB (EPA 2018a). Leaks, openings in the walls, and yellow stains believed to be chromium were observed in the facility building (EPA 2018a). Yellow stains were additionally observed on the west side of the facility building on the exterior southeast corner (EPA 2018a). Soil samples were collected from the southern boundary of the property at a depth of 0-3 inches (in.) below ground surface (bgs) (EPA 2018a). Antimony, arsenic, cadmium, chromium, and mercury were detected above SCDM soil exposure pathway benchmarks, and lead was detected above the screening level (EPA 2018a).

TCEQ conducted a limited removal action in November and December 2015 (EPA 2018a). The scope of work included hazard characterization analysis/chemical characterization of chemicals in the facility lab, lab pack and re-packaging of select chemicals, the removal of chromic acid sludge from two sumps at the facility, and securing the chromic acid waste into poly totes. All outside doors to the facility building were secured and locked, and metal cattle panels were used to secure the first floor windows (EPA 2018a). As State enforcement was exhausted, TCEQ referred the site to the EPA Region 6 Superfund Program for further evaluation (EPA 2018a).

Representatives from TCEQ and EPA Superfund Removals program conducted a facility visit in February 2016 and observed incompatible wastes stored together, staining, visibly impacted soils, wastes appearing to seep underneath the facility foundation, and large volumes of hazardous wastes (EPA 2018a). Grab samples collected by TCEQ from the two shallow facility water wells in February 2016 contained concentrations of chromium and hexavalent chromium above SCDM groundwater pathway benchmarks and the Maximum Contaminant Level (MCL) (EPA 2018a).

TCEQ performed a Site Inspection sampling event in July 2016 to evaluate the surface water pathway (TCEQ 2017). Antimony, cadmium, chromium, copper, lead, mercury, nickel, and zinc were detected at elevated concentrations in soil along the overland segments at depths up to six to eight in. bgs. Of these, arsenic, cadmium, chromium, and mercury were detected above SCDM soil exposure pathway benchmarks, and lead was detected above the screening level in soil (EPA 2018a). Chromium, cyanide, lead, and mercury in sediment at depths of 0-6 or 6-12 in. bgs., and aluminum, arsenic, chromium, copper, iron, lead, manganese, mercury, nickel, and zinc in surface water were detected at elevated concentrations in the surface water pathway. Of these, aluminum, copper, iron, lead, and zinc were detected above SCDM surface water

ED_004144A_00003226-00011

pathway environmental benchmarks (chronic, fresh criteria continuous concentration) (EPA 2018a).

In March 2016, the EPA Emergency Management Branch tasked an EPA Region 6 Superfund Technical Assessment Response Team (START-3) contractor, to perform a Removal Assessment at the site. A two-phase Removal Assessment was conducted at the site in April and September 2016 (EPA 2018a). Excessive chromium staining on the floor and small pools of plating wastes from ongoing releases were observed in the facility building, in addition to chromium staining on the outside of the building from past spills and releases (EPA 2018a).

During the April 2016 assessment activities, composite five-point soil sampling was conducted within thirty-seven 50 by 50 foot grids along the exterior of the facility. Within each grid, sample aliquots were collected from each corner and from the center of the grid at a depth of 0 to 6 in. bgs. The aliquots were then combined and containerized as a composite sample. Five biased grab soil samples were collected by the EPA Team in areas previously identified by TCEQ to have elevated concentrations of lead and chromium along the southeastern part of the site. A total of 36 soil samples and 4 liquid waste samples were collected to determine the nature and extent of site-related, hazardous constituents associated with electroplating waste (plating waste) in onsite soils. Liquid waste samples were used to verify if liquids, contained in an unknown number of drums and totes, were considered hazardous substances. Soil samples were submitted for analysis of metals and hexavalent chromium (Cr VI). Soil analytical data was compared to the May 2016 EPA RSLs for industrial use. The liquid waste characterization results were compared to 40 Code of Federal Regulations (CFR) Part 261. Based on the analytical results, hexavalent chromium, lead, and mercury contaminated soil was present around the footprint of the building. Hexavalent chromium was reported in 17 grids exceeding the EPA industrial RSL of 6.3 milligrams per kilogram (mg/kg). Hexavalent chromium contaminated soil ranged in concentration from 167 mg/kg to 5,620 mg/kg. Lead exceeded the EPA RSL of 800 mg/kg in six grids. Mercury was observed above instrument detection limits in several grids but only exceeded in one grid above the EPA RSL of 46 mg/kg (EPA 2018a).

During the September 2016 assessment activities, composite five point soil samples were collected from within approximately seventy-two 50 by 50 foot grids. Samples were collected at three depth intervals: 0 to 6 in. bgs, 6 to 12 in. bgs, and 12 to 18 in. bgs. Soil samples were submitted for analysis of metals and hexavalent chromium. A total 216 samples (192 normal, 20 duplicate, and 4 equipment blanks) were collected during this sampling event. Samples collected at the 6 to 12 in. interval were placed on hold pending analytical results from the 0 to 6 in. and 12 to 18 in. intervals. Based on the analytical results, hexavalent chromium, lead, and mercury contaminated soil was present around the footprint of the building. Hexavalent chromium was reported in three grids exceeding the May 2016 EPA industrial RSL of 6.3 mg/kg. Hexavalent chromium contaminated soil ranged in concentration from 9.69 mg/kg to 203 mg/kg. Lead exceeded the EPA RSL of 800 mg/kg in one grid at a concentration of 3740 mg/kg. Mercury was reported in two grids exceeding the EPA RSL of 46 mg/kg, ranging from 46.2 mg/kg to 77.8 mg/kg (EPA 2018a).

Samples of chromic acid waste collected during the 2016 Removal Assessment activities were confirmed to be hazardous (EPA 2018a). Hazardous characterization identification of waste

ED_004144A_00003226-00012

containers was performed, and remaining vats and sumps were pumped and transferred into compatible containers (EPA 2018a). Waste containers were transported from the facility to authorized facilities for final disposal in November 2016 (EPA 2018a). The following waste streams were identified: cyanide solution and solids, chromic acid and chromic acid sludges/solids, sulfuric acid, flammable aerosol and liquids, acid solids and liquids, neutral solids and liquids, elemental mercury, caustic solids and liquids, and soil (Weston Solutions, Inc. [Weston] 2016). *In situ* contaminated soils currently remain in place and will be investigated further as part of this RI.

In May 2018, the site was placed on the National Priorities List.

3. SITE CHARACTERISTICS

This preliminary site characterization summary will be revised as new information develops and details can be refined.

3.1 SURFACE FEATURES

As discussed in Section 2, the original facility building and adjacent structures are still present and include the main facility building where the majority of electroplating operations took place, a shed structure known as the HWTB, and a former wastewater treatment building and miscellaneous tractor trailers located south of the facility and HWTB. A barbed wire and locked chain-link fence surrounds the property. The chain link fence that runs along Bonnie View Road is in good condition but the barbed wire fencing elsewhere on the site is in fair to poor condition. Asphalt/concrete cover extends from the facility entrance to the driveway and footprint around the facility building. Two old, unused water wells are located on the north side of the facility building. Old equipment and trash surround the facility in open and wooded areas located to the east and south (EPA 2018a).

The closest residences are located approximately 200 to 300 feet west of the facility along Bonnie View Road, and a baseball diamond is located approximately 650 feet south of the facility. No daycare facilities, schools, or churches have been documented within 200 feet of the facility. The primary receptors near the site consist of small nearby streams and associated wetlands. An unnamed creek, referred to as Stream 5A2, is located approximately 450 feet east of the facility and flows south into a small pond located southeast of the facility (EPA 2018a).

3.2 DEMOGRAPHICS

The U.S. Census Bureau American Fact Finder website, which is available at the following link: https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml, contained 2010 census data for Dallas, Texas. This source indicated that in 2010, the population of Dallas, Texas, was 1,197,816. There were 516,639 households with 449,597 occupied units, and 65.4 percent of these units were occupied by two or more persons per household. The population was 50.7 percent Caucasian, 42.4 percent Hispanic, and 25 percent African-American. The median

ED_004144A_00003226-00013

household income was estimated to be $41,682. This data also estimated that 22.3 percent of the individuals in Dallas, Texas, have an income below the poverty level.

For the area within a two-mile radius of the site, the population in 2010 was 32,016 with a population density of 2,600 people per square mile and 11,322 households. The population was 6 percent Caucasian, 13 percent Hispanic, and 85 percent African-American. Sixty-seven percent of the population is low income indicating ratio of household income to poverty level in the past 12 months was less than two.

3.3 METEOROLOGY AND CLIMATE

In Dallas County, Texas, summers are hot and winters are cool as a result of the occasional surges of cold air, which cause the otherwise mild temperatures to drop. The average winter temperature is 48 °F, and the average daily minimum temperature is 38°F. In summer, the average temperature is 84°F, and the average daily maximum temperature is 94°F (U.S. Department of Agriculture [USDA] 1980).

The total average annual precipitation is 36 in. Of this, 20 in., or 57 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 15 in. Thunderstorms occur on about 40 days each year, and most occur in the spring. Average seasonal snowfall is 2 in. (USDA 1980).

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 79 percent. The sun shines 75 percent of the time possible in summer and 55 percent in winter. The prevailing wind is from the south. Average wind speed is highest, 13 miles per hour, in April. Tornadoes and severe thunderstorms occur occasionally. These storms are local and of short duration. Damage is variable and spotty.

The climate of the site is classified as humid subtropical, based on the Köppen-Geiger climate classification system (Kottek et al. 2006).

3.4 LAND USE

Dallas County has a total area of 902 square miles, or 577,280 acres. As of 1980, about 25 percent of the county was cropland, and 46 percent of the county was used for urban development (USDA 1980). As indicated in Section 2.1, land use in the vicinity of the site is a mixture of residential and commercial development (EPA 2018a), with undeveloped plots of land situated to the east, south, and west of the site.

3.5 SOILS

Information in this section was gathered from the USDA Soil Survey of Dallas County, Texas (USDA 1980) and Natural Resource Conservation Service (NRCS) Web Soil Survey for Dallas County (NRCS 2018). There are three different soil units encompassing the site. Of the three units, the majority of the site is underlain by the Lewisville-Urban land complex, 0 to 4 percent slopes (Soil unit 49). Frio-Urban Land complex, frequently flooded (Soil Unit 38), underlies the

ED_004144A_00003226-00014

southwest portion of the site; while Frio-silty clay, 0 to 1 percent slopes, frequently flooded (Soil Unit 37), lies beneath the southeast portion of the site.

3.5.1 Lewisville-Urban Land Complex, 0 to 4 Percent Slopes

The dominant soil type beneath the developed portion of the site is Lewisville-Urban land Complex, which is characterized by slopes of 0 to 4 percent. This complex is made up of deep, well drained, nearly level and gently sloping soils and areas of urban land. The Lewisville soil makes up about 55 percent of this complex, and urban land, which consists of areas covered with buildings and pavement, makes up 30 percent. Minor soils make up the rest. In many places, the soil has been altered by excavation, cutting and filling, and land leveling.

Typically, the surface layer of the Lewisville soil is moderately alkaline, dark grayish brown silty clay 17 in. thick. To a depth of 27 in., the soil is moderately alkaline, and grayish brown silty clay. To a depth of 42 in., the soil is moderately alkaline, and light yellowish brown silty clay. To a depth of 55 in., the soil is moderately alkaline and light brownish gray silty clay that has brownish mottles. To a depth of 75 inches, the soil is moderately alkaline and light yellowish brown silty clay that has fine, gray and brown mottles. Permeability is moderate, and the available water capacity is high. Runoff is slow to medium, and the hazard of erosion is moderate.

3.5.2 Frio-Urban Land complex, Frequently Flooded

Located beneath the southwest portion of the site, in association with the unnamed creek drainage system located south of the site, this soil unit is made up of deep, nearly level, well drained soils and areas of urban land on the flood plains of small streams.

The Frio soil makes up about 70 percent of this complex, and urban land, which consists of areas covered with buildings and pavement, makes up 15 percent. The rest of the area consists of minor soils. In some areas, fill material consisting of clay, broken concrete, and pavement has been stacked or spread 2 to 4 feet deep on the surface.

Typically, the surface layer of the Frio soil is moderately alkaline, dark grayish brown silty clay 7 in. thick. To a depth of 53 in., the soil is moderately alkaline, very dark grayish brown silty clay. To a depth of 74 in., it is moderately alkaline, brown silty clay loam. Permeability is moderately slow, and the available water capacity is high. Runoff is slow, and the hazard of erosion is slight.

The Frio soil has low potential for urban uses because of the hazard of flooding. In most areas of this complex, however, levees have been constructed to prevent damage by floods. Other limitations to urban uses are the low strength and corrosivity of the soil. The Frio soil has low potential for recreation uses because of the hazard of flooding and the clayey surface texture. Some areas of this complex are used as greenbelts or open space as well as for city parks.

ED_004144A_00003226-00015

3.5.3 Frio-Silty Clay, 0 to 1 Percent Slopes, Frequently Flooded

Located beneath the southeast portion of the site, this is a deep, well drained, nearly level soil located on flood plains. This soil generally is flooded one or more times each year. The floodwaters are shallow, and the floods are of brief duration.

Typically, the surface layer is moderately alkaline, dark grayish brown silty clay 7 in. thick. To a depth of 46 in., the soil is moderately alkaline, very dark grayish brown silty clay. To a depth of 74 in., it is moderately alkaline, brown silty clay loam.

Permeability is moderately slow, and the available water capacity is high. Runoff is slow, and the hazard of erosion is slight. This soil is used mainly as pasture, for which it has high potential. It is well suited to improved Bermuda grass. This soil is not suited to use as cropland because of the frequent flooding.

This soil has very low potential for urban uses because of the frequent flooding and the low strength and corrosivity of the soil.

3.6 SURFACE WATER

The information provided in this section was adapted from the May 2016 Preliminary Assessment Report, which was Prepared by TCEQ, in cooperation with EPA Region 6 (TCEQ 2016).

The site is bordered by Bonnie View Road to the west, which is slightly elevated from the site. The road creates a high ridge on the west side of the baseball diamond which is located south of the site. Five Mile Creek is located approximately 0.3 miles to the south of the site and discharges into the Trinity River. An unnamed creek flows underneath Bonnie View Road approximately 500 to 1,000 feet south/southeast of the site and is situated north of the baseball diamond and south of the site. A secondary stream, referred to as Stream 5A2 in the Dallas County Storm Water Infrastructure Assessment, is located approximately 500 to 600 feet east of the site. A small pond is located approximately 500 feet southeast of the site (Figure 2).

The site and area topography slope gently to the south and southeast. The Preliminary Assessment site visit was reportedly made one day after a storm event while site conditions were still wet. A low depression filled with rain water was observed along the south fence line of the site near Bonnie View Road. Water drainage and site runoff were observed flowing adjacent north of the facility building towards the east and then along the east side of the facility building to the south. Runoff was observed to continue south through a low depression/ponding area towards the unnamed creek and the small pond/Stream 5A2.

Stream 5A2 crosses Bonnie View Road at a location northwest of the site and south of Stag Road, and then continues south on a pathway that flows east of the facility building into the northeast corner of the small pond. This stream was observed exiting the southwest corner of the pond, continuing south until it connected to site drainage coming from the east side of the facility building into the unnamed creek. Trash was observed collecting in the drainage out of the pond

ED_004144A_00003226-00016

to the south. Stream 5A2 continues to flow past the small pond towards the east/southeast and eventually merges with the unnamed creek to the east. A field located west of the small pond was saturated and appears to collect drained water in the area.

Five Mile Creek is listed as an intermittent, unclassified freshwater stream (Segment 0805D) that flows into the perennial Upper Trinity River (Segment 0805) at a point approximately 0.25 miles north of Interstate 20. Five Mile Creek forms a dendritic drainage pattern and has been channelized east of Interstate 35 and re-routed. It is the main tributary to the Trinity River in the site vicinity and capable of flooding the site and connecting with the unnamed creek and Stream 5A2 during storm events.

Although the unnamed creek is likely intermittent and may connect to Five Mile Creek during flood events, a connection between the unnamed creek and Five Mile Creek was not observed during the Site Inspection. TCEQ and EPA have not fully mapped the braided pattern of the merged Unnamed Creek and Stream 5A2 in this area.

The unnamed creek appears to flow east and connect with Stream 5A2, continuing to the east in a braided stream pattern across Interstate 45 into a small ditch towards Highway 310 and across. The channelized stream in this section was redone in 2008 to 2009 when the Trinity Forest Trail was constructed to bypass Lemmon Lake in the Joppa Preserve, and now apparently connects directly to the Trinity River. The apparent course of the stream from the site towards the Trinity River is approximately two miles.

The site and the section of Stream 5A2 located east of the site are situated within the Special Flood Hazard Area subject to inundation by the one percent annual chance flood, also known as the 100-year flood or base flood area. Five Mile Creek is situated in the regulatory floodway, which is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so the one percent annual chance flood can be carried without substantial increases in flood heights.

The two-year, 24-hour rainfall for the site is 3.5 to 4.5 inches. The average flow rate of the Upper Trinity River near Lemmon Lake is 3,570 cubic feet per second over a 56 year record, with a 2015 annual average flow of 5,665 cubic feet per second. Flow rates have not been located for Five Mile Creek.

3.7 GROUNDWATER

The information provided in this section has been adapted from the May 2016 Preliminary Assessment Report, which was Prepared by TCEQ in cooperation with EPA Region 6 (TCEQ 2016).

The site overlies the Quaternary alluvium and Pleistocene fluviatile terrace deposits and the Austin Chalk. The Quaternary alluvium and Pleistocene fluviatile terrace deposits are generally irregular in thickness and extent in close proximity to the site, as well as along Five Mile Creek and the Trinity River to the east of the site. Several nearby groundwater monitoring wells are installed to the northwest, northeast, and east of the site to an average depth of 40 feet bgs.

ED_004144A_00003226-00017

These monitoring wells are completed in the unconfined alluvium and terrace deposits, with static water levels around 10 feet bgs. Groundwater gradient information is not available for the shallow aquifer. Hydraulic conductivity is low in the Austin Chalk, which is very limited as an aquifer. The Woodbine Aquifer and Twin Mountains Formation of the Trinity Aquifer are also present below the site, based on area well drilling logs.

Underlying the Austin Chalk is the Eagle Ford Group. The 200 to 300 foot thick Eagle Ford Group unconformably overlies the Woodbine Aquifer and acts as a confining unit. The Woodbine Aquifer is categorized by the Texas Water Development Board as a minor aquifer consisting of sandstone interbedded with shale and clay that form three distinct water-bearing zones. The Woodbine Aquifer occurs from approximately 700 to 1,100 feet bgs and reaches 600 to 700 feet in thickness in subsurface areas, with freshwater saturated thickness averages of about 160 feet. Based on area well drilling logs, water levels in the Woodbine Aquifer in the vicinity of the site ranges from 100 to 230 feet bgs, with total depths of approximately 853 to 1,100 feet bgs. Groundwater gradient in the Woodbine Aquifer is generally to the east-southeast.

The Washita Group underlies the Woodbine and overlies the Fredericksburg Group. The two groups are generally considered a confining unit above the Trinity Aquifer and yield only small amounts of water. The two water-bearing formations of the Trinity Group in the vicinity of the site are the Paluxy and Twin Mountains Formations, separated by the Glen Rose Formation. The Glen Rose Formation only yields small amounts of water to localized areas.

The top of the Paluxy Formation occurs from approximately 1,700 to 2,000 feet bgs, with a maximum thickness of approximately 400 feet. The Paluxy Formation yields small to moderate quantities of fresh to slightly saline water to municipal, industrial, domestic, and livestock wells. The Twin Mountains Formation has a maximum thickness of up to 1,000 feet, and the top of the formation occurs from approximately 2,300 to 2,800 feet bgs. It is the primary Cretaceous-age water-bearing formation in the region and yields moderate to large quantities of fresh to slightly saline water to municipal and industrial wells. Groundwater gradient in both aquifers is generally to the east. The Trinity is the largest and most prolific aquifer in the region; however, the aquifer has been overdeveloped, resulting in significant water level declines across the region.

The unconfined alluvium, Woodbine Aquifer, and Paluxy Formation of the Trinity Aquifer are unlikely to have interconnectivity in this area as the three aquifers are separated from one another by confining units of the Eagle Ford and Washita/Fredericksburg Groups, as discussed earlier in this section. Interconnectivity between the Paluxy and Twin Mountains Formations of the Trinity Aquifer is also unlikely in the vicinity of the site as they are separated by the Glen Rose Formation, which yields small amounts of water. Additionally, the upper part of the Twin Mountains Formation is mostly claystone, and few wells are developed in the upper part of the formation. The Glen Rose Formation pinches out towards the north and is absent in northern Texas counties where the Paluxy and Twin Mountains Formations coalesce into the Antlers Formation.

The Trinity Aquifer supplies wells for pubic supply, industrial, irrigation, domestic, and livestock use. Irrigation use constitutes a small portion of overall pumpage in the Paluxy and

ED_004144A_00003226-00018

Twin Mountains Formations and is generally limited to irrigation of golf courses and lawns. Irrigation of crops from the Twin Mountains Formation is confined to the outcrop areas located in Hood, Parker, and Wise Counties. Approximately 55 percent of total groundwater use in the Twin Mountains Formation is for municipal and industrial purposes. Municipal and domestic use of the Paluxy Formation accounted for approximately 50 and 24 percent of total groundwater pumpage, respectively. There is no evidence at this time that groundwater is used for irrigation of food or forage crops of five or more acres, for commercial livestock watering, as an ingredient in commercial food preparation, for commercial aquaculture, or for major or designated recreation in close proximity to the site.

Based on information provide in the 2016 Preliminary Assessment, one domestic well, three public water supply (PWS) wells, two stock wells, eight irrigation wells, and seven industrial wells lie within four miles of the site. The only well located within a mile of the site is an irrigation well. Additional irrigation wells are located within two miles to the northeast and southwest (three wells), within three miles to the east and west (three wells), and within four miles northeast. The nearest PWS wells are located within two, three, and four miles west and southwest of the site and are screened in the Woodbine Aquifer. The closest domestic well is located within three miles east of the site, and two stock wells are located within three and four miles east of the site, all screened within shallow alluvium. Industrial wells are situated within two miles east-northeast (two wells) and four miles north (five wells) of the site. Irrigation and industrial wells within four miles of the site are screened in the shallow alluvium and Woodbine Aquifer (EPA 2018a).

Water analytical results were not available for the domestic and PWS wells identified in the search. The TCEQ Texas Drinking Water Watch (TXDWW) website lists one of the PWS facilities (Community Water Service Grand Prairie) as buying their water from the City of Grand Prairie, which buys from the Cities of Fort Worth and Midlothian and the Dallas Water Utility. These are all surface water sources of drinking water located west or north of the site. The other PWS facilities are not listed on the TXDWW website. Installation dates of the domestic and PWS wells are old, ranging from the 1940s to the 1970s, and it is unknown if these wells are still in use.

There are two onsite shallow wells of unknown historical use located adjacent north of the facility building (Figure 2). These onsite wells were sampled in February 2016 for metals, and WW-1 displayed chromium and hexavalent chromium concentrations that exceeded the MCL and SCDM for these metals while WW-2 had a hexavalent chromium concentration that exceeded the SCDM. The site is not located within a wellhead protection area.

3.8 GEOLOGY

The information provided in this section was adapted from the May 2016 Preliminary Assessment Report, which was Prepared by TCEQ, in cooperation with EPA Region 6 (TCEQ 2016).

The site is underlain by Quaternary alluvium and Pleistocene fluviatile terrace deposits. The Quaternary alluvium is comprised of flood plain deposits of gravel, sand, silt, silty clay, and

ED_004144A_00003226-00019

organic matter. Fluviatile terrace deposits consist of gravel, sand, silt, and clay in contiguous terraces. These deposits range in thickness from approximately zero to 75 feet bgs. The Quaternary sediments are underlain by the Cretaceous-age Austin Chalk. The upper and lower parts of the Austin Chalk consist of mostly massive microgranular calcite and some interbeds and partings of calcareous clay, with thin bentonitic beds locally in the lower part. The middle part of the Austin Chalk is mostly thin-bedded marl with interbeds of massive chalk. The Austin Chalk has a thickness of approximately 300 to 500 feet.

Underlying the Austin Chalk is the Eagle Ford Group of Cretaceous age, which is 200 to 300 feet thick and comprised predominantly of shale with thin beds of limestone and bentonite. The Cretaceous-age Woodbine Formation underlies the Eagle Ford Group. This formation is approximately 175 to 250 feet thick and is composed mostly of sandstone. The Woodbine is underlain by the Cretaceous-age Washita and Fredericksburg Groups, which consist primarily of limestone, dolomite, marl, and shale. The Fredericksburg and Washita Groups have a combined thickness of approximately 1,250 feet and separate the Woodbine from the underlying Paluxy Formation of the Trinity Group. The Paluxy Formation is the upper member of the Trinity Group, approximately 400 feet thick, and is comprised mostly of sand/sandstone and some shale and limestone. The Glen Rose Formation divides the two Trinity Group aquifer formations in the area and consists of limestone, marl, shale, and anhydrite. It can reach thicknesses of up to 1,500 feet. The Twin Mountains Formation, originally named the Travis Peak Formation, consists of sand, silty clay, and siliceous conglomerates of chert, quartzite, and quartz pebbles and has a thickness of up to 1,000 feet.

3.9 ECOLOGICAL SETTING

The information provided in this section was adapted from the May 2016 Preliminary Assessment Report, which was Prepared by TCEQ, in cooperation with EPA Region 6 (TCEQ 2016) and the HRS Documentation Record (EPA 2018a).

The site property is approximately five acres. Impermeable cover extends from the site entrance off Bonnie View Road up to the driveway and footprint around the facility building. The site property and adjacent lots are fenced off with barbed-wire fence north and east of the facility building and along the creek and are generally not accessible to the public. The adjacent property lots north and east of the site are prairie habitat, and horses were observed grazing during a site visit in February 2016 (TCEQ 2016). A chain-link fence isolates the site from Bonnie View Road. Parts of the barbed-wire fence are in disrepair along the creek; however, dense vegetation contributes to limiting site access (EPA 2018a).

South of the facility building there are forested and shrub habitat areas. In the southeast corner of the site, there is freshwater forested/shrub wetland habitat, which is characterized as palustrine, forested, and temporarily flooded. Abundant forested vegetation that may be indicative of this wetland type is discernible and consistent in aerial photos from 1952, 1968, 1982, 1996, and 2007, indicating persistence over several decades. Additionally, the presence of obligate wetland species was confirmed by an ecologist in photos taken from the wetland area located in the site vicinity and downstream from the site. Spikerush (*Eleocharis* sp.), smartweed

ED_004144A_00003226-00020

(*Polygonum* sp.), and alligatorweed (*Alternanthera philoxeroides*) were specifically identified (TCEQ 2016, EPA 2018a).

The 6,000-acre Great Trinity Forest is the largest urban hardwood forest in the United States and is located approximately two miles east of the site. It follows the Trinity River and contains a mixture of bottomland hardwoods, wetlands, and grasslands, and supports a diverse community of plant and animal species, including bald eagles, wood storks, and ibises. It contains the Joppa Preserve, McCommas Bluff Preserve, and Trinity River Audubon Center. It is not currently listed as a specific preserve area; however, the City of Dallas may develop it for outdoor recreational use in the future (TCEQ 2016).

The 307-acre Joppa Preserve is a major stopping point for migratory water birds, including the endangered white-faced ibis and wood stork. The McCommas Bluff Preserve is 111 acres and is situated along the Trinity River. Trinity River Audubon Center, a 120-acre natural center located in the Great Trinity Forest. The Trinity River Audubon Center is a reclaimed former illegal dump site and serves as a haven for birds and wildlife. Priority birds that are protected in this center include species listed as Species of Greatest Conservation Need for Texas under Texas Parks & Wildlife Department Texas Conservation Plan and/or Climate Threatened or Climate Endangered status based on National Audubon's Climate Initiative. Hardwood forests, pond, wetland, and prairie ecosystems are found within this natural center (TCEQ 2016).

The site is located within the Texas Blackland Prairies ecoregion. The landscape is gently rolling to nearly level, and elevations range from 300 to 800 feet above sea level. Blackland Prairie soils once supported a tallgrass prairie dominated by tall-growing grasses such as big bluestem (*Andropogon gerardi)*, little bluestem *(Schizachyrium scoparium)*, indiangrass *(Sorghastrum nutans)*, and switchgrass *(Panicum virgatum)*. Crop production and cattle ranching are the primary agricultural industries (Texas Parks & Wildlife Department 2018a).

3.10 THREATENED AND ENDANGERED SPECIES

The table below presents the list of rare species expected to occur in Dallas County. Species that are state or federally listed as endangered or threatened (Texas Parks & Wildlife Department 2018b) are also noted in the table. It is important to note that these listed species may occur within Dallas County, but there has been no known documentation of any of the species at the site. However, habitat known to be used by the state-designated threatened wood stork and white-faced ibis is located in the Joppa Preserve (approximately 2 miles away from the site) and Lemmon Lake Park (approximately 1.5 miles from the site). The habitat requirements of each protected species will be reviewed, and Texas Parks & Wildlife Department will be consulted during the ecological risk assessment in phase two of the RI to determine if any protected species are expected on site. For each protected species expected on site, a suitable surrogate species will be identified and used as a representative receptor throughout the risk evaluation.

ED_004144A_00003226-00021

Species	Scientific Name	Federal Status	State Status
Birds			
White-faced Ibis	*Plegadis chihi*		Threatened
Wood Stork	*Mycteria americana*		Threatened
Bald Eagle	*Haliaeetus leucocephalus*	Delisted	Threatened
Peregrine Falcon	*Falco peregrinus*	Delisted	Threatened
American Peregrine Falcon	*Falco peregrinus anatum*	Delisted	Threatened
Arctic Peregrine Falcon	*Falco peregrinus tundrius*	Delisted	
Whooping Crane	*Grus americana*	Endangered	Endangered
Piping Plover	*Charadrius melodus*	Threatened	Threatened
Red Knot	*Calidris canutus rufa*	Threatened	
Interior Least Tern	*Sternula antillarum athalassos*	Endangered	Endangered
Western Burrowing Owl	*Athene cunicularia hypugaea*		
Sprague's Pipit	*Anthus spragueii*		
Black-capped Vireo	*Vireo atricapilla*	Delisted	Endangered
Golden-cheeked Warbler	*Setophaga chrysoparia*	Endangered	Endangered
Henslow's Sparrow	*Ammodramus henslowii*		
Mammals			
Cave myotis	*Myotis velifer*		
Plains spotted skunk	*Spilogale putorius interrupta*		
Reptiles			
Alligator snapping turtle	*Macrochelys temminckii*		Threatened
Texas horned lizard	*Phrynosoma cornutum*		Threatened
Texas garter snake	*Thamnophis sirtalis annectens*		
Timber rattlesnake	*Crotalus horridus*		Threatened

ED_004144A_00003226-00022

Mollusks			
Texas pigtoe	*Fusconaia askewi*		Threatened
Sandbank pocketbook	*Lampsilis satura*		Threatened
Louisiana pigtoe	*Pleurobema riddellii*		Threatened
Texas heelsplitter	*Potamilus amphichaenus*		Threatened
Insects			
Black Lordithon rove beetle	*Lordithon niger*	Endangered	Endangered
Plants			
Plateau milkvine	*Matelea edwardsensis*		
Tree dodder	*Cuscuta exaltata*		
Texas milk vetch	*Astragalus reflexus*		
Hall's prairie clover	*Dalea hallii*		
Osage Plains false foxglove	*Agalinis densiflora*		
Glen Rose yucca	*Yucca necopina*		
Glass Mountains coral-root	*Hexalectris nitida*		
Warnock's coral-root	*Hexalectris warnockii*		

4. NATURE AND EXTENT OF CONTAMINATION

The following subsections regarding nature and extent of contamination include: (1) comparison criteria, (2) discussion of historical data, (3) identification of COPCs, (4) discussion of potential source materials, and (5) evaluation of nature and extent of contaminants based on existing data. Data used in this nature and extent of contamination section are from the following sources:

- 2016 Removal Assessment Report (Weston 2016)
- 2017 TCEQ Site Inspection Report (TCEQ 2017).

Additional soil samples were collected and analyzed in November 2015 for use in the 2016 Preliminary Assessment prepared by TCEQ, in cooperation with EPA Region 6 (TCEQ 2016). These samples were collected within the same areas that were sampled for the Removal Assessment (Weston 2016), global positioning system coordinates were not provided for the sample locations, and a Level 4 Data Package was not prepared. Therefore, the data does not meet EPA data quality requirements and has not been carried forward for use in completing the RI.

ED_004144A_00003226-00023

4.1 COMPARISON CRITERIA

To provide a basis for evaluating existing chemical concentration data, human health risk levels as well as ecological screening levels were identified as protective comparison values for chemical concentrations in soil, sediment, surface water, liquid waste, and groundwater.

Screening levels were based on conservative estimates of exposure and do not represent cleanup levels. Screening level exceedances do not automatically designate an area as contaminated nor do they trigger a response action. Rather, screening level exceedances suggest that further evaluation of the potential risks posed by site contamination is appropriate. The magnitude of exceedance is helpful in evaluating source areas, the nature and extent of contamination, and migration pathways. EPA human health screening levels are based on an excess lifetime carcinogenic risk of 1 in 1,000,000 individuals ($1x10^{-6}$) or a non-carcinogenic hazard quotient of 1 unless otherwise indicated.

Maximum concentrations of chemicals detected in soil, sediment, surface water, and groundwater data were compared to EPA's risk-based residential and industrial RSLs (EPA 2018b) and TCEQ ecological screening levels.

4.2 CHEMICALS OF POTENTIAL CONCERN

Chemicals that were detected in soil, sediment, surface water, and liquid waste were considered COPCs for this site. Elevated concentrations of COPCs from previous investigations at the site include, but are not limited to: cyanide, lead, mercury, chromium, and hexavalent chromium. These chemicals have been identified as primary COPCs impacting onsite soils, underlying groundwater, and sediments downstream from the site. Contaminant levels in onsite soils exceed the EPA RSLs for residential and industrial use (EPA 2018a).

A thorough understanding of the impacts from these primary COPCs across the exposure areas will provide a reliable yet concise picture of COPC distribution. The list of COPCs will be refined as the investigation progresses, which may result in identification of additional COPCs.

4.3 SOURCE

The 2018 HRS Documentation Record (EPA 2018a) identified the following sources: (1) contaminated soil currently located underneath and surrounding the facility building, (2) underground sumps located inside the facility building, (3) wastes containerized in tanks and other containers, and (4) wastes containerized in drums.

4.4 EXTENT OF CONTAMINATION

An analysis of the data is performed to describe the nature and extent of contamination to soil, sediment, and surface water (EPA 1989a). Chemical concentrations are incorporated with physical characteristics, historical information regarding site activities, and other evidence to evaluate the nature and magnitude of contamination. Similar evidence is used to delineate the extent of contamination both horizontally and vertically. Section 2.2 Site History and Previous Investigations details the sampling results of each investigation. Soil sample locations are

ED_004144A_00003226-00024

presented in Figure 3 and sediment and surface water samples are presented in Figure 4. The overall sample results are summarized here.

4.4.1 Soil

A total of 188 soil samples were analyzed for metals. The soil sample results are presented in Table 1. Concentrations of antimony, arsenic, barium, cadmium, chromium, hexavalent chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, thallium, vanadium, and zinc exceed the most conservative screening level in at least one sample. Concentrations of the following compounds in surface soil exceed the industrial RSLs: arsenic, hexavalent chromium, lead, and mercury. Generally, the highest concentrations of the primary COPCs (cyanide, lead, mercury, chromium, and hexavalent chromium [Figure 5]) are found in the facility footprint, in the immediate vicinity of the HWTB/Waste Storage Shed, and just south of the HWTB/Waste Storage Shed. The concentrations of at least one primary COPC in each sample exceeds the TCEQ ecological soil benchmarks.

4.4.2 Sediment and Surface Water

Fifteen co-located sediment and surface water samples were collected near the site (Figure 4). The sediment and surface water sample results are presented in Tables 2 and 3, respectively. Concentrations of arsenic, cadmium, chromium, lead, manganese, and mercury in sediment exceed the most conservative screening level in at least one sample. Highest concentrations were generally not found in the same samples. The following sediment samples had detected concentrations of primary COPCs in exceedance of the most conservative screening levels: SE-03, SE-04, SE-05, SE-06, SE-07, SE-08, SE-09, SE-10, SE-14, and SE-15. Concentrations of primary COPCs in site sediment do not exceed human health risk screening criteria. Concentrations of primary COPCs in site sediment are compared to ecological risk screening criteria in Figure 6.

Detected total concentrations of aluminum, arsenic, chromium, copper, iron, lead, manganese, mercury, nickel, vanadium, and zinc in surface water exceed the most conservative screening level in at least one sample. The highest surface water concentrations were found in samples SW-04 and SW-03, the samples nearest and downgradient (southeast) to the known sources. Concentrations of the primary COPCs in surface water are compared to human health risk screening criteria in Figure 7 and ecological risk screening criteria in Figure 8.

4.4.3 Waste Samples

Four waste samples were collected from an unknown number of drums and totes and the results are presented in Table 4.

4.4.4 Groundwater

The two onsite shallow wells located adjacent and north of the facility building were sampled in February 2016 for metals. WW-1 displayed chromium and hexavalent chromium concentrations that exceeded the MCL and SCDM for these metals, and WW-2 displayed a hexavalent chromium concentration that exceeded the SCDM for these metals.

ED_004144A_00003226-00025

5. CONTAMINANT FATE AND TRANSPORT

The nature and extent of contamination is combined with source identification and physical characteristic information to evaluate migration pathways. The following migration pathways may be present, further site evaluation will be necessary to definitively conclude which are present.

5.1 SURFACE WATER TRANSPORT

Contaminant transport of particulates and dissolved phase contaminants via surface water transport may occur through ephemeral pathways during precipitation events toward Stream 5A2, the unnamed creek, wetlands, and the small pond.

5.2 LEACHING TO GROUNDWATER

As water percolates through vadose zone soil to the underlying groundwater, it can carry dissolved phase constituents. Additionally, source material in contact with groundwater can leach directly to groundwater.

5.3 GROUNDWATER TRANSPORT

As groundwater migrates laterally through the saturated zone, it can carry dissolved phase constituents.

5.4 GROUNDWATER TO SURFACE WATER

Groundwater may emanate as surface water at various points (e.g., gaining streams) around the site.

5.5 AIR PARTICULATE MIGRATION

Generally, soil is not considered mobile because ground cover or vegetation often precludes migration. Nonetheless, it may be possible for high wind events to carry fine-grained surface materials and particulates from source areas.

5.6 SOIL VAPOR TO AIR

Volatile organic compounds in soil can migrate from the soil to ambient air, where they can then be transported in the atmosphere.

6. DATA GAPS

To support the development of the RI, additional hydrogeological, shallow groundwater, surface and subsurface soil, sediment, and surface water data will be collected. All additional samples will be analyzed for metals including hexavalent chromium. A subset of samples will also be

ED_004144A_00003226-00026

analyzed for organics to determine if the list of COPCs should be expanded. This additional data will help delineate the source areas and the lateral and vertical extent of contamination.

7. HUMAN HEALTH CONCEPTUAL EXPOSURE PATHWAY ANALYSIS

This section presents the preliminary human health CSM and summarizes information on sources of site chemicals, affected environmental media, chemical release and transport mechanisms, potentially exposed receptors, and potentially complete exposure pathways for each receptor. Figures 9 and 10 present the preliminary human health CSM. The human health risk assessment will be conducted during phase two of the RI, and the assumptions made in the preliminary human health CSM will be reviewed at that time.

7.1 SOURCES OF SITE CHEMICALS

Section 4 summarizes the nature and extent of contamination. As shown in Figure 10, sources for chemical exposure may include surface soil, subsurface soil, sediment, surface water, groundwater, and air. Residual soil source areas are a result of historic site activities. The 2018 HRS Documentation Record (EPA 2018a) identified the following sources: (1) contaminated soil currently located underneath and surrounding the facility building, (2) underground sumps located inside the facility building, (3) wastes containerized in tanks and other containers, and (4) wastes containerized in drums. Sampling activities will be completed as part of the RI to further define residual source areas and fill existing data gaps.

7.2 AFFECTED ENVIRONMENTAL MEDIA

Residual soil source area(s) have resulted in chemical releases to soil (e.g., vadose zone), sediment, surface water, groundwater, and air. Further information regarding chemical releases is a potential data gap that may be filled by future investigatory activities.

7.3 CHEMICAL RELEASES AND TRANSPORT MECHANISMS

Figure 10 summarizes the chemical release and transport mechanisms for the detected chemicals. Based on these mechanisms, chemicals in soil, sediment, surface water, and groundwater may also migrate to ambient (i.e., outdoor) air and indoor air (i.e., vapor intrusion and domestic use).

7.4 POTENTIALLY EXPOSED RECEPTORS

The site is in an area with mixed residential or commercial/industrial land use, so these are the most likely potential exposure scenarios. It is likely that construction or maintenance activities may occur that would require excavation, construction, or regrading; therefore, a construction worker scenario was considered. A trespasser/recreational scenario was also included in the event that a receptor intrudes onto an impacted portion of the property or a recreational user from the nearby park and abandoned baseball field enter the site.

ED_004144A_00003226-00027

7.5 POTENTIALLY COMPLETE EXPOSURE PATHWAYS

According to EPA guidance (1989b), a complete exposure pathway consists of four elements:

- A source and mechanism of chemical release.
- A retention or transport medium (or media in cases involving transfer of chemicals).
- A point of potential human contact with the contaminated medium (referred to as the "exposure point").
- An exposure route (such as ingestion) at the exposure point.

If any of these elements are missing, then the exposure pathway is considered incomplete. For example, if receptor contact with the source or transport medium does not occur, then the exposure pathway is considered incomplete and is not quantitatively evaluated. Similarly, if human contact with an exposure medium is not possible, the exposure pathway is considered incomplete and is not evaluated.

The preliminary CSM (Figure 10) summarizes information on sources of COPCs, affected environmental media, COPC release and transport mechanisms, potentially exposed receptors, and potential exposure pathways for each receptor. Potentially complete exposure pathways are designated by a "C" in the preliminary CSM. Incomplete exposure pathways are designated by an "I." Because some of these pathways are based on hypothetical-future exposure, they are considered potentially complete, but may not actually be complete for all receptors in the future.

Exposure routes for each receptor associated with the potentially complete exposure pathways are described in the following sections for the following potential receptors:

- Commercial/Industrial Worker
- Construction Worker
- Trespasser/Recreational
- Residential.

Commercial/Industrial Worker Exposure

The following exposure pathways for surface soil are potentially complete for the commercial/industrial worker scenario:

- Incidental ingestion of soil
- Dermal contact with soil
- Inhalation of chemicals adsorbed to windblown soils released to outdoor air
- Inhalation of chemicals volatilized from soil to outdoor air
- Inhalation of indoor air vapors from soil vapor intrusion.

ED_004144A_00003226-00028

The following exposure pathways for groundwater are potentially complete for the commercial/industrial worker scenario:

- Ingestion of groundwater
- Dermal contact with groundwater
- Inhalation of chemicals volatilized from groundwater
- Inhalation of indoor air vapors from groundwater vapor intrusion.

Commercial/industrial workers are not expected to come into contact with subsurface soil, sediment, or surface water at the site, so these pathways are not complete.

Construction Worker Exposure

The following exposure pathways for surface and subsurface soil are potentially complete for the construction worker scenario:

- Incidental ingestion of soil
- Dermal contact with soil
- Inhalation of chemicals adsorbed to windblown soils in outdoor air
- Inhalation of chemicals volatilized from soil to outdoor air.

The following exposure pathways for groundwater are potentially complete for the construction worker scenario:

- Ingestion of groundwater
- Dermal contact with groundwater
- Inhalation of chemicals volatilized from groundwater into a trench.

Construction workers are not expected to come into contact with sediment or surface water at the site, so these pathways are not complete.

Trespasser/Recreational Exposure

The following exposure pathways for surface soil are potentially complete for the trespasser/recreational scenario:

- Incidental ingestion of soil
- Dermal contact with soil
- Inhalation of chemicals adsorbed to windblown soils released to outdoor air
- Inhalation of chemicals volatilized from soil to outdoor air.

The following exposure pathways for surface water and sediment are potentially complete for the trespasser/recreational scenario:

ED_004144A_00003226-00029

- Ingestion of fish from Small Pond, Stream 5A2, and other downgradient bodies of water if catchable fish are present.

- Incidental ingestion of sediment and surface water.

- Dermal contact with sediment and surface water.

Trespassers/recreational users are not expected to come into contact with groundwater or subsurface soil at the site, so these pathways are not complete.

Residential Exposure

The following exposure pathways for surface and subsurface soil are potentially complete for the residential scenario:

- Incidental ingestion of soil
- Dermal contact with soil
- Ingestion of homegrown produce in contact with soil
- Inhalation of chemicals adsorbed to windblown soils released to outdoor air
- Inhalation of chemicals volatilized from soil to outdoor air
- Inhalation of indoor air vapors from soil vapor intrusion.

The following exposure pathways for surface water and sediment are potentially complete for the residential scenario:

- Ingestion of fish from Small Pond, Stream 5A2, and other downgradient bodies of water if catchable fish are present.

- Incidental ingestion of sediment and surface water.

- Dermal contact with sediment and surface water.

The following exposure pathways for groundwater are potentially complete for the residential scenario:

- Ingestion of groundwater
- Dermal contact with groundwater
- Inhalation of chemicals volatilized from groundwater during domestic use
- Inhalation of indoor air vapors from groundwater vapor intrusion.

8. ECOLOGICAL CONCEPTUAL EXPOSURE PATHWAY ANALYSIS

Figures 11 and 12 present the ecological CSM, including potential exposure pathways evaluated for ecological receptors. These were divided into exposures for aquatic and terrestrial habitats.

ED_004144A_00003226-00030

The CSM illustrates both potential and quantifiable pathways through which receptors may be exposed to COPCs. The *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (EPA 1997) provides guidance for designing and conducting technically defensible ecological risk assessments for the Superfund program. The ecological risk assessment will be conducted during phase two of the RI, and the assumptions made in the ecological CSM will be reviewed at that time.

8.1 IDENTIFICATION OF EXPOSURE PATHWAYS

Exposure routes link chemicals in exposure media to ecological receptors. The following sections describe the major exposure routes. Ecological receptors potentially present at the site include plants, terrestrial invertebrates, wildlife (birds, mammals, etc.), and aquatic and benthic organisms. The following sections identify the major routes of exposure and their applicability to each of these receptor groups.

8.1.1 Direct Contact/Dermal Contact

Plants, invertebrates, aquatic and benthic organisms, and wildlife may all be exposed to environmental media through direct contact. Plants may absorb chemicals from surface soil via their roots. They may also absorb chemicals from air or airborne particles through their leaves. Absorption through the roots is expected to be the most significant pathway. Absorption of chemicals from air or airborne particles is expected to be an insignificant pathway (EPA 2005, U.S. Army Center for Health Promotion and Preventive Medicine [CHPPM] 2004); although this pathway may be re-evaluated if new data indicate that significant airborne contamination is present. It is also possible that deep rooting plants come into direct contact with groundwater; however, the groundwater onsite is likely too deep for this to be a complete pathway. Plants are known to uptake metals and some organics; however, uptake of hydrophobic and/or large molecular weight compounds by plants is limited. Based on this information, direct exposure to surface soil is considered a complete and significant pathway for plants (Figure 12).

Aquatic and benthic organisms may be exposed to chemicals in sediment and surface water through direct contact. Chemicals may be absorbed from water or sediment through the skin and gills. This exposure pathway is considered to be complete and significant for both media (Figure 12).

For soil invertebrates, direct contact with soil is identified as a significant exposure pathway as these organisms live in constant contact with the soil. The invertebrates may also be exposed to chemicals in air through direct contact; however, this exposure is not significant in relation to exposure from soil. Chemicals may be absorbed from soil through the skin. Therefore, for soil invertebrates this exposure pathway is considered to be complete and significant for soil (Figure 12).

Wildlife may be exposed to chemicals in air, soil, sediment, or water via direct contact during foraging or burrowing. However, absorption and uptake through this contact is likely to be insignificant, as shown by example calculations in EPA guidance (EPA 2005). Most wildlife are equipped with protective outer coverings such as fur, feathers, or scales that prevent or limit the

ED_004144A_00003226-00031

dermal absorption of chemicals from environmental media (CHPPM 2004). Amphibians and reptiles may not be as well protected from dermal exposure. EPA guidance identifies that, in most cases, dermal exposures are likely to be less significant than exposures through ingestion and their evaluation involves considerable uncertainty (EPA 2005). This guidance provides example calculations for an example species showing that less than 0.2 percent of the total chemical dose to wildlife is likely to come from dermal contact. This exposure route is considered complete for reptiles and amphibians and complete but insignificant for other wildlife receptors (Figure 12).

8.1.2 Inhalation

Inhalation is a potentially complete pathway for both terrestrial invertebrates and wildlife. These animals may inhale chemicals which have volatilized or which are adsorbed to airborne particulates. Currently, it is unclear whether volatile compounds are present at the site in high enough concentrations to cause significant exposures. Similarly, it is unclear whether suspension of airborne particulates occurs with sufficient duration or frequency to result in significant inhalation exposures. EPA guidance indicates that, in general, inhalation pathways are likely to be insignificant compared to ingestion pathways (EPA 2005). This guidance states that most chemicals inhaled with dust are trapped in mucus membranes and ingested; therefore, their impact is captured through analysis of incidentally ingested soil. It also provides example calculations showing that less than 0.1 percent of the total risk to wildlife is likely to come from inhalation. Finally, a large number of assumptions are required for quantification of inhalation exposures, leading to significant uncertainties. Based on this information, inhalation exposures are considered to be a complete but insignificant exposure pathway for the site (Figure 12).

8.1.3 Ingestion

The most significant exposure route for wildlife is ingestion of chemicals in contaminated media (EPA 2005). Wildlife may ingest chemicals in environmental media by drinking surface water or by incidentally ingesting soil and sediment while grooming or foraging. As discussed above, chemicals may bioaccumulate in the tissue of plants and animals. Therefore, wildlife may also ingest chemicals in plants and animals that they consume as food. Herbivores may be exposed to chemicals that have bioaccumulated in plant tissue. Carnivores may be exposed to chemicals that have accumulated in prey. Omnivores may be exposed to chemicals in both plant and animal food items. The site is expected to support a range of wildlife that spans several trophic levels and feeding guilds. This includes both primary and secondary consumers, and species which consume plants, invertebrates, small birds and mammals, and fish or aquatic organisms. Ingestion of chemicals in soil, sediment, surface water, and food are considered complete and potentially significant exposure pathways (Figure 12).

8.1.4 Exposure to Subsurface Soil and Groundwater

For aquatic and terrestrial receptors, exposure to groundwater and subsurface soil are considered incomplete pathways. Aquatic receptors are expected to receive most of their exposure in the top 1 foot of sediments and terrestrial receptors in the top 1 foot of the surface soil. Since many of the samples collected previously at the site have results through the top 18 inches, exposures

ED_004144A_00003226-00032

for the top 18 inches will be evaluated. However, subsurface soil and groundwater contamination may contaminate surface media, which ecological receptors will be exposed to, via exfiltration and seeps. The subsurface soil and groundwater are considered potential sources but not exposure media for most ecological receptors with the exception of burrowing mammals, which may be exposed to subsurface soil.

8.1.5 Media of Concern

The expected media of concern include site surface and subsurface soil, site groundwater, and sediment in the forest near the facility; and sediment and surface water in the Stream 5A2, unnamed creek, wetlands, and small pond. Complete, significant exposure pathways for receptors are expected to be limited to exposure to surface soil, subsurface soil (burrowing mammals only), sediment, surface water, and terrestrial and aquatic food chains.

8.2 ASSESSMENT ENDPOINTS

EPA guidance stresses the importance of ecologically significant endpoints. As EPA indicates, "Assessment endpoints are explicit expressions of the actual environmental value that are to be protected, operationally defined by an ecological entity and its attributes" (EPA 1998, U.S. Army Biological Technical Assistance Group [BTAG] 2002). The selection of assessment endpoints is based on the fundamental knowledge of local ecology. Assessment endpoints typically relate to an effect on a population or community. Survival of a specific species of insect is an example of a population level assessment endpoint. Community level assessment endpoints could include survival of benthic invertebrates or maintenance of multiple populations of birds. TCEQ's ecological risk assessment program does not typically focus on plants if protected (rare, threatened, or endangered) plants are not present on site and are therefore not listed as an assessment endpoint. If any protected plant species are determined to be on site (Section 3.10), plants will be added as an assessment endpoint.

Based on the CSM, ecological receptors may be exposed to COPCs from food, surface water, soil, and sediment. Based on the identified ecological receptors, habitats, and the above observations, the following ecological assessment endpoints are defined:

1. Protection of **soil invertebrates** exposed to COPCs in soil from adverse effects on survival, growth, and reproduction.

2. Protection of **aquatic and benthic communities** (e.g., fish and crustaceans) exposed to COPCs in sediment, surface water, and food from adverse effects on survival, growth, and reproduction.

3. Protection of **herbivorous mammals** to ensure that ingestion of COPCs in soil, sediment, and food do not have adverse effects on survival, growth, and reproduction.

4. Protection of **herbivorous birds** to ensure that ingestion of COPCs in soil, sediment, and food do not have adverse effects on survival, growth, and reproduction.

ED_004144A_00003226-00033

5. Protection of **insectivorous mammals** to ensure that ingestion of COPCs in soil and food do not have adverse effects on survival, growth, and reproduction.

6. Protection of **insectivorous birds** to ensure that ingestion of COPCs in soil and food do not have adverse effects on survival, growth, and reproduction.

7. Protection of **piscivorous mammals** to ensure that ingestion of COPCs in sediment and food do not have adverse effects on survival, growth, and reproduction.

8. Protection of **piscivorous birds** to ensure that ingestion of COPCs in sediment and food do not have adverse effects on survival, growth, and reproduction.

9. Protection of **predatory mammals** to ensure that ingestion of COPCs in soil and food do not have adverse effects on survival, growth, and reproduction.

10. Protection of **predatory birds** to ensure that ingestion of COPCs in soil and food do not have adverse effects on survival, growth, and reproduction.

11. Protection of **reptiles and amphibians** to ensure that ingestion of COPCs through contact with soil, sediment, and food does not have adverse effects on survival, growth, and reproduction.

EPA guidance (EPA 1999) specifies that the goal is to protect the above receptor groups from population impacts. The use of individuals to assess impacts is a highly conservative estimator of potential impacts on populations. This is a source of uncertainty that may lead to the overestimation of risks.

8.3 SELECTION OF REPRESENTATIVE RECEPTORS

Specific receptor groups and representative receptor species are selected to represent each of the ecological resource categories identified above. Selection of representative receptor species is based primarily on several factors: (1) the likelihood of a species to use the site, (2) the potential for exposure to site-related contaminants based on the feeding habits and life history of the organisms/guild represented by the receptor species, (3) the availability of life history and exposure information for the selected receptor species, and (4) the availability of toxicity information for the representative receptor species. The rationale for use of representative receptor species is summarized below. In cases where available toxicity data are of a general nature, communities or trophic levels were selected for evaluation.

Although currently it does not appear to be the case, as there is no known documentation, if it is determined that a protected species exists at the site through consultation with Texas Parks & Wildlife Department during the ecological risk assessment; a suitable surrogate species will be identified and used as a representative receptor throughout the risk evaluation. When evaluating risk to a protected species via a surrogate, it is important that the individual be protected. The representative receptor groups are summarized below.

ED_004144A_00003226-00034

8.3.1 Aquatic Species

Aquatic and Benthic Organisms

These receptors are exposed to chemical contaminants by direct contact with and ingestion of sediment and surface water, as well as consumption of fish and benthos (Figure 12). Exposure to groundwater and subsurface soil are also incomplete pathways, because these organisms live in the bottom sediments or within surface waters. Because of the aquatic nature of these receptors, exposure to airborne particulates is also an incomplete pathway.

The toxicity data being used in the risk assessment are designed to evaluate the potential for adverse effects to aquatic and benthic organisms. Therefore, individual species are not selected for evaluation, and the assessments evaluate the potential for adverse effects to the overall aquatic and benthic populations.

Herbivorous Wildlife

Herbivorous birds and mammals are exposed to chemical contaminants from surface water, sediment, and vegetative matter, chiefly during foraging. These receptors are exposed to contaminants via direct contact with and ingestion of surface water and sediment and the ingestion of food (plant tissue). All of these represent complete pathways, but only the incidental ingestion of sediment and the consumption of food will be considered significant (Figure 12).

The muskrat (*Ondatra zibethicus*) is selected as the mammalian receptor species for evaluating potential adverse effects to mammals from the ingestion of plants. The muskrat diet includes significant amounts of plant food items (EPA 1993). Therefore, the muskrat is selected as a representative receptor species for the evaluation of potential adverse effects to mammals from feeding at the site.

The Canada goose (*Branta canadensis*) is selected as the representative receptor species to evaluate the potential for adverse effects to herbivorous birds from the ingestion of chemicals in plant material. Birds can be more sensitive to certain contaminants (Sample et al. 1996), and it is therefore more conservative to include an avian receptor. The Canada goose is selected as a representative receptor species because its diet is mostly comprised of plant material (EPA 1993) and this species can be an important part of the diet of predatory mammals.

Piscivorous Wildlife

Piscivorous birds and mammals are exposed to chemical contaminants chiefly during foraging and feeding. These receptors are exposed to contaminants via direct contact with surface water and sediment as well as the ingestion of food (fish and benthos), surface water, and sediment. All of these represent complete pathways, but only the incidental ingestion of sediment and the consumption of food will be considered significant (Figure 12). To identify potentially impacted piscivorous species groups, the feeding guilds of the mammals, invertebrates, and birds known to occur in the study area were reviewed. Those identified as having the greatest potential to be adversely affected are selected for detailed evaluation.

ED_004144A_00003226-00035

The North American river otter (*Lutra canadensis*) was selected as the mammal species for evaluating potential adverse effects to mammals from the ingestion of fish and benthic and aquatic invertebrates at the site. Since a large proportion of their diet is comprised of fish, the river otter was selected as the representative piscivorous mammal.

The great blue heron (*Ardea herodias*) is selected as the avian receptor species for evaluating potential adverse effects to birds from the ingestion of fish, amphibians, and crayfish from the area. The great blue heron is selected for evaluation, because a large proportion of the diet is comprised of fish (including game fish) and larger aquatic invertebrates, and the heron may forage in the areas bordering these sites. In some areas, game fish (such as large-mouth bass) can comprise one-quarter of a heron's diet (Cottam and Uhler 1945).

8.3.2 Terrestrial Species

Soil Invertebrates

Complete exposure pathways for soil invertebrates include direct contact with soil and the ingestion of soil and food (Figure 12). The site is expected to provide habitat for a range of invertebrates, including earthworms and arthropods. The earthworm was selected as the representative receptor species for soil invertebrates. The earthworm is ideal because it is in constant contact with the soil, has a significant lipid content that may accumulate chemicals, and does not have an exoskeleton; as such, they represent a precautionary estimate of exposure.

Herbivorous Wildlife

Herbivorous birds and mammals are exposed to chemical contaminants from soil and vegetative matter, chiefly during foraging. These receptors are exposed to contaminants via direct contact with soil, ingestion of food (plant tissue), and incidental ingestion of soil. All of these represent complete pathways but only the ingestion of soil and food are considered significant (Figure 12).

The white-footed mouse (*Peromyscus leucopus*) was selected as the representative receptor species to evaluate the potential for adverse effects to herbivorous mammals. The white-footed mouse is an appropriate receptor species because it is likely to occur at the site, it is a potential food source for other animals, and has a life history similar to that of many other small mammals. Also, sufficient data is available for this species to support quantitative evaluation of food web exposures.

The song sparrow (*Melospiza melodia*) was selected as the representative receptor species to evaluate the potential for adverse effects to herbivorous birds. Song sparrows are an appropriate representative receptor because they are expected to be present at the site and have a life history similar to that of many other songbirds. Also, sufficient data is available for this species to support quantitative evaluation of food web exposures.

Insectivorous Wildlife

Insectivorous birds and mammals are exposed to chemical contaminants chiefly during foraging and feeding. These receptors are exposed to contaminants via direct contact with soil and

ED_004144A_00003226-00036

airborne dust, ingestion of food (animal tissue), incidental ingestion of soil, and inhalation of airborne dust. All of these represent complete pathways but only the ingestion of soil and food are considered significant (Figure 12).

The American robin (*Turdus migratorius*) was selected as the representative receptor species to evaluate the potential for adverse effects to insectivorous birds. American robin is an appropriate receptor because it occurs in a wide range of habitat types, is expected to be present at the site, feeds primarily on invertebrates, and has a life history similar to that of many other passerine birds. Also, sufficient data is available for this species to support quantitative evaluation of food web exposures.

The least shrew (*Cryptotis parva*) was selected as the representative receptor species to evaluate the potential for adverse effects to insectivorous mammals. The shrew is an appropriate receptor species because it is a potential food source for other animals, is likely to occur around the site, and has a life history similar to that of many other small mammals. Also, sufficient data is available for this species to support quantitative evaluation of food web exposures.

Predatory Wildlife

Predatory birds and mammals are exposed to chemical contaminants from soil, airborne particulates, and prey. These receptors are exposed to contaminants via direct contact with soil and airborne dust, ingestion of food (animal tissue), incidental ingestion of soil, and inhalation of airborne dust. All of these represent complete pathways but only ingestion of soil and food are considered significant (Figure 12). Because these organisms are commonly not herbivorous, direct and indirect exposure to contaminants in plant tissue is not a complete pathway. Consumption of fish and benthos is also not a major exposure pathway for predatory wildlife. Predatory species identified as having the greatest potential to be adversely affected are selected for detailed evaluation.

Red fox (*Vulpes vulpes*) was selected as the representative receptor for predatory mammals and burrowing mammals because it is expected to be present at the site, feeds primarily on small mammals, has a high potential for exposure due to bioaccumulation though the food chain, and is a valuable component to ecosystem structure by regulating the abundance, reproduction, distribution, and recruitment of lower trophic level prey (EPA 1999). Also, sufficient data is available for this species to support quantitative evaluation of food web exposures.

The red-tailed hawk (*Buteo jamaicensis*) was selected as the representative receptor for predatory birds because it is likely to be present at the site. The red-tailed hawk is selected as a suitable representative for a predatory bird receptor, because it feeds predominantly on small mammals (such as mice, shrews, voles, rabbits, and squirrels). Also, sufficient data is available for this species to support quantitative evaluation of food web exposures.

8.3.3 Reptiles and Amphibians

Reptiles and amphibians are exposed to chemical contaminants from surface water, sediment, soil, airborne dust, and prey. These receptors are exposed to contaminants via direct contact with and ingestion of sediment, surface water, airborne dust, and soil as well as ingestion of food

ED_004144A_00003226-00037

(prey tissue). All of these represent complete pathways but only the ingestion of food and the ingestion of and direct contact with sediment and soil are considered significant (Figure 12). Although oral dose toxicity data are largely unavailable for these taxa, some toxicological information for amphibians and reptiles are available. Immersion and dermal absorption may also be available and are appropriate pathways for evaluation of, or in conjunction with, oral dose data particularly for amphibians. Amphibians can be assumed to be protected in the event that no amphibian toxicity data for specific contaminants can be found; if it can be shown that surface water concentrations meet water quality benchmarks; and if sediment concentrations are protective of benthic invertebrates. The toxicity data being used in the risk assessment are designed to evaluate the potential for adverse effects to aquatic and benthic organisms. Therefore, individual species are not selected for evaluation, and the assessments evaluate the potential for adverse effects to the overall reptile and amphibian populations.

ED_004144A_00003226-00038

9. REFERENCES

Cottam, C., and F. M. Uhler. 1945. *Birds in relation to fishes*. Fish and Wildlife Service. Leaflet No 272.

Kottek, M., J. Grieser, C. Beck, B. Rudolf, and F. Rubel. 2006. World Map of the Köppen-Geiger climate classification updated.Meteorol. Z., 15, 259-263. DOI: 10.1127/0941-2948/2006/0130.

Natural Resources Conservation Service (NRCS). 2018. Web Soil Survey. https://websoilsurvey.sc.egov.usda.gov/. United States Department of Agriculture.

Sample, B.E., Opresko, D.M., and Suter, G.W. 1996. *Toxicological Benchmarks for Wildlife: 1996 Revision*. ES/ER/TM-86/R3. Rsk Assessment Program, Health Sciences Research Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Texas Commission on Environmental Quality (TCEQ). 2006a. Sediment PCLs. https://www.tceq.texas.gov/assets/public/remediation/trrp/sedpcls_2006.pdf March 31.

———. 2006b. Contact Recreation Water PCLs. https://www.tceq.texas.gov/assets/public/remediation/trrp/contactrecpcls.pdf March 31.

———. 2016. *Preliminary Assessment.* Lane Plating Works, Inc. Dallas, Dallas County, Texas TXD007336571. Prepared in cooperation with U.S. Environmental Protection Agency (EPA). May.

———. 2017. *Site Inspection Report.* Lane Plating Works, Inc. Dallas, Dallas County, Texas TXD007336571. Prepared in cooperation with U.S. Environmental Protection Agency (EPA). January.

———. 2018a. TCEQ. 2018. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

———. 2018b. *TCEQ's Ecological Benchmark Tables. Sediment Benchmarks, Second-Effects Levels, and Benthic PCLs.* TCEQ publication RG-263b. https://www.tceq.texas.gov/remediation/eco/eco.html. August.

———. 2018c. Human Health Surface Water RBELs tables. https://www.tceq.texas.gov/assets/public/remediation/trrp/humanhealthrbels.xlsx. March.

———. 2018d. TCEQ's Ecological Benchmark Tables. Surface Water Benchmarks for Metals, Inorganics. TCEQ publication RG-263b.

Texas Parks & Wildlife Department. 2018a. Texas Ecoregions. Accessed October 2018. https://tpwd.texas.gov/education/hunter-education/online-course/wildlife-conservation/texas-ecoregions

ED_004144A_00003226-00039

———. 2018b. Annotated County Lists of Rare Species-Dallas County. Revised 8 August 2018.

U.S. Army Biological Technical Assistance Group (BTAG). 2002. *Technical Document for Ecological Risk Assessment: Selection of Assessment and Measurement Endpoints*.

U.S. Army Center for Health Promotion and Preventive Medicine (CHPPM). 2004. *Development of Terrestrial Exposure and Bioaccumulation Information for the Army Risk Assessment Modeling System (ARAMS)*. U.S. Army Center for Health Promotion and Preventive Medicine Contract Number DAAD050-00-P-8365, Aberdeen Proving Ground, Maryland.

U.S. Department of Agriculture (USDA). 1980. Soil Survey of Dallas County, Texas. In cooperation with Texas Agricultural Experiment Station. https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/texas/TX113/0/dallas.pdf

U.S. Environmental Protection Agency (EPA). 1989a. *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA* (Comprehensive Environmental Response, Compensation, and Liability Act). OSWER Directive 9355.3-01. October.

———. 1989b. *Risk Assessment Guidance for Superfund, Volume I, Human Health Evaluation Manual (Part A), Interim Final*. Office of Emergency and Remedial Response (OERR). EPA/540/1-89/002. December.

———. 1993. *Wildlife Exposure Factors Handbook*. Wildlife Exposure Factors Handbook. 2 Volumes, EPA/630/R-93/187a. U.S. Environmental Protection Agency, Office of Research and Development, Washington, D.C.

———. 1997. *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments, Interim Final*. Solid Waste and Emergency Response. OSWER 9285.7-25. EPA 540-R-97-006. Washington, D.C. June.

———. 1998. *Guidelines for Ecological Risk Assessment*. Office of Research and Development. EPA/630/R-95/002FA. April.

———. 1999. *Issuance of Final Guidance: Ecological Risk Assessment and Risk Management Principles for Superfund Sites*. Memorandum from Stephen D. Luftig, Director of the Office of Emergency and Remedial Response. http://www.epa.gov/superfund/programs/risk/ ecorisk/final99.pdf

———. 2005. *Guidance for Developing Ecological Soil Screening Levels*. EPA Office of Solid Waste and Emergency Response (OSWER). OSWER Directive 9285.7-55.

———. 2006. *Guidance on Systematic Planning Using the Data Quality Objectives Process (QA/G-4)*. EPA/240/B-06/001. OEI. Washington, D.C. February.

ED_004144A_00003226-00040

———. 2018a. *HRS Documentation Record, Lane Plating Works, Inc., EPA ID No. TXN0000605240*

———. 2018b. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018. https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables.

Weston Solutions, Inc. (Weston). 2016. Removal Report for Lane Plating Removal Action, 5322 Bonne View Road, Dallas, Dallas County, Texas. Prepared for EPA Region 6. December.

ED_004144A_00003226-00041

This page left intentionally blank

Tables

This page left intentionally blank

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	SO-01	SO-02	SO-03	SO-04	SO-05	SO-06	SO-07	SO-08
				Date:	7/20/2016	7/20/2016	7/20/2016	7/20/2016	7/20/2016	7/19/2016	7/20/2016	7/20/2016
				Depth (in):	--	--	--	--	--	--	--	--
Aluminum	77000	1100000	NA	mg/kg	8220	6200	6380 J	9430	11200	6260	5840	7910 J
Antimony	31	470	5	mg/kg	0.6 U	0.6 U	6.4 J-	0.5	0.5	0.9	0.5 U	12.7
Arsenic	0.68	3	18	mg/kg	***5.2***	***4.6***	***6.2***	***6.5***	***7.4***	***5.7***	***5.4***	***6.8***
Barium	15000	220000	330	mg/kg	97.2	77.6	141	97.3	122	96.1	88.9	133
Beryllium	160	2300	10	mg/kg	0.8	0.6	0.6 U	0.7	0.9	0.6	0.6	0.5
Cadmium	NA	NA	32	mg/kg	0.8	0.6	82.2 J	14.9	17	7.3	1	63 J
Chromium	120000	1800000	0.4	mg/kg	10.7	7.9	4180 J	2100	3970	1440	30.5	4510 J
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg								
Cobalt	23	350	13	mg/kg	8	4.8	10.7	9.8	11.3	6.5	6.1	9.6
Copper	3100	47000	70	mg/kg	12.8	11.1	249 J	59.1	44.4	61.7	23.7	276 J
Cyanide	23	150	NA	mg/kg	0.29 J	0.56 U	0.48 J	0.8	0.24 J	0.56 UJ-	0.47 J	0.59 J
Iron	55000	820000	NA	mg/kg	10400	7440	27400 J	13400	22300	8930	8780	16600 J
Lead	400	800	120	mg/kg	52.9	24.6	***1620*** J	109	60.7	171	149	***3010*** J
Manganese	1800	26000	220	mg/kg	913	651	788	952	1190	857	770	804
Mercury	11	46	0.1	mg/kg	0.074 U	0.069 U	**32.6** J	6.63	5.37	6.18	0.2	***54.6*** J
Nickel	1500	22000	38	mg/kg	18.5	15.2	535	359	82.3	78.5	17.3	497
Selenium	390	5800	0.52	mg/kg	1.1 U	1.1 U	1.1 UJ	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Silver	390	5800	560	mg/kg	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Thallium	0.78	12	1	mg/kg	0.6 U	0.6 U	0.6 U	0.5 U	0.5 U	0.6 U	0.5 U	0.5 U
Vanadium	390	5800	2	mg/kg	40.3	25.4	36.1	44.2	50.3	31.3	30.9	37.4
Zinc	23000	350000	120	mg/kg	47.5	36.1	465	176	249	106	90.5	433

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	A0-160920-SS-06-01	A0-160920-SS-18-01	A10-160921-SS-06-01	A10-160921-SS-18-01	A1-160412-SS-03-01
				Sample ID:	A0-160920-SS-06-01	A0-160920-SS-18-01	A10-160921-SS-06-01	A10-160921-SS-18-01	A1-160412-SS-03-01
				Date:	9/20/2016	9/20/2016	9/21/2016	9/21/2016	4/12/2016
				Depth (in):	0-6	12-18	0-6	12-18	0-3
Aluminum	77000	1100000	NA	mg/kg	5040	5400	6360	10000	9370 JK
Antimony	31	470	5	mg/kg	2.57 UJL	2.62 UJL	1.04 UJL	1.09 UJL	0.236 UJ
Arsenic	0.68	3	18	mg/kg	***6.14*** JL	***6.85*** JL	***7.85*** JL	***6.4*** JL	***9.37***
Barium	15000	220000	330	mg/kg	66.1	52.4	85	97.9	68.8
Beryllium	160	2300	10	mg/kg	0.398 JQ	0.369 JQ	0.407 JQL	0.462 JQL	0.534
Cadmium	NA	NA	32	mg/kg	0.294 JQ	2.62 U	0.931 JQ	0.334 JQ	0.351
Chromium	120000	1800000	0.4	mg/kg	20.2	9.56	39.2	16.4	26.5 JK
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.14** UJL	**2.14** UJL	**2.22** U	**2.26** U	**2.24** U
Cobalt	23	350	13	mg/kg	5.75	5.84	7.92	6.75	6.95
Copper	3100	47000	70	mg/kg	8.37	6.2	20	11.4	12.9
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	8910	9470	14200	11200	11800
Lead	400	800	120	mg/kg	28.8	9.33	75.4 JL	21.3 JL	36.8 D
Manganese	1800	26000	220	mg/kg	805	733	1140	957	962 JKD
Mercury	11	46	0.1	mg/kg	0.0806	0.0149	0.194 JL	0.0402 JL	0.153 JH
Nickel	1500	22000	38	mg/kg	14.9 JL	14.8 JL	29.9 JL	19.2 JL	18.3
Selenium	390	5800	0.52	mg/kg	1.25 JQ	1.16 JQ	1.06	0.935 JQ	0.677 JQ
Silver	390	5800	560	mg/kg	2.57 U	2.62 U	1.04 U	1.09 U	0.121 U
Thallium	0.78	12	1	mg/kg	**2.57** U	**2.62** U	0.169 JQL	**1.09** U	**1.41** UD
Vanadium	390	5800	2	mg/kg	23.3 JK	26.9 JK	28.1 JH	32.8 JH	27
Zinc	23000	350000	120	mg/kg	35.2 JL	29.9 JL	120	50.2	58.2

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	A1-160920-SS-18-01	A2-160412-SS-03-01	A2-160412-SS-03-02	A2-160922-SS-18-01	A3-160412-SS-03-01
				Sample ID:	A1-160920-SS-18-01	A2-160412-SS-03-01	A2-160412-SS-03-02	A2-160922-SS-18-01	A3-160412-SS-03-01
				Date:	9/20/2016	4/12/2016	4/12/2016	9/22/2016	4/12/2016
				Depth (in):	12-18	0-3	0-3	12-18	0-3
Aluminum	77000	1100000	NA	mg/kg	5140	12200 JK	13500 JK	8910	13900 JK
Antimony	31	470	5	mg/kg	2.63 UJL	0.587 UJ	0.37 UJ	1.04 U	0.543 UJ
Arsenic	0.68	3	18	mg/kg	***5.2*** JL	***9.24***	***10.1***	***7.23***	***9.85***
Barium	15000	220000	330	mg/kg	48.2	65.6	65.9	65.1	75.6
Beryllium	160	2300	10	mg/kg	0.34 JQ	0.618	0.659	0.56 JQ	0.707
Cadmium	NA	NA	32	mg/kg	2.63 UJL	0.417	0.429	0.247 JQ	0.875
Chromium	120000	1800000	0.4	mg/kg	8.87 JL	36.4 JL	37.5 JK	15.1	60.5 JL
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.2** UJL	***228*** U	***235*** U	**2.24** UJL	***243*** U
Cobalt	23	350	13	mg/kg	5.12 JL	7.39	7.55	6.84	8.06
Copper	3100	47000	70	mg/kg	5.8 JL	12.7	12.9	9.22	16.8
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	8670	14100	16000	12400	15700
Lead	400	800	120	mg/kg	8.36 JL	36.9 D	33.7 D	13.6	55.2 D
Manganese	1800	26000	220	mg/kg	589 JK	902 JKD	928 JKD	828	982 JKD
Mercury	11	46	0.1	mg/kg	0.016	0.398 JK	0.47 JK	0.035	0.776 JK
Nickel	1500	22000	38	mg/kg	13.6 JL	19.9	20.8	18.4	24.1
Selenium	390	5800	0.52	mg/kg	1.23 JQL	0.281 UJ	0.305 UJ	1.04 JQ	0.3 UJ
Silver	390	5800	560	mg/kg	2.63 U	0.129 U	0.14 U	1.04 U	0.138 U
Thallium	0.78	12	1	mg/kg	**2.63** UJL	**1.5** UD	**1.63** UD	**1.04** U	**1.6** UD
Vanadium	390	5800	2	mg/kg	24.8 JL	29.6	33.8	38.5	32.9
Zinc	23000	350000	120	mg/kg	27.3 JL	65.2 JH	66.2 JH	72.7	73.9 JH

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	A3-160922-SS-18-01	A5-160922-SS-06-01	A5-160922-SS-18-01	A5-160922-SS-18-02	A6-160412-SS-03-01
				Sample ID:	A3-160922-SS-18-01	A5-160922-SS-06-01	A5-160922-SS-18-01	A5-160922-SS-18-02	A6-160412-SS-03-01
				Date:	9/22/2016	9/22/2016	9/22/2016	9/22/2016	4/12/2016
				Depth (in):	12-18	0-6	12-18	12-18	0-3
Aluminum	77000	1100000	NA	mg/kg	11000	3310	16200	12000	7610 JK
Antimony	31	470	5	mg/kg	1.15 U	1	0.583	0.612	0.53 UJ
Arsenic	0.68	3	18	mg/kg	***8.02***	***4.13***	***9.15***	***7.25***	***7.68***
Barium	15000	220000	330	mg/kg	78.6	40.5	116	86	62.6
Beryllium	160	2300	10	mg/kg	0.683 JQ	0.234	0.94	0.707	0.553
Cadmium	NA	NA	32	mg/kg	0.295 JQ	0.417	0.291	0.224	1.46
Chromium	120000	1800000	0.4	mg/kg	18.9	50.7	20.5	16.1	102 JL
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.37** UJL	**2.12**	**2.54**	**2.51**	***219*** U
Cobalt	23	350	13	mg/kg	8	3.15	9.69	7.24	6.96
Copper	3100	47000	70	mg/kg	11.5	10.7	14.5	11.2	18.8
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	14200	7800	17600	13400	20900
Lead	400	800	120	mg/kg	15.4	70.2	17.2	16.1	149 D
Manganese	1800	26000	220	mg/kg	947	345	992	803	699 JKD
Mercury	11	46	0.1	mg/kg	0.0266	0.0857	0.0184	0.0312	0.54 JK
Nickel	1500	22000	38	mg/kg	22	30.2	23.9	19.3	35.9
Selenium	390	5800	0.52	mg/kg	1.05 JQ	1	0.66	0.591	0.281 UJ
Silver	390	5800	560	mg/kg	1.15 U	1	0.583	0.612	0.129 U
Thallium	0.78	12	1	mg/kg	0.169 JQ	**1**	0.221	0.18	**1.5** UD
Vanadium	390	5800	2	mg/kg	44.5	13.5	52.3	41.9	24.1
Zinc	23000	350000	120	mg/kg	46.9	38.3	58.5	41.9	94.3 JH

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	A6-160922-SS-18-01	A7-160412-SS-03-01	A7-160921-SS-18-01	A8-160921-SS-06-01	A8-160921-SS-18-01
				Date:	9/22/2016	4/12/2016	9/21/2016	9/21/2016	9/21/2016
				Depth (in):	12-18	0-3	12-18	0-6	12-18
Aluminum	77000	1100000	NA	mg/kg	9010	10700 JK	11600	4300	5130
Antimony	31	470	5	mg/kg	1.11	0.713 UJ	1.13 UJL	1 UJL	0.479 JQL
Arsenic	0.68	3	18	mg/kg	***4.99***	***6.28***	***6.74***	***3.62*** JL	***4.19*** JL
Barium	15000	220000	330	mg/kg	64.5	77	84.1	32.5	48.5
Beryllium	160	2300	10	mg/kg	0.438	0.552	0.564 JQ	0.195 JQL	0.273 JQL
Cadmium	NA	NA	32	mg/kg	0.251	1.18	0.321 JQL	0.253 JQ	5.98
Chromium	120000	1800000	0.4	mg/kg	16	111 JL	20.5	20.2	110
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.41**	***235*** U	**2.35** UJL	**2.14** U	***10.4***
Cobalt	23	350	13	mg/kg	4.88	6.58	6.3	3.66	3.94
Copper	3100	47000	70	mg/kg	7.98	19.3	11.4 JL	6.66	9.68
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	10200	11800	11800	5800	8910
Lead	400	800	120	mg/kg	25.1	105 D	25.4	23.2 JL	45.9 JL
Manganese	1800	26000	220	mg/kg	643	789 JKD	865	664	419
Mercury	11	46	0.1	mg/kg	0.0285	0.622 JK	0.0579	0.167 JL	0.41 JL
Nickel	1500	22000	38	mg/kg	14.3	23.6	19	13.6 JL	11.2 JL
Selenium	390	5800	0.52	mg/kg	1.11	0.298 UJ	0.658 JQL	0.852 JQ	0.797 JQ
Silver	390	5800	560	mg/kg	1.11	0.137 U	1.13 U	1 U	1.05 U
Thallium	0.78	12	1	mg/kg	**1.11**	**1.59** UD	**1.13** U	**1** U	**1.05** U
Vanadium	390	5800	2	mg/kg	27.9	24.1	35.4 JH	13.3 JH	19.7 JH
Zinc	23000	350000	120	mg/kg	34.3	110 JH	45.8 JH	41.4	27.8

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	A9-160921-SS-06-01		A9-160921-SS-18-01		A9-160921-SS-18-02		B0-160920-SS-06-01		B0-160920-SS-06-02	
				Date:	9/21/2016		9/21/2016		9/21/2016		9/20/2016		9/20/2016	
				Depth (in):	0-6		12-18		12-18		0-6		0-6	
Aluminum	77000	1100000	NA	mg/kg	4510		10700		11300		6390		6500	
Antimony	31	470	5	mg/kg	1.05	UJL	1.08	UJL	1.16	UJL	0.51	UJL	0.519	UJL
Arsenic	0.68	3	18	mg/kg	***5.36***	JL	***6.43***	JL	***6.19***	JL	***5.97***	JL	***5.61***	JL
Barium	15000	220000	330	mg/kg	50.5		80.3		85.8		70.6		64.5	
Beryllium	160	2300	10	mg/kg	0.244	JQL	0.491	JQL	0.565	JQL	0.577		0.527	
Cadmium	NA	NA	32	mg/kg	0.592	JQ	0.243	JQ	0.256	JQ	0.292	JQ	0.27	JQ
Chromium	120000	1800000	0.4	mg/kg	30.2		17.6		20.9		23.7		22.9	
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.15**	U	**2.33**	U	**2.35**	U	**2.19**	UJL	**2.19**	UJL
Cobalt	23	350	13	mg/kg	4.85		6.1		6.5		6.38		5.8	
Copper	3100	47000	70	mg/kg	13.9		8.79		9.7		8.83		8.24	
Cyanide	23	150	NA	mg/kg										
Iron	55000	820000	NA	mg/kg	7970		13100		12500		10400		9210	
Lead	400	800	120	mg/kg	60.4	JL	20.5	JL	23.1	JL	19.6		18.8	
Manganese	1800	26000	220	mg/kg	978		787		768		822		858	
Mercury	11	46	0.1	mg/kg	0.286	JL	0.0323	JL	0.0192	JL	0.0848		0.0769	
Nickel	1500	22000	38	mg/kg	19.7	JL	17.4	JL	18.1	JL	16.9	JL	15	JL
Selenium	390	5800	0.52	mg/kg	0.923	JQ	0.987	JQ	1.13	JQ	1.01		0.822	
Silver	390	5800	560	mg/kg	1.05	U	1.08	U	1.16	U	0.51	U	0.519	U
Thallium	0.78	12	1	mg/kg	**1.05**	U	**1.08**	U	**1.16**	U	0.132	JQ	0.129	JQ
Vanadium	390	5800	2	mg/kg	16.4	JH	33.3	JH	36.6	JH	32.2	JK	29.3	JK
Zinc	23000	350000	120	mg/kg	87		40.8		44		34.8	JL	32.1	JL

NOTES:

Bold = Exceedances of Residential Human Screening Values.
***Bold Italic* =** Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	B0-160920-SS-18-01	B10-160921-SS-06-01	B10-160921-SS-18-01	B1-160412-SS-03-01	B1-160920-SS-18-01
				Date:	9/20/2016	9/21/2016	9/21/2016	4/12/2016	9/20/2016
				Depth (in):	12-18	0-6	12-18	0-3	12-18
Aluminum	77000	1100000	NA	mg/kg	4960	5900	11200	10900 JK	7040
Antimony	31	470	5	mg/kg	0.513 UJL	1.05 UJL	1.11 UJL	0.706 UJ	2.65 UJL
Arsenic	0.68	3	18	mg/kg	***4.83*** JL	***4.37*** JL	***7.22*** JL	***10.3***	***5.73*** JL
Barium	15000	220000	330	mg/kg	54.2	55.7	76.7	74.7	68
Beryllium	160	2300	10	mg/kg	0.444 JQ	0.355 JQL	0.433 JQL	0.648	0.544 JQ
Cadmium	NA	NA	32	mg/kg	0.173 JQ	0.363 JQ	0.251 JQ	0.377	2.65 UJL
Chromium	120000	1800000	0.4	mg/kg	10.4	30.9	17.6	37.8 JK	13.3 JL
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.18** UJL	**2.16** U	**2.34** U	**2.32** U	**2.22** UJL
Cobalt	23	350	13	mg/kg	5.11	4.49	6.34	7.87	6.72 JL
Copper	3100	47000	70	mg/kg	5.59	9.17	8.63	14.3	8.6 JL
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	8400	9410	12900	13900	10500
Lead	400	800	120	mg/kg	8.94	65.7 JL	21.6 JL	28.8 D	12.1 JL
Manganese	1800	26000	220	mg/kg	577	471	775	978 JKD	791 JK
Mercury	11	46	0.1	mg/kg	0.0172	0.0802 JL	0.0216 JL	0.242 JH	0.0341
Nickel	1500	22000	38	mg/kg	13.2 JL	13.3 JL	16.4 JL	21.1	17.7 JL
Selenium	390	5800	0.52	mg/kg	0.711	1 JQ	1.08 JQ	0.305 U	1.11 JQL
Silver	390	5800	560	mg/kg	0.513 U	1.05 U	1.11 U	0.14 U	2.65 U
Thallium	0.78	12	1	mg/kg	0.119 JQ	**1.05** U	**1.11** U	0.653 UD	**2.65** UJL
Vanadium	390	5800	2	mg/kg	27.7 JK	19.4 JH	30.9 JH	32.4	31.4 JL
Zinc	23000	350000	120	mg/kg	25.8 JL	51.5	39.4	58.5	35.3 JL

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	B2-160412-SS-03-01 (4/12/2016, 0-3)	B2-160922-SS-18-01 (9/22/2016, 12-18)	B5-160922-SS-06-01 (9/22/2016, 0-6)	B5-160922-SS-18-01 (9/22/2016, 12-18)	B6-160412-SS-03-01 (4/12/2016, 0-3)
Aluminum	77000	1100000	NA	mg/kg	12200 JK	11500	3370	13800	5200 JK
Antimony	31	470	5	mg/kg	1.58 UJ	1.13 U	0.254	0.618	4.27 JL
Arsenic	0.68	3	18	mg/kg	***9.08***	***8.63***	***7.3***	***5.47***	***5.81***
Barium	15000	220000	330	mg/kg	84.5	74.4	38.2	86.4	48.7
Beryllium	160	2300	10	mg/kg	0.651	0.667 JQ	0.281	0.766	0.42
Cadmium	NA	NA	32	mg/kg	2.42	0.424 JQ	1.36	0.194	1.49
Chromium	120000	1800000	0.4	mg/kg	530 JL	30.1	31.1	15.8	94.5 JL
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.31** U	**2.34** UJL	**2.37**	**2.62**	**2.19** U
Cobalt	23	350	13	mg/kg	7.98	8.04	4.37	8.9	5.26
Copper	3100	47000	70	mg/kg	29.1	12.3	7.35	10.9	15.3
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	16000	14700	13200	13300	13100
Lead	400	800	120	mg/kg	209 D	18.1	46.2	15.9	**446** D
Manganese	1800	26000	220	mg/kg	995 JKD	1060	593	920	525 JKD
Mercury	11	46	0.1	mg/kg	4.02 UJ	0.181	0.259	0.0359	0.646 JH
Nickel	1500	22000	38	mg/kg	55.3	23.5	11.6	16.8	17.6
Selenium	390	5800	0.52	mg/kg	0.296 UJ	1.15	0.212	0.387	0.231 UJ
Silver	390	5800	560	mg/kg	0.223 JQ	1.13 U	0.579	0.618	0.106 U
Thallium	0.78	12	1	mg/kg	**1.58** UD	0.164 JQ	0.579	0.231	**1.24** UD
Vanadium	390	5800	2	mg/kg	30.1	44.2	14	38	17
Zinc	23000	350000	120	mg/kg	112 JH	50.2	24.3	37.7	67.3 JH

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Sample ID: / Date: / Depth (in): / Units	B6-160922-SS-18-01 9/22/2016 12-18		B7-160412-SS-03-01 4/12/2016 0-3		B7-160921-SS-18-01 9/21/2016 12-18		B8-160921-SS-06-01 9/21/2016 0-6		B8-160921-SS-18-01 9/21/2016 12-18	
Aluminum	77000	1100000	NA	mg/kg	16600		13500	JK	14400		10400		5410	
Antimony	31	470	5	mg/kg	0.572		1.49	UJ	0.573	UJL	1.01	UJL	1.02	UJL
Arsenic	0.68	3	18	mg/kg	***7.14***		***8.04***		***7.03***		***6.07***	JL	***6.16***	JL
Barium	15000	220000	330	mg/kg	126		94.3		89.5		83.3		52.1	
Beryllium	160	2300	10	mg/kg	1.09		0.736		0.775		0.507	JQL	0.304	JQL
Cadmium	NA	NA	32	mg/kg	0.309		2.84		0.33	JQL	0.891	JQ	0.933	JQ
Chromium	120000	1800000	0.4	mg/kg	23.2		239	JL	18.2		143		223	
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.48**		***251***	U	**2.44**	UJL	**2.19**	U	**0.799**	JQ
Cobalt	23	350	13	mg/kg	9.55		8.45		7.1		6.4		4.63	
Copper	3100	47000	70	mg/kg	14.6		22.1		11.6	JL	12.1		7.55	
Cyanide	23	150	NA	mg/kg										
Iron	55000	820000	NA	mg/kg	18100		14000		13500		11700		9600	
Lead	400	800	120	mg/kg	20.2		88.9	D	18.5		194	JL	21.7	JL
Manganese	1800	26000	220	mg/kg	942		995	JKD	1080		828		619	
Mercury	11	46	0.1	mg/kg	0.027		2.33	JH	0.0455		0.341	JL	0.529	JL
Nickel	1500	22000	38	mg/kg	23.1		78.1		20.4		30.5	JL	78.2	JL
Selenium	390	5800	0.52	mg/kg	0.508		0.28	UJ	0.77	JL	1.08		0.856	JQ
Silver	390	5800	560	mg/kg	0.572		0.129	U	0.573	U	1.01	U	1.02	U
Thallium	0.78	12	1	mg/kg	0.267		**1.5**	UD	0.192	JQ	**1.01**	U	**1.02**	U
Vanadium	390	5800	2	mg/kg	51.1		31.7		37.8	JH	30.1	JH	24.3	JH
Zinc	23000	350000	120	mg/kg	53.9		124		45.4	JH	54.5		37.3	

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	B9-160921-SS-06-01		B9-160921-SS-18-01		BKG1-161013-SS-06-01		BKG1-161013-SS-18-01		C0-160920-SS-06-01	
				Date:	9/21/2016		9/21/2016		10/13/2016		10/13/2016		9/20/2016	
				Depth (in):	0-6		12-18		0-6		6-18		0-6	
Aluminum	77000	1100000	NA	mg/kg	4670		4810		5180		3690		7350	
Antimony	31	470	5	mg/kg	0.975	UJL	1.02	UJL	0.533	U	0.512	U	0.539	UJL
Arsenic	0.68	3	18	mg/kg	***3.97***	JL	***6.23***	JL	***4.73***		***3.04***		***5.3***	JL
Barium	15000	220000	330	mg/kg	97.2		39.6		93.9		64.9		84.9	
Beryllium	160	2300	10	mg/kg	0.276	JQL	0.297	JQL	0.38	JQ	0.252	JQ	0.703	
Cadmium	NA	NA	32	mg/kg	0.33	JQ	0.122	JQ	0.317	JQ	0.182	JQ	0.35	JQ
Chromium	120000	1800000	0.4	mg/kg	25.6		11.5		9.18		5.44		32.9	
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.13**	U	**2.11**	U	**2.29**	UJL	**2.12**	UJL	**2.27**	UJL
Cobalt	23	350	13	mg/kg	5.8		4.63		5.43		3.28		7.19	
Copper	3100	47000	70	mg/kg	9.14		5.08		8.38		4.79		11	
Cyanide	23	150	NA	mg/kg										
Iron	55000	820000	NA	mg/kg	7410		13100		6850		4720		10800	
Lead	400	800	120	mg/kg	84.9	JL	20	JL	65.6		25.5		20.2	
Manganese	1800	26000	220	mg/kg	901		490		790		547		825	
Mercury	11	46	0.1	mg/kg	0.102	JL	0.0149	JL	0.0413		0.0183		0.117	
Nickel	1500	22000	38	mg/kg	16.5	JL	12.7	JJL	15.2		9.32		18.8	JL
Selenium	390	5800	0.52	mg/kg	0.941	JQ	1.01	JQ	0.648		0.462	JQ	1.09	
Silver	390	5800	560	mg/kg	0.975	U	1.02	U	0.533	U	0.512	U	0.539	U
Thallium	0.78	12	1	mg/kg	**0.975**	U	**1.02**	U	0.0969	JQ	0.512	U	0.163	JQ
Vanadium	390	5800	2	mg/kg	17.5	JH	23.8	JH	20.7		13.4		37.4	JK
Zinc	23000	350000	120	mg/kg	46.3		25.1		53.9		29		39.3	JL

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	C0-160920-SS-18-01		C10-160921-SS-06-01		C10-160921-SS-18-01		C1-160412-SS-03-01		C1-160920-SS-18-01	
				Date:	9/20/2016		9/21/2016		9/21/2016		4/12/2016		9/20/2016	
				Depth (in):	12-18		0-6		12-18		0-3		12-18	
Aluminum	77000	1100000	NA	mg/kg	8510		7710		3790		12400	JK	10500	
Antimony	31	470	5	mg/kg	0.55	UJL	1.03	UJL	1.05	UJL	0.859	UJ	1.22	UJL
Arsenic	0.68	3	18	mg/kg	***5.19***	JL	***6.24***	JL	***5.49***	JL	***9.27***		***5.45***	JL
Barium	15000	220000	330	mg/kg	90.3		71		56		89.6		78.7	
Beryllium	160	2300	10	mg/kg	0.745		0.461	JQL	0.295	JQL	0.734		0.617	JQ
Cadmium	NA	NA	32	mg/kg	0.24	JQ	0.477	JQ	0.137	JQ	0.622		0.27	JQL
Chromium	120000	1800000	0.4	mg/kg	16.1		112		16.3		97.6	JK	19.3	JL
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.26**	UJL	**2.15**	U	**2.14**	U	**2.26**	U	**2.5**	UJL
Cobalt	23	350	13	mg/kg	7.5		6.58		6.69		8.45		6.93	JL
Copper	3100	47000	70	mg/kg	9.37		11.5		4.81		15.1		9.69	JL
Cyanide	23	150	NA	mg/kg										
Iron	55000	820000	NA	mg/kg	11600		15000		14400		13700		10400	
Lead	400	800	120	mg/kg	12.3		61.1	JL	8.94	JL	32.9	D	13.1	JL
Manganese	1800	26000	220	mg/kg	790		653		736		1030	JKD	1040	JK
Mercury	11	46	0.1	mg/kg	0.017		0.71	JL	0.0386	JL	1.49		0.0497	
Nickel	1500	22000	38	mg/kg	19.4	JL	17.8	JL	12.4	JL	23.9		18	JL
Selenium	390	5800	0.52	mg/kg	1.07		1.25		0.982	JQ	0.278	U	0.801	JQL
Silver	390	5800	560	mg/kg	0.55	U	1.03	U	1.05	U	0.128	U	1.22	U
Thallium	0.78	12	1	mg/kg	0.165	JQ	**1.03**	U	**1.05**	U	0.594	UD	0.171	JQL
Vanadium	390	5800	2	mg/kg	41	JK	26.5	JH	17	JH	32		35.9	JL
Zinc	23000	350000	120	mg/kg	35.5	JL	55.1		26.3		57.9		32.9	JL

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	C2-160412-SS-03-01		C2-160922-SS-12-01		C2-160922-SS-18-01		C5-160922-SS-06-01		C5-160922-SS-18-01	
				Date:	4/12/2016		9/22/2016		9/22/2016		9/22/2016		9/22/2016	
				Depth (in):	0-3		6-12		12-18		0-6		12-18	
Aluminum	77000	1100000	NA	mg/kg	13300	JK	13900		13100		2050		17900	
Antimony	31	470	5	mg/kg	**33.1**	UJ	0.579	U	1.15	U	0.349	JQ	0.618	U
Arsenic	0.68	3	18	mg/kg	***14.9***	D	***9.11***		***7.9***		***7.83***		***9.8***	
Barium	15000	220000	330	mg/kg	95.3		131		107		52.2		131	
Beryllium	160	2300	10	mg/kg	0.699		0.881		0.791	JQ	0.335	JQ	1.16	
Cadmium	NA	NA	32	mg/kg	30.7		0.703		0.792	JQ	0.941		0.363	JQ
Chromium	120000	1800000	0.4	mg/kg	11400	JLD	139		137		32.3		24.3	
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.34**	U	**2.42**	U	**2.4**	UJL	**2.06**	UJL	**2.53**	UJL
Cobalt	23	350	13	mg/kg	8.01		10.1		9.37		5.64		11.6	
Copper	3100	47000	70	mg/kg	736		17.7		19.5		14.1		17.9	
Cyanide	23	150	NA	mg/kg										
Iron	55000	820000	NA	mg/kg	24900		15500		16700		15600		20400	
Lead	400	800	120	mg/kg	***1250***	D	28.4		37.5		28.1		20.2	
Manganese	1800	26000	220	mg/kg	921	JKD	1530		1110		589		1330	
Mercury	11	46	0.1	mg/kg	***113***	JK	0.597		2.13		0.353		5.52	
Nickel	1500	22000	38	mg/kg	110		31.4		31.9		16.6		26.6	
Selenium	390	5800	0.52	mg/kg	0.272	UJ	1.1		0.903	JQ	0.195	JQ	0.642	
Silver	390	5800	560	mg/kg	1.12		0.579	U	1.15	U	0.485	U	0.618	U
Thallium	0.78	12	1	mg/kg	**1.46**	UD	0.249	JQ	0.196	JQ	0.485	U	0.235	JQ
Vanadium	390	5800	2	mg/kg	33.9		46.7		47		15.6		56.2	
Zinc	23000	350000	120	mg/kg	874	JHD	57.6		395		28.9		58.4	

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	C6-160412-SS-03-01		C6-160922-SS-18-01		C7-160412-SS-03-01		C7-160921-SS-18-01		C8-160921-SS-06-01	
				Date:	4/12/2016		9/22/2016		4/12/2016		9/21/2016		9/21/2016	
				Depth (in):	0-3		12-18		0-3		12-18		0-6	
Aluminum	77000	1100000	NA	mg/kg	3220		19500		12000		18300		7830	
Antimony	31	470	5	mg/kg	4.52	U	0.608		6.26	U	0.562	UJL	1.09	UJL
Arsenic	0.68	3	18	mg/kg	***4.24***	UJ	***6.11***		***5.88***	UJ	***7.25***		***4.41***	JL
Barium	15000	220000	330	mg/kg	54.7		112		90.9		107		69.3	
Beryllium	160	2300	10	mg/kg	0.681	JQ	1.01		0.944	JQ	0.967		0.418	JQL
Cadmium	NA	NA	32	mg/kg	4.77	JHQ	0.536		5.53	JHQ	0.353	JQL	0.555	JQ
Chromium	120000	1800000	0.4	mg/kg	228		23.1		399		20.5		46.7	
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**4.42**	JQ	**2.54**		***269***	U	**2.36**	UJL	**2.23**	U
Cobalt	23	350	13	mg/kg	4.87	JQ	9.59		7.82	JQ	9.57		5.07	
Copper	3100	47000	70	mg/kg	19.2		16.2		36.5		14.6	JL	9.41	
Cyanide	23	150	NA	mg/kg										
Iron	55000	820000	NA	mg/kg	22000		15500		15600		16700		8710	
Lead	400	800	120	mg/kg	160		20.8		178		18.1		90.1	JL
Manganese	1800	26000	220	mg/kg	563		1460		910		1170		579	
Mercury	11	46	0.1	mg/kg	1.08		0.627		1.02		0.0391		0.577	JL
Nickel	1500	22000	38	mg/kg	14.8	JQ	24.8		31.7		23.1		19.5	JL
Selenium	390	5800	0.52	mg/kg	5.04	UJ	0.681		8.08	UJ	0.681	JL	1.13	
Silver	390	5800	560	mg/kg	2.32	U	0.608		3.21	U	0.562	U	1.09	U
Thallium	0.78	12	1	mg/kg	**5.39**	UJ	0.216		**7.47**	UJ	0.232	JQ	**1.09**	U
Vanadium	390	5800	2	mg/kg	14.4	JL	41		31.7	JL	46.2	JH	24	JH
Zinc	23000	350000	120	mg/kg	120		50.8		1550		53.5	JH	42.9	

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	C8-160921-SS-18-01		C9-160921-SS-06-01		C9-160921-SS-18-01		D0-160920-SS-06-01		D0-160920-SS-06-02	
				Date:	9/21/2016		9/21/2016		9/21/2016		9/20/2016		9/20/2016	
				Depth (in):	12-18		0-6		12-18		0-6		0-6	
Aluminum	77000	1100000	NA	mg/kg	6710		6440		2260		9110		10100	
Antimony	31	470	5	mg/kg	1.06	UJL	1.07	UJL	1.01	UJL	0.527	UJL	0.528	UJL
Arsenic	0.68	3	18	mg/kg	***7.29***	JL	***4.3***	JL	**2.37**	JL	***5.78***	JL	***5.48***	JL
Barium	15000	220000	330	mg/kg	59.1		69.4		50.6		95.3		95.6	
Beryllium	160	2300	10	mg/kg	0.352	JQL	0.386	JQL	0.144	JQL	0.764		0.738	
Cadmium	NA	NA	32	mg/kg	0.359	JQ	0.373	JQ	1.01	U	0.426	JQ	0.428	JQ
Chromium	120000	1800000	0.4	mg/kg	26.1		32.4		4.25		45.8		46.9	
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.19**	U	**2.22**	U	**2.12**	U	**2.24**	UJL	**2.22**	UJL
Cobalt	23	350	13	mg/kg	4.96		4.64		2.03		7.85		7.92	
Copper	3100	47000	70	mg/kg	6.52		8.15		2.43		12.1		12.2	
Cyanide	23	150	NA	mg/kg										
Iron	55000	820000	NA	mg/kg	11600		9920		4850		11700		11600	
Lead	400	800	120	mg/kg	25.8	JL	76.3	JL	4.7	JL	21.2		20.6	
Manganese	1800	26000	220	mg/kg	642		483		213		989		1110	
Mercury	11	46	0.1	mg/kg	1.04	JL	0.165	JL	0.00814	JL	0.21		0.204	
Nickel	1500	22000	38	mg/kg	20.2	JL	13.1	JL	5.18	JL	20.9	JL	20.9	JL
Selenium	390	5800	0.52	mg/kg	1.16		1.19		0.922	JQ	1.2		1.16	
Silver	390	5800	560	mg/kg	1.06	U	1.07	U	1.01	U	0.527	U	0.528	U
Thallium	0.78	12	1	mg/kg	**1.06**	U	0.159	JQ	**1.01**	U	0.178	JQ	0.192	JQ
Vanadium	390	5800	2	mg/kg	26.6	JH	21.4	JH	9.02	JH	39.6	JK	39.3	JK
Zinc	23000	350000	120	mg/kg	32.2		42.5		10.9		42.4	JL	40.3	JL

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	D0-160920-SS-18-01	D10-160921-SS-06-01	D10-160921-SS-06-02	D10-160921-SS-18-01	D1-160412-SS-03-01
				Date:	9/20/2016	9/21/2016	9/21/2016	9/21/2016	4/12/2016
				Depth (in):	12-18	0-6	0-6	12-18	0-3
Aluminum	77000	1100000	NA	mg/kg	10500	7250	6890	3190	13400 JK
Antimony	31	470	5	mg/kg	0.555 UJL	1.03 UJL	1.02 UJL	1.01 UJL	0.828 UJ
Arsenic	0.68	3	18	mg/kg	***4.94*** JL	***4.19***	***4.89***	***4.86***	***9.23***
Barium	15000	220000	330	mg/kg	104	62.8	61.8	39.6	90.2
Beryllium	160	2300	10	mg/kg	0.808	0.408 JQ	0.408 JQ	0.268 JQ	0.757
Cadmium	NA	NA	32	mg/kg	0.298 JQ	0.437 JQL	0.434 JQL	0.21 JQL	0.939
Chromium	120000	1800000	0.4	mg/kg	21.1	43.6	42.2	8.56	151 JK
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.26** UJL	**2.19** UJL	**2.18** UJL	**2.13** U	**2.36** U
Cobalt	23	350	13	mg/kg	8.3	5.05	4.9	4.38	8.97
Copper	3100	47000	70	mg/kg	10.9	10.4 JL	9.55 JL	3.87 JL	16.8
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	12600	9190	9740	10200	14100
Lead	400	800	120	mg/kg	14	42.2	39.2	5.81	48.5 D
Manganese	1800	26000	220	mg/kg	981	574	570	435	1110 JKD
Mercury	11	46	0.1	mg/kg	0.0503	0.211	0.219	0.00829	3.13
Nickel	1500	22000	38	mg/kg	21.3 JL	14.5	14.1	11.7	27.8
Selenium	390	5800	0.52	mg/kg	1.08	0.401 JQL	1.02 UJL	1.01 UJL	0.262 U
Silver	390	5800	560	mg/kg	0.555 U	1.03 U	1.02 U	1.01 U	0.12 U
Thallium	0.78	12	1	mg/kg	0.187 JQ	**1.03** U	**1.02** U	**1.01** U	**1.4** UD
Vanadium	390	5800	2	mg/kg	45.6 JK	22.3 JH	22.9 JH	16.2 JH	32.5
Zinc	23000	350000	120	mg/kg	38 JL	46.5 JH	44.8 JH	18.7 JH	67.1

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	D1-160920-SS-18-01	D2-160412-SS-03-01	D2-160922-SS-12-01	D2-160922-SS-18-01	D5-160922-SS-06-01
				Date:	9/20/2016	4/12/2016	9/22/2016	9/22/2016	9/22/2016
				Depth (in):	12-18	0-3	6-12	12-18	0-6
Aluminum	77000	1100000	NA	mg/kg	8080	12400 JK	17200	17400	3210
Antimony	31	470	5	mg/kg	0.51 UJL	1.13 UJD	0.623 U	0.633 U	0.776
Arsenic	0.68	3	18	mg/kg	***4.41*** JL	***8.17***	***7.48***	***6.86***	***11.1***
Barium	15000	220000	330	mg/kg	71.3	75.6	103	110	185
Beryllium	160	2300	10	mg/kg	0.634	0.613	1.07	0.925	0.426
Cadmium	NA	NA	32	mg/kg	0.233 JQL	6.68	0.759	0.47 JQ	2.16
Chromium	120000	1800000	0.4	mg/kg	21.3 JL	1970 JL	484	279	83.1
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.14** UJL	***302***	**2.64**	**2.59** UJL	**3.65**
Cobalt	23	350	13	mg/kg	5.71 JL	7.56	9.68	9.12	7.52
Copper	3100	47000	70	mg/kg	7.7 JL	102	18.6	15.6	12.7
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	9370	16300	15800	15400	18900
Lead	400	800	120	mg/kg	10.8 JL	287 D	23.9	22.5	76.5
Manganese	1800	26000	220	mg/kg	646 JK	853 JKD	1090	1170	1400
Mercury	11	46	0.1	mg/kg	0.166	**26.8** JK	4.84	4.07	0.898
Nickel	1500	22000	38	mg/kg	15 JL	103	27.1	25.5	24.4
Selenium	390	5800	0.52	mg/kg	0.846 JL	0.252 UJ	1.05	0.589 JQ	0.268
Silver	390	5800	560	mg/kg	0.51 U	0.18 JQ	0.623 U	0.633 U	0.511
Thallium	0.78	12	1	mg/kg	0.141 JQL	**1.35** UD	0.21 JQ	0.205 JQ	0.101
Vanadium	390	5800	2	mg/kg	31.1 JL	27.7	48.3	50.7	22.7
Zinc	23000	350000	120	mg/kg	28.5 JL	487 JHD	60.3	70.1	46.9

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	D5-160922-SS-18-01	D6-160412-SS-03-01	D6-160922-SS-12-01	D6-160922-SS-18-01	D7-160412-SS-03-01
				Date:	9/22/2016	4/12/2016	9/22/2016	9/22/2016	4/12/2016
				Depth (in):	12-18	0-3	6-12	12-18	0-3
Aluminum	77000	1100000	NA	mg/kg	16200	8610	13500	14700	12000
Antimony	31	470	5	mg/kg	0.603	7.45 JQ	0.586 U	0.594	7.81 U
Arsenic	0.68	3	18	mg/kg	***8.06***	***8.19*** JLQ	***7.39***	***5.78***	***7.87*** JLQ
Barium	15000	220000	330	mg/kg	207	143	142	131	110
Beryllium	160	2300	10	mg/kg	1.05	0.745 JQ	1.11	0.879	0.903 JQ
Cadmium	NA	NA	32	mg/kg	0.566	17.2	0.933	0.443	32.9
Chromium	120000	1800000	0.4	mg/kg	43.3	1260	93.9	52.8	2850
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.54**	***223*** U	**2.51** U	**2.52**	***254*** U
Cobalt	23	350	13	mg/kg	15.1	9.15 JQ	10.9	11	8 JQ
Copper	3100	47000	70	mg/kg	16.3	510	19.1	12	206
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	17500	20000	15900	13900	16400
Lead	400	800	120	mg/kg	26.3	***1810***	28.2	24.2	304
Manganese	1800	26000	220	mg/kg	**2210**	770	1370	1610	910
Mercury	11	46	0.1	mg/kg	0.025	**25.7**	0.45	0.0615	**13**
Nickel	1500	22000	38	mg/kg	29.1	143	27.2	23.3	99.8
Selenium	390	5800	0.52	mg/kg	0.576	5.51 UJ	1.17	0.455	6.68 UJ
Silver	390	5800	560	mg/kg	0.603	2.53 U	0.586 U	0.594	3.07 U
Thallium	0.78	12	1	mg/kg	0.26	**5.89** UJ	0.231 JQ	0.206	**7.14** UJ
Vanadium	390	5800	2	mg/kg	48.2	28.3 JL	45.6	34.8	36.4 JL
Zinc	23000	350000	120	mg/kg	49.5	181	64.8	43.8	285

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	D7-160921-SS-18-01	E0-160920-SS-06-01	E0-160920-SS-18-01	E10-160923-SS-06-01	E10-160923-SS-18-01
				Date:	9/21/2016	9/20/2016	9/20/2016	9/23/2016	9/23/2016
				Depth (in):	12-18	0-6	12-18	0-6	12-18
Aluminum	77000	1100000	NA	mg/kg	14900	10500	11200	9610	9800
Antimony	31	470	5	mg/kg	0.576 UJL	1.4 UJL	1.05 UJL	0.275 UB	1.11 U
Arsenic	0.68	3	18	mg/kg	***6.32***	***6.23*** JL	***5.38*** JL	***6.8***	***7.38***
Barium	15000	220000	330	mg/kg	103	101	101	90.5	91.2
Beryllium	160	2300	10	mg/kg	0.942	0.739 JQ	0.705 JQ	0.622 JQ	0.538 JQ
Cadmium	NA	NA	32	mg/kg	0.441 JQL	0.438 JQ	0.282 JQ	0.788	0.288 JQ
Chromium	120000	1800000	0.4	mg/kg	28.9	46.1	17.2	79.3	14.9
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.41** UJL	**2.92** UJL	**2.22** UJL	**2.88** U	**2.21** U
Cobalt	23	350	13	mg/kg	8.09	8.16	7.96	7.75	7.27
Copper	3100	47000	70	mg/kg	15 JL	13	11.2	15	9.81
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	15300	12300	12300	13200	11800
Lead	400	800	120	mg/kg	17	22.2	13	62.5	16.3
Manganese	1800	26000	220	mg/kg	1020	1030	973	866	894
Mercury	11	46	0.1	mg/kg	0.0608	0.258	0.0273	0.263	0.0292
Nickel	1500	22000	38	mg/kg	23.2	22.2 JL	20.7 JL	22	20.2
Selenium	390	5800	0.52	mg/kg	0.662 JL	1.01 JQ	0.939 JQ	0.531 JQ	1.08 JQ
Silver	390	5800	560	mg/kg	0.576 U	1.4 U	1.05 U	0.241 JQ	1.11 U
Thallium	0.78	12	1	mg/kg	0.223 JQ	0.205 JQ	0.195 JQ	0.158 JQ	**1.11** U
Vanadium	390	5800	2	mg/kg	41.3 JH	42 JK	42.5 JK	32.6	37.2
Zinc	23000	350000	120	mg/kg	50.9 JH	43.2 JL	37.6 JL	69.9	41.2

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	Sample ID: E1-160412-SS-03-01	E1-160920-SS-18-01	E6-160922-SS-06-01	E6-160922-SS-06-02	E6-160922-SS-12-01	E6-160922-SS-18-01
				Date:	4/12/2016	9/20/2016	9/22/2016	9/22/2016	9/22/2016	9/22/2016
				Depth (in):	0-3	12-18	0-6	0-6	6-12	12-18
Aluminum	77000	1100000	NA	mg/kg	13800 JK	12200	4960	4220	15500	14700
Antimony	31	470	5	mg/kg	5.95 UJD	0.578 UJL	16.8	15.3	0.431 JQ	1.13
Arsenic	0.68	3	18	mg/kg	***9.2***	***5.45*** JL	***6.12***	***5.25***	***8.89***	***6.29***
Barium	15000	220000	330	mg/kg	101	101	153	137	116	87.8
Beryllium	160	2300	10	mg/kg	0.817	0.775	0.277	0.301	1	0.781
Cadmium	NA	NA	32	mg/kg	6.27	0.363 JQL	36.3	41.5	4.19	0.877
Chromium	120000	1800000	0.4	mg/kg	1510 JK	36.9 JL	3890	3150	252	314
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.35** U	**2.36** UJL	***203***	***189***	**3.16**	**1.33**
Cobalt	23	350	13	mg/kg	9.25	7.64 JL	8.81	9.24	9.77	7.74
Copper	3100	47000	70	mg/kg	61.9	11.1 JL	290	319	25.2	14.7
Cyanide	23	150	NA	mg/kg						
Iron	55000	820000	NA	mg/kg	16100	12600	22300	26300	17000	13700
Lead	400	800	120	mg/kg	154	12.9 JL	***3740***	***2840***	99.9	31.3
Manganese	1800	26000	220	mg/kg	1010 JKD	983 JK	521	500	946	788
Mercury	11	46	0.1	mg/kg	**24.4**	0.272	***77.8***	***75.6***	1.55	0.322
Nickel	1500	22000	38	mg/kg	84.1	21.6 JL	344	376	58.8	29.3
Selenium	390	5800	0.52	mg/kg	0.29 U	1.03 JL	1.11	1.11	1.21	0.539
Silver	390	5800	560	mg/kg	0.168 JQ	0.578 U	2.64	2.14	0.264 JQ	1.13
Thallium	0.78	12	1	mg/kg	0.62 UD	0.178 JQL	**1.11**	**1.11**	0.199 JQ	0.162
Vanadium	390	5800	2	mg/kg	34.6	41.7 JL	15.6	16.4	50.1	42.3
Zinc	23000	350000	120	mg/kg	164	38.1 JL	254	251	89.9	51.5

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	E7-160412-SS-03-01	E7-160922-SS-12-01	E7-160922-SS-18-01	E7-160922-SS-18-02	E9-160923-SS-06-01	E9-160923-SS-18-01
				Date:	4/12/2016	9/22/2016	9/22/2016	9/22/2016	9/23/2016	9/23/2016
				Depth (in):	0-3	6-12	12-18	12-18	0-6	12-18
Aluminum	77000	1100000	NA	mg/kg	7980	14400	13000	16900	10900	16300
Antimony	31	470	5	mg/kg	5.24 U	0.588 U	1.19	0.642	0.6 U	0.564 U
Arsenic	0.68	3	18	mg/kg	***4.96*** JLQ	***8.35***	***6.99***	***7.13***	***6.4***	***7.13***
Barium	15000	220000	330	mg/kg	131	98.9	103	78.7	148	153
Beryllium	160	2300	10	mg/kg	0.677 JQ	0.885	0.768	0.846	0.711	0.865
Cadmium	NA	NA	32	mg/kg	64.3	1.14	0.698	3.73	0.737	0.295 JQ
Chromium	120000	1800000	0.4	mg/kg	3190	256	1020	898	75.3	17.4
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	***167***	**1.88** JQ	**2.27**	**2.61**	**2.43** U	**2.43** U
Cobalt	23	350	13	mg/kg	10 JQ	7.88	9.57	7.07	13.4	11.8
Copper	3100	47000	70	mg/kg	304	14.3	17.2	15.6	12.8	12.7
Cyanide	23	150	NA	mg/kg						
Iron	55000	820000	NA	mg/kg	21400	14800	14200	16400	11900	15200
Lead	400	800	120	mg/kg	***1470***	27.6	57	26	89.8	157
Manganese	1800	26000	220	mg/kg	669	787	941	637	1300	1400
Mercury	11	46	0.1	mg/kg	**24.6**	0.144	0.361	0.24	0.113	0.0224
Nickel	1500	22000	38	mg/kg	383	24.8	27.9	21.5	24.3	24.5
Selenium	390	5800	0.52	mg/kg	5.84 UJ	1.24	0.617	0.76	0.569 JQ	0.542 JQ
Silver	390	5800	560	mg/kg	2.69 U	0.588 U	1.19	0.119	0.6 U	0.564 U
Thallium	0.78	12	1	mg/kg	**6.25** UJ	0.179 JQ	0.17	0.208	0.176 JQ	0.203 JQ
Vanadium	390	5800	2	mg/kg	25.7 JL	47.7	42.9	45	38.9	44.7
Zinc	23000	350000	120	mg/kg	374	51.8	46.7	57.3	41.6	46.5

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	F0-160920-SS-06-01	F0-160920-SS-18-01	F0-160920-SS-18-02	F1-160412-SS-03-01	F1-160920-SS-12-01
				Date:	9/20/2016	9/20/2016	9/20/2016	4/12/2016	9/20/2016
				Depth (in):	0-6	12-18	12-18	0-3	6-12
Aluminum	77000	1100000	NA	mg/kg	10700	12000	11100	11700 JK	12900
Antimony	31	470	5	mg/kg	1.09 UJL	1.05 UJL	1.1 UJL	8.39 UJD	0.579 U
Arsenic	0.68	3	18	mg/kg	***6.62*** JL	***6.1*** JL	***5.54*** JL	***8.59***	***5.85***
Barium	15000	220000	330	mg/kg	101	108	104	108	108
Beryllium	160	2300	10	mg/kg	0.665 JQ	0.741 JQ	0.691 JQ	0.72	0.809
Cadmium	NA	NA	32	mg/kg	0.339 JQ	0.243 JQ	0.252 JQ	8.51	0.379 JQ
Chromium	120000	1800000	0.4	mg/kg	28.7	16.9	15.4	2050 JK	26.5
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.32** UJL	**2.3** UJL	**2.31** UJL	***247***	**2.38** U
Cobalt	23	350	13	mg/kg	7.81	7.55	7.33	9.32	8.03
Copper	3100	47000	70	mg/kg	12.2	10.6	10.1	80	10.9
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	12500	13300	12000	17600	12600
Lead	400	800	120	mg/kg	17.8	13.2	12.8	219	16.4
Manganese	1800	26000	220	mg/kg	1050	848	844	971 JKD	998
Mercury	11	46	0.1	mg/kg	0.151	0.0244	0.038	**36.5**	0.453
Nickel	1500	22000	38	mg/kg	21.2 JL	20 JL	18.7 JL	116	21.9
Selenium	390	5800	0.52	mg/kg	0.979 JQ	0.8 JQ	0.822 JQ	0.284 JQ	0.929
Silver	390	5800	560	mg/kg	1.09 U	1.05 U	1.1 U	0.386 JQ	0.579 U
Thallium	0.78	12	1	mg/kg	0.181 JQ	0.185 JQ	0.178 JQ	0.562 UD	0.186 JQ
Vanadium	390	5800	2	mg/kg	40.2 JK	42.9 JK	39.8 JK	32.3	41.7
Zinc	23000	350000	120	mg/kg	41.9 JL	36.7 JL	34.5 JL	186	38.8

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	F1-160920-SS-18-01	F7-160412-SS-03-01	F7-160922-SS-12-01	F7-160922-SS-18-01	F7-160922-SS-18-02	F9-160923-SS-06-01
				Date:	9/20/2016	4/12/2016	9/22/2016	9/22/2016	9/22/2016	9/23/2016
				Depth (in):	12-18	0-3	6-12	12-18	12-18	0-6
Aluminum	77000	1100000	NA	mg/kg	12000	4430	13600	11200	9100	8940
Antimony	31	470	5	mg/kg	0.543 UJL	30.9 JQ	0.739	1.12	1.15	0.389 UB
Arsenic	0.68	3	18	mg/kg	***4.97*** JL	***8.79*** JLQ	***8.66***	***6.83***	***6.43***	***5.55***
Barium	15000	220000	330	mg/kg	95.1	84.2	112	97	71.7	127
Beryllium	160	2300	10	mg/kg	0.82	0.529 JQ	0.864	0.658	0.524	0.594 JQ
Cadmium	NA	NA	32	mg/kg	0.322 JQL	53.1	2.18	0.853	1.01	6.95 JK
Chromium	120000	1800000	0.4	mg/kg	28.3 JL	4660	847	451	286	196 JK
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.36** UJL	***421***	**2.76**	**1.75**	**1.17**	**3.4** U
Cobalt	23	350	13	mg/kg	7.35 JL	13.2	10.1	8.27	7.21	8.54
Copper	3100	47000	70	mg/kg	10.5 JL	545	20.6	14.5	15.1	25.5
Cyanide	23	150	NA	mg/kg						
Iron	55000	820000	NA	mg/kg	12200	48800	14300	12700	10900	11500
Lead	400	800	120	mg/kg	13.9 JL	***5400***	95.7	30.3	44.2	86.4
Manganese	1800	26000	220	mg/kg	832 JK	660	907	898	750	947
Mercury	11	46	0.1	mg/kg	2.56	**32.4**	4.02	0.388	0.921	0.462
Nickel	1500	22000	38	mg/kg	19.5 JL	448	701	231	1470	34
Selenium	390	5800	0.52	mg/kg	1.04 JL	5.49 UJ	1.1	0.479	1.15	0.568 JQ
Silver	390	5800	560	mg/kg	0.543 U	2.52 U	0.339 JQ	0.319	1.39	0.801 U
Thallium	0.78	12	1	mg/kg	0.161 JQL	**5.87** UJ	0.172 JQ	**1.12**	**1.15**	0.171 JQ
Vanadium	390	5800	2	mg/kg	40.6 JL	17.4 JL	48.2	41.4	34.5	35.1
Zinc	23000	350000	120	mg/kg	35.5 JL	266	51.5	41.2	35.3	66.3

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	F9-160923-SS-06-02	F9-160923-SS-18-01	G0-160920-SS-06-01	G0-160920-SS-18-01	G1-160412-SS-03-01
				Date:	9/23/2016	9/23/2016	9/20/2016	9/20/2016	4/12/2016
				Depth (in):	0-6	12-18	0-6	12-18	0-3
Aluminum	77000	1100000	NA	mg/kg	7420	8300	10400	9260	16300 JK
Antimony	31	470	5	mg/kg	1.3 U	1.16 U	1.31 UJL	1.06 UJL	0.285 UJ
Arsenic	0.68	3	18	mg/kg	***5.41***	***4.96***	***6.32*** JL	***6.19*** JL	***10.2***
Barium	15000	220000	330	mg/kg	194	85	101	107	115
Beryllium	160	2300	10	mg/kg	0.477 JQ	0.552 JQ	0.744 JQ	0.725 JQ	0.977
Cadmium	NA	NA	32	mg/kg	2.75 JK	0.639 JQ	0.444 JQ	0.286 JQ	0.86
Chromium	120000	1800000	0.4	mg/kg	116 JK	43.6	40.3	14.7	112 JK
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.84** U	**2.34** U	**2.86** UJL	**2.3** UJL	**2.48** U
Cobalt	23	350	13	mg/kg	12.3	5.43	8.28	8.12	10.3
Copper	3100	47000	70	mg/kg	17.4	9.4	14.4	10.9	28.1
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	9620	9440	12300	12500	16500
Lead	400	800	120	mg/kg	66.4	25.9	23.2	13.5	37.5
Manganese	1800	26000	220	mg/kg	1530	589	1090	915	1100 JKD
Mercury	11	46	0.1	mg/kg	0.42	0.119	0.214	0.0276	1.14
Nickel	1500	22000	38	mg/kg	29.9	16.6	22 JL	20.3 JL	30.9
Selenium	390	5800	0.52	mg/kg	1.06 JQ	1.07 JQ	1.21 JQ	0.964 JQ	0.332 JQ
Silver	390	5800	560	mg/kg	1.3 U	1.16 U	1.31 U	1.06 U	0.146 U
Thallium	0.78	12	1	mg/kg	0.196 JQ	**1.16** U	0.188 JQ	0.187 JQ	0.681 UD
Vanadium	390	5800	2	mg/kg	32.2	30.7	41.1 JK	42.8 JK	41.2
Zinc	23000	350000	120	mg/kg	51.4	35.9	46 JL	38.1 JL	77.1

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	G1-160920-SS-18-01	G5-160412-SS-03-01	G5-160922-SS-12-01	G5-160922-SS-18-01	G6-160923-SS-18-01
				Date:	9/20/2016	4/12/2016	9/22/2016	9/22/2016	9/23/2016
				Depth (in):	12-18	0-3	6-12	12-18	12-18
Aluminum	77000	1100000	NA	mg/kg	11900	7190	7420	9910	8540
Antimony	31	470	5	mg/kg	0.544 UJL	7.48 JQ	7.14	0.675 JQ	1.06 U
Arsenic	0.68	3	18	mg/kg	***5.59*** JL	***6.81*** JLQ	***7.41***	***7.55***	***7.29***
Barium	15000	220000	330	mg/kg	98.3	101	111	89.9	76.1
Beryllium	160	2300	10	mg/kg	0.85	0.67 JQ	0.548 JQ	0.679 JQ	0.553 JQ
Cadmium	NA	NA	32	mg/kg	0.252 JQL	86.5	27.3	3.16	9.62
Chromium	120000	1800000	0.4	mg/kg	17.6 JL	4690	3560	565	371
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.38** UJL	***274***	***14.5***	**2.34** UJL	**2.31** U
Cobalt	23	350	13	mg/kg	7.47 JL	11.8	9.63	8.16	6.41
Copper	3100	47000	70	mg/kg	10.4 JL	484	147	22.2	13.7
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	13100	23700	17200	13200	11500
Lead	400	800	120	mg/kg	12.8 JL	***1950***	***2890***	174	21.5
Manganese	1800	26000	220	mg/kg	811 JK	726	770	830	771
Mercury	11	46	0.1	mg/kg	0.273	**41.7**	1.01	1.61	2.94
Nickel	1500	22000	38	mg/kg	18.7 JL	1040	573	79	40.9
Selenium	390	5800	0.52	mg/kg	1.01 JL	5.78 UJ	1.08	1.03 JQ	0.957 JQ
Silver	390	5800	560	mg/kg	0.544 U	2.79 JQ	0.95	1.11 U	1.06 U
Thallium	0.78	12	1	mg/kg	0.173 JQL	**6.18** UJ	0.11 JQ	**1.11** U	**1.06** U
Vanadium	390	5800	2	mg/kg	42.6 JL	26.9 JL	33.7	40.8	36.8
Zinc	23000	350000	120	mg/kg	35.9 JL	771	297	65.4	91.9

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	G7-160412-SS-03-01	G7-160923-SS-12-01	G7-160923-SS-18-01	H0-160920-SS-06-01	H0-160920-SS-18-01
				Date:	4/12/2016	9/23/2016	9/23/2016	9/20/2016	9/20/2016
				Depth (in):	0-3	6-12	12-18	0-6	12-18
Aluminum	77000	1100000	NA	mg/kg	6220	12200	8550	8140	11600
Antimony	31	470	5	mg/kg	14.1 JQ	0.292 JQ	1.09 U	0.551 UJL	0.539 UJL
Arsenic	0.68	3	18	mg/kg	***6.18*** JLQ	***7.76***	***6.92***	***4.7*** JL	***7.2*** JL
Barium	15000	220000	330	mg/kg	172	89.5	85	72.6	156
Beryllium	160	2300	10	mg/kg	0.485 JQ	0.679	0.528 JQ	0.689	1.05
Cadmium	NA	NA	32	mg/kg	52.5	3.71	2.07	0.331 JQL	0.376 JQL
Chromium	120000	1800000	0.4	mg/kg	4080	539	332	26.5 JL	17.8 JL
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	***5620***	**2.75**	**1.34** JQ	**2.32** UJL	**2.33** UJL
Cobalt	23	350	13	mg/kg	11.3 JQ	6.85	7.1	6.06 JL	10.7 JL
Copper	3100	47000	70	mg/kg	384	13.8	11.3	10.5 JL	12.6 JL
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	23300	11900	11100	9440	14600
Lead	400	800	120	mg/kg	***4660***	32.8	28.8	16.3 JL	16.8 JL
Manganese	1800	26000	220	mg/kg	1160	862	932	850 JK	1540 JK
Mercury	11	46	0.1	mg/kg	**36.4**	3.74	1.89	0.23	0.0221
Nickel	1500	22000	38	mg/kg	657	29.5	25.5	16.3 JL	28.5 JL
Selenium	390	5800	0.52	mg/kg	6.6 UJ	1.12	1.02 JQ	0.941 JL	1.1 JL
Silver	390	5800	560	mg/kg	3.03 JQ	0.667 U	1.09 U	0.551 U	0.539 U
Thallium	0.78	12	1	mg/kg	**6.72** UJ	0.143 JQ	**1.09** U	0.125 JQL	0.28 JQL
Vanadium	390	5800	2	mg/kg	24.2 JL	39.6	36.9	31.6 JL	49.8 JL
Zinc	23000	350000	120	mg/kg	491	53.9	43.3	35.9 JL	42.6 JL

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	H1-160412-SS-03-01		H1-160920-SS-18-01		H2-160412-SS-03-01		H2-160920-SS-18-01		H3-160412-SS-03-01	
				Date:	4/12/2016		9/20/2016		4/12/2016		9/20/2016		4/12/2016	
				Depth (in):	0-3		12-18		0-3		12-18		0-3	
Aluminum	77000	1100000	NA	mg/kg	14700	JK	9060		12200	JK	12100		11300	JK
Antimony	31	470	5	mg/kg	0.763	UJ	0.557	UJL	1.18	UJ	1.13	UJL	2.31	UJ
Arsenic	0.68	3	18	mg/kg	***9.96***		***5.48***	JL	***8.77***		***7.81***		***8.77***	
Barium	15000	220000	330	mg/kg	111		82.6		99.9		103		92.7	
Beryllium	160	2300	10	mg/kg	0.892		0.728		0.767		0.715	JQ	0.718	
Cadmium	NA	NA	32	mg/kg	0.716		0.246	JQL	2.26		0.313	JQ	4.12	
Chromium	120000	1800000	0.4	mg/kg	80.6	JK	16.3	JL	293	JK	88.2	JH	631	JK
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.43**	U	**2.37**	UJL	**2.36**	U	**2.31**	UJL	***238***	U
Cobalt	23	350	13	mg/kg	10.2		6.89	JL	9.14		9.05		8.48	
Copper	3100	47000	70	mg/kg	18.2		9.94	JL	23.8		13.9	JK	32.3	
Cyanide	23	150	NA	mg/kg										
Iron	55000	820000	NA	mg/kg	15200		11000		13400		14000		14800	
Lead	400	800	120	mg/kg	34.4		13	JL	72.6		17.2		93.7	
Manganese	1800	26000	220	mg/kg	1080	JKD	798	JK	935	JKD	1060		856	JKD
Mercury	11	46	0.1	mg/kg	1.17		0.0332		1.95		0.0765		6.52	
Nickel	1500	22000	38	mg/kg	27.4		16.6	JL	34.9		21.3		41.5	
Selenium	390	5800	0.52	mg/kg	0.304	U	0.997	JL	0.301	U	1.03	UB	0.4	JQ
Silver	390	5800	560	mg/kg	0.14	U	0.557	U	0.138	U	1.13	U	0.138	U
Thallium	0.78	12	1	mg/kg	0.65	UD	0.146	JQL	0.644	UD	0.231	JQ	0.642	UD
Vanadium	390	5800	2	mg/kg	39.2		36.9	JL	34.3		45.3	JH	32.8	
Zinc	23000	350000	120	mg/kg	70.4		33.4	JL	78.8		41.5	JH	97.1	

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	H3-160920-SS-18-01		H4-160412-SS-03-01		H4-160921-SS-18-01		H5-160412-SS-03-01		H5-160921-SS-18-01	
				Date:	9/20/2016		4/12/2016		9/21/2016		4/12/2016		9/21/2016	
				Depth (in):	12-18		0-3		12-18		0-3		12-18	
Aluminum	77000	1100000	NA	mg/kg	9910		9150	JK	8130		11500	JK	9970	
Antimony	31	470	5	mg/kg	1.1	UJL	1.83	JQL	0.816	JQL	2.8	UJ	1.08	UJL
Arsenic	0.68	3	18	mg/kg	***7.09***		***7.73***		***7.93***		***8.75***		***8.16***	
Barium	15000	220000	330	mg/kg	90		100		92.5		105		98.5	
Beryllium	160	2300	10	mg/kg	0.651	JQ	0.634		0.616	JQ	0.737		0.652	JQ
Cadmium	NA	NA	32	mg/kg	0.442	JQ	32.4		5.33		16		0.358	JQ
Chromium	120000	1800000	0.4	mg/kg	133	JH	1780	JK	301	JH	1290	JK	35.7	JH
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.28**	UJL	***242***	U	***9.69***	JL	***273***	U	**2.31**	UJL
Cobalt	23	350	13	mg/kg	7.02		10.9		8.1		9.46		9.25	
Copper	3100	47000	70	mg/kg	10.8	JK	166		55.2	JK	94.6		10.8	JK
Cyanide	23	150	NA	mg/kg										
Iron	55000	820000	NA	mg/kg	12100		21200		15500		16400		12800	
Lead	400	800	120	mg/kg	17.5		**797**		172		325		19.4	
Manganese	1800	26000	220	mg/kg	823		752	JKD	774		814	JKD	1000	
Mercury	11	46	0.1	mg/kg	0.309		**25.7**		4.64		**44.2**		0.981	
Nickel	1500	22000	38	mg/kg	18.9		282		133		176		21	
Selenium	390	5800	0.52	mg/kg	0.962	UB	0.304	U	1.02	UB	0.324	U	0.949	UB
Silver	390	5800	560	mg/kg	1.1	U	0.71		0.224	JQ	0.281	JQ	1.08	U
Thallium	0.78	12	1	mg/kg	0.159	JQ	0.65	UD	**1.12**	U	0.692	UD	**1.08**	U
Vanadium	390	5800	2	mg/kg	39.4	JH	28.5		39.2	JH	33.5		42.6	JH
Zinc	23000	350000	120	mg/kg	37.3	JH	304		79.9	JH	340		38	JH

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	I0-160920-SS-06-01	I0-160920-SS-18-01	I10-160921-SS-06-01	I10-160921-SS-12-01	I10-160921-SS-18-01
				Date:	9/20/2016	9/20/2016	9/21/2016	9/21/2016	9/21/2016
				Depth (in):	0-6	12-18	0-6	6-12	12-18
Aluminum	77000	1100000	NA	mg/kg	9570	10400	9430	11300	11800
Antimony	31	470	5	mg/kg	0.559 UJL	0.558 UJL	3.34 JL	0.279 JQ	1.08 UJL
Arsenic	0.68	3	18	mg/kg	***6.38*** JL	***6.8*** JL	***6.9***	***8.6***	***6.51***
Barium	15000	220000	330	mg/kg	97.3	86.4	109	110	121
Beryllium	160	2300	10	mg/kg	0.815	0.782	0.616 JQ	0.725	0.61 JQ
Cadmium	NA	NA	32	mg/kg	0.379 JQL	0.244 JQL	30.5 JL	0.922	0.324 JQL
Chromium	120000	1800000	0.4	mg/kg	33.5 JL	15.6 JL	5170	552	57 JK
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.32** UJL	**2.29** UJL	**5.89** JL	**1.51** JQ	**2.35** UJL
Cobalt	23	350	13	mg/kg	7.9 JL	7.51 JL	7.09	8.37	7.35
Copper	3100	47000	70	mg/kg	12.1 JL	10.1 JL	173 JL	12.7	9.48 JL
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	11500	11900	13200	12700	11300
Lead	400	800	120	mg/kg	22.4 JL	14 JL	339	20	13.9
Manganese	1800	26000	220	mg/kg	1030 JK	989 JK	617	1130	1360
Mercury	11	46	0.1	mg/kg	0.182	0.0423	***46.2***	2.44	0.432
Nickel	1500	22000	38	mg/kg	19 JL	17.9 JL	230	26.2	20.5
Selenium	390	5800	0.52	mg/kg	1.19 JL	1.01 JL	0.555 JQL	1.06	0.429 JQL
Silver	390	5800	560	mg/kg	0.559 U	0.558 U	0.823 JQ	0.578 U	1.08 U
Thallium	0.78	12	1	mg/kg	0.144 JQL	0.126 JQL	**1.13** U	0.154 JQ	**1.08** U
Vanadium	390	5800	2	mg/kg	39.3 JL	39.5 JL	34.6 JH	43.4	35.3 JH
Zinc	23000	350000	120	mg/kg	46.8 JL	36.8 JL	390 JH	62.1	35.1 JH

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	I10-160921-SS-18-02	I1-160920-SS-06-01	I1-160920-SS-06-02	I1-160920-SS-18-01	I2-160921-SS-06-01
				Date:	9/21/2016	9/20/2016	9/20/2016	9/20/2016	9/20/2016
				Depth (in):	12-18	0-6	0-6	12-18	0-6
Aluminum	77000	1100000	NA	mg/kg	10900	8450	9920	6390	10300
Antimony	31	470	5	mg/kg	1.08 UJL	0.555 UJL	1.05 UJL	0.528 UJL	1.11 UJL
Arsenic	0.68	3	18	mg/kg	***6.25***	***5.42*** JL	***5.58*** JL	***4.75*** JL	***6.44***
Barium	15000	220000	330	mg/kg	93.7	80.7	88.8	63.9	93.8
Beryllium	160	2300	10	mg/kg	0.565 JQ	0.633	0.634 JQ	0.477 JQ	0.645 JQ
Cadmium	NA	NA	32	mg/kg	0.45 JQL	0.475 JQL	0.412 JQL	0.161 JQL	0.43 JQ
Chromium	120000	1800000	0.4	mg/kg	261 JK	36.1 JL	33.3 JL	10 JL	39.7 JH
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.33** UJL	**2.27** UJL	**2.28** UJL	**2.3** UJL	**2.27** UJL
Cobalt	23	350	13	mg/kg	6.36	6.91 JL	7.52 JL	5.51 JL	8.16
Copper	3100	47000	70	mg/kg	10.4 JL	10.4 JL	11.2 JL	6.94 JL	12.4 JK
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	10500	10000	10300	8240	11700
Lead	400	800	120	mg/kg	15	20.1 JL	22 JL	10.2 JL	23.8
Manganese	1800	26000	220	mg/kg	1020	827 JK	998 JK	645 JK	953
Mercury	11	46	0.1	mg/kg	0.511	0.277	0.266	0.0271	0.237
Nickel	1500	22000	38	mg/kg	17.6	16.6 JL	17.8 JL	12.3 JL	19.7
Selenium	390	5800	0.52	mg/kg	1.08 UJL	1.05 JL	0.767 JQL	0.7 JL	1.13 UB
Silver	390	5800	560	mg/kg	1.08 U	0.555 U	1.05 U	0.528 U	1.11 U
Thallium	0.78	12	1	mg/kg	**1.08** U	0.128 JQL	0.149 JQL	0.104 JQL	**1.11** U
Vanadium	390	5800	2	mg/kg	32.7 JH	34.8 JL	36.7 JL	28.7 JL	39.6 JH
Zinc	23000	350000	120	mg/kg	34.2 JH	41.1 JL	42.4 JL	23.7 JL	47.4 JH

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	I2-160921-SS-18-01	I3-160921-SS-06-01	I3-160921-SS-18-01	I4-160921-SS-06-01	I4-160921-SS-18-01
				Date:	9/20/2016	9/21/2016	9/21/2016	9/21/2016	9/21/2016
				Depth (in):	12-18	0-6	12-18	0-6	12-18
Aluminum	77000	1100000	NA	mg/kg	8990	9680	8850	10100	9390
Antimony	31	470	5	mg/kg	1.1 UJL	1.11 UJL	1.08 UJL	1.11 UJL	1.05 UJL
Arsenic	0.68	3	18	mg/kg	***6.86***	***6.97***	***7.42***	***6.91***	***6.85***
Barium	15000	220000	330	mg/kg	95.4	93.1	98.6	85.7	83.5
Beryllium	160	2300	10	mg/kg	0.629 JQ	0.67 JQ	0.654 JQ	0.627 JQ	0.611 JQ
Cadmium	NA	NA	32	mg/kg	0.24 JQ	0.467 JQ	0.257 JQ	0.444 JQ	0.241 JQ
Chromium	120000	1800000	0.4	mg/kg	14.9 JH	44.8 JH	14.4 JH	40.2 JH	16.5 JH
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.31** UJL	**2.33** UJL	**2.29** UJL	**2.32** UJL	**2.26** UJL
Cobalt	23	350	13	mg/kg	8.06	8.02	7.89	7.32	6.93
Copper	3100	47000	70	mg/kg	10.1 JK	13.3 JK	9.97 JK	12 JK	9.32 JK
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	11800	12000	12000	11300	11100
Lead	400	800	120	mg/kg	15.3	25.9	15.7	24.2	15
Manganese	1800	26000	220	mg/kg	869	866	896	869	884
Mercury	11	46	0.1	mg/kg	0.0594	0.335	0.0765	0.324	0.0843
Nickel	1500	22000	38	mg/kg	18.3	20.6	18.6	19.1	16.7
Selenium	390	5800	0.52	mg/kg	1.05 UB	1.24 UB	1.07 UB	1.19 UB	1.08 UB
Silver	390	5800	560	mg/kg	1.1 U	1.11 U	1.08 U	1.11 U	1.05 U
Thallium	0.78	12	1	mg/kg	**1.1** U	**1.11** U	**1.08** U	**1.11** U	**1.05** U
Vanadium	390	5800	2	mg/kg	40.2 JH	40.8 JH	40 JH	37 JH	36.6 JH
Zinc	23000	350000	120	mg/kg	35.6 JH	53.1 JH	36.4 JH	48.4 JH	34.2 JH

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	I5-160921-SS-06-01	I5-160921-SS-06-02	I5-160921-SS-18-01	I6-160921-SS-06-01	I6-160921-SS-18-01
				Date:	9/21/2016	9/21/2016	9/21/2016	9/21/2016	9/21/2016
				Depth (in):	0-6	0-6	12-18	0-6	12-18
Aluminum	77000	1100000	NA	mg/kg	9850	10300	9470	10600	11100
Antimony	31	470	5	mg/kg	1.1 UJL	1.14 U	1.08 UJL	1.15 UJL	1.12 UJL
Arsenic	0.68	3	18	mg/kg	***6.86***	***7.01***	***7.76***	***6.89***	***6.67***
Barium	15000	220000	330	mg/kg	92.9	93.6	84.9	89.6	78.2
Beryllium	160	2300	10	mg/kg	0.688 JQ	0.712 JQ	0.611 JQ	0.633 JQ	0.554 JQ
Cadmium	NA	NA	32	mg/kg	0.512 JQ	0.526 JQ	0.234 JQ	0.65 JQL	0.199 JQL
Chromium	120000	1800000	0.4	mg/kg	40.1 JH	45.4 JJH	13.4 JH	54.4	13.4
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.32** UJL	**2.32** UJL	**2.28** UJL	**2.41** UJL	**2.33** UJL
Cobalt	23	350	13	mg/kg	7.42	7.42	7.26	7.06	6.26
Copper	3100	47000	70	mg/kg	13.3 JK	13.5 JK	9.55 JK	14.5 JL	8.45 JL
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	11700	11900	11900	11500	11000
Lead	400	800	120	mg/kg	27.4	28.7	14.7	30.5	11.9
Manganese	1800	26000	220	mg/kg	841	846	911	799	895
Mercury	11	46	0.1	mg/kg	0.379	0.343 UJL	0.0396	0.574	0.02
Nickel	1500	22000	38	mg/kg	19.8	19.7	17.4	20.5	15.7
Selenium	390	5800	0.52	mg/kg	1.26 UB	1.28 UB	0.981 UB	0.628 JQL	1.12 UJL
Silver	390	5800	560	mg/kg	1.1 U	1.14 U	1.08 U	1.15 U	1.12 U
Thallium	0.78	12	1	mg/kg	**1.1** U	**1.14** U	**1.08** U	**1.15** U	**1.12** U
Vanadium	390	5800	2	mg/kg	39 JH	39 JH	38.1 JH	36.7 JH	35.4 JH
Zinc	23000	350000	120	mg/kg	52.5 JH	54.1 JH	34 JH	59 JH	31.1 JH

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	J0-160920-SS-06-01	J0-160920-SS-18-01	J10-160921-SS-06-01	J10-160921-SS-18-01	J10-160921-SS-18-02
				Date:	9/20/2016	9/20/2016	9/21/2016	9/21/2016	9/21/2016
				Depth (in):	0-6	12-18	0-6	12-18	12-18
Aluminum	77000	1100000	NA	mg/kg	8640	8600	8190	13000	10400
Antimony	31	470	5	mg/kg	1.08 UJL	1.08 UJL	1.15 UJL	1.12 UJL	1.14 UJL
Arsenic	0.68	3	18	mg/kg	***6.53*** JL	***6.6*** JL	***4.48***	***6.09***	***6.26***
Barium	15000	220000	330	mg/kg	210	83.5	63.7	73.9	69.8
Beryllium	160	2300	10	mg/kg	0.649 JQ	0.561 JQ	0.438 JQ	0.646 JQ	0.584 JQ
Cadmium	NA	NA	32	mg/kg	0.41 JQL	0.22 JQL	1.05 JQL	0.211 JQL	0.199 JQL
Chromium	120000	1800000	0.4	mg/kg	24.6 JL	12.3 JL	183	18.1	13.9
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.27** UJL	**2.27** UJL	**0.964** JQL	**2.41** UJL	**2.35** UJL
Cobalt	23	350	13	mg/kg	10.1 JL	7.3 JL	4.67	5.68	6.66
Copper	3100	47000	70	mg/kg	12.2 JL	9.19 JL	17.4 JL	10.1 JL	9.7 JL
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	11300	10900	8060	11500	10700
Lead	400	800	120	mg/kg	22.2 JL	13.8 JL	71.3	13.9	13.5
Manganese	1800	26000	220	mg/kg	1590 JK	833 JK	600	548	686
Mercury	11	46	0.1	mg/kg	0.124	0.0276	0.813	0.033	0.0325
Nickel	1500	22000	38	mg/kg	21.8 JL	16.7 JL	18.3	14.4	15.1
Selenium	390	5800	0.52	mg/kg	0.951 JQL	0.819 JQL	1.15 UJL	0.552 JQL	0.61 JQL
Silver	390	5800	560	mg/kg	1.08 U	1.08 U	1.15 U	1.12 U	1.14 U
Thallium	0.78	12	1	mg/kg	0.195 JQL	**1.08** UJL	**1.15** U	**1.12** U	**1.14** U
Vanadium	390	5800	2	mg/kg	40.4 JL	37 JL	23.3 JH	35.6 JH	34.5 JH
Zinc	23000	350000	120	mg/kg	45.6 JL	33.5 JL	73.9 JH	35.8 JH	33 JH

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	J1-160920-SS-06-01	J1-160920-SS-18-01	J2-160921-SS-06-01	J2-160921-SS-18-01	J3-160921-SS-06-01
				Date:	9/20/2016	9/20/2016	9/20/2016	9/20/2016	9/21/2016
				Depth (in):	0-6	12-18	0-6	12-18	0-6
Aluminum	77000	1100000	NA	mg/kg	6300	6460	9670	8030	9290
Antimony	31	470	5	mg/kg	0.537 UJL	0.529 UJL	1.12 UJL	1.07 UJL	1.06 UJL
Arsenic	0.68	3	18	mg/kg	***4.44***	***5.69*** JL	***7.41***	***7.28***	***7.33***
Barium	15000	220000	330	mg/kg	59.3	69.5	93.3	80.8	91.7
Beryllium	160	2300	10	mg/kg	0.469 JQ	0.536	0.653 JQ	0.554 JQ	0.673 JQ
Cadmium	NA	NA	32	mg/kg	0.245 JQL	0.19 JQL	0.378 JQ	0.213 JQ	0.385 JQ
Chromium	120000	1800000	0.4	mg/kg	21.3 JL	10.7 JL	29.4 JH	12.9 JH	28.1 JH
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.29** UJL	**2.25** UJL	**2.31** UJL	**2.27** UJL	**2.31** UJL
Cobalt	23	350	13	mg/kg	5.12 JL	6.12 JL	8.09	7.08	7.84
Copper	3100	47000	70	mg/kg	7.85 JL	7.36 JL	12.8 JK	9.49 JK	12.6 JK
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	7700	9310	12400	11400	12400
Lead	400	800	120	mg/kg	14.6 JL	11.1 JL	22.5	13.8	24.1
Manganese	1800	26000	220	mg/kg	641 JK	698 JK	899	826	840
Mercury	11	46	0.1	mg/kg	0.161	0.0381	0.172	0.0287	0.162
Nickel	1500	22000	38	mg/kg	12.7 JL	13.7 JL	19.4	16.8	19.4
Selenium	390	5800	0.52	mg/kg	0.745 JL	0.882 JL	1.1 UB	0.927 UB	1.3 UB
Silver	390	5800	560	mg/kg	0.537 U	0.529 U	1.12 U	1.07 U	1.06 U
Thallium	0.78	12	1	mg/kg	0.0998 JQL	0.125 JQL	**1.12** U	**1.07** U	**1.06** U
Vanadium	390	5800	2	mg/kg	26.2 JL	31.9 JL	41.8 JH	37.2 JH	41 JH
Zinc	23000	350000	120	mg/kg	31.2 JL	26.4 JL	51.9 JH	34.1 JH	55.1 JH

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic **=** Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	J3-160921-SS-18-01	J4-160921-SS-06-01	J4-160921-SS-18-01	J5-160921-SS-06-01	J5-160921-SS-18-01
				Date:	9/21/2016	9/21/2016	9/21/2016	9/21/2016	9/21/2016
				Depth (in):	12-18	0-6	12-18	0-6	12-18
Aluminum	77000	1100000	NA	mg/kg	8910	9110	10200	9800	9150
Antimony	31	470	5	mg/kg	1.1 UJL	1.07 UJL	1.1 UJL	1.1 UJL	1.09 UJL
Arsenic	0.68	3	18	mg/kg	***8.84***	***6.74***	***8.02***	***6.78***	***7.02***
Barium	15000	220000	330	mg/kg	85.9	84.5	79.6	86.7	80
Beryllium	160	2300	10	mg/kg	0.613 JQ	0.627 JQ	0.591 JQ	0.66 JQ	0.569 JQ
Cadmium	NA	NA	32	mg/kg	0.234 JQ	0.344 JQ	0.22 JQ	0.371 JQ	0.25 JQ
Chromium	120000	1800000	0.4	mg/kg	14.1 JH	25.6 JH	13 JH	26.2 JH	15.3 JH
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.27** UJL	**2.3** UJL	**2.26** UJL	**2.3** UJL	**2.3** UJL
Cobalt	23	350	13	mg/kg	7.76	7.16	7.47	7.13	6.96
Copper	3100	47000	70	mg/kg	23.4 JK	11.9 JK	9.51 JK	12.6 JK	10.2 JK
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	15100	11200	11900	11300	11400
Lead	400	800	120	mg/kg	293	22.5	14.5	23.6	16.5
Manganese	1800	26000	220	mg/kg	887	834	1080	879	827
Mercury	11	46	0.1	mg/kg	0.0329	0.168	0.0357	0.201	0.0885
Nickel	1500	22000	38	mg/kg	20.1	17.9	17.3	18.4	17.2
Selenium	390	5800	0.52	mg/kg	1.16 UB	1.31 UB	1.19 UB	1.5 UB	1.15
Silver	390	5800	560	mg/kg	1.1 U	1.07 U	1.1 U	1.1 U	1.09 U
Thallium	0.78	12	1	mg/kg	**1.1** U	**1.07** U	**1.1** U	0.191 JQ	**1.09** U
Vanadium	390	5800	2	mg/kg	39 JH	37 JH	37.9 JH	36.5 JH	38.3 JH
Zinc	23000	350000	120	mg/kg	37.1 JH	49.3 JH	36.2 JH	49.8 JH	36.9 JH

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic **=** Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Units	J6-160921-SS-06-01	J6-160921-SS-18-01	J8-160921-SS-06-01	J8-160921-SS-18-01	J9-160921-SS-06-01
				Date:	9/21/2016	9/21/2016	9/21/2016	9/21/2016	9/21/2016
				Depth (in):	0-6	12-18	0-6	12-18	0-6
Aluminum	77000	1100000	NA	mg/kg	7700	7920	10000	8630	14100
Antimony	31	470	5	mg/kg	1.11 UJL	1.09 UJL	1.15 UJL	1.09 UJL	1.16 UJL
Arsenic	0.68	3	18	mg/kg	***5.13***	***6.95***	***5.49***	***5.89***	***5.29***
Barium	15000	220000	330	mg/kg	67	67.7	71.1	66.5	78.3
Beryllium	160	2300	10	mg/kg	0.47 JQ	0.461 JQ	0.55 JQ	0.516 JQ	0.567 JQ
Cadmium	NA	NA	32	mg/kg	0.45 JQL	0.212 JQL	0.637 JQL	0.192 JQL	0.627 JQL
Chromium	120000	1800000	0.4	mg/kg	35.7	10.9	54.8	11.7	44.1
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.39** UJL	**2.27** UJL	**2.38** UJL	**2.37** UJL	**2.4** UJL
Cobalt	23	350	13	mg/kg	5.23	5.96	5.47	5.76	5.52
Copper	3100	47000	70	mg/kg	11.2 JL	6.9 JL	12.6 JL	8.53 JL	12 JL
Cyanide	23	150	NA	mg/kg					
Iron	55000	820000	NA	mg/kg	8550	9690	9730	9830	9540
Lead	400	800	120	mg/kg	25.2	10.6	34.1	12.1	29.2
Manganese	1800	26000	220	mg/kg	606	922	631	683	895
Mercury	11	46	0.1	mg/kg	0.34	0.0221	0.584	0.0384	0.247
Nickel	1500	22000	38	mg/kg	14.6	12.5	16.7	14.1	15.6
Selenium	390	5800	0.52	mg/kg	0.527 JQL	0.481 JQL	0.589 JQL	0.554 JQL	0.75 JQL
Silver	390	5800	560	mg/kg	1.11 U	1.09 U	1.15 U	1.09 U	1.16 U
Thallium	0.78	12	1	mg/kg	**1.11** U	**1.09** U	**1.15** U	**1.09** U	0.2 JQ
Vanadium	390	5800	2	mg/kg	27.6 JH	29.8 JH	30.3 JH	31.6 JH	30.1 JH
Zinc	23000	350000	120	mg/kg	46.3 JH	25.8 JH	48.2 JH	30.9 JH	49.5 JH

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic **=** Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Sample ID: / Date: / Depth (in): / Units	J9-160921-SS-18-01	LPW01-E6-SS-160413-01	LPW01-E6-SS-160413-02	LPW02-F7-SS-160413-01
				Date:	9/21/2016	4/13/2016	4/13/2016	4/13/2016
				Depth (in):	12-18	0-3	0-3	0-3
				Units				
Aluminum	77000	1100000	NA	mg/kg	9170	4870	5290	13800
Antimony	31	470	5	mg/kg	1.09 UJL	**94.7** JLD	**102** JL	6.31 UJ
Arsenic	0.68	3	18	mg/kg	***5.11***	***6.46*** JLQD	***7.09*** JLQ	***9.25*** JLQ
Barium	15000	220000	330	mg/kg	65.3	373	558	143
Beryllium	160	2300	10	mg/kg	0.552 JQ	0.368	0.481 JQ	0.952 JQ
Cadmium	NA	NA	32	mg/kg	0.196 JQL	80.3 JK	64.8 JK	172 JK
Chromium	120000	1800000	0.4	mg/kg	14.3	9530 JKD	13000 JK	3670 JK
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	**2.37** UJL	***2130***	***1010***	***130***
Cobalt	23	350	13	mg/kg	5.14	12.7	12.4	11 JQ
Copper	3100	47000	70	mg/kg	8.3 JL	533 JK	510 JK	270 JK
Cyanide	23	150	NA	mg/kg				
Iron	55000	820000	NA	mg/kg	9450	29800	35800	19600
Lead	400	800	120	mg/kg	12.4	***19300*** JKD	***24500*** JK	***1760*** JK
Manganese	1800	26000	220	mg/kg	584	515	648	976
Mercury	11	46	0.1	mg/kg	0.0188	2.15 UJ	***97.8*** JK	**22.4** JKD
Nickel	1500	22000	38	mg/kg	13.4	529 JL	932 JL	233 JL
Selenium	390	5800	0.52	mg/kg	0.623 JQL	0.307 UJ	7.09 UJ	7.04 UJ
Silver	390	5800	560	mg/kg	1.09 U	5.75	7.33 JQ	3.24 U
Thallium	0.78	12	1	mg/kg	**1.09** U	**3.28** UD	**6.66** U	**7.53** U
Vanadium	390	5800	2	mg/kg	29.2 JH	16.3 JH	17.8 JH	43.2 JH
Zinc	23000	350000	120	mg/kg	31.8 JH	396 D	404	379

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

Table 1 Soil Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	Ecological Screening Value	Sample ID: / Date: / Depth (in): / Units	LPW03-D5-SS-160413-01 4/13/2016 0-3		LPW04-E2-SS-160413-01 4/13/2016 0-3		LPW05-G3-SS-160413-01 4/13/2016 0-3	
Aluminum	77000	1100000	NA	mg/kg	5260		12400		11100	
Antimony	31	470	5	mg/kg	4.62	UJ	5.73	UJ	5.42	UJ
Arsenic	0.68	3	18	mg/kg	***4.34***	UJ	***6.79***	JLQ	***8.29***	JLQ
Barium	15000	220000	330	mg/kg	82.9		105		108	
Beryllium	160	2300	10	mg/kg	0.697	JQ	0.988	JQ	1.17	JQ
Cadmium	NA	NA	32	mg/kg	48.8	JK	2.47	JKQ	53.1	JK
Chromium	120000	1800000	0.4	mg/kg	1210	JK	165	JK	8330	JK
Chromium, Hexavalent*	0.3	6.3	0.4	mg/kg	***54.5***		**2.72**	U	***267***	
Cobalt	23	350	13	mg/kg	6.27	JQ	7.78	JQ	11	JQ
Copper	3100	47000	70	mg/kg	1930	JK	23.1	JK	381	JK
Cyanide	23	150	NA	mg/kg						
Iron	55000	820000	NA	mg/kg	19000		13500		22900	
Lead	400	800	120	mg/kg	***973***	JK	54.5	JK	***854***	JK
Manganese	1800	26000	220	mg/kg	617		869		875	
Mercury	11	46	0.1	mg/kg	5.86	JKD	2.32	JKD	**35**	JKD
Nickel	1500	22000	38	mg/kg	97.4	JL	22.1	JLQ	1040	JL
Selenium	390	5800	0.52	mg/kg	5.15	UJ	6.72	UJ	6.05	UJ
Silver	390	5800	560	mg/kg	2.37	U	2.94	U	2.78	U
Thallium	0.78	12	1	mg/kg	**5.51**	U	**6.84**	U	**6.47**	U
Vanadium	390	5800	2	mg/kg	17.7	JH	37.7	JH	38.9	
Zinc	23000	350000	120	mg/kg	527		70.1		504	

NOTES:

Bold = Exceedances of Residential Human Screening Values.
Bold Italic = Exceedances of Industrial Human Health Screening Values.
Underlined = Exceedances of Ecological Screening Values.
*Ecological screening level for chromium used for hexavalent chromium.
- = Low bias
CRQL = Contract required quantitation limit
J = Indicates that the concentration is an estimated value.
L = Reported concentration is between the MDL and the CRQL
MDL = Method detection limit
U = Indicates the analyte was analyzed for but not detected.
mg/kg = Milligrams per kilogram.
NA = Not available.
S0-08 is a field duplicate of S0-03
Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

Ecological Screening Values are protective of most sensitive receptor from: TCEQ. 2018a. TCEQ's Ecological Benchmark Tables. Soil Benchmarks. TCEQ publication RG-263b.

This page left intentionally blank

Table 2 Sediment Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	TCEQ TRRP Tier 1 Protective Concentration Levels for Human Health	Ecological Screening Value	Sample ID: Sample Date:	SE-01 7/20/2016	SE-02 7/20/2016	SE-03 7/20/2016	SE-04 7/20/2016
					Units				
Aluminum	77000	1100000	150000	NA	mg/kg	3150	5830	3620	6800
Antimony	31	470	83	0.3	mg/kg	0.5 U	0.6 U	0.5 U	0.5 U
Arsenic	0.68	3	110	9.79	mg/kg	***5.4***	***5***	***5.8***	***5.8***
Barium	15000	220000	22900	NA	mg/kg	55.1	73.5	51.5	101
Beryllium	160	2300	26.6	NA	mg/kg	0.5 U	0.6	0.5 U	0.6
Cadmium	NA	NA	1100	0.99	mg/kg	0.5	0.6	0.9	1
Chromium	120000	1800000	36000	43.4	mg/kg	6.3	7.8	11.4	33.4
Copper	3100	47000	21000	31.6	mg/kg	7.6	12.8	17.9	27.4
Cyanide	23	150	320	NA	mg/kg	0.67 U	0.11 J	0.63 U	0.84 U
Iron	55000	820000	N/A	20000	mg/kg	8160	8330	11900	10200
Lead	400	800	500	35.8	mg/kg	26.8	30.3	52.9	69.9
Manganese	1800	26000	14000	460	mg/kg	625	501	583	596
Mercury	11	46	34	0.18	mg/kg	0.058 U	0.066 U	0.068 U	0.214
Nickel	1500	22000	1400	22.7	mg/kg	9.4	15.9	14.5	19.7
Vanadium	390	5800	84.7	NA	mg/kg	21.7	27.6	24.3	35.6
Zinc	23000	350000	76000	121	mg/kg	45.1	56.7	57.7	111

NOTES:

Bold = Exceedances of Residential Human Health Screening Values.

Bold Italic = Exceedances of Industrial Human Health Screening Values.

Red = Exceedances of TRRP Protective Concentration Levels.

Underlined = Exceedances of Ecological Screening Values.

- = Low bias

+ = High bias

CRQL = Contract required quantitation limit

J = Indicates that the concentration is an estimated value.

MDL = Method detection limit

U = Indicates the analyte was analyzed for but not detected.

mg/kg = Milligrams per kilogram.

NA = Not available.

SE- 14 and SE-15 are field duplicates of SE-08 and SE-09, respectively.

Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

TCEQ. 2006a. Sediment PCLs. https://www.tceq.texas.gov/assets/public/remediation/trrp/sedpcls_2006.pdf March 31. PCL values for barium, beryllium, vanadium, and cyanide have been updated to preliminarily calculated draft PCLs provided by TCEQ with updated toxicity factors in accordance with the exposure factors listed in TRRP 24.

Ecological Screening Values are freshwater values from: TCEQ. 2018b. TCEQ's Ecological Benchmark Tables. Sediment Benchmarks, Second-Effects Levels, and Benthic PCLs. TCEQ publication RG-263b.

Table 2 Sediment Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	TCEQ TRRP Tier 1 Protective Concentration Levels for Human Health	Ecological Screening Value	Sample ID: Sample Date:	SE-05 7/19/2016	SE-06 7/21/2016	SE-07 7/19/2016	SE-08 7/21/2016
					Units				
Aluminum	77000	1100000	150000	NA	mg/kg	6020	7870	7940	5750
Antimony	31	470	83	0.3	mg/kg	0.5 U	0.4 R	0.5 U	0.5 U
Arsenic	0.68	3	110	9.79	mg/kg	***4.8***	***8***	***7.4***	***3.6*** J
Barium	15000	220000	22900	NA	mg/kg	85.8	120	113	69.8
Beryllium	160	2300	26.6	NA	mg/kg	0.6	0.7	0.7	0.5
Cadmium	NA	NA	1100	0.99	mg/kg	0.9	0.7	0.8	0.8
Chromium	120000	1800000	36000	43.4	mg/kg	87.3	61.4	83.4	31.5
Copper	3100	47000	21000	31.6	mg/kg	20.7	15.8	17.3	16.1
Cyanide	23	150	320	NA	mg/kg	0.93 J-	0.18 J	0.73 UJ-	0.1 J
Iron	55000	820000	N/A	20000	mg/kg	8520	10500	10600	7920
Lead	400	800	500	35.8	mg/kg	77.4	36.5 J+	44	109
Manganese	1800	26000	14000	460	mg/kg	669	1530	1130	473
Mercury	11	46	34	0.18	mg/kg	0.271	0.091	0.143	0.074
Nickel	1500	22000	1400	22.7	mg/kg	14.9	20.1	22.3	14.6
Vanadium	390	5800	84.7	NA	mg/kg	26	35.2	38	27.8
Zinc	23000	350000	76000	121	mg/kg	87.6	49.6	67.3	74.3

NOTES:

Bold = Exceedances of Residential Human Health Screening Values.

Bold Italic = Exceedances of Industrial Human Health Screening Values.

Red = Exceedances of TRRP Protective Concentration Levels.

Underlined = Exceedances of Ecological Screening Values.

- = Low bias

+ = High bias

CRQL = Contract required quantitation limit

J = Indicates that the concentration is an estimated value.

MDL = Method detection limit

U = Indicates the analyte was analyzed for but not detected.

mg/kg = Milligrams per kilogram.

NA = Not available.

SE- 14 and SE-15 are field duplicates of SE-08 and SE-09, respectively.

Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

TCEQ. 2006a. Sediment PCLs. https://www.tceq.texas.gov/assets/public/remediation/trrp/sedpcls_2006.pdf March 31. PCL values for barium, beryllium, vanadium, and cyanide have been updated to preliminarily calculated draft PCLs provided by TCEQ with updated toxicity factors in accordance with the exposure factors listed in TRRP 24.

Ecological Screening Values are freshwater values from: TCEQ. 2018b. TCEQ's Ecological Benchmark Tables. Sediment Benchmarks, Second-Effects Levels, and Benthic PCLs. TCEQ publication RG-263b.

Table 2 Sediment Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	TCEQ TRRP Tier 1 Protective Concentration Levels for Human Health	Ecological Screening Value	Sample ID: Sample Date:	SE-09 7/21/2016	SE-10 7/19/2016	SE-11 7/18/2016	SE-12 7/18/2016
					Units				
Aluminum	77000	1100000	150000	NA	mg/kg	7860	6610	2850	4250
Antimony	31	470	83	0.3	mg/kg	0.6 U	0.5 U	0.5 UJ	0.5 U
Arsenic	0.68	3	110	9.79	mg/kg	***4.7***	***6.5***	0.5	***4.2***
Barium	15000	220000	22900	NA	mg/kg	89.1	85.9	47.4	46.7
Beryllium	160	2300	26.6	NA	mg/kg	0.7	0.7	0.6	0.5
Cadmium	NA	NA	1100	0.99	mg/kg	0.9	0.8	0.5 U	0.6
Chromium	120000	1800000	36000	43.4	mg/kg	19.5	38.3	3.5	6.5
Copper	3100	47000	21000	31.6	mg/kg	21.9	14.7	6.6	6.5
Cyanide	23	150	320	NA	mg/kg	1.1 U	0.034 J-	0.35 J	0.067 J
Iron	55000	820000	N/A	20000	mg/kg	10100	9350	3040	9450
Lead	400	800	500	35.8	mg/kg	70.6	107	1.2 J+	1.2 J+
Manganese	1800	26000	14000	460	mg/kg	500	880	68.1 J	339
Mercury	11	46	34	0.18	mg/kg	0.085	0.117	0.056 U	0.055 U
Nickel	1500	22000	1400	22.7	mg/kg	18.6	19.8	5.9	10.7
Vanadium	390	5800	84.7	NA	mg/kg	34.3	32	13	18.8
Zinc	23000	350000	76000	121	mg/kg	81.5	64.8	15.2	20

NOTES:

Bold = Exceedances of Residential Human Health Screening Values.

Bold Italic = Exceedances of Industrial Human Health Screening Values.

Red = Exceedances of TRRP Protective Concentration Levels.

Underlined = Exceedances of Ecological Screening Values.

- = Low bias

+ = High bias

CRQL = Contract required quantitation limit

J = Indicates that the concentration is an estimated value.

MDL = Method detection limit

U = Indicates the analyte was analyzed for but not detected.

mg/kg = Milligrams per kilogram.

NA = Not available.

SE- 14 and SE-15 are field duplicates of SE-08 and SE-09, respectively.

Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

TCEQ. 2006a. Sediment PCLs. https://www.tceq.texas.gov/assets/public/remediation/trrp/sedpcls_2006.pdf March 31. PCL values for barium, beryllium, vanadium, and cyanide have been updated to preliminarily calculated draft PCLs provided by TCEQ with updated toxicity factors in accordance with the exposure factors listed in TRRP 24.

Ecological Screening Values are freshwater values from: TCEQ. 2018b. TCEQ's Ecological Benchmark Tables. Sediment Benchmarks, Second-Effects Levels, and Benthic PCLs. TCEQ publication RG-263b.

Table 2 Sediment Sample Results

Chemical	Residential Human Health Screening Value	Industrial Human Health Screening Value	TCEQ TRRP Tier 1 Protective Concentration Levels for Human Health	Ecological Screening Value	Sample ID: Sample Date:	SE-13 7/18/2016	SE-14 7/21/2016	SE-15 7/21/2016
					Units			
Aluminum	77000	1100000	150000	NA	mg/kg	3270	5180	6910
Antimony	31	470	83	0.3	mg/kg	0.6 U	0.4 U	0.5 U
Arsenic	0.68	3	110	9.79	mg/kg	***3***	***5.1*** J	***4***
Barium	15000	220000	22900	NA	mg/kg	51.6	66.8	73.3
Beryllium	160	2300	26.6	NA	mg/kg	0.6 U	0.5	0.6
Cadmium	NA	NA	1100	0.99	mg/kg	0.6	0.8	0.7
Chromium	120000	1800000	36000	43.4	mg/kg	6.8	28.6	18
Copper	3100	47000	21000	31.6	mg/kg	7.4	14.7	18.4
Cyanide	23	150	320	NA	mg/kg	0.62 J	0.74 UJ	0.65 J
Iron	55000	820000	N/A	20000	mg/kg	7430	8830	8640
Lead	400	800	500	35.8	mg/kg	15.6 B	131	61.5
Manganese	1800	26000	14000	460	mg/kg	225	501	426
Mercury	11	46	34	0.18	mg/kg	0.063 U	0.098	0.086
Nickel	1500	22000	1400	22.7	mg/kg	8.3	14.7	16
Vanadium	390	5800	84.7	NA	mg/kg	13.6	28	28.2
Zinc	23000	350000	76000	121	mg/kg	25	70.9	73.3

NOTES:

Bold = Exceedances of Residential Human Health Screening Values.

Bold Italic = Exceedances of Industrial Human Health Screening Values.

Red = Exceedances of TRRP Protective Concentration Levels.

Underlined = Exceedances of Ecological Screening Values.

- = Low bias

+ = High bias

CRQL = Contract required quantitation limit

J = Indicates that the concentration is an estimated value.

MDL = Method detection limit

U = Indicates the analyte was analyzed for but not detected.

mg/kg = Milligrams per kilogram.

NA = Not available.

SE- 14 and SE-15 are field duplicates of SE-08 and SE-09, respectively.

Qualifiers based on "Result_Qualifier" field of EPA provided sample database.

Human Health Screening Values from: EPA. 2018. Region 9. Regional Screening Levels (RSL) for Chemical Contaminants at Superfund Sites. San Francisco, CA: U. S. Environmental Protection Agency, Region 9; October 2018.

TCEQ. 2006a. Sediment PCLs. https://www.tceq.texas.gov/assets/public/remediation/trrp/sedpcls_2006.pdf March 31. PCL values for barium, beryllium, vanadium, and cyanide have been updated to preliminarily calculated draft PCLs provided by TCEQ with updated toxicity factors in accordance with the exposure factors listed in TRRP 24.

Ecological Screening Values are freshwater values from: TCEQ. 2018b. TCEQ's Ecological Benchmark Tables. Sediment Benchmarks, Second-Effects Levels, and Benthic PCLs. TCEQ publication RG-263b.

Table 3 Surface Water Sample Results

Chemical	Human Health Surface Water Risk-Based Exposure Limits for Water and Fish	Human Health Surface Water Risk-Based Exposure Limits for Fish Only	Human Health Surface Water Risk-Based Exposure Limits for Incidental Fishery	Ecological Screening Values		Sample ID:	SW-01	SW-03	SW-04	SW-05	SW-06
				Chronic Benchmark	Acute Benchmark	Date:	7/20/2016	7/20/2016	7/20/2016	7/19/2016	7/19/2016
						Unit					
Aluminum	NA	NA	NA	87	991	ug/L	100 U	4380	23200	120	171
Antimony	6	1071	10710	2200	6600	ug/L	2 U	2 U	2 U	2 U	2 U
Arsenic	10	10	100	150	340	ug/L	2 U	5.5	**17.6**	4.2	4
Barium	2000	NA	NA	16000	96000	ug/L	95.3 J	127 J	376 J	99.5 J	88.3 J
Beryllium	NA	NA	NA	5.3	130	ug/L	5 U	5 U	5 U	5 U	5 U
Cadmium	5	NA	NA	0.15	4.37	ug/L	2 U	2 U	2 U	2 U	2 U
Chromium	62	502	5020	42	320	ug/L	10 U	10 U	51.3	10 U	10 U
Copper	1300	NA	NA	5.24	7.39	ug/L	4 U	6.1	41.2	4 U	4 U
Cyanide	4	400	4000	10.7	45.8	ug/L	**10** UR	**10** UR	**10** UR	**10** UR	**10** UR
Iron	NA	NA	NA	1000	NA	ug/L	72.6	4500	25400	435	372
Lead	1.15	3.83	38.3	1.17	30.14	ug/L	**2** U	**2.3** J+	***139***	**2.3** J+	**2.3** J+
Manganese	50	100	1000	1310	2370	ug/L	45.5 J	**820** J	***2730*** J	**334** J	**262** J
Mercury	0.0122	0.0122	0.122	1.3	2.4	ug/L	***0.2*** U	***0.2*** U	***0.357***	***0.2*** U	***0.2*** U
Nickel	332	1140	11400	28.93	260	ug/L	20 U	20 U	42.6	20 U	20 U
Vanadium	NA	NA	NA	20	284	ug/L	20 U	20 U	75.9	20 U	20 U
Zinc	7400	26000	260000	65.7	65.1	ug/L	20 U	29.4	239	20 U	20 U

NOTES:

Bold = Exceedances of Risk-Based Exposure Limits for Water and Fish.

Bold Italic = Exceedances of Risk-Based Exposure Limits for Fish Only/Incidental Fishery.

Underlined = Exceedances of Chronic Ecological Screening Values.

Red Underlined = Exceedances of Acute Ecological Screening Values.

+ = High bias

J = Indicates that the concentration is an estimated value.

R = Rejected data

U = Indicates the analyte was analyzed for but not detected.

ug/L = Micrograms per liter.

NA = Not available.

SW-14 and SW-15 are field duplicates of SW-08 and SW-09, respectively.

Quallifiers based on "Result_Qualifier" field of EPA provided sample database.

The surface water concentratons are based on total metals results.

TCEQ. 2018c. Human Health Surface Water RBELs tables.
https://www.tceq.texas.gov/assets/public/remediation/trrp/humanhealthrbels.xlsx March 2.

The Human Health for Fish Only Consumption value multiplied by 10 represents the value for an incidental fishery, as discussed in the TCEQ Regulatory Guidance RG-366/TRRP 24 "Determining PCLs for Surface Water and Sediment" (December 2007). The values for fish only are applicable to Sample SW-13 and the incidental fishery values are applicable to all other samples.

Ecological screening values are Freshwater Chronic and Acute Benchmarks from: TCEQ. 2018d. TCEQ's Ecological Benchmark Tables. Surface Water Benchmarks for Metals, Inorganics. TCEQ publication RG-263b.

The ecological screening value for chromium is for trivalent chromium and human health values are for hexavalent chromium.

Table 3 Surface Water Sample Results

Chemical	Human Health Surface Water Risk-Based Exposure Limits for Water and Fish	Human Health Surface Water Risk-Based Exposure Limits for Fish Only	Human Health Surface Water Risk-Based Exposure Limits for Incidental Fishery	Ecological Screening Values		Sample ID:	SW-07	SW-08	SW-09	SW-11
				Chronic Benchmark	Acute Benchmark	Date:	7/19/2016	7/21/2016	7/21/2016	7/18/2016
						Unit				
Aluminum	NA	NA	NA	87	991	ug/L	381	386	762	100 U
Antimony	6	1071	10710	2200	6600	ug/L	2 U	2 U	2 U	2 U
Arsenic	10	10	100	150	340	ug/L	3.9	4.1	4	2
Barium	2000	NA	NA	16000	96000	ug/L	83.6 J	82.8 J	53.6 J	85.7 J
Beryllium	NA	NA	NA	5.3	130	ug/L	5 U	5 U	5 U	5 U
Cadmium	5	NA	NA	0.15	4.37	ug/L	2 U	2 U	2 U	2 U
Chromium	62	502	5020	42	320	ug/L	10 U	10 U	10 U	10 U
Copper	1300	NA	NA	5.24	7.39	ug/L	4 U	4 U	4 U	4 U
Cyanide	4	400	4000	10.7	45.8	ug/L	**10** UR	**10** UR	**10** UR	**10** UR
Iron	NA	NA	NA	1000	NA	ug/L	531	528	943	434
Lead	1.15	3.83	38.3	1.17	30.14	ug/L	**2.3** J+	**2.3** J+	**2.3** J+	**2** U
Manganese	50	100	1000	1310	2370	ug/L	**265** J	**974** J	**318** J	**257** J
Mercury	0.0122	0.0122	0.122	1.3	2.4	ug/L	***0.2*** U	***0.2*** U	***0.2*** U	***0.2*** U
Nickel	332	1140	11400	28.93	260	ug/L	20 U	20 U	20 U	20 U
Vanadium	NA	NA	NA	20	284	ug/L	20 U	20 U	20 U	20 U
Zinc	7400	26000	260000	65.7	65.1	ug/L	20 U	20 U	20 U	20 U

NOTES:

Bold = Exceedances of Risk-Based Exposure Limits for Water and Fish.

Bold Italic = Exceedances of Risk-Based Exposure Limits for Fish Only/Incidental Fishery.

Underlined = Exceedances of Chronic Ecological Screening Values.

Red Underlined = Exceedances of Acute Ecological Screening Values.

+ = High bias

J = Indicates that the concentration is an estimated value.

R = Rejected data

U = Indicates the analyte was analyzed for but not detected.

ug/L = Micrograms per liter.

NA = Not available.

SW-14 and SW-15 are field duplicates of SW-08 and SW-09, respectively.

Quallifiers based on "Result_Qualifier" field of EPA provided sample database.

The surface water concentratons are based on total metals results.

TCEQ. 2018c. Human Health Surface Water RBELs tables.
https://www.tceq.texas.gov/assets/public/remediation/trrp/humanhealthrbels.xlsx March 2.

The Human Health for Fish Only Consumption value multiplied by 10 represents the value for an incidental fishery, as discussed in the TCEQ Regulatory Guidance RG-366/TRRP 24 "Determining PCLs for Surface Water and Sediment" (December 2007). The values for fish only are applicable to Sample SW-13 and the incidental fishery values are applicable to all other samples.

Ecological screening values are Freshwater Chronic and Acute Benchmarks from: TCEQ. 2018d. TCEQ's Ecological Benchmark Tables. Surface Water Benchmarks for Metals, Inorganics. TCEQ publication RG-263b.

The ecological screening value for chromium is for trivalent chromium and human health values are for hexavalent chromium.

Table 3 Surface Water Sample Results

Chemical	Human Health Surface Water Risk-Based Exposure Limits for Water and Fish	Human Health Surface Water Risk-Based Exposure Limits for Fish Only	Human Health Surface Water Risk-Based Exposure Limits for Incidental Fishery	Ecological Screening Values		Sample ID:	SW-12	SW-13	SW-14	SW-15
				Chronic Benchmark	Acute Benchmark	Date:	7/18/2016	7/18/2016	7/21/2016	7/21/2016
						Unit				
Aluminum	NA	NA	NA	87	991	ug/L	324	1560	351	842
Antimony	6	1071	10710	2200	6600	ug/L	2 U	2 U	2 U	2 U
Arsenic	10	10	100	150	340	ug/L	2 U	2.9	4.3	4.5
Barium	2000	NA	NA	16000	96000	ug/L	86.1 J	63.4 J	63.2 J	57.7 J
Beryllium	NA	NA	NA	5.3	130	ug/L	5 U	5 U	5 U	5 U
Cadmium	5	NA	NA	0.15	4.37	ug/L	2 U	2 U	2 U	2 U
Chromium	62	502	5020	42	320	ug/L	10 U	10 U	10 U	10 U
Copper	1300	NA	NA	5.24	7.39	ug/L	13.9	4 U	4 U	4 U
Cyanide	4	400	4000	10.7	45.8	ug/L	**10** UR	**10** UR	**10** UR	**10** UR
Iron	NA	NA	NA	1000	NA	ug/L	439	1870	571	1020
Lead	1.15	3.83	38.3	1.17	30.14	ug/L	**2.3** J+	**2.3** J+	**2.3** J+	**2.3** J+
Manganese	50	100	1000	1310	2370	ug/L	**205** J	***144*** J	**359** J	**399** J
Mercury	0.0122	0.0122	0.122	1.3	2.4	ug/L	***0.2*** U	***0.2*** U	***0.2*** U	***0.2*** U
Nickel	332	1140	11400	28.93	260	ug/L	20 U	20 U	20 U	20 U
Vanadium	NA	NA	NA	20	284	ug/L	20 U	20 U	20 U	20 U
Zinc	7400	26000	260000	65.7	65.1	ug/L	20 U	20 U	20 U	20 U

NOTES:

Bold = Exceedances of Risk-Based Exposure Limits for Water and Fish.

Bold Italic = Exceedances of Risk-Based Exposure Limits for Fish Only/Incidental Fishery.

Underlined = Exceedances of Chronic Ecological Screening Values.

Red Underlined = Exceedances of Acute Ecological Screening Values.

+ = High bias

J = Indicates that the concentration is an estimated value.

R = Rejected data

U = Indicates the analyte was analyzed for but not detected.

ug/L = Micrograms per liter.

NA = Not available.

SW-14 and SW-15 are field duplicates of SW-08 and SW-09, respectively.

Quallifiers based on "Result_Qualifier" field of EPA provided sample database.

The surface water concentratons are based on total metals results.

TCEQ. 2018c. Human Health Surface Water RBELs tables.
https://www.tceq.texas.gov/assets/public/remediation/trrp/humanhealthrbels.xlsx March 2.

The Human Health for Fish Only Consumption value multiplied by 10 represents the value for an incidental fishery, as discussed in the TCEQ Regulatory Guidance RG-366/TRRP 24 "Determining PCLs for Surface Water and Sediment" (December 2007). The values for fish only are applicable to Sample SW-13 and the incidental fishery values are applicable to all other samples.

Ecological screening values are Freshwater Chronic and Acute Benchmarks from: TCEQ. 2018d. TCEQ's Ecological Benchmark Tables. Surface Water Benchmarks for Metals, Inorganics. TCEQ publication RG-263b.

The ecological screening value for chromium is for trivalent chromium and human health values are for hexavalent chromium.

Table 4 Waste Sample Results

Chemical	Units	Sample ID: LPW01-AQ-160413-01 Date: 4/13/2016	LPW02-AQ-160413-01 4/13/2016	LPW02-AQ-160413-02 4/13/2016	LPW03-AQ-160413-01 4/13/2016
Aluminum	mg/kg	604 F1	1520	1360	878
Barium	mg/kg	3.23	36.9	33.5	0.976
Beryllium	mg/kg	0.284 U	0.213 U	0.279 U	0.381 J
Cadmium	mg/kg	7.48	28.1	24.5	12
Chromium	mg/kg	105000 B	296000 B	264000 B	133000 B
Copper	mg/kg	1600	6690	5410	1970
Iron	mg/kg	7000	12300	11400	8290
Lead	mg/kg	2.52	168	203	2 U
Manganese	mg/kg	67.7 F1	120	107	82.2
Mercury	mg/kg	1.25	8.16 J	7.18 J	60
Nickel	mg/kg	54.8 F1	218	193	66.1
Vanadium	mg/kg	63.8 F1	42.2	36.7	69.6
Zinc	mg/kg	169 F1	726	635	215

NOTES:

J = Indicates that the concentration is an estimated value.

U = Indicates the analyte was analyzed for but not detected.

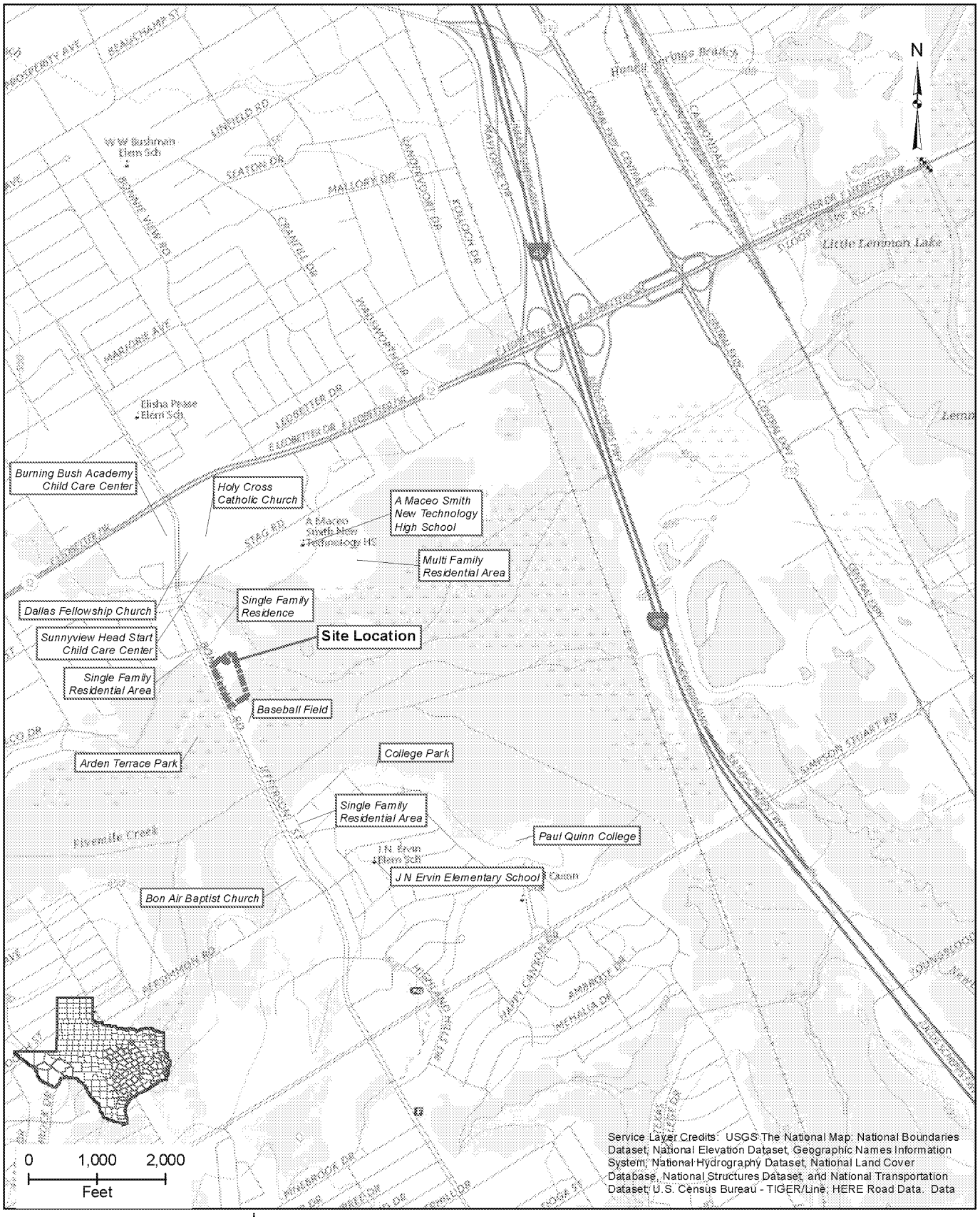
mg/kg = Milligrams per kilogram.

NA = Not available.

Quallifiers based on "Result_Qualifier" field of EPA provided sample database.

Figures

This page left intentionally blank



Lane Plating Works Superfund Site
Dallas, Dallas County, Texas

Figure 1
Site Location

2019-02-14 M:\Federal\EPA\RAC II\0168-Lane RI-FS_309\GIS\MXDs\CUSTMLP_SigFeaturesP.mxd EA-Dallas jschwertz

This page left intentionally blank

N

0 100 200
Feet

Legend

- On-site Wells
- Overland Flow
- Approximate Site Boundary
- Stream
- Stream Seasonal
- Barbed Wire Fence fair to poor condition
- Chainlink Fence good condition
- Chainlink Gate good condition
- Freshwater Emergent Wetland
- Freshwater Forested /Shrub Wetland
- Freshwater Pond

Note:
HWTB: Hazardous Waste Treatment Building

Imagery Source:
Site:Texas Orthoimagery
Program 2015 0.5 Meter DOQQ,
Texas Strategic Mapping Program, 2015.

Lane Plating Works Superfund Site
Dallas, Dallas County, Texas

Figure 2
Site Features

This page left intentionally blank

Lane Plating Works Superfund Site
Dallas, Dallas County, Texas

Imagery Source: Texas Orthoimagery Program 2015 0.5 Meter DOQQ, Texas Strategic Mapping Program, 2015.

Figure 3
Soil Sample Locations

2019-02-12 M:\Federal\EPA\RAC II\0168-Lane RI-FS_309\GIS\MXDs\ACUSTMALP_SoilSampleLocations.mxd EA-Dallas jschwartz

This page left intentionally blank

Lane Plating Works Superfund Site
Dallas, Dallas County, Texas

Figure 4
Sediment and Surface Water
Sample Locations

This page left intentionally blank

Legend

Soil Human Health COPC Exceedances

- Greater than EPA Industrial RSL
- Greater than or equal to EPA Residential RSL and less than Industrial RSL
- Does not exceed EPA RSL for residential and industrial use
- On-site Wells
- Stream
- Freshwater Forested/Shrub Wetland
- Approximate Site Boundary

COPC	EPA RSL Residential (mg/kg)	EPA RSL Industrial (mg/kg)
Chromium	120000	1800000
Hexavalent Chromium	0.3	6.3
Cyanide	23	150
Lead	400	800
Mercury	11	46

NOTES
COPC - Chemical of potential concern
EPA - Environmental Protection Agency
RSL - Regional Screening Level
mg/kg - Milligrams per kilogram
Detected results as qualified by U.S. EPA

Lane Plating Works Superfund Site
Dallas, Dallas County, Texas

Imagery Source: Texas Orthoimagery Program 2015 0.5 Meter DOQQ, Texas Strategic Mapping Program, 2015.

Figure 5
Soil Human Health Screening

2019-02-08 M:\Fusion\EPA\RAC II\0168-Lane RI-FS_309\GIS\MXD\SUSTMLP_HH_Soil.mxd EA-Dallas jschwartz

This page left intentionally blank

COPC	TCEQ Freshwater Sediment Benchmark (mg/kg)	TCEQ Second-Effects Level (mg/kg)
Chromium	43.4	111
Cyanide	NA	NA
Lead	35.8	128
Mercury	0.18	1.06

N

0 150 300
Feet

Legend

Sediment Ecological COPC Exceedances

- Greater than TCEQ Second-Effects Level
- Greater than or equal to TCEQ Freshwater Sediment Benchmark and less than TCEQ Second-Effects Level
- Does not exceed TCEQ Freshwater Sediment Benchmark
- Stream
- Stream Seasonal
- Approximate Site Boundary

Wetlands

- Freshwater Emergent Wetland
- Freshwater Forested /Shrub Wetland
- Freshwater Pond
- Riverine

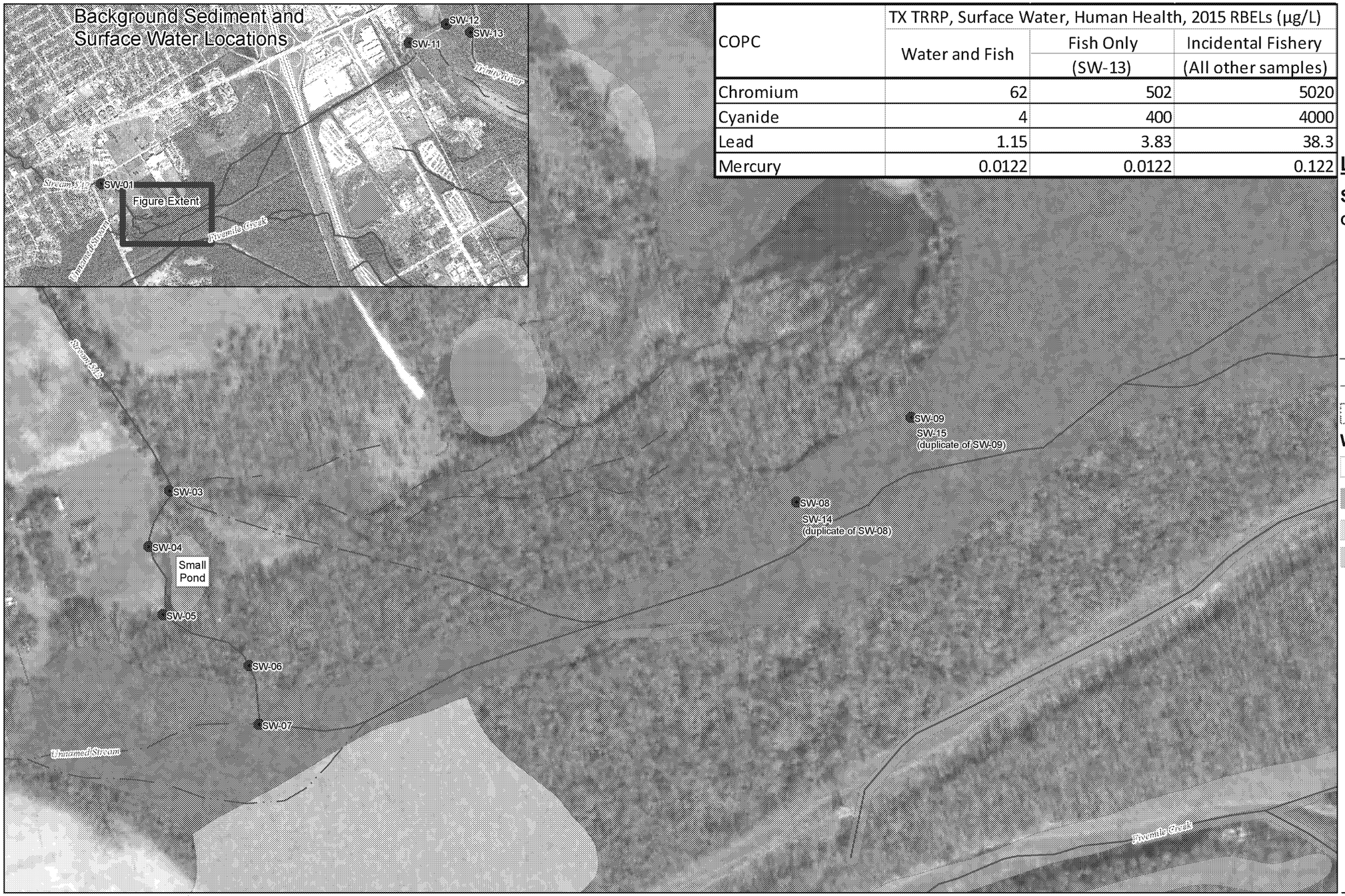
NOTES
COPC - Chemical of potential concern
TCEQ - Texas Commission on Environmental Quality
mg/kg - Milligrams per kilogram

Imagery Source:
Texas Orthoimager
Program 2015 0.5 Meter DOQQ,
Texas Strategic Mapping Program, 2015.

Lane Plating Works Superfund Site
Dallas, Dallas County, Texas

Figure 6
Sediment Ecological Risk Screening

This page left intentionally blank



COPC	TX TRRP, Surface Water, Human Health, 2015 RBELs (µg/L)		
	Water and Fish	Fish Only (SW-13)	Incidental Fishery (All other samples)
Chromium	62	502	5020
Cyanide	4	400	4000
Lead	1.15	3.83	38.3
Mercury	0.0122	0.0122	0.122

N

0 150 300
Feet

Legend

Surface Water Human Health

COPC Exceedance

- Greater than or equal to RBEL for Fish Only/Incidental Fishery
- Greater than or equal to RBEL for Water and Fish and less than RBEL for Fish Only/Incidental Fishery
- Does not exceed screening values
- Stream
- Stream Seasonal
- Approximate Site Boundary

Wetlands

- Freshwater Emergent Wetland
- Freshwater Forested /Shrub Wetland
- Freshwater Pond
- Riverine

NOTES

COPC - Chemical of potential concern
RBEL: Risk-Based Exposure Limit
TCEQ: Texas Commission on Environmental Quality
µg/L - Micrograms per liter
>= - Greater than or equal to
< - less than

The Human Health for Fish Only Consumption value multiplied by 10 represents the value for an incidental fishery, as discussed in the TCEQ Regulatory Guidance RG-366/TRRP 24 "Determining PCLs for Surface Water and Sediment" (December 2007).

Reference:
TCEQ 2015. Human Health RBEL Values.
https://www.tceq.texas.gov/assets/public/remediation/trrp/humanhealthrbels.xlsx

Imagery Source:
Texas Orthoimager
Program 2015 0.5 Meter DOQQ,
Texas Strategic Mapping Program, 2015.

Lane Plating Works Superfund Site
Dallas, Dallas County, Texas

Figure 7
Surface Water Human Health Screening

2019-03-08 M:\Federal\EPA\RAC II\01684-1.mxd RI-FS 3D\GIS\MxDoc\US\Hel.P H4 SW.mxd EA-Dallas

This page left intentionally blank

COPC	TCEQ Freshwater Chronic Benchmark (ug/L)	TCEQ Freshwater Acute Benchmark (ug/L)
Chromium	42	320
Cyanide	10.7	45.8
Lead	1.17	30.14
Mercury	1.3	2.4

N

0 150 300
Feet

Legend

Surface Water Ecological COPC Exceedance

- Greater than TCEQ Freshwater Acute Benchmark
- Greater than TCEQ Freshwater Chronic less than TCEQ Freshwater Acute Benchmark
- Less than TCEQ Freshwater Chronic Benchmark
- Approximate Site Boundary
- Stream
- Stream Seasonal

Wetlands

- Freshwater Emergent Wetland
- Freshwater Forested /Shrub Wetland
- Freshwater Pond
- Riverine

NOTES
COPC - Chemical of potential concern
TCEQ - Texas Commission on Environmental Quality
µg/L - Micrograms per liter

Imagery Source:
Texas Orthoimager
Program 2015 0.5 Meter DOQQ,
Texas Strategic Mapping Program, 2015.

Lane Plating Works Superfund Site
Dallas, Dallas County, Texas

Figure 8
Surface Water Ecological Screening

This page left intentionally blank

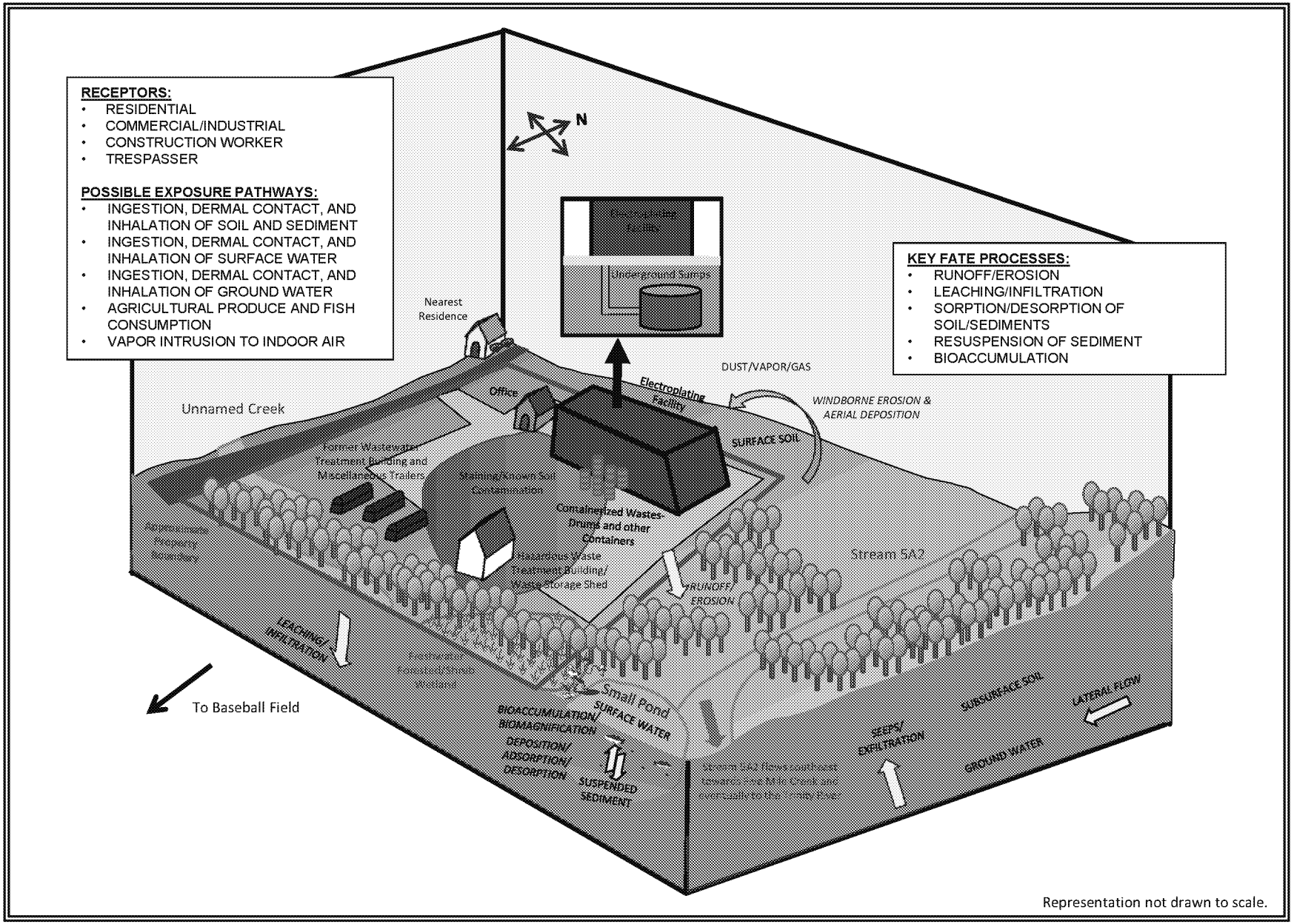
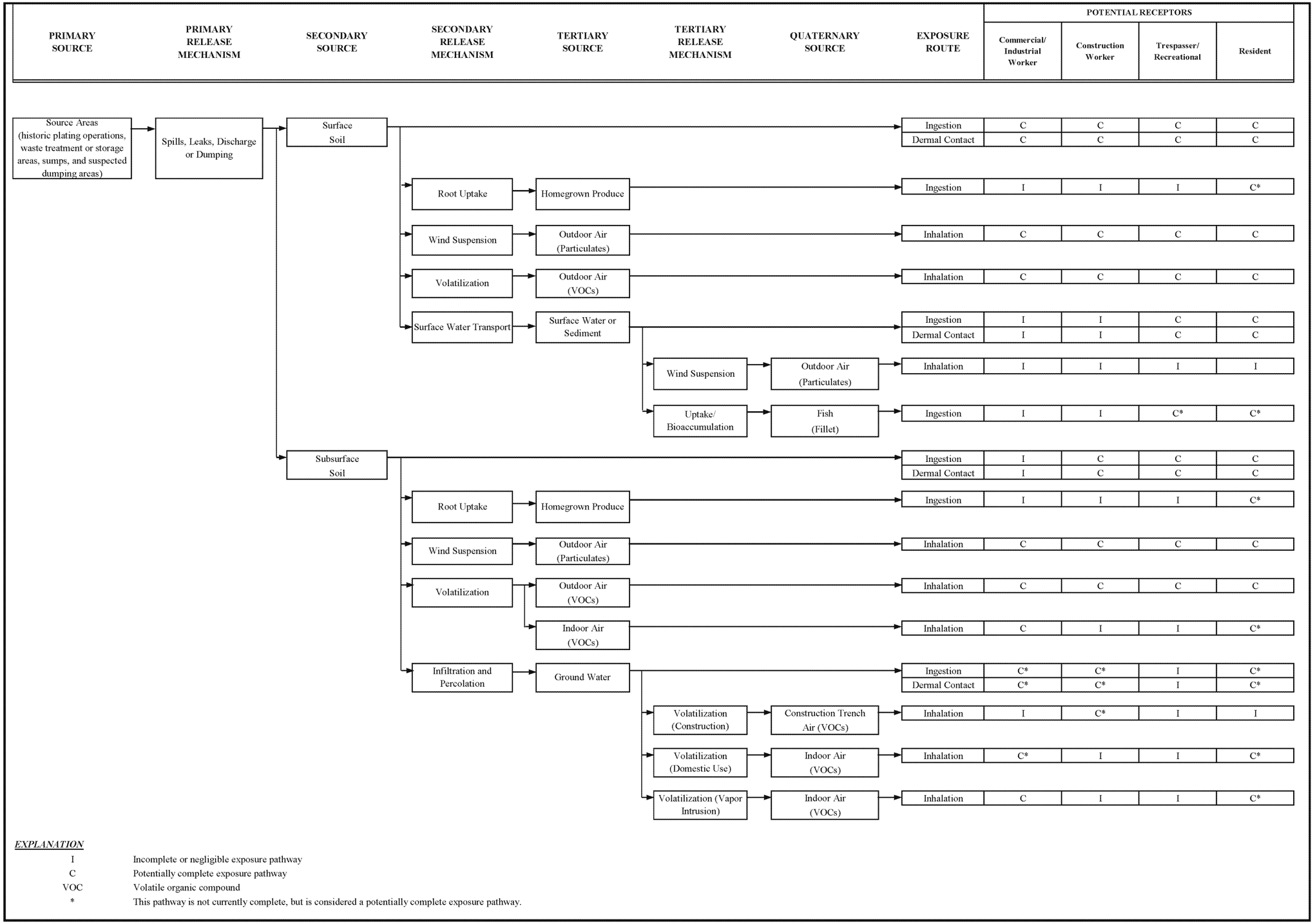


Figure 9 Graphical Presentation of the Preliminary Human Health Conceptual Site Model

This page left intentionally blank



EXPLANATION

I	Incomplete or negligible exposure pathway
C	Potentially complete exposure pathway
VOC	Volatile organic compound
*	This pathway is not currently complete, but is considered a potentially complete exposure pathway.

Figure 10 Preliminary Human Health Conceptual Site Model

This page left intentionally blank

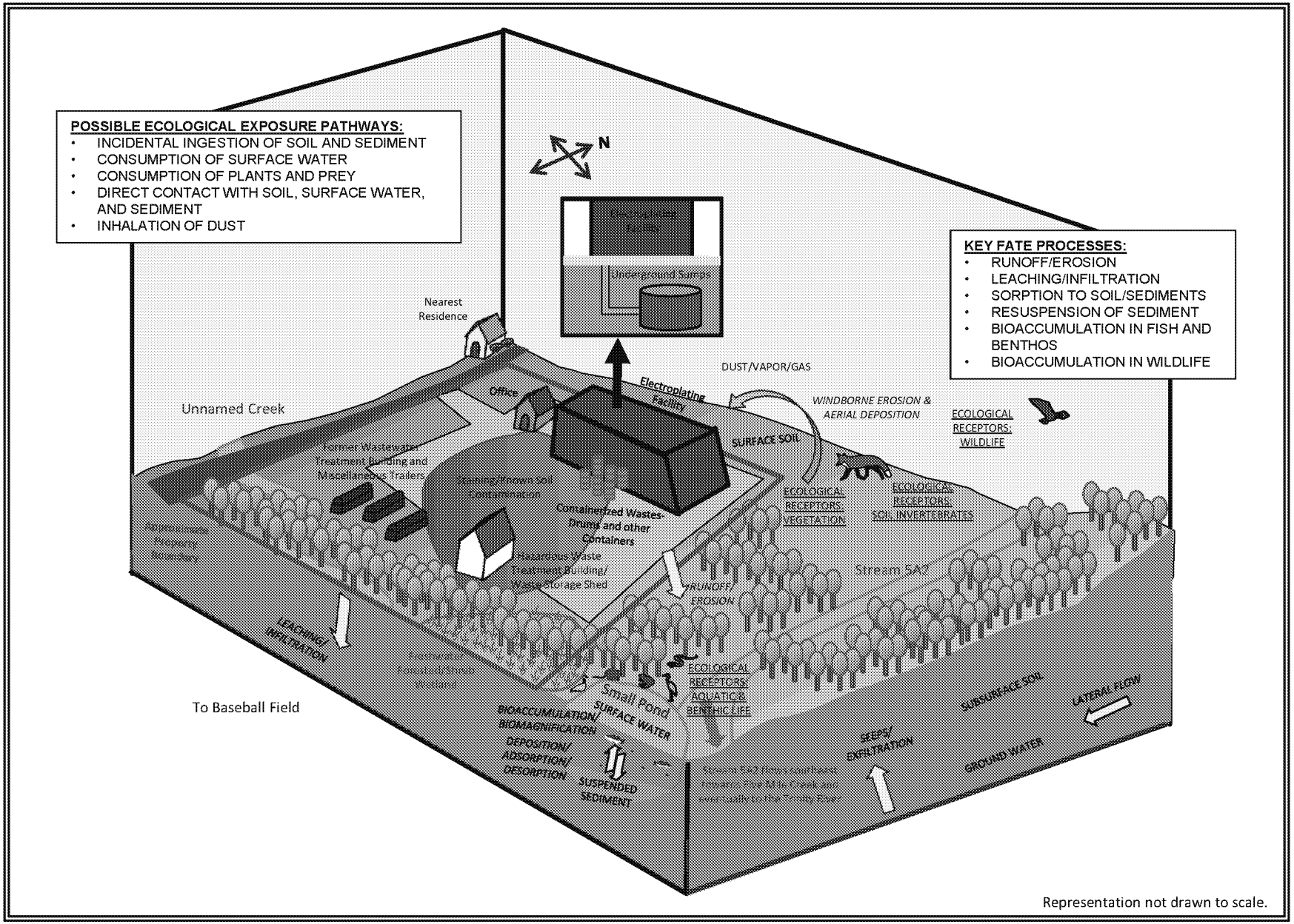


Figure 11 Graphical Presentation of the Preliminary Ecological Conceptual Site Model

This page left intentionally blank

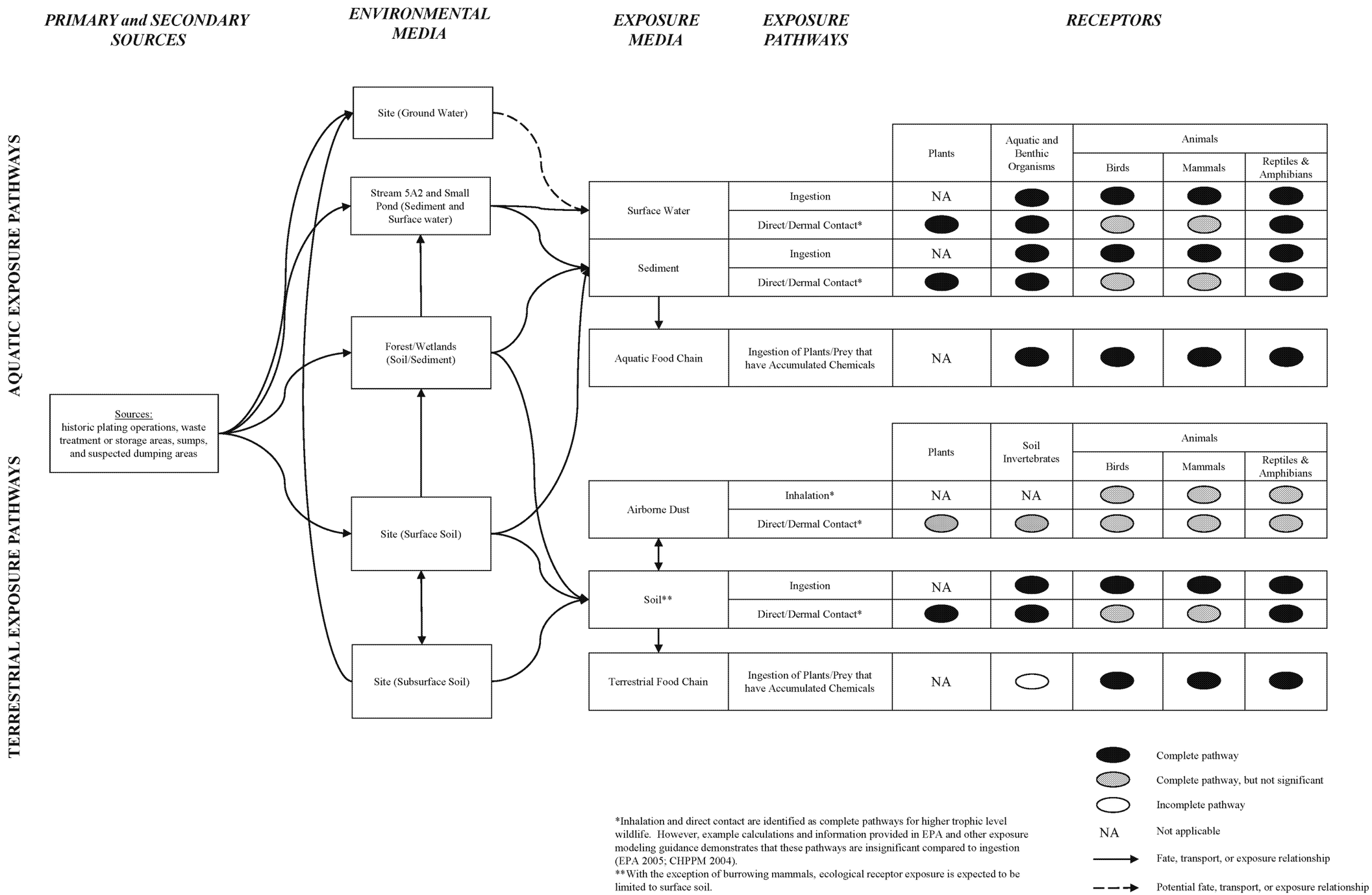


Figure 12 Preliminary Ecological Conceptual Site Model

This page left intentionally blank

APPENDIX A:

Response to Comments

This page left intentionally blank

EA Engineering, Science, and Technology, Inc., PBC

405 S. Highway 121, Suite C-100
Lewisville, TX 75067
Telephone: 972-315-3922
Fax: 972-315-5181
www.eaest.com

15 March 2019

Mr. Kenneth Shewmake
Task Order Monitor
U.S. Environmental Protection Agency – Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

RE: Response to Comments on the Conceptual Site Model Technical Memorandum, Revision 01
Remedial Investigation
Lane Plating Works, Inc. Superfund Site
Dallas, Dallas County, Texas
Remedial Action Contract 2
Contract: EP-W-06-004
Task Order: 68HE0618F0309

Dear Mr. Shewmake:

EA Engineering, Science, and Technology, Inc., PBC (EA) has prepared the following letter regarding the Conceptual Site Model Technical Memorandum (CSMTM), Revision 01 based on comments received from the Texas Commission on Environmental Quality (TCEQ).

Comments from Rebecca Storms, P.G., TCEQ Project Manager

TCEQ Comment 1: Section 4.4.2, second paragraph, first sentence - mercury should be included in the list of chemicals with detected total concentrations in surface water exceeding the most conservative screening level in at least one sample.

EA Response: The text has been revised.

TCEQ Comment 2: Table 2, Sediment Sample Results -

a. The following table note should be removed because it is no longer applicable - "L = Reported concentration is between the MDL and the CRQL."

EA Response: The table has been revised.

b. TCEQ Texas Risk Reduction Program (TRRP) Tier 1 Protective Concentration Levels (PCLs) for Human Health - please update these values according to the February 1, 2019, TCEQ comments on the Sampling and Analysis Plan for Remedial Investigation, Revision 00, December 11, 2018 (SAP). The Toxicology Division review of the SAP included as an attachment to these comments, January 16, 2018, pages 2-4, Screening Criteria for Sediment, calculates revised draft PCLs for some chemicals that have updated toxicity factors. This will primarily affect the values for cyanide and vanadium.

EA Response: The table has been revised.

TCEQ Comment 3: Table 3, Surface Water Sample Results -

a. All cyanide surface water data were reported as not detected. Please maintain the appropriate not detected "U" qualifiers in addition to the rejected "R" qualifiers to show that results were reported as not detected at the associated reporting limit.

EA Response: The table has been revised.

b. The ecological screening value for zinc is missing. Please include this value on the final version of this table.

EA Response: The table has been revised.

c. The ecological freshwater acute benchmark could be included instead of the TCEQ TRRP Tier 1 PCLs for Contact Recreation for consistency with Figure 8. Please also refer to comment 4 (c).

EA Response: The table has been revised.

TCEQ Comment 4: Table 3, Surface Water Sample Results and Figure 7, Surface Water Human Health Screening -

a. The following human health risk-based exposure limits (RBELs) for fish only values should be updated to reflect the default RBELS in lieu of the previous site-specific calculations: arsenic (10 micrograms per liter (ug/L)), chromium, using the hexavalent chromium value (502 ug/L), lead (3.83 ug/L), and nickel (1,140 ug/L). This is appropriate for this stage of the investigation and is consistent with the SAP. Associated note 1 on Table 3 should also be removed.

EA Response: The table and figure have been revised.

b. Please include the note from comment 30 (b) of the February 1, 2019, TCEQ comments on the SAP: "The Human Health for Fish Only Consumption value multiplied by 10 represents the value for an incidental fishery, as discussed in the TCEQ Regulatory Guidance RG-366/TRRP 24 "Determining PCLs for Surface Water and Sediment" (December 2007). Refer to this guidance to determine applicability to site data."

EA Response: The table and figure have been revised.

c. The TCEQ TRRP Tier 1 PCLs for Contact Recreation and associated notes can be removed. These are no longer needed because the human health RBELs are included.

EA Response: The table and figure have been revised.

d. Several sample results are inaccurately shown as exceedances of certain screening values, including some values that are reported as not detected. Comparison of results to screening values should be quality controlled (QC).

EA Response: The table has been reviewed for accuracy. Where the reporting limit of non-detects is in exceedance of the screening values, it is shown as an exceedance.

TCEQ Comment 5: Figure 7, Surface Water Human Health Screening - the incidental fishery values can be removed from the figure table and replaced with the note in comment 4 (b).

EA Response: The note from comment 4(b) has been added to Figure 7. For clarity, the incidental fishery values have been left on the figure.

TCEQ Comment 6: Figure 8, Surface Water Ecological Screening - see comment 4 (d).

EA Response: The Figure has been reviewed for accuracy. Where the reporting limit of non-detects is in exceedance of the screening values, it is shown as an exceedance.

Comments from Greg Zychowski, TCEQ Technical Program Support Team

TCEQ Comment 1: I have reviewed the subject document (EA 2019), with a specific focus on section 8, "Ecological Conceptual Exposure Pathway Analysis" and the responses to previous comments (TCEQ 2018). No additional responses are requested at this time. The ambiguity of the groundwater-to-surface water pathway will be addressed in the future. This subject is of interest to both the TCEQ and the EPA, and the pathway is considered "potential" until more data is collected.

EA Response: Comment acknowledged.

If you have any questions regarding this submittal, please call me at (972) 315-3922.

Sincerely,

Mark Paddack
Project Manager

Enclosure

cc:

Brian Delaney, EPA Contract Officer (letter only)
Rebecca Storms TCEQ Project Manager (one electronic copy on CD)
Tim Startz, EA Program Manager (letter only)
File

This page left intentionally blank

EA Engineering, Science, and Technology, Inc., PBC

405 S. Highway 121, Suite C-100
Lewisville, TX 75067
Telephone: 972-315-3922
Fax: 972-315-5181
www.eaest.com

15 February 2019

Mr. Kenneth Shewmake
Task Order Monitor
U.S. Environmental Protection Agency – Region 6
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

RE: Response to Comments on the Conceptual Site Model Technical Memorandum, Revision 00
Remedial Investigation
Lane Plating Works, Inc. Superfund Site
Dallas, Dallas County, Texas
Remedial Action Contract 2
Contract: EP-W-06-004
Task Order: 68HE0618F0309

Dear Mr. Shewmake:

EA Engineering, Science, and Technology, Inc., PBC (EA) has prepared the following letter regarding the Conceptual Site Model Technical Memorandum (CSMTM), Revision 00 based on comments received from United States Environmental Protection Agency (EPA) and the Texas Commission on Environmental Quality (TCEQ).

Comments from EPA

General Comments

EPA Comment 1: Sections 7 and 8 describe work that would normally be done in the problem formulation and the exposure assessment portion of the human health and ecological risk assessments.

The risk assessments will not be completed under phase one of this contract, but we asked for planning documents that anticipate work that will be done in phase 2. We will need to review and revise some of the assumptions made in sections 7 and 8 before completing the risk assessments. I think it would be helpful if we include a statement at the beginning of sections 7 and 8 explaining that the risk assessments will be conducted in phase two and that we will review the assumptions made in this document at that time.

> **EA Response:** The following statement has been added to the beginning of section 7: The human health risk assessment will be conducted during phase two of the RI and the assumptions made in the preliminary human health CSM will be reviewed at that time. The following statement has been added to the beginning of Section 8: The ecological

risk assessment will be conducted during phase two of the RI and the assumptions made in the ecological CSM will be reviewed at that time.

EPA Comment 2: Could we provide more information on the condition of the fences and if possible show the fences in figures?

EA Response: Figure 2 has been updated to show the fences and information regarding the condition of the fences has been added to section 3.1.

EPA Comment 3: Can we get a figure that shows the proximity to the school and other significant areas near the site?

EA Response: The site's proximity to the school and other significant areas near the site have been added to Figure 1 and Figure 2.

Specific Comments:

EPA Comment 4: Section 3.2 and 3.4: Need demographic information for the area near the site not for entire city of Dallas or Dallas county. I can provide additional data if needed.

EA Response: Demographic information for the area within a two-mile radius of the site has been added to Section 3.2.

EPA Comment 5: Section 3.5.3, last paragraph: The site borders a park and an abandoned baseball field. Recreational uses need to be considered.

EA Response: The referenced sentence has been deleted. The trespasser receptor in Section 7.5 has been revised to be a trespasser/recreational receptor.

EPA Comment 6: Section 3.6, second paragraph in section, page 9: The first sentence in the paragraph seems broken. Revise or breakup the sentence after "west side".

EA Response: The sentence was revised as follows: The site is bordered by Bonnie View Road to the west, which is slightly elevated from the site. The road creates a high ridge on the west side of the baseball diamond which is located south of the site.

EPA Comment 7: Page 15, section 3.10: State that we will evaluate type of habitat needed for the listed species and consult with the state and federal wildlife agencies to determine the final list of T&E species that will be evaluated in the risk assessment. We may need to consider surrogate species for evaluation in the ecological risk assessment. This will be done in phase two during the risk assessment.

EA Response: Text has been added as suggested.

EPA Comment 8: Section 4.4.3, Waste samples: This data is useful for developing a COPC list, but we don't want to compare these results to soil benchmarks. The waste material should have been removed after it was sampled. Do not list COPCs from waste samples that are non-detect.

> **EA Response:** The benchmarks have been removed from Table 4, and the benchmark comparison text has been deleted.

EPA Comment 9: Figure 2: Please remove the name Lane from the Lane Residence and change the label nearest residence to residential area.

> **EA Response:** The figure has been revised.

EPA Comment 10: Figure 4,6,7: The figure does not show a lake, so this can be removed from the legend.

> **EA Response:** The figures have been revised.

EPA Comment 11: Figure 10: Be more specific on the primary sources. List historic plating operations, waste treatment or storage areas, sumps, and suspected dumping areas.

> **EA Response:** The figure has been revised.

EPA Comment 12: Figure 10: Be more specific on primary release mechanism. Include spills, leaks, discharge or dumping, and consider adding flooding with a release to offsite wetland areas.

> **EA Response:** The figure has been revised in include additional primary release mechanisms. Flooding and release to offsite release is covered by the secondary release mechanism "surface water transport" to surface water and sediment.

EPA Comment 13: Figure 10: The figure shows exposure to outdoor air particulates and VOCs is complete. Are we going to evaluate outdoor air? If not change to potentially complete or P.

> **EA Response:** Outdoor air particulates will be evaluated as part of the surface soil direct contact calculations. If VOCs are detected in groundwater, vapor intrusion will be evaluated and used as an indication of outdoor VOC exposure.

EPA Comment 14: Figure 10: We may want to put a note saying we will re-evaluate fish ingestion after determining the presence of catchable fish.

> **EA Response:** The figure has been revised to indicate fish ingestion is not currently complete but is considered a potentially complete exposure pathway, and text has been

added to Section 7.5 to note fish ingestion is a complete pathway if catchable fish are present.

EPA Comment 15: Figure 12: Show groundwater to surface water as potentially complete. We will need to determine if this pathway is complete.

EA Response: The figure has been revised.

EPA Comment 16: Figure 12: Reptile amphibian dermal contact with surface water pathway is complete.

EA Response: The figure has been revised.

EPA Comment 17: Table 1: Check mercury values in the table. The decimal may be in the wrong place.

EA Response: Values in the tables have been checked for accuracy.

Comments from Rebecca Storms, P.G., TCEQ Project Manager

TCEQ Comment 1: Section 3.6, Surface Water, third paragraph, "Runoff was observed to continue south through a low depression/ponding area towards the unnamed creek" - this statement should be revised to reflect the surface water pathway route description in the Hazard Ranking System Document Record (HRS), which indicates the overland route runs directly into both the unnamed creek and the small pond/Stream 5A2.

EA Response: The text has been revised as suggested.

TCEQ Comment 2: Section 3.6, Surface Water, sixth paragraph, "Although the unnamed creek is likely intermittent and may connect to Five Mile Creek during flood events, a connection upstream to the west of the site with Five Mile Creek is not clear" - a suggested revision is "a connection between the unnamed creek and Five Mile Creek was not observed during the Site Inspection."

EA Response: The text has been revised as suggested.

TCEQ Comment 3: Section 3.6, Surface Water, sixth paragraph, "The braided pattern and dendritic drainage of Five Mile Creek and Stream 5A2 make the surface water pathway uncertain" - a suggested revision is "The TCEQ and EPA have not fully mapped the braided pattern of the merged Unnamed Creek and Stream 5A2 in this area."

EA Response: The text has been revised as suggested.

TCEQ Comment 4: Section 3.9, Ecological Setting - a lot of the information in this section came from the HRS and the referenced sources should be quality control reviewed.

EA Response: The HRS Documentation Record is now properly cited.

TCEQ Comment 5: Section 4.4.2, Sediment and Surface Water - please refer to comments on Tables 2 and 3. This section may need to be updated if additional analytes or benchmarks are added to the associated tables.

EA Response: This section was updated as warranted.

TCEQ Comment 6: Section 4.4.3, Waste Samples, second paragraph - this paragraph provides a list of chemicals that exceed the most conservative screening levels in at least one sample and identifies which chemicals exceed industrial Regional Screening Levels (RSLs). However, all arsenic, hexavalent chromium, selenium, and thallium waste sample results are reported as not detected and should be removed from both lists. Additionally, the list of chemicals that exceed industrial RSLs is referred to as "compounds in surface soil" - this should be revised to "compounds in waste."

EA Response: In response to EPA comment, the comparison of waste sample concentrations to screening levels has been removed.

TCEQ Comment 7: Section 5.1, Surface Water Transport, first paragraph, "Contaminant transport of particulates and dissolved phase contaminants via surface water transport may occur through ephemeral pathways during precipitation events toward Stream 5A2 and the small pond" - this should be revised to also include wetlands and the unnamed creek.

EA Response: The text has been revised as suggested.

TCEQ Comment 8: Section 7, Human Health Conceptual Exposure Pathway Analysis, first paragraph, "Figures 9 and 1110 present the preliminary human health CSM" - lists an incorrect figure number and should be rephrased to reference "Figures 9 and 10."

EA Response: The text has been revised as suggested.

TCEQ Comment 9: Section 7.5, Potentially Complete Exposure Pathways, Construction Worker Exposure - sediment and surface water are not addressed under the Construction Worker Exposure scenario. If Construction Workers are not expected to come into contact with sediment or surface water at the site, this should be indicated in this section.

EA Response: The text has been revised as suggested.

TCEQ Comment 10: Section 7.5, Potentially Complete Exposure Pathways, Trespasser Exposure - Ground water is not addressed under the Trespasser Exposure scenario. If Trespassers are not expected to come into contact with ground water at the site, this should be indicated in this section.

EA Response: The text has been revised as suggested.

TCEQ Comment 11: Section 8.1.5, Media of Concern, first paragraph, "The expected media of concern include site surface and subsurface soil, site ground water, and sediment in the forest near the facility; and sediment and surface water in the Stream 5A2 and small pond" - should be revised to additionally include sediment and surface water in the unnamed creek.

EA Response: The text has been revised as suggested.

TCEQ Comment 12: Tables, general comment - Final data review qualifiers for the Site Inspection data were not included on the associated report tables. The final data review qualifiers are included in References 34 and 35 of the HRS and were delivered to the EPA via email by TCEQ on November 28, 2018. Please use these references to update report tables with the correct data review qualifiers.

EA Response: The tables have been updated with the final data review qualifiers.

TCEQ Comment 13: Table 1, Soil Sample Results -
a. The TCEQ recommends tabulating all of the chemicals currently listed in this table for the Site Inspection samples so they are comparable and consistently reported with the other soil samples. Aluminum, barium, beryllium, cobalt, iron, manganese, selenium, silver, thallium, and vanadium data are available for Site Inspection samples but are not tabulated in Table 1. These data are included in References 33 and 56 of the HRS and were delivered to the EPA in electronic format via email by TCEQ on November 28, 2018.

EA Response: The table has been updated as suggested.

b. The detection limits for mercury in samples S0-01 and S0-02 are incorrectly reported and should be "0.074" and "0.069" instead of "0.74" and "0.69" milligrams per kilogram (mg/kg).

EA Response: The table has been updated as suggested.

c. The S0-06 cyanide data qualifier is incorrect and should be listed as "UJ-".

EA Response: The table has been updated as suggested.

d. The following should be added to the table notes - "L = Reported concentration is between the MDL and the CRQL," "- = Low bias," "MDL = Method detection limit," "CRQL = Contract required quantitation limit," and "S0-08 is a field duplicate of S0-03."

EA Response: The table has been updated as suggested.

TCEQ Comment 14: Table 2, Sediment Sample Results -
a. The TCEQ recommends tabulating the same list of chemicals for both sediment and surface water to provide a direct comparison of results between the two media. The TCEQ

suggests adding the following analytes to Table 2 to be consistent with significant concentrations detected in the source or surface water, or to show detections of analytes in sediment that were detected above the RSLs in soil: aluminum, antimony, arsenic, barium, iron, manganese, nickel, vanadium, and zinc. These data are included in References 33 and 56 of the HRS and were delivered to the EPA in electronic format via email by TCEQ on November 28, 2018.

EA Response: The table has been updated as suggested.

b. Most of the cyanide qualifiers are incorrect and need to be updated with the final data review qualifiers referenced in Comment 12. Cyanide results in the following samples should be qualified as "LJ" - SE-02, SE-06, SE-08, SE-10, SE-11, SE-12, and SE-15. Cyanide results in the following samples should be qualified as "J-" - SE-05 and SE-07. Cyanide results in the following samples should be qualified as "J" - SE-13 and SE-14.

EA Response: The final data review qualifiers are presented in Reference 35 of the HRS and were delivered to the EPA via email by TCEQ on November 28, 2018. Table 1 of Reference 35 was used to update data presented in the CUSTM. The sediment cyanide qualifiers in Table 2 are consistent with Reference 35.

c. The lead results for samples SE-11 and SE-12 are reported incorrectly. Results for these samples should be corrected to the final qualified lead results of 1.2 J+ mg/kg.

EA Response: The table has been updated as suggested.

d. The following should be added to the table notes - "L = Reported concentration is between the MDL and the CRQL," "- = Low bias," "+ = High bias," "MDL = Method detection limit," "CRQL = Contract required quantitation limit," and "SE- 14 and SE-15 are field duplicates of SE-08 and SE-09, respectively."

EA Response: The table has been updated as suggested.

e. The table note that indicates the Ecological Screening Values source should specify the use of Freshwater Benchmarks.

EA Response: The table has been updated as suggested.

f. The TCEQ recommends that EPA consider adding the TCEQ human health benchmarks for sediment based on incidental ingestion and dermal contact. These exposure routes are indicated in Section 7.5, Potentially Complete Exposure Pathways. These benchmarks were delivered to the EPA in electronic format via email by TCEQ on November 28, 2018.

EA Response: The table TCEQ TRRP Tier 1 Protective Concentration Levels for Human Health have been added to the table.

TCEQ Comment 15: Table 3, Surface Water Sample Results -

a. The TCEQ recommends tabulating the same list of chemicals for both sediment and surface water to provide a direct comparison of results between the two media. The TCEQ suggests adding the following analytes to Table 3 to be consistent with significant concentrations detected in the source or sediment, or to show detections of analytes in surface water that were detected above the RSLs in soil: antimony, beryllium, and cadmium. These data are included in References 33 and 56 of the HRS and were delivered to the EPA in electronic format via email by TCEQ on November 28, 2018.

EA Response: The table has been updated as suggested.

b. All cyanide surface water data were rejected and need to be updated with the final data review qualifiers referenced in Comment 12. Cyanide surface water results for all samples should be qualified as "R."

EA Response: The table has been updated as suggested.

c. The lead results for the following samples are reported incorrectly: SW-03, SW- 05, SW-06, SW-07, SW-08, SW-09, SW-12, SW-13, SW-14, and SW-15. Results for these samples should be corrected to the final qualified lead results of 2.3 J+ micrograms per liter (ug/L).

EA Response: The table has been updated as suggested.

d. The following should be added to the table notes - "R = Rejected data," "+ = High bias," and "SW-14 and SW-15 are field duplicates of SW-08 and SW-09, respectively."

EA Response: The table has been updated as suggested.

e. The table note that indicates the Ecological Screening Values source should specify the chromium benchmark used is for trivalent chromium.

EA Response: The table has been updated as suggested.

f. The chromium Maximum Contaminant Level (MCL) is listed incorrectly as not available (NA) - the chromium MCL should be corrected to 100 ug/L.

EA Response: The MCLs have been replaced with TCEQ human health benchmarks.

g. The TCEQ recommends that EPA consider adding the TCEQ human health benchmarks for surface water based on incidental ingestion, dermal contact, and an incidental or sustainable fishery based on stream size. These exposure routes are indicated in Section 7.S, Potentially Complete Exposure Pathways. These benchmarks were delivered to the EPA in electronic format via email by TCEQ on November 28, 2018.

EA Response: The table has been updated as suggested.

TCEQ Comment 16: Table 4, Waste Sample Results - Nickel results exceed the ecological screening value. TCEQ recommends underlining them to be consistent with other metals shown in exceedance of ecological screening values on this table.

EA Response: In response to EPA comment #8, the waste samples are no longer compared to screening levels.

TCEQ Comment 17: Figures 3 and 4, Soil Sample Locations and Sediment and Surface Water Sample Locations - the TCEQ recommends adding all duplicate labels for duplicate samples on these figures. This includes sample S0-08 on Figure 3 (duplicate of S0-03) and samples SW-14 and SW-l5 on Figure 4 (duplicates of SW-08 and SW-09).

EA Response: The figures have been revised as suggested.

TCEQ Comment 18: Figure 5, Soil Human Health Screening - sample locations A5, A6, and B5 are unshaded. This is incorrect because hexavalent chromium exceeds the residential RSL in these samples. These samples should be correctly shaded yellow. TCEQ also recommends quality control review of this figure to ensure all exceedances are represented.

EA Response: The figure has been revised. All figures have been checked to ensure accuracy.

TCEQ Comment 19: Figures 6, 7, and 8, Sediment Ecological Risk Screening, Surface Water Human Health Screening, and Surface Water Ecological Risk Screening - the TCEQ recommends removing hexavalent chromium from the figure tables because hexavalent chromium was not analyzed in surface water or sediment samples and is not tabulated in associated Tables 2 and 3.

EA Response: Hexavalent chromium has been removed from Figures 6, 7, and 8.

TCEQ Comment 20: Figure 7, Surface Water Human Health Screening -
a. The EPA RSL Resident Tapwater value listed for hexavalent chromium is incorrect and should be updated.

EA Response: Hexavalent chromium has been removed from Figure 7.

b. The chromium MCL is listed incorrectly as NA and should be corrected to 100 ug/L.

EA Response: Surface water results are not compared to MCL values, and alternative screening levels are now presented on Figure 7.

c. The qualified lead result for sample SW-03 of "2.3 J+" does not exceed the MCL and the shading on Figure 7 needs to be updated to reflect the qualified result.

EA Response: Surface water results are no longer compared to MCL values, and alternative screening levels are now presented on Figure 7. Benchmark comparisons have been checked for accuracy.

d. The TCEQ recommends that EPA consider adding the TCEQ human health benchmarks for surface water based on an incidental or sustainable fishery discussed in Comment 15f. If included, Figure 7 would show sample locations SW-04 and SW-13 in exceedance of the corresponding fishery values for mercury and manganese. These benchmarks were delivered to the EPA in electronic format via email by TCEQ on November 28, 2018.

EA Response: Figure 7 has been updated as suggested.

Comments from Greg Zychowski, TCEQ Technical Program Support Team

TCEQ Comment 1: Pathways - Most of the important ecological exposure pathways have been identified. Consistent with the TCEQ's guidance (TCEQ 2018a, section 9.2), wildlife ingestion is prioritized over other exposure routes such as dermal absorption and inhalation.

EA Response: Comment acknowledged.

TCEQ Comment 2: Groundwater as a source medium - Figure 12 graphically summarizes the CSM for the site. Note that the groundwater-to-surface water pathway is believed to be complete and significant for aquatic wildlife and benthic invertebrates. The CSM does not include any groundwater data, but such information would eventually be useful in determining whether groundwater sources are protective for ERA purposes. Site representatives may consult with the following references to aid in the evaluation of these pathways: TCEQ (2018a), especially sections 2.5 (under "Sampling depth"), 2.6, and 10.2.5; TRRP-15eco (TCEQ 2013), especially section 5 and the associated workbook for determining discharge- weighted groundwater concentrations (both at the link under "References" below); and TRRP-24 (TCEQ 2007), especially sections 4.0 and 7.0, and Figure 7-5.

EA Response: Comment acknowledged. It is noted that in response to EPA Comment #15, the groundwater-to-surface water pathway has been changed to "potential" until it is determined the pathway is complete.

TCEQ Comment 3: Soil versus sediment - Figure 12 suggests that all forested areas under consideration for the ecological risk assessment (ERA) are within an "aquatic exposure pathway." This may be suitable if the forested areas are typically inundated.' Otherwise, site representatives should evaluate the typical condition of the forested areas and determine whether "soil" may be an appropriate descriptor for the more upland/upgradient locations. Also see TCEQ (2013) sections 2.1.6, 3.1.2 , and 3.3.2.3.

EA Response: The pathways have been adjusted to make it clear that the forest/wetland areas are within aquatic and terrestrial exposure pathways.

TCEQ Comment 4: Additional resources - Site representatives may also find useful the Protective Concentration Levels Calculator (the "PCL Database," WTM1U 2018). In addition to providing default PCL values, the PCL Database features representative species for various habitats, stores chemical profiles and profiles containing the inputs and references underlying the PCL calculations, and allows for the adjustment of PCL results based on site-specific factors.

> **EA Response:** Comment acknowledged.

TCEQ Comment 5: Representative species - A diversity of habitats and feeding guilds are represented in the CSM. Site representatives should evaluate whether the current representative species for aquatic and terrestrial wildlife are among the more sensitive for their respective feeding guilds. As an example, the great blue heron was selected in the CSM as the representative species for piscivorous birds, while similar species with a similar habitat and diet (e.g., green heron) may be more sensitive and therefore encourage a lower target cleanup value. The PCL Database may offer insights into species sensitivity.

> **EA Response:** Since these heron receptors have about the same ingestion rate and the TRVs used are the same, the relative sensitivity is dependent upon the chemical compound evaluated in the PCL Database. For instance, the green heron is more sensitive to some chemicals, but the great blue heron is more sensitive to others (lead, for example). The main difference is the PCL Database assumes the great blue heron eats only fish and the green heron eats mostly fish and some benthic invertebrates; and the chemical uptake into fish and benthic invertebrates is dependent upon the chemical. The ERA will evaluate risk of fish and benthic invertebrate ingestion. Although there could be minor differences in dose due to differing ingestion rates, the goal of the ERA is to evaluate risk to receptor groups on a population level, and the selected representative species are expected to be sufficient for that evaluation. If a protected species is expected on site, a suitable surrogate species will be identified and used as a representative receptor throughout the risk evaluation.

TCEQ Comment 6: Plants - The CSM accounts for the possible exposure of terrestrial and aquatic plants to COPCs. The conservatism of this approach is appreciated. Although the TCEQ's ERA program does not typically focus on plants, they are prioritized to the extent that they are either protected (rare, threatened, or endangered) or compromised to the point of affecting higher trophic levels. According to CSM section 3.10, none of the protected plants featured in the corresponding table have been documented on the site.

> **EA Response:** Since none of the protected plants have been documented on site, plants have been removed as an assessment endpoint and the ERA will not focus on plants as ecological receptors. However, plants are still discussed in the identification of exposure pathways and included in Figure 12.

TCEQ Comment 7: Soil sampling depths - Because the affected ecological habitat includes areas that may be suitable for burrowing receptors, site representatives should reconsider their position that subsurface soil is an insignificant exposure medium (see section 8.1.4). Burrowing receptors may include armadillo, foxes, skunks, and others. Also note that the practice of

grouping results from various depth intervals into the same statistical analysis is not usually endorsed. Therefore, if the different depth intervals shown in Table 1 are retained and all included in the same statistical analysis, a justification for this should eventually be provided (for example, if the COPCs are uniformly distributed vertically).

> **EA Response:** In addition to being evaluated as a predatory mammal, the red fox will be evaluated as a burrowing mammal receptor for exposure to subsurface soil sample collected below 18 inches through ten feet below ground surface. For the ERA, it is assumed that a receptor exposed to surface soil will be exposed through the entire column of surface soil. Since most samples have results through 18 inches, surface soil exposures will evaluate the top 18 inches of soil. The ERA will consider the maximum surface soil concentration and the 95 percent upper confidence limit of the mean of all surface soil sample results will be calculated for a mean exposure. Separately calculating risk for each sample depth doesn't make sense since the depth intervals on the previously collected data overlap and the receptor is being exposed to all 18 inches. Therefore, the mean exposure point concentration should reflect the entire column. The ERA will also delineate any source areas or hot spots on a sample by sample basis.

TCEQ Comment 8: COPCs by medium - The lists of COPCs between soil, sediment, and surface water differ between Table l, Table 2, and Table 3 in the CSM. If there is a rationale for this, it should eventually be provided.

> **EA Response:** An expanded list of COPCs is now included in the tables.

TCEQ Comment 9: Screening values - The TCEQ benchmarks (TCEQ 2018b) can often be used to screen from further evaluation the non-bioaccumulative COPCs that pose minimal risk. However, the TCEQ's requirement is to retain bioaccumulative COPCs (such as cadmium and mercury in soil and sediment) for further evaluation. The same practice is often applied to those COPCs that have no readily available screening value. Note that Table 3 in the CSM features the surface water benchmark for trivalent chromium (42 µg/L) but not for hexavalent chromium (10.6 µg/L), even though hexavalent chromium is relevant to the site. Although the TCEQ's soil and sediment benchmark tables do not offer hexavalent chromium screening values (only total chromium values are available), the PCL Database does offer results specifically for hexavalent chromium (for wildlife exposure pathways).

Please also note that while the sediment benchmarks are the ecological screening values of interest in Table 2, the second effects levels are mentioned in the Figure 6 lege11d. The intended use of the second effects values in the figure is unclear, but such values have been used to calculate the benthic PCLs (see TCEQ 2018a, section 2.1 under "Sediment"). In the TCEQ's ERA program, benthic PCLs should eventually be considered alongside wildlife PCLs for the determination of final ecological PCLs for sediment.

> **EA Response:** The comparison of screening levels to site concentrations in the CUSTM is to identify any potential COPCs and does not attempt to dismiss any COPCs. In future risk assessments, all detected analytes will be evaluated. Additional samples will be collected as part of the remedial investigation and analyzed for hexavalent chromium.

These results will be compared to hexavalent chromium benchmarks. The second effects levels are used in Figure 6 to delineate areas of highest exceedances.

TCEQ Comment 10: Interpretation of available data - Because the CSM focuses mainly on identifying complete ecological exposure pathways, an in-depth review of the available data is def erred until sample collection and analysis for an ERA is complete. A first impression of the tables and figures is that delineation to ecologically protective levels is not yet complete for any medium. Figures 6 and 8 illustrate the ecological screening results for surface water and sediment. No figure illustrates the results from ecological soil screening, although Table 1indicates several exceedances of ecological screening benchmarks.

EA Response: As discussed in Section 6, additional samples will be collected as part of the remedial investigation to delineate source areas and the extent of contamination. As discussed in Section 4.4.1, the concentrations of at least one primary COPC in each sample exceeds the TCEQ ecological soil benchmarks; therefore a figure of the soil screening was not necessary as each sample exceeded.

If you have any questions regarding this submittal, please call me at (510) 545-4138.

Sincerely,

Mark Paddack
Project Manager

Enclosure

cc:

Brian Delaney, EPA Contract Officer (letter only)
Rebecca Storms TCEQ Project Manager (one electronic copy on CD)
Tim Startz, EA Program Manager (letter only)
File

This page left intentionally blank