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

August 29, 2011

Halaco Superfund Site: EPA testing results for the Halaco properties in Oxnard, California

The attached report provides testing results for the former Halaco properties in Oxnard, California. The Halaco properties consist of the Perkins Road "smelter parcel" where Halaco conducted most of its operations, and the waste management area east of the Oxnard Industrial Drain (OID). The report includes a description of the testing effort, a tabular summary of results, and figures depicting selected results. The testing is part of the remedial investigation (RI) performed by the U.S. Environmental Protection Agency (EPA) for the Halaco Superfund Site in Oxnard, California. Halaco operated an aluminum and magnesium smelter at the site from 1965 to 2004.

Testing

EPA and its contractors collected 241 soil and waste samples from 68 locations between November 2009 and June 2010 to define the nature and extent of contamination on the Halaco properties.

All soil and waste samples were analyzed for aluminum, magnesium, and other metals, and most samples were analyzed for radioactive thorium and radium. About one-quarter to one-half of the samples were analyzed for volatile and semi-volatile organic compounds, total petroleum hydrocarbons (TPH), polychlorinated biphenyls (PCBs), dioxins, and furans. Nine soil gas samples were also collected and analyzed for a variety of constituents, and nine waste samples underwent geotechnical analysis.

Findings

Based on the testing, and previous studies, EPA has concluded the following.

- The majority of Halaco's waste is in the 26-acre waste management area east of the OID where Halaco discharged its wastes from about 1970 to 2002. The volume of waste exceeds 700,000 cubic yards.
- An estimated 50,000 cubic yards of Halaco's waste is buried in the southeastern portion of the 11-acre Perkins Road property. Halaco's waste solids appear to have been used in the late 1960s to fill in a former OID channel.
- Halaco's wastes are, on average, about 11% aluminum, 13% magnesium, and less than a percent each of various other metals.

- Some of Halaco's wastes are contaminated by organic contaminants: PCBs, dioxins and furans, polycyclic aromatic hydrocarbons (PAHs), and Total Petroleum Hydrocarbons (TPH).
- Thorium and radium are present at elevated levels in the wastes buried at the Perkins Road property and the bottom several feet of the waste pile. These are presumed to be older waste materials, generated before about 1978. Thorium and radium are generally at background levels (i.e., no higher than in clean soils) in the majority of the waste pile.
- The banks of the OID, where it passes through the Halaco properties, consist largely of Halaco's waste materials.
- The levels of contamination in soils and sediments adjacent to the Halaco properties are described in three companion reports (CH2M HILL, 2011a, 2011b, 2011c).
- Additional waste believed to be the remains of a municipal burn dump from the 1940s and 1950s is buried under much of the Perkins Road property. The report describes the composition of the burn dump waste, and changes in topography, surface drainage, and land use at the Halaco properties from the 19th century to the present.
- EPA has completed a screening-level risk assessment that indicates that the Halaco waste management area may pose a health risk to people in frequent contact with the wastes.
- The Halaco waste pile rises about 35 feet above ground. About 5 feet of the waste is below grade and in contact with the groundwater. Some of the Halaco waste buried on the Perkins Road property is also in contact with the groundwater. The report includes several geologic cross sections depicting the approximate extent of Halaco's wastes and the burn dump wastes.

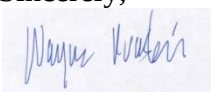
Next Steps

EPA has been investigating the potential for the industrial use of Halaco's wastes. As part of its evaluation, EPA is considering a pilot-scale test of the feasibility and cost of using the waste to manufacture cement.

After its evaluation is complete, EPA will conduct a formal "feasibility study" comparing cleanup options and develop a cleanup proposal for the properties. EPA will seek and consider public comments as it evaluates cleanup options and develops its cleanup proposal.

If you have comments or seek additional information, please contact me at 415-972-3181 or praskins.wayne@epa.gov. Additional information is also available at http://www.epa.gov/region9/halaco

Sincerely,



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EPA Project Manager

Enclosure ("Solid Matrix and Soil Gas Sampling and Analysis Results for the Smelter Parcel and Waste Management Areas, Halaco Superfund Site Remedial Investigation," August 2011)

SOLID MATRIX AND SOIL GAS SAMPLING AND ANALYSIS RESULTS FOR THE SMELTER PARCEL AND WASTE MANAGEMENT AREAS

HALACO SUPERFUND SITE
REMEDIAL INVESTIGATION

OXNARD, CALIFORNIA

EPA CONTRACT NO. EP-S9-08-04
EPA TASK ORDER NO. 015-RIRI-09X6
CH2M HILL PROJECT NO. 385135

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Acronyms and Abbreviations

µg/kg	microgram(s) per kilogram
µg/L	microgram(s) per Liter
95% UCL	95 percent upper confidence limit
bgs	below ground surface
COC	chain of custody
cpm	count(s) per minute
CPT	cone penetrometer test
CRQL	contract-required quantitation limit
Cs 137	cesium 137
DTSC	California Department of Toxic Substances Control
EDi	Environmental Dimensions, Inc.
EPA	U.S. Environmental Protection Agency
FSP	Field Sampling Plan
GPS	Global Positioning System
Halaco	Halaco Engineering Co.
K 40	potassium 40
KLI	Kinnetic Laboratories, Inc.
LDT	leak detection test
MEK	methyl ethyl ketone
mg/kg	milligram(s) per kilogram
mL/min	milliliter(s) per minute
MTBE	methyl tert-butyl ether
ng/kg	nanogram(s) per kilogram
NaI	sodium iodide
NAVD 88	North American Vertical Datum of 1988
ND	not detected
NCL	Nature Conservancy Land

NPL	National Priorities List
NRC	Nuclear Regulatory Commission
OCDD	octachlorodibenzo-p-dioxin
OCDF	octachlorodibenzofuran
OID	Oxnard Industrial Drain
OSWER	Office of Solid Waste and Emergency Response
PAH	polycyclic aromatic compounds
PCB	polychlorinated biphenyl
PCDD	polychlorinated dibenzo-p-dioxin (or dioxin)
PCDF	polychlorinated dibenzofuran (or furan)
PCE	tetrachloroethene
pCi/g	picocurie(s) per gram
ppbv	part(s) per billion by volume
ppm	part(s) per million
QAPP	Quality Assurance Project Plan
Ra 228	radium 228
Ra 226	radium 226
RI	Remedial Investigation
RSL	Regional Screening Level
SOP	standard operating procedure
SPT	standard penetration test
Site	Halaco Engineering Co. Superfund Site
SVOC	semivolatile organic compound
TCDD	tetrachlorodibenzodioxin
TCE	trichloroethene
TEF	toxicity equivalency factor
Th 232	thorium 232
Th 230	thorium 230
Th 228	thorium 228
TIC	tentatively identified compounds

TPH	total petroleum hydrocarbons
ULS	ULS Services Corp.
USGS	U.S. Geological Survey
VOC	volatile organic compound
WDA	Waste Disposal Area
WDC	WDC Exploration & Wells
WMU	Waste Management Unit

SECTION 1

Introduction

This report provides the results of soil, waste, and soil gas testing for the Smelter Parcel and Waste Management Areas ("the Halaco properties") at the Halaco Engineering Co. Superfund Site (Site) in Oxnard, California. See Figure 1a for locations. Wastes at the Halaco properties include process waste produced by Halaco's operations and municipal burn dump waste that predates Halaco's operations. The soil gas samples, and most soil and waste samples, were collected in March 2010. Some soil and waste samples also were collected in November 2009 and June 2010. This report includes a description of the testing effort, a brief narrative and tabular summary of results, and figures depicting selected results. Monitoring well installation and groundwater sampling activities performed at the Halaco properties will be described in a separate report. This testing is part of the remedial investigation (RI) performed by the U.S. Environmental Protection Agency (EPA) for the Site. The testing was completed in accordance with an EPA-approved Quality Assurance Project Plan (QAPP; CH2M HILL, 2009a) and Field Sampling Plan (FSP; CH2M HILL, 2009b).

1.1 Objectives

The primary objective of the testing was to provide data needed to determine the nature and extent of wastes and soil contamination at the Halaco properties. The data also will be used to characterize the human health and environmental risks posed by the contaminated soils and wastes and to evaluate remedial options.

1.2 Background

The Site is located in eastern Ventura County at and near 6200 Perkins Road in Oxnard, California. Halaco Engineering Company (Halaco) operated a secondary metal smelter at the Site from 1965 to 2004, recovering aluminum and magnesium for reuse. The site background, including a description of Halaco's operations and waste disposal practices, and the physical and ecological settings, is described in the QAPP. A brief summary is provided below.

The Site includes an 11-acre parcel containing the former smelter, a 26-acre Waste Management Area where wastes were deposited and managed, and adjacent areas affected by Halaco's wastes. The 26-acre area includes the Waste Management Unit (WMU), which contained Halaco's former waste settling ponds, and the Waste Disposal Area (WDA) to the north, which received waste from the WMU. The adjacent areas affected by Halaco's wastes include portions of:

- Land owned by the Nature Conservancy east and north of the Waste Management Area, referred to as NCL-East and NCL-North
- Wetland and beach areas south of the Smelter Parcel and WMU
- The Oxnard Industrial Drain (OID), which bisects the Halaco properties, and an associated lagoon

During its 40 years of operation, Halaco acquired scrap metal from more than 400 suppliers in a variety of forms and in varying levels of purity. Halaco processed dross, sludge, castings, sheets, pellets, granules, cans, car parts, and other scrap. Halaco reports that it processed one type of scrap, a low-level radioactive magnesium-thorium alloy, until about 1977. Other metals found in aluminum and magnesium alloys include copper, silver, zinc, lead, chromium, titanium, tin, manganese, and nickel.

Halaco produced large quantities of solid and liquid waste. Most of the waste was "process waste" generated during the smelting process. Other waste was generated by the air pollution control equipment and from used oil and spent solvent. From 1965 to about 1970, Halaco discharged much or all of its waste to a former channel of the OID and a settling pond adjacent to the OID and used waste solids as fill in the smelter area. In about 1970, Halaco began pumping its wastewater across the OID into unlined earthen settling ponds in the area later named the WMU. Beginning in or before 1980, Halaco moved waste solids from the WMU to the WDA.

Halaco reports that all operations ceased in September 2004. In 2007, EPA estimated that more than 700,000 cubic yards of waste solids remained onsite. Most of the solids are in the WMU, which covers about 15 acres and rises up to 40 feet above grade. Previous testing at the Site showed that elevated levels of several metals are present in the waste, and that soils, sediments, and groundwater have been contaminated by Halaco's wastes. Constituents found at elevated levels included aluminum, barium, beryllium, cadmium, chromium, copper, lead, magnesium, manganese, nickel, and zinc. Elevated levels of radioactive thorium (and decay products) were found in some areas. In past sampling, elevated levels of ammonia and petroleum hydrocarbons also were detected at the Site. The ammonia is believed to be a byproduct of the smelting process.

1.3 EPA Actions from 2006 through 2010

In 2006, EPA completed a testing effort at the Site called the Integrated Assessment (Weston Solutions, Inc., 2007) to (1) determine the Site's eligibility for placement on the Superfund National Priorities List (NPL), and (2) evaluate the need for immediate actions to stabilize the Site. In September 2007, EPA added the former Halaco facility and adjacent areas of contamination to the NPL. Shortly thereafter, EPA began the RI to determine the nature and extent of contamination at the Site, identify human health and ecological risks posed by the contamination, and identify areas needing remediation.

In 2006 and 2007, two removal actions were completed to address immediate site risks while EPA evaluated the Site for placement on the NPL. The first removal action, completed by the property owners between August 2006 and February 2007, included the removal of drums and other hazardous substances from the Site. A second, EPA-funded removal action was completed in 2007 to stabilize and secure the Site and limit offsite migration of contaminated wastes. It included re-grading the waste pile to reduce the steepness of the slopes; placing matting on the slopes to reduce erosion; stabilizing the banks along the lower portion of the OID; removing an estimated 9,000 cubic yards of waste from the smelter area; removing an estimated 7,600 cubic yards of material from a wetland area adjacent to the Halaco property; and installing more than 6,000 feet of fencing around the perimeter of the Waste Management Area. See the "Team 9" report (2008) for additional details. The aerial photo in Figure 1a was taken after the second removal action was completed.

In 2007, EPA completed additional site characterization activities. These included a radiation assessment of surface and subsurface conditions throughout the Smelter Parcel (Team 9, 2008).

In 2008, EPA completed a screening-level ecological and human health risk assessment to support RI activities for the Site (CH2M HILL, 2008a). This screening-level risk assessment identified major contaminants of potential concern and environmental exposure pathways for ecological and human receptors. This assessment used conservative estimates of exposure and potential ecological and human health effects to identify areas of the Site that may pose unacceptable risks to human health and/or the environment and may warrant remediation.

Also in 2008, EPA completed a preliminary evaluation of the sources, nature, extent, and movement of contamination in surface water and groundwater at the Site (CH2M HILL, 2008b). This preliminary evaluation compiled and evaluated information on the sources, nature and extent of surface water and groundwater contamination at the Site, and the physical processes that affect the movement of the contamination.

In 2009, using the results of the Integrated Assessment, the radiation assessment, screening-level risk assessment, and preliminary groundwater evaluation, EPA identified data gaps and prepared a plan for additional sampling and analysis activities needed before remediation can occur (EPA Region 9, 2009). CH2M HILL then prepared the data quality objectives, QAPP, and FSP for this RI based on the testing plan.

In 2010, EPA demolished two abandoned industrial buildings at the Site. The two buildings were in poor condition and at risk of collapse.

SECTION 2

Initial Conceptual Site Model

This section describes what was known about the Halaco properties prior to the 2009-2010 RI activities, and why these areas were thought to pose a potential threat to human health or the environment.

2.1 Halaco Properties

The historical aerial photographs in Attachment A show changes in topography, surface drainage, and land use at the Halaco properties between 1929 and 1991. The 14 photographs were compiled and analyzed by the EPA Environmental Monitoring Systems Laboratory (Lockheed Engineering and Management Services Company, 1982, and Lockheed Engineering and Sciences Company, 1991). Figure 1b displays photographs from those presented in Attachment A at key times in the Site's history. Changes to the Halaco properties are also shown in four historical topographic maps in Figure 1c. The four maps are excerpts from 1850s U.S. Coastal Survey maps, a 1904 U.S. Geological Survey (USGS) map, a 1925 Ventura County map, and a 1949 (photo revised 1967) USGS map.

The 1850s, 1904, and 1925 topographic maps (Figure 1c) and the 1929 aerial photograph (Figure 1b) show predevelopment conditions, with the OID flowing southwest through NCL-North and the Smelter Parcel. The OID terminated in a small lagoon near the southeastern corner of the Smelter Parcel. The modern-day lagoon shown in Figure 1a was not present.

The 1945 aerial photograph (Attachment A) appears to show disturbed soil, bulldozer tracks, and fill activities at the Smelter Parcel, and the OID shifted east of its 1929 predevelopment alignment. The activities at the Smelter Parcel are presumed to be associated with the City of Oxnard's municipal burn dump, and remain visible in the 1951 and 1959 photographs. An annotation on the 1959 photograph identifies an "active burial area" covering most of the Smelter Parcel. Also visible in the 1945 photograph is the former coastal canal that conveyed surface water from the Hueneme Drain (a.k.a. Bubbling Springs) southeast to the Mugu Lagoon. This coastal canal was constructed during or before the 1930s according to an Oxnard Drainage District No. 3 drawing (undated). It appears to still be operational in the 1951 photograph, but partially filled with sand and dilapidated in the 1959 photograph. The modern-day lagoon is not present during this period.

The 1965 aerial photograph shows the Halaco properties prior to development by Halaco. The burn dump is no longer visible and the portion of the coastal canal to the east of the OID appears to be filled with sand. The 1969 photograph shows early Halaco operations at the Smelter Parcel and process waste being discharged to a small pond in the OID. The 1970 photograph shows a realigned OID channel east of the 1945 through 1965 alignment. It appears that process waste filled the existing OID channel in the late 1960s to create the alignment that exists today.

The photographs from 1970 through 1991 show Halaco's waste disposal activities at the Waste Management Area east of the OID. The historical photographs also show a portion of the OID flowing across the west half of the WDA and the northwest corner of the WMU. This historical channel is also indicated by the historical topographic maps (Figure 1c). The 1981 photograph shows the initial disposal of process waste in the WDA, which was not evident in the 1978 photograph.

The 1991 aerial photo shows the early stages of the modern-day lagoon. During this time, Ventura County manually breached the naturally occurring coastal sand berm (the "beach berm") at the end of the J Street Drain to prevent upstream flooding. Flow from the J Street Drain and OID discharged into a small lagoon (compared to its current extent) and then exited the breach to the ocean.

Figures 1d through 1g provide aerial photographs and topographic maps prior to and after EPA's 2007 re-grading of the waste pile at the Waste Management Area. The former settling ponds visible at the WMU in the February 2007 photograph (Figure 1d) are no longer present in the April 2007 photograph (Figure 1e). EPA demolished and removed the two large process buildings shown in these photos in 2010.

Figure 1h provides an undated aerial photograph of Halaco's operations. There appears to be steam rising from one of the settling ponds at the WMU, possibly from Halaco's discharge of process water.

2.2 Sources, Nature, and Extent of Contamination

The sources, nature, and extent of contamination are described in each of the investigation areasshown in Figure 1i. The Smelter Parcel consists of the Southeast Smelter Area, Process Area, Parking Area, and North Area. The Southeast Area includes the 1959 OID channel and the area between this former channel and the current OID. The Process Area includes the two former industrial buildings that EPA demolished in 2010. The Parking Area consists of the paved area north of the office and machine shop building. The North Area is to the north of the Parking Area and Process Area. The Waste Management Area consists of the WDA and WMU.

2.2.1 Smelter Parcel

Southeast Smelter Area

The Southeast Smelter Area was known to be a disposal location for Halaco's process waste solids, based on review of aerial photographs, data from the Integrated Assessment performed in 2006, and data from EPA's followup investigation in 2007. Halaco discharged process waste into a settling pond in or adjacent to the OID from about 1965 to 1970 (see the "1969 pond" in Figure 1i) and apparently used some or all of the waste solids as fill in a former OID channel (see the "1959 OID" channel shown in Figure 1i). Until 2007, when EPA removed concrete during subsurface testing, much of this area was paved.

The metals that Halaco primarily targeted for recovery (aluminum and magnesium) are major constituents of Halaco's wastes. Halaco's wastes also contain non-target metals that were present in the alloys that Halaco processed. Non-target metals include barium,

beryllium, cadmium, chromium, copper, lead, manganese, nickel, and zinc. The older wastes emit low levels of radioactivity from the low-level radioactive magnesium-thorium alloy that Halaco reports processing until about 1977. The wastes also contain elevated levels of potassium, sodium, and chloride, components of the "flux" salts added by Halaco during the smelting process. The wastes were reactive when first produced, creating ammonia and other gases.

Sampling completed as part of the Integrated Assessment in the 1959 OID channel, and between the 1959 channel and the current OID channel, confirmed the presence of Halaco's wastes in this area. As part of the Integrated Assessment, EPA collected surface soil samples from eight locations (SSN13 through SSN20) and subsurface soil samples from one location (SSN-9/MW-12). EPA analyzed the surface samples in the field for metals using X-ray fluorescence. EPA then analyzed one of these samples (SSN-15) in an offsite lab for metals and five radionuclides (cesium [Cs] 137, potassium [K] 40, thorium [Th] 228, Th 230, and Th 232).

EPA's additional investigation in 2007 further delineated the process wastes in the Southeast Smelter Area. EPA first completed a surface soil gamma survey using a sodium iodide (NaI) detector in (1) the area southeast of the southern process building and (2) the northeast portion of the smelter property along the western bank of the OID. As shown in the Summary Report (Team 9, 2008, Figure 5-7), the survey results indicated that surface gamma radiation exceeded background in the southeast corner (up to and over 10 times background) and the northwest area (between 2 and 5 times background).

Following the surface gamma survey, EPA collected soil samples from borings drilled approximately 12 to 16 feet below ground surface (bgs) using direct push methods at (1) twenty-seven locations in the area southeast of the process buildings and along the western portion of the Smelter Parcel (B1 through B28; B8 was not performed), (2) five locations along the west bank of the OID (OID1 through OID5) and (3) three locations between the Smelter Parcel and the lagoon to the south (OID6 through OID8). Most of these locations were in the 1959 OID channel, and between the 1959 channel and the current OID channel. EPA also collected soil samples from three borings to assess background conditions, one at the North Area (BKG1) and two in the Parking Area (BKG2 and BKG3). Temporary screens were set in the borings and a NaI gamma probe was lowered into the screens to measure gamma radiation levels at 1-foot increments. EPA measured gamma radiation levels in the borings and analyzed soil samples in the field for metals using X-ray fluorescence. EPA then analyzed some of the soil samples in an offsite lab for metals and five radionuclides (Th 228, Th 230, Th 232, radium [Ra] 226, and Ra 228).

The process waste samples generally had elevated levels of magnesium, aluminum, and a variety of other metals. Radionuclides were detected at elevated levels, consistent with evidence that these materials were deposited when Halaco processed the low-level radioactive magnesium-thorium. The process wastes exhibited ammonia odors during drilling and sampling.

Process Area

The Process Area was the location of most of Halaco's operations, including the rotary furnaces used for smelting, storage of raw materials and wastes, equipment storage and maintenance, and fuel and oil storage in above-ground and underground tanks. The two former industrial process buildings that EPA demolished in 2010 were in this area. The northern (foundry) building housed the rotary furnaces. Unlike the Southeast Smelter Area, it was not known whether Halaco buried wastes in this area. Housekeeping practices were reportedly poor, however, indicating that surface or near-surface contamination from Halaco's process wastes was likely. A large amount of waste material was removed during the EPA removal action in 2007, but some waste may have remained.

Also thought to be buried in this area were the remains of the City of Oxnard's former dump, which pre-dates Halaco's smelter operations. The municipal dump materials were reportedly burned after disposal. Much of the Smelter Parcel was thought to be a disposal location for these materials based on the "active burial areas" identified in the 1951 and 1959 aerial photographs. As described in a guidance document by the California Department of Toxic Substances Control (DTSC) to investigate and characterize burn dumps (DTSC, 2003), municipalities commonly managed waste prior to the 1970s by landfilling and burning solid waste to minimize organic material that harbored disease-carrying vectors and created other unsanitary conditions. Few regulations governed the management of solid waste prior to the 1970s. In the early 1970s, the burning of municipal wastes was phased out in response to stricter air pollution laws (e.g., Clean Air Act).

Historical aerial photos show that a portion of the OID channel formerly passed through the Process Area (see 1929 OID channel in Figure 1i). It was thought that burn dump wastes might have filled a portion of the former OID channel. If Halaco subsequently buried process waste in this area, it would be expected to overlie the burn dump materials.

Sampling completed as part of the Integrated Assessment confirmed the presence of both process waste and burn dump waste. As part of the Integrated Assessment, EPA collected process waste samples from five surface locations (SWF1 through SWF5) and subsurface soil samples from four locations to a depth of 8 feet bgs (SSN1 through SSN4). Surface soil samples were not collected in this area because of the presence of concrete inside and outside the process buildings. EPA analyzed these samples in the field for metals using X-ray fluorescence. EPA then analyzed two of the waste samples (SWF1 and SWF5) and two of the subsurface samples (SSN1-1 and SSN2-8) in an offsite lab for metals and five radionuclides (Cs 137, K 40, Th 228, Th 230, and Th 232). Three of the subsurface samples were analyzed in an offsite lab for volatile organic compounds (VOCs) (SSN4, SSN7, and SSN6).

The process waste samples generally had elevated levels of magnesium, aluminum, and other metals, similar to the samples collected at the Southeast Smelter Area. Radionuclides also were elevated in some samples. Samples of burn dump waste also had elevated levels of metals.

Limited testing in the Process Area for organic constituents as part of the Integrated Assessment did not detect organic constituents at levels of concern, although oil and solvents were stored and used in large quantities, and there are reports that used oil and spent solvent were observed dripping on the ground during the years that Halaco operated.

Fuels or solvents were stored in above-ground and underground tanks. Historical documents were reviewed to identify the tank locations shown in Figure 1j.

Parking Area

The Parking Area was used by Halaco primarily for vehicle parking and is entirely paved. Based on a review of historical aerial photos and site documents, no smelting, maintenance, or raw materials storage activities are known to have occurred in this area. No process wastes were believed to be buried in this relatively small area (approximately 125 by 150 feet). However, burn dump waste was potentially thought to be buried in this area based on the "active burial area" identified in the 1951 and 1959 aerial photographs.

EPA did not collect any samples in this area as part of the Integrated Assessment.

The two Parking Area soil samples collected underneath the pavement as part of the background assessment in 2007 (BKG2 and BKG3, at 10 and 12 feet bgs, respectively) were analyzed in the field for metals using X-ray fluorescence. One of the two samples was analyzed in an offsite lab for metals and five radionuclides (Th 228, Th 230, Th 232, Ra 226, and Ra 228).

North Area

The North Area was used for material and equipment storage, and for temporary impoundment of surface water runoff pumped from the smelter area (URS, 2004). As in the Process Area, historical aerial photos show that an OID channel formerly passed through this area (see 1929 OID channel in Figure 1i) and that burn dump materials may have been buried in this area. The western edge of the 1959 OID channel was located at the eastern edge of the North Area. As in the Southeast Smelter Area, the former OID channel could have been filled with process waste.

Sampling completed in the North Area as part of the Integrated Assessment did not confirm the presence of process wastes. As part of the Integrated Assessment, EPA collected surface soil samples from twelve locations (SSN21 through SSN32) and subsurface soil samples from two locations (SSN5 and SSN-10/MW-13). EPA analyzed soil samples in the field for metals using X-ray fluorescence. EPA did not analyze any of these samples in an offsite lab for metals or radionuclides. One sample was analyzed in an offsite lab for VOCs (SSN5).

The North Area sample collected as part of the background assessment in 2007 (BKG1) was analyzed in the field for metals using X-ray fluorescence. EPA did not analyze this sample in an offsite lab for metals or radionuclides.

2.2.2 Waste Management Area

Waste Management Unit

The WMU was the disposal location for most or all of Halaco's process wastes from about 1970 to 2002. In addition to process wastes from the smelting operation, the WMU received wastes from the air pollution control equipment, and may have been a disposal location for waste oil (DTSC, 2000).

Sampling completed as part of the Integrated Assessment characterized the upper portion of the WMU. EPA collected surface and subsurface samples from approximately thirty-six locations. Subsurface samples (SW1-1 through SW1-7, SW2-1 through SW2-7, SW3-1 through SW3-7, SW4-1 through SW4-7, and SW5-1 through SW5-7) were collected from depths of 5 to 20 feet and analyzed by X-ray fluorescence, for a total of 132 samples. EPA then analyzed one randomly selected sample from each boring in an offsite lab for metals and five radionuclides (Cs 137, K 40, Th 228, Th 230, and Th 232). Ten of the subsurface samples were analyzed in an offsite lab for VOCs. Two of the borings were drilled deeper than 20 feet bgs for the installation of water table groundwater monitoring wells (SW4-1/MW-17 and SW5-6/MW-18).

The samples generally had elevated levels of magnesium, aluminum, and a variety of other metals, similar to the sampling results of the process waste materials at the Smelter Parcel. Radionuclides were detected at elevated levels at two locations at depths of 15 feet or greater. Similar results were found in a 2002 study, with elevated levels of thorium in samples at depths of 25 feet or greater (Padre Associates, Inc., 2002). The deeper wastes are most likely the oldest wastes, produced in the 1960s or 1970s when Halaco reports processing thorium-containing alloys. VOCs were infrequently detected and at concentrations below risk screening levels. When Halaco was operating, ammonia was measured in liquids seeping from the WMU at concentrations up to approximately 1,000 parts per million (ppm).

Waste Disposal Area

The WDA is the final disposal location for some of Halaco's wastes, which were initially discharged to the WMU and then moved to the WDA. Wastes were placed in the WDA beginning in or before 1980.

Sampling completed as part of the Integrated Assessment characterized the upper portion of the WDA. EPA collected surface and shallow subsurface samples to a maximum of 2 feet bgs from approximately nineteen locations (SSN34 through SSN52) and analyzed them in the field for metals by X-ray fluorescence. EPA then analyzed four of the samples in an offsite lab for metals and five radionuclides (Cs 137, K 40, Th 228, Th 230, and Th 232). In addition, one deeper boring was drilled for installation of a groundwater monitoring well (SSN33/MW-19). Samples from this deeper boring were analyzed in the field for metals by X-ray fluorescence

The samples generally had elevated levels of magnesium, aluminum, and a variety of other metals, similar to the process waste samples from the WMU and Smelter Parcel. The levels of radionuclides were elevated in two of the five sampling locations.

West and East Banks of the OID

The west bank of the OID was reconstructed in approximately 1970, as indicated by the OID alignments shown in the 1969 and 1971 aerial photographs. Halaco's process wastes were potentially used to construct the west and east banks of the OID. The location and size of the OID channel has not changed appreciably since 1971.

The soil samples collected in 2007 along the west bank of the OID (OID1 through OID5), and between the Smelter Parcel and the lagoon to the south (OID6 through OID8), were analyzed in the field for metals using X-ray fluorescence. A subset of samples was analyzed in an offsite lab for metals and five radionuclides (Th 228, Th 230, Th 232, Ra 226, and Ra 228). The samples generally had elevated levels of magnesium, aluminum, and a variety of other metals, similar to the sampling results of the process waste materials at the Southeast Smelter Area. Radionuclides were also elevated in some samples.

No samples were collected from the east bank of the OID.

2.3 Contaminant Fate and Transport

2.3.1 Smelter Parcel

Southeast Smelter Parcel

The bulk of the waste in the Southeast Smelter Area is buried and not mobile. It was thought, however, that wastes exposed at the surface could be transported during windy periods or by stormwater runoff, wastes along the OID could be eroded during periods of high flow, and buried wastes could be in contact with and acting as a continuing source of contamination to the underlying groundwater.

Process, Parking, and North Areas

Although large amounts of Halaco's process waste were not known to be present in these areas, it was thought that any wastes exposed at the surface could be transported during windy periods or by stormwater runoff, and any buried wastes could be in contact with and acting as a continuing source of contamination to the underlying groundwater.

2.3.2 Waste Management Area

It was thought that wastes exposed at the surface could be transported during windy periods or by stormwater runoff, wastes along the OID could erode during periods of high flow, and buried wastes could be in contact with and acting as a continuing source of contamination to the underlying groundwater.

2.4 Threat Posed by Contaminated Soil and Waste to Human Health and the Environment

In the 2008 screening level risk evaluation, EPA concluded that soil and waste samples collected from the Halaco properties exceeded screening levels for industrial land use (CH2M HILL, 2008a). These exceedances included the following:

- **Smelter Parcel – Southeast Area.** Soil or waste samples from about one-third of the approximately 16 soil sampling locations analyzed at an offsite lab exceeded screening levels for industrial land use. This statistic and the statistics provide below for other areas do not include locations exceeding the arsenic screening level because samples from background locations also exceeded the screening level.

- **Smelter Parcel – Process Area.** One soil sample collected and analyzed at an offsite laboratory exceeded the industrial use screening level for lead. One other sampling location analyzed by X-ray fluorescence also exceeded the industrial use screening level for lead (800 milligrams per kilogram [mg/kg]).
- **Smelter Parcel – Parking Area.** Not applicable.
- **Smelter Parcel – North Area.** One-quarter of the 12 soil samples (at nine locations) exceeded the human health risk screening level for lead in soils in industrial areas.
- **Waste Management Area – WMU.** More than one-half of the approximately 36 locations tested at an offsite lab exceeded an industrial screening level for one or more metals. Most of the exceedances were for aluminum and/or chromium.
- **Waste Management Area – WDA.** More than one-half of the five locations tested at an offsite laboratory exceeded screening levels for industrial land use (for aluminum, beryllium, or chromium).

These areas also had the potential to act as a continuing source of contamination to the underlying groundwater and adjacent areas.

No ecological risks were expected in these areas due to the lack of habitat.

SECTION 3

Remedial Investigation Activities

This section describes the RI activities that were completed for the Halaco properties in 2009 and 2010. To control measurement error, analytical measurements were undertaken as documented in the project QAPP, and samples were collected and shipped as documented in the project FSP and field standard operating procedures (SOPs) contained within the FSP.

RI activities were completed as planned for the Halaco properties to address the data gaps identified in the QAPP (CH2M HILL, 2009a). Figure 2 shows solid matrix and soil gas sampling locations sitewide, and Figure 3a shows the sampled locations for the Halaco properties. Figure 3b shows the sampled locations in relation to historical above-ground and underground fuel and oil tanks.

In addition, radiation monitoring was performed during sample collection for health and safety purposes. This radiation monitoring is described in Section 3.7.

3.1 Field Investigation Activities

3.1.1 Soil and Waste Samples

Two hundred forty-one surface and subsurface soil and solid waste samples were collected at the Halaco properties to delineate the extent of contamination (not including duplicates). All samples were analyzed for metals, and most samples were analyzed for the radionuclides Th 232, Th 230, Th 228, Ra 228, and Ra 226. Approximately 25 to 50 percent of the samples were analyzed to check for the presence of the following organic compounds:

- VOCs and semivolatile organic compounds (SVOCs)
- Total petroleum hydrocarbons (TPH), quantified as gas, diesel, and motor oil
- Polychlorinated biphenyls (PCBs)
- Dioxins/furans (polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans [PCDDs/PCDFs])

Table 1a provides information about each of the 241 samples, including the principal material type in the samples and the laboratory analyses performed for each sample. The material types include process waste fill, burn dump waste, soil used as fill ("general fill"), and native soils. Table 1a also notes whether asphalt or concrete were present at ground surface during sample collection. "Surface samples" were collected beneath asphalt or concrete, where present. Nine samples were collected for geotechnical analysis. Table 1b provides information about each of the geotechnical samples.

Samples were collected and analyzed as further described below.

- **Smelter Parcel – Process and Southeast Areas.** Soil and waste samples were collected from the Process and Southeast Areas at the Smelter Parcel at twenty-seven locations (SPS-1 through 27). Concrete was present at ground surface at several locations. Soil and

waste samples were collected at ground surface or under concrete, if present, at approximate 5-foot intervals bgs until underlying native soils were encountered, and also from the underlying native soil. Sample depths were adjusted to sample both burn dump and process wastes, where both were present. All samples were analyzed for metals and radionuclides. Approximately 50 percent of the samples were analyzed for VOCs, SVOCs, and TPH. Approximately 25 percent of the samples were analyzed for PCBs and dioxins/furans.

- **Smelter Parcel – Parking Area.** Soil and waste samples were collected from the Parking Area north of the office building and machine shop at four locations (SPP-1 through -4). Asphalt was present at ground surface throughout the Parking Area. Soil and waste samples were collected beneath the asphalt and at approximately 2 feet bgs. All samples were analyzed for metals and radionuclides. Fifty percent of the samples were analyzed for VOCs, SVOCs, and TPH.
- **Smelter Parcel – North Area.** Soil and waste samples were collected from the North Area at the Smelter Parcel at twelve locations (SPN-1 through -12). At most locations, soil and waste samples were collected at ground surface or under concrete, if present, and at approximately 2 feet bgs. At the two locations closest to the OID (SPN-11 and -12), soil and waste samples were collected at ground surface, at approximate 5-foot intervals bgs until underlying native soils were encountered, and also from the underlying native soil. All samples were analyzed for metals and radionuclides. Samples from two locations were analyzed for VOCs, SVOCs, and TPH.
- **Waste Management Area – WMU.** Soil and waste samples were collected from the WMU at nine locations (WMU-1 through -9). Waste samples were collected at ground surface and at approximately 5, 30, and 35 feet bgs. Underlying native soil samples were collected at approximately 44 feet bgs. All surface and 5-foot bgs samples were analyzed for metals, VOCs, SVOCs, TPH, PCBs, and dioxins/furans (but not for radionuclides). All deeper samples (30 and 35 feet bgs, and native) were analyzed for metals and radionuclides. Deeper samples at four locations were analyzed for VOCs, SVOCs, and TPH and at two locations were also analyzed for PCBs and dioxins/furans.
- **Waste Management Area – WDA.** Soil and waste samples were collected from the WDA at six locations (WDA-1 through -6). Waste samples were collected at ground surface and at approximately 5 feet bgs. Underlying native soil samples were collected at approximately 15 feet bgs. The surface samples were analyzed for metals, VOCs, SVOCs, TPH, PCBs, and dioxins/furans (but not for radionuclides). The samples from 5 feet bgs were analyzed for the same analytes as the surface samples and also for radionuclides. The native soil samples were analyzed for metals and radionuclides.
- **Waste Management Area – North of WDA.** Soil and waste samples were collected from immediately north of the WDA at four locations (WNO-1 through -4). Samples were collected at ground surface and at approximately 2 feet bgs. The samples were analyzed for metals and radionuclides.
- **Waste Management Area – East Bank of OID.** Soil and waste samples were collected from the east bank of the OID at six locations (ODE-1 through -6). Samples were collected at ground surface, at 5 and 10 feet bgs, and from underlying native soils.

Samples were successfully collected from the northern three locations along the WDA (ODE-4 through -6) but could only be collected to a maximum depth of 5 feet bgs at the southern three planned locations (ODE-1 through -3) due to access limitations caused by the steep slope of the WMU adjacent to the chain-link fence bordering the OID. Additional samples were subsequently collected from a barge in the OID next to the chain-link fence at the southern three locations (ODE-1A through -3A). The samples were analyzed for metals and radionuclides.

- **Geotechnical Samples.** Waste samples were collected for geotechnical analysis to provide information for future evaluations of remedial options. Samples were collected at two locations at the WMU (WGT-1 and WGT-2) and at one of the two planned locations at the Smelter Parcel (SGT-2). Samples were not collected at the other planned location (SGT-1) because of shipping concerns related to radiation levels. The samples from the WMU were collected at 10, 20, and 30 feet bgs. The samples from the Smelter Parcel were collected at 5 and 10 feet bgs, and also from underlying native soil. All samples were analyzed for grain size, Atterberg limits, moisture content, and dry bulk density. The waste samples were also analyzed for direct shear or modified proctor.

- **CPT Borings.** Cone penetrometer test (CPT) borings were completed to evaluate geotechnical and hydrogeologic properties of waste and deeper native soils. CPT borings were completed at three locations at the Smelter Parcel (SCP-1 through -3) and at five locations at the Waste Management Area (WCP-1 through WCP-5). Five of the CPT borings were completed to depths greater than 100 feet bgs to evaluate the hydrogeologic units underlying the Site, two at the Smelter Parcel (SCP-1 and SCP-3) and three at the Waste Management Unit (WCP-3, -4, and -5). SCP-3 and WCP-5 were added after preliminary results from SCP-1, WCP-3, and WCP-4 were evaluated. The results and interpretation of these data will be presented in a separate report expected later in 2011 on the groundwater conditions at the Site.

Professional judgment was used to determine the number of samples and select preliminary sampling locations. After a grid was applied to identify preliminary sampling locations, most of the preliminary locations were displaced randomly in the x and/or y directions approximately 10 percent of the nominal sample spacing as follows:

- **WMU and WDA.** The preliminary locations for the WMU and WDA were displaced randomly up to 15 feet in the x and y directions.

- **North of WDA.** The preliminary locations north of the WDA were displaced randomly up to 20 feet in the x (east-west) direction.

- **East Bank of OID.** The preliminary locations at the east bank of the OID (the western edge of the WMU and WDA) were displaced randomly up to 20 feet in the y (north-south) direction.

- **Smelter Parcel.** The sample locations at the Smelter Parcel were not displaced randomly because buildings, storage tanks, and other obstacles would have made sample collection impractical.

- **CPT Borings and Geotechnical Samples.** The locations for the CPT borings and geotechnical samples were not randomly displaced.

Most of the soil and waste fill samples for chemical analysis were collected in March 2010. The following samples for chemical analysis were collected in June 2010:

- WDA-3 samples were collected in June 2010 when this area was dry. It was submerged in March 2010 by the small pond that forms each winter in the northeast corner of the WDA and was not accessible.
- ODE-1A through -3A samples were collected in June 2010 when the OID was seasonally high (beach berm not breached) and the barge used in the OID for sample collection could be moved close to the chain-link fence along the Waste Management Area.

The CPT borings were completed in October 2009 and the geotechnical samples were collected during November 2009, when the groundwater monitoring wells were installed.

3.1.2 Soil Gas Samples

Soil gas samples were collected from ten soil gas probes at the Halaco properties to assess the presence and concentrations of organic and inorganic compounds. Three of these probes were at two locations at the WMU and seven were at seven locations at the Smelter Parcel. Samples were not collected at three of the originally planned depths at the two WMU locations because of failed leak detection tests (LDTs). All samples were analyzed for VOCs, methane, carbon dioxide, carbon monoxide, acetylene, hydrogen, and oxygen. All samples were analyzed for ammonia except for one due to a failed LDT. All samples from the Smelter Parcel were analyzed for hydrogen sulfide. Table 1c provides information about the samples collected from each of the probes, including the principal material type in which each probe was installed. The material types include process and burn dump wastes. Table 1c also notes whether concrete was present at ground surface during sample collection.

Samples were collected and analyzed as further described below.

- **WMU.** Soil gas samples at the WMU were collected at two locations (WSG-1 and WSG-2). The soil gas probes were initially installed in January 2010 and then sampled in March 2010. Soil gas samples at WSG-1 were collected from 5 and 30 feet bgs. The planned soil gas sample at WSG-1 from 15 feet bgs was not collected because of failed LDTs for the initial probe installed during January 2010 and a replacement probe installed during March 2010. A soil gas sample at WSG-2 was collected from 30 feet bgs. The planned soil gas samples at WSG-2 from 5 and 15 feet bgs were not collected because of failed LDTs for the initial probes installed during January 2010 and replacement probes installed during March 2010.
- **Smelter Parcel.** Soil gas samples at the Smelter Parcel were collected at seven locations (SSG-1 through -7). Soil gas samples were collected from 5 feet bgs at all locations. SSG-7 was added in the field to assess impacts, if any, from the above-ground and underground fuel and oil tanks formerly located in the southwestern portion of the Smelter Parcel.

The soil gas probes were co-located with the following soil borings:

- **Smelter Parcel**

Soil Gas Probe	Soil Boring
– SSG-1	– SPS-1
– SSG-2	– SPS-9
– SSG-3	– SPS-12
– SSG-4	– SPS-4
– SSG-5	– SPS-14
– SSG-6	– SPS-20
– SSG-7	– SPS-7

- **Waste Management Unit**

Soil Gas Probe	Soil Boring
– WSG-1	– WGT-1
– WSG-2	– WGT-2

The three soil gas probes at the WMU were screened in process waste. The probes for SSG-1, -2, and -3 were also screened in process waste. The probes for SSG-4, -5, and -6 were screened in burn dump waste, and the probe for SSG-7 was screened in general fill near the former locations of several Halaco fuel and oil tanks.

3.2 Field Sample Collection Procedures

3.2.1 Soil and Waste Samples

CH2M HILL and subcontractors WDC Exploration & Wells (WDC) and Kinnetic Laboratories, Inc. (KLI) collected the Smelter Parcel and Waste Management Area soil and waste samples. CH2M HILL led the sample collection activities, logged all samples, filled and labeled sample containers, completed chain-of-custody (COC) documentation, and shipped samples to the offsite analytical laboratories. WDC cored concrete (where present), and collected soil and waste samples using direct push methods. WDC also collected some of the samples along the east bank of the OID using a hand auger (ODE-1 through ODE-3). KLI collected soil and waste samples for the OID east bank samples (ODE-1A through ODE-3A) using a vibracore, and at WDA-3 using a hand auger. CH2M HILL and subcontractor ULS Services Corp. (ULS) cleared locations of potential subsurface utilities using surface geophysical methods for the locations at the Smelter Parcel. Attachment B provides photographs of the direct push, vibracore, and hand auger soil sampling activities.

Soil and waste samples were collected in accordance with a City of Oxnard Well Permit Application. The City of Oxnard Development Services provided notice that the Well Permit Application materials were complete in an October 7, 2009 e-mail.

The soil and waste samples for chemical analysis were collected as follows:

- Locations with asphalt or concrete were initially cored prior to sampling. These included two locations in the North Area and eighteen locations in the Process and Southeast Areas of the Smelter Parcel. The asphalt at all four of the Parking Area locations was cored.
- Soil samples collected by direct push methods were obtained using a 2-inch-diameter, 5-foot-long core barrel deployed using a Geoprobe 6000 rig. New, disposable clear acetate liners were used in the core barrel to retrieve soil core samples.

- Soil samples obtained with the vibracore were collected using a 4-inch-diameter, 20-foot-long vibracore deployed from a small barge. New disposable polyethylene liner was used within the vibracore to retrieve soil core samples. The barge was launched from the foot bridge at the end of Perkins Road using a crane. The barge was towed with a small boat. The boat was also used to ferry personnel, supplies, and samples between the sample locations and the foot bridge staging area.
- Soil samples obtained with a hand auger were collected using a 4-inch-diameter, stainless steel core barrel.
- Surface samples were collected using new, disposable scoops.

The soil and waste samples collected for geotechnical analysis were obtained using a hollow stem auger drill rig in accordance with ASTM D1586 so that standard penetration test (SPT) blow counts could be determined during sample collection. Samples were collected using a 1.5-foot-long SPT split barrel stainless steel sampler. SPT blow counts for each 6-inch interval were recorded by repeatedly dropping a 140-pound hammer a distance of 30 inches.

The methodology for deploying the CPT borings and the CPT results will be provided in the groundwater report expected later in 2011.

Sampling equipment was decontaminated in accordance with SOP 6-24 of the FSP. The potential for cross contamination of samples collected for laboratory chemical analysis was minimized with the use of new, disposable acetate liners for the direct push soil samples, disposable soft polyethylene liners for the vibracore soil samples, and disposable scoops for the surface soil samples. The reusable sampling equipment that came into contact with soil or waste sample material consisted of the drill shoes for the direct push and vibracore samples and the hand augers. The direct push and vibracore cutting head and other non-disposable sampling equipment coming into contact with samples were decontaminated by washing the sampling equipment in an Alconox solution (or equivalent), rinsing with potable water, and rinsing with distilled water.

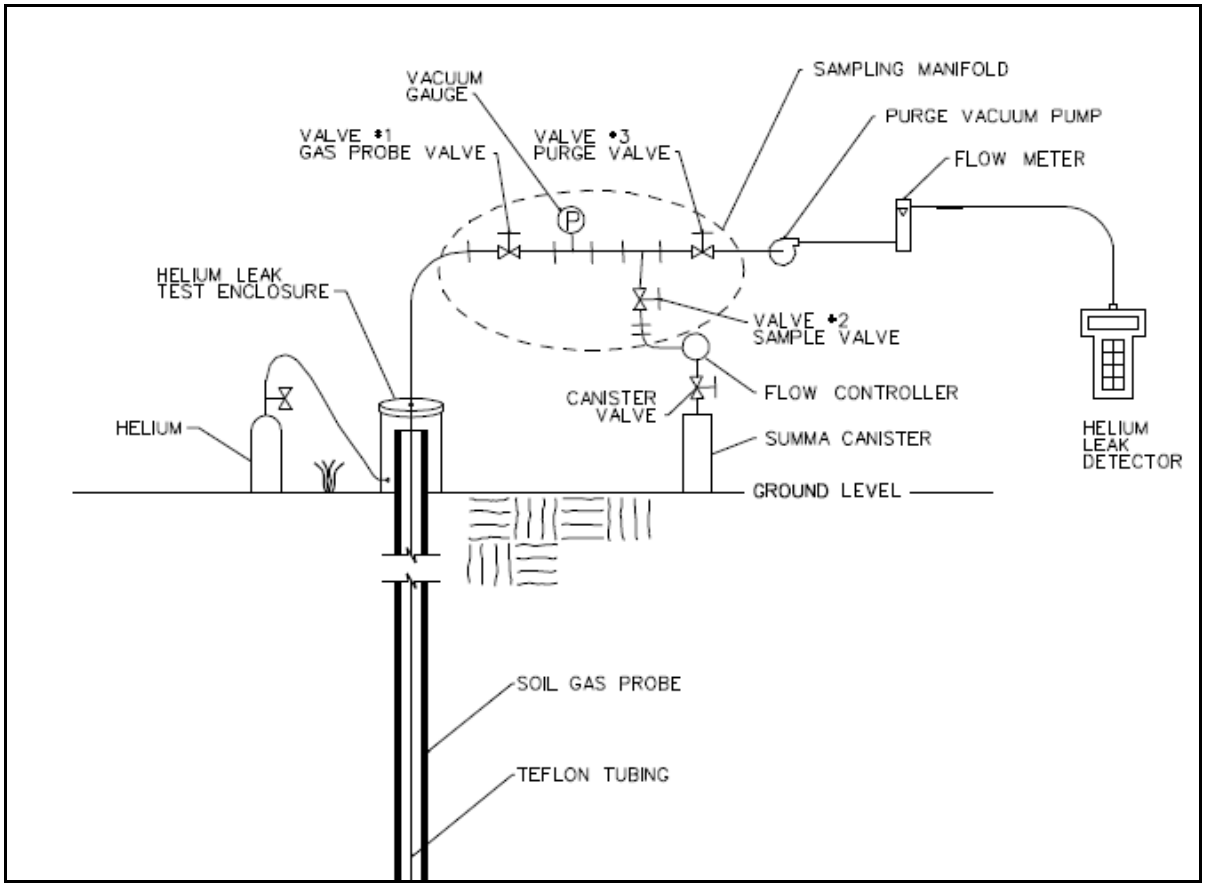
Soil and waste samples were generally collected at the planned locations. Sample locations specified in the FSP were field-located using Global Positioning System (GPS) equipment (Trimble Geo XT) prior to sample collection. As-sampled locations were recorded and are shown on Figures 2 and 3a. CH2M HILL used the field procedures documented in SOP 6-1 of the FSP for determining sample locations with GPS equipment.

Soil and waste samples were logged in accordance with SOP 6-10 from the FSP, including identifying the soil type in accordance with the Unified Soil Classification System.

3.2.2 Soil Gas Samples

CH2M HILL and subcontractor WDC installed the soil gas probes, and CH2M HILL then collected the soil gas samples for laboratory analysis. CH2M HILL led the sample collection activities, observed probe installations, filled and labeled sample containers, completed COC documentation, and shipped samples to the offsite analytical laboratories. WDC cored concrete (where present) and installed the soil gas probes using direct push methods. CH2M HILL and subcontractor ULS cleared locations of potential subsurface utilities using surface geophysical methods for the locations at the Smelter Parcel.

The soil gas probes were installed using direct push methods to create a leak-free seal between the atmosphere and the probe screen in the subsurface. A schematic diagram of an installed soil gas probe is provided below.



The probes were constructed of 0.25-inch Teflon tubing with a 6-inch stainless steel wire screen implant at the bottom of the probe. The annulus around the soil gas implants was backfilled with a silica sand pack, extending several inches above and below the soil gas implant. Granular bentonite was placed above the sand pack and hydrated as the bentonite was placed. A Swagelok™ union was attached to the end of the 0.25-inch Teflon tubing at ground surface. A metal surface cover (e.g., flush mount vault) was installed at ground surface to protect the surface completion.

The soil gas samples were collected using the soil gas sampling system shown in the schematic diagram above. All above-ground fittings were installed to be gas tight. A portable air vacuum pump was used to purge the probes. A helium LDT system was used to check for potential atmospheric air breakthrough. The LDT system consisted of an enclosure (inverted 5-gallon bucket) over the soil gas probe with the sample tubing pushed through a hole in the enclosure. Ultrapure helium was used as the leak detection compound and was delivered to the enclosure and then monitored using a helium detector (MGD-2002 Multi-Gas Leak Detector) during initial system setup and then during purging and sampling. Sampling was terminated if helium was detected during purging or sampling. A helium reading of greater than 1 percent was used as the action level to determine if the

leak check failed and corrective action should be taken. Corrective action would include checking that all fittings and connections were tight at ground surface and, if necessary, reinstalling the soil gas probes at a nearby location.

The probes were purged at a flow rate of 200 milliliters/minute (mL/min). A minimum of three probe volumes were purged before filling sample containers. One probe volume included the volume in the tubing, screen, and screen sand pack. The sample containers were filled as follows (from first to last) after purging was complete:

- **VOCs.** Soil gas samples for VOC analysis were filled in mini-Summa canisters (400 mL) provided by the analytical laboratory (EPA Region 9 Lab). The canisters were received from the laboratory under vacuum and filled in the field by directly connecting the probe tubing to the container using the Swagelok™ union. A slight vacuum was left in the canisters after filling (i.e., the pressure in the canister was less than atmospheric pressure) so that the laboratory could verify that air did not leak into the containers after sampling. The canisters were filled at a rate of 200 mL/min using a flow controller provided and preset by the lab. The laboratory confirmed that there was a vacuum in each sample canister returned for analysis, indicating that the canister did not leak after sample collection.
- **Other Gases.** Soil gas samples for analysis of other gases (methane, carbon dioxide, carbon monoxide, acetylene, hydrogen, and oxygen) were filled in mini-Summa canisters (250 mL) provided by the analytical laboratory (Air Toxics). The sampling process was the same as for VOCs.
- **Hydrogen Sulfide.** Soil gas samples for hydrogen sulfide analysis were filled in Tedlar bags (1 liter) provided by the analytical laboratory (Air Toxics). The bags were filled by directly running the probe tubing through the purge pump and then to the container using Swagelok™ fittings. The bags were not filled beyond 75 percent capacity. The bags were filled at a rate of 200 mL/min.
- **Ammonia.** Soil gas samples for ammonia analysis were run through a sorbent tube provided by the analytical laboratory (Air Toxics). Soil gas was run through the tube at a rate of 200 mL/min for approximately 1 hour.

3.3 Sample Collection and Quality Control Samples

3.3.1 Soil and Waste Samples

Soil and waste samples for laboratory chemical analysis were placed in containers as detailed in Table 5-3 of the FSP. The following quality control samples were collected as specified in the QAPP and FSP:

- Field duplicates were collected at a frequency of one in every 10 samples.
- Field equipment blanks were collected at a frequency of once per day when non-dedicated sampling equipment was used.
- Extra volume for laboratory matrix spikes and matrix spike duplicates was collected at a frequency of one in every twenty collected samples.

Samples for laboratory geotechnical analysis were collected in containers as detailed in Table 5-7 of the FSP. Samples for moisture, density, and direct shear analysis were collected in 2-inch-diameter brass or stainless steel sleeves housed in the SPT sampler. Samples for grain size and Atterberg limits were collected in these sleeves, glass jars, or freezer zip lock baggies. Samples for modified proctor were collected in 5-gallon buckets. Duplicates and other quality control samples were not collected for the geotechnical samples.

The sample naming convention described in the FSP was used.

Duplicate samples were identified by adding "100" to the sample location number. For example, SM-SPN-103-A is the duplicate sample for SM-SPN-003-A.

3.3.2 Soil Gas Samples

Samples for laboratory chemical analysis were placed in sample containers as described above.

Two duplicate samples were collected.

The sample naming convention described in the FSP was used.

Duplicate samples were identified by adding "100" to the sample location number. For example, SG-WSG-101-C is the duplicate sample for SG-WSG-001-C.

3.4 Sample Custody and Tracking Procedures

COC procedures were followed in accordance with the FSP and QAPP. This included generating COC forms requesting analytical services from each of the analytical laboratories. EPA's Forms II Lite program was used to generate sample labels, bottle tags, and COC forms; track samples from the field to the laboratory; and facilitate electronic capture of sample information into databases for the chemistry samples. Hard-copy COC forms were used for the samples analyzed for geotechnical parameters and soil gas samples.

All samples for chemical analysis were placed on ice upon field collection and then shipped on ice to the analytical laboratories, except for the solid matrix samples for radionuclide and geotechnical analysis and the soil gas samples. The solid matrix samples for radionuclide and geotechnical analysis, and the soil gas samples, did not require this step. All samples for chemical analysis were shipped to the analytical laboratories using Federal Express to facilitate tracking from the field to the laboratory. The samples for geotechnical analysis were hand-couriered by the laboratory.

3.5 Chemistry Laboratory Analysis and Data Validation

3.5.1 Soil and Waste Samples

The soil and waste samples collected for chemical analysis were analyzed in offsite laboratories as follows:

- **Metals.** All samples were analyzed for metals under the EPA Contract Laboratory Program by ALS Laboratory Group (formerly DataChem) in Salt Lake City, Utah. The metals were analyzed using the following techniques:
  - Inductively coupled plasma atomic emission spectroscopy: aluminum (Al), barium (Ba), beryllium (Be), calcium (Ca), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), magnesium (Mg), manganese (Mn), nickel (Ni), potassium (K), sodium (Na), and zinc (Zn).
  - Inductively coupled plasma mass spectrometer to generate lower detection limits: antimony (Sb), arsenic (As), cadmium (Cd), chromium (Cr), selenium (Se), silver (Ag), thallium (Tl), and vanadium (V).
  - Cold vapor atomic absorption: Mercury (Hg)
- **Radionuclides.** Most samples were analyzed for three thorium and two radium radionuclides under subcontract by Eberline Services, Inc. at its laboratory in Oak Ridge, Tennessee. Thorium isotopes (Th 232, Th 230, and Th 228) were analyzed using Method DOE HASL 300 4.5.2.3 Modified. Ra 226 was analyzed using EPA Method 903.1 Modified. Ra 228 was analyzed using EPA Method 904.0 Modified.
- **VOCs, SVOCs, and PCBs.** Samples were analyzed for VOCs, SVOC, and PCBs under the EPA Contract Laboratory Program by ALS Laboratory Group (formerly DataChem) in Salt Lake City, Utah.
- **Dioxins/Furans.** Samples were analyzed for dioxins/furans under the EPA Contract Laboratory Program. The samples were first extracted by ALS Laboratory Group (formerly DataChem) in Salt Lake City, Utah. The extract was then shipped to and analyzed by Southwest Research Institute in San Antonio, Texas.
- **TPH.** Samples were analyzed for TPH quantitated as gasoline, diesel, and motor oil by the EPA Region 9 Laboratory. TPH as gasoline (TPH-gas) was analyzed as purgeable petroleum hydrocarbons by EPA Method 8015C. TPH as diesel (TPH-diesel) and TPH as motor oil (TPH-oil) were analyzed as extractable petroleum hydrocarbons by EPA Method 8015B.

The laboratory analytical results were reviewed or validated as follows:

- **Metals, VOCs, SVOCs, PCBs, and Dioxins.** The EPA Contract Laboratory Program lab data for metals went through the EPA Computer-Aided Data Review and Evaluation automated data review. This is equivalent to a stage S2BVE under EPA's national guidance for validating laboratory analytical data for Superfund use.

- **Radionuclides.** The subcontract Eberline lab data for radionuclides were reviewed by Rob Terry of EPA Region 9's Technical Support Section and found to be reliable.
- **TPH.** The EPA Region 9 Lab data for TPH went through internal review. The Region 9 Lab's internal data review process is equivalent to Tier 1A review under the Region 9 guidance.

3.5.2 Soil Gas Samples

The soil gas samples were analyzed in offsite laboratories as follows:

- **VOCs.** Samples were analyzed for VOCs by the EPA Region 9 Laboratory using Method TO-15.
- **Ammonia, Hydrogen Sulfide, and Other Gases.** Samples were analyzed for hydrogen sulfide and other gases by Air Toxics, LTD in Folsom, California. The samples for ammonia were analyzed under subcontract to Air Toxics, LTD by Chester LabNet in Tigard, Oregon. The samples were analyzed using the following methodologies:
  - Modified ASTM D-1945 – Methane, carbon dioxide, carbon monoxide, acetylene, hydrogen, and oxygen
  - ASTM D-5504 – Hydrogen sulfide
  - NIOSH 6016 – Ammonia

The laboratory analytical results were reviewed or validated as follows:

- **VOCs.** The EPA Region 9 Lab data for VOCs went through internal review. The Region 9 Lab's internal data review process is equivalent to Tier 1A review under the Region 9 guidance.
- **Ammonia, Hydrogen Sulfide, and Other Gases.** The Air Toxics, LTD data for ammonia, hydrogen sulfide, and other gases have not been reviewed or validated outside of the analytical laboratory.

3.6 Geotechnical Laboratory Analysis

The geotechnical analyses were completed by PTS Environmental, Inc. in Santa Fe Springs, California.

- All samples collected for geotechnical analysis were analyzed for the following:
  - Grain size using ASTM D4464M
  - Atterberg limits using ASTM D4318
  - Moisture content using ASTM D2216
  - Dry bulk density using ASTM D2937
- Five samples were analyzed for direct shear using ASTM D3080, and three samples were analyzed for modified proctor using ASTM D1557.

3.7 Radiation Monitoring

Radiation monitoring was performed during soil and waste sample collection activities to ensure site worker health and safety; document that samples and sample containers were in compliance with laboratory radiological acceptance criteria; and document that personnel, drilling equipment, and other equipment that potentially came into contact with waste were in compliance with release criteria in Nuclear Regulatory Commission Regulatory Guide 1.86.

Subcontractor Environmental Dimensions, Inc. (EDi) provided a field technician who monitored radiation levels in accordance with a Radiation Protection Plan prepared by EDi for the project. EDi used the following field equipment:

- Geiger Mueller "pancake-type" probe (measures alpha, beta, and gamma radiation)
- 2-inch by 2-inch NaI probe (measures gamma radiation)
- Scintillation detector (measures alpha and beta radiation)

EDi initially measured and documented radiation levels in uncontaminated surface soils to assess background conditions. EDi then measured and documented ground surface radiation levels prior to performing drilling or other intrusive investigation work at each sampling location.

During drilling, EDi used the pancake probe to spot check drill cores (soil samples) and drill equipment that came into contact with subsurface materials for high activity. EDi took these readings in dose rate during routine work and counts for release surveys.

As the drill cores were retrieved and the acetate liners opened, they were more thoroughly surveyed using the NaI probe and alpha-beta flat probe. The NaI probe was slowly moved over the soil core after it was opened and laying flat on a table for logging and sample collection. Equipment was surveyed between sample locations and before release from the Site. Alpha-beta probe readings (count rate) were compared to Regulation Guide 1.86 values. NaI probe readings were compared to background.

EDI took and measured wipe samples from drill equipment and sample containers to be sent to the offsite laboratories, using alpha-beta combination probe in scalar mode, to verify compliance with release criteria per Nuclear Regulatory Commission (NRC) Regulatory Guidance 1.86.

SECTION 4

Remedial Investigation Results

This section presents the results of the soil, waste, and soil gas testing completed for the Halaco properties. The results are provided in the following tables, figures, and attachments:

- Tables 2 through 8 provide the metals, radionuclides, detected VOCs, detected SVOCs, PCBs, dioxins/furans, and TPH analytical results, respectively.
- Tables 9 and 10 provide the VOC and non-VOC analytical results for the soil gas samples, respectively.
- Figures 4a, 4b, 4c, 4d, and 4e illustrate the analytical results for the surface and subsurface samples for lead, one of the metals in both Halaco's process wastes and the burn dump wastes. Subsurface sample depths range from approximately 2 to 45 feet bgs and are listed in Table 2.
- Figures 5a, 5b, 5c, 5d, and 5e illustrate the analytical results for the surface and subsurface samples for Th 232, a radionuclide in some of the older process wastes.
- Figures 7a through 7d are cross sections illustrating the subsurface soil and waste materials encountered during sampling. Figure 6 shows the cross section locations in plan view. Figures 7a, 7b, and 7c are east-west cross sections through the Halaco properties (Cross Sections A-A' B-B', and C-C'), and Figure 7d is a north-south cross section through the Waste Management Area (Cross Section D-D').
- Figures 8a through 8d combine information from Figures 4, 5, and 7. They provide cross sections, analytical results for lead, and analytical results for Th 232.
- Attachment B provides photographs of direct push, vibracore, and hand augering equipment used to collect soil and waste samples.
- Attachment C provides photographs of direct push cores showing process waste, burn dump waste, and native soil at contacts between the waste materials and native soil.
- Attachment D provides the lithologic descriptions of the waste and soils investigated.
- Attachment E provides the list of metals, VOC, SVOC, PCB, and dioxin/furan analytes reported by the laboratories, and the contract-required quantitation limits (CRQLs).
- Attachment F provides laboratory reports with the measurements of geotechnical parameters (grain size, Atterberg limits dry bulk density, direct shear, and modified proctor) for waste and soil samples.

Lead and Th 232 are used as representative contaminants to illustrate the relative levels of contamination. Their use in the figures does not imply that lead or Th 232 pose more or less risk to human health or the environment than the other metals and radionuclides. Figures 4a through 4e and 5a through 5e also incorporate lead and Th 232 data from the

Integrated Assessment and follow-up investigation of the southeast area of the Smelter Parcel. Table 11 and Figure 9 provide summary statistics for and compare the metals concentrations in Halaco's process waste, burn dump waste, and background soils and sediments. The sand and soil samples used to calculate background concentrations are described in the reports prepared for the NCL and Wetlands-Beach areas (CH2M HILL, 2011a and 2011b).

4.1 Description of Waste Materials

Halaco's process waste is present at both the Smelter Parcel and Waste Management Areas. Burn dump waste is present only at the Smelter Parcel. The process and burn dump wastes are distinguished based on their differing physical appearance and chemistry. The physical description of these materials is provided below. The chemistry of these materials is described in Section 4.3.

Figure 10 provides photographs of process waste (SPS-12) and burn dump waste (SPS-13) in cores collected during sampling. The process waste sample in the photo is from a depth of approximately 17 feet bgs and 12 feet below the water table. The burn dump waste is from a depth of 12 feet bgs and 6 feet below the water table. Additional photographs showing the contacts between process waste and burn dump waste (SPC-12), burn dump waste and native soil (SPS-13), process waste and native soil at the Smelter Parcel (SPS-9), and process waste and native soil at the WMU (WMU-3), are provided in Attachment C.

The process waste encountered during the March 2010 sampling activities differed in appearance between the Smelter Parcel and the Waste Management Area. In part, this is because most of the process waste at the Smelter Parcel occurs below the water table while most of the process waste at the Waste Management Area occurs above the water table.

Process waste encountered while drilling at the Smelter Parcel was mostly brown to light to dark greenish or bluish gray in color, with most locations being damp to moist and stiff. Iron oxide staining and soft, dull white crystalline nodules were encountered at many locations. Some samples had a slight ammonia odor. Brick fragments were occasionally encountered. Some samples were a mix of process waste and soil and behaved like silty sand or silt with sand. Sands were fine to medium with fine sands dominating where present. Generally there was little to no gravel encountered.

Process waste encountered while drilling at the WMU was most often bluish gray to black, mostly moist or wet, and very loose to stiff. Some samples had a strong ammonia odor. Some samples within the WMU were a mix of process waste and soil with transitioning layers of sandy elastic silt and sand with silt. Sands were fine to medium with fine sands dominating where present. Generally, there was little to no gravel encountered.

Burn dump waste encountered at the Smelter Parcel was typically black, moist to wet, and loose to dense. Iron oxide staining was found in approximately half of the locations. Several locations had a strong sulphur odor. There was a significant number of glass and brick fragments in most samples. Some locations contained intervals of non-decomposed trash. Some samples were a mix of burn dump waste and soil, which behaved like silty sand or sand silt with little to some gravel in the material.

4.2 Extent of Waste Materials

The subsurface extent of general fill, burn dump waste, process waste, and native soil are shown in Cross Sections A-A′ through D-D′ (Figures 7a through 7d). These cross sections were constructed using topography mapped after EPA's 2007 removal action (Figure 1g) and using the descriptions of waste and soil materials identified during drilling for the (1) remedial investigation conducted in 2009 and 2010, (2) southeast smelter investigation conducted in 2007, (3) Integrated Assessment investigation conducted in 2006, and (4) the well installation activities by Halaco in 2003. Data collected from borings drilled for both soil sampling and monitoring well installation were used. The water table shown in these cross sections is interpreted from surface water and groundwater elevation data measured from the monitoring network on June 1, 2010. The Site's monitoring network and an interpretation of hydrogeologic conditions will be presented in a separate report.

4.2.1 Smelter Parcel

Surface Materials and General Fill

As of August 2011, concrete slabs cover large parts of the Smelter Parcel. Exceptions are an area east of the former process buildings along the OID, the area southeast of the former process buildings (where EPA demolished and removed concrete in 2007 to facilitate testing), inside and near the footprints of the former process buildings (covered by concrete fragments generated during EPA's 2010 building demolition activities), the Parking Area (asphalt), and most of the North Area (unpaved). Concrete was present and cored at eighteen locations during the 2010 sampling activities as noted in Tables 1a-1c. Asphalt was cored at four locations.

In the subsurface, general fill occurs at the southwest corner of the Smelter Parcel (SPS-7 and -8) to depths of between approximately 5 and 10 feet, and as a shallow surficial layer at the North Area of the Smelter Parcel overlying the burn dump waste. General fill also occurs as base materials beneath the concrete slabs and asphalt.

Process Waste

Process waste at the Smelter Parcel occurs primarily in the former 1959 OID channel and between this former alignment and the west edge of the current OID channel. The west bank of the OID appears to have been constructed with process waste as described below. Figure 1b shows a small waste pond in the 1959 alignment where Halaco discharged its process waste from about 1965 through 1970. The process waste is greater than 10 feet thick, as shown in east-west Cross Sections A-A′, B-B′, and C-C′ (Figures 7a, 7b, and 7c). The maximum thickness is about 18 feet at SPS-12 (B-B′), which coincides with the 1959 OID alignment. Additional process waste occurs between the 1959 OID channel and Perkins Road where it appears that Halaco used process waste and soil as fill.

The estimated volume of process waste buried at the Smelter Parcel is 50,000 cubic yards, assuming a 15-foot thickness over the 2-acre area in the 1959 OID alignment and between this former alignment and the west edge of the current OID. This estimate does not account for lesser amounts of waste that are present outside this area.

Burn Dump Waste

Burn dump waste occurs throughout the Smelter Parcel between Perkins Road and the west edge of the 1959 OID alignment, over a slightly larger area than the "active burial area" identified in the 1959 aerial photograph (Figure 1b). This includes the Process, Parking, and North Areas. Burn dump waste underlies process waste where both occur, consistent with the earlier placement of the burn dump waste.

Burn dump waste in the Process Area is more than 10 feet thick, as shown in east-west Cross Sections A-A′, B-B′, and C-C′ (Figures 7a, 7b, and 7c). The maximum thickness of 17 feet at SPS-22 (Figure 7c) coincides with the former 1929 OID alignment.

The bottom of the burn dump waste identified in the deeper borings in the North Area of the Smelter Parcel was at 10 feet bgs at SPN-11 and 9.5 feet bgs at SPN-12. The latter is in the former 1959 OID alignment and near the current OID. SPN-11 and SPN-12 are the two deep borings drilled and sampled to reach native soils in the North Area. Except for the boring drilled to install MW-13 (SSN10), the remaining samples collected during the 2006 (SSN21 through SSN32) and 2010 sampling events (SPN-1 through SPN-10) are not deep enough to determine the bottom of the burn dump waste in the North Area.

Burn dump waste was identified beneath the asphalt in the Parking Area. Similar to the North Area, the samples collected during the 2007 (BKG2 and BKG3) and 2010 (SPP-1 through SPP-4) sampling events were not deep enough to determine the bottom of the burn dump waste in this area.

The area over which the burn dump waste occurs is approximately 9 acres, but the volume of burn dump waste cannot be accurately determined because the thickness is not known in the Parking and North Areas. If the burn dump material averages 10 feet in thickness over the entire 9 acres, the volume of burn dump material would be approximately 150,000 cubic yards.

Native Soils

Native soils underlie the Smelter Parcel as shown in Cross Sections A-A′, B-B′, and C-C′. This material consists primarily of clay and silt with sand and silty sand interbeds.

4.2.2 Waste Management Area

Process waste occurs at and below ground surface throughout the Waste Management Area. Figures 1e through 1g provide aerial photographs and topographic maps before and after the 2007 removal action completed to stabilize the area.

Waste Management Unit

Halaco began discharging its process waste into settling ponds at the WMU beginning in about 1970. The settling ponds are apparent in the 1971 aerial photograph but not in the 1969 photograph (Attachment A). The process waste at the WMU is approximately 40 feet thick as shown in east-west Cross Sections A-A′ and B-B′ (Figures 7a and 7b) and north-south Cross Section D-D′ (Figure 7d).

Waste Disposal Area

Halaco began moving process waste from the WMU to the WDA in about 1980. Waste is apparent in the WDA in the 1981 aerial photograph but not in the 1978 photograph (Attachment A). The thickness of the process waste in the WDA increases from east to west, from approximately 12 feet (at WDA-6) to 16 feet (at WDA-4), most likely due to the decrease in the surface elevation of the underlying native soil (Figure 7c).

North Edge of Waste Disposal Area

Process waste occurs in the fill material at the north edge of the WDA as observed in borings WNO-1 through WNO-4. This fill material occurs where a former OID channel appears to cross the (future) WDA and WMU in historical photographs (Figure 1b) and topographic maps (Figure 1c). The maximum depth sampled at the north edge of the WDA is 2 feet bgs. It is likely that fill material containing process waste extends deeper, to the bottom of the former OID channel.

East Bank of OID

Process waste was observed in the fill material forming the east bank of the OID in borings ODE-1 through ODE-6 and ODE-1A through ODE-3A. The process waste extends to less than 5 feet bgs at the southwest corner of the WMU (ODE-1), and from approximately 5 to 10 feet bgs at the remaining locations (ODE-2 through ODE-6, as shown in Figures 7a, 7b, and 7c).

Native Soils

Native soils underlie the Waste Management Area as shown in Cross Sections A-A′ through D-D′. The native soils consist primarily of clay and silt with sand and silty sand interbeds.

4.2.3 Surface Water and Groundwater Conditions

The process and burn dump wastes occur above and below the water table at the Smelter Parcel as shown in Cross Sections A-A′, B-B′, and C-C′. Process waste occurs above and below the water table at the Waste Management Area as shown in these cross sections and also in Cross Section D-D′. The surface water and groundwater elevations are briefly described below. Hydrogeologic conditions at the Site will be presented in detail in a separate report expected in late 2011.

The surface water and groundwater elevations shown on Cross Sections A-A′ through D-D′ were measured on June 1, 2010, when the beach berm was not breached. The surface water elevations in the OID and lagoon were seasonally high at that time (several feet higher than the ocean). The surface water elevation in NCL-East was also relatively high as a result of surface water from the OID and lagoon flowing through the ditch south of the WMU and spilling into the NCL-East area. The water table elevation, which is partly controlled by surface water elevations, was also seasonally high. The surface water elevation in the OID and lagoon was 8.52 feet (North American Vertical Datum of 1988 [NAVD 88]) as measured at a staff gauge mounted on the foot bridge at the end of Perkins Road. The surface water elevation in NCL-East was 8.0 feet as measured at a staff gauge mounted in NCL-East. Except at monitoring wells and piezometers located near McWane Boulevard, the water table elevations ranged from a minimum of 5.00 feet elevation to a maximum of 8.47 feet

elevation. The water table elevation at the northern part of the Halaco properties was near 0 feet elevation.

Surface water and groundwater elevations decrease when the beach berm is breached. The berm breaches primarily during the winter months in response to rainfall and increased flow in the OID. When the berm is breached, the surface water elevations in the OID and lagoon drop several feet and then rise and fall with the ocean tides. The surface water elevation in NCL-East usually drops too because surface water in the OID and lagoon cannot flow into the NCL-East area and make up for evaporative losses and percolation.

At the Smelter Parcel, the amount of process waste and burn dump waste beneath the water table on June 1, 2010, is shown in Cross Sections A-A′, B-B′ and C-C′. The maximum thickness of process waste beneath the water table is 13 feet, in the vicinity of the former 1959 OID channel (Figure 7b). The maximum thickness of burn dump waste beneath the water table is 9 feet, in the vicinity of the former 1929 OID channel (Figure 7c). Another 5 to 10 feet of process waste and burn dump waste are above the water table, depending on location and time of year.

Throughout most of the Waste Management Area, approximately 5 feet of process waste are beneath the water table as shown in Cross Sections A-A′ through D-D′. The amount of waste below the water table increases in the vicinity of the OID. Another 5 to 15 feet of process waste occur above the water table at the WDA, and another 30 to 35 feet at the WMU, depending on location and time of year.

4.3 Background Metals Concentrations and Radionuclide Activities

EPA has not yet developed site-specific soil or sediment cleanup levels. The levels are likely to be risk-based except when a risk-based value is below the background level for a chemical. Generally, EPA does not clean up to levels below background (Office of Solid Waste and Emergency Response [OSWER] guidance 9285.6-07P [EPA, 2002]). Twenty soil and fourteen sand samples believed to be unaffected by Halaco's wastes were collected from several locations and depths near the Halaco properties in the beach, wetlands, and NCL areas in 2010 to assess background metals concentrations and radionuclide activities. The two types of materials generally have different concentrations of naturally occurring metals. The "soil" materials sampled include primarily silt and clay. The "sand" materials sampled include primarily beach sand.

The metals concentrations and radionuclide activities in the background locations vary. Metal and radionuclide levels are generally higher in soils than in sands, and there is variability within soil and sand, as shown in Table 11. For example, lead concentrations for the 20 background sand samples vary from 1.5 to 3.4 mg/kg, and the levels for the 20 background soil samples vary from 4.9 to 12.3 mg/kg.

EPA is conducting a statistical analysis of the metals and radionuclide data to identify representative background values. A statistical parameter often used to establish background levels is known as the 95 Percent Upper Tolerance Limit (95% UTL). The 95% UTL is a calculated value that only the highest 5 percent of background

concentrations are expected to exceed. The 95% UTL also can be described as a confidence limit on the 95th percentile of the data. The extent to which sample locations exceed the 95% UTL provides an indication of the extent and degree of site-related contamination.

The preliminary 95% UTL values for lead are 3.4 mg/kg for sand and 14.4 mg/kg for soil. The preliminary 95% UTL values for Th 232 are 1.7 picocuries per gram (pCi/g) for sand and 2.1 pCi/g for soil. The preliminary values for soil are used in Figures 4a through 4e and Figures 5a through 5e to define the concentration range represented by the white symbols. The UTL values have been calculated from a combined dataset that includes the samples in Table 11 and an additional six background samples collected during the 2006 Integrated Assessment (samples SDB 31 through SDB 36).

4.4 Waste Material Concentrations and Activities

The process wastes at the Halaco properties have high concentrations of a variety of metals (compared to native soils), and the older wastes are also elevated in the radionuclides thorium and radium. The burn dump waste at the Smelter Parcel is also enriched in some but not all of the same metals. As discussed below, the concentrations of several indicator metals can help distinguish between the two material types.

Both the process wastes and burn dump materials are elevated in organic compounds, most notably PCBs and dioxins/furans. The presence of dioxins and furans in the process waste is consistent with a March 2005 draft EPA report that documents the production of dioxin-like compounds by six secondary aluminum smelters tested in the early 1990s (EPA, 2005). The presence of dioxins and furans (and TPH, SVOC, and PCBs) has also been reported in burn dump materials in other former burn dumps in California (e.g., DTSC, 2003).

4.4.1 Metals and Radionuclides

Metals in Process Waste and Burn Dump Waste

The process and burn dump wastes have elevated concentrations of numerous metals compared to native soils. Table 11 summarizes the metals concentrations detected in thirty-six process waste samples, twenty-two burn dump waste samples, and the background samples described in Section 4.3. Figure 9 illustrates the high and median metals concentrations for the process waste, burn dump wastes, and the 95% UTL concentrations calculated for the background sand and soil materials.

The two metals that Halaco primarily targeted for recovery (aluminum and magnesium) are notably higher in concentration in process waste compared to burn dump wastes. Other metals that are notably higher in process waste include (from high to low concentration in process waste): barium, manganese, chromium, vanadium, and beryllium. Metals that are notably higher in burn dump waste compared to process waste include iron, calcium, lead, and mercury. The most useful metals for distinguishing between the two materials are aluminum, beryllium, iron, lead, and magnesium.

The concentrations of most metals in process waste exceed background, including (from high to low concentration): magnesium, aluminum, barium, potassium, manganese, copper,

zinc, lead, chromium, nickel, vanadium, beryllium, antimony, arsenic, cadmium, silver, and selenium. The metals in process waste that do not exceed background or where it is less clear whether metals in process waste exceed background include iron, calcium, sodium, mercury, and thallium.

Radionuclides in Process Waste and Burn Dump Waste

Neither the more recent process waste, nor the burn dump waste, are elevated in thorium or radium compared to unaffected soils. (Halaco reportedly stopped processing thorium-containing scrap in the late 1970s.) The Th 232, Th 230, Th 228, Ra 228, and Ra 226 activities in more recent process waste, burn dump waste, general fill, and native soils are typically less than 2 pCi/g. The Th 232 95% UTL for native soils is 2.1 pCi/g, as described above.

The older process waste is elevated in thorium and radium compared to native soils. The older wastes are present in the Southeast Smelter Area of the Smelter Parcel and the bottom several feet of the WMU. The highest levels have been measured at the Smelter Parcel. The median, second highest, and highest Th 232 activities in waste at the Smelter Parcel were 12.0, 90.1, and 653 pCi/g. The median and highest Th 232 activities at the bottom of the WMU were 5.4 and 13.8 pCi/g. (Only samples with elevated radionuclides were used to calculate the median activities.)

Th 232, Th 228, and Ra 228 are part of the same natural radionuclide decay series and their activities are similar, as expected. Activities for Th 230 also tend to be similar to these three radionuclides, even though it is part of another decay series. Ra 226 activities are significantly less and are in the range expected after decay of the parent radionuclide (Th 230) for a period of tens of years.

Figures Depicting the Extent of Contamination at the Site

Figures 4a, 4b, 4c, 4d, and 4e depict the extent of metals contamination in the Halaco properties, using lead as an "indicator" metal. Lead is present at elevated concentrations in both process waste and burn dump waste. Data from the 2006, 2007, and 2010 sampling events are shown, except for the 2006 data for the WMU. The 2006 WMU data are not shown because the WMU surface elevations changed in 2007 when EPA re-graded the waste pile.

Figures 4a, 4b, 4c, 4d, and 4e use the following lead concentration ranges:

- < 14 mg/kg (white) – lead levels in silt/clay soil unaffected by Halaco wastes
- 14 to 100 mg/kg (blue) – up to seven times higher than background
- 100 to 400 mg/kg (yellow) – up to four times higher than blue
- 400 to 800 mg/kg (orange) – up to two times higher than yellow
- > 800 mg/kg (red)

Figures 5a, 5b, 5c, 5d, and 5e depict the extent of radionuclide contamination in the Halaco properties, using Thorium 232 as an "indicator" radionuclide. Thorium is present above background in the older process waste materials, as noted above. Data from the 2006, 2007, and 2010 sampling events are shown. This includes the 2006 data for the A and B Intervals for the WMU, even though the WMU surface elevations changed in 2007. Although the current elevations represented by the 2006 data are not known precisely, they are shown

because radionuclides were not analyzed in 2010 for the A and B Interval samples. The 2006 data for the A and B Intervals are intended to generally represent the radionuclide activities in the upper part of the WMU.

Figures 5a, 5b, 5c, 5d, and 5e use the following activity ranges:

- < 2 pCi/g (white) – radionuclide levels unaffected by Halaco wastes
- 2 to 5 pCi/g (blue) – radionuclide levels potentially affected by Halaco waste
- 5 to 10 pCi/g (yellow) – radionuclide levels two times higher than blue
- 10 to 30 pCi/g (orange) – radionuclide levels three times higher than yellow
- > 30 pCi/g (red)

The depth ranges for the sample results shown in Figures 4 and 5 vary, but are generally as follows:

- Figures 4a and 5a show lead and Th 232 levels for surface and near surface samples, which include samples collected at a depth of approximately 1 foot bgs or less and samples collected beneath asphalt or concrete. Figure 5a includes the 2006 Th 232 data for the samples collected at 5 and 10 feet bgs for the WMU, as explained above.

- Figures 4b and 5b show lead and Th 232 levels for samples at depths of approximately 2 or 5 feet bgs. Figure 5b also includes the 2006 Th 232 data for the samples collected at 15 and 20 feet bgs for the WMU, as explained above.

- Figures 4c and 5c show lead and Th 232 levels for samples at depths ranging from approximately 8 to 15 feet bgs at the Smelter Parcel, 15 feet bgs at the WDA, and 30 feet bgs at the WMU.

- Figures 4d and 5d show lead and Th 232 levels for samples at depths ranging from approximately 13 to 20 feet bgs at the Smelter Parcel and 35 feet at the WMU.

- Figures 4e and 5e show lead and Th 232 levels for samples at depths ranging from approximately 18 to 24 feet ft bgs at the Smelter Parcel and 44 feet bgs at the WMU.

The lead and Th 232 levels are also shown on Cross Sections A-A′ through D-D′ in Figures 8a through 8d using the same color ranges used in Figures 4 and 5.

General Fill Indicated by Lead and Th 232

Most of the general fill in the North Area of the Smelter Parcel has lead concentrations above background but less than 100 mg/kg, as indicated by yellow and blue symbols in Figure 4a. Lead concentrations in unaffected soils are generally below 14 mg/kg. The above-background levels may be due to mixing with underlying burn dump waste, surface water runoff pumped from the smelter area (URS, 2004), minor amounts of process waste from other sources, or lead in imported fill material. Scattered glass and other incombustible material suggest burn dump material, while elevated concentrations of beryllium and aluminum suggest process waste (SPN-3, -4, -5, -7, -9, -11, and -12). Th 232 is below background levels (i.e., less than 2 pCi/g), as indicated by the white symbols in Figure 5a.

The general fill underneath the Parking Area is indicated by the white and blue symbols (Figure 4a). The elevated lead indicated by the yellow symbol (BKG-3) may be due to burn dump waste that underlies this area.

The general fill at the southwest corner of the process area is indicated by the white and blue symbols for SPS-7 and SPS-8 (Figures 4a, 4b, and 4c).

Process Waste Indicated by Lead and Th 232

Process waste at the Smelter Parcel is indicated by the combined presence of elevated lead and Th 232 as shown by the blue, yellow, and orange symbols for lead (Figures 4a, 4b, 4c, and 4d) and by the blue, yellow, orange, and red symbols for Th 232 (Figure 5a, 5b, 5c, and 5d). Lead concentrations are generally between 100 mg/kg and 800 mg/kg. The process waste is primarily in the former 1959 OID channel and between this former alignment and the west edge of the current OID. The west bank of the OID also appears to consist largely of process waste. Additional areas of process waste occur west of the 1959 OID alignment as indicated by SPS-6 and SPS-13. The surface sample underneath the concrete at SPS-13 is one of the few instances where lead in process waste is greater than 1,000 mg/kg as indicated by the red symbol.

The Waste Management Area consists mostly of process waste. Figures 4a, 4b, 4c, and 4d show blue, yellow, and orange symbols for most samples. Older process waste occurs in the bottom several feet of the WMU as indicated by the blue, yellow, and orange symbols for Th 232 (Figures 5c and 5d). Older process waste generally does not occur in the upper portion of the WMU or in the WDA as indicated by the mostly white symbols for Th 232 (Figures 5a and 5b). Possible exceptions are SSN33-8 and SSN51 from the WDA, with Th 232 activities at 3.2 and 19.8 pCi/g, respectively.

Process waste occurs in the fill material at the north edge of the WDA as indicated by the blue and yellow symbols for WNO-3, -2, and -4 (Figures 4a and 4b). This fill material occurs in the area where a former OID channel crossed the western half of the WDA and the northwestern corner of the WMU. The channel is visible in historical photographs (Figure 1b) and topographic maps (Figure 1c). The maximum depth sampled at the north edge of the WDA is 2 feet bgs. As noted above, it is likely that fill material containing process waste extends deeper to the bottom of the former OID channel.

Process waste also occurs in the fill material forming the east bank of the OID as indicated by the blue, yellow, and orange symbols for ODE-1 through ODE-6 (Figures 4a through and 4d). The elevated metals at ODE-1 occur to a depth of less than 5 feet bgs. The elevated metals at the remaining locations (ODE-2 through ODE-6) occur to a depth of between approximately 5 and 10 feet bgs.

Burn Dump Waste Indicated by Lead and Th 232

Burn dump waste at the Smelter Parcel is indicated by the presence of high levels of lead as shown primarily by the red symbols, indicating concentrations above 800 mg/kg. Burn dump waste may also be indicated by yellow and orange symbols where the waste has mixed with other material and diluted the lead concentration (Figures 4a, 4b, 4c, and 4d). The burn dump waste occurs throughout the Smelter Parcel between Perkins Road and the west edge of the 1959 OID channel, in and near the “active burial area” identified in the 1959 aerial photograph (Figure 1b).

Burn dump waste is present in the subsurface throughout the Process Area, Parking Area, and North Area as indicated by the yellow, orange, and red symbols west of the 1959 OID

alignment (Figures 4b, 4c, and 4d). The maximum thickness coincides with the former 1929 OID channel as shown by the orange and red symbols (Figures 4c and 4d).

Native Soils Indicated by Lead and Th 232

Native soils underlie the fill materials at the Smelter Parcel and Waste Management Area as shown by the white symbols for lead (Figures 4c, 4d, 4e) and Th 232 (Figures 5c, 5d, and 5e).

4.4.2 Organic Compounds

VOCs, SVOCs, PCBs, dioxins, and/or TPH were detected in some process waste and burn dump samples.

VOCs

VOCs were detected at low concentrations in some samples of process waste, burn dump waste, general fill, and native materials (Table 4). Twenty-one VOCs were detected, all below EPA industrial soil Regional Screening Levels (RSLs). RSLs are risk-based concentrations considered by EPA to be protective for humans (EPA – Region 9, 2011). Excluding VOCs known to be common laboratory contaminants (2-butanone, acetone, and methylene chloride [National Function Guidelines, EPA 2008]), the maximum VOC concentration was 26 micrograms per kilogram (µg/kg) (chloroform).

The following VOCs were detected:

- The common laboratory contaminants 2-butanone (also known as methyl ethyl ketone or MEK) and acetone were frequently detected in process waste, burn dump waste, general fill, and native soil samples. The maximum concentrations were 79 and 160 µg/kg, respectively. Methylene chloride was detected in fewer samples, all with J flags. The maximum concentration was 11 µg/kg.
- The following aromatic compounds were detected, primarily in burn dump waste samples: benzene, toluene, ethylbenzene, xylenes, and isobutyl benzene. The maximum detected concentration was 3.1 µg/kg for benzene. All detections are flagged with a "J," indicating that the compound was positively identified in the sample but that the concentration is estimated because quality control criteria were not met, or the concentration of the analyte was below the quantitation limit.
- Carbon disulfide was frequently detected in process waste, burn dump waste, general fill, and native soil samples. The maximum concentration was 11 µg/kg and all detections are flagged with a "J."
- The following chlorinated VOCs were detected, primarily in burn dump waste samples: tetrachloroethene (PCE), trichloroethene (TCE), 1,2-dichlorobenzene, 1,4-dichlorobenzene, cis-1,2-dichloroethene, and chloromethane. The maximum detected concentration was 24 µg/kg and all detections are flagged with a "J," except for PCE.
- Chloroform was detected in process waste, burn dump waste, general fill, and native soil samples. The maximum detected concentration was 26 µg/kg.

- The following additional VOCs were detected, each with three or less detections: cyclohexane, methyl cyclohexane, methyl tert-butyl ether (MTBE), and styrene. The maximum concentration was 13 µg/kg.

SVOCs

With the exception of polycyclic aromatic compounds (PAHs) and bis(2-ethylhexyl)phthalate, SVOCs were detected at relatively low concentrations in process waste, burn dump waste, general fill, and native material samples (Table 5). Thirty-seven SVOCs were detected. With the exception of PAHs, all of the detections were below industrial soil RSLs. Excluding PAHs and bis(2-ethylhexyl)phthalate, the maximum SVOC concentration was less than 1,000 µg/kg, or 1 mg/kg.

The following SVOCs were detected:

- Benzaldehyde and acetophenone were detected in most samples. The maximum concentrations were 210 and 150 µg/kg, respectively. All samples are flagged with a "J."
- Phenol was frequently detected in process waste, burn dump waste, general fill, and native soil samples. The maximum concentration was 350 µg/kg. Several other phenolic compounds were detected infrequently (1,1-biphenyl, 2-methylphenol, 2,4-dimethylphenol, 4,6-dinitro-2-methylphenol, and 4-methylphenol). The maximum concentration of the other phenolic compounds was 160 µg/kg (4-Methylphenol). All detections are flagged with a "J," except for the maximum detection for phenol.
- Sixteen PAHs were detected in process waste, burn dump waste, general fill, and native soil samples. As noted above, some PAHs were detected above industrial soil RSLs. The maximum concentration was 22,000 µg/kg (22 mg/kg) for fluoranthene.
- The common laboratory contaminant bis(2-ethylhexyl)phthalate was frequently detected in most samples. The maximum concentration was 12,000 µg/kg. Several other phthalate compounds were detected less frequently (diethylphthalate, dimethylphthalate, di-n-butylphthalate, and butylbenzylphthalate). The maximum concentration for the other phthalate compounds was 160 µg/kg for butylbenzylphthalate. All detections are flagged with a "J," except for several of the higher concentration detections for bis(2-ethylhexyl)phthalate.
- The aromatic heterocyclic SVOCs carbazole (also known as diphenylamine) and dibenzofuran were detected five or fewer times at maximum concentrations of 280 and 240 µg/kg, respectively. All detections are flagged with a "J."
- The following chlorinated SVOCs were detected two or fewer times: 1,2,4,5-tetrachlorobenzene, 2,4-dichlorophenol, 3,3'-dichlorobenzidine, and hexachlorobenzene. The maximum concentration was 430 µg/kg for 2,4-dichlorophenol. All detections are flagged with a "J."
- N-Nitrosodiphenylamine was detected in two samples at a maximum concentration of 110 µg/kg. Both detections are flagged with a "J."

PCBs

PCBs were detected in both process waste and burn dump waste (Table 6). Three of the nine Aroclors analyzed were detected. Aroclor 1248 was the most frequently detected followed by Aroclor 1254. They were detected at maximum concentrations of 1,000 and 840 µg/kg , respectively, both above industrial soil RSLs. These two Aroclors were detected more frequently and generally at higher concentrations in process waste compared to burn dump waste. Aroclor 1260 was detected in one sample of process waste at 10 µg/kg.

Dioxins/Furans

Dioxins/furans were detected in both process waste and burn dump waste (Table 7). In addition to presenting the dioxin and furan congener concentrations, Table 7 also presents the calculated effective 2,3,7,8-TCDD concentration for each sample. The effective 2,3,7,8-TCDD concentration in a sample is the sum of 2,3,7,8-TCDD equivalence concentrations of 17 dioxin and furan isomers. The 2,3,7,8-TCDD equivalence concentration for an isomer is the product of the measured concentration of the isomer multiplied by a Toxicity Equivalence Factor (TEF) for the isomer. TEFs range from 0.003 (for OCDD and OCDF) to 1 (for 2,3,7,8-TCDD and 1,2,3,7,8-PeCDD).

The effective 2,3,7,8-TCDD concentrations in process waste and burn dump waste are similar, with a maximum concentration of 228 nanograms per kilogram (ng/kg). The measured concentrations in many of the process waste and burn dump waste samples exceed EPA's industrial cancer RSL for dioxin-contaminated soils (18 ng/kg), but are below EPA's industrial non-cancer RSL for dioxin-contaminated soils (850 ng/kg). Dioxins/furans were also detected in native soils at low levels, below 1 ng/kg.

Total Petroleum Hydrocarbons

TPH-oil was frequently detected. TPH-diesel was also frequently detected but in fewer samples than TPH-oil. TPH-gas was not detected except in four samples at low concentrations (Table 8).

- TPH-gas was detected in four samples and at low concentrations near the detection limit. The maximum detected concentration was 6 mg/kg. All detections are flagged with a "J."
- TPH-diesel was detected frequently in process waste and burn dump waste. The maximum concentration in process waste is 830 mg/kg and the maximum concentration in burn dump waste is 390 mg/kg. The maximum concentration in process waste (830 mg/kg) was detected at SPS-15 and may be due to spills or leaks associated with oil and fuel storage tanks formerly located in the southwest portion of the Smelter Parcel. The maximum concentration of TPH-diesel in process waste in locations not in the vicinity of the oil or fuel tanks (SPS-6, SPS-7, SPS-8, and SPS-15) was 48 mg/kg at the Waste Management Area and 130 mg/kg at the Smelter Parcel.
- TPH-diesel was detected in native soils in the vicinity of the oil and fuel tanks in the southwest portion of the Smelter Parcel. Here, TPH-diesel was detected at the highest concentrations of any samples. TPH-diesel was detected in native soils at SPS-7 at a depth of 10 feet bgs (840 mg/kg) and in process waste at SPS-15 at a depth of 5 feet bgs (830 mg/kg).

- TPH-oil was detected frequently in process waste and burn dump waste samples. The maximum concentration in process waste is 2,800 mg/kg at the Smelter Parcel and 560 mg/kg at the Waste Management Area. The maximum concentration in burn dump waste is 5,000 mg/kg. Similar to TPH-diesel, the higher concentrations of TPH-oil in process waste and burn dump waste appear to preferentially occur near former oil or fuel storage tanks in the southwest portion of the Smelter Parcel (SPS-6, SPS-7, SPS-8, and SPS-15). TPH-oil was detected in native soils in the vicinity of the oil and fuel tanks in the southwest area of the Smelter Parcel, similar to TPH-diesel (SPS-7, -8, and -15).

Subsurface samples observed at SPS-7 and SPS-15 had hydrocarbon odor and staining that correspond with the elevated TPH-diesel and TPH-oil concentrations.

4.5 Soil Gas Concentrations

The soil gas samples from the process and burn dump wastes at the Halaco properties contained generally low concentrations of VOCs. Elevated concentrations of ammonia were detected in soil gas samples from process waste, which was expected and is consistent with ammonia odors detected during drilling and sampling through these wastes. The concentrations of these and other analyzed gases are described below.

VOCs

VOCs were detected at low concentrations in some soil gas samples (Table 9). Only one sample had VOCs more than the industrial use screening level of 100 times EPA's industrial air RSLs. The industrial air RSLs are meant for chemicals in indoor air in a structure. Measured concentrations in soil gas are compared to 100 times the RSLs to account for the attenuation that would occur if the chemicals moved upward from the subsurface into a structure.

The following VOCs were detected:

- Aromatic compounds were detected at low levels in process and burn dump wastes at the Smelter Parcel. All concentrations were below industrial use screening levels (100 times the indoor air RSL). Aromatic compounds were not detected at the WMU. Benzene, toluene, and ethylbenzene concentrations were less than 20 parts per billion by volume (ppbv), compared with industrial use screening levels of 50, 584,000, and 113 ppbv respectively. Total xylene concentrations were less than 60 ppbv, compared with the industrial use screening level of over 20,000 ppbv.

- Chlorinated solvent compounds were detected in both process waste and burn dump waste. Eleven chlorinated solvent compounds were detected. All detections were below screening levels, except for tetrachloroethene (PCE) in one sample. The sample (SG-SSG-004-A) was collected from burn dump waste at the Smelter Parcel. The measured concentration was 110 ppbv, compared to the industrial use screening level of 31 ppbv. TCE was detected at 28 ppbv in the same sample, below the 114 ppbv screening level. Vinyl chloride was detected at a maximum concentration of 35 ppbv, below the 110 ppbv screening level.

- Sixteen tentatively identified compounds (TICs) were detected.

Ammonia

Ammonia was detected at a maximum concentration of 287 micrograms per liter (µg/L), at a depth of 30 feet bgs at the WMU. Ammonia was also detected at the Smelter Parcel, at a maximum concentration of 102 µg /L. Both values are greater than the 44 µg /L industrial screening level (100 times the indoor air RSL).

Methane, Carbon Dioxide, and Oxygen

Methane, carbon dioxide, and oxygen were detected in process waste at the WMU and Smelter Parcel, and in burn dump waste at the Smelter Parcel.

- **WMU, Process Waste.** The highest methane concentration was measured in a sample collected from process waste near the bottom (30 feet bgs) of the WMU (0.26 percent). This sample also had one of the lowest measured concentrations of oxygen (1.8 percent) and had carbon dioxide below the reporting limit. This indicates chemical and/or biological activity that consumes oxygen and produces methane. (Atmospheric concentrations of oxygen, carbon dioxide, and methane are 21, 0.036, and 0.00017 percent, respectively.) The activity may be occurring within the WMU or in native soil below the WMU. The depth of the sample decreases the potential for soil gas to escape to the atmosphere or for atmospheric gases to reach the sample location, which would increase oxygen and decrease methane levels. The sample from process waste near the top of the WMU (5 feet bgs) did not contain methane above the detection limit and had a higher concentration of oxygen (15 percent), which suggests less chemical and biological activity and greater exchange between soil gases and the atmosphere.
- **Smelter Parcel, Process Waste.** The methane concentrations in the samples from process waste at the Smelter Parcel (0.00046 to 0.0024 ppbv) are much lower than those at the bottom of the WMU, while the oxygen concentrations (7.6 to 19 percent) are much higher. This suggests a lower level of chemical or biological activity and/or more exchange with the atmosphere at the relatively shallow depth at which the samples were collected (5 feet bgs).
- **Smelter Parcel, Burn Dump Waste.** The methane and oxygen concentrations in the samples from burn dump waste at the Smelter Parcel (0.014 to 0.022 ppbv for methane, 2.4 percent to 6.4 percent for oxygen) are between those in process waste at the bottom of the WMU and those in process waste at the Smelter Parcel. The methane concentration is well above and the oxygen concentration is well below atmospheric concentrations. Carbon dioxide was also detected in the samples from burn dump waste (1.8 to 8.6 percent) at concentrations well above those found in the atmosphere.
- **Smelter Parcel, General Fill.** Methane was not detected, carbon dioxide was elevated (1.9 percent), and oxygen was depressed (13 percent) below atmospheric concentrations in the sample from general fill.

Carbon Monoxide, Acetylene, Hydrogen, and Hydrogen Sulfide

Carbon monoxide and acetylene were not detected in any soil gas samples. Hydrogen was detected at 0.028 percent in one sample from process waste, slightly above the laboratory reporting limit. Hydrogen sulfide, which was only analyzed for in the Smelter Parcel samples, was detected in one soil gas sample at a concentration of 2,600 ppbv. The sample

was from burn dump waste. This concentration exceeds the industrial screening level of 631 ppbv (100 times the indoor air RSL).

4.6 Radiation Monitoring

Radiation monitoring was performed during sample collection to ensure site worker health and safety, comply with laboratory radiological acceptance criteria, and comply with NRC guidelines.

Except for two locations at the Smelter Parcel, no soil core samples surveyed with the NaI probe were above background levels. The two locations with above-background gamma count readings were SPS-1 (10,600 counts per minute [cpm]) and SPS-2 (19,600 cpm). The background level was 9,600 cpm, based on ground surface readings in the North Area of the Smelter Parcel and other areas outside of the Smelter Parcel and Waste Management Area.

Drill equipment moved between sample locations and sent offsite was in compliance with NRC Regulation Guide 1.86 values based on the radiation monitoring performed.
Drill equipment sent offsite and sample containers sent to the offsite laboratories were in compliance with release criteria per NRC Regulatory Guidance 1.86 based on the results of wipe sample readings taken with the Alpha-Beta combination probe in scalar mode.

SECTION 5

Conclusions

This section provides conclusions regarding the nature and extent of contamination at the Halaco properties attributable to Halaco's operations. It also addresses wastes likely to be the remains of a municipal burn dump that operated at the Smelter Parcel in the 1940s, 1950s, and possible into the early 1960s.

Two hundred forty-one surface and subsurface soil and solid waste samples (not including duplicates) were collected at the Halaco properties and analyzed at offsite laboratories to delineate the extent of contamination. Of these, 143 samples were collected from 43 locations at the Smelter Parcel and 98 samples were collected from 25 locations at the Waste Management Area. All samples were analyzed for metals and most (90 percent) were analyzed for radionuclides. Approximately half of the samples were analyzed for VOCs, SVOCs, and TPH. Approximately one quarter of the samples were analyzed for PCBs, and dioxins/furans. Past testing of soil and waste at the Halaco properties focused primarily on metals and radionuclides.

From the Smelter Parcel, soil gas samples were collected from shallow soil gas probes at seven locations and analyzed at offsite laboratories. From the Waste Management Area, soil gas samples were collected from multi-depth depth soil gas probes at two locations and analyzed at offsite laboratories. All samples were analyzed for VOCs, methane, carbon dioxide, carbon monoxide, acetylene, hydrogen, oxygen and ammonia. Samples from the Smelter Parcel were also analyzed for hydrogen sulfide. Soil gas samples had not been collected at the Halaco properties during past testing.

These data, and findings from previous studies, indicate the following.

5.1 Extent of Waste Material

Halaco's process waste is present at both the Smelter Parcel and Waste Management Area. Burn dump waste is also present at the Smelter Parcel. The process waste and burn dump materials are distinguished based on their differing physical and chemical characteristics.

Smelter Parcel

- Burn dump waste occurs over approximately 9 acres of the 11-acre Smelter Parcel, between the historical alignment of the OID visible in a 1959 aerial photograph and Perkins Road.
- Halaco's process waste occurs primarily in the remaining two acres of the 11-acre Smelter Parcel in and between the 1959 OID alignment and the current OID alignment. The two acres are at the east and southeast portions of the Smelter Parcel.
- Process waste and burn dump waste occur above and below the water table. As much as 13 feet of process waste and 9 feet of burn dump waste are beneath the water table. The process waste is deepest in the vicinity of the former 1959 OID channel; the burn dump

waste is deepest in the vicinity of the former 1929 OID. Another 5 to 10 feet of process waste and burn dump waste are above the water table, depending on location and time of year.

- The estimated volume of process waste is 50,000 cubic yards. The volume of burn dump waste is less certain, but could be around 150,000 cubic yards.

Waste Management Area

- Most of the process waste at the Halaco properties is in the Waste Management Area, which consists of the 14-acre WMU and the 13-acre WDA. The process waste is approximately 40 feet thick in the WMU, where Halaco discharged its process waste into settling ponds from about 1970 through 2002. The process waste varies from about 12 to 16 feet thick in the WDA, where wastes were moved from the WMU beginning in about 1980. The total volume of process waste at the Waste Management Area may exceed 700,000 cubic yards.
- Approximately 5 feet of process waste are beneath the water table. The amount increases near the current OID channel. At the WDA, another 5 to 15 feet of waste are above the water table. At the WMU, another 30 to 35 feet of waste are above the water table. The amount depends on location and time of year.
- Process waste is present in the fill material at the north edge of the WDA, where a former OID channel crossed the WDA and the northwest corner of the WMU. As described in a companion report, process waste also has contaminated soils and sediments in the NCL-North area north of the WDA (CH2M HILL, 2011a).
- As described in two companion reports, process waste from the WMU and WDA has contaminated shallow soils and sediments in the NCL-East area east of the Waste Management Area (CH2M HILL, 2011a) and in the wetlands area south of the Waste Management Area (CH2M HILL, 2011b).

Banks of the OID

- The west and east banks of the OID are constructed with Halaco's process waste material. As described in a companion report, process waste has contaminated sediments in the OID and lagoon areas (CH2M HILL, 2011c).

5.2 Metals and Radionuclides in Soil and Waste

All of the process wastes at the Halaco properties have high concentrations of a variety of metals, and the older wastes also have elevated levels of the radionuclides thorium and radium. The burn dump waste at the Smelter Parcel has high concentrations of metals.

Metals

- The process and burn dump wastes both have elevated concentrations of a variety of metals compared to native soils. The two types of waste differ in the concentrations of some metals, providing a means to help distinguish between the two materials.

- The two metals that Halaco primarily targeted for recovery (aluminum and magnesium) have notably higher concentrations in process waste compared to burn dump waste. Other metals that are notably higher in process waste are barium, manganese, chromium, vanadium, and beryllium. In contrast, iron, calcium, lead, and mercury concentrations are notably higher in burn dump waste compared to process waste. Beryllium, magnesium, aluminum, and lead are the most useful metals in helping to distinguish between the two waste types.
- The concentrations of most metals in process waste exceed background, including (ordered from high to low concentration): magnesium, aluminum, barium, potassium, manganese, copper, zinc, lead, chromium, nickel, vanadium, beryllium, antimony, arsenic, cadmium, silver, and selenium. The metals in process waste that do not exceed background or where it is less clear whether they exceed background include iron, calcium, sodium, mercury, and thallium.

Radionuclides

- The older process waste is elevated in radionuclides compared to native soil. The older waste materials with elevated radionuclides are present in the Southeastern Area of the Smelter Parcel and the bottom several feet of the WMU. The radionuclide levels are higher in process waste present in the Southeastern Area of the Smelter Parcel compared to the WMU. The more-recent process waste and burn dump waste are not elevated in radionuclides compared to native soils.
- Elevated radionuclides in the older process waste materials include Th 232, Th 228, and Ra 228. These radionuclides are part of the same natural radionuclide decay series and their activities are similar, as expected. Activities for Th 230 also tend to be similar to these three radionuclides, even though it is part of another decay series. Ra 226 activities are significantly less and are in the range expected after decay of the parent radionuclide (Th 230) for a period of tens of years.

5.3 Organic Compounds in Soil and Waste

PCBs and dioxins were frequently detected in process waste and burn dump waste samples. Relatively low levels of VOCs and SVOCs were also detected in some samples.

VOCs

VOCs were detected at low concentrations in process waste, burn dump waste, general fill, and native materials. Twenty-one VOCs were detected, all below industrial soil RSLs. Aromatic and chlorinated VOCs were detected most frequently in burn dump waste.

SVOCs

SVOCs were detected at relatively low concentrations in process waste, burn dump waste, general fill, and native materials. Thirty-seven SVOCs were detected. Except for PAHs, all detections were below industrial soil RSLs. PAHs were detected above RSLs for industrial soil in process waste and burn dump waste.

PCBs

PCBs were detected in process waste and burn dump waste. Aroclor 1248 was the most frequently detected, followed by Aroclor 1254. They were detected above industrial soil RSLs in both waste types, but were detected most frequently and at higher concentrations in process waste.

Dioxins/Furans

Dioxins/furans were detected in both smelter waste and burn dump waste. The effective 2,3,7,8-TCDD concentrations in the two material types are similar. Dioxins/furans were detected above EPA's industrial cancer RSL for dioxin-contaminated soils (18 ng/kg), but below EPA's industrial non-cancer RSL for dioxin-contaminated soils (850 ng/kg) in both materials. Dioxins/furans were also detected in native soils at low levels (below 1 ng/kg).

Total Petroleum Hydrocarbons

TPH-diesel and TPH-oil were detected frequently in process waste and burn dump waste. TPH-gasoline was only detected in four samples at low concentrations near the detection limit.

The highest TPH-diesel concentrations were in the vicinity of oil and fuel tanks formerly used by Halaco in the southwestern portion of the Smelter Parcel. TPH-diesel and TPH-oil were also detected in general fill and underlying native soils in this area. Hydrocarbon odor and staining were noted for subsurface samples from two borings in this area.

5.4 Organic and Inorganic Compounds in Soil Gas

The soil gas samples from the process and burn dump wastes at the Halaco properties have generally low concentrations of VOCs. Elevated concentrations of ammonia were detected in soil gas samples from process waste, which was expected and is consistent with ammonia odors detected during drilling and sampling through these wastes.

The concentrations of oxygen, carbon dioxide, and methane indicate varying degrees of chemical or biological activity occurring in the process and burn dump wastes. The highest levels of activity appear to be occurring at depth in the WMU, possibly within process waste or in native soils beneath the WMU.

Carbon monoxide and acetylene were not detected in any soil gas samples.

Hydrogen was detected slightly above the laboratory reporting limit in one sample from process waste.

Hydrogen sulfide was detected in one soil gas sample from burn dump waste.

SECTION 6

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Tables

TABLE 1a

Material Types and Samples Analyzed for Chemistry and Radionuclides, Solid Matrix

Halaco Site Remedial Investigation, Oxnard, California

Location ID	Sample ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	Metals	Radio-nuclides	VOC	SVOC	TPH	PCB	Dioxin/ Furan
Smelter Parcel - North Area												
SPN-001	SM-SPN-001-A	3/1/10	0.5	Concrete	Gen Fill	■	■	-	-	-	-	-
	SM-SPN-001-B	3/1/10	2	-	Gen Fill	■	■	-	-	-	-	-
SPN-002	SM-SPN-002-A	3/1/10	0.5	Concrete	Gen Fill	■	■	■	■	■	-	-
	SM-SPN-002-B	3/1/10	2	-	Burn Dump	■	■	■	■	■	-	-
SPN-003	SM-SPN-003-A	3/1/10	Surface	-	Gen Fill	■	■	■	■	■	-	-
	SM-SPN-003-B	3/1/10	2	-	Burn Dump	■	■	■	■	■	-	-
SPN-004	SM-SPN-004-A	3/1/10	Surface	-	Gen Fill	■	■	-	-	-	-	-
	SM-SPN-004-B	3/1/10	2	-	Burn Dump	■	■	-	-	-	-	-
SPN-005	SM-SPN-005-A	3/1/10	Surface	-	Gen Fill	■	■	-	-	-	-	-
	SM-SPN-005-B	3/1/10	2	-	Gen Fill	■	■	-	-	-	-	-
SPN-006	SM-SPN-006-A	3/1/10	Surface	-	Gen Fill	■	■	-	-	-	-	-
	SM-SPN-006-B	3/1/10	2	-	Burn Dump	■	■	-	-	-	-	-
SPN-007	SM-SPN-007-A	3/1/10	Surface	-	Gen Fill	■	■	-	-	-	-	-
	SM-SPN-007-B	3/1/10	2	-	Burn Dump	■	■	-	-	-	-	-
SPN-008	SM-SPN-008-A	3/1/10	Surface	-	Gen Fill	■	■	-	-	-	-	-
	SM-SPN-008-B	3/1/10	2	-	Burn Dump	■	■	-	-	-	-	-
SPN-009	SM-SPN-009-A	3/1/10	Surface	-	Gen Fill	■	■	-	-	-	-	-
	SM-SPN-009-B	3/1/10	2	-	Burn Dump	■	■	-	-	-	-	-
SPN-010	SM-SPN-010-A	3/1/10	Surface	-	Gen Fill	■	■	-	-	-	-	-
	SM-SPN-010-B	3/1/10	2	-	Burn Dump	■	■	-	-	-	-	-
SPN-011	SM-SPN-011-A	3/8/10	Surface	-	Gen Fill	■	■	-	-	-	-	-
	SM-SPN-011-B	3/8/10	5	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPN-011-C	3/8/10	10	-	Transition	■	■	-	-	-	-	-
	SM-SPN-011-D	3/8/10	14.5	-	Native	■	■	-	-	-	-	-
SPN-012	SM-SPN-012-A	3/2/10	Surface	-	Gen Fill	■	■	-	-	-	-	-
	SM-SPN-012-B	3/2/10	5	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPN-012-C	3/2/10	8	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPN-012-D	3/2/10	12	-	Native	■	■	-	-	-	-	-
Smelter Parcel - Parking Area												
SPP-001	SM-SPP-001-A	3/1/10	0.5	Asphalt	Gen Fill	■	■	-	-	-	-	-
	SM-SPP-001-B	3/1/10	2	-	Burn Dump	■	■	-	-	-	-	-
SPP-002	SM-SPP-002-A	3/1/10	0.5	Asphalt	Gen Fill	■	■	-	-	-	-	-
	SM-SPP-002-B	3/1/10	2	-	Burn Dump	■	■	-	-	-	-	-
SPP-003	SM-SPP-003-A	3/1/10	0.5	Asphalt	Gen Fill	■	■	■	■	■	-	-
	SM-SPP-003-B	3/1/10	2	-	Burn Dump	■	■	■	■	■	-	-
SPP-004	SM-SPP-004-A	3/1/10	0.5	Asphalt	Gen Fill	■	■	■	■	■	-	-
	SM-SPP-004-B	3/1/10	2	-	Burn Dump	■	■	■	■	■	-	-
Smelter Parcel - Southeast and Process Area												
SPS-001	SM-SPS-001-A	3/9/10	Surface	-	Process Waste	■	■	-	-	-	-	-
	SM-SPS-001-B	3/9/10	5	-	Process Waste	■	■	-	-	-	-	-
	SM-SPS-001-C	3/9/10	10	-	Process Waste	■	■	-	-	-	-	-
	SM-SPS-001-D	3/9/10	13	-	Process Waste	■	■	-	-	-	-	-
	SM-SPS-001-E	3/9/10	19.5	-	Native	■	■	-	-	-	-	-
SPS-002	SM-SPS-002-A	3/9/10	Surface	-	Process Waste	■	■	■	■	■	■	■
	SM-SPS-002-B	3/9/10	5	-	Process Waste	■	■	■	■	■	■	■
	SM-SPS-002-C	3/9/10	10	-	Process Waste	■	■	■	■	■	■	■
	SM-SPS-002-D	3/9/10	14	-	Process Waste	■	■	■	■	■	■	■
	SM-SPS-002-E	3/9/10	18	-	Native	■	■	■	■	■	■	■
SPS-003	SM-SPS-003-A	3/9/10	Surface	-	Process Waste	■	■	-	-	-	-	-
	SM-SPS-003-B	3/9/10	5	-	Process Waste	■	■	-	-	-	-	-
	SM-SPS-003-C	3/9/10	10	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-003-D	3/9/10	14.5	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-003-E	3/9/10	19.5	-	Native	■	■	-	-	-	-	-
SPS-004	SM-SPS-004-A	3/10/10	Surface	-	Process Waste	■	■	■	■	■	■	■
	SM-SPS-004-B	3/10/10	5	-	Burn Dump	■	■	■	■	■	■	■
	SM-SPS-004-C	3/10/10	10	-	Burn Dump	■	■	■	■	■	■	■
	SM-SPS-004-D	3/10/10	14	-	Native	■	■	■	■	■	■	■
SPS-005	SM-SPS-005-A	3/9/10	0.5	Concrete	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-005-B	3/9/10	10	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-005-C	3/9/10	14.5	-	Native	■	■	-	-	-	-	-
SPS-006	SM-SPS-006-A	3/10/10	0.5	Concrete	Process Waste	■	■	■	■	■	-	-
	SM-SPS-006-B	3/10/10	5	-	Process Waste	■	■	■	■	■	-	-
	SM-SPS-006-C	3/10/10	14	-	Native	■	■	■	■	■	-	-
SPS-007	SM-SPS-007-A	3/2/10	0.5	Concrete	Gen Fill	■	■	■	■	■	-	-
	SM-SPS-007-B	3/2/10	4.5	-	Gen Fill	■	■	■	■	■	-	-
	SM-SPS-007-C	3/2/10	9.5	-	Native	■	■	■	■	■	-	-
SPS-008	SM-SPS-008-A	3/10/10	0.5	Concrete	Gen Fill	■	■	■	■	■	-	-
	SM-SPS-008-B	3/10/10	5	-	Gen Fill	■	■	■	■	■	-	-
	SM-SPS-008-C	3/10/10	9.5	-	Native	■	■	■	■	■	-	-

TABLE 1a

Material Types and Samples Analyzed for Chemistry and Radionuclides, Solid Matrix

Halaco Site Remedial Investigation, Oxnard, California

Location ID	Sample ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	Metals	Radio-nuclides	VOC	SVOC	TPH	PCB	Dioxin/ Furan
SPS-009	SM-SPS-009-A	3/9/10	0.5	Concrete	Process Waste	■	■	-	-	-	-	-
	SM-SPS-009-B	3/9/10	5	-	Process Waste	■	■	-	-	-	-	-
	SM-SPS-009-C	3/9/10	10	-	Process Waste	■	■	-	-	-	-	-
	SM-SPS-009-D	3/9/10	14.5	-	Native	■	■	-	-	-	-	-
SPS-010	SM-SPS-010-A	3/10/10	Surface	-	Process Waste	■	■	■	■	■	■	■
	SM-SPS-010-B	3/10/10	5	-	Process Waste	■	■	■	■	■	■	■
	SM-SPS-010-C	3/10/10	10	-	Burn Dump	■	■	■	■	■	■	■
	SM-SPS-010-D	3/10/10	14.5	-	Native	■	■	■	■	■	■	■
SPS-011	SM-SPS-011-A	3/9/10	Surface	-	Process Waste	■	■	-	-	-	-	-
	SM-SPS-011-B	3/9/10	5	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-011-C	3/9/10	10	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-011-D	3/9/10	11.5	-	Native	■	■	-	-	-	-	-
SPS-012	SM-SPS-012-A	3/9/10	Surface	-	Process Waste	■	■	■	■	■	■	■
	SM-SPS-012-B	3/9/10	5	-	Process Waste	■	■	■	■	■	■	■
	SM-SPS-012-C	3/9/10	10	-	Process Waste	■	■	■	■	■	■	■
	SM-SPS-012-D	3/9/10	18.5	-	Process Waste	■	■	■	■	■	■	■
	SM-SPS-012-E	3/9/10	24.5	-	Native	■	■	■	■	■	■	■
SPS-013	SM-SPS-013-A	3/10/10	0.5	Concrete	Process Waste	■	■	-	-	-	-	-
	SM-SPS-013-B	3/10/10	5	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-013-C	3/10/10	10	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-013-D	3/10/10	14.5	-	Native	■	■	-	-	-	-	-
SPS-014	SM-SPS-014-A	3/10/10	0.5	Concrete	Gen Fill	■	■	■	■	■	■	■
	SM-SPS-014-B	3/10/10	5	-	Burn Dump	■	■	■	■	■	■	■
	SM-SPS-014-C	3/10/10	10	-	Burn Dump	■	■	■	■	■	■	■
	SM-SPS-014-D	3/10/10	14.5	-	Native	■	■	■	■	■	■	■
SPS-015	SM-SPS-015-A	3/2/10	0.5	Concrete	Process Waste	■	■	■	■	■	-	-
	SM-SPS-015-B	3/2/10	6	-	Burn Dump	■	■	■	■	■	-	-
	SM-SPS-015-C	3/2/10	10	-	Gen Fill	■	■	■	■	■	-	-
	SM-SPS-015-D	3/2/10	14.5	-	Native	■	■	■	■	■	-	-
SPS-016	SM-SPS-016-A	3/10/10	0.5	Concrete	Gen Fill	■	■	■	■	■	■	■
	SM-SPS-016-B	3/10/10	5	-	Burn Dump	■	■	■	■	■	■	■
	SM-SPS-016-C	3/10/10	10	-	Burn Dump	■	■	■	■	■	■	■
	SM-SPS-016-D	3/10/10	14.5	-	Native	■	■	■	■	■	■	■
SPS-017	SM-SPS-017-A	3/2/10	0.5	Concrete	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-017-B	3/2/10	4.5	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-017-C	3/2/10	9.5	-	Native	■	■	-	-	-	-	-
SPS-018	SM-SPS-018-A	3/2/10	0.5	Concrete	Process Waste	■	■	■	■	■	-	-
	SM-SPS-018-B	3/2/10	4.5	-	Burn Dump	■	■	■	■	■	-	-
	SM-SPS-018-C	3/2/10	9.5	-	Native	■	■	■	■	■	-	-
SPS-019	SM-SPS-019-A	3/10/10	0.5	Concrete	Process Waste	■	■	-	-	-	-	-
	SM-SPS-019-B	3/10/10	5	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-019-C	3/10/10	10	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-019-D	3/10/10	19.5	-	Native	■	■	-	-	-	-	-
SPS-020	SM-SPS-020-A	3/8/10	0.5	Concrete	Burn Dump	■	■	■	■	■	■	■
	SM-SPS-020-B	3/8/10	5	-	Burn Dump	■	■	■	■	■	■	■
	SM-SPS-020-C	3/8/10	10	-	Burn Dump	■	■	■	■	■	■	■
	SM-SPS-020-D	3/8/10	15	-	Burn Dump	■	■	■	■	■	■	■
	SM-SPS-020-E	3/8/10	19.5	-	Native	■	■	■	■	■	■	■
SPS-021	SM-SPS-021-A	3/9/10	Surface	-	Process Waste	■	■	-	-	-	-	-
	SM-SPS-021-B	3/9/10	5	-	Process Waste	■	■	-	-	-	-	-
	SM-SPS-021-C	3/9/10	12.5	-	Process Waste	■	■	-	-	-	-	-
	SM-SPS-021-D	3/9/10	14.5	-	Native	■	■	-	-	-	-	-
SPS-022	SM-SPS-022-A	3/8/10	0.5	Concrete	Burn Dump	■	■	■	■	■	-	-
	SM-SPS-022-B	3/8/10	5	-	Burn Dump	■	■	■	■	■	-	-
	SM-SPS-022-C	3/8/10	10	-	Burn Dump	■	■	■	■	■	-	-
	SM-SPS-022-D	3/8/10	15	-	Burn Dump	■	■	■	■	■	-	-
	SM-SPS-022-E	3/8/10	19.5	-	Native	■	■	■	■	■	-	-
SPS-023	SM-SPS-023-A	3/2/10	0.5	Concrete	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-023-B	3/2/10	5	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-023-C	3/2/10	9.5	-	Native	■	■	-	-	-	-	-
SPS-024	SM-SPS-024-A	3/2/10	0.5	Concrete	Burn Dump	■	■	■	■	■	-	-
	SM-SPS-024-B	3/2/10	3	-	Burn Dump	■	■	■	■	■	-	-
	SM-SPS-024-C	3/2/10	9.5	-	Native	■	■	■	■	■	-	-
SPS-025	SM-SPS-025-A	3/8/10	Surface	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-025-B	3/8/10	5	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-025-C	3/8/10	10	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-025-D	3/8/10	14.5	-	Native	■	■	-	-	-	-	-

TABLE 1a
Material Types and Samples Analyzed for Chemistry and Radionuclides, Solid Matrix
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Sample ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	Metals	Radio-nuclides	VOC	SVOC	TPH	PCB	Dioxin/ Furan
SPS-026	SM-SPS-026-A	3/2/10	0.5	Concrete	Burn Dump	■	■	■	■	■	-	-
	SM-SPS-026-B	3/2/10	5	-	Burn Dump	■	■	■	■	■	-	-
	SM-SPS-026-C	3/2/10	10	-	Burn Dump	■	■	■	■	■	-	-
	SM-SPS-026-D	3/2/10	16	-	Burn Dump	■	■	■	■	■	-	-
	SM-SPS-026-E	3/2/10	19.5	-	Native	■	■	■	■	■	-	-
SPS-027	SM-SPS-027-A	3/2/10	0.5	Concrete	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-027-B	3/2/10	6	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-027-C	3/2/10	10	-	Burn Dump	■	■	-	-	-	-	-
	SM-SPS-027-D	3/2/10	14	-	Native	■	■	-	-	-	-	-
Waste Disposal Area												
WDA-001	SM-WDA-001-A	3/5/10	Surface		Process Waste	■	-	■	■	■	■	■
	SM-WDA-001-B	3/5/10	5	-	Process Waste	■	■	■	■	■	■	■
	SM-WDA-001-C	3/5/10	14.5	-	Native	■	■	-	-	-	-	-
WDA-002	SM-WDA-002-A	3/5/10	Surface		Process Waste	■	-	■	■	■	■	■
	SM-WDA-002-B	3/5/10	5	-	Process Waste	■	■	■	■	■	■	■
	SM-WDA-002-C	3/5/10	14.5	-	Native	■	■	-	-	-	-	-
WDA-003	SM-WDA-003-A	6/29/10	Surface		Process Waste	■	-	■	■	■	■	■
	SM-WDA-003-B	6/29/10	5	-	Process Waste	■	■	■	■	■	■	■
WDA-004	SM-WDA-004-A	3/5/10	Surface		Process Waste	■	-	■	■	■	■	■
	SM-WDA-004-B	3/5/10	5	-	Process Waste	■	■	■	■	■	■	■
	SM-WDA-004-C	3/5/10	17	-	Native	■	■	-	-	-	-	-
WDA-005	SM-WDA-005-A	3/5/10	Surface		Process Waste	■	-	■	■	■	■	■
	SM-WDA-005-B	3/5/10	5	-	Process Waste	■	■	■	■	■	■	■
	SM-WDA-005-C	3/5/10	14.5	-	Native	■	■	-	-	-	-	-
WDA-006	SM-WDA-006-A	3/11/10	Surface		Process Waste	■	-	■	■	■	■	■
	SM-WDA-006-B	3/11/10	5	-	Process Waste	■	■	■	■	■	■	■
	SM-WDA-006-C	3/11/10	14.5	-	Native	■	■	-	-	-	-	-
Waste Management Unit												
WMU-001	SM-WMU-001-A	3/3/10	Surface	-	Process Waste	■	-	■	■	■	■	■
	SM-WMU-001-B	3/3/10	6	-	Process Waste	■	-	■	■	■	■	■
	SM-WMU-001-C	3/3/10	30	-	Process Waste	■	■	-	-	-	-	-
	SM-WMU-001-D	3/3/10	35	-	Process Waste	■	■	-	-	-	-	-
	SM-WMU-001-E	3/3/10	44	-	Native	■	■	-	-	-	-	-
WMU-002	SM-WMU-002-A	3/3/10	Surface	-	Process Waste	■	-	■	■	■	■	■
	SM-WMU-002-B	3/3/10	5	-	Process Waste	■	-	■	■	■	■	■
	SM-WMU-002-C	3/3/10	30	-	Process Waste	■	■	■	■	■	-	-
	SM-WMU-002-D	3/3/10	35	-	Process Waste	■	■	■	■	■	-	-
	SM-WMU-002-E	3/3/10	44	-	Native	■	■	■	■	■	-	-
WMU-003	SM-WMU-003-A	3/3/10	Surface	-	Process Waste	■	-	■	■	■	■	■
	SM-WMU-003-B	3/3/10	5	-	Process Waste	■	-	■	■	■	■	■
	SM-WMU-003-C	3/3/10	30	-	Process Waste	■	■	-	-	-	-	-
	SM-WMU-003-D	3/3/10	35	-	Process Waste	■	■	-	-	-	-	-
	SM-WMU-003-E	3/3/10	44	-	Native	■	■	-	-	-	-	-
WMU-004	SM-WMU-004-A	3/4/10	Surface	-	Process Waste	■	-	■	■	■	■	■
	SM-WMU-004-B	3/4/10	5	-	Process Waste	■	-	■	■	■	■	■
	SM-WMU-004-C	3/4/10	30	-	Process Waste	■	■	■	■	■	■	■
	SM-WMU-004-D	3/4/10	35	-	Process Waste	■	■	■	■	■	■	■
	SM-WMU-004-E	3/4/10	44	-	Native	■	■	■	■	■	■	■
WMU-005	SM-WMU-005-A	3/4/10	Surface	-	Process Waste	■	-	■	■	■	■	■
	SM-WMU-005-B	3/4/10	Surface	-	Process Waste	■	-	■	■	■	■	■
	SM-WMU-005-C	3/4/10	30	-	Process Waste	■	■	-	-	-	-	-
	SM-WMU-005-D	3/4/10	35	-	Process Waste	■	■	-	-	-	-	-
	SM-WMU-005-E	3/4/10	44	-	Native	■	■	-	-	-	-	-
WMU-006	SM-WMU-006-A	3/4/10	Surface	-	Process Waste	■	-	■	■	■	■	■
	SM-WMU-006-B	3/4/10	5	-	Process Waste	■	-	■	■	■	■	■
	SM-WMU-006-C	3/4/10	30	-	Process Waste	■	■	■	■	■	■	■
	SM-WMU-006-D	3/4/10	35	-	Process Waste	■	■	■	■	■	■	■
	SM-WMU-006-E	3/4/10	44	-	Native	■	■	■	■	■	■	■
WMU-007	SM-WMU-007-A	3/4/10	Surface	-	Process Waste	■	-	■	■	■	■	■
	SM-WMU-007-B	3/4/10	5	-	Process Waste	■	-	■	■	■	■	■
	SM-WMU-007-C	3/4/10	30	-	Process Waste	■	■	-	-	-	-	-
	SM-WMU-007-D	3/4/10	35	-	Process Waste	■	■	-	-	-	-	-
	SM-WMU-007-E	3/4/10	44	-	Native	■	■	-	-	-	-	-
WMU-008	SM-WMU-008-A	3/4/10	Surface	-	Process Waste	■	-	■	■	■	■	■
	SM-WMU-008-B	3/4/10	5	-	Process Waste	■	-	■	■	■	■	■
	SM-WMU-008-C	3/4/10	30	-	Process Waste	■	■	■	■	■	-	-
	SM-WMU-008-D	3/4/10	35	-	Process Waste	■	■	■	■	■	-	-
	SM-WMU-008-E	3/4/10	44	-	Native	■	■	■	■	■	-	-

TABLE 1a

Material Types and Samples Analyzed for Chemistry and Radionuclides, Solid Matrix

Halaco Site Remedial Investigation, Oxnard, California

Location ID	Sample ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	Metals	Radio-nuclides	VOC	SVOC	TPH	PCB	Dioxin/ Furan
WMU-009	SM-WMU-009-A	3/5/10	Surface	-	Process Waste	■	-	■	■	■	■	-
	SM-WMU-009-B	3/5/10	5	-	Process Waste	■	-	■	■	■	■	-
	SM-WMU-009-C	3/5/10	30	-	Process Waste	■	■	-	-	-	-	-
	SM-WMU-009-D	3/5/10	35	-	Process Waste	■	■	-	-	-	-	-
	SM-WMU-009-E	3/5/10	44	-	Native	■	■	-	-	-	-	-
North of Waste Disposal Area												
WNO-001	SM-WNO-001-A	3/11/10	Surface	-	Native	■	■	-	-	-	-	-
	SM-WNO-001-B	3/11/10	2	-	Native	■	■	-	-	-	-	-
WNO-002	SM-WNO-002-A	3/11/10	Surface	-	Native	■	■	-	-	-	-	-
	SM-WNO-002-B	3/11/10	2	-	Native	■	■	-	-	-	-	-
WNO-003	SM-WNO-003-A	3/11/10	Surface	-	Native	■	■	-	-	-	-	-
	SM-WNO-003-B	3/11/10	2	-	Process Waste	■	■	-	-	-	-	-
WNO-004	SM-WNO-004-A	3/11/10	Surface	-	Native	■	■	-	-	-	-	-
	SM-WNO-004-B	3/11/10	2	-	Process Waste	■	■	-	-	-	-	-
East Bank of OID												
ODE-001	SM-ODE-001-A	3/11/10	Surface	-	General Fill	■	■	-	-	-	-	-
	SM-ODE-001-B	3/11/10	3	-	General Fill	■	■	-	-	-	-	-
ODE-001A	SM-ODE-001A-A	6/15/10	Surface	-	General Fill	■	■	-	-	-	-	-
	SM-ODE-001A-B	6/15/10	5	-	General Fill	■	■	-	-	-	-	-
	SM-ODE-001A-C	6/15/10	10	-	General Fill	■	■	-	-	-	-	-
	SM-ODE-001A-D	6/15/10	16	-	Native	■	■	-	-	-	-	-
ODE-002	SM-ODE-002-A	3/11/10	Surface	-	Process Waste	■	■	-	-	-	-	-
ODE-002A	SM-ODE-002A-A	6/16/10	Surface	-	General Fill	■	■	-	-	-	-	-
	SM-ODE-002A-B	6/16/10	5	-	General Fill	■	■	-	-	-	-	-
	SM-ODE-002A-C	6/16/10	10	-	General Fill	■	■	-	-	-	-	-
	SM-ODE-002A-D	6/16/10	14	-	Native	■	■	-	-	-	-	-
ODE-003	SM-ODE-003-A	3/11/10	Surface	-	Process Waste	■	■	-	-	-	-	-
	SM-ODE-003-B	3/11/10	4.5	-	Process Waste	■	■	-	-	-	-	-
ODE-003A	SM-ODE-003A-A	6/16/10	Surface	-	General Fill	■	■	-	-	-	-	-
	SM-ODE-003A-B	6/16/10	5	-	General Fill	■	■	-	-	-	-	-
	SM-ODE-003A-C	6/16/10	10	-	General Fill	■	■	-	-	-	-	-
	SM-ODE-003A-D	6/16/10	13	-	Native	■	■	-	-	-	-	-
ODE-004	SM-ODE-004-A	3/11/10	Surface	-	Process Waste	■	■	-	-	-	-	-
	SM-ODE-004-B	3/11/10	5	-	Process Waste	■	■	-	-	-	-	-
	SM-ODE-004-C	3/11/10	10	-	Process Waste	■	■	-	-	-	-	-
	SM-ODE-004-D	3/11/10	14.5	-	Native	■	■	-	-	-	-	-
ODE-005	SM-ODE-005-A	3/11/10	Surface	-	Process Waste	■	■	-	-	-	-	-
	SM-ODE-005-B	3/11/10	5	-	Process Waste	■	■	-	-	-	-	-
	SM-ODE-005-C	3/11/10	10	-	Process Waste	■	■	-	-	-	-	-
	SM-ODE-005-D	3/11/10	14.5	-	Native	■	■	-	-	-	-	-
ODE-006	SM-ODE-006-A	3/11/10	Surface	-	Process Waste	■	■	-	-	-	-	-
	SM-ODE-006-B	3/11/10	5	-	Process Waste	■	■	-	-	-	-	-
	SM-ODE-006-C	3/11/10	9.5	-	Native	■	■	-	-	-	-	-
SUMMARY												
Smelter Parcel												
Smelter Parcel - North Area (12 locations)						28	28	4	4	4	-	-
Smelter Parcel - Parking Area (4 locations)						8	8	4	4	4	-	-
Smelter Parcel - Southeast and Process Area (27 locations)						107	107	60	60	60	31	31
					Subtotal (43 locations)	**143**	**143**	**68**	**68**	**68**	**31**	**31**
Waste Management Area												
Waste Disposal Area (6 locations)						17	11	12	12	12	12	12
Waste Management Unit (9 locations)						45	27	30	30	30	24	22
North of Waste Disposal Area (4 locations)						8	8	-	-	-	-	-
East Bank of OID (6 locations)						28	28	-	-	-	-	-
					Subtotal (25 locations)	**98**	**74**	**42**	**42**	**42**	**36**	**34**
					Total (68 locations)	**241**	**217**	**110**	**110**	**110**	**67**	**65**

Notes:

A/C = asphalt/concrete

TABLE 1b

Material Types and Samples Analyzed for Geotechnical Parameters, Solid Matrix

Halaco Site Remedial Investigation, Oxnard, California

Location ID	Sample ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	Grain Size	Atterberg Limits	Moisture Content	Dry Bulk Density	Direct Shear	Modified Proctor
Smelter Parcel											
SGT-2	SM-SGT-002-A	11/10/09	5	Concrete	Burn Dump	■	■	■	■	■	-
	SM-SGT-002-B	11/10/09	10	-	Burn Dump	■	■	■	■	-	■
	SM-SGT-002-C	11/10/09	15	-	Native	■	■	■	■	-	-
Waste Management Unit											
WGT-1	SM-WGT-001-A	11/10/09	10	-	Process Waste	■	■	■	■	■	-
	SM-WGT-001-B	11/10/09	20	-	Process Waste	■	■	■	■	-	■
	SM-WGT-001-C	11/10/09	30	-	Process Waste	■	■	■	■	■	-
WGT-2	SM-WGT-002-A	11/10/09	10	-	Process Waste	■	■	■	■	■	-
	SM-WGT-002-B	11/10/09	20	-	Process Waste	■	■	■	■	-	■
	SM-WGT-002-C	11/10/09	30	-	Process Waste	■	■	■	■	■	-
SUMMARY											
Smelter Parcel						3	3	3	3	1	1
Waste Management Unit						6	6	6	6	4	2
					Total	**9**	**9**	**9**	**9**	**5**	**3**

Notes:

A/C = asphalt/concrete

TABLE 1c

Material Types and Samples Analyzed for Chemistry, Soil Gas Matrix

Halaco Site Remedial Investigation, Oxnard, California

Location ID	Sample ID	Probe Install Date	Probe Sample Date	Probe Depth (ft, bgs)	Concrete at Surface	Material Type	Duplicate	Summa Canister		Summa Canister							Adsorbent Tube	Tedlar Bag	Comment
								VOC	Lab Receipt Vacuum	Methane	Carbon Dioxide	Carbon Monoxide	Acetylene	Hydrogen	Oxygen	Lab Receipt Vacuum	Ammonia	Hydrogen Sulfide	
Waste Management Unit																			
WSG-001	SG-WSG-001-A	1/15/10	3/3/10	5	-	Process Waste		■	1.3	■	■	■	■	■	■	3.0	■		
	SG-WSG-001-B	1/15/10	3/3/10	15	-	Process Waste													Failed Field LDT
	SG-WSG-001-B	3/11/10	3/15/10	15	-	Process Waste													Reinstalled, failed Field LDT
	SG-WSG-001-C	1/15/10	3/3/10	30	-	Process Waste		■	2.2	■	■	■	■	■	■	1.4	■		
	SG-WSG-101-C	n/a	3/3/10	30	-	Process Waste	Duplicate	■	2.0	■	■	■	■	■	■	2.0	■		
WSG-002	SG-WSG-002-A	1/16/10	3/4/10	5	-	Process Waste													Failed Field LDT
	SG-WSG-002-A	3/11/10	3/15/10	5	-	Process Waste													Reinstalled, failed Field LDT
	SG-WSG-002-B	1/16/10	3/4/10	15	-	Process Waste													Failed Field LDT
	SG-WSG-002-B	3/11/10	3/15/10	15	-	Process Waste													Reinstalled, failed Field LDT
	SG-WSG-002-C	1/16/10	3/4/10	30	-	Process Waste		■	2.4	■	■	■	■	■	■	2.3	■		
Smelter Parcel																			
SSG-001	SG-SSG-001-A	1/15/10	3/3/10	5	-	Process Waste		■	1.2	■	■	■	■	■	■	0.5	■	■	
SSG-002	SG-SSG-002-A	1/15/10	3/3/10	5	-	Process Waste		■	1.3	■	■	■	■	■	■	1.9	■	■	
	SG-SSG-102-A	n/a	3/3/10	5	-	Process Waste	Duplicate	■	1.7	■	■	■	■	■	■	0.4	■	■	
SSG-003	SG-SSG-003-A	1/15/10	3/4/10	5	-	Process Waste		■	0.7	■	■	■	■	■	■	1.6	■	■	
SSG-004	SG-SSG-004-A	1/15/10	3/4/10	5	-	Burn Dump		■	1.9	■	■	■	■	■	■	0.7	■	■	
SSG-005	SG-SSG-005-A	1/15/10	3/4/10	5	Concrete	Burn Dump		■	2.0	■	■	■	■	■	■	2.9	■	■	
SSG-006	SG-SSG-006-A	1/15/10	3/4/10	5	Concrete	Burn Dump													Probe vault flooded
	SG-SSG-006-A	3/9/10	3/15/10	5	Concrete	Burn Dump		■	1.9	■	■	■	■	■	■	3.4	■	■	Reinstalled
SSG-007	SG-SSG-007-A	3/9/10	3/15/10	5	Concrete	General Fill		■	3.0	■	■	■	■	■	■	4.7		■	NH3 Failed Field LDT
SUMMARY																			
Smelter Parcel								4		4	4	4	4	4	4		4	-	
Waste Management Unit								8		8	8	8	8	8	8		7	8	
							Total	**12**		**12**	**12**	**12**	**12**	**12**	**12**		**11**	**8**	

Notes:

Summa canister receipt vacuum measured in psi

LDT = leak detection test ▒ = LDT failed, not analyzed

n/a = not applicable

TABLE 2
Metals Analytical Results, Solid Matrix, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	CLP ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	Aluminum Result	Q	Antimony Result	Q	Arsenic Result	Q	Barium Result	Q	Beryllium Result	Q	Cadmium Result	Q	Calcium Result	Q	Chromium Result	Q	Cobalt Result	Q	Copper Result	Q	Iron Result	Q	Lead Result	Q	Magnesium Result	Q	Manganese Result	Q	Mercury Result	Q	Nickel Result	Q	Potassium Result	Q	Selenium Result	Q	Silver Result	Q	Sodium Result	Q	Thallium Result	Q	Vanadium Result	Q	Zinc Result	Q
Smelter Parcel - North Area																																																							
SPN-001		SM-SPN-001-A	MY5R22	3/1/10	0.5	Concrete	Gen Fill	7,720		0.29	J+	3.9	J+	167	J	0.36	UJ	1.2	J+	15,700		16.3	J+	6.2		103	J	18,000		161		5,220		361		0.027	J	17.2		2,930	J+	0.42	J+	0.31	J+	220	J	0.19	J+	25.2	J+	244	
		SM-SPN-001-B	MY5SK1	3/1/10	2	-	Gen Fill	7,390		0.24	J+	3.7	J+	141	J	0.36	UJ	1.1	J+	10,900		15.7	J+	5.6	UJ	28.4	J	16,200		39.3		4,990		326		0.13	U	15.9		2,930	J+	0.61	J+	0.25	J+	168	J	0.18	J+	26.9	J+	108	
SPN-002		SM-SPN-002-A	MY5R24	3/1/10	0.5	Concrete	Gen Fill	7,570		0.084	J+	3.5	J+	111	J	0.37	UJ	0.67	J+	27,500		14.2	J+	5.5	UJ	17.4	J	16,100		11.2		6,300		381		0.026	J	15.1		3,030	J+	0.75	J+	0.61	UM	507	J	0.19	J+	26.3	J+	52.2	
		SM-SPN-002-B	MY5R25	3/1/10	2	-	Burn Dump	6,420		0.31	J+	2.8	J+	103		0.32	UJ	0.89	J+	16,700	J	12.4	J+	4.7	UJ	18.4		12,900		33.1	J	4,070		263	J	0.032	J	12.7		2,080	J+	0.41	J+	0.14	J+	579		0.16	J+	22.9	J+	85.7	
SPN-003		SM-SPN-003-A	MY5R26	3/1/10	Surface	-	Gen Fill	12,300		2	J+	8.4	J+	309	J	1.5	J	2.4	J+	9,780		70.4	J+	5.9		427	J	20,800		317		8,960		482		0.056	J	77.2		1,920	J+	1.1	J+	1.3	J+	195	J	0.076	J+	17.9	J+	1,920	
	Dup	SM-SPN-103-A	MY5R27	3/1/10	Surface	-	Gen Fill	9,600		0.34	J+	3.8	J+	194	J	0.75	J	1.1	J+	7,390		29.5	J+	4.5	UJ	316	J	14,700		59.7		6,040		360		0.028	J	35.1		1,960	J+	0.7	J+	0.3	J+	203	J	0.099	J+	20	J+	733	
		SM-SPN-003-B	MY5R28	3/1/10	2	-	Burn Dump	5,620		0.11	J+	2.7	J+	100	J	0.28	UJ	0.66	J+	8,070		12.3	J+	4.5	UJ	14.8	J	12,400		29.1		3,760		174		0.014	J	13.1		2,530	J+	0.61	J+	0.53	UM	276	J	0.12	J+	21.8	J+	68	
	Dup	SM-SPN-103-B	MY5R29	3/1/10	2	-	Burn Dump	5,770		0.22	J+	2.9	J+	138	J	0.29	UJ	0.72	J+	7,550		12.4	J+	4.7	UJ	17.6	J	13,400		51.4		3,730		179		0.031	J	12.9		2,480	J+	0.54	J+	0.55	UM	266	J	0.12	J+	21	J+	109	
SPN-004		SM-SPN-004-A	MY5SK2	3/1/10	Surface	-	Gen Fill	138,000		3.4	J+	5.5	J+	608	J	8.5	J	2.1	J+	4,790		411	J+	10.5		3,430	J	36,700		260		75,800		4100		0.017	J	231		2,190	J+	1.2	J+	8.2	J+	2,860		0.037	J+	60.8	J+	4,130	
		SM-SPN-004-B	MY5SK3	3/1/10	2	-	Burn Dump	13,400		7.6	J+	20	J+	618	J	0.16	UJ	9.1	J+	21,600		56.3	J+	18.5		618	J	95,200		2190		2,780		725		0.087	J	64.7		5,180	J+	0.97	J+	2.8	J+	1,910		0.059	J+	24	J+	1,210	
SPN-005		SM-SPN-005-A	MY5SK4	3/1/10	Surface	-	Gen Fill	20,500		1.1	J+	6.7	J+	224	J	2.1	J	1.8	J+	15,200		50.1	J+	14.7		311	J	44,100		80.5		20,100		956		0.026	J	49		3,830	J+	1.3	J+	2.2	J+	2,080		0.094	J+	37.5	J+	791	
		SM-SPN-005-B	MY5SK5	3/1/10	2	-	Gen Fill	5,000		0.14	J+	2.4	J+	85.5	J	0.25	UJ	0.54	J+	10,500		8.4	J+	3.9	UJ	14.5	J	11,200		38.2		3,840		356		0.019	J	15.7		2,140	J+	0.38	J+	0.54	UM	733		0.067	J+	19.8	J+	43.2	
SPN-006		SM-SPN-006-A	MY5SK6	3/1/10	Surface	-	Gen Fill	7,920		0.069	J+	2.5	J+	63.1	J	0.27	UJ	0.47	J+	9,570		15.7	J+	8.5		20.6	J	23,400		9.1		6,430		416		0.1	U	13.7		3,150	J+	0.63	J+	0.55	UM	763		0.085	J+	42.6	J+	55	
		SM-SPN-006-B	MY5SK7	3/1/10	2	-	Burn Dump	4,940		0.96	J+	12.4	J+	2,460	J	0.23	UJ	0.88	J+	8,540		16.3	J+	4.9	UJ	89.2	J	17,600		140		3,680		227		0.074	J	15.6		2,780	J+	0.55	J+	0.23	J+	361	J	0.11	J+	20.3	J+	109	
SPN-007		SM-SPN-007-A	MY5SK8	3/1/10	Surface	-	Gen Fill	12,600		0.14	J+	3.5	J+	193	J	1.1	J	1.3	J+	12,300		21	J+	8.3		169	J	22,200		30.4		12,300		475		0.12	U	24		1,980	J+	0.88	J+	0.13	J+	1,620		0.096	J+	40.1	J+	247	
		SM-SPN-007-B	MY5SK9	3/1/10	2	-	Burn Dump	9,320		0.33	J+	7	J+	165	J	0.57	UJ	1.7	J+	13,400		23.9	J+	6.5		92.2	J	22,300		42.7		6,380		605		0.037	J	27.3		4,830	J+	0.99	J+	0.54	J+	847		0.16	J+	28.6	J+	324	
SPN-008		SM-SPN-008-A	MY5SL0	3/1/10	Surface	-	Gen Fill	7,920		0.98	J+	4.3	J+	178		0.37	UJ	1.6	J+	17,800	J	18.4	J+	5.8		309		19,600		200	J	4,740		409	J	0.055	J	18.4		3,230	J+	0.27	J+	0.54	J+	336	J	0.13	J+	22.6	J+	549	
		SM-SPN-008-B	MY5SL1	3/1/10	2	-	Burn Dump	15,400		14.9	J+	20.7	J+	1240		0.21	UJ	20.9	J+	50,200	J	48.7	J+	11.2		697		21,400		796	J	3,900		468	J	0.1	U	28.9		4,570	J+	0.56	UM	19.3	J+	2,050		0.059	J+	26.1	J+	3,080	
SPN-009		SM-SPN-009-A	MY5SL2	3/1/10	Surface	-	Gen Fill	13,600		1.2	J+	10.6	J+	346		4.6	J	7.2	J+	8,680	J	119	J+	15.1		365		153,000		113	J	6,150		1260	J	0.071	J	104		3,150	J+	0.62	UM	1.1	J+	438	J	0.12	J+	25	J+	1,130	
		SM-SPN-009-B	MY5SL3	3/1/10	2	-	Burn Dump	11,500		8.5	J+	17.4	J+	670		0.21	UJ	8.5	J+	24,700	J	57.6	J+	20.4		839		99,000		2470	J	3,780		744	J	0.16		60.2		4,960	J+	0.65	UM	4.2	J+	1,490		0.051	J+	22.9	J+	3,100	
SPN-010		SM-SPN-010-A	MY5SL4	3/1/10	Surface	-	Gen Fill	10,400		0.19	J+	2.3	J+	95.3		0.19	UJ	0.59	J+	16,700	J	13.1	J+	11.4		23.9		27,000		12.9	J	10,900		453	J	0.11	U	15.6		1,050	J+	0.3	J+	0.57	UM	1,120		0.083	J+	29.9	J+	86.2	
		SM-SPN-010-B	MY5SL5	3/1/10	2	-	Burn Dump	11,300		0.11	J+	2.2	J+	62.6		0.29	UJ	0.56	J+	9,300	J	15.3	J+	13.4		24.8		34,400		7.5	J	8,810		474	J	0.12	U	16.5		1,800	J+	0.35	J+	0.6	UM	1,260		0.1	J+	48.9	J+	62.8	
SPN-011		SM-SPN-011-A	MY5SL6	3/8/10	Surface	-	Gen Fill	12,300		0.42	J+	6.5	J+	143		1.1		0.93	J+	10,200		28.1	J+	13.8		86.8	J	33,300		44.3		11,600		567		0.11	UJ	22.2		3,250	J+	0.68	J+	0.26	J+	592		0.082	J+	35.7	J+	186	
		SM-SPN-011-B	MY5SL7	3/8/10	5	-	Burn Dump	9,000		9.7	J+	16.9	J+	730		0.092	UJ	6.5	J+	15,800		55.6	J+	17.7		665	J	125,000		1970		3,750		753		0.085	U	73.6		2,250	J+	0.68	J+	3.1	J+	610		0.052	J+	14.9	J+	1,610	
		SM-SPN-011-C	MY5SL8	3/8/10	10	-	Transition	7,750		0.43	J+	3.1	J+	162		0.4	UJ	0.89	J+	123,000		17.2	J+	6.1	UJ	52.3	J	21,500		135		14,400		731		0.14	UJ	21.7		5,950	J+	1.3	J+	0.21	J+	2,550		0.19	J+	27.5	J+	116	
		SM-SPN-011-D	MY5SL9	3/8/10	14.5	-	Native	13,900		0.13	J+	6	J+	183		0.83		0.5	J+	16,000		25.1	J+	8.9		23.7	J	32,900		16.1		9,700		353		0.027	U	26.2		8,480	J+	1	J+	0.7	UM	1,840		0.27	J+	44.9	J+	82	
SPN-012		SM-SPN-012-A	MY5SM1	3/2/10	Surface	-	Gen Fill	22,500		2	J+	6.1		557		9.9	J	1.9	J+	13,700		3,800	J+	5.5	UJ	627		21,300		69900		22,100		900		0.14	J-	40.7	J	2,370	J+	1.4	J+	1.5	J+	392	J	0.12	J+	187	J+	592	
	Dup	SM-SPN-112-A	MY5SM6	3/2/10	Surface	-	Gen Fill	7,500		0.18	J+	3.2		128		0.51	UJ	0.63	J+	13,300		15.2	J+	5.2	UJ	26.3		15,000		14.4		5,560		282		0.027	J-	14.8	J	2,650	J+	0.58	J+	0.58	UM	187	J	0.15	J+	26.2	J+	84.4	
		SM-SPN-012-B	MY5SM2	3/2/10	5	-	Burn Dump	10,600		8.2	J+	29.2		498		0.28	UJ	5.1	J+	17,400		39.9	J+	9.1	J	649		71,200		1210		4,510		576		0.73	J-	35.6	J	4,550	J+	1.2	J+	2.7	J+	1,470		0.092	J+	21.6	J+	1,540	
	Dup	SM-SPN-112-B	MY5SM7	3/2/10	5	-	Burn Dump	10,900		8.2	J+	20.9		456		0.24	J	7.1	J+	20,800		59.4	J+	16.1	J	655		79,000		1170		3,870		684		0.28	J-	65	J	3,850	J+	0.87	J+	2.9	J+	1,430		0.067	J+	23.3	J+	1,870	
		SM-SPN-012-C	MY5SM3	3/2/10	8	-	Burn Dump	8,390		7	J+	9.8		615		0.24	UJ	9.6	J+	21,200		43.3	J+	6.9	UJ	686		38,100		1060		6,170		404		0.22	J-	27.5	J	4,910	J+	2.1	J+	3.9	J+	2,570		0.12	J+	24.2	J+	21,400	
	Dup	SM-SPN-112-C	MY5SM8	3/2/10	8	-	Burn Dump	6,470		3.1	J+	49.3		431		0.24	UJ	6.4	J+	18,300		46.1	J+	7.9	J	277		27,200		1140		4,990		314		0.52	J-	26	J	4,320	J+	1.3	J+	1.9	J+	1,760		0.083	J+	18	J+	1,420	
		SM-SPN-012-D	MY5SM4	3/2/10	12	-	Native	17,600		0.2	J+	4.4		248		1.1	J	2.5	J+	53,600		33.7	J+	13.3	J	40.4		41,300		12.8		12,900		1830		0.076	J-	38.6	J	10,700	J+	1.7	J+	0.81	UM	2,480		0.36	J+	63	J+	106	
	Dup	SM-SPN-112-D	MY5SM9	3/2/10	12	-	Native	17,000		0.1	J+	3.8		225		0.97	J	2.3	J+	52,600		30.6	J+	11.6	J	35.9		33,400		14.9		10,900		673		0.08	J-	27.6	J	9,620	J+	1.6	J+	0.79	UM	2,360		0.38	J+	56.2	J+	91.1	
Smelter Parcel - Parking Area																																																							
SPP-001		SM-SPP-001-A	MY5SN1	3/1/10	0.5	Asphalt	Gen fill	3,120		0.12	J+	1.7	J+	49.9		0.16	UJ	0.4	J+	9,010	J	6.3	J+	2.7	UJ	8.6		7,510		4.2	J	2,460		146	J	0.11	U	7.6		884	J+	0.25	J+	0.54	UM	142	J	0.059	J+	13.5	J+	23.5	
		SM-SPP-001-B	MY5SN2	3/1/10	2	-	Burn Dump	4,460		0.32	J+	2.8	J+	70.8		0.21	UJ	0.74	J+	7,030	J	12.3	J+	3.5	UJ	17.2		10,400		45.2	J	2,850		162	J	0.11	U	11.2		1,600	J+	0.3	J+	0.55	UM	163	J	0.12	J+	21.2	J+	65.4	
SPP-002		SM-SPP-002-A	MY5SN3	3/1/10	0.5	Asphalt	Gen fill	2,860		0.12	J+	2	J+	50.4		0.14	UJ	0.39	J+	11,600	J	6.2	J+	1.9	UJ	8.6		6,500		3.7	J	4,000		149	J	0.11	U	6.4		858	J+	0.56	UM	0.54	UM	131	J	0.056	J+	16.3	J+	22.2	
		SM-SPP-002-B	MY5SN4	3/1/10	2	-	Burn Dump	6,510		6.1	J+	9.6	J+	243		0.23	UJ	3.6	J+	10,800	J	25.1	J+	7.5		261		31,900		500	J	3,080		281	J	0.17		23.9		2,130	J+	0.58	UM	1.1	J+	344	J	0.09	J+	20	J+	648	
SPP-003		SM-SPP-003-A	MY5R63	3/1/10	0.5	Asphalt	Gen fill	3,080		0.07	J+	1.7	J+	75.3	J	0.21	UJ	0.48	J+	21,300		6.5	J+	21.2		17.4	J	6,700		6.9		2,370		147		0.11	U	9.6		800	J+	0.33	J+	0.17	J+	159	J	0.067	J+	13.5	J+	31.5	
		SM-SPP-003-B	MY5R64	3/1/10	2	-	Burn Dump	5,410		0.25	J+	2.9	J+	106	J	0.26	UJ	0.86	J+	9,740		12.1	J+	4.8	UJ	36.1	J	14,000		53.9		3,380		166		0.013	J	14.9		1,990	J+	0.48	J+	0.18	J+	141	J	0.12	J+	21.7	J+	109	
SPP-004		SM-SPP-004-A	MY5R65	3/1/10	0.5	Asphalt	Gen fill	3,560		0.2	J+	1.7	J+	58.6	J	0.15	UJ	0.45	J+	9,880		8.9	J+	2.3	UJ	23.2	J	7,930		46.1		2,400		176		0.11	U	8.2		937	J+	0.56	UM	0.13	J+	108	J	0.067	J+	13.5	J+	111	
		SM-SPP-004-B	MY5R66	3/1/10	2	-	Burn Dump	5,650		0.22	J+	3.9	J+	97	J	0.27	UJ	0.84	J+	12,600		13	J+	4.7	UJ	32.8	J	13,800		62		3,570		217		0.032	J	14.1		2,280	J+	0.54	J+	0.14	J+	192	J	0.12	J+	22	J+	258	
Smelter Parcel - South Area																																																							
SPS-001		SM-SPS-001-A	MY5SN5	3/9/10	Surface	-	Process Waste	70,100		11.8	J+	10.3		4,060		42.8		4.2	J+	18,200		466		8.8		2,260		13,500		278		130,000		3,690		0.13	U	130		607	J+	1.7	J+	16.6	J+	396	J	0.028	J+	64	J+	3,540	
		SM-SPS-001-B	MY5SN6	3/9/10	5	-	Process Waste	71,600		6.7	J+	10.1		4,630		24.9		7.1	J+	15,200		374		10.3		2,710		18,100		299		112,000		4,030		0.47		160		1,390	J+	2.1	J+	15	J+	1,100		0.032	J+	44.3	J+	3,630	
		SM-SPS-001-C	MY5SN7	3/9/10	10	-	Process Waste	70,400		7.5	J+	11.9		4,160		25		4.6	J+	11,400		349		11.1		2,670		30,300		377		93,100		2,460		0.15		262		1,780	J+	1.8	J+	28.5	J+	871		0.027	J+	50.9	J+	3,680	
		SM-SPS-001-D	MY5SN8	3/9/10	13	-	Process Waste	10,700		0.32	J+	4.3	J+	1,500		0.6	UJ	1	J+	69,800	J	18.4	J+	7.4	UJ	29.9		24,400		36.2		11,800		650	J	0.022	UJ	20.7		11,900	J+	1.2	J+	0.8	UM	3,810		0.25	J+	36.2	J+	74.6	
		SM-SPS-001-E	MY5SN9	3/9/10	19.5	-	Native	14,000		0.22	J+	13.3	J+	193		0.83		1.6	J+	23,000	J	25.3	J+	10		32.1		34,800		11.9		10,500		757	J	0.054	UJ	25.9		7,510	J+	1.5	J+	0.18	J+	5,560		0.32	J+	46.6	J+	80.5	
SPS-002		SM-SPS-002-A	MY5R72	3/9/10	Surface	-	Process Waste	143,000	J	8	J+	7.9	J+	6,840	J	39	J	4.7	J+	7,400		202		9.3	J	6,520	J	11,700		425	J	89,200		3,070		0.061	UJ	269		819	J+	2.4	J+	12.6	J+	429	J	0.052	J+	49.4	J+	5,970	J
	Dup	SM-SPS-102-A	MY5R77	3/9/10	Surface	-	Process Waste	198,000	J	5.6	J+	7.2	J+	908	J	3.5	J	13	J+	4,670		361		17.4	J	7,260	J	17,300		328	J	23,500		1,250		0.017	UJ	238		1,630	J+	2.4	J+	5.7	J+	1,000		1.5	UM	60.6	J+	6,050	J
		SM-SPS-002-B	MY5R73	3/9/10	5	-	Process Waste	17,700	J	2.6	J+	13.7	J+	10,100	J	47.8	J	4.2	J+	8,550		145		6.2	UJ	202	J	21,700		124	J	196,000		4,270		0.14	U	45.9		2,780	J+	1.5	J+	4.2	J+	1,810		1.5	UM	27	J+	1,160	J
	Dup	SM-SPS-102-B	MY5R78	3/9/10	5	-	Process Waste	8,200	J	3.3	J+	7.2	J+	7,740	J	41.5	J	1.1	J+	1,020		194		5.4	UJ	194	J	20,100		160	J	299,000		6,380		0.15	U	33.4		3,110	J+	0.75	J+	1.4	J+	3,420		1.6	UM	22.2	J+	885	J
		SM-SPS-002-C	MY5R74	3/9/10	10	-	Process Waste	31,900	J	0.67	J+	5	J+	4,360	J	97	J	0.66	J+	4,640		143		7.6	UJ	59.3	J	8,430		14.6	J	348,000		7,070		0.15	U	20.3		8,090	J+	0.82	J+	1	J+	6,200		0.059	J+	26.1	J+	554	J
	Dup	SM-SPS-102-C	MY5R79	3/9/10	10	-	Process Waste	28,400	J	0.45	J+	3	J+	2,840	J	98.4	J	1.1	J+	4,990		127		9.4	J	119	J	9,780		9.9	J	351,000		4,410		0.18	U	18		12,500	J+	0.81	J+	0.92	J+	9,250		1.7	UM	23.7	J+	1,570	J
		SM-SPS-002-D	MY5R75	3/9/10	14	-	Process Waste	8,800	J	0.26	J+	5	J+	5,840	J	0.63	UJ	0.65	J+	59,700		12.4		5.3	UJ	26.2	J	17,500		44.1	J	45,900		3,700		0.13	U	14.7		14,400	J+	1.1	J+	0.18	J+	6,570		0.12	J+	19.3	J+	84.9	J
		SM-SPS-002-E	MY5R76	3/9/10	18	-	Native	11,600	J	0.3	J+	5.3	J+	2,350	J	0.69	J	1	J+	20,700		21.1		9.9	J	30.6	J	27,800		10.7	J	9,560		557		0.017	UJ	26.4		16,500	J+	1.5	J+	0.14	J+	5,040		0.24	J+	39	J+	75.6	J
	Dup	SM-SPS-102-E	MY5R81	3/9/10	18	-	Native	7,120	J	0.19	J+	3.5	J+	2,250	J	0.51	J	0.58	J+	11,300		12.1		6.1	UJ	18.4	J	13,400		6.1	J	6,780		353		0.13	U	15.7		10,700	J+	0.91	J+	0.62	UM	3,930		0.1	J+	23	J+	50.5	J

TABLE 2
Metals Analytical Results, Solid Matrix, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	CLP ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	Aluminum Result	Q	Antimony Result	Q	Arsenic Result	Q	Barium Result	Q	Beryllium Result	Q	Cadmium Result	Q	Calcium Result	Q	Chromium Result	Q	Cobalt Result	Q	Copper Result	Q	Iron Result	Q	Lead Result	Q	Magnesium Result	Q	Manganese Result	Q	Mercury Result	Q	Nickel Result	Q	Potassium Result	Q	Selenium Result	Q	Silver Result	Q	Sodium Result	Q	Thallium Result	Q	Vanadium Result	Q	Zinc Result	Q
SPS-003		SM-SPS-003-A	MY5SP0	3/9/10	Surface	-	Process Waste	22,100		12.8	J+	11.7	J+	1140		6		4.9	J+	24,200	J	51.2	J+	7.8		1,270		41,300		756		21,300		996	J	0.22		53.1		3,420	J+	1.1	J+	1.5	J+	593		0.055	J+	23.5	J+	1,860	
		SM-SPS-003-B	MY5SP1	3/9/10	5	-	Process Waste	24,200		9.3	J+	12.8	J+	1,820		6.3		3.9	J+	30,900	J	186	J+	8.7		1,700		34,700		609		24,400		1,100	J	0.088	UJ	112		2,790	J+	1	J+	4.9	J+	570	UJ	0.049	J+	39.7	J+	2,200	
		SM-SPS-003-C	MY5SP2	3/9/10	10	-	Burn Dump	10,700		10.8	J+	24.5	J+	627		0.22	UJ	3.9	J+	41,900	J	101	J+	16.5		559		97,000		1040		8,050		1,330	J	0.55		61.9		4,430	J+	0.71	J+	1.9	J+	2370		0.039	J+	19.1	J+	1,740	
		SM-SPS-003-D	MY5SP3	3/9/10	14.5	-	Burn Dump	7,800		36.8	J+	57.1	J+	450		0.16	UJ	7.6	J+	49,900	J	56.4	J+	35.1		400		138,000		2470		5,450		1,100	J	0.022	UJ	81.3		1,860	J+	4.2	J+	0.78	J+	2490		0.031	J+	15.9	J+	37,800	
		SM-SPS-003-E	MY5SP4	3/9/10	19.5	-	Native	1,850		0.2	J+	3	J+	23.3	UJ	0.11	UJ	0.17	J+	4,630	J	3.3	J+	1.6	UJ	3.6		9,360		2.4		1,320		193	J	0.11	U	3.9	UJ	815	J+	0.62	UM	0.6	UM	932		0.014	J+	6.2	J+	16.2	
SPS-004		SM-SPS-004-A	MY5R87	3/10/10	Surface	-	Process Waste	154,000	J	9.3	J+	13.8	J+	667	J	2.2	J	5.9	J+	28,600		120		96.6	J	2,620	J	25,900		872	J	15,300		905		0.13		69		2,180	J+	1.5	J+	8.9	J+	415	J	0.069	J+	32.2	J+	2,050	J
		SM-SPS-004-B	MY5R88	3/10/10	5	-	Burn Dump	9,640		10.2	J+	37		486		0.17	J	7.3	J+	45,600		160		12.8		334		76,600		1180		7,540		656		0.29		72.4		4,710	J+	1.1	J+	5	J+	1,590		0.084	J+	20.2	J+	1,430	
		SM-SPS-004-C	MY5R89	3/10/10	10	-	Burn Dump	8,550		4.6	J+	11.6	J+	533		0.21	UJ	3.8	J+	48,400	J	24.6	J+	5.9	UJ	414		33,700		18100		4,830		457	J	0.16		26.3		4,000	J+	0.85	J+	1.1	J+	1,380		0.089	J+	21.5	J+	1,310	
		SM-SPS-004-D	MY5R90	3/10/10	14	-	Native	10,700		0.23	J+	3.3	J+	179		0.63	J	1.5	J+	11,300		23.9	J+	7.4		27.9		23,500		7.6		8,510		259		0.034	J	20.5		6,620	J+	1	J+	0.62	UM	1,490		0.3	J+	40.7	J+	65.7	
SPS-005		SM-SPS-005-A	MY5SP5	3/9/10	0.5	Concrete	Burn Dump	9,270		3.1	J+	8.5	J+	324		0.55	UJ	5.2	J+	14,700	J	35.3	J+	7.9		343		22,000		350		4,740		399	J	0.11	UJ	20.7		1,640	J+	0.72	J+	1.8	J+	342	UJ	0.044	J+	16.8	J+	717	
		SM-SPS-005-B	MY5SP6	3/9/10	10	-	Burn Dump	7,140		3.5	J+	7.8	J+	174		0.28	UJ	2.1	J+	8,260	J	20.2	J+	6.8		440		43,800		329		2,470		337	J	0.054	UJ	47		1,160	J+	0.52	J+	0.67	J+	616	UJ	0.02	J+	11.3	J+	618	
		SM-SPS-005-C	MY5SP7	3/9/10	14.5	-	Native	15,700		0.28	J+	9.2	J+	241		0.97		1.3	J+	17,400	J	29.1	J+	11		35.1		33,800		13.5		10,800		920	J	0.037	UJ	33.7		8,150	J+	1.6	J+	0.74	UM	1,380		0.37	J+	53.8	J+	102	
SPS-006		SM-SPS-006-A	MY5R98	3/10/10	0.5	Concrete	Process Waste	60,500		3.5	J+	10.2		1,640		13.3		3.8	J+	17,400		160		6.5	UJ	1,690		22,100		284		49,700		2,390		0.045	J	78.9		3,910	J+	1.3	J+	5.3	J+	731		0.059	J+	33.4	J+	2,970	
		SM-SPS-006-B	MY5R99	3/10/10	5	-	Process Waste	29,600		2.2	J+	7.4		995		6.9		2.5	J+	30,000		66.8		14.3		895		20,600		319		18,600		1,250		0.034	J	48.6		3,050	J+	1.1	J+	2.4	J+	641		0.076	J+	24.6	J+	1,590	
		SM-SPS-006-C	MY5RA0	3/10/10	14	-	Native	13,000		0.19	J+	6.2		191		0.66		0.34	J+	5,040		23		7.6		22.8		22,300		11		8,150		219		0.14	U	24.3		5,910	J+	0.76	J+	0.67	UM	1,110		0.27	J+	39.4	J+	76.5	
SPS-007		SM-SPS-007-A	MY5RA3	3/2/10	0.5	Concrete	Gen Fill	3,390		0.2	J+	2.5	J+	71.9	J	0.25	J	0.44	J+	10,500		10.3	J+	2.3	UJ	26	J	8,130		9.9	J	2,370		137	J	0.046	J	8.8		1,150	J+	0.48	J+	0.15	J+	115	J	0.086	J+	17.9	J+	119	
		SM-SPS-007-B	MY5RA4	3/2/10	4.5	-	Gen Fill	7,820		0.2	J+	4.6	J+	128	J	0.42	J	0.73	J+	11,100		16.6	J+	6.1		18.5	J	17,100		9.1	J	5,290		293	J	0.028	J	16.2		3,050	J+	0.69	J+	0.15	J+	338	J	0.18	J+	29	J+	60	
		SM-SPS-007-C	MY5RA5	3/2/10	9.5	-	Native	3,840		0.18	J+	2.4	J+	59.5	J	0.23	J	0.58	J+	6,300		8	J+	3.1	UJ	16.5	J	9,190		11.7	J	2,590		117	J	0.016	J	8.8		1,540	J+	0.82	J+	0.57	UM	213	J	0.097	J+	15.5	J+	67.1	
SPS-008		SM-SPS-008-A	MY5RA8	3/10/10	0.5	Concrete	Gen Fill	8,070		0.51	J+	3.5		212		0.92		0.9	J+	11,800		27.5		7.9		178		14,600		41.9		7,060		621		0.11	U	19.3		3,720	J+	0.83	J+	0.55	J+	1,470		0.072	J+	18	J+	443	
		SM-SPS-008-B	MY5RA9	3/10/10	5	-	Gen Fill	18,400		0.6	J+	2.6		155		0.6		0.52	J+	7,820		39.1		4.1	UJ	306		8,990		21.7		5,410		311		0.11	U	47.8		3,640	J+	0.53	J+	0.27	J+	1,380		0.059	J+	19.2	J+	259	
		SM-SPS-008-C	MY5RB0	3/10/10	9.5	-	Native	4,860		0.22	J+	2.1		59.6		0.21	J	0.62	J+	5,530		9		2.5	UJ	27		7,860		12.9		2,440		105		0.11	U	8.7		1,810	J+	0.62	J+	0.55	UM	458	J	0.05	J+	13.7	J+	126	
SPS-009		SM-SPS-009-A	MY5SQ0	3/9/10	0.5	Concrete	Process Waste	48,100		3.8	J+	5.3	J+	2,630		12.1	J	2.2	J+	14,300		117	J+	7		1,270		22,800		128		73,300		2,000		0.016	J	76.7		1,330	J+	0.83	J+	5.3	J+	393	UJ	0.026	J+	24	J+	1,710	
		SM-SPS-009-B	MY5SQ1	3/9/10	5	-	Process Waste	85,300		8.2	J+	8.7	J+	5,990		26.2	J	3.8	J+	12,200		280	J+	7.2		2,590		21,500		186		133,000		5,310		0.022	J	112		1,570	J+	2.6	J+	11.6	J+	656		0.023	J+	50.1	J+	4,180	
		SM-SPS-009-C	MY5SQ2	3/9/10	10	-	Process Waste	36,700		4	J+	8.8	J+	12,300		48.7	J	3.5	J+	24,700		110	J+	9.3		672		14,900		112		198,000		10,100		0.039	J	46.6		3,310	J+	1.4	J+	38.2	J+	1,800		0.04	J+	40.1	J+	1460	
		SM-SPS-009-D	MY5SQ3	3/9/10	14.5	-	Native	7,800		0.15	J+	2.2	J+	167		0.54	UJ	0.9	J+	65,900		13.4	J+	5	UJ	17.8		14,900		6.6		13,000		415		0.14	U	12.4		8,090	J+	1.2	J+	0.7	UM	9,340		0.17	J+	25.5	J+	54.7	
SPS-010		SM-SPS-010-A	MY5RB8	3/10/10	Surface	-	Process Waste	32,400		2.5	J+	4.4		571		4		2.3	J+	22,400		112		5.3	UJ	1,190		11,800		64.8		16,500		552		0.12	U	55.3		3,880	J+	1.2	J+	1.7	J+	1,760		0.086	J+	33.1	J+	606	
		SM-SPS-010-B	MY5RB9	3/10/10	5	-	Process Waste	79,800	J	11.6	J+	9.1	J+	4,740	J	28.6	J	5.4	J+	12,900		872		11.2	J	2,640	J	16,000		304	J	147,000		3,080		0.016	UJ	300		16,000	J+	2.6	J+	8.2	J+	16,000		1.4	UM	65.9	J+	2,510	J
		SM-SPS-010-C	MY5RC0	3/10/10	10	-	Burn Dump	7,340	J	1.1	J+	5.9	J+	114	J	0.38	UJ	1.8	J+	11,400		16.5		5.2	UJ	36.4	J	22,700		195	J	6,340		253		0.2		17.6		8,670	J+	0.76	J+	0.15	J+	3,420		0.1	J+	23	J+	361	J
		SM-SPS-010-D	MY5RC1	3/10/10	14.5	-	Native	8,530		0.32	J+	2.6	J+	147		0.44	UJ	0.93	J+	111,000	J	14.4	J+	5.9	UJ	24.7		20,700		20.5		14,800		727	J	0.16	U	16.3		11,600	J+	1.7	J+	0.78	UM	5,670		0.19	J+	27.1	J+	58.5	
SPS-011		SM-SPS-011-A	MY5SQ5	3/9/10	Surface	-	Process Waste	114,000		8.3	J+	5.4	J+	3,460		20.3	J	3.8	J+	8,220		207	J+	5	UJ	3,070		22,800		381		100,000		3,870		0.036	J	123		1,340	J+	1.4	J+	7.2	J+	1,200		0.029	J+	44.4	J+	2,170	
		SM-SPS-011-B	MY5SQ6	3/9/10	5	-	Burn Dump	10,600		6.8	J+	10.5	J+	1,240		0.31	J	13.5	J+	30,600		40.2	J+	7.5		711		40,700		1050		5,510		375		0.27		30.2		5,520	J+	1.3	J+	2.1	J+	1,020		0.081	J+	21.1	J+	4,530	
		SM-SPS-011-C	MY5SQ7	3/9/10	10	-	Burn Dump	7,530		20.7	J+	32.8	J+	1,020		0.23	J	10.4	J+	44,100		70.5	J+	8.4		362		70,100		896		8,780		875		0.081	J	37.9		3,970	J+	1.3	J+	3.2	J+	2,100		0.074	J+	19.8	J+	2,630	
		SM-SPS-011-D	MY5SQ8	3/9/10	11.5	-	Native	1,970		0.28	J+	5.3	J+	41		0.08	J	0.59	J+	1,250		4.1	J+	2.4	UJ	7.4		4,840		3.3		1,410		49.4		0.12	U	6.2		1,840	J+	0.9	J+	0.6	UM	1,470		0.034	J+	7.3	J+	13.3	
SPS-012		SM-SPS-012-A	MY5RC8	3/9/10	Surface	-	Process Waste	86,300	J	7.5	J+	6.5	J+	1,410	J	15.6	J	10.6	J+	10,300		273		10.8	J	3,220	J	20,300		305	J	77,000		2,810		0.059	UJ	199		985	J+	2.1	J+	4.1	J+	280	J	0.023	J+	28.4	J+	1,780	J
		SM-SPS-012-B	MY5RC9	3/9/10	5	-	Process Waste	50,200	J	4.7	J+	6.9	J+	17,300	J	267	J	3.3	J+	3,130		199		5.5	UJ	1,170	J	6,930		130	J	290,000		9,530		0.19	U	57.2		16,700	J+	2.2	J+	7.6	J+	14,600		1.9	UM	29.1	J+	2,050	J
		SM-SPS-012-C	MY5RD0	3/9/10	10	-	Process Waste	62,900	J	10.4	J+	10.9	J+	9,860	J	44.1	J	3.2	J+	4,650		219		5.6	UJ	1,550	J	7,830		216	J	199,000		5,990		0.19	U	84.6		5,320	J+	2.3	J+	15.8	J+	5,860		1.9	UM	60.3	J+	1,810	J
		SM-SPS-012-D	MY5RD1	3/9/10	18.5	-	Process Waste	16,400	J	0.68	J+	10.7	J+	448	J	1.8	J	2.4	J+	59,400		48.4		12.2	J	69	J	39,800		26.7	J	22,000		1,140		0.028	UJ	35.8		18,200	J+	2.5	J+	1.8	J+	4,830		0.26	J+	49.2	J+	153	J
		SM-SPS-012-E	MY5RD2	3/9/10	24.5	-	Native	6,380	J	0.21	J+	3.1	J+	117	J	0.43	UJ	0.73	J+	9,780		12.3		5.5	UJ	17.6	J	21,600		5.6	J	5,520		235		0.13	U	14.2		5,500	J+	0.79	J+	0.66	UM	1,350		0.12	J+	22.5	J+	44.6	J
SPS-013		SM-SPS-013-A	MY5SR0	3/10/10	0.5	Concrete	Process Waste	19,400		13	J+	10.9	J+	2,230		2.6	J	5.1	J+	17,800		98.3	J+	12.4		1,030		89,000		1130		12,200		1,700		0.14		56		4,750	J+	1	J+	2.6	J+	1,030		0.062	J+	27.2	J+	2,780	
		SM-SPS-013-B	MY5SR1	3/10/10	5	-	Burn Dump	8,410		8.7	J+	12.2	J+	2,630		0.23	J	3.3	J+	35,200		21.2	J+	8.1		266		17,300		442		4,960		575		0.36		37.8		4,200	J+	0.67	J+	1.1	J+	1,550		0.07	J+	36.4	J+	1,130	
		SM-SPS-013-C	MY5SR2	3/10/10	10	-	Burn Dump	6,100		2.4	J+	14.6	J+	509		0.33	J	3.3	J+	16,900		28.5	J+	85.5		240		54,700		499		5,520		515		0.052	J	83.9		2,950	J+	0.76	J+	0.76	J+	565	J	0.064	J+	18.9	J+	3,550	
		SM-SPS-013-D	MY5SR3	3/10/10	14.5	-	Native	8,980		0.37	J+	7.3	J+	117		0.49	J	2.1	J+	17,500		23.2	J+	7.4	UJ	48.1		19,300		8.8		6,630		234		0.053	J	17.3		8,590	J+	1.6	J+	0.22	J+	2,190		0.25	J+	44.3	J+	54.3	
SPS-014		SM-SPS-014-A	MY5RD8	3/10/10	0.5	Concrete	Burn Dump	5,720	J	1.2	J+	3.8	J+	132	J	0.3	UJ	1.2	J+	10,500		14.7		4.3	UJ	110	J	12,400		144	J	4,310		212		0.042	UJ	15.7		3,010	J+	0.57	J+	0.59	J+	702		0.055	J+	20.2	J+	270	J
		SM-SPS-014-B	MY5RD9	3/10/10	5	-	Burn Dump	19,500	J	24.5	J+	12.6	J+	1,320	J	0.27	UJ	11.2	J+	57,000		45.5		19.9	J	1,290	J	68,400		1420	J	3,100		523		0.11	UJ	70.1		5,730	J+	1.2	J+	4.8	J+	2,720		1.2	UM	18.8	J+	3,510	J
		SM-SPS-014-C	MY5RE0	3/10/10	10	-	Burn Dump	10,000		5.6	J+	40.5		387		0.21	J	5.8	J+	21,300		45.4		8.7		220		53,600		1670		3,910		444		0.12		39.5		3,610	J+	1	J+	1.5	J+	1,460		0.072	J+	20.8	J+	1,870	
		SM-SPS-014-D	MY5RE1	3/10/10	14.5	-	Native	1,950		0.074	J+	1.3		23.2		0.095	J	0.18	J+	3,610		3.3		1.5	UJ	2.6	UJ	5,060		1.6		1,310		86.4		0.11	U	3.5	UJ	711	J+	0.59	UM	0.57	UM	458	J	0.022	J+	6.1	J+	10.7	
SPS-015		SM-SPS-015-A	MY5RE3	3/2/10	0.5	Concrete	Process Waste	58,200		4.4	J+	5.1	J+	1,790	J	21.1		6.8	J+	13,500		178	J+	5.9	UJ	2,260	J	13,800		183	J	62,700		2,540	J	0.038	J	108		1,320	J+	1.5	J+	4.9	J+	360	J	0.07	J+	29	J+	1,280	
	Dup	SM-SPS-115-A	MY5RE8	3/2/10	0.5	-	Process Waste	38,200		2.2	J+	4.2	J+	994	J	9.1		2.7	J+	11,300		63.2	J+	5.8	U	1,240	J	14,100		540	J	39,000		1,300	J	0.046	J	75.3		1,300	J+	0.96	J+	2.1	J+	277	J	0.07	J+	20.3	J+	883	
		SM-SPS-015-B	MY5RE4	3/2/10	6	-	Process Waste	6,150		0.3	J+	6.2	J+	128	J	0.47	J	1.5	J+	10,200		12.2	J+	4.5	UJ	61.6	J	13,800		45.7	J	4,300		232	J	0.033	J	13.9		3,990	J+	0.5	J+	0.17	J+	373	J	0.12	J+	22.9	J+	129	
	Dup	SM-SPS-115-B	MY5RE9	3/2/10	6	-	Process Waste	109,000		4.2	J+	5.1	J+	1,980	J	16.5		4.6	J+	19,300		174	J+	6.2	U	2,950	J	12,900		242	J	62,800		2,600	J	0.042	J	107		1,470	J+	1.6	J+	4.3	J+	317	J	0.072	J+	34	J+	1,770	
		SM-SPS-015-C	MY5RE5	3/2/10	10	-	Gen Fill	6,580		0.15	J+	2.6	J+	103	J	0.36	J	0.35	J+	6,850		13.2	J+	4.8	UJ	12.2	J	14,700		5.6	J	5,350		168	J	0.11	U	12.5		4,040	J+	0.59	J+	0.54	UM	524	J	0.15	J+	25.4	J+	44.1	
	Dup	SM-SPS-115-C	MY5RF0	3/2/10	10	-	Gen Fill	7,070		0.14	J+	2.8	J+	114	J	0.39	J	0.51	J+	7,300		14.1	J+	5.2	UJ	13.8	J	15,700		6	J	5,680		180	J	0.11	U	13.5		4,370	J+	0.68	J+	0.59	UM	559	J	0.17	J+	27	J+	46.6	
		SM-SPS-015-D	MY5RE6	3/2/10	14.5	-	Native	5,620		0.13	J+	4.1	J+	108	J	0.35	J	0.31	J+	5,560		12.2	J+	4.1	UJ	12.9	J	12,800		5	J	3,870		152	J	0.13	U	10.9		3,370	J+	0.65	J+	0.65	UM	477	J	0.13	J+	23.5	J+	34.1	
	Dup	SM-SPS-115-D	MY5RF1	3/2/10	14.5	-	Native	11,500		0.12	J+	4.9	J+	188	J	0.68		2.3	J+	6,050		27.7	J+	8.5		21.9	J	24,200		10	J	8,130		225	J	0.035	J	22.9		7,350	J+	1.1	J+	0.68	UM	793		0.33	J+	45.9	J+	71.5	
SPS-016		SM-SPS-016-A	MY5RF3	3/10/10	0.5	Concrete	Gen Fill	10,300		0.27	J+	3.7		111		0.48	J	0.79	J+	13,700		17.9		5.8		31.1		15,000		8.4		5,780		329		0.12	U	17		3,940	J+	0.71	J+	0.58	UM	491	J	0.16	J+	29.6	J+	63.1	
		SM-SPS-016-B	MY5RF4	3/10/10	5	-	Burn Dump	9,770		5.1	J+	11.2		301		0.25	J	5.3	J+	15,500		33.8		13.7		320		34,700		725		5,120		367		0.31		48.4		4,080	J+	0.9	J+	3.4	J+	808		0.074	J+	21.4	J+	1,090	
		SM-SPS-016-C	MY5RF5	3/10/10	10	-	Burn Dump	3,870		690	J+	40.2		436		1.5		8.9	J+	18,600		56.4		16		1,540		221,000		2280		4,270		1,060		0.36		96.9		3,030	J+	1	J+	3.1	J+	1,190		0.047	J+	18.2	J+	2,580	
		SM-SPS-016-D	MY5RF6	3/10/10	14.5	-	Native	6,490		0.87	J+	2.2		71.4		0.33	J	0.32	J+	8,820		7.6		4.3	UJ	13.7		13,000		6		3,840		162		0.14	U	10.9		4,320	J+	0.58	J+	0.71	UM	1,080		0.061	J+	15	J+	34.1	

TABLE 2
Metals Analytical Results, Solid Matrix, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	CLP ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	Aluminum Result	Q	Antimony Result	Q	Arsenic Result	Q	Barium Result	Q	Beryllium Result	Q	Cadmium Result	Q	Calcium Result	Q	Chromium Result	Q	Cobalt Result	Q	Copper Result	Q	Iron Result	Q	Lead Result	Q	Magnesium Result	Q	Manganese Result	Q	Mercury Result	Q	Nickel Result	Q	Potassium Result	Q	Selenium Result	Q	Silver Result	Q	Sodium Result	Q	Thallium Result	Q	Vanadium Result	Q	Zinc Result	Q
SPS-017		SM-SPS-017-A	MY5SR9	3/2/10	0.5	Concrete	Burn Dump	7,370		2.5	J+	5.8		110		0.55	UJ	1.5	J+	7,730		27.1	J+	4.9	UJ	125		16,400		116		5,070		219		0.069	J-	17.5	J	3,420	J+	0.87	J+	0.97	J+	246	J	0.11	J+	23	J+	241	
		SM-SPS-017-B	MY5SR6	3/2/10	4.5	-	Burn Dump	5,050		3.1	J+	3.6		108		0.24	UJ	1.8	J+	6,540		12.3	J+	3.8	UJ	35.7		11,100		78.9		3,630		148		0.053	J-	11.3	J	2,880	J+	0.61	J+	0.33	J+	364	J	0.089	J+	19.3	J+	107	
		SM-SPS-017-C	MY5SR7	3/2/10	9.5	-	Native	4,750		0.12	J+	2		102		0.26	UJ	0.3	J+	7,320		9.2	J+	3.1	UJ	8		13,300		3.6		3,470		158		0.016	J-	8	J	2,190	J+	0.63	J+	0.61	UM	940		0.09	J+	18.7	J+	30	
SPS-018		SM-SPS-018-A	MY5RG3	3/2/10	0.5	Concrete	Process Waste	10,100		0.74	J+	3.3	J+	5,940	J	15.7		0.081	J+	33,900		18.1	J+	6.7		109	J	14,100		88.4	J	41,000		2,980	J	0.02	J	15.6		1,580	J+	0.42	J+	2.2	J+	472	J	0.074	J+	16.5	J+	649	
		SM-SPS-018-B	MY5RG4	3/2/10	4.5	-	Burn Dump	6,870		9.4	J+	17.5	J+	523	J	0.11	J	9.5	J+	12,900		49.7	J+	11		498	J	88,600		1510	J	2,380		688	J	0.37		46.6		2,400	J+	1.1	J+	4	J+	872		0.067	J+	22	J+	1,870	
		SM-SPS-018-C	MY5RG5	3/2/10	9.5	-	Native	7,910		0.22	J+	3.4	J+	145	J	0.47	J	0.83	J+	12,400		17.5	J+	6.2	UJ	16.4	J	21,900		7	J	6,150		248	J	0.016	J	16.5		3,760	J+	1.8	J+	0.3	J+	1,370		0.24	J+	34.2	J+	49.6	
SPS-019		SM-SPS-019-A	MY5SS1	3/10/10	0.5	Concrete	Burn Dump	13,300		6.9	J+	17.3	J+	1,830		0.22	J	5.3	J+	14,600		45	J+	10.4		554		43,500		748		4,290		512		0.17		44.6		3,620	J+	1.2	J+	3.6	J+	1,010		0.073	J+	24.9	J+	1,660	
		SM-SPS-019-B	MY5SS2	3/10/10	5	-	Burn Dump	25,900		153	J+	24.6	J+	1,160		0.32	J	17.3	J+	50,600		83.7	J+	13.1		3,980		62,000		3640		7,930		777		0.45		70.4		7,170	J+	2.1	J+	9.7	J+	2,120		0.083	J+	33.3	J+	4,870	
		SM-SPS-019-C	MY5SS3	3/10/10	10	-	Burn Dump	9,570		15.7	J+	37.3	J+	675		0.21	J	8.8	J+	26,400		88.3	J+	11.8		856		89,900		1890		5,450		904		0.12	J	65.9		4,730	J+	0.74	J+	13	J+	2,060		0.044	J+	18.5	J+	2,180	
		SM-SPS-019-D	MY5SS4	3/10/10	19.5	-	Native	2,240		0.077	J+	0.94	J+	31.1		0.092	J	0.27	J+	4,590		4.4	J+	2	UJ	4.1		4,910		1.7		1,670		73.5		0.12	U	4.6	UJ	1,550	J+	0.63	UM	0.6	UM	1,270		0.028	J+	7.9	J+	14.9	
SPS-020		SM-SPS-020-A	MY5RH2	3/8/10	0.5	Concrete	Burn Dump	11,600		1.7	J+	6.2	J+	194		0.72		1.8	J+	37,200		25.7	J+	11.8		207	J	19,900		264		5,600		329		0.092	U	22.9		4,030	J+	0.65	J+	0.88	J+	7,820		0.086	J+	22.1	J+	498	
		SM-SPS-020-B	MY5RH3	3/8/10	5	-	Burn Dump	8,940		1.9	J+	5	J+	163		2.1		1.1	J+	39,800		39.5	J+	14.5		126	J	22,200		103		8,750		399		0.039	U	25.1		3,190	J+	0.51	J+	0.46	J+	5,750		0.095	J+	24	J+	366	
		SM-SPS-020-C	MY5RH4	3/8/10	10	-	Burn Dump	15,700		15.5	J+	15	J+	2,530		0.21	UJ	16.5	J+	37,800		78.2	J+	17.5		698	J	51,300		2520		5,060		477		0.041	U	322		3,920	J+	1.8	J+	4.2	J+	2,670		0.054	J+	23.2	J+	5,560	
		SM-SPS-020-D	MY5RH5	3/8/10	15	-	Burn Dump	5,920		2.7	J+	12.3	J+	167		0.27	UJ	4.9	J+	198,000		27.6	J+	4.6	UJ	61.4	J	23,000		170		12,800		468		0.062	U	16.6		4,180	J+	1.2	J+	0.77	J+	4,870		0.14	J+	22.5	J+	190	
		SM-SPS-020-E	MY5RH6	3/8/10	19.5	-	Native	1,400		0.12	J+	1	J+	21.7		0.086	UJ	0.19	J+	7,580		4.4	J+	1.2	UJ	5.1	J-	3,720		6.5		1,010		116		0.11	UJ	3.6	UJ	500	UJ	0.55	UM	0.53	UM	467	J	0.028	J+	5.6	J+	19.2	
SPS-021		SM-SPS-021-A	MY5SS6	3/9/10	Surface	-	Process Waste	54,900		9.2	J+	10.4	J+	6,370		20.7	J	7.6	J+	7,270		218	J+	6	UJ	1,460		9,920		175		252,000		2,710		0.11	J	98.4		11,900	J+	2.9	J+	8.6	J+	11,900		0.021	J+	41.1	J+	2,830	
		SM-SPS-021-B	MY5SS7	3/9/10	5	-	Process Waste	33,600		6.6	J+	9.2	J+	4,240		30.7	J	2.6	J+	14,300		129	J+	6.6	UJ	1,060		40,700		128		88,900		2,310		0.037	J	65		5,250	J+	1.4	J+	6.7	J+	2,780		0.037	J+	34	J+	1,360	
		SM-SPS-021-C	MY5SS8	3/9/10	12.5	-	Process Waste	62,400		9.5	J+	11.3	J+	13,600		81.4	J	2.2	J+	20,500		161	J+	7.9	UJ	1,460		8,760		159		225,000		5,770		0.18	U	80.4		5,570	J+	2.8	J+	14.6	J+	4,740		1.8	UM	43	J+	2,840	
		SM-SPS-021-D	MY5SS9	3/9/10	14.5	-	Native	4,200		0.1	J+	1.7	J+	116		0.29	UJ	0.55	J+	9,060	J	9.6	J+	3.1	UJ	8.5		8,800		3.4		3,010		184	J	0.13	U	7.8		3,720	J+	0.59	J+	0.63	UM	1,080		0.098	J+	17.9	J+	26.4	
SPS-022		SM-SPS-022-A	MY5RJ2	3/8/10	0.5	Concrete	Burn Dump	10,900		4.6	J+	10.6	J+	315		0.28	UJ	3.8	J+	19,200		34.1	J+	7.2		609	J	28,600		758		4,120		334		0.15	J-	37.7		5,260	J+	0.85	J+	1.4	J+	1,530		0.082	J+	22.5	J+	1,430	
		SM-SPS-022-B	MY5RJ3	3/8/10	5	-	Burn Dump	11,500		7.9	J+	13.7	J+	748		0.17	UJ	9.5	J+	21,600		76.3	J+	9.8		464	J	52,900		2270		3,340		622		0.13	J-	44		4,350	J+	0.99	J+	3.8	J+	2,460		0.049	J+	21.6	J+	3,060	
		SM-SPS-022-C	MY5RJ4	3/8/10	10	-	Burn Dump	4,870		7.1	J+	19.8	J+	279		0.025	UJ	16	J+	17,200		70.4	J+	23.1		471	J	187,000		1920		2,280		1,020		0.092	U	94.3		1,600	J+	0.75	J+	2.4	J+	1,200		0.028	J+	12.4	J+	1,230	
		SM-SPS-022-D	MY5RJ5	3/8/10	15	-	Burn Dump	5,230		3.3	J+	104	J+	233		0.09	UJ	4	J+	76,000		45.6	J+	15.5		258	J	155,000		305		11,000		797		0.093	U	53.9		3,480	J+	0.81	J+	2.8	J+	3,630		0.079	J+	17	J+	590	
		SM-SPS-022-E	MY5RJ6	3/8/10	19.5	-	Native	2,090		0.052	J+	1.7	J+	23.9		0.13	UJ	0.27	J+	10,300		3.8	J+	1.8	UJ	3.6	J-	5,910		2.7		1,920		141		0.11	UJ	4.9		915	J+	0.59	UM	0.57	UM	559	J	0.033	J+	6.7	J+	14.6	
SPS-023		SM-SPS-023-A	MY5ST1	3/2/10	0.5	Concrete	Burn Dump	6,250		0.25	J+	3.7		111		0.4	UJ	0.6	J+	12,100		11.9	J+	4.7	UJ	19		13,000		55.7		4,250		192		0.035	U	12.4	J	3,170	J+	0.52	J+	0.56	UM	223	J	0.12	J+	22.3	J+	69.3	
		SM-SPS-023-B	MY5ST2	3/2/10	5	-	Burn Dump	10,300		5.7	J+	16.9		426		0.2	UJ	8.3	J+	20,000		40	J+	9.8	J	1,280		51,500		661		4,060		480		0.47	J-	41.2	J	3,600	J+	1.1	J+	2.7	J+	975		0.077	J+	23.4	J+	1,830	
		SM-SPS-023-C	MY5ST3	3/2/10	9.5	-	Native	11,000		0.16	J+	4.1		161		0.57	UJ	0.95	J+	27,000		19.2	J+	8	J	23.2		23,400		10.3		7,670		398		0.037	U	21	J	5,100	J+	1	J+	0.66	UM	1,960		0.24	J+	37.3	J+	66.5	
SPS-024		SM-SPS-024-A	MY5RK2	3/2/10	0.5	Concrete	Burn Dump	14,700		10.4	J+	16.8	J+	459	J	0.33	J	10.7	J+	21,400		61.1	J+	20.1		909	J	72,300		1910	J	3,900		642	J	1		66.4		3,970	J+	1	J+	4.2	J+	2,010		0.069	J+	26	J+	2,000	
		SM-SPS-024-B	MY5RK3	3/2/10	3	-	Burn Dump	8,990		10.5	J+	13.1	J+	395	J	0.17	J	6	J+	22,900		43.3	J+	13		417	J	68,000		1810	J	4,620		632	J	0.66		88		3,160	J+	0.72	J+	3.2	J+	1,690		0.064	J+	19.1	J+	2,460	
		SM-SPS-024-C	MY5RK4	3/2/10	9.5	-	Native	4,480		0.14	J+	1.7	J+	91.7	J	0.27	J	0.3	J+	7,700		10.1	J+	5.5	UJ	8.5	J	11,400		8.8	J	3,140		147	J	0.018	J	14.1		1,750	J+	0.65	J+	0.61	UM	544	J	0.11	J+	19.9	J+	31.5	
SPS-025		SM-SPS-025-A	MY5ST6	3/8/10	Surface	-	Burn Dump	7,470		1.2	J+	5.7	J+	160		1.5		1.6	J+	8,140		28.9	J+	5.3	UJ	368	J	21,100		156		7,190		385		0.018	U	38.6		3,850	J+	0.79	J+	0.83	J+	790		0.072	J+	27.7	J+	1,160	
		SM-SPS-025-B	MY5ST7	3/8/10	5	-	Burn Dump	13,700		8.8	J+	20	J+	504		0.23	UJ	7.9	J+	15,600		27.9	J+	8.5		889	J	50,800		4780		4,130		238		0.056	U	257		7,610	J+	4.2	J+	2.2	J+	1,700		0.077	J+	20.2	J+	8,620	
		SM-SPS-025-C	MY5ST8	3/8/10	10	-	Burn Dump	4,630		4	J+	30	J+	457		0.051	UJ	4.8	J+	12,900		43.1	J+	11.7		299	J	107,000		771		3,310		619		0.2	J-	51.1		2,740	J+	0.93	J+	1.1	J+	1,650		0.15	J+	27.4	J+	1,490	
		SM-SPS-025-D	MY5ST9	3/8/10	14.5	-	Native	2,330		0.055	J+	1.9	J+	35		0.14	UJ	0.1	J+	5,080		5.1	J+	2.2	UJ	4.5	J-	5,150		1.5		1,700		77.5		0.12	UJ	5.3		1,740	J+	0.37	J+	0.62	UM	751		0.077	J+	9.1	J+	14.4	
SPS-026		SM-SPS-026-A	MY5RL2	3/2/10	0.5	Concrete	Process Waste	16,700		3.5	J+	17.6	J+	1,300	J	10.1		7	J+	35,800		210	J+	15.3		501	J	67,600		596	J	33,300		2,160	J	0.21		53		2,420	J+	0.95	J+	2.3	J+	597	J	0.091	J+	25.6	J+	5,340	
		SM-SPS-026-B	MY5RL3	3/2/10	5	-	Burn Dump	18,300		195	J+	60.7	J+	316	J	0.22	J	14.8	J+	29,300		48.2	J+	16.9		289	J	63,100		2510	J	5,420		800	J	0.039	J	79.8		7,420	J+	0.67	J+	8.5	J+	4,000		0.081	J+	28	J+	1,220	
		SM-SPS-026-C	MY5RL4	3/2/10	10	-	Burn Dump	14,000		11.1	J+	11.4	J+	1,580	J	0.28	J	16.7	J+	39,000		52.1	J+	8.4		1,680	J	23,300		3290	J	5,190		476	J	0.63		34.7		6,320	J+	1.2	J+	3.6	J+	2,720		0.24	J+	25.9	J+	3,160	
		SM-SPS-026-D	MY5RL5	3/2/10	16	-	Burn Dump	5,780		9.3	J+	18.3		212		0.023	UJ	6.7	J+	27,600		81.9	J+	42.8	J	294		317,000		1780		17,600		1,470		0.17	J-	107	J	2,100	J+	1.4	J+	1.8	J+	1,890		0.065	J+	15.8	J+	652	
		SM-SPS-026-E	MY5RL6	3/2/10	19.5	-	Native	21,000		0.16	J+	3		189		1.2	J	0.9	J+	21,500		35.5	J+	12.7	J	41.3		42,600		14.7		14,000		481		0.067	J-	30.6	J	10,900	J+	1.2	J+	0.73	UM	3,660		0.42	J+	65.7	J+	107	
SPS-027		SM-SPS-027-A	MY5SW1	3/2/10	0.5	Concrete	Burn Dump	6,360		1.4	J+	5.6		187		0.26	UJ	3.3	J+	46,100		19.3	J+	4.9	UJ	57.8		17,000		106		3,940		440		643	J-	18.8	J	3,600	J+	0.94	J+	0.37	J+	263	J	0.098	J+	22.4	J+	532	
		SM-SPS-027-B	MY5SW2	3/2/10	6	-	Burn Dump	22,200		3.8	J+	26.5		5,130		0.22	UJ	8.1	J+	142,000		65.7	J+	154	J	3,550		99,500		1150		7,880		783		1.7	J-	177	J	5,670	J+	1.3	J+	1.6	J+	1,900		0.094	J+	20.4	J+	1,820	
		SM-SPS-027-C	MY5SW3	3/2/10	10	-	Burn Dump	8,880		0.74	J+	3.2	J+	132	J	0.48	J	0.65	J+	12,300		18.6	J+	7	J	19.2	J	17,800		7	J	7,420		279	J	0.13		19.9	J	5,080	J+	0.51	J+	0.62	UM	1,030		0.21	J+	34.3	J+	58.4	J
		SM-SPS-027-D	MY5SW4	3/2/10	14	-	Native	2,640		1.2	J+	2.2	J+	58.7	J	0.14	J	0.2	J+	5,750		6.7	J+	1.7	J	4.4	J	5,570		3	J	1,810		98.7	J	0.038	UJ	5	J	1,390	J+	0.38	J+	0.6	UM	524	J	0.031	J+	14.6	J+	16.1	J
Waste Disposal Area																																																							
WDA-001		SM-WDA-001-A	MY5RS2	3/5/10	Surface		Process Waste	49,700		1.7	J+	1.7	J+	4,610		122		1.4	J+	10,500		142		5.8	UJ	885		18,100		45.2		209,000		12,400		0.13	UJ	110	J	866	J+	0.48	J+	8.8	J+	167	J	0.051	J+	63.4	J+	3,630	
		SM-WDA-001-B	MY5RS3	3/5/10	5	-	Process Waste	106,000		5	J+	3.2	J+	3,850		81.4		1.6	J+	7,120		803		13.2		1,920		13,200		93.4		157,000		8,020		0.13	UJ	416	J	775	J+	0.79	J+	5.7	J+	542	J	0.032	J+	58	J+	1,380	
		SM-WDA-001-C	MY5SY4	3/5/10	14.5	-	Native	7,880		0.22	J+	3.4	J+	138		0.41	UJ	0.54	J+	13,000		14		5.6	UJ	16.6		19,100		6.1		6,300		318		0.044	U	17.1	J	8,370	J+	0.61	J+	0.65	UM	2,830		0.12	J+	27.5	J+	48.8	
WDA-002		SM-WDA-002-A	MY5RS5	3/5/10	Surface		Process Waste	41,400		0.98	J+	2.6	J+	2,980		62.9		1.2	J+	11,500		170		7.3		484		18,800		38.1		149,000		8,440		0.13	UJ	45.7	J	2,220	J+	0.81	J+	5.7	J+	201	J	0.11	J+	60.5	J+	680	
		SM-WDA-002-B	MY5RS6	3/5/10	5	-	Process Waste	118,000		3.5	J+	3.8	J+	562		7.8		2.8	J+	7,010		408		6.2	UJ	1,990		11,400		132		44,200		1,790		0.015	U	222	J	2,510	J+	1.2	J+	2.4	J+	510	J	0.068	J+	59.4	J+	1,350	
		SM-WDA-002-C	MY5SY5	3/5/10	14.5	-	Native	10,800		0.17	J+	1.7	J+	124		0.43	UJ	0.93	J+	18,200		11.8		3.9	UJ	93.8		9,060		7.5		5,020		353		0.037	U	18.6	J	5,720	J+	0.73	J+	0.62	UM	2,560		0.078	J+	21.8	J+	90.9	
WDA-003		SM-WDA-003-A	MY5RS8	6/29/10	Surface		Process Waste	30,500		1.1	J+	3.3	J+	420		4.8	J	1.2	J+	11,000		53.9	J+	5.6		491		15,800		39.9		18,600		780		0.02	J	30.3		4,220	J+	0.75	J+	0.73	J+	979		0.13	J+	30.4	J+	374	
		SM-WDA-003-B	MY5RS9	6/29/10	5	-	Process Waste	224,000		10	J+	5.2	J+	753		11.5	J	1.2	J+	9,920		303	J+	5.8	UJ	4,180		10,900		334		72,800		1,650		0.026	J	150		3,410	J+	1.7	J+	5.3	J+	1,940		0.048	J+	73.7	J+	3,100	
WDA-004		SM-WDA-004-A	MY5RT1	3/5/10	Surface		Process Waste	88,800		4.1	J+	2.8	J+	6,070		122		1.6	J+	8,930		945		8.1		1,640		7,650		85		191,000		10,600		0.015	UJ	207	J	696	J+	0.65	J+	10.6	J+	798		0.065	J+	54.9	J+	1,300	
		SM-WDA-004-B	MY5RT2	3/5/10	5	-	Process Waste	74,800		1.8	J+	1.2	J+	2,970		90.5		0.38	J+	7,100		104		5.8	UJ	1,050		7,410		58.2		219,000		12,400		0.045	U	174	J	1,980	J+	1.1	J+	6.8	J+	926		0.018	J+	21.2	J+	1,120	
		SM-WDA-004-C	MY5SY7	3/5/10	17	-	Native	16,600		0.15	J+	16.6	J+	230		1		1.2	J+	6,290		24.6		11.7		34.7		33,800		13.2		9,500		311		0.12	U	29.9	J	17,900	J+	1.2	J+	0.23	J+	6,100		0.26	J+	49.1	J+	99	

TABLE 2
Metals Analytical Results, Solid Matrix, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	CLP ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	Aluminum Result	Q	Antimony Result	Q	Arsenic Result	Q	Barium Result	Q	Beryllium Result	Q	Cadmium Result	Q	Calcium Result	Q	Chromium Result	Q	Cobalt Result	Q	Copper Result	Q	Iron Result	Q	Lead Result	Q	Magnesium Result	Q	Manganese Result	Q	Mercury Result	Q	Nickel Result	Q	Potassium Result	Q	Selenium Result	Q	Silver Result	Q	Sodium Result	Q	Thallium Result	Q	Vanadium Result	Q	Zinc Result	Q
WDA-005		SM-WDA-005-A	MY5RT4	3/5/10	Surface		Process Waste	20,100		0.45	J+	2.9	J+	471		4.5		1	J+	11,900		36.1		6.7		291		17,100		27.2		16,000		682		0.025	U	27.8	J	4,900	J+	0.74	J+	0.51	J+	1,180		0.12	J+	30.6	J+	261	
	Dup	SM-WDA-105-A	MY5RT7	3/5/10	Surface		Process Waste	17,900		1.1	J+	3.1	J+	412	J	3	J	1.1	J+	10,400		46.3	J+	6.7	J	278	J	16,000		34.4	J	13,600		600	J	0.041	UJ	26.2	J	5,500	J+	0.54	J+	1.1	J+	1,700		0.11	J+	34.5	J+	244	J
		SM-WDA-005-B	MY5RT5	3/5/10	5	-	Process Waste	25,800		0.72	J+	3.1	J+	1,630		19.8		1.2	J+	11,300		49.8		8.7		346		20,800		27.9		63,500		3,010		0.013	U	31.7	J	7,080	J+	0.81	J+	2.4	J+	1,140		0.12	J+	49.7	J+	374	
	Dup	SM-WDA-105-B	MY5RT8	3/5/10	5	-	Process Waste	94,700		11.4	J+	4.9	J+	3,260	J	22.4	J	2.6	J+	6,400		165	J+	5.5	UJ	1,970	J	8,000		228	J	150,000		3,340	J	0.021	UJ	82.2	J	8,620	J+	0.48	J+	4.8	J+	2,800		0.02	J+	45.2	J+	1,360	J
		SM-WDA-005-C	MY5SY8	3/5/10	14.5	-	Native	17,200		0.19	J+	8	J+	296		0.91		0.62	J+	4,750		34.5		13.5		41.7		41,800		12.5		12,500		1,060		0.076	U	37.8	J	26,200	J+	0.61	J+	0.17	J+	4,010		0.34	J+	61.2	J+	101	
	Dup	SM-WDA-105-C	MY5SY9	3/5/10	14.5	-	Native	15,200		0.11	J+	6.5	J+	264		0.8		0.47	J+	4,770		29.7		9.7		31.8		34,200		9.6		10,700		843		0.064	U	29.2	J	23,100	J+	0.76	J+	0.17	J+	3,390		0.29	J+	50.9	J+	85.9	
WDA-006		SM-WDA-006-A	MY5RW0	3/11/10	Surface		Process Waste	43,500		8.2	J+	1.4	J+	2180		28.5		10.4	J+	997		103	J+	1.4	UJ	179	J	5,210		85.3		349,000		10,200		0.024	UJ	60.5		3,150	J+	0.78	J+	2	J+	1,270		0.014	J+	79	J+	1,380	
		SM-WDA-006-B	MY5RW1	3/11/10	5	-	Process Waste	85,000		8.4	J+	4.5	J+	3,010		36.8		4.2	J+	8,000		199	J+	4.6	UJ	1,420	J	10,700		136		190,000		5,520		0.14	U	80.4		2,950	J+	1.8	J+	3.9	J+	1,020		0.017	J+	55.3	J+	1,380	
		SM-WDA-006-C	MY5SZ0	3/11/10	14.5	-	Native	15,800		0.26	J+	7.7	J+	189		0.76		1.1	J+	42,300		30.2	J+	10.2		54.8	J	30,100		9.4		10,400		515		0.13	U	28.2		15,900	J+	1.3	J+	0.71	UM	9,180		0.35	J+	58.8	J+	94.1	
Waste Management Unit																																																							
WMU-001		SM-WMU-001-A	MY5RM2	3/3/10	Surface		Process Waste	202,000		11.2	J+	3.4	J+	2,600	J	9.2	J	6.9	J+	4,630		891	J+	16.6	J	5,770	J	9,740		443	J	53,600		2,130	J	0.075	UJ	256	J	500	J+	0.7	UM	4.8	J+	422	J	2.7	UM	83.3	J+	3,310	J
		SM-WMU-001-B	MY5RM3	3/3/10	6		Process Waste	200,000		7.8	J+	1.7	J+	1,750	J	8.4	J	4.9	J+	4,590		371	J+	13.4	J	5,900	J	9,710		488	J	42,400		1,790	J	0.053	UJ	515	J	3,370	J+	0.67	UM	3.8	J+	3,920		2.6	UM	72.4	J+	3,920	J
		SM-WMU-001-C	MY5SW6	3/3/10	30	-	Process Waste	214,000		76.9	J+	3.7	J+	2,460	J	14.2	J	6.9	J+	4,920		642	J+	9.5	J	10,100	J	10,300		427	J	68,000		3,110	J	0.047	UJ	295	J	3,380	J+	0.64	UM	3.9	J+	3,330		0.047	J+	98	J+	4,090	J
		SM-WMU-001-D	MY5SW7	3/3/10	35	-	Process Waste	140,000		13.6	J+	11.6	J+	3,240	J	17.1	J	3.2	J+	2,400		278	J+	6.1	UJ	5,520	J	7,730		348	J	125,000		4,010	J	0.086	UJ	194	J	4,950	J+	0.8	UM	8.3	J+	7,600		1.5	UM	67.8	J+	4,340	J
		SM-WMU-001-E	MY5SW8	3/3/10	44	-	Native	15,200		0.59	J+	12.9	J+	218	J	0.77	J	0.77	J+	17,200		30	J+	9.8	J	38.6	J	32,600		12.2	J	10,600		530	J	0.043	UJ	30	J	14,500	J+	0.64	J+	0.67	UM	4,410		0.33	J+	56	J+	87.2	J
WMU-002		SM-WMU-002-A	MY5RM7	3/3/10	Surface		Process Waste	155,000		21.7	J+	3.3	J+	6,220	J	19.1	J	7.7	J+	5,760		316	J+	9.1	J	3,720	J	7,660		493	J	110,000		2,920	J	0.087	UJ	164	J	1,770	J+	0.38	J+	4.2	J+	1,770		0.021	J+	68.2	J+	2,510	J
		SM-WMU-002-B	MY5RM8	3/3/10	5		Process Waste	6,120		1.3	J+	2.1	J+	1,090	J	4.6	J	0.67	J+	16,100		13.7	J+	2.2	UJ	97.6	J	5,900		30.2	J	12,700		340	J	0.031	UJ	11.6	J	657	J+	0.35	J+	0.38	J+	145	UJ	0.026	J+	12.5	J+	138	J
		SM-WMU-002-C	MY5RM9	3/3/10	30	-	Process Waste	109,000		12	J+	7.2	J+	3,010	J	14.2	J	5.3	J+	2,930		163	J+	1.7	UJ	1,160	J	5,970		307	J	137,000		3,490	J	0.035	UJ	61.7	J	5,070	J+	0.41	J+	5.7	J+	7,990		0.094	J+	50.7	J+	1,200	J
		SM-WMU-002-D	MY5RN0	3/3/10	35	-	Process Waste	81,600		11.1	J+	14.7	J+	4,130	J	26.9	J	6.2	J+	9,510		187	J+	5.6	UJ	2,220	J	7,390		280	J	182,000		3,730	J	0.061	UJ	102	J	3,580	J+	0.6	J+	9.4	J+	5,680		0.02	J+	45.4	J+	1,930	J
		SM-WMU-002-E	MY5RN1	3/3/10	44	-	Native	10,700		0.67	J+	2	J+	132	J	0.61	J	0.44	J+	3,580		24.8	J+	6.7	J	23.8	J	21,200		9.1	J	6,400		190	J	0.054	UJ	20.5	J	11,200	J+	0.66	J+	0.24	J+	3,030		0.24	J+	44.1	J+	68.4	J
WMU-003		SM-WMU-003-A	MY5RN2	3/3/10	Surface		Process Waste	130,000		13	J+	5	J+	6,660	J	29	J	5.8	J+	4,600		240	J+	7	UJ	3,170	J	6,970		373	J	116,000		2,940	J	0.051	UJ	133	J	1,170	J+	0.75	UM	4.9	J+	871		0.015	J+	61.8	J+	2,240	J
		SM-WMU-003-B	MY5RN3	3/3/10	5		Process Waste	17,800		2.7	J+	1.9	J+	1,530	J	71.8	J	0.57	J+	13,700		29.2	J+	3.2	UJ	101	J	10,200		23.7	J	149,000		3,480	J	0.055	UJ	19.1	J	3,780	J+	0.36	J+	2.1	J+	2,810		0.05	J+	18.8	J+	413	J
		SM-WMU-003-C	MY5SW9	3/3/10	30	-	Process Waste	93,500		17.3	J+	14.9	J+	6,190	J	27.8	J	4.3	J+	2,290		242	J+	5.9	UJ	2,510	J	6,790		250	J	184,000		4,640	J	0.059	UJ	123	J	5,070	J+	3.3	J+	26.2	J+	7,970		3.7	UM	46.4	J+	3,110	J
		SM-WMU-003-D	MY5SX0	3/3/10	35	-	Process Waste	67,700		15.2	J+	19	J+	7,300	J	50.2	J	7.1	J+	1,820		180	J+	3.9	UJ	1,550	J	5,830		287	J	189,000		2,650	J	0.093	UJ	64.6	J	7,780	J+	0.59	J+	17.9	J+	11,100		2	UM	60.2	J+	2,080	J
		SM-WMU-003-E	MY5SX1	3/3/10	44	-	Native	14,300		0.77	J+	7.8	J+	214	J	0.91	J	0.47	J+	12,400		32.8	J+	11.6	J	29.6	J	30,200		12.8	J	9,960		452	J	0.048	UJ	31.8	J	14,800	J+	0.91	J+	0.67	UM	6,300		0.38	J+	57	J+	91.3	J
WMU-004		SM-WMU-004-A	MY5RN7	3/4/10	Surface		Process Waste	88,300	J	10.9	J+	3.5	J+	7,400		87.4		4.6	J+	14,800	J	178		5.5	UJ	1,990	J	5,990		226	J	165,000		4,390		0.043	J	80.3	J	6,730	J+	2.5	J+	4.4	J+	8,130		0.059	J+	44.5	J+	1,630	
		SM-WMU-004-B	MY5RN8	3/4/10	5		Process Waste	212,000	J	11.9	J+	1.5	J+	537		69.3		10.8	J+	16,500	J	360		7.5		8,610	J	7,610		328	J	108,000		4,320		0.13	U	358	J	723	J+	1.9	J+	6.9	J+	1,270		0.023	J+	41.3	J+	7,100	
		SM-WMU-004-C	MY5RN9	3/4/10	30	-	Process Waste	154,000	J	23.1	J+	7.5	J+	1,020		15		5.5	J+	3,220	J	287		7.3		2,470	J	7,030		533	J	72,600		1,790		0.052	J	123	J	4,360	J+	3	J+	23.4	J+	4,400		0.079	J+	76.4	J+	2,180	
		SM-WMU-004-D	MY5RP0	3/4/10	35	-	Process Waste	86,900	J	7.1	J+	8.8	J+	1,730		6		26.5	J+	2,310	J	363		4.6	UJ	3,070	J	6,490		194	J	127,000		3,220		0.14	U	100	J	2,630	J+	2.3	J+	10	J+	5,190		0.076	J+	43.9	J+	3,480	
		SM-WMU-004-E	MY5RP1	3/4/10	44	-	Native	5,950	J	0.61	J+	43.3	J+	167		0.47	J	2.3	J+	35,200	J	32.4		4.8	UJ	30.4	J	9,560		11.7	J	4,580		286		0.064	J	13.4	J	14,200	J+	1.6	J+	0.2	J+	4,180		0.41	J+	59.4	J+	42.1	
WMU-005		SM-WMU-005-A	MY5RP2	3/4/10	Surface		Process Waste	110,000	J	14.9	J+	5.2	J+	3,810		20.3		7.8	J+	6,480	J	354		7.6		4,420	J	7,010		577	J	91,500		2,930		0.028	J	297	J	5,050	J+	3.4	J+	4.6	J+	5,530		0.045	J+	71.8	J+	2,630	
	Dup	SM-WMU-105-A	MY5RP7	3/4/10	5		Process Waste	85,800	J	10.6	J+	7	J+	4,410		27.6		6	J+	7,020	J	307		5.6	UJ	2,870	J	6,000		310	J	96,700		3,160		0.018	J	170	J	3,410	J+	2.9	J+	6	J+	3,400		0.045	J+	63.3	J+	2,100	
		SM-WMU-005-B	MY5RP3	3/4/10	Surface		Process Waste	71,000	J	8.6	J+	8	J+	3,560		14.8		3.5	J+	7,210	J	211		4.9	UJ	2,550	J	5,790		253	J	82,700		2,660		0.025	J	134	J	3,790	J+	2.4	J+	5.6	J+	3,770		0.034	J+	51.8	J+	2,170	
	Dup	SM-WMU-105-B	MY5RP8	3/4/10	5		Process Waste	115,000	J	15.4	J+	5.5	J+	4,570		23.7		8.2	J+	6,000	J	707		7.1	UJ	4,330	J	6,250		390	J	98,500		3,230		0.024	J	190	J	4,720	J+	3.3	J+	4.8	J+	5,560		0.062	J+	78.2	J+	2,520	
		SM-WMU-005-C	MY5SX2	3/4/10	30	-	Process Waste	153,000		8.6	J+	6.8	J+	1,840		14.1	J	2.5	J+	2,690	J	244	J+	2.9	UJ	2,960		6,610		151	J	131,000		6,110	J	0.14	U	88.1		353	UJ	0.71	UM	5.5	J+	450	UJ	0.042	J+	75.8	J+	2,690	
	Dup	SM-WMU-105-C	MY5SX5	3/4/10	35	-	Process Waste	163,000		23.1	J+	20.4	J+	1,270		15.5	J	3.2	J+	8,670	J	333	J+	5.1	UJ	4,160		8,100		323	J	101,000		1,610	J	0.18	U	177		731	UJ	0.94	UM	5.8	J+	694	UJ	0.019	J+	67.7	J+	5,090	
		SM-WMU-005-D	MY5SX3	3/4/10	44	-	Process Waste	106,000		16.1	J+	18	J+	5,640		25.5	J	7.8	J+	5,370	J	287	J+	5.9	UJ	1,750		8,030		199	J	175,000		5,310	J	0.17	U	111		1,350	J+	0.82	UM	17.5	J+	1,460		0.018	J+	57.7	J+	2,260	
	Dup	SM-WMU-105-D	MY5SX6	3/4/10	30	-	Process Waste	93,600		13.5	J+	16.8	J+	7,250		50.2	J	4.5	J+	8,840	J	270	J+	6.3	UJ	1,880		7,150		173	J	179,000		5,120	J	0.16	U	91.4		1,340	J+	0.57	J+	14.6	J+	1,430		0.022	J+	52.6	J+	2,050	
		SM-WMU-005-E	MY5SX4	3/4/10	35	-	Native	16,900		0.2	J+	7.4	J+	217		0.81	J	0.92	J+	16,000	J	27.7	J+	9.9		36.4		35,100		9.6	J	10,600		341	J	0.018	J	28.5		17,400	J+	0.66	J+	0.66	UM	4,110		0.34	J+	47.9	J+	89.9	
	Dup	SM-WMU-105-E	MY5SX7	3/4/10	44	-	Native	16,600		0.2	J+	17.1	J+	250		0.8	J	0.92	J+	6,110	J	30.2	J+	12.3		36.2		49,000		10.2	J	10,700		409	J	0.13	U	30.6		17,300	J+	0.61	J+	0.14	J+	4,320		0.37	J+	58.1	J+	93.1	
WMU-006		SM-WMU-006-A	MY5RQ2	3/4/10	Surface		Process Waste	87,700	J	14.3	J+	5.3	J+	4,910		20.3		6.1	J+	5,800	J	249		5.4	UJ	3,070	J	5,350		345	J	90,200		2,440		0.019	J	133	J	12,300	J+	3.5	J+	4.7	J+	14,500		0.031	J+	59.4	J+	1,820	
		SM-WMU-006-B	MY5RQ3	3/4/10	5		Process Waste	88,800	J	11.7	J+	5.7	J+	3,860		22.3		6.6	J+	7,280	J	560		6.3	UJ	4,010	J	5,850		379	J	88,000		3,070		0.036	J	153	J	3,820	J+	3.3	J+	5.1	J+	4,220		0.035	J+	72	J+	2,250	
		SM-WMU-006-C	MY5RQ4	3/4/10	30	-	Process Waste	122,000	J	15.8	J+	12	J+	4,160		24.8		5.3	J+	3,370	J	166		2	UJ	1,680	J	4,790		224	J	140,000		3,280		0.037	J	67.2	J	3,730	J+	3.6	J+	4.1	J+	6,220		0.044	J+	57.3	J+	1,480	
		SM-WMU-006-D	MY5RQ5	3/4/10	35	-	Process Waste	79,000	J	12	J+	23.8	J+	7,060		17.7		5.7	J+	5,150	J	244		5	UJ	1,930	J	6,660		278	J	173,000		4,160		0.022	J	91.5	J	3,550	J+	2.3	J+	13.6	J+	5,460		0.029	J+	59.4	J+	2,110	
		SM-WMU-006-E	MY5RQ6	3/4/10	44	-	Native	3,050	J	0.24	J+	7.8	J+	134		0.34	J	0.88	J+	18,500	J	24.6		4.3	UJ	16.2	J	6,200		6.5	J	3,280		300		0.13	U	14.7	J	6,850	J+	1.1	J+	0.65	UM	4,020		0.45	J+	46.9	J+	24.6	
WMU-007		SM-WMU-007-A	MY5RQ7	3/4/10	Surface		Process Waste	86,100	J	11.6	J+	5.2	J+	1,900		9.2		5.7	J+	6,990	J	436		6.5	UJ	4,040	J	5,650		311	J	49,100		1,500		0.021	J	170	J	7,510	J+	3.3	J+	4.1	J+	8,530		0.049	J+	88.6	J+	2,480	
		SM-WMU-007-B	MY5RQ8	3/4/10	5		Process Waste	48,000	J	8.4	J+	1.3	J+	2,320		151		6.3	J+	5,140	J	180		3.2	UJ	655	J	3,770		45	J	248,000		14,400		0.12	U	48.9	J	611	U	1.7	J+	4.7	J+	405	UJ	0.027	J+	22.6	J+	1,100	
		SM-WMU-007-C	MY5SX8	3/4/10	30	-	Process Waste	107,000		13.6	J+	12.5	J+	5,930		29	J	3.3	J+	2,070	J	193	J+	3.8	UJ	1,680		7,100		160	J	210,000		4,970	J	0.2	U	81.3		6,460	J+	1.1	UM	6.6	J+	4,450		2	UM	114	J+	2,130	
		SM-WMU-007-D	MY5SX9	3/4/10	35	-	Process Waste	89,700		8.7	J+	18.1	J+	5,680		17.8	J	8.1	J+	1,580	J	181	J+	4.2	UJ	1,640		6,110		175	J	203,000		3,790	J	0.16	U	68.3		3,850	J+	0.83	UM	19.2	J+	3,640		0.022	J+	42	J+	1,980	
		SM-WMU-007-E	MY5SY0	3/4/10	44	-	Native	9,130		0.64	UM	3.9	J+	97.3	J	0.49	UJ	0.86	J+	7,090		21.9	J+	6.2	UJ	24	J	17,500		7.3		5,860		208		0.037	J	16.7		8,890	J+	1.8	J+	0.64	UM	2,670		0.28	J+	41.3	J+	59.9	
WMU-008		SM-WMU-008-A	MY5RR2	3/4/10	Surface		Process Waste	96,200	J	10	J+	5.3	J+	5,040		33.6		4.3	J+	5,000	J	196		4.7	UJ	2,440	J	5,720		325	J	118,000		4,430		0.021	J	97.5	J	1,770	J+	2.7	J+	5.1	J+	1,960		0.024	J+	55.5	J+	1,670	
		SM-WMU-008-B	MY5RR3	3/4/10	5		Process Waste	86,400	J	11.1	J+	5.9	J+	4,530		28.2		5.2	J+	4,590	J	334		5.7	UJ	2,880	J	5,780		357	J	98,100		3,180		0.043	J	120	J	753	J+	3	J+	4.5	J+	509	UJ	0.03	J+	58.8	J+	1,850	
		SM-WMU-008-C	MY5RR4	3/4/10	30	-	Process Waste	92,200	J	13.3	J+	14.5	J+	7,320		32.6		3.3	J+	4,310	J	156		3.6	UJ	1,660	J	5,360		198	J	121,000		3,270		0.022	J	72.5	J	6,230	J+	2.4	J+	9.7	J+	6,890		0.026	J+	59.2	J+	1,500	
		SM-WMU-008-D	MY5RR5	3/4/10	35	-	Process Waste	90,300	J	6.9	J+	4	J+	1,290		4.8		4	J+	3,650	J	483		8.4		3,780	J	7,490		519	J	40,900		1,830		0.13	U	238	J	3,350	J+	1.9	J+	3.5	J+	3,350		0.057	J+	88.6	J+	1,590	
		SM-WMU-008-E	MY5RR6	3/4/10	44	-	Native	3,540		0.095	J+	0.96	J+	42.7		0.18	UJ	0.22	J+	2,550	J	9.3	J+	2.3	UJ	7.1		6,020		2.8	J	2,500		79.6	J	0.11	U	6.8		3,850	J+	0.44	J+	0.57	UM	1,430		0.059	J+	14.6	J+	19.4	
WMU-009		SM-WMU-009-A	MY5RR7	3/5/10	Surface		Process Waste	180,000		10.7	J+	4.6	J+	5,560		20.7		5.7	J+	6,420		449		7.5	UJ	3,770		8,960		436		98,500		3110		0.028	U	128	J	5,170	J+	2.4	J+	3.7	J+	4,680		3.1	UM	76.2	J+	2,320	
		SM-WMU-009-B	MY5RR8	3/5/10	5		Process Waste	163,000		12.4	J+	5.9	J+	5,270		23.2		5.7	J+	6,820		286		5.8	UJ	3,650		8,490		411		99,300		2,960		0.035	U	133	J	5,220	J+	2.9	J+	4.1	J+	4,790		2.9	UM	64.6	J+	2,080	
		SM-WMU-009-C	MY5SY1	3/5/10	30	-	Process Waste	99,600		12	J+	14.8	J+	9,400		20.2		3.6	J+	4,320		170		1	UJ	1,510		5,930		216		181,000		4,040		0.2	UJ	74.8	J	8,180	J+	2.1	J+	15.4	J+	11,800		0.023	J+	58.2	J+	1,490	
		SM-WMU-009-D	MY5SY2	3/5/10	35	-	Process Waste	67,400		6.8	J+	28	J+	15,500		27.7		10.7	J+	2,770		134		5.3	UJ	1,290		6,710		183		228,000		3,470		0.21	UJ	56.2	J	7,710	J+	1.7	J+	19	J+	12,100		2	UM	37.6	J+	1,810	
		SM-WMU-009-E	MY5SY3	3/5/10	44	-	Native	4,300		0.18	J+	3.7	J+	50.7		0.25	UJ	0.42	J+	4,810		12.8		3.5	UJ	10.6		9,210		3.4		2,940		115		0.041	U	8.7	J	5,200	J+	0.72	J+	0.14	J+	1,990		0.073	J+	21.4	J+	26.7	

TABLE 2
Metals Analytical Results, Solid Matrix, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	CLP ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	Aluminum Result	Q	Antimony Result	Q	Arsenic Result	Q	Barium Result	Q	Beryllium Result	Q	Cadmium Result	Q	Calcium Result	Q	Chromium Result	Q	Cobalt Result	Q	Copper Result	Q	Iron Result	Q	Lead Result	Q	Magnesium Result	Q	Manganese Result	Q	Mercury Result	Q	Nickel Result	Q	Potassium Result	Q	Selenium Result	Q	Silver Result	Q	Sodium Result	Q	Thallium Result	Q	Vanadium Result	Q	Zinc Result	Q
North of Waste Disposal Area																																																							
WNO-001		SM-WNO-001-A	MY5SZ1	3/11/10	Surface	-	Native	10,700		1.2	J+	4.1	J+	611		0.58	UJ	2.7	J+	51,000		76.6	J+	5.1	UJ	383	J	15,400		129		5,820		151		1.7		29.4		2,450	J+	3.1	J+	8.6	J+	1,800		0.073	J+	26.9	J+	716	
		SM-WNO-001-B	MY5SZ2	3/11/10	2	-	Native	11,800		1.5	J+	4.9	J+	901		0.39	UJ	2.3	J+	134,000		74.2	J+	6.2	UJ	382	J	22,100		128		6,320		342		0.1	UJ	29		2,810	J+	3.5	J+	7.6	J+	3,090		0.093	J+	34.9	J+	1,190	
WNO-002		SM-WNO-002-A	MY5SZ3	3/11/10	Surface	-	Native	26,400		1	J+	4.3	J+	598		2.5		1.2	J+	19,800		51	J+	5.2	UJ	418	J	14,300		33		13,300		723		0.13	U	32.6		2,930	J+	0.98	J+	1.5	J+	385	UJ	0.12	J+	30.3	J+	460	
		SM-WNO-002-B	MY5SZ4	3/11/10	2	-	Native	113,000		12.4	J+	13.6	J+	7,420		27.5		4.3	J+	4,260		200	J+	3.3	UJ	1,970	J	7,680		185		157,000		4,180		0.16	U	88.8		616	J+	3.6	J+	15	J+	1,740		1.6	UM	57.8	J+	2,330	
WNO-003		SM-WNO-003-A	MY5SZ5	3/11/10	Surface	-	Native	5,610		0.22	J+	2	J+	66.7		0.34	UJ	0.39	J+	7,490		10.1	J+	3	UJ	39.3	J	8,800		8.1		3,450		125		0.11	U	9.8		1,470	J+	0.54	J+	0.12	J+	195	UJ	0.06	J+	16.5	J+	49	
		SM-WNO-003-B	MY5SZ6	3/11/10	2	-	Process Waste	8,040		0.21	J+	3.7	J+	139		0.43	UJ	0.85	J+	17,100		14.8	J+	6.1	U	15.9	J	17,500		6.4		6,870		318		0.12	U	16.6		4,030	J+	0.68	J+	0.6	UM	1,180		0.16	J+	28.6	J+	50.7	
WNO-004		SM-WNO-004-A	MY5SZ7	3/11/10	Surface	-	Native	9,930		0.49	J+	5.2	J+	278		0.6	UJ	1.8	J+	38,400		33.9	J+	6.7		115	J	19,500		49.3		7,790		365		0.26		21.8		4,100	J+	1.3	J+	2.5	J+	727		0.15	J+	32.1	J+	285	
		SM-WNO-004-B	MY5SZ8	3/11/10	2	-	Process Waste	7,240		0.26	J	3.7		156		0.35	J	0.89		23,100		21.3		5.7	J	34.6		15,900		14.9		6,520		303		0.09	J	16		3,230		0.79		0.77		1,090		0.15	J	27.2		103	
East Bank of OID																																																							
ODE-001		SM-ODE-001-A	MY5SZ9	3/11/10	Surface	-	General Fill	84,200		9.9	J+	5.9	J+	4,900		26.3		4.6	J+	3,590		175	J+	5.6	UJ	1,910	J	10,100		192		92,100		3,250		0.017	UJ	95.2		1,260	J+	2.9	J+	3.5	J+	385	UJ	0.015	J+	44.9	J+	2,700	
		SM-ODE-001-B	MY5T00	3/11/10	3	-	General Fill	1,320		0.2	J+	1.1	J+	27		0.11	UJ	0.096	J+	2,450		4.7	J+	0.8	UJ	16.8	J	2,990		8.8		1,810		64.1		0.13	U	2.3	UJ	1,020	J+	0.65	UM	0.15	J+	958		1.3	UM	4.5	J+	13.4	
ODE-001A		SM-ODE-001A-A	MY5W31	6/15/10	Surface	-	General Fill	17,700		1.5	J+	3.2	J+	556		2.8		0.56	J+	14,600		38.9	J+	3.8	UJ	301		9,720		44.4	J	8,770		471		0.029	J	21.9		1,910	J+	0.66	J+	0.57	J+	1,690		0.11	J+	22.8	J+	300	
		SM-ODE-001A-B	MY5W32	6/15/10	5	-	General Fill	12,600		0.25	J+	4	J+	158		0.58	UJ	0.54	J+	14,000		19.5	J+	7.2		18.7		23,200		7.8	J	7,150		957		0.038	J	21.8		9,720	J+	0.76	J+	0.69	M	4,230		0.29	J+	34.8	J+	62.2	
		SM-ODE-001A-C	MY5W33	6/15/10	10	-	General Fill	12,700		0.22	J+	5	J+	159		0.62	UJ	0.54	J+	11,100		18.9	J+	8.5		23.2		23,600		8.8	J	8,230		290		0.044	J	23.4		5,970	J+	0.97	J+	0.13	J+	8,530		0.28	J+	34.9	J+	67.1	
		SM-ODE-001A-D	MY5W34	6/15/10	16	-	Native	5,800		0.18	J+	4.1	J+	79.2		0.3	UJ	0.47	J+	6,660	J	13.1	J+	3.9	UJ	9.5		11,500		3.9	J	3,780		158		0.13	U	11		3,420	J+	0.53	J+	0.65	M	4,780		0.15	J+	20.4	J+	30.3	
ODE-002		SM-ODE-002-A	MY5T03	3/11/10	Surface	-	Process Waste	132,000		17.2	J+	6.3	J+	2,010		24		7.8	J+	3,730		436	J+	16.4		4,970	J	16,800		469		70,600		9,110		0.018	UJ	412		1,310	J+	1.9	J+	15.1	J+	688		1.2	UM	69.8	J+	4,120	
ODE-002A		SM-ODE-002A-A	MY5W35	6/16/10	Surface	-	General Fill	78,400		8.2	J+	6.1	J+	1,980		12		4	J+	8,350	J	369	J+	5	UJ	2,100		9,930		440	J	40,200		2,090		0.028	J	93.7		1,400	J+	2.2	J+	3.6	J+	1,780		0.056	J+	44.3	J+	1,500	
		SM-ODE-002A-B	MY5W36	6/16/10	5	-	General Fill	12,500		0.29	J+	3.7	J+	185		0.64	UJ	0.42	J+	9,400	J	22.5	J+	8.5		25.1		24,700		16.6	J	8,290		918		0.038	J	23.6		11,200	J+	0.61	J+	0.64	M	2,270		0.33	J+	38.3	J+	93.7	
		SM-ODE-002A-C	MY5W37	6/16/10	10	-	General Fill	19,000		0.39	J+	3.4	J+	201		0.95		0.41	J+	13,300	J	29.2	J+	11.6		57.1		35,900		12.4	J	10,500		443		0.057	J	31		12,400	J+	1.2	J+	0.69	M	9,000		0.38	J+	51.5	J+	92.6	
		SM-ODE-002A-D	MY5W38	6/16/10	14	-	Native	10,900		0.35	J+	4.4	J+	154		0.52	UJ	0.86	J+	10,700	J	18.2	J+	7.2		19.1		19,800		7.3	J	6,980		261		0.02	J	20.1		6,440	J+	0.82	J+	0.64	M	5,870		0.28	J+	33.3	J+	58.5	
ODE-003		SM-ODE-003-A	MY5T07	3/11/10	Surface	-	Process Waste	160,000		12.5	J+	11.1	J+	1,710		34.2		6.8	J+	6,140		436	J+	8.6		2,830	J	14,400		318		63,100		7,510		0.13	U	221		1,480	J+	1.8	J+	5.5	J+	805		1.3	UM	75.7	J+	3,750	
		SM-ODE-003-B	MY5T08	3/11/10	4.5	-	Process Waste	9,160		0.28	J+	4.3	J+	145		0.83		0.76	J+	14,200		13.1	J+	4.5	UJ	80.8	J	12,500		43.5		8,540		336		0.019	UJ	19.6		4,820	J+	0.59	J+	0.14	J+	897		0.09	J+	22.4	J+	122	
ODE-003A		SM-ODE-003A-A	MY5W39	6/16/10	Surface	-	General Fill	7,680		0.91	J+	5.9	J+	410		0.96		0.68	J+	14,600	J	57.8	J+	4.4	UJ	29		13,300		51	J	5,450		271		0.027	J	13.3		3,080	J+	0.43	J+	1.1	J+	1,180		0.12	J+	25.4	J+	70.5	
		SM-ODE-003A-B	MY5W40	6/16/10	5	-	General Fill	14,300		0.17	J+	5.8	J+	211		0.69		0.12	J+	4,740	J	19.9	J+	9.5		19.6		28,400		8.6	J	9,600		336		0.025	J	23.4		7,420	J+	0.62	J+	0.67	M	3,080		0.29	J+	37.5	J+	75.6	
		SM-ODE-003A-C	MY5W41	6/16/10	10	-	General Fill	19,400		0.55	J+	5	J+	222		0.94	J	2.7	J+	16,700		34.6	J+	10.1		40.3		33,300		13.4	J	11,500		425		0.037	J	32.2		16,400	J+	1.7	J+	0.17	J+	9,340		0.4	J+	62.1	J+	103	
		SM-ODE-003A-D	MY5W42	6/16/10	13	-	Native	23,000		0.34	J+	6.5	J+	173		1.2	J	1.4	J+	15,500		36.7	J+	13.5		45.6		39,400		16.1	J	13,500		479		0.05	J	32.5		12,300	J+	1.5	J+	0.83	M	6,350		0.41	J+	66.6	J+	106	
ODE-004		SM-ODE-004-A	MY5T11	3/11/10	Surface	-	Process Waste	31,400		1.6	J+	10.9	J+	1,460		20.1		1.4	J+	30,400		82.6	J+	5.4	UJ	647	J	12,400		75		35,700		3,080		0.12	U	49.1		5,180	J+	0.89	J+	2.5	J+	2,820		0.061	J+	33	J+	882	
	Dup	SM-ODE-104-A	MY5T15	3/11/10	Surface	-	Process Waste	6,660		0.91	J+	5.7	J+	203		0.88	J	1.2	J+	16,400		41.3	J+	4.9	UJ	33.8		13,900		19.1		7,560		371		0.12	U	13		5,590	J+	0.9	J+	0.57	J+	1,960		0.17	J+	39.1	J+	76.3	
		SM-ODE-004-B	MY5T12	3/11/10	5	-	Process Waste	20,400		0.41	J+	2.2	J+	141		0.9		0.56	J+	5,870		20.6	J+	3.6	UJ	346	J	9,480		38.7		9,010		336		0.11	U	23.7		3,840	J+	0.55	J+	0.17	J+	1,350		0.06	J+	19.7	J+	290	
	Dup	SM-ODE-104-B	MY5T16	3/11/10	5	-	Process Waste	7,150		0.58	UM	0.58	UM	160		0.72	J	0.42	UM	8,150		0.58	UM	3.3	UJ	82		9,020		24.6		5,440		294		0.12	U	13.6		3,610	J+	0.6	UM	0.58	UM	1,190		1.2	UM	2.3	UM	104	
		SM-ODE-004-C	MY5T13	3/11/10	10	-	Process Waste	3,670		0.15	J+	1.6	J+	46.5		0.18	UJ	0.1	J+	5,870		7.1	J+	2.8	UJ	5.2	J	8,470		2.9		5,790		123		0.12	U	6.5		1,890	J+	0.43	J+	0.6	UM	606		0.075	J+	12.7	J+	20.1	
	Dup	SM-ODE-104-C	MY5T17	3/11/10	10	-	Process Waste	6,680		0.071	J+	2.3	J+	69.6		0.26	J	0.35	J+	12,900		9.7	J+	5.4	UJ	10.5		15,300		4.8		8,450		202		0.12	U	11.5		3,530	J+	0.5	J+	0.62	UM	717		0.081	J+	17.1	J+	36.1	
		SM-ODE-004-D	MY5T14	3/11/10	14.5	-	Native	11,200		0.24	J+	6.8	J+	215		0.59	J	1.1	J+	52,100		16.3	J+	9.3		27.9		26,200		11		11,900		742		0.16	U	27.1		7,210	J+	0.96	J+	0.79	UM	4,430		0.2	J+	35.7	J+	73	
	Dup	SM-ODE-104-D	MY5T18	3/11/10	14.5	-	Native	5,070		0.22	J+	1.9	J+	144		0.23	J	0.44	J+	9,290		8.1	J+	4	UJ	9.5		11,100		4.7		4,360		171		0.12	U	10.4		2,600	J+	0.43	J+	0.62	UM	1,570		0.061	J+	15.5	J+	31	
ODE-005		SM-ODE-005-A	MY5T19	3/11/10	Surface	-	Process Waste	9,300		0.44	J+	4.9	J+	123		0.43	J	0.74	J+	17,400		19	J+	5.3	UJ	93.2		14,600		14.8		5,500		299		0.015	UJ	16.8		4,770	J+	0.53	J+	0.28	J+	1,600		0.12	J+	23.9	J+	116	
		SM-ODE-005-B	MY5T20	3/11/10	5	-	Process Waste	8,160		0.27	J+	3.9	J+	126		0.42	J	0.83	J+	19,400		12.8	J+	6.3		20.8		18,100		18.3		6,270		477		0.12	U	17.6		5,360	J+	0.56	J+	0.12	J+	1,950		0.12	J+	24.6	J+	65.9	
		SM-ODE-005-C	MY5T21	3/11/10	10	-	Process Waste	7,760		0.87	J+	3.5	J+	159		0.55	J	0.9	J+	15,200		28	J+	4.2	UJ	68.8		12,100		18.9		5,520		264		0.12	U	13.7		3,100	J+	0.76	J+	0.37	J+	1,920		0.095	J+	25	J+	86.6	
		SM-ODE-005-D	MY5T22	3/11/10	14.5	-	Native	7,240		0.22	J+	3.5	J+	111		0.33	J	0.78	J+	10,600		12.9	J+	5.7	UJ	14.4		15,800		6.1		5,300		296		0.14	U	15.2		3,030	J+	0.74	J+	0.66	UM	2,360		0.14	J+	25.9	J+	44.8	
ODE-006		SM-ODE-006-A	MY5T23	3/11/10	Surface	-	Process Waste	8,500		0.55	J+	4.6	J+	203		0.48	J	0.96	J+	10,800		16.1	J+	5.7	U	103		17,000		80.2		6,310		298		0.12	U	18.8		3,470	J+	0.52	J+	0.32	J+	922		0.11	J+	23.6	J+	184	
		SM-ODE-006-B	MY5T24	3/11/10	5	-	Process Waste	20,300		0.78	J+	8.7	J+	489		1.5	J	2.2	J+	39,100		23.8	J+	15		167		42,400		222		16,900		880		0.064	UJ	46.7		11,600	J+	1.2	J+	0.58	J+	2,990		0.25	J+	38.7	J+	427	
		SM-ODE-006-C	MY5T25	3/11/10	9.5	-	Native	9,600		0.22	J+	4.3	J+	150		0.51	J	0.71	J+	24,300		15.7	J+	11.7		21.9		19,600		10.7		6,380		2,180		0.11	U	27.7		4,440	J+	0.72	J+	0.55	UM	1,090		0.2	J+	30.1	J+	57.3	

Notes:

Units are in mg/kg

bgs = below ground surface

A/C = asphalt/concrete

Data Qualifiers (Q):

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit listed in the table.
J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+ = The result is an estimated quantity that may be biased high.
J- = The result is an estimated quantity that may be biased low.
UJ = The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R = The data did not meet quality control criteria and are rejected as unusable. The analyte may or may not be present in the sample.
M = Data could not be fully qualified.

TABLE 3
Radionuclide Analytical Results, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	Thorium 228			Thorium 230			Thorium 232			Radium 226			Radium 228		
							Result	Q	Uncertainty	Result	Q	Uncertainty	Result	Q	Uncertainty	Result	Q	Uncertainty	Result	Q	Uncertainty
Smelter Parcel - North Area																					
SPN-001		SM-SPN-001-A	3/1/10	0.5	Concrete	Gen Fill	1.11		0.36	1.10		0.35	1.11		0.36	1.27		0.24	1.54		0.36
		SM-SPN-001-B	3/1/10	2	-	Gen Fill	0.96		0.33	0.84		0.30	0.93		0.32	1.30	J	0.68	1.71	J	0.84
SPN-002		SM-SPN-002-A	3/1/10	0.5	Concrete	Gen Fill	1.49		0.45	1.30		0.40	1.32		0.41	1.13		0.28	0.93		0.29
		SM-SPN-002-B	3/1/10	2	-	Burn Dump	1.34		0.37	1.03		0.31	1.12		0.33	0.71		0.14	0.81		0.25
SPN-003		SM-SPN-003-A	3/1/10	Surface	-	Gen Fill	1.24		0.39	1.63		0.47	1.34		0.40	1.30		0.35	1.59		0.51
	Dup	SM-SPN-103-A	3/1/10	Surface	-	Gen Fill	0.99		0.30	1.06		0.31	0.87		0.27	0.94	J	0.49	1.13	J	0.88
		SM-SPN-003-B	3/1/10	2	-	Burn Dump	0.87		0.30	0.71		0.25	1.22		0.36	1.03		0.34	1.92		0.49
	Dup	SM-SPN-103-B	3/1/10	2	-	Burn Dump	1.00		0.29	0.87		0.26	0.67		0.21	1.08	J	0.47	0.96	U	1.05
SPN-004		SM-SPN-004-A	3/1/10	Surface	-	Gen Fill	1.24		0.37	1.56		0.43	1.17		0.35	0.88	J	0.44	1.45	J	0.82
		SM-SPN-004-B	3/1/10	2	-	Burn Dump	0.78		0.25	0.52		0.19	0.77		0.24	1.02		0.26	0.93		0.30
SPN-005		SM-SPN-005-A	3/1/10	Surface	-	Gen Fill	0.48		0.21	0.60		0.24	0.56		0.23	0.49		0.16	0.56	J	0.25
		SM-SPN-005-B	3/1/10	2	-	Gen Fill	1.05		0.34	0.88		0.29	0.80		0.27	0.91		0.31	1.25	J	0.66
SPN-006		SM-SPN-006-A	3/1/10	Surface	-	Gen Fill	0.95		0.33	0.78		0.28	0.80		0.29	0.83		0.21	1.07		0.32
		SM-SPN-006-B	3/1/10	2	-	Burn Dump	0.46		0.22	0.49		0.22	0.56		0.24	0.65	J	0.28	0.62	J	0.28
SPN-007		SM-SPN-007-A	3/1/10	Surface	-	Gen Fill	0.66		0.25	0.71		0.26	0.59		0.23	1.04	J	0.49	0.44	U	0.58
		SM-SPN-007-B	3/1/10	2	-	Burn Dump	1.30		0.45	1.24		0.43	1.31		0.45	1.40		0.26	1.56		0.33
SPN-008		SM-SPN-008-A	3/1/10	Surface	-	Gen Fill	1.48		0.53	0.92		0.38	1.07		0.42	1.45		0.38	1.30		0.43
		SM-SPN-008-B	3/1/10	2	-	Burn Dump	1.04		0.40	0.60		0.27	0.66		0.29	0.85	J	0.61	1.39	J	1.19
SPN-009		SM-SPN-009-A	3/1/10	Surface	-	Gen Fill	0.86		0.25	0.96		0.27	0.83		0.24	0.68	J	0.42	1.82	J	0.97
		SM-SPN-009-B	3/1/10	2	-	Burn Dump	0.40		0.17	0.38		0.16	0.41		0.16	0.45		0.16	0.51	J	0.25
SPN-010		SM-SPN-010-A	3/1/10	Surface	-	Gen Fill	0.66		0.22	0.71		0.23	0.60		0.20	1.01		0.43	1.63		0.60
		SM-SPN-010-B	3/1/10	2	-	Burn Dump	0.81		0.26	0.72		0.24	0.76		0.25	0.66		0.16	0.59		0.26
SPN-011		SM-SPN-011-A	3/8/10	Surface	-	Gen Fill	0.96		0.36	1.18		0.41	1.07		0.38	0.57		0.16	0.77	J	0.30
		SM-SPN-011-B	3/8/10	5	-	Burn Dump	0.88		0.29	0.92		0.29	0.96		0.30	0.98		0.34	0.82	J	0.51
		SM-SPN-011-C	3/8/10	10	-	Transition	0.23		0.12	0.41		0.17	0.67		0.23	0.55		0.18	0.46	J	0.23
		SM-SPN-011-D	3/8/10	14.5	-	Native	0.67		0.23	0.61		0.21	0.69		0.23	0.44	J	0.17	0.98		0.31
SPN-012		SM-SPN-012-A	3/2/10	Surface	-	Gen Fill	0.69		0.26	0.93		0.32	0.84		0.29	0.97		0.28	1.23		0.54
	Dup	SM-SPN-112-A	3/2/10	Surface	-	Gen Fill	1.71		0.45	1.48		0.40	1.11		0.33	1.70		0.46	2.20	J	0.99
		SM-SPN-012-B	3/2/10	5	-	Burn Dump	0.53		0.20	0.73		0.25	0.67		0.23	0.81	J	0.37	1.34	J	0.79
	Dup	SM-SPN-112-B	3/2/10	5	-	Burn Dump	0.60		0.22	0.96		0.30	0.92		0.29	1.20		0.39	1.30	J	0.57
		SM-SPN-012-C	3/2/10	8	-	Burn Dump	0.71		0.26	0.72		0.26	0.84		0.29	0.90	J	0.44	0.78	U	0.84
	Dup	SM-SPN-112-C	3/2/10	8	-	Burn Dump	0.69		0.21	0.78		0.23	0.73		0.22	0.75	J	0.50	2.49	J	1.60
		SM-SPN-012-D	3/2/10	12	-	Native	2.09		0.50	1.95		0.47	1.93		0.47	3.07		0.62	4.06		1.00
	Dup	SM-SPN-112-D	3/2/10	12	-	Native	2.00		0.50	2.17		0.53	2.21		0.54	2.85		0.68	3.23		0.89
Smelter Parcel - Parking Area																					
SPP-001		SM-SPP-001-A	3/1/10	0.5	Asphalt	Gen fill	0.65		0.21	0.76		0.23	0.74		0.22	0.84		0.27	1.04		0.31
		SM-SPP-001-B	3/1/10	2	-	Burn Dump	0.83		0.25	0.78		0.24	0.78		0.24	0.93	J	0.49	1.16	J	0.56
SPP-002		SM-SPP-002-A	3/1/10	0.5	Asphalt	Gen fill	0.88		0.26	0.69		0.22	0.65		0.21	0.81		0.20	1.15		0.30
		SM-SPP-002-B	3/1/10	2	-	Burn Dump	0.78		0.25	0.66		0.22	0.81		0.26	1.62		0.46	1.30	J	0.62
SPP-003		SM-SPP-003-A	3/1/10	0.5	Asphalt	Gen fill	1.05		0.34	1.21		0.37	0.95		0.31	1.05		0.38	1.73		0.64
		SM-SPP-003-B	3/1/10	2	-	Burn Dump	0.81		0.29	0.88		0.30	1.03		0.33	0.77	J	0.48	2.05	J	0.95
SPP-004		SM-SPP-004-A	3/1/10	0.5	Asphalt	Gen fill	0.59		0.22	0.67		0.23	0.73		0.25	1.14		0.26	1.22		0.52
		SM-SPP-004-B	3/1/10	2	-	Burn Dump	1.11		0.34	1.06		0.33	0.89		0.29	0.78	J	0.38	1.29	J	0.67
Smelter Parcel - South Area																					
SPS-001		SM-SPS-001-A	3/9/10	Surface	-	Process Waste	12.15		2.82	30.04		6.68	12.43		2.87	1.01		0.34	11.86		0.96
		SM-SPS-001-B	3/9/10	5	-	Process Waste	6.13		1.95	15.94		4.65	6.62		2.07	0.85	J	0.48	6.35		1.04
		SM-SPS-001-C	3/9/10	10	-	Process Waste	6.48		1.51	11.55		2.55	5.68		1.33	0.66		0.25	7.13		0.97
		SM-SPS-001-D	3/9/10	13	-	Process Waste	2.99		0.80	1.48		0.46	1.57		0.48	1.61		0.32	3.15		0.53
		SM-SPS-001-E	3/9/10	19.5	-	Native	1.63		0.45	1.46		0.41	1.80		0.48	1.63		0.44	1.44	J	0.90
SPS-002		SM-SPS-002-A	3/9/10	Surface	-	Process Waste	0.41	J	0.22	0.33	J	0.19	0.47		0.23	0.19	J	0.17	0.67	J	0.42
	Dup	SM-SPS-102-A	3/9/10	Surface	-	Process Waste	9.10		4.50	15.70		7.40	7.71		3.85	0.39	U	0.42	8.71		1.34
		SM-SPS-002-B	3/9/10	5	-	Process Waste	18.06		4.18	60.08		13.45	17.90		4.14	2.96		0.52	24.22		1.64
	Dup	SM-SPS-102-B	3/9/10	5	-	Process Waste	37.66		6.98	114.40		20.93	37.06		6.87	4.88		0.83	72.28		4.22
		SM-SPS-002-C	3/9/10	10	-	Process Waste	10.05		2.95	8.08		2.41	3.00		1.03	0.72	U	0.72	12.24		1.75
	Dup	SM-SPS-102-C	3/9/10	10	-	Process Waste	11.72		3.26	10.27		2.88	3.08		1.01	0.30	U	0.44	6.94		1.27
		SM-SPS-002-D	3/9/10	14	-	Process Waste	19.33		4.12	33.00		6.91	12.67		2.75	3.04		0.49	22.12		1.46
		SM-SPS-002-E	3/9/10	18	-	Native	3.58		0.94	0.98		0.35	1.02		0.36	0.94		0.23	3.42		0.43
	Dup	SM-SPS-102-E	3/9/10	18	-	Native	2.78		0.73	0.66		0.25	0.56		0.22	1.32		0.28	4.58		0.50
SPS-003		SM-SPS-003-A	3/9/10	Surface	-	Process Waste	0.85		0.27	0.83		0.26	0.72		0.24	0.76		0.31	0.65	J	0.64
		SM-SPS-003-B	3/9/10	5	-	Process Waste	0.76		0.24	0.86		0.26	0.65		0.21	0.82		0.20	0.97		0.29
		SM-SPS-003-C	3/9/10	10	-	Burn Dump	0.68		0.24	0.62		0.22	0.60		0.22	0.73		0.20	0.73		0.31
		SM-SPS-003-D	3/9/10	14.5	-	Burn Dump	0.39		0.16	0.54		0.19	0.43		0.17	0.42	J	0.19	0.73		0.27
		SM-SPS-003-E	3/9/10	19.5	-	Native	0.38		0.16	0.46		0.18	0.63		0.22	0.43		0.18	0.53	J	0.42
SPS-004		SM-SPS-004-A	3/10/10	Surface	-	Process Waste	1.16		0.35	1.93		0.51	1.16		0.35	0.68		0.18	0.91		0.25
		SM-SPS-004-B	3/10/10	5	-	Burn Dump	1.12		0.38	0.95		0.33	0.81		0.30	1.06		0.31	1.17	J	0.43
		SM-SPS-004-C	3/10/10	10	-	Burn Dump	0.51		0.20	0.66		0.23	0.40		0.17	0.83		0.17	0.88	J	0.31
		SM-SPS-004-D	3/10/10	14	-	Native	1.27		0.42	1.46		0.45	1.21		0.39	1.25		0.25	1.58		0.34
SPS-005		SM-SPS-005-A	3/9/10	0.5	Concrete	Burn Dump	1.13		0.36	0.98		0.32	0.98		0.32	0.96		0.21	1.50		0.46
		SM-SPS-005-B	3/9/10	10	-	Burn Dump	0.67		0.26	0.51		0.21	0.66		0.25	0.52		0.16	0.69		0.20
		SM-SPS-005-C	3/9/10	14.5	-	Native	2.15		0.60	1.75		0.51	1.72		0.50	2.06		0.41	2.34		0.52
SPS-006		SM-SPS-006-A	3/10/10	0.5	Concrete	Process Waste	4.04		0.93	5.76		1.26	4.12		0.94	0.82		0.35	5.21		0.63
		SM-SPS-006-B	3/10/10	5	-	Process Waste	0.66		0.24	0.75		0.25	0.67		0.23	0.94		0.26	1.13	J	0.43
		SM-SPS-006-C	3/10/10	14	-	Native	2.05		0.58	2.14		0.60	2.06		0.58	1.78		0.30	2.41		0.45
SPS-007		SM-SPS-007-A	3/2/10	0.5	Concrete	Gen Fill	0.71		0.22	0.77		0.23	0.75		0.22	0.74	J	0.44	1.44	J	0.88
		SM-SPS-007-B	3/2/10	4.5	-	Gen Fill	1.14		0.31	0.77		0.24	1.08		0.30	1.58		0.32	1.67		0.50
		SM-SPS-007-C	3/2/10	9.5	-	Native	0.75		0.22	0.54		0.18	0.69		0.21	0.80	J	0.35	0.77	J	0.49

TABLE 3
Radionuclide Analytical Results, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	Thorium 228			Thorium 230			Thorium 232			Radium 226			Radium 228		
							Result	Q	Uncertainty	Result	Q	Uncertainty	Result	Q	Uncertainty	Result	Q	Uncertainty	Result	Q	Uncertainty
SPS-008		SM-SPS-008-A	3/10/10	0.5	Concrete	Gen Fill	0.74		0.28	0.69		0.27	0.99		0.34	1.03		0.21	0.84	J	0.32
		SM-SPS-008-B	3/10/10	5	-	Gen Fill	0.66		0.25	0.69		0.25	1.01		0.33	1.16		0.23	1.59		0.34
		SM-SPS-008-C	3/10/10	9.5	-	Native	0.58		0.21	0.54		0.20	0.73		0.25	0.64		0.15	0.68	J	0.34
SPS-009		SM-SPS-009-A	3/9/10	0.5	Concrete	Process Waste	4.61		1.04	7.94		1.69	4.39		1.00	0.64		0.23	5.37		0.55
		SM-SPS-009-B	3/9/10	5	-	Process Waste	7.63		1.92	15.66		3.72	8.71		2.15	0.84		0.31	7.95		0.73
		SM-SPS-009-C	3/9/10	10	-	Process Waste	31.33		6.41	77.16		15.54	31.02		6.34	2.21		0.44	33.98		2.05
		SM-SPS-009-D	3/9/10	14.5	-	Native	0.80		0.38	0.89		0.39	0.70		0.34	0.50		0.17	0.72	J	0.35
SPS-010		SM-SPS-010-A	3/10/10	Surface	-	Process Waste	2.26		0.54	3.95		0.86	2.53		0.59	1.25		0.30	3.36		0.50
		SM-SPS-010-B	3/10/10	5	-	Process Waste	9.44		1.89	14.73		2.87	9.15		1.83	0.87		0.35	10.30		0.83
		SM-SPS-010-C	3/10/10	10	-	Burn Dump	8.22		1.78	12.94		2.71	7.54		1.64	1.10	J	0.44	8.69		1.30
		SM-SPS-010-D	3/10/10	14.5	-	Native	1.11		0.32	1.09		0.31	1.12		0.32	1.24		0.24	1.08		0.29
SPS-011		SM-SPS-011-A	3/9/10	Surface	-	Process Waste	0.73		0.26	0.82		0.27	0.69		0.24	0.61		0.17	1.63		0.45
		SM-SPS-011-B	3/9/10	5	-	Burn Dump	0.74		0.27	0.65		0.24	0.69		0.25	1.02		0.18	0.70	J	0.31
		SM-SPS-011-C	3/9/10	10	-	Burn Dump	0.72		0.29	0.90		0.33	0.65		0.27	0.54		0.16	0.73		0.20
		SM-SPS-011-D	3/9/10	11.5	-	Native	1.19		0.39	0.98		0.33	1.31		0.41	1.18		0.22	1.44		0.29
SPS-012		SM-SPS-012-A	3/9/10	Surface	-	Process Waste	5.66		1.33	11.30		2.49	5.98		1.39	1.03		0.31	8.56		0.93
		SM-SPS-012-B	3/9/10	5	-	Process Waste	1.55		0.52	2.66		0.77	2.02		0.62	0.65		0.17	1.99		0.36
		SM-SPS-012-C	3/9/10	10	-	Process Waste	7.53		1.97	13.94		3.48	6.23		1.66	0.39	U	0.58	9.92		1.55
		SM-SPS-012-D	3/9/10	18.5	-	Process Waste	1.72		0.47	3.25		0.77	2.75		0.67	1.42		0.30	2.06		0.44
		SM-SPS-012-E	3/9/10	24.5	-	Native	2.15		0.57	1.79		0.49	1.83		0.50	1.45		0.29	2.19		0.37
SPS-013		SM-SPS-013-A	3/10/10	0.5	Concrete	Burn Dump	4.09		0.93	7.27		1.54	3.48		0.80	0.98		0.35	5.43		0.94
		SM-SPS-013-B	3/10/10	5	-	Burn Dump	1.11		0.32	1.42		0.37	1.12		0.31	0.59		0.18	1.01		0.30
		SM-SPS-013-C	3/10/10	10	-	Burn Dump	0.91		0.27	0.65		0.21	0.56		0.19	0.62		0.17	0.69		0.21
		SM-SPS-013-D	3/10/10	14.5	-	Native	0.94		0.29	0.61		0.21	0.75		0.25	0.62		0.17	1.12		0.39
SPS-014		SM-SPS-014-A	3/10/10	0.5	Concrete	Burn Dump	1.51		0.41	2.04		0.51	1.12		0.32	1.28		0.27	1.91		0.43
		SM-SPS-014-B	3/10/10	5	-	Burn Dump	0.41	J	0.24	0.47		0.25	0.53		0.27	0.65		0.17	0.53	J	0.29
		SM-SPS-014-C	3/10/10	10	-	Burn Dump	0.31		0.16	0.41		0.18	0.42		0.18	0.23	J	0.17	0.37	J	0.28
		SM-SPS-014-D	3/10/10	14.5	-	Native	0.24		0.13	0.29		0.13	0.31		0.14	0.32		0.12	0.34	J	0.21
SPS-015		SM-SPS-015-A	3/2/10	0.5	Concrete	Process Waste	0.66		0.22	0.68		0.22	0.66		0.21	0.88		0.39	1.48	J	0.60
	Dup	SM-SPS-115-A	3/2/10	0.5	-	Process Waste	0.92		0.33	1.65		0.49	0.81		0.29	0.81	J	0.73	1.84	J	0.89
		SM-SPS-015-B	3/2/10	6	-	Process Waste	0.73		0.26	0.84		0.28	0.72		0.26	0.45	J	0.45	0.78	J	0.65
	Dup	SM-SPS-115-B	3/2/10	6	-	Process Waste	0.72		0.28	0.80		0.30	0.62		0.26	1.42	J	0.65	1.18	J	0.70
		SM-SPS-015-C	3/2/10	10	-	Gen Fill	1.01		0.34	0.85		0.30	0.69		0.26	0.67		0.23	0.86	J	0.43
	Dup	SM-SPS-115-C	3/2/10	10	-	Gen Fill	0.92		0.38	1.00		0.39	0.89		0.37	0.54	U	0.57	1.63	J	0.71
		SM-SPS-015-D	3/2/10	14.5	-	Native	1.17		0.37	1.01		0.33	1.14		0.36	1.42		0.56	0.87	J	0.82
	Dup	SM-SPS-115-D	3/2/10	14.5	-	Native	0.61		0.23	0.77		0.27	1.11		0.35	1.95		0.74	1.76	J	0.93
SPS-016		SM-SPS-016-A	3/10/10	0.5	Concrete	Gen Fill	0.54		0.24	0.60		0.26	0.78		0.30	1.06	J	0.46	2.84		1.44
		SM-SPS-016-B	3/10/10	5	-	Burn Dump	0.72		0.28	0.81		0.29	0.74		0.27	0.72		0.17	0.73	J	0.33
		SM-SPS-016-C	3/10/10	10	-	Burn Dump	0.51		0.21	0.67		0.25	0.60		0.23	0.55	J	0.26	0.78	J	0.41
		SM-SPS-016-D	3/10/10	14.5	-	Native	1.18		0.33	1.01		0.29	0.95		0.28	1.43		0.22	1.57		0.33
SPS-017		SM-SPS-017-A	3/2/10	0.5	Concrete	Burn Dump	1.11		0.32	0.83		0.26	0.64		0.22	1.01		0.25	1.12	J	0.69
		SM-SPS-017-B	3/2/10	4.5	-	Burn Dump	0.89		0.28	0.63		0.22	0.61		0.22	0.92	J	0.54	0.98	J	0.57
		SM-SPS-017-C	3/2/10	9.5	-	Native	1.04		0.32	0.97		0.30	1.01		0.31	1.35		0.49	1.17	J	0.80
SPS-018		SM-SPS-018-A	3/2/10	0.5	Concrete	Process Waste	0.99		0.30	1.28		0.35	0.91		0.28	1.26		0.30	1.10		0.38
		SM-SPS-018-B	3/2/10	4.5	-	Burn Dump	0.94		0.28	1.07		0.30	1.03		0.29	1.28		0.26	1.29		0.46
		SM-SPS-018-C	3/2/10	9.5	-	Native	1.55		0.40	1.43		0.38	1.25		0.34	0.80		0.26	1.21		0.36
SPS-019		SM-SPS-019-A	3/10/10	0.5	Concrete	Burn Dump	1.24		0.35	0.78		0.25	0.81		0.26	0.41	J	0.26	0.31	U	0.41
		SM-SPS-019-B	3/10/10	5	-	Burn Dump	0.71		0.27	0.73		0.27	0.87		0.30	0.64		0.19	0.64		0.21
		SM-SPS-019-C	3/10/10	10	-	Burn Dump	0.44		0.20	0.69		0.27	0.40		0.19	0.54	J	0.22	0.40	J	0.36
		SM-SPS-019-D	3/10/10	19.5	-	Native	0.54		0.19	0.52		0.18	0.78		0.24	0.65		0.18	0.46	J	0.22
SPS-020		SM-SPS-020-A	3/8/10	0.5	Concrete	Burn Dump	1.08		0.32	0.78		0.25	0.89		0.28	1.07		0.18	1.19		0.37
		SM-SPS-020-B	3/8/10	5	-	Burn Dump	1.00		0.28	0.80		0.24	0.87		0.25	0.88		0.19	1.05		0.35
		SM-SPS-020-C	3/8/10	10	-	Burn Dump	0.69		0.25	0.57		0.21	0.59		0.22	0.62		0.20	0.72	J	0.39
		SM-SPS-020-D	3/8/10	15	-	Burn Dump	0.71	J	0.46	0.86	J	0.51	0.57	J	0.38	0.51		0.17	0.50	J	0.29
		SM-SPS-020-E	3/8/10	19.5	-	Native	0.64		0.27	1.02		0.36	0.78		0.30	0.58		0.13	0.70		0.19
SPS-021		SM-SPS-021-A	3/9/10	Surface	-	Process Waste	16.63		3.95	29.17		6.78	15.45		3.68	0.91		0.29	14.15		1.12
		SM-SPS-021-B	3/9/10	5	-	Process Waste	14.25		3.53	29.21		7.01	13.37		3.31	1.01		0.32	12.83		0.97
		SM-SPS-021-C	3/9/10	12.5	-	Process Waste	14.85		4.69	29.49		9.03	12.19		3.90	1.17		0.39	14.51		1.15
		SM-SPS-021-D	3/9/10	14.5	-	Native	1.08		0.33	0.73		0.25	0.98		0.30	0.83		0.16	0.93		0.28
SPS-022		SM-SPS-022-A	3/8/10	0.5	Concrete	Burn Dump	0.88		0.27	1.08		0.31	0.97		0.29	0.66		0.19	1.09		0.31
		SM-SPS-022-B	3/8/10	5	-	Burn Dump	0.57		0.25	0.63		0.25	0.57		0.24	0.46		0.19	0.64	J	0.30
		SM-SPS-022-C	3/8/10	10	-	Burn Dump	0.40		0.17	0.46		0.18	0.43		0.18	0.48		0.16	0.52	J	0.30
		SM-SPS-022-D	3/8/10	15	-	Burn Dump	0.77		0.31	0.71		0.29	0.62		0.26	0.51		0.19	0.70	J	0.43
		SM-SPS-022-E	3/8/10	19.5	-	Native	0.58		0.22	0.45		0.18	0.44		0.18	0.56		0.16	0.70		0.28
SPS-023		SM-SPS-023-A	3/2/10	0.5	Concrete	Burn Dump	1.00		0.31	0.89		0.28	1.22		0.35	1.04		0.24	1.42		0.31
		SM-SPS-023-B	3/2/10	5	-	Burn Dump	0.94		0.30	0.78		0.26	0.80		0.26	1.26		0.24	1.15		0.37
		SM-SPS-023-C	3/2/10	9.5	-	Native	1.09		0.28	1.09		0.28	1.28		0.32	1.69		0.32	1.88		0.40
SPS-024		SM-SPS-024-A	3/2/10	0.5	Concrete	Burn Dump	1.14		0.33	0.85		0.26	0.86		0.26	1.04		0.30	1.46		0.40
		SM-SPS-024-B	3/2/10	3	-	Burn Dump	0.72		0.23	0.52		0.19	0.60		0.20	1.44		0.42	1.41	J	0.92
		SM-SPS-024-C	3/2/10	9.5	-	Native	1.19		0.35	1.04		0.31	0.91		0.29	1.13		0.28	1.49	J	0.65
SPS-025		SM-SPS-025-A	3/8/10	Surface	-	Burn Dump	0.62		0.23	0.80		0.28	0.97		0.31	0.91		0.15	0.88		0.26
		SM-SPS-025-B	3/8/10	5	-	Burn Dump	0.65		0.26	0.76		0.29	0.77		0.29	0.68		0.18	0.88		0.28
		SM-SPS-025-C	3/8/10	10	-	Burn Dump	0.74		0.25	0.55		0.21	0.79		0.26	0.65		0.15	0.78		0.27
		SM-SPS-025-D	3/8/10	14.5	-	Native	1.11		0.34	0.93		0.30	1.21		0.36	1.13		0.23	1.30		0.30

TABLE 3
Radionuclide Analytical Results, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	Thorium 228			Thorium 230			Thorium 232			Radium 226			Radium 228		
							Result	Q	Uncertainty	Result	Q	Uncertainty	Result	Q	Uncertainty	Result	Q	Uncertainty	Result	Q	Uncertainty
SPS-026		SM-SPS-026-A	3/2/10	0.5	Concrete	Process Waste	0.76		0.27	0.58		0.23	0.61		0.23	0.84		0.31	1.01	J	0.50
		SM-SPS-026-B	3/2/10	5	-	Burn Dump	0.73		0.27	0.72		0.26	0.67		0.25	0.79		0.21	0.80		0.28
		SM-SPS-026-C	3/2/10	10	-	Burn Dump	0.58		0.22	0.78		0.26	0.87		0.28	0.92		0.29	1.51		0.54
		SM-SPS-026-D	3/2/10	16	-	Burn Dump	0.53		0.21	0.48		0.19	0.34		0.15	0.65	J	0.39	0.54	J	0.48
		SM-SPS-026-E	3/2/10	19.5	-	Native	2.21		0.56	1.95		0.51	1.64		0.44	2.13		0.51	2.55		0.60
SPS-027		SM-SPS-027-A	3/2/10	0.5	Concrete	Burn Dump	0.96		0.32	0.60		0.23	1.07		0.34	1.19		0.32	1.33	J	0.73
		SM-SPS-027-B	3/2/10	6	-	Burn Dump	0.55		0.21	0.57		0.21	0.47		0.19	0.57	J	0.32	0.68	J	0.47
		SM-SPS-027-C	3/2/10	10	-	Burn Dump	1.56		0.47	1.50		0.45	1.46		0.44	1.90		0.65	2.19	J	1.14
		SM-SPS-027-D	3/2/10	14	-	Native	0.89		0.34	1.18		0.41	0.77		0.30	1.30	J	0.61	1.63	J	0.85
Waste Disposal Area																					
WDA-001		SM-WDA-001-B	3/5/10	5	-	Process Waste	0.62		0.26	0.82		0.31	0.89		0.32	0.55	J	0.23	0.78	J	0.42
		SM-WDA-001-C	3/5/10	14.5	-	Native	1.49		0.45	1.63		0.48	1.88		0.53	1.35		0.35	1.68		0.38
WDA-002		SM-WDA-002-B	3/5/10	5	-	Process Waste	0.61		0.28	0.68		0.28	0.44		0.22	0.44	J	0.18	0.94		0.30
		SM-WDA-002-C	3/5/10	14.5	-	Native	0.38		0.17	0.67		0.24	0.45		0.19	0.89		0.19	0.52	J	0.42
WDA-003		SM-WDA-003-B	6/29/10	5	-	Process Waste	1.15		0.35	1.30		0.39	0.98		0.32	0.33	J	0.23	1.10		0.33
WDA-004		SM-WDA-004-B	3/5/10	5	-	Process Waste	1.60		0.49	1.10		0.37	1.80		0.53	0.29	J	0.15	1.78		0.31
		SM-WDA-004-C	3/5/10	17	-	Native	1.93		0.52	1.91		0.52	1.85		0.50	1.43		0.23	1.70		0.39
WDA-005		SM-WDA-005-B	3/5/10	5	-	Process Waste	0.72		0.28	0.73		0.27	0.54		0.23	0.64		0.26	1.23	J	0.47
	Dup	SM-WDA-105-B	3/5/10	5	-	Process Waste	0.81		0.29	0.59		0.23	1.07		0.34	0.77		0.24	0.72	J	0.40
		SM-WDA-005-C	3/5/10	14.5	-	Native	1.46		0.43	1.67		0.47	1.47		0.42	1.66		0.27	1.37		0.30
	Dup	SM-WDA-105-C	3/5/10	14.5	-	Native	2.22		0.62	1.88		0.54	1.61		0.48	1.66		0.33	1.69		0.37
WDA-006		SM-WDA-006-B	3/11/10	5	-	Process Waste	1.65		0.45	1.32		0.38	1.30		0.38	1.35		0.33	2.17		0.39
		SM-WDA-006-C	3/11/10	14.5	-	Native	0.24	J	0.15	0.27	J	0.16	0.13	J	0.10	1.47		0.24	1.63		0.38
Waste Management Unit																					
WMU-001		SM-WMU-001-C	3/3/10	30	-	Process Waste	0.35	J	0.18	0.33		0.17	0.28		0.15	0.37	J	0.22	0.16	U	0.25
		SM-WMU-001-D	3/3/10	35	-	Process Waste	4.04		0.98	3.14		0.79	4.41		1.05	0.08	U	0.33	6.39		0.86
		SM-WMU-001-E	3/3/10	44	-	Native	1.91		0.54	1.76		0.50	1.52		0.45	2.00		0.32	2.25		0.62
WMU-002		SM-WMU-002-C	3/3/10	30	-	Process Waste	9.13		2.60	5.43		1.63	8.27		2.37	0.74	J	0.57	11.41		1.17
		SM-WMU-002-D	3/3/10	35	-	Process Waste	1.88		0.70	1.81		0.67	1.81		0.67	0.87	J	0.71	1.87	J	1.07
		SM-WMU-002-E	3/3/10	44	-	Native	2.27		0.62	2.35		0.63	1.81		0.52	2.83		0.97	2.78		1.07
WMU-003		SM-WMU-003-C	3/3/10	30	-	Process Waste	8.28		2.17	4.13		1.18	7.36		1.95	1.70	J	1.28	9.57		2.36
		SM-WMU-003-D	3/3/10	35	-	Process Waste	13.24		3.22	6.51		1.67	13.76		3.33	1.07	U	1.11	27.81		2.47
		SM-WMU-003-E	3/3/10	44	-	Native	1.28		0.39	1.60		0.46	1.41		0.42	1.72		0.61	1.79	J	0.80
WMU-004		SM-WMU-004-C	3/4/10	30	-	Process Waste	0.89		0.34	0.89		0.33	1.18		0.40	0.33	J	0.31	1.16	J	0.63
		SM-WMU-004-D	3/4/10	35	-	Process Waste	4.03		1.09	6.85		1.72	4.03		1.08	0.18	J	0.17	2.99		0.41
		SM-WMU-004-E	3/4/10	44	-	Native	2.12		0.54	2.07		0.52	1.68		0.45	1.22		0.49	1.89	J	0.94
WMU-005		SM-WMU-005-C	3/4/10	30	-	Process Waste	1.09		0.44	1.22		0.46	1.06		0.42	0.30	J	0.24	1.02		0.36
	Dup	SM-WMU-105-C	3/4/10	35	-	Process Waste	0.36		0.19	0.80		0.31	0.62		0.26	0.46	J	0.27	1.14		0.38
		SM-WMU-005-D	3/4/10	44	-	Process Waste	7.14		1.88	4.02		1.13	6.84		1.80	0.78	J	0.70	8.28		1.37
	Dup	SM-WMU-105-D	3/4/10	30	-	Process Waste	4.24		1.01	3.52		0.86	4.64		1.09	0.26	U	0.28	6.74		0.68
		SM-WMU-005-E	3/4/10	35	-	Native	2.25		0.57	1.79		0.47	1.99		0.51	1.70		0.33	2.55		0.43
	Dup	SM-WMU-105-E	3/4/10	44	-	Native	1.91		0.54	1.87		0.53	2.54		0.67	3.29		0.77	3.94		0.75
WMU-006		SM-WMU-006-C	3/4/10	30	-	Process Waste	0.96		0.48	0.74		0.40	0.91		0.44	0.11	U	0.18	0.96	J	0.58
		SM-WMU-006-D	3/4/10	35	-	Process Waste	9.87		2.72	8.40		2.34	9.92		2.72	-0.11	U	0.59	9.16		1.47
		SM-WMU-006-E	3/4/10	44	-	Native	2.06		0.57	1.65		0.47	1.86		0.52	1.42		0.25	1.59		0.50
WMU-007		SM-WMU-007-C	3/4/10	30	-	Process Waste	3.12		0.91	3.06		0.89	3.68		1.04	0.79	J	0.63	5.08		0.99
		SM-WMU-007-D	3/4/10	35	-	Process Waste	9.19		2.24	6.42		1.62	8.20		2.02	0.45	J	0.44	10.47		1.49
		SM-WMU-007-E	3/4/10	44	-	Native	1.86		0.50	1.74		0.47	2.01		0.52	1.70		0.24	1.49		0.35
WMU-008		SM-WMU-008-C	3/4/10	30	-	Process Waste	1.94		0.73	1.04		0.47	2.15		0.79	0.12	U	0.22	1.39		0.43
		SM-WMU-008-D	3/4/10	35	-	Process Waste	2.36		0.65	1.81		0.52	2.64		0.70	0.48	J	0.47	4.39	J	1.59
		SM-WMU-008-E	3/4/10	44	-	Native	1.16		0.36	1.07		0.34	1.44		0.42	0.85		0.21	1.08		0.22
WMU-009		SM-WMU-009-C	3/5/10	30	-	Process Waste	2.06		0.71	2.16		0.73	2.29		0.77	0.05	U	0.23	3.04		0.75
		SM-WMU-009-D	3/5/10	35	-	Process Waste	5.58		1.37	4.27		1.08	6.13		1.49	0.37	J	0.33	12.04		1.35
		SM-WMU-009-E	3/5/10	44	-	Native	1.20		0.35	1.01		0.30	1.00		0.30	0.87		0.21	1.26		0.28
North of Waste Management Unit																					
WNO-001		SM-WNO-001-A	3/11/10	Surface	-	Native	-0.02	U	0.01	0.03	U	0.05	-0.01	U	0.01	1.00		0.22	0.68		0.25
		SM-WNO-001-B	3/11/10	2	-	Native	0.91		0.36	1.23		0.43	1.00		0.37	1.22		0.23	0.71	J	0.29
WNO-002		SM-WNO-002-A	3/11/10	Surface	-	Native	1.11		0.35	1.46		0.43	1.21		0.37	0.91		0.23	1.49		0.35
		SM-WNO-002-B	3/11/10	2	-	Native	-0.05	U	0.03	0.47		0.27	0.14	J	0.13	0.12	U	0.13	2.61		0.50
WNO-003		SM-WNO-003-A	3/11/10	Surface	-	Native	0.88		0.27	0.96		0.29	0.76		0.24	0.74		0.21	0.93		0.32
		SM-WNO-003-B	3/11/10	2	-	Process Waste	1.12		0.34	1.11		0.33	1.22		0.36	0.82		0.30	0.91	J	0.44
WNO-004		SM-WNO-004-A	3/11/10	Surface	-	Native	1.57		0.45	1.20		0.37	1.23		0.37	1.73		0.42	2.60		0.84
		SM-WNO-004-B	3/11/10	2	-	Process Waste	0.88		0.41	1.18		0.49	0.89		0.40	1.63		0.29	1.00		0.35
East Bank of OID																					
ODE-001		SM-ODE-001-A	3/11/10	Surface	-	General Fill	1.14		0.37	1.06		0.35	0.92		0.31	0.60	J	0.25	1.15		0.37
		SM-ODE-001-B	3/11/10	3	-	General Fill	0.50		0.20	0.58		0.22	0.53		0.20	0.59	J	0.26	0.95		0.38
ODE-001A		SM-ODE-001A-A	6/15/10	Surface	-	General Fill	2.32		0.63	2.39		0.64	1.41		0.43	1.16		0.35	1.80		0.56
		SM-ODE-001A-B	6/15/10	5	-	General Fill	1.48		0.42	1.86		0.50	1.29		0.38	0.90		0.22	0.54	J	0.34
		SM-ODE-001A-C	6/15/10	10	-	General Fill	1.80		0.49	2.42		0.62	1.09		0.34	1.05		0.22	1.09	J	0.54
		SM-ODE-001A-D	6/15/10	16	-	Native	1.79		0.51	2.34		0.63	1.18		0.38	0.96		0.28	0.95	J	0.37
ODE-002		SM-ODE-002-A	3/11/10	Surface	-	Process Waste	4.09		0.89	4.04		0.88	3.67		0.81	0.47		0.20	3.87		0.45
ODE-002A		SM-ODE-002A-A	6/16/10	Surface	-	General Fill	0.87		0.35	1.89		0.60	0.82		0.33	0.23	J	0.21	0.62	J	0.37
		SM-ODE-002A-B	6/16/10	5	-	General Fill	1.62		0.43	1.35		0.38	1.50		0.41	1.13		0.29	0.90	J	0.53
		SM-ODE-002A-C	6/16/10	10	-	General Fill	1.81		0.45	1.66		0.41	1.75		0.43	1.15		0.28	1.43		0.48
		SM-ODE-002A-D	6/16/10	14	-	Native	1.31		0.38	1.23		0.37	1.72		0.47	0.91		0.28	1.07		0.30

TABLE 3
Radionuclide Analytical Results, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	Thorium 228			Thorium 230			Thorium 232			Radium 226			Radium 228		
							Result	Q	Uncertainty	Result	Q	Uncertainty	Result	Q	Uncertainty	Result	Q	Uncertainty	Result	Q	Uncertainty
ODE-003		SM-ODE-003-A	3/11/10	Surface	-	Process Waste	2.30		0.54	2.37		0.55	2.20		0.52	0.21	J	0.14	2.79		0.35
		SM-ODE-003-B	3/11/10	4.5	-	Process Waste	1.17		0.36	1.34		0.39	1.08		0.34	1.07		0.41	1.26	J	0.67
ODE-003A		SM-ODE-003A-A	6/16/10	Surface	-	General Fill	0.97		0.30	1.32		0.37	1.03		0.31	0.64		0.16	0.98		0.28
		SM-ODE-003A-B	6/16/10	5	-	General Fill	1.79		0.48	1.54		0.43	1.59		0.44	0.90		0.26	0.86	J	0.42
		SM-ODE-003A-C	6/16/10	10	-	General Fill	1.67		0.46	2.00		0.52	1.52		0.42	1.35	J	0.53	1.53	J	0.82
		SM-ODE-003A-D	6/16/10	13	-	Native	1.89		0.48	2.00		0.50	2.34		0.57	0.87		0.27	1.39		0.53
ODE-004		SM-ODE-004-A	3/11/10	Surface	-	Process Waste	3.19		0.81	5.69		1.32	3.11		0.79	1.20		0.23	2.98		0.38
	Dup	SM-ODE-104-A	3/11/10	Surface	-	Process Waste	1.38		0.41	1.25		0.38	1.28		0.39	1.13		0.27	1.65		0.41
		SM-ODE-004-B	3/11/10	5	-	Process Waste	1.07		0.32	1.05		0.32	1.07		0.32	0.92		0.21	1.08		0.37
	Dup	SM-ODE-104-B	3/11/10	5	-	Process Waste	1.36		0.41	1.28		0.38	1.27		0.38	1.25		0.29	1.95		0.45
		SM-ODE-004-C	3/11/10	10	-	Process Waste	1.00		0.31	0.99		0.31	1.06		0.32	0.54	J	0.28	0.68	J	0.61
	Dup	SM-ODE-104-C	3/11/10	10	-	Process Waste	1.00		0.29	1.21		0.33	1.24		0.34	0.80		0.20	1.27		0.30
		SM-ODE-004-D	3/11/10	14.5	-	Native	1.51		0.49	1.50		0.47	1.47		0.47	1.69		0.30	2.15		0.46
	Dup	SM-ODE-104-D	3/11/10	14.5	-	Native	1.77		0.47	1.66		0.44	1.89		0.49	1.30		0.26	1.59		0.56
ODE-005		SM-ODE-005-A	3/11/10	Surface	-	Process Waste	1.48		0.51	1.25		0.45	1.03		0.39	0.91		0.21	1.23		0.28
		SM-ODE-005-B	3/11/10	5	-	Process Waste	1.04		0.34	0.87		0.30	1.14		0.36	1.71		0.41	0.91	J	0.71
		SM-ODE-005-C	3/11/10	10	-	Process Waste	1.37		0.45	1.03		0.36	1.05		0.37	1.06		0.23	1.57		0.51
		SM-ODE-005-D	3/11/10	14.5	-	Native	0.81		0.26	1.08		0.32	0.96		0.29	1.07		0.25	1.32		0.37
ODE-006		SM-ODE-006-A	3/11/10	Surface	-	Process Waste	1.05		0.32	1.28		0.36	1.26		0.36	2.28		0.47	2.42		0.66
		SM-ODE-006-B	3/11/10	5	-	Process Waste	1.55		0.43	1.56		0.43	1.65		0.44	2.14		0.34	2.11		0.50
		SM-ODE-006-C	3/11/10	9.5	-	Native	1.04		0.31	1.26		0.35	1.13		0.33	1.84		0.57	2.29		0.82

Notes:

Units are in pCi/g

bgs = below ground surface
A/C = asphalt/concrete

Data Qualifiers (Q):

U = The error is greater than or equal to the result.
J = The result minus the error is less than the detection limit but greater than zero.

TABLE 4
VOC Analytical Results, Solid Matrix, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample Sample ID	CLP ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	1,2-Dichloro-benzene		1,4-Dichloro-benzene		2-Butanone		Acetone		Benzene		Carbon disulfide		Chloroform		Chloro-methane		cis-1,2-Dichloro-ethene		Cyclohexane		Ethylbenzene		Isopropyl-benzene		m,p-Xylene		Methyl tert-butyl ether		Methyl-cyclohexane		Methylene chloride		o-Xylene		Styrene		Tetrachloro-ethene		Toluene		Trichloro-ethene	
								Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Smelter Parcel - North Area																																																	
SPN-002		SM-SPN-002-A	Y5R24	3/1/10	0.5	Concrete	Gen Fill	5.5	U	5.5	U	11	U	11	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	0.55	J	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U
		SM-SPN-002-B	Y5R25	3/1/10	2	-	Burn Dump	4.3	U	4.3	U	8.7	U	11		4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U
SPN-003		SM-SPN-003-A	Y5R26	3/1/10	Surface	-	Gen Fill	4.9	U	4.9	U	9.8	U	9.8	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	0.37	J	4.9	U	4.9	U	4.9	U	0.13	J	4.9	U
	Dup	SM-SPN-103-A	Y5R27	3/1/10	Surface	-	Gen Fill	4.9	U	4.9	U	9.7	U	9.7	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	0.32	J	4.9	U	4.9	U	4.9	U	0.11	J	4.9	U
		SM-SPN-003-B	Y5R28	3/1/10	2	-	Burn Dump	4.5	UR	4.5	UR	19		49		4.5	U	1.1	J	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	0.37	J	4.5	U	4.5	U	4.5	U	0.19	J	4.5	U
	Dup	SM-SPN-103-B	Y5R29	3/1/10	2	-	Burn Dump	5.2	U	5.2	U	53		160		5.2	U	1.8	J	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	0.23	J	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U
Smelter Parcel - Parking Area																																																	
SPP-003		SM-SPP-003-A	Y5R63	3/1/10	0.5	Asphalt	Gen fill	5.2	U	5.2	U	10	U	10	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	0.27	J	5.2	U	5.2	U	5.2	U	0.12	J	5.2	U
		SM-SPP-003-B	Y5R64	3/1/10	2	-	Burn Dump	5.2	U	5.2	U	25		77		1	J	1	J	5.2	U	5.2	U	0.19	J	1.9	J	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U
SPP-004		SM-SPP-004-A	Y5R65	3/1/10	0.5	Asphalt	Gen fill	4.9	U	4.9	U	9.8	U	9.8	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	0.33	J	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U
		SM-SPP-004-B	Y5R66	3/1/10	2	-	Burn Dump	5	U	5	U	20		51		5	U	0.85	J	5	U	5	U	0.26	J	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	0.13	J	5	U
Smelter Parcel - South Area																																																	
SPS-002		SM-SPS-002-A	Y5R72	3/9/10	Surface	-	Process Waste	6.4	U	6.4	U	13	U	13	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U
	Dup	SM-SPS-102-A	Y5R77	3/9/10	Surface	-	Process Waste	7	U	7	U	14	U	14	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U
		SM-SPS-002-B	Y5R73	3/9/10	5	-	Process Waste	7.2	U	7.2	U	14	U	14	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U
	Dup	SM-SPS-102-B	Y5R78	3/9/10	5	-	Process Waste	9.5	U	9.5	U	19	U	19	U	9.5	U	9.5	U	2.4	J	9.5	U	9.5	U	9.5	U	9.5	U	9.5	U	9.5	U	0.18	J	9.5	U	9.5	U	9.5	U	9.5	U	9.5	U	9.5	U	9.5	U
		SM-SPS-002-C	Y5R74	3/9/10	10	-	Process Waste	8.8	U	8.8	U	18	U	18	U	8.8	U	8	J	8.8	U	8.8	U	8.8	U	8.8	U	8.8	U	8.8	U	8.8	U	8.8	U	8.8	U	8.8	U	8.8	U	8.8	U	8.8	U	8.8	U	8.8	U
	Dup	SM-SPS-102-C	Y5R79	3/9/10	10	-	Process Waste	9.7	U	9.7	U	19	U	34		9.7	U	5.8	J	9.7	U	9.7	U	9.7	U	9.7	U	9.7	U	9.7	U	9.7	U	9.7	U	9.7	U	9.7	U	9.7	U	9.7	U	9.7	U	9.7	U	9.7	U
		SM-SPS-002-D	Y5R75	3/9/10	14	-	Process Waste	6.1	U	6.1	U	12	U	12	U	6.1	U	4.6	J	6.1	U	6.1	U	6.1	U	6.1	U	0.13	J	6.1	U	0.16	J	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U
		SM-SPS-002-E	Y5R76	3/9/10	18	-	Native	6	U	6	U	8.3	J	15		6	U	0.89	J	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U
	Dup	SM-SPS-102-E	Y5R81	3/9/10	18	-	Native	5.7	U	5.7	U	8.1	J	18		5.7	U	1.1	J	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U
SPS-004		SM-SPS-004-A	Y5R87	3/10/10	Surface	-	Process Waste	5.9	U	5.9	U	12	U	12	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	3.2	J	5.9	U	0.3	J
		SM-SPS-004-B	Y5R88	3/10/10	5	-	Burn Dump	7.9	UR	7.9	UR	37	J	43	J	3.1	J	2.1	J	7.9	U	7.9	U	3.4	J	7.9	UR	0.52	J	7.9	UR	7.9	UR	7.9	U	7.9	UR	7.9	U	7.9	UR	7.9	UR	7.9	UR	7.9	UJ	1.1	J
		SM-SPS-004-C	Y5R89	3/10/10	10	-	Burn Dump	0.42	J	1.4	J	9.1	U	11		0.95	J	2.8	J	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U
		SM-SPS-004-D	Y5R90	3/10/10	14	-	Native	5.3	U	5.3	U	11	U	6.6	J	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U
SPS-006		SM-SPS-006-A	Y5R98	3/10/10	0.5	Concrete	Process Waste	6.4	U	6.4	U	13	U	13	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U	6.4	U
		SM-SPS-006-B	Y5R99	3/10/10	5	-	Process Waste	5.1	U	5.1	U	13		16		5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
		SM-SPS-006-C	Y5RA0	3/10/10	14	-	Native	7.2	U	7.2	U	14	U	14	U	7.2	U	1.2	J	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U
SPS-007		SM-SPS-007-A	Y5RA3	3/2/10	0.5	Concrete	Gen Fill	5	U	5	U	9.9	U	7.6	J	5	U	0.53	J	5	U	5	U	5	U	5	U	0.28	J	5	U	0.83	J	5	U	5	U	5	U	0.51	J	13		5	U	5	U	5	U
		SM-SPS-007-B	Y5RA4	3/2/10	4.5	-	Gen Fill	5.2	U	5.2	U	10	U	10	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	0.54	J	5.2	U	5.2	U	5.2	U
		SM-SPS-007-C	Y5RA5	3/2/10	9.5	-	Native	5.1	U	5.1	U	10	U	17		5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U	5.1	U
SPS-008		SM-SPS-008-A	Y5RA8	3/10/10	0.5	Concrete	Gen Fill	5.2	U	5.2	U	10	U	19		5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U
		SM-SPS-008-B	Y5RA9	3/10/10	5	-	Gen Fill	5	U	5	U	10	U	10	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
		SM-SPS-008-C	Y5RB0	3/10/10	9.5	-	Native	4.5	U	4.5	U	9.1		13		4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U
SPS-010		SM-SPS-010-A	Y5RB8	3/10/10	Surface	-	Process Waste	5.5	U	5.5	U	11	U	11	U	5.5	U	5.5	U	5.9		5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U
		SM-SPS-010-B	Y5RB9	3/10/10	5	-	Process Waste	12	U	12	U	41		150		12	U	3.9	J	11	J	12	U	12	U	12	U	12	U	12	U	0.83	J	12	U	12	U	12	U	0.23	J	12	U	12	U	12	U	12	U
		SM-SPS-010-C	Y5RC0	3/10/10	10	-	Burn Dump	5	U	5	U	12		16		5	U	0.88	J	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
		SM-SPS-010-D	Y5RC1	3/10/10	14.5	-	Native	8.5	U	8.5	U	29		33		8.5	U	11		8.5	U	8.5	U	8.5	U	8.5	U	8.5	U	8.5	U	0.25	J	8.5	U	8.5	U	8.5	U	8.5	U	8.5	U	8.5	U	8.5	U
SPS-012		SM-SPS-012-A	Y5RC8	3/9/10	Surface	-	Process Waste	6.5	U	6.5	U	13	U	13	U	6.5	U	6.5	U	2	J	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U
		SM-SPS-012-B	Y5RC9	3/9/10	5	-	Process Waste	6.6	U	6.6	U	13	U	35		6.6	U	0.85	J	1	J	2.2	J	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U
		SM-SPS-012-C	Y5RD0	3/9/10	10	-	Process Waste	11	U	11	U	23	U	73		11	U	2.1	J	11	U	4.2	J	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U
		SM-SPS-012-D	Y5RD1	3/9/10	18.5	-	Process Waste	8.4	U	8.4	U	19		36		2.3	J	4.7	J	0.59	J	8.4	U	8.4	U	3.2	J	0.39	J	8.4	U	0.73	J	8.4	U	1	J	8.4	U	8.4	U	8.4	U	8.4	U	8.4	U	8.4	U
		SM-SPS-012-E	Y5RD2	3/9/10	24.5	-	Native	8.5	U	8.5	U	17	U	17	U	8.5	U	2.8	J	8.5	U	8.5	U	8.5	U	8.5	U	8.5	U	8.5	U	8.5	U	8.5	U	8.5	U	8.5	U	8.5	U	8.5	U	8.5	U	8.5	U	8.5	U
SPS-014		SM-SPS-014-A	Y5RD8	3/10/10	0.5	Concrete	Burn Dump	4.6	U	4.6	U	9.1	U	9.1	U	4.6	U	4.6	U	0.35	J	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U
		SM-SPS-014-B	Y5RD9	3/10/10	5	-	Burn Dump	6.5	U	6.5	U	13	U	19		2.2	J	6.5	U	6.5	U	6.5	U	0.44	J	6.5	U	6.5	U	6.5	U	0.11	J	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	0.28	J
		SM-SPS-014-C	Y5RE0	3/10/10	10	-	Burn Dump	5.4	U	5.4	U	17		25		2.5	J	0.97	J	5.4	U	5.4	U	5.4	U	5.4	U	0.28	J	5.4	U	0.1	J	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U
		SM-SPS-014-D	Y5RE1	3/10/10	14.5	-	Native	4.9	U	4.9	U	9.8	U	9.8	U	4.9	U	2.5	J	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U
SPS-015		SM-SPS-015-A	Y5RE3	3/2/10	0.5	Concrete	Process Waste	6.2	U	6.2	U	12	U	12	U	6.2	U	6.2	U	6.2	U	6.2	U	6.2	U	6.2	U	6.2	U	6.2	U	6.2	U	6.2	U	6.2	U	6.2	U	6.2	U	4	J	6.2	U	6.2	U	6.2	U
	Dup	SM-SPS-115-A	Y5RE8	3/2/10	0.5	-	Process Waste	5.3	U	5.3	U	11	U	11	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U
		SM-SPS-015-B	Y5RE4	3/2/10	6	-	Process Waste	5.2	UR	0.26	J	17		42		5.2	U	2	J	5.2	U	5.2	U	5.2	U	5.2	U	0.39	J	0.84	J	0.12	J	5.2	U	5.2	U	5.2	U	0.29	J	5.2	U	5.2	U	5.2	U	5.2	U
	Dup	SM-SPS-115-B	Y5RE9	3/2/10	6	-	Process Waste	4.8	U	4.8	U	14		39		4.8	U	1.2	J	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U
		SM-SPS-015-C	Y5RE5	3/2/10	10	-	Gen Fill	4.8	U	4.8	U	19		37		4.8	U	0.66	J	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U
	Dup	SM-SPS-115-C	Y5RF0	3/2/10	10	-	Gen Fill	5	U	5	U	14		21		5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
		SM-SPS-015-D	Y5RE6	3/2/10	14.5	-	Native	5.8	U	5.8	U	12	U	11	J	5.8	U	1.3	J	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U
	Dup	SM-SPS-115-D	Y5RF1	3/2/10	14.5	-	Native	7.6	U	7.6	U	15	U	15	U	7.6	U	2.6	J	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U
SPS-016		SM-SPS-016-A	Y5RF3	3/10/10	0.5	Concrete	Gen Fill	5	U	5	U	9.9	U	9.9	U	5	U	0.54	J	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	1.1	J	5	U	5	U
		SM-SPS-016-B	Y5RF4	3/10/10	5	-	Burn Dump	5.7	U	1.7	J	16		18		2.7	J	0.79	J	5.7	U	5.7	U	5.7	U	5.7	U	0.26	J	5.7	U	0.3	J	5.7	U	5.7	U	5.7	U	0.089	J	5.7	U	24		5.7	U	2.2	J
		SM-SPS-016-C	Y5RF5	3/10/10	10	-	Burn Dump	5.4	U	5.4	U	13		21		1.3	J	0.63	J	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U
		SM-SPS-016-D	Y5RF6	3/10/10	14.5	-	Native	7.4	U	7.4	U	15	U	15	U	7.4	U	1.3	J	7.4	U	7.4	U	7.4	U	7.4	U	7.4	U	7.4	U	7.4	U	7.4	U	7.4	U	7.4	U	7.4	U	7.4	U	7.4	U	7.4	U	7.4	U
SPS-018		SM-SPS-018-A	Y5RG3	3/2/10	0.5	Concrete	Process Waste	4.8	U	4.8	U	9.7	U	13		4.8	U	0.98	J	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U
		SM-SPS-018-B	Y5RG4	3/2/10	4.5	-	Burn Dump	5	U	5	U	16		35		5	U	1.8	J	5	U	5	U	5	U	5	U	0.22	J	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
		SM-SPS-018-C	Y5RG5	3/2/10	9.5	-	Native	4.9	U	4.9	U	9.9	U	8.3	J	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U	4.9	U
SPS-020		SM-SPS-020-A	Y5RH2	3/8/10	0.5	Concrete	Burn Dump	0.15	J	0.48	J	14		43		1.5	J	5	U	0.44	J	5	U	5	U	5	U	0.53	J	5	U	1.3	J	5	U	5	U	5	U	0.6	J	5	U	5.5		5	U	0.36	J
		SM-SPS-020-B	Y5RH3	3/8/10	5	-	Burn Dump	4.5	U	0.19	J	12		34		1.6	J	1.9	J	5.6		4.5	U	4.5	U	4.5	U	0.45	J	4.5	U	0.74	J	4.5	U	4.5	U	4.5	U	0.33	J	4.5	U	2	J	4.5	U	0.54	J
		SM-SPS-020-C	Y5RH4	3/8/10	10	-	Burn Dump	7.1	U	7.1	U	22		51		7.1	U	1	J	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U
		SM-SPS-020-D	Y5RH5	3/8/10	15	-	Burn Dump	11	U	11	U	33		56		2.9	J	5.2	J	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U
		SM-SPS-020-E	Y5RH6	3/8/10	19.5	-	Native	5.9	U	5.9	U	12	U	12	U	5.9	U	3.4	J	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U
SPS-022		SM-SPS-022-A	Y5RJ2	3/8/10	0.5	Concrete	Burn Dump	4.8	U	4.8	U	9.6	U	9.6	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	0.083	J	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	3.7	J	4.8	U	0.67	J
		SM-SPS-022-B	Y5RJ3	3/8/10	5	-	Burn Dump	5.7	U	5.7	U	25		65		5.7	U	1.4	J	5.7	U	5.7	U	0.84	J	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	5.7	U	0.29	J	5.7	U	1.1	J
		SM-SPS-022-C	Y5RJ4	3/8/10	10	-	Burn Dump	6.5	U	6.5	U	12	J	18		1.3	J	0.79	J	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U	6.5	U
		SM-SPS-022-D	Y5RJ5	3/8/10	15	-	Burn Dump	9	U	9	U	21		32		9	U	4.6	J	9	U	9	U	9	U	9	U	9	U	9	U	9	U	9	U	9	U	9	U	9	U	9	U	9	U	9	U	9	U
		SM-SPS-022-E	Y5RJ6	3/8/10	19.5	-	Native	5.6	U	5.6	U	11	U	11	U	5.6	U	3.3	J	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U

TABLE 4
VOC Analytical Results, Solid Matrix, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample Sample ID	CLP ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	1,2-Dichloro-benzene		1,4-Dichloro-benzene		2-Butanone		Acetone		Benzene		Carbon disulfide		Chloroform		Chloro-methane		cis-1,2-Dichloro-ethene		Cyclohexane		Ethylbenzene		Isopropyl-benzene		m,p-Xylene		Methyl tert-butyl ether		Methyl-cyclohexane		Methylene chloride		o-Xylene		Styrene		Tetrachloro-ethene		Toluene		Trichloro-ethene	
								Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
SPS-024		SM-SPS-024-A	Y5RK2	3/2/10	0.5	Concrete	Burn Dump	4.9	U	4.9	U	12		26		1.3	J	1	J	4.9	U	4.9	U	0.36	J	4.9	U	0.35	J	0.26	J	0.68	J	4.9	U	4.9	U	4.9	U	0.75	J	4.9	U	0.35	J	4.9	U	1.5	J
		SM-SPS-024-B	Y5RK3	3/2/10	3	-	Burn Dump	5.6	U	5.6	U	26		58		5.6	U	2.6	J	5.6	U	5.6	U	0.78	J	5.6	U	0.18	J	0.46	J	0.1	J	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U
		SM-SPS-024-C	Y5RK4	3/2/10	9.5	-	Native	5.6	U	5.6	U	11	U	14		5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U
SPS-026		SM-SPS-026-A	Y5RL2	3/2/10	0.5	Concrete	Process Waste	4.7	UR	4.7	UR	9.3	U	9.3	U	0.94	J	4.7	U	4.7	U	4.7	U	4.7	U	4.7	U	4.7	U	4.7	U	0.096	J	4.7	U	4.7	U	4.7	U	0.18	J	4.7	U	16		4.7	U	1.4	J
		SM-SPS-026-B	Y5RL3	3/2/10	5	-	Burn Dump	5.4	U	5.4	U	11	U	11	U	1	J	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	0.66	J	0.36	J	0.72	J	5.4	U	5.4	U	5.4	U	2.7	J	5.4	U	7.7		5.4	U	1.2	J
		SM-SPS-026-C	Y5RL4	3/2/10	10	-	Burn Dump	5.5	U	5.5	U	10	J	25		5.5	U	0.62	J	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	5.5	U	0.15	J	5.5	U	5.5	U	5.5	U	0.1	J	5.5	U	5.5	U	0.12	J	5.5	U
		SM-SPS-026-D	Y5RL5	3/2/10	16	-	Burn Dump	7.8	UR	7.8	UR	35		68		1.5	J	3.5	J	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U	0.22	J	7.8	U
		SM-SPS-026-E	Y5RL6	3/2/10	19.5	-	Native	6	U	6	U	12	U	8.3	J	6	U	0.61	J	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U
Waste Disposal Area																																																	
WDA-001		SM-WDA-001-A	Y5RS2	3/5/10	Surface		Process Waste	6.1	U	6.1	U	12	U	17		6.1	U	6.1	U	3.3	J	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	4.1	J	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U
		SM-WDA-001-B	Y5RS3	3/5/10	5	-	Process Waste	5.3	U	5.3	U	11	U	11	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	1	J	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U
WDA-002		SM-WDA-002-A	Y5RS5	3/5/10	Surface		Process Waste	6.3	U	6.3	U	13	U	13	U	6.3	U	6.3	U	6.7		6.3	U	6.3	U	6.3	U	6.3	U	6.3	U	6.3	U	6.3	U	6.3	U	0.92	J	6.3	U	6.3	U	6.3	U	6.3	U	6.3	U
		SM-WDA-002-B	Y5RS6	3/5/10	5	-	Process Waste	5.8	U	5.8	U	12	U	12	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	0.58	J	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U
WDA-003		SM-WDA-003-A	Y5RS8	6/29/10	Surface		Process Waste	5.4	U	5.4	U	11	U	11	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U
		SM-WDA-003-B	Y5RS9	6/29/10	5	-	Process Waste	6.8	U	6.8	U	14	U	14	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U
WDA-004		SM-WDA-004-A	Y5RT1	3/5/10	Surface		Process Waste	8	U	8	U	16	U	16	U	8	U	8	U	5.8	J	8	U	8	U	8	U	8	U	8	U	8	U	8	U	8	U	5.2	J	8	U	8	U	8	U	8	U	8	U
		SM-WDA-004-B	Y5RT2	3/5/10	5	-	Process Waste	6.7	U	6.7	U	13	U	13	U	6.7	U	6.7	U	8.6		6.7	U	6.7	U	6.7	U	6.7	U	6.7	U	6.7	U	6.7	U	6.7	U	0.75	J	6.7	U	6.7	U	6.7	U	6.7	U	6.7	U
WDA-005		SM-WDA-005-A	Y5RT4	3/5/10	Surface		Process Waste	5	U	5	U	10	U	10	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U	5	U
	Dup	SM-WDA-105-A	Y5RT7	3/5/10	Surface		Process Waste	5.3	U	5.3	U	11	U	11	U	5.3	U	5.3	U	1.2	J	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U
		SM-WDA-005-B	Y5RT5	3/5/10	5	-	Process Waste	5.8	U	5.8	U	12	U	12	U	5.8	U	5.8	U	7.8		5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U
	Dup	SM-WDA-105-B	Y5RT8	3/5/10	5	-	Process Waste	6	U	6	U	12	U	12	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U	6	U
WDA-006		SM-WDA-006-A	Y5RW0	3/11/10	Surface		Process Waste	7	U	7	U	14	U	14	U	7	U	7	U	2.9	J	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U
		SM-WDA-006-B	Y5RW1	3/11/10	5	-	Process Waste	6.6	U	6.6	U	13	U	20		6.6	U	1.7	J	2.7	J	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U	6.6	U
Waste Management Unit																																																	
WMU-001		SM-WMU-001-A	Y5RM2	3/3/10	Surface		Process Waste	7.5	U	7.5	U	15	U	11	J	7.5	U	7.5	U	0.65	J	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	UJ	7.5	U	11	J	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U
		SM-WMU-001-B	Y5RM3	3/3/10	6		Process Waste	7.2	U	7.2	U	14	U	14	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U
WMU-002		SM-WMU-002-A	Y5RM7	3/3/10	Surface		Process Waste	9	UR	9	UR	17	U	17	U	8.4	U	8.4	U	1.3	J	8.4	U	8.4	U	8.4	U	8.4	U	8.4	U	8.4	U	8.4	U	8.4	U	8.4	U	8.4	U	8.4	U	8.4	U	8.4	U	8.4	U
		SM-WMU-002-B	Y5RM8	3/3/10	5		Process Waste	5.3	U	5.3	U	11	U	11	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U	5.3	U
		SM-WMU-002-C	Y5RM9	3/3/10	30	-	Process Waste	9.8	U	9.8	U	79		80		9.8	U	2.7	J	9.8	U	9.8	U	9.8	U	9.8	U	9.8	U	9.8	U	9.8	U	9.8	U	9.8	U	1.2	J	9.8	U	9.8	U	9.8	U	9.8	U	9.8	U
		SM-WMU-002-D	Y5RN0	3/3/10	35	-	Process Waste	9.5	U	9.5	U	66		71		9.5	U	2	J	0.72	J	9.5	U	9.5	U	9.5	U	9.5	U	9.5	U	9.5	U	9.5	U	9.5	U	2.1	J	9.5	U	9.5	U	9.5	U	9.5	U	9.5	U
		SM-WMU-002-E	Y5RN1	3/3/10	44	-	Native	5.8	U	5.8	U	27		12	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	5.8	U	1.5	J	5.8	U	5.8	U	5.8	U	0.13	J	5.8	U
WMU-003		SM-WMU-003-A	Y5RN2	3/3/10	Surface		Process Waste	7.5	U	7.5	U	15	U	15	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U
		SM-WMU-003-B	Y5RN3	3/3/10	5		Process Waste	5.9	U	5.9	U	12	U	10	J	5.9	U	5.9	U	1.5	J	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U	5.9	UJ	5.9	U	0.38	J	5.9	U	5.9	U	5.9	U	5.9	U	5.9	U
WMU-004		SM-WMU-004-A	Y5RN7	3/4/10	Surface		Process Waste	7.6	U	7.6	U	15	U	15	U	7.6	U	7.6	U	0.98	J	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U
		SM-WMU-004-B	Y5RN8	3/4/10	5		Process Waste	9.4	U	9.4	U	19	U	28		9.4	U	9.4	U	9.4	U	9.4	U	9.4	U	9.4	U	9.4	U	9.4	U	9.4	U	9.4	U	9.4	U	9.4	U	9.4	U	9.4	U	9.4	U	9.4	U	9.4	U
		SM-WMU-004-C	Y5RN9	3/4/10	30	-	Process Waste	7.8	UR	7.8	UR	67		24		7.8	U	7.8	J	0.55	J	4.6	J	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U	0.42	J	7.8	U	7.8	U	7.8	U	7.8	U	7.8	U
		SM-WMU-004-D	Y5RP0	3/4/10	35	-	Process Waste	6.1	U	6.1	U	23		12	J	6.1	U	7.2		6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	0.34	J	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U
		SM-WMU-004-E	Y5RP1	3/4/10	44	-	Native	6.8	U	6.8	U	14	U	14	U	6.8	U	0.75	J	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U	1	J	6.8	U	1.2	J	6.8	U	6.8	U	6.8	U	6.8	U	6.8	U
WMU-005		SM-WMU-005-A	Y5RP2	3/4/10	Surface		Process Waste	7.5	UR	7.5	UR	15	U	15	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	1.3	J	7.5	U	7.5	U	7.5	U	7.5	UJ	7.5	U
	Dup	SM-WMU-105-A	Y5RP7	3/4/10	5		Process Waste	7.3	U	7.3	U	15	U	15	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	0.5	J	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U
		SM-WMU-005-B	Y5RP3	3/4/10	Surface		Process Waste	7.5	UR	7.5	UR	40		33		1.4	J	1.3	J	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	7.5	U	1.1	J	7.5	U	7.5	U	7.5	U	7.5	UJ	7.5	U
	Dup	SM-WMU-105-B	Y5RP8	3/4/10	5		Process Waste	7	U	7	U	25		24		7	U	0.96	J	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	7	U	1	J	7	U	7	U	7	U	7	U	7	U
WMU-006		SM-WMU-006-A	Y5RQ2	3/4/10	Surface		Process Waste	8.3	UR	8.3	UR	17	U	17	U	8.3	U	0.89	J	8.3	U	8.3	U	8.3	U	8.3	U	8.3	U	8.3	U	8.3	U	8.3	U	8.3	U	2.3	J	8.3	U	8.3	U	8.3	U	8.3	UJ	8.3	U
		SM-WMU-006-B	Y5RQ3	3/4/10	5		Process Waste	7.1	UR	7.1	UR	14	U	14	U	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U	7.1	U	2.5	J	7.1	U	7.1	U	7.1	U	7.1	UJ	7.1	U
		SM-WMU-006-C	Y5RQ4	3/4/10	30	-	Process Waste	12	U	12	U	67		110		12	U	4.1	J	0.97	J	12	U	12	U	12	U	12	U	12	U	12	U	12	U	12	U	3.2	J	12	U	12	U	12	U	12	U	12	U
		SM-WMU-006-D	Y5RQ5	3/4/10	35	-	Process Waste	11	UR	11	UR	68		85		11	U	8.3	J	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	11	U	1	J	11	U	11	U	11	U	11	U	11	U
		SM-WMU-006-E	Y5RQ6	3/4/10	44	-	Native	6.1	U	6.1	U	12	U	12	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U
WMU-007		SM-WMU-007-A	Y5RQ7	3/4/10	Surface		Process Waste	7.3	UR	7.3	UR	15	U	15	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U	1.2	J	7.3	U	7.3	U	7.3	U	7.3	U	7.3	U
		SM-WMU-007-B	Y5RQ8	3/4/10	5		Process Waste	7.6	U	7.6	U	15	U	59		7.6	U	1.5	J	26	J	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	7.6	U	1.4	J	7.6	U	7.6	U	7.6	U	7.6	U	3.4	J
WMU-008		SM-WMU-008-A	Y5RR2	3/4/10	Surface		Process Waste	8.1	UR	8.1	UR	17		77		1.7	J	4.5	J	8.1	U	8.1	U	8.1	U	8.1	U	8.1	U	8.1	U	8.1	U	0.81	J	8.1	U	1.2	J	8.1	U	8.1	U	8.1	U	8.1	UJ	8.1	U
		SM-WMU-008-B	Y5RR3	3/4/10	5		Process Waste	8.1	UR	8.1	UR	16	U	16	U	1.8	J	8.1	U	8.1	U	8.1	U	8.1	U	7.9	U	7.9	U	7.9	U	7.9	U	8.1	U	7.9	U	1.6	J	7.9	U	7.9	U	7.9	U	8.1	UJ	7.9	U
		SM-WMU-008-C	Y5RR4	3/4/10	30	-	Process Waste	14	UJ	14	UJ	28	U	34		14	U	2	J	14	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U	14	U
		SM-WMU-008-D	Y5RR5	3/4/10	35	-	Process Waste	7.2	U	7.2	U	14	U	14	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U	7.2	U
		SM-WMU-008-E	Y5RR6	3/4/10	44	-	Native	5.6	U	5.6	U	11	U	11	U	5.6	U	0.78	J	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U
WMU-009		SM-WMU-009-A	Y5RR7	3/5/10	Surface		Process Waste	8.3	UR	8.3	UR	47		17	U	8.3	U	8.3	U	8.3	U	8.3	U	8.3	U	8.3	U	8.3	U	8.3	U	8.3	U	8.3	U	8.3	U	4.8	J	8.3	U	8.3	U	8.3	U	8.3	UJ	8.3	U
		SM-WMU-009-B	Y5RR8	3/5/10	5		Process Waste	7.8	UR	7.8	UR	51		16	U	7.8	UR	7.8	U	7.8	U	7.8	U	7.8	U	7.8	UR	7.8	UR	7.8	UR	7.8	UR	7.8	U	7.8	UR	2.4	J	7.8	UR	7.8	UR	7.8	UR	7.8	UJ	7.8	UR

Notes:

Units are in µg/kg

bgs = below ground surface
A/C = asphalt/concrete

Data Qualifiers (Q):

U = The analyte was analyzed for, but was not detected at a level greater than or equal to the detection limit listed in the table.

J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (because quality control criteria were not met, or the concentration of the analyte was below the reporting limit).

UJ = The analyte was not detected at a level greater than or equal to the detection limit. However, the reported detection limit is approximate.

R = The data did not meet quality control criteria and are rejected as unusable. The analyte may or may not be present in the sample.

TABLE 5
SVOC Analytical Results, Solid Matrix, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	CLP ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	1,1'-Biphenyl Result	Q	1,2,4,5-Tetrachlorobenzene Result	Q	2,4-Dichlorophenol Result	Q	2,4-Dimethylphenol Result	Q	2-Methylnaphthalene Result	Q	2-Methylphenol Result	Q	3,3'-Dichlorobenzidine Result	Q	4,6-Dinitro-2-methylphenol Result	Q	4-Methylphenol Result	Q	Acenaphthene Result	Q	Acetophenone Result	Q	Anthracene Result	Q	Benzaldehyde Result	Q	Benzo(a)anthracene Result	Q
Smelter Parcel - North Area																																			
SPN-002		SM-SPN-002-A	Y5R24	3/1/10	0.5	Concrete	Gen Fill	200	U	200	U	200	U	200	U	6	J	200	U	200	U	390	U	200	U	200	U	28	J	200	U	43	J	200	U
		SM-SPN-002-B	Y5R25	3/1/10	2	-	Burn Dump	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	3,600	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	74	J
SPN-003		SM-SPN-003-A	Y5R26	3/1/10	Surface	-	Gen Fill	190	U	190	U	190	U	190	U	190	U	190	U	190	U	360	U	190	U	190	U	18	J	190	U	52	J	190	U
	Dup	SM-SPN-103-A	Y5R27	3/1/10	Surface	-	Gen Fill	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	150	J	3,700	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U
		SM-SPN-003-B	Y5R28	3/1/10	2	-	Burn Dump	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	3,600	U	1,900	U	1,900	U	1,900	U	1,900	U	77	J	1,900	U
	Dup	SM-SPN-103-B	Y5R29	3/1/10	2	-	Burn Dump	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	3,800	U	2,000	U	2,000	U	2,000	U	2,000	U	72	J	2,000	U
Smelter Parcel - Parking Area																																			
SPP-003		SM-SPP-003-A	Y5R63	3/1/10	0.5	Asphalt	Gen fill	7.3	J	200	U	200	U	200	U	200	U	200	U	200	U	390	U	200	U	200	U	22	J	200	U	55	J	200	U
		SM-SPP-003-B	Y5R64	3/1/10	2	-	Burn Dump	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,900	U	1,000	U	1,000	U	31	J	1,000	U	72	J	1,000	U
SPP-004		SM-SPP-004-A	Y5R65	3/1/10	0.5	Asphalt	Gen fill	180	U	180	U	180	U	180	U	180	U	180	U	180	U	350	U	180	U	180	U	14	J	180	U	29	J	180	U
		SM-SPP-004-B	Y5R66	3/1/10	2	-	Burn Dump	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	3,700	U	1,900	U	1,900	U	1,900	U	1,900	U	66	J	1,900	U
Smelter Parcel - South Area																																			
SPS-002		SM-SPS-002-A	Y5R72	3/9/10	Surface	-	Process Waste	180	U	180	U	180	U	180	U	180	U	180	U	180	U	350	U	180	U	180	U	28	J	180	U	51	J	180	U
	Dup	SM-SPS-102-A	Y5R77	3/9/10	Surface	-	Process Waste	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	3,800	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U
		SM-SPS-002-B	Y5R73	3/9/10	5	-	Process Waste	1,200	U	1,200	U	1,200	U	1,200	U	1,200	U	1,200	U	1,200	U	2,300	U	1,200	U	1,200	U	39	J	1,200	U	73	J	1,200	U
	Dup	SM-SPS-102-B	Y5R78	3/9/10	5	-	Process Waste	280	U	280	U	280	U	280	U	280	U	280	U	280	U	540	U	280	U	280	U	43	J	280	U	68	J	280	U
		SM-SPS-002-C	Y5R74	3/9/10	10	-	Process Waste	260	U	260	U	260	U	260	U	260	U	260	U	260	U	510	U	260	U	260	U	36	J	260	U	55	J	260	U
	Dup	SM-SPS-102-C	Y5R79	3/9/10	10	-	Process Waste	290	U	290	U	290	U	290	U	290	U	290	U	290	U	560	U	8.8	J	290	U	51	J	290	U	66	J	290	U
		SM-SPS-002-D	Y5R75	3/9/10	14	-	Process Waste	230	U	230	U	230	U	230	U	230	U	230	U	230	U	440	U	13	J	230	U	37	J	230	U	66	J	230	U
		SM-SPS-002-E	Y5R76	3/9/10	18	-	Native	220	U	220	U	220	U	220	U	220	U	220	U	220	U	430	U	8.7	J	220	U	41	J	220	U	62	J	220	U
	Dup	SM-SPS-102-E	Y5R81	3/9/10	18	-	Native	220	U	220	U	220	U	220	U	220	U	220	U	220	U	420	U	220	U	220	U	33	J	220	U	54	J	220	U
SPS-004		SM-SPS-004-A	Y5R87	3/10/10	Surface	-	Process Waste	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U	12,000	U	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U
		SM-SPS-004-B	Y5R88	3/10/10	5	-	Burn Dump	41	J	280	U	430		280	U	18	J	14	J	280	U	540	U	160	J	280	U	70	J	280	U	170	J	280	U
		SM-SPS-004-C	Y5R89	3/10/10	10	-	Burn Dump	970	U	970	U	970	U	970	U	970	U	970	U	970	U	1,900	U	31	J	48	J	970	U	970	U	59	J	970	U
		SM-SPS-004-D	Y5R90	3/10/10	14	-	Native	200	U	200	U	200	U	200	U	200	U	200	U	200	U	390	U	200	U	200	U	36	J	200	U	55	J	200	U
SPS-006		SM-SPS-006-A	Y5R98	3/10/10	0.5	Concrete	Process Waste	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	2,000	U	1,000	U	1,000	U	40	J	1,000	U	75	J	1,000	U
		SM-SPS-006-B	Y5R99	3/10/10	5	-	Process Waste	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	4,000	U	2,100	U	2,100	U	75	J	2,100	U	2,100	U	2,100	U
		SM-SPS-006-C	Y5RA0	3/10/10	14	-	Native	230	U	230	U	230	U	230	U	230	U	230	U	230	U	440	U	230	U	230	U	46	J	230	U	55	J	230	U
SPS-007		SM-SPS-007-A	Y5RA3	3/2/10	0.5	Concrete	Gen Fill	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	220	J	3,700	U	1,900	U	1,900	U	1,900	U	1,900	U	110	J	150	J
		SM-SPS-007-B	Y5RA4	3/2/10	4.5	-	Gen Fill	200	U	200	U	200	U	200	U	200	U	200	U	200	U	400	U	200	U	200	U	23	J	200	U	72	J	38	J
		SM-SPS-007-C	Y5RA5	3/2/10	9.5	-	Native	190	U	190	U	190	U	190	U	140	J	190	U	190	U	370	U	190	U	200		190	U	190	U	190	U	190	U
SPS-008		SM-SPS-008-A	Y5RA8	3/10/10	0.5	Concrete	Gen Fill	940	U	940	U	940	U	940	U	940	U	940	U	940	U	1,800	U	940	U	940	U	31	J	940	U	64	J	61	J
		SM-SPS-008-B	Y5RA9	3/10/10	5	-	Gen Fill	190	U	190	U	190	U	190	U	6.6	J	190	U	190	U	380	U	190	U	11	J	44	J	18	J	50	J	70	J
		SM-SPS-008-C	Y5RB0	3/10/10	9.5	-	Native	180	U	180	U	180	U	180	U	180	U	180	U	180	U	360	U	180	U	180	U	45	J	180	U	73	J	6.8	J
SPS-010		SM-SPS-010-A	Y5RB8	3/10/10	Surface	-	Process Waste	930	U	930	U	930	U	930	U	68	J	930	U	930	U	1,800	U	930	U	930	U	44	J	930	U	69	J	930	U
		SM-SPS-010-B	Y5RB9	3/10/10	5	-	Process Waste	1,000	U	1,000	U	1,000	U	1,000	U	48	J	1,000	U	1,000	U	2,000	U	1,000	U	1,000	U	42	J	1,000	U	79	J	57	J
		SM-SPS-010-C	Y5RC0	3/10/10	10	-	Burn Dump	41	J	960	U	960	U	960	U	100	J	960	U	960	U	1,900	U	130	J	390	J	61	J	3,300		96	J	8,300	
		SM-SPS-010-D	Y5RC1	3/10/10	14.5	-	Native	910	U	910	U	910	U	910	U	910	U	910	U	910	U	1,800	U	910	U	910	U	30	J	34	J	51	J	91	J
SPS-012		SM-SPS-012-A	Y5RC8	3/9/10	Surface	-	Process Waste	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	2,200	U	1,100	U	1,100	U	34	J	1,100	U	66	J	1,100	U
		SM-SPS-012-B	Y5RC9	3/9/10	5	-	Process Waste	230	U	230	U	230	U	230	U	230	U	230	U	230	U	450	U	230	U	230	U	45	J	230	U	73	J	12	J
		SM-SPS-012-C	Y5RD0	3/9/10	10	-	Process Waste	1,600	U	1,600	U	1,600	U	1,600	U	1,600	U	1,600	U	1,600	U	3,000	U	1,600	U	1,600	U	57	J	1,600	U	100	J	69	J
		SM-SPS-012-D	Y5RD1	3/9/10	18.5	-	Process Waste	220	U	220	U	220	U	50	J	220	U	220	U	220	U	66	J	25	J	220	U	44	J	220	U	80	J	220	U
		SM-SPS-012-E	Y5RD2	3/9/10	24.5	-	Native	310	U	310	U	310	U	13	J	310	U	310	U	310	U	610	U	34	J	310	U	63	J	310	U	100	J	310	U
SPS-014		SM-SPS-014-A	Y5RD8	3/10/10	0.5	Concrete	Burn Dump	980	U	980	U	980	U	980	U	980	U	980	U	980	U	1,900	U	980	U	980	U	38	J	980	U	70	J	44	J
		SM-SPS-014-B	Y5RD9	3/10/10	5	-	Burn Dump	14	J	6	J	200	U	200	U	10	J	200	U	200	U	380	U	200	U	200	U	50	J	200	U	97	J	200	U
		SM-SPS-014-C	Y5RE0	3/10/10	10	-	Burn Dump	180	U	180	U	180	U	180	U	13	J	180	U	180	U	360	U	11	J	180	U	55	J	180	U	55	J	12	J
		SM-SPS-014-D	Y5RE1	3/10/10	14.5	-	Native	190	U	190	U	190	U	190	U	190	U	190	U	190	U	370	U	190	U	190	U	190	U	190	U	49	J	190	U
SPS-015		SM-SPS-015-A	Y5RE3	3/2/10	0.5	Concrete	Process Waste	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	3,700	U	1,900	U	1,900	U	1900	U	1,900	U	91	J	1,900	U
	Dup	SM-SPS-115-A	Y5RE8	3/2/10	0.5	-	Process Waste	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	3,600	U	1,800	U	1,800	U	1800	U	1,800	U	1,800	U	1,800	U
		SM-SPS-015-B	Y5RE4	3/2/10	6	-	Process Waste	3,700	U	3,700	U	3,700	U	3,700	U	3,700	U	3,700	U	3,700	U	7,200	U	3,700	U	3,700	U	3700	U	3,700	U	3,700	U	3,700	U
	Dup	SM-SPS-115-B	Y5RE9	3/2/10	6	-	Process Waste	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	3,600	U	1,900	U	1,900	U	1900	U	1,900	U	1,900	U	1,900	U
		SM-SPS-015-C	Y5RE5	3/2/10	10	-	Gen Fill	3,800	U	3,800	U	3,800	U	3,800	U	3,800	U	3,800	U	3,800	U	7,400	U	3,800	U	3,800	U	3800	U	3,800	U	3,800	U	3,800	U
	Dup	SM-SPS-115-C	Y5RF0	3/2/10	10	-	Gen Fill	200	U	200	U	200	U	200	U	200	U	200	U	200	U	400	U	200	U	200	U	23	J	200	U	61	J	200	U
		SM-SPS-015-D	Y5RE6	3/2/10	14.5	-	Native	220	U	220	U	220	U	220	U	220	U	220	U	220	U	430	U	220	U	220	U	23	J	220	U	42	J	220	U
	Dup	SM-SPS-115-D	Y5RF1	3/2/10	14.5	-	Native	240	U	240	U	240	U	240	U	240	U	240	U	240	U	480	U	240	U	240	U	23	J	240	U	35	J	240	U
SPS-016		SM-SPS-016-A	Y5RF3	3/10/10	0.5	Concrete	Gen Fill	1,200	U	1,200	U	1,200	U	1,200	U	1,200	U	1,200	U	1,200	U	2,400	U	1,200	U	1,200	U	54	J	1,200	U	67	J	58	J
		SM-SPS-016-B	Y5RF4	3/10/10	5	-	Burn Dump	930	U	930	U	930	U	930	U	930	U	930	U	930	U	1,800	U	930	U	930	U	51	J	930	U	65	J	34	J
		SM-SPS-016-C	Y5RF5	3/10/10	10	-	Burn Dump	960	U	960	U	960	U	960	U	960	U	960	U	960	U	1,900	U	960	U	960	U	49	J	960	U	58	J	960	U
		SM-SPS-016-D	Y5RF6	3/10/10	14.5	-	Native	190	U	190	U	190	U	190	U	190	U	190	U	190	U	360	U	190	U	190	U	34	J	190	U	71	J	190	U
SPS-018		SM-SPS-018-A	Y5RG3	3/2/10	0.5	Concrete	Process Waste	190	U	190	U	190	U	190	U	190	U	190	U	190	U	370	U	190	U	190	U	19	J	190	U	32	J	190	U
		SM-SPS-018-B	Y5RG4	3/2/10	4.5	-	Burn Dump	73	J	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	4,000	U	2,100	U	2,100	U	68	J	2,100	U	210	J	72	J
		SM-SPS-018-C	Y5RG5	3/2/10	9.5	-	Native	180	U	180	U	180	U	180	U	180	U	180	U	180	U	350	U	180	U	180	U	20	J	180	U	33	J	180	U
SPS-020		SM-SPS-020-A	Y5RH2	3/8/10	0.5	Concrete	Burn Dump	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	3,900	U	2,000	U	2,000	U	60	J	2,000	U	2,000	U	2,000	U
		SM-SPS-020-B	Y5RH3	3/8/10	5	-	Burn Dump	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	3,600	U	1,800	U	1,800	U	1800	U	1,800	U	1,800	U	1,800	U
		SM-SPS-020-C	Y5RH4	3/8/10	10	-	Burn Dump	12	J	270	U	270	U	270	U	8.9	J	270	U	270	U	520	U	270	U	270	U	62	J	270	U	64	J	270	U
		SM-SPS-020-D	Y5RH5	3/8/10	15	-	Burn Dump	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	2,200	U	150	J	1,100	U	59	J	1,100	U	89	J	1,100	U
		SM-SPS-020-E	Y5RH6	3/8/10	19.5	-	Native	200	U	200	U	200	U	200	U	200	U	200	U	200	U	390	U	200	U	200	U	32	J	200	U	48	J	200	U
SPS-022		SM-SPS-022-A	Y5RJ2	3/8/10	0.5	Concrete	Burn Dump	920	U	920	U	920	U	920	U	920	U	920	U	920	U	1,800	U	920	U	920	U	27	J	920	U	53	J	920	U
		SM-SPS-022-B	Y5RJ3	3/8/10	5	-	Burn Dump	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,900	U	1,000	U	1,000	U	44	J	1,000	U	87	J	150	J
		SM-SPS-022-C	Y5RJ4	3/8/10	10	-	Burn Dump	210	U	210	U	210	U	210	U	210	U	210	U	210	U	400	U	210	U	210	U	39	J	210	U	57	J	55	J
		SM-SPS-022-D	Y5RJ5	3/8/10	15	-	Burn Dump	280	U	280	U	280	U	280	U	280	U	280	U	280	U	550	U	56	J	280	U	42	J	280	U	76	J	280	U
		SM-SPS-022-E	Y5RJ6	3/8/10	19.5	-	Native	190	U	190	U	190	U	190	U	190	U	190	U	190	U	380	U	190	U	190	U	22	J	190	U	38	J	190	U

Sample ID	Benzo(a)pyrene Result	Q	Benzo(b)fluoranthene Result	Q	Benzo(g,h,i)perylene Result	Q	Benzo(k)fluoranthene Result	Q	Bis(2-ethylhexyl)phthalate Result	Q	Butylbenzylphthalate Result	Q	Carbazole Result	Q	Chrysene Result	Q	Dibenzo(a,h)anthracene Result	Q	Dibenzofuran Result	Q	Diethylphthalate Result	Q	Dimethylphthalate Result	Q	Di-n-butylphthalate Result	Q	Fluoranthene Result	Q	Fluorene Result	Q	Hexachlorobenzene Result	Q	Indeno(1,2,3-cd)pyrene Result	Q	Isophorone Result	Q	Naphthalene Result	Q	N-Nitrosodiphenylamine Result	Q	Phenanthrene Result	Q	Phenol Result	Q	Pyrene Result	Q
Smelter Parcel - North Area																																														
SM-SPN-002-A	200	U	200	U	200	U	200	U	42	J	200	U	200	U	14	J	200	U	200	U	6.9	J	200	U	8.6	J	11	J	200	U	200	U	200	U	200	U	9.1	J	200	U	12	J	10	J	12	J
SM-SPN-002-B	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	61	J	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	94	J	1,800	U	1,800	U	1,800	U	1,800	UJ	1,800	U	1,800	U	1,800	U	1,800	U	58	J
SM-SPN-003-A	190	U	190	U	190	U	190	U	840		130	J	190	U	19	J	190	U	190	U	190	U	9.8	J	15	J	31	J	190	U	37	J	190	U	8.1	J	7.4	J	190	U	20	J	10	J	30	J
SM-SPN-103-A	1,900	U	1,900	U	1,900	U	1,900	U	210	J	83	J	1,900	U	150	J	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	UJ	1,900	U	1,900	U	1,900	U	1,900	U	60	J
SM-SPN-003-B	1,900	U	1,900	U	1,900	U	1,900	U	63	J	1,900	U	1,900	U	76	J	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	UJ	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U
SM-SPN-103-B	2,000	U	2,000	U	2,000	U	2,000	U	95	J	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	UJ	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U
Smelter Parcel - Parking Area																																														
SM-SPP-003-A	200	U	200	U	200	U	200	U	31	J	200	U	200	U	200	U	200	U	200	U	6.8	J	200	U	200	U	200	U	200	U	200	U	200	U	200	U	8.7	J	200	U	7.9	J	10	J	8.1	J
SM-SPP-003-B	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	160	J	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	44	J	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	49	J	1,000	U	76	J
SM-SPP-004-A	180	U	180	U	180	U	180	U	13	J	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U
SM-SPP-004-B	1,900	U	1,900	U	1,900	U	1,900	U	66	J	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	UJ	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U
Smelter Parcel - South Area																																														
SM-SPS-002-A	180	U	180	U	180	U	180	U	45	J	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	7	J	180	U
SM-SPS-102-A	2,000	U	67	J	2,000	U	2,000	U	400	J	2,000	U	2,000	U	100	J	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	78	J
SM-SPS-002-B	1,200	U	1,200	U	1,200	U	1,200	U	210	J	1,200	U	1,200	U	1,200	U	1,200	U	1,200	U	83	J	1,200	U	1,200	U	1,200	U	1,200	U	1,200	U	1,200	U	1,200	U	1,200	U	1,200	U	39	J	1,200	U	1,200	U
SM-SPS-102-B	280	U	280	U	280	U	280	U	110	J	280	U	280	U	280	U	280	U	280	U	23	J	280	U	280	U	280	U	280	U	280	U	280	U	280	U	19	J	280	U	280	U	10	J	280	U
SM-SPS-002-C	260	U	260	U	260	U	260	U	230	J	260	U	260	U	260	U	260	U	260	U	8.6	J	260	U	260	U	260	U	260	U	260	U	260	U	260	U	260	U	260	U	260	U	9.7	J	260	U
SM-SPS-102-C	290	U	290	U	290	U	290	U	470		290	U	290	U	290	U	290	U	290	U	9.3	J	290	U	290	U	290	U	290	U	290	U	290	U	290	U	12	J	290	U	290	U	13	J	290	U
SM-SPS-002-D	230	U	230	U	230	U	230	U	7,200		230	U	230	U	230	U	230	U	230	U	39	J	230	U	230	U	7.1	J	7.2	J	230	U	230	U	230	U	7.8	J	230	U	11	J	10	J	12	J
SM-SPS-002-E	220	U	220	U	220	U	220	U	1,300		220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	8.1	J	220	U	220	U	8.5	J	220	U
SM-SPS-102-E	220	U	220	U	220	U	220	U	130	J	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	6.6	J	220	U	220	U	10	J	220	U
SM-SPS-004-A	6,200	U	6,200	U	6,200	U	6,200	U	690	J	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U	6,200	U
SM-SPS-004-B	280	U	280	U	280	U	280	U	540		280	U	280	U	280	U	280	U	12	J	14	J	280	U	280	U	9.9	J	12	J	280	U	280	U	280	U	46	J	280	U	16	J	33	J	9.6	J
SM-SPS-004-C	970	U	45	J	970	U	970	U	170	J	970	U	970	U	970	U	970	U	33	J	970	U	970	U	970	U	60	J	970	U	970	U	970	U	970	U	43	J	970	U	93	J	970	U	49	J
SM-SPS-004-D	200	U	200	U	200	U	200	U	18	J	200	U	200	U	200	U	200	U	200	U	7.3	J	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U
SM-SPS-006-A	1,000	U	1,000	U	1,000	U	1,000	U	84	J	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	37	J	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U
SM-SPS-006-B	2,100	U	210	J	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	560	J	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	93	J	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	150	J	2,100	U	130	J
SM-SPS-006-C	230	U	230	U	230	U	230	U	66	J	230	U	230	U	230	U	230	U	230	U	9.1	J	230	U	230	U	230	U	230	U	230	U	230	U	230	U	7.6	J	230	U	7.6	J	9.5	J	230	U
SM-SPS-007-A	220	J	190	J	280	J	220	J	1,400	J	130	J	1,900	U	110	J	250	J	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	330	J	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U
SM-SPS-007-B	40	J	52	J	24	J	16	J	120	J	200	U	200	U	35	J	200	U	200	U	200	U	19	J	200	U	62	J	200	U	200	U	24	J	200	U	200	U	200	U	35	J	200	U	55	J
SM-SPS-007-C	190	U	190	U	190	U	190	U	45	J	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U	150	J	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U
SM-SPS-008-A	51	J	69	J	63	J	42	J	81	J	940	U	940	U	53	J	940	U	940	U	940	U	940	U	940	U	100	J	940	U	940	U	940	U	940	U	940	U	940	U	74	J	940	U	85	J
SM-SPS-008-B	73	J	110	J	40	J	34	J	88	J	16	J	14	J	71	J	10	J	9.6	J	190	U	7.2	J	190	U	150	J	15	J	190	U	45	J	190	U	13	J	190	U	120	J	190	U	120	J
SM-SPS-008-C	180	U	6.7	J	180	U	180	U	160	J	180	U	180	U	6.4	J	180	U	180	U	7.8	J	180	U	180	U	9.4	J	180	U	180	U	180	U	180	U	8.9	J	180	U	13	J	8.4	J	11	J
SM-SPS-010-A	930	U	930	U	930	U	930	U	150	J	930	U	930	U	930	U	930	U	930	U	930	U	930	U	930	U	32	J	930	U	930	U	930	U	930	U	120	J	930	U	59	J	930	U	49	J
SM-SPS-010-B	60	J	57	J	1,000	U	1,000	U	120	J	160	J	1,000	U	60	J	1,000	U	1000	U	1000	U	1000	U	1000	U	97	J	1000	U	1000	U	1000	U	1000	U	62	J	1000	U	120	J	1,000	U	88	J
SM-SPS-010-C	6,300		9,400		2,600		2,500		83	J	960	U	280	J	6,800		930	J	240	J	960	U	960	U	960	U	22000		730	J	960	U	3200		960	U	180	J	960	U	11,000		140	J	14,000	
SM-SPS-010-D	75	J	79	J	61	J	54	J	37	J	910	U	910	U	74	J	910	U	910	U	910	U	910	U	910	U	160	J	910	U	910	U	72	J	910	U	40	J	910	U	91	J	910	U	120	J
SM-SPS-012-A	1,100	U	1,100	U	1,100	U	1,100	U	12,000		1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	39	J	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	49	J	1,100	U	40	J
SM-SPS-012-B	8.1	J	14	J	230	U	230	U	49	J	230	U	230	U	11	J	230	U	230	U	7.9	J	230	U	8.3	J	23	J	230	U	230	U	230	U	230	U	7.3	J	230	U	18	J	7.9	J	21	J
SM-SPS-012-C	1,600	U	63	J	1,600	U	1,600	U	81	J	1,600	U	1,600	U	1,600	U	1,600	U	1,600	U	1,600	U	1,600	U	1,600	U	96	J	1,600	U	1,600	U	1,600	U	1,600	U	1,600	U	1,600	U	80	J	48	J	81	J
SM-SPS-012-D	220	U	220	U	220	U	220	U	30	J	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	7.3	J	220	U	220	U	12	J	220	U
SM-SPS-012-E	310	U	310	U	310	U	310	U	400		310	U	310	U	310	U	310	U	310	U	11	J	310	U	310	U	310	U	310	U	310	U	310	U	310	U	310	U	310	U	310	U	17	J	310	U
SM-SPS-014-A	980	U	980	U	980	U	980	U	63	J	980	U	980	U	39	J	980	U	980	U	980	U	980	U	980	U	50	J	980	U	980	U	980	U	980	U	980	U	980	U	40	J	980	U	51	J
SM-SPS-014-B	200	U	200	U	200	U	200	U	48	J	200	U	200	U	200	U	200	U	9.7	J	9.4	J	200	U	37	J	7.9	J	200	U	200	U	200	U	200	U	90	J	200	U	17	J	13	J	10	J
SM-SPS-014-C	19	J	18	J	25	J	8.4	J	65	J	180	U	180	U	11	J	180	U	180	U	16	J	180	U	180	U	180	U	11	J	180	U	24	J	180	U	35	J	180	U	19	J	180	U	180	U
SM-SPS-014-D	190	U	190	U	190	U	190	U	21	J	190	U	190	U	190	U	190	U	190	U	6.9	J	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U
SM-SPS-015-A	110	J	96	J	200	J	130	J	110	J	1,900	U	1,900	U	1,900	U	160	J	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	230	J	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U
SM-SPS-115-A	56	J	71	J	170	J	55	J	150	J	1,800	U	1,800	U	1,800	U	94	J	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	99	J	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U
SM-SPS-015-B	210	J	230	J	330	J	3,700	U	390	J	3,700	U	3,700	U	3,700	U	270	J	3,700	U	3,700	U	3,700	U	3,700	U	3,700	U	3,700	U	3,700	U	340	J	3,700	U	3,700	U	3,700	U	580	J	3,700	U	150	J
SM-SPS-115-B	98	J	83	J	180	J	79	J	380	J	1,900	U	1,900	U	96	J	160	J	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	150	J	1,900	U	1,900	U	1,900	U	170	J	1,900	U	1,900	U
SM-SPS-015-C	150	J	130	J	300	J	130	J	3,800	U	3,800	U	3,800	U	3,800	U	230	J	3,800	U	3,800	U	3,800	U	3,800	U	3,800	U	3,800	U	3,800	U	260	J	3,800	U	3,800	U	3,800	U	3,800	U	3,800	U	3,800	U
SM-SPS-115-C	200	U	200	U	200	U	200	U	26	J	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	6.8	J	200	U	200	U	200	U	200	U
SM-SPS-015-D	220	U	220	U	220	U	220	U	25	J	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U
SM-SPS-115-D	240	U	240	U	240	U	240	U	25	J	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U
SM-SPS-016-A	1,200	U	1,200	U	1,200	U	1,200	U	110	J	130	J	1,200	U	65	J	1,200	U	1,200	U	1,200	U	1,200	U	1,200	U	66	J	1,200	U	1,200	U	1,200	U	1,200	U	45	J	1,200	U	41	J	1,200	U	52	J
SM-SPS-016-B	930	U	930	U	930	U	930	U	110	J	93	J	930	U	36	J	930	U	930	U	930	U	930	U	930	U	51	J	930	U	930	U	930	U	930	U	41	J	930	U	57	J	930	U	45	J
SM-SPS-016-C	960	U	960	U	960	U	960	U	280	J	960	U	960	U	960	U	960	U	960	U	960	U	960	U	960	U	960	U	960	U	960	U	960	U	960	U	29	J	960	U	960	U	960	U	960	U
SM-SPS-016-D	190	U	190	U	190	U	190	U	39	J	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U	190	U
SM-SPS-018-A	190	U	190	U	190	U	190	U	33	J	190	U	190	U	190	U	190	U	190	U	15	J	190	U	190	U	8.9	J	190	U	190	U	190	U	190	U	190	U	190	U	10	J	190	U	8.7	J
SM-SPS-018-B	98	J	100	J	150	J	2,100	U	430	J	2,100	U	2,100	U	2,100	U	110	J	2,100	U	2,100	U	2,100	U	2,100	U	72	J	2,100	U	2,100	U	190	J	2,100	U	120	J	110	J	88	J	2,100	U	81	J
SM-SPS-018-C	180	U	180	U	180	U	180	U	27	J	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U	180	U
SM-SPS-020-A	2,000	U	2,000	U	2,000	U	2,000	U	860	J	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U
SM-SPS-020-B	1,800	U	1,800	U	1,800	U	1,800	U	3,900		1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U	1,800	U
SM-SPS-020-C	270	U	270	U	270	U	270	U	460		270	U	270	U	270	U	270	U	270	U	61	J	270	U	12	J	270	U	270	U	270	U	270	U	270	U	28	J	270	U	12	J	13	J	270	U
SM-SPS-020-D	1,100	U	1,100	U	1,100	U	1,100	U	520	J	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	1,100	U	56	J	1,100	U	1,100	U	1,100	U	1,100	U
SM-SPS-020-E	200	U	200	U	200	U	200	U	1100		200	U	200	U	200	U	200	U	200	U	7.9	J	200	U	6.2	J	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	8.7	J	200	U
SM-SPS-022-A	920	U	920	U	920	U	920	U	920	U	920	U	920	U	920	U	920	U	920	U	920	U	920	U	920	U	920	U	920	U	920	U	920	U	920	U	920	U	920	U	920	U	920	U	920	U
SM-SPS-022-B	240	J	330	J	220	J	96	J	76	J	1,000	U	1,000	U	190	J	1,000	U	1,000	U	1,000	U	1,000	U	1,000	U	130	J	1,000	U	1,000	U	190	J	1,000	U	1,000	U	1,000	U	33	J	1,000	U	160	J
SM-SPS-022-C	98	J	110	J	74	J	38	J	28	J	210	U	210	U	47	J	17	J	210	U	210	U	210	U	6.7	J	52	J	210	U	210	U	65	J	210	U	7.1	J	210	U	19	J	7.6	J	50	J
SM-SPS-022-D	280	U	14	J	280	U	280	U	590		280	U	280	U	280	U	280	U	280	U	8.7	J	280	U	8.7	J	280	U	280	U	280	U	280	U	280	U	14	J	280	U	280	U	9.8	J	280	U
SM-SPS-022-E	190	U	190	U	190	U	190	U	17	J	190	U	190	U	190	U	190	U	190	U	190	U	190	U	9.3	J	190	U	190	U	190	U	190	U	190	U	190	U	190	U	6.8	J	190	U	190	U

TABLE 5

SVOC Analytical Results, Solid Matrix, Smelter Parcel and Waste Management Areas

Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	CLP ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	1,1'-Biphenyl Result	Q	1,2,4,5-Tetrachloro-benzene Result	Q	2,4-Dichloro-phenol Result	Q	2,4-Dimethyl-phenol Result	Q	2-Methyl-naphthalene Result	Q	2-Methylphenol Result	Q	3,3'-Dichloro-benzidine Result	Q	4,6-Dinitro-2-methylphenol Result	Q
SPS-024		SM-SPS-024-A	Y5RK2	3/2/10	0.5	Concrete	Burn Dump	5,800	U	5,800	U	5,800	U	5,800	U	5,800	U	5,800	U	5,800	U	11,000	U
		SM-SPS-024-B	Y5RK3	3/2/10	3	-	Burn Dump	260	J	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	4,000	U
		SM-SPS-024-C	Y5RK4	3/2/10	9.5	-	Native	210	U	210	U	210	U	210	U	210	U	210	U	210	U	410	U
SPS-026		SM-SPS-026-A	Y5RL2	3/2/10	0.5	Concrete	Process Waste	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	3,700	U
		SM-SPS-026-B	Y5RL3	3/2/10	5	-	Burn Dump	13	J	200	U	200	U	200	U	200	U	200	U	200	U	400	U
		SM-SPS-026-C	Y5RL4	3/2/10	10	-	Burn Dump	29	J	240	U	240	U	240	U	13	J	240	U	240	U	460	U
		SM-SPS-026-D	Y5RL5	3/2/10	16	-	Burn Dump	2,600	U	2,600	U	2,600	U	2,600	U	2,600	U	2,600	U	2,600	U	5,100	U
		SM-SPS-026-E	Y5RL6	3/2/10	19.5	-	Native	220	U	220	U	220	U	220	U	220	U	220	U	220	U	420	U
Waste Disposal Area																							
WDA-001		SM-WDA-001-A	Y5RS2	3/5/10	Surface		Process Waste	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	3,800	U
		SM-WDA-001-B	Y5RS3	3/5/10	5	-	Process Waste	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	3,900	U
WDA-002		SM-WDA-002-A	Y5RS5	3/5/10	Surface		Process Waste	230	U	230	U	230	U	230	U	8.3	J	230	U	230	U	100	J
		SM-WDA-002-B	Y5RS6	3/5/10	5	-	Process Waste	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	4,200	U
WDA-003		SM-WDA-003-A	Y5RS8	6/29/10	Surface		Process Waste	180	U	180	U	180	U	180	U	180	U	180	U	180	U	340	UJ
		SM-WDA-003-B	Y5RS9	6/29/10	5	-	Process Waste	230	U	230	U	230	U	230	U	230	U	230	U	230	U	450	U
WDA-004		SM-WDA-004-A	Y5RT1	3/5/10	Surface		Process Waste	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	4,500	U
		SM-WDA-004-B	Y5RT2	3/5/10	5	-	Process Waste	2,400	U	2,400	U	2,400	U	2,400	U	2,400	U	2,400	U	2,400	U	4,700	U
WDA-005		SM-WDA-005-A	Y5RT4	3/5/10	Surface		Process Waste	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	3,900	U
	Dup	SM-WDA-105-A	Y5RT7	3/5/10	Surface		Process Waste	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	3,800	U
		SM-WDA-005-B	Y5RT5	3/5/10	5	-	Process Waste	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	4,500	U
	Dup	SM-WDA-105-B	Y5RT8	3/5/10	5	-	Process Waste	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	4,000	U
WDA-006		SM-WDA-006-A	Y5RW0	3/11/10	Surface		Process Waste	240	U	240	U	240	U	240	U	240	U	240	U	240	U	460	U
		SM-WDA-006-B	Y5RW1	3/11/10	5	-	Process Waste	220	U	220	U	220	U	220	U	220	U	220	U	220	U	420	U
Waste Management Unit																							
WMU-001		SM-WMU-001-A	Y5RM2	3/3/10	Surface		Process Waste	220	U	220	U	220	U	220	U	13	J	220	U	220	U	18	J
		SM-WMU-001-B	Y5RM3	3/3/10	6		Process Waste	220	U	220	U	220	U	220	U	8.3	J	220	U	220	U	440	U
WMU-002		SM-WMU-002-A	Y5RM7	3/3/10	Surface		Process Waste	270	U	270	U	270	U	270	U	23	J	270	U	270	U	520	U
		SM-WMU-002-B	Y5RM8	3/3/10	5		Process Waste	190	U	190	U	190	U	190	U	190	U	190	U	190	U	11	J
		SM-WMU-002-C	Y5RM9	3/3/10	30	-	Process Waste	280	U	280	U	280	U	280	U	280	U	280	U	280	U	550	UJ
		SM-WMU-002-D	Y5RN0	3/3/10	35	-	Process Waste	260	U	260	U	260	U	260	U	8.8	J	260	U	260	U	510	U
		SM-WMU-002-E	Y5RN1	3/3/10	44	-	Native	210	U	210	U	210	U	210	U	210	U	210	U	210	U	400	U
WMU-003		SM-WMU-003-A	Y5RN2	3/3/10	Surface		Process Waste	250	U	250	U	250	U	250	U	25	J	250	U	250	U	480	U
		SM-WMU-003-B	Y5RN3	3/3/10	5		Process Waste	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2100	U	2,100	U	4,000	U
WMU-004		SM-WMU-004-A	Y5RN7	3/4/10	Surface		Process Waste	220	U	220	U	220	U	220	U	15	J	220	U	220	U	430	U
		SM-WMU-004-B	Y5RN8	3/4/10	5		Process Waste	220	U	220	U	220	U	220	U	220	U	220	U	220	U	430	U
		SM-WMU-004-C	Y5RN9	3/4/10	30	-	Process Waste	210	U	210	U	210	U	210	U	24	J	210	U	210	U	410	U
		SM-WMU-004-D	Y5RP0	3/4/10	35	-	Process Waste	210	U	210	U	210	U	210	U	210	U	210	U	210	U	400	U
		SM-WMU-004-E	Y5RP1	3/4/10	44	-	Native	240	U	240	U	240	U	240	U	240	U	240	U	240	U	470	U
WMU-005		SM-WMU-005-A	Y5RP2	3/4/10	Surface		Process Waste	230	U	230	U	230	U	230	U	24	J	230	U	230	U	450	U
	Dup	SM-WMU-105-A	Y5RP7	3/4/10	5		Process Waste	240	U	240	U	240	U	240	U	27	J	240	U	240	U	460	U
		SM-WMU-005-B	Y5RP3	3/4/10	Surface		Process Waste	230	U	230	U	230	U	230	U	28	J	230	U	230	U	450	U
	Dup	SM-WMU-105-B	Y5RP8	3/4/10	5		Process Waste	230	U	230	U	230	U	230	U	21	J	230	U	230	U	440	U
WMU-006		SM-WMU-006-A	Y5RQ2	3/4/10	Surface		Process Waste	270	U	270	U	270	U	270	U	34	J	270	U	270	U	520	U
		SM-WMU-006-B	Y5RQ3	3/4/10	5		Process Waste	210	U	210	U	210	U	210	U	21	J	210	U	210	U	420	U
		SM-WMU-006-C	Y5RQ4	3/4/10	30	-	Process Waste	310	U	310	U	310	U	310	U	14	J	310	U	310	U	610	U
		SM-WMU-006-D	Y5RQ5	3/4/10	35	-	Process Waste	300	U	300	U	300	U	300	U	300	U	300	U	300	U	590	U
		SM-WMU-006-E	Y5RQ6	3/4/10	44	-	Native	220	U	220	U	220	U	220	U	220	U	220	U	220	U	420	U
WMU-007		SM-WMU-007-A	Y5RQ7	3/4/10	Surface		Process Waste	230	U	230	U	230	U	230	U	14	J	230	U	230	U	440	U
		SM-WMU-007-B	Y5RQ8	3/4/10	5		Process Waste	200	U	200	U	200	U	200	U	200	U	200	U	200	U	380	U
WMU-008		SM-WMU-008-A	Y5RR2	3/4/10	Surface	-	Process Waste	270	U	270	U	270	U	270	U	11	J	270	U	270	U	530	U
		SM-WMU-008-B	Y5RR3	3/4/10	5	-	Process Waste	230	U	230	U	230	U	230	U	26	J	230	U	230	U	450	U
		SM-WMU-008-C	Y5RR4	3/4/10	30	-	Process Waste	360	U	360	U	360	U	360	U	360	U	360	U	360	U	700	U
		SM-WMU-008-D	Y5RR5	3/4/10	35	-	Process Waste	220	U	220	U	220	U	220	U	7.9	J	220	U	220	U	430	U
		SM-WMU-008-E	Y5RR6	3/4/10	44	-	Native	220	U	220	U	220	U	220	U	220	U	220	U	220	U	430	U
WMU-009		SM-WMU-009-A	Y5RR7	3/5/10	Surface		Process Waste	260	U	260	U	260	U	260	U	10	J	260	U	260	U	10	J
		SM-WMU-009-B	Y5RR8	3/5/10	5		Process Waste	260	U	260	U	260	U	260	U	20	J	260	U	260	U	500	U

Sample ID	4-Methylphenol Result	Q	Acenaphthene Result	Q	Acetophenone Result	Q	Anthracene Result	Q	Benzaldehyde Result	Q	Benzo(a)-anthracene Result	Q	Benzo(a)-pyrene Result	Q	Benzo(b)-fluoranthene Result	Q	Benzo(g,h,i)-perylene Result	Q	Benzo(k)-fluoranthene Result	Q	Bis(2-ethylhexyl)-phthalate Result	Q	Butylbenzyl-phthalate Result	Q	Carbazole Result	Q	Chrysene Result	Q
SM-SPS-024-A	5,800	U	5,800	U	5800	U	5,800	U	5,800	U	5,800	U	5,800	U	5,800	U	480	J	5,800	U	200	J	5,800	U	5,800	U	5,800	U
SM-SPS-024-B	63	J	2,100	U	2100	U	2,100	U	2,100	U	81	J	140	J	140	J	220	J	70	J	340	J	2,100	U	2,100	U	99	J
SM-SPS-024-C	210	U	210	U	30	J	210	U	42	J	210	U	210	U	210	U	210	U	210	U	53	J	210	U	210	U	210	U
SM-SPS-026-A	1,900	U	1,900	U	1900	U	1,900	U	70	J	66	J	90	J	120	J	220	J	81	J	450	J	130	J	1,900	U	66	J
SM-SPS-026-B	200	U	200	U	29	J	200	U	44	J	200	U	200	U	200	U	200	U	200	U	26	J	200	U	200	U	200	U
SM-SPS-026-C	240	U	240	U	49	J	240	U	110	J	240	U	240	U	240	U	240	U	240	U	79	J	240	U	240	U	16	J
SM-SPS-026-D	2,600	U	2,600	U	2600	U	2,600	U	120	J	2,600	U	2,600	U	2,600	U	2,600	U	2,600	U	400	J	2,600	U	2,600	U	2,600	U
SM-SPS-026-E	220	U	220	U	22	J	220	U	54	J	220	U	220	U	220	U	220	U	220	U	37	J	220	U	220	U	220	U
Waste Disposal Area																												
SM-WDA-001-A	1,900	U	1900	U	1900	U	1,900	U	74	J	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	60	J	1,900	U	1,900	U	1,900	U
SM-WDA-001-B	2,000	U	2,000	U	2000	U	2,000	U	88	J	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U
SM-WDA-002-A	230	U	230	U	30	J	230	U	74	J	230	U	230	U	230	U	230	U	230	U	22	J	230	U	230	U	230	U
SM-WDA-002-B	2,100	U	2,100	U	2100	U	2,100	U	100	J	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U
SM-WDA-003-A	180	U	180	U	97	J	180	U	85	J	7	J	180	U	180	U	180	U	180	U	31	J	6.5	J	180	U	5.8	J
SM-WDA-003-B	230	U	230	U	81	J	230	U	88	J	230	U	230	U	230	U	230	U	230	U	32	J	230	U	230	U	230	U
SM-WDA-004-A	2,300	U	2,300	U	2300	U	2,300	U	110	J	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U
SM-WDA-004-B	2,400	U	2,400	U	2400	U	2,400	U	80	J	2,400	U	2,400	U	2,400	U	2,400	U	2,400	U	110	J	2,400	U	2,400	U	2,400	U
SM-WDA-005-A	2,000	U	2,000	U	2000	U	2,000	U	110	J	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U
SM-WDA-105-A	2,000	U	2,000	U	2000	U	2,000	U	65	J	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	110	J	2,000	U	2,000	U	2,000	U
SM-WDA-005-B	2,300	U	2,300	U	2300	U	2,300	U	100	J	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U
SM-WDA-105-B	2,100	U	2,100	U	2100	U	2,100	U	100	J	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U
SM-WDA-006-A	240	U	240	U	41	J	240	U	74	J	240	U	240	U	240	U	240	U	240	U	590		240	U	240	U	240	U
SM-WDA-006-B	220	U	220	U	34	J	220	U	59	J	220	U	220	U	220	U	220	U	220	U	260		220	U	220	U	220	U
Waste Management Unit																												
SM-WMU-001-A	220	U	220	U	39	J	220	U	95	J	220	U	220	UJ	220	UJ	220	UJ	220	UJ	38	J	23	J	220	U	220	U
SM-WMU-001-B	220	U	220	U	38	J	220	U	95	J	220	U	220	UJ	220	UJ	220	UJ	220	UJ	27	J	220	U	220	U	220	U
SM-WMU-002-A	270	U	270	U	53	J	270	U	170	J	270	U	270	UJ	270	UJ	270	UJ	270	UJ	150	J	23	J	270	U	270	U
SM-WMU-002-B	190	U	190	U	13	J	190	U	38	J	6.1	J	190	U	8.9	J	190	U	190	U	23	J	190	U	190	U	9.2	J
SM-WMU-002-C	19	J	12	J	40	J	12	J	86	J	280	U	280	U	280	U	280	U	280	U	46	J	280	U	280	U	14	J
SM-WMU-002-D	11	J	260	U	43	J	9.3	J	66	J	260	U	260	U	260	U	260	U	260	U	110	J	260	U	260	U	12	J
SM-WMU-002-E	210	U	210	U	23	J	210	U	57	J	210	U	210	U	210	U	210	U	210	U	23	J	210	U	210	U	210	U
SM-WMU-003-A	250	U	250	U	49	J	250	U	66	J	250	U	250	UJ	250	UJ	250	UJ	250	UJ	98	J	250	U	250	U	250	U
SM-WMU-003-B	2100	U	2,100	U	2100	U	2100	U	120	J	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	180	J	2,100	U	2,100	U	2,100	U
SM-WMU-004-A	220	U	220	U	76	J	220	U	94	J	220	UJ	220	UJ	220	UJ	220	UJ	220	UJ	220	U	220	U	220	U	220	UJ
SM-WMU-004-B	220	U	220	U	68	J	220	U	95	J	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U
SM-WMU-004-C	17	J	8.1	J	59	J	210	U	96	J	210	U	210	UJ	210	UJ	210	UJ	210	UJ	210	U	210	U	210	U	210	U
SM-WMU-004-D	210	U	12	J	44	J	210	U	67	J	210	U	210	U	210	U	210	U	210	U	210	U	210	U	210	U	210	U
SM-WMU-004-E	240	U	240	U	39	J	240	U	57	J	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U
SM-WMU-005-A	230	U	230	U	87	J	230	U	72	J	230	UJ	230	UJ	230	UJ	230	UJ	230	UJ	230	U	230	U	230	U	230	UJ
SM-WMU-105-A	240	U	240	U	89	J	240	U	92	J	240	UJ	240	UJ	240	UJ	240	UJ	240	UJ	240	U	240	U	240	U	240	UJ
SM-WMU-005-B	230	U	230	U	81	J	230	U	110	J	230	UJ	230	UJ	230	UJ	230	UJ	230	UJ	230	U	230	U	230	U	230	UJ
SM-WMU-105-B	230	U	230	U	62	J	230	U	94	J	230	UJ	230	UJ	230	UJ	230	UJ	230	UJ	230	U	230	U	230	U	230	UJ
SM-WMU-006-A	270	U	270	U	68	J	270	U	97	J	270	U	270	U	270	U	270	U	270	U	270	U	270	U	270	U	270	U
SM-WMU-006-B	210	U	210	U	47	J	210	U	78	J	210	U	210	UJ	210	UJ	210	UJ	210	UJ	210	U	210	U	210	U	210	U
SM-WMU-006-C	53	J	310	U	150	J	310	U	140	J	310	UJ	310	UJ	310	UJ	310	UJ	310	UJ	310	U	310	U	310	U	310	UJ
SM-WMU-006-D	45	J	300	U	51	J	300	U	80	J	300	U	300	U	300	U	300	U	300	U	300	U	300	U	300	U	300	U
SM-WMU-006-E	220	U	220	U	46	J	220	U	93	J	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U
SM-WMU-007-A	230	U	230	U	47	J	230	U	92	J	230	U	230	UJ	230	UJ	230	UJ	230	UJ	230	U	230	U	230	U	230	U
SM-WMU-007-B	200	U	11	J	72	J	22	J	100	J	200	U	200	U	350		100	J	200	U	200	U	200	U	25	J	200	
SM-WMU-008-A	270	U	14	J	52	J	21	J	93	J	270	U	270	UJ	270	UJ	270	UJ	270	UJ	270	U	270	U	270	U	270	U
SM-WMU-008-B	230	U	230	U	230	U	230	U	110	J	230	UJ	230	UJ	230	UJ	230	UJ	230	UJ	230	U	230	U	230	U	230	UJ
SM-WMU-008-C	360	U	360	U	55	J	360	U	93	J	15	J	13	J	360	U	360	U	360	U	34	J	360	U	360	U	360	U
SM-WMU-008-D	220	U	220	U	35	J	220	U	79	J	220	U	220	U	220	U	220	U	220	U	21	J	220	U	220	U	220	U
SM-WMU-008-E	220	U	220	U	30	J	220	U	52	J	220	U	220	U	220	U	220	U	220	U	21	J	220	U	220	U	220	U
SM-WMU-009-A	260	U	260	U	28	J	260	U	70	J	260	UJ	260	UJ	260	UJ	260	UJ	260	UJ	190	J	260	U	260	U	260	UJ
SM-WMU-009-B	260	U	260	U	60	J	260	U	130	J	260	U	260	UJ	260	UJ	260	UJ	260	UJ	130	J	23	J	260	U	260	U

Sample ID	Dibenzo(a,h)-anthracene Result	Q	Dibenzofuran Result	Q	Diethyl-phthalate Result	Q	Dimethyl-phthalate Result	Q	Di-n-butyl-phthalate Result	Q	Fluoranthene Result	Q	Fluorene Result	Q	Hexachloro-benzene Result	Q	Indeno-(1,2,3-cd)-pyrene Result	Q	Isophorone Result	Q	Naphthalene Result	Q	N-Nitrosodi-phenylamine Result	Q	Phenanthrene Result	Q	Phenol Result	Q	Pyrene Result	Q
SM-SPS-024-A	320	J	5,800	U	5,800	U	5,800	U	5,800	U	5,800	U	5,800	U	5,800	U	340	J	5,800	U	5,800	U	5,800	U	5,800	U	5,800	U	5,800	U
SM-SPS-024-B	130	J	2,100	U	2,100	U	2,100	U	2,100	U	110	J	90	J	2,100	U	210	J	2,100	U	150	J	2,100	U	100	J	2,100	U	130	J
SM-SPS-024-C	210	U	210	U	210	U	210	U	210	U	210	U	210	U	210	U	210	U	210	U	7.6	J	210	U	12	J	210	U	210	U
SM-SPS-026-A	130	J	1,900	U	1,900	U	1,900	U	1,900	U	110	J	1,900	U	1,900	U	160	J	1,900	U	1,900	U	1,900	U	84	J	1,900	U	83	J
SM-SPS-026-B	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	200	U	21	J	200	U	11	J	200	U	200	U
SM-SPS-026-C	240	U	20	J	25	J	240	U	17	J	27	J	7.8	J	240	U	240	U	240	U	45	J	240	U	35	J	17	J	26	J
SM-SPS-026-D	2,600	U	2,600	U	2,600	U	2,600	U	2,600	U	2,600	U	2,600	U	2,600	U	2,600	U	2,600	UJ	120	J	2,600	U	2,600	U	2,600	U	2,600	U
SM-SPS-026-E	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	10	J	220	U	220	U	12	J	220	U
Waste Disposal Area																														
SM-WDA-001-A	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U	1,900	U
SM-WDA-001-B	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U
SM-WDA-002-A	230	U	230	U	230	U	230	U	230	U	230	U	230	U	230	U	230	U	230	U	13	J	230	U	9.1	J	7.9	J	8.6	J
SM-WDA-002-B	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U
SM-WDA-003-A	180	U	180	U	180	U	180	U	180	U	6.7	J	180	U	180	U	180	U	180	U	180	U	180	U	5.5	J	14	J	11	J
SM-WDA-003-B	230	U	230	U	230	U	230	U	230	U	230	U	230	U	230	U	230	U	230	U	230	U	230	U	230	U	11	J	230	U
SM-WDA-004-A	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U
SM-WDA-004-B	2,400	U	2,400	U	2,400	U	2,400	U	2,400	U	2,400	U	2,400	U	2,400	U	2,400	U	2,400	U	2,400	U	2,400	U	2,400	U	2,400	U	2,400	U
SM-WDA-005-A	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U
SM-WDA-105-A	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U	2,000	U
SM-WDA-005-B	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U	2,300	U
SM-WDA-105-B	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U
SM-WDA-006-A	240	U	240	U	12	J	240	U	240	U	240	U	240	U	240	U	240	U	240	U	12	J	240	U	240	U	10	J	240	U
SM-WDA-006-B	220	U	220	U	8.3	J	220	U	220	U	220	U	220	U	220	U	220	U	220	U	7.5	J	220	U	220	U	8.9	J	220	U
Waste Management Unit																														
SM-WMU-001-A	220	UJ	220	U	220	U	220	U	7.5	J	16	J	220	U	220	U	220	UJ	220	U	21	J	220	U	20	J	11	J	19	J
SM-WMU-001-B	220	UJ	220	U	220	U	220	U	7	J	8.2	J	220	U	220	U	220	UJ	220	U	15	J	220	U	12	J	12	J	8.5	J
SM-WMU-002-A	270	UJ	270	U	270	U	270	U	16	J	28	J	270	U	270	U	270	UJ	270	U	32	J	270	U	32	J	18	J	24	J
SM-WMU-002-B	190	U	190	U	190	U	190	U	7.1	J	16	J	190	U	190	U	190	U	190	U	190	U	190	U	13	J	190	U	18	J
SM-WMU-002-C	280	U	280	U	10	J	280	U	280	U	55	J	280	U	280	U	280	U	280	U	14	J	280	U	67	J	72	J	50	J
SM-WMU-002-D	260	U	260	U	12	J	260	U	12	J	44	J	260	U	260	U	260	U	260	U	16	J	260	U	59	J	58	J	42	J
SM-WMU-002-E	210	U	210	U	210	U	210	U	210	U	210	U	210	U	210	U	210	U	210	U	6.9	J	210	U	8.7	J	15	J	210	U
SM-WMU-003-A	250	UJ	250	U	250	U	250	U	17	J	31	J	250	U	250	U	250	UJ	250	U	18	J	250	U	39	J	8.4	J	29	J
SM-WMU-003-B	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U	2,100	U
SM-WMU-004-A	220	UJ	220	U	220	U	220	U	220	U	18	J	220	U	220	U	220	UJ	220	U	18	J	220	U	23	J	10	J	11	J
SM-WMU-004-B	220	U	220	U	220	U	220	U	8.7	J	220	U	220	U	220	U	220	U	220	U	9.8	J	220	U	7.5	J	13	J	220	U
SM-WMU-004-C	210	UJ	210	U	210	U	210	U	210	U	27	J	13	J	210	U	210	UJ	210	U	25	J	210	U	37	J	37	J	21	J
SM-WMU-004-D	210	U	210	U	210	U	210	U	210	U	27	J	210	U	210	U	210	U	210	U	9.7	J	210	U	21	J	22	J	29	J
SM-WMU-004-E	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U	240	U	8.3	J	240	U
SM-WMU-005-A	230	UJ	230	U	230	U	230	U	11	J	24	J	230	U	230	U	230	UJ	230	U	21	J	230	U	32	J	11	J	17	J
SM-WMU-105-A	240	UJ	240	U	240	U	240	U	14	J	23	J	240	U	240	U	240	UJ	240	U	23	J	240	U	32	J	12	J	15	J
SM-WMU-005-B	230	UJ	230	U	230	U	230	U	13	J	21	J	230	U	230	U	230	UJ	230	U	22	J	230	U	31	J	17	J	13	J
SM-WMU-105-B	230	UJ	230	U	230	U	230	U	230	U	29	J	230	U	230	U	230	UJ	230	U	19	J	230	U	28	J	13	J	20	J
SM-WMU-006-A	270	U	270	U	270	U	270	U	14	J	22	J	270	U	270	U	270	U	270	U	31	J	270	U	30	J	12	J	16	J
SM-WMU-006-B	210	UJ	210	U	210	U	210	U	8.9	J	20	J	210	U	210	U	210	UJ	210	U	20	J	210	U	25	J	8.1	J	15	J
SM-WMU-006-C	310	UJ	310	U	310	U	310	U	13	J	310	UJ	310	U	310	U	310	UJ	310	U	24	J	310	U	12	J	350		310	UJ
SM-WMU-006-D	300	U	300	U	300	U	300	U	300	U	68	J	300	U	300	U	300	U	300	U	13	J	300	U	59	J	71	J	61	J
SM-WMU-006-E	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	220	U	6.8	J	220	U	8.4	J	10	J	220	U
SM-WMU-007-A	230	UJ	230	U	230	U	230	U	8.5	J	18	J	230	U	230	U	230	UJ	230	U	16	J	230	U	21	J	9.2	J	16	J
SM-WMU-007-B	15	J	200	U	200	U	200	U	200	U	510		200	U	200	U	110	J	200	U	10	J	200	U	210		12	J	280	
SM-WMU-008-A	270	UJ	270	U	270	U	270	U	13	J	120	J	270	U	270	U	270	UJ	270	U	22	J	14	J	150	J	50	J	100	J
SM-WMU-008-B	230	UJ	230	U	230	U	230	U	14	J	27	J	230	U	230	U	230	UJ	230	U	26	J	230	U	37	J	11	J	16	J
SM-WMU-008-C	360	U	360	U	14	J	360	U	13	J	34	J	360	U	360	U	360	U	360	U	15	J	360	U	32	J	47	J	25	J
SM-WMU-008-D	220	U	220	U	220	U	220	U	7.8	J	220	U	220	U	220	U	220	U	220	U	12	J	220	U	7.9	J	14	J	220	U
SM-WMU-008-E	220	U	220	U	220	U	220	U	8.1	J	220	U	220	U	220	U	220	U	220	U	6.7	J	220	U	8	J	220	U	220	U
SM-WMU-009-A	260	UJ	260	U	260	U	260	U	14	J	11	J	260	U	260	U	260	UJ	260	U	14	J	260	U	14	J	260	U	8.4	J
SM-WMU-009-B	260	UJ	260	U	8	J	260	U	12	J	21	J	260	U	260	U	260	UJ	260	U	25	J	260	U	21	J	19	J	18	J

Notes:

Units are in µg/kg

bgs = below ground surface

A/C = asphalt/concrete

Data Qualifiers (Q):

U = The analyte was analyzed for, but was not detected at a level greater than or equal to the detection limit listed in the table.

J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (because quality control criteria were not met, or the concentration of the analyte was below the reporting limit).

UJ = The analyte was not detected at a level greater than or equal to the detection limit. However, the reported detection limit is approximate.

TABLE 6
PCB Aroclor Analytical Results, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	CLP ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	Aroclor-1016		Aroclor-1221		Aroclor-1232		Aroclor-1242		Aroclor-1248		Aroclor-1254		Aroclor-1260		Aroclor-1262		Aroclor-1268	
								Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Smelter Parcel - South Area																									
SPS-002		SM-SPS-002-A	Y5R72	3/9/10	Surface	-	Process Waste	3.5	U	3.5	U	3.5	U	3.5	U	290		130		3.5	U	3.5	U	3.5	U
	Dup	SM-SPS-102-A	Y5R77	3/9/10	Surface	-	Process Waste	3.8	U	3.8	U	3.8	U	3.8	U	340		260		3.8	U	3.8	U	3.8	U
		SM-SPS-002-B	Y5R73	3/9/10	5	-	Process Waste	4.5	U	4.5	U	4.5	U	4.5	U	880		840		4.5	U	4.5	U	4.5	U
	Dup	SM-SPS-102-B	Y5R78	3/9/10	5	-	Process Waste	5.4	U	5.4	U	5.4	U	5.4	U	21		9.5		5.4	U	5.4	U	5.4	U
		SM-SPS-002-C	Y5R74	3/9/10	10	-	Process Waste	5.1	U	5.1	U	5.1	U	5.1	U	46		35		5.1	U	5.1	U	5.1	U
	Dup	SM-SPS-102-C	Y5R79	3/9/10	10	-	Process Waste	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U	5.6	U
		SM-SPS-002-D	Y5R75	3/9/10	14	-	Process Waste	4.4	U	4.4	U	4.4	U	4.4	U	4.4	U	4.4	U	10		4.4	U	4.4	U
		SM-SPS-002-E	Y5R76	3/9/10	18	-	Native	4.4	U	4.4	U	4.4	U	4.4	U	4.4	U	4.4	U	4.4	U	4.4	U	4.4	U
	Dup	SM-SPS-102-E	Y5R81	3/9/10	18	-	Native	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U
SPS-004		SM-SPS-004-A	Y5R87	3/10/10	Surface	-	Process Waste	4	U	4	U	4	U	4	U	4	U	4	U	4	U	4	U	4	U
		SM-SPS-004-B	Y5R88	3/10/10	5	-	Burn Dump	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U	5.4	U
		SM-SPS-004-C	Y5R89	3/10/10	10	-	Burn Dump	3.8	U	3.8	U	3.8	U	3.8	U	3.8	U	44		3.8	U	3.8	U	3.8	U
		SM-SPS-004-D	Y5R90	3/10/10	14	-	Native	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	2.4	J	3.9	U	3.9	U	3.9	U
SPS-010		SM-SPS-010-A	Y5RB8	3/10/10	Surface	-	Process Waste	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U
		SM-SPS-010-B	Y5RB9	3/10/10	5	-	Process Waste	4	U	4	U	4	U	4	U	4	U	4	U	4	U	4	U	4	U
		SM-SPS-010-C	Y5RC0	3/10/10	10	-	Burn Dump	3.7	U	3.7	U	3.7	U	3.7	U	24		3.7	U	3.7	U	3.7	U	3.7	U
		SM-SPS-010-D	Y5RC1	3/10/10	14.5	-	Native	3.5	U	3.5	U	3.5	U	3.5	U	1.4	J	3.5	U	3.5	U	3.5	U	3.5	U
SPS-012		SM-SPS-012-A	Y5RC8	3/9/10	Surface	-	Process Waste	4.3	U	4.3	U	4.3	U	4.3	U	26		36		4.3	U	4.3	U	4.3	U
		SM-SPS-012-B	Y5RC9	3/9/10	5	-	Process Waste	4.5	U	4.5	U	4.5	U	4.5	U	22		4.5	U	4.5	U	4.5	U	4.5	U
		SM-SPS-012-C	Y5RD0	3/9/10	10	-	Process Waste	6.1	U	6.1	U	6.1	U	6.1	U	36		6.1	U	6.1	U	6.1	U	6.1	U
		SM-SPS-012-D	Y5RD1	3/9/10	18.5	-	Process Waste	4.2	U	4.2	U	4.2	U	4.2	U	4.2	J	4.2	U	4.2	U	4.2	U	4.2	U
		SM-SPS-012-E	Y5RD2	3/9/10	24.5	-	Native	6.1	U	6.1	U	6.1	U	6.1	U	2.8	J	6.1	U	6.1	U	6.1	U	6.1	U
SPS-014		SM-SPS-014-A	Y5RD8	3/10/10	0.5	Concrete	Burn Dump	3.8	U	3.8	U	3.8	U	3.8	U	3.8	U	310		3.8	U	3.8	U	3.8	U
		SM-SPS-014-B	Y5RD9	3/10/10	5	-	Burn Dump	3.8	U	3.8	U	3.8	U	3.8	U	3.8	U	3.8	U	3.8	U	3.8	U	3.8	U
		SM-SPS-014-C	Y5RE0	3/10/10	10	-	Burn Dump	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U
		SM-SPS-014-D	Y5RE1	3/10/10	14.5	-	Native	3.8	U	3.8	U	3.8	U	3.8	U	3.8	U	3.8	U	3.8	U	3.8	U	3.8	U
SPS-016		SM-SPS-016-A	Y5RF3	3/10/10	0.5	Concrete	Gen Fill	4.7	U	4.7	U	4.7	U	4.7	U	200		4.7	U	4.7	U	4.7	U	4.7	U
		SM-SPS-016-B	Y5RF4	3/10/10	5	-	Burn Dump	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U
		SM-SPS-016-C	Y5RF5	3/10/10	10	-	Burn Dump	3.7	U	3.7	U	3.7	U	3.7	U	5.6		3.7	U	3.7	U	3.7	U	3.7	U
		SM-SPS-016-D	Y5RF6	3/10/10	14.5	-	Native	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U
SPS-020		SM-SPS-020-A	Y5RH2	3/8/10	0.5	Concrete	Burn Dump	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	520		3.9	U	3.9	U	3.9	U
		SM-SPS-020-B	Y5RH3	3/8/10	5	-	Burn Dump	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U	3.6	U
		SM-SPS-020-C	Y5RH4	3/8/10	10	-	Burn Dump	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U	5.2	U
		SM-SPS-020-D	Y5RH5	3/8/10	15	-	Burn Dump	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	13		4.5	U	4.5	U	4.5	U
		SM-SPS-020-E	Y5RH6	3/8/10	19.5	-	Native	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U
Waste Disposal Area																									
WDA-001		SM-WDA-001-A	Y5RS2	3/5/10	Surface		Process Waste	3.8	U	3.8	U	3.8	U	3.8	U	3.8	U	3.8	U	3.8	U	3.8	U	3.8	U
		SM-WDA-001-B	Y5RS3	3/5/10	5	-	Process Waste	4	U	4	U	4	U	4	U	4		4	U	4	U	4	U	4	U
WDA-002		SM-WDA-002-A	Y5RS5	3/5/10	Surface		Process Waste	4.4	U	4.4	U	4.4	U	4.4	U	4.4	U	4.4	U	4.4	U	4.4	U	4.4	U
		SM-WDA-002-B	Y5RS6	3/5/10	5	-	Process Waste	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U	4.2	U
WDA-003		SM-WDA-003-A	Y5RS8	6/29/10	Surface		Process Waste	3.4	U	3.4	U	3.4	U	3.4	U	3.4	U	3.4	U	3.4	U	3.4	U	3.4	U
		SM-WDA-003-B	Y5RS9	6/29/10	5	-	Process Waste	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U	4.5	U
WDA-004		SM-WDA-004-A	Y5RT1	3/5/10	Surface		Process Waste	4.5	U	4.5	U	4.5	U	4.5	U	25		4.5	U	4.5	U	4.5	U	4.5	U
		SM-WDA-004-B	Y5RT2	3/5/10	5	-	Process Waste	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U	4.8	U

TABLE 6
PCB Aroclor Analytical Results, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	CLP ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	Aroclor-1016		Aroclor-1221		Aroclor-1232		Aroclor-1242		Aroclor-1248		Aroclor-1254		Aroclor-1260		Aroclor-1262		Aroclor-1268	
								Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
WDA-005		SM-WDA-005-A	Y5RT4	3/5/10	Surface		Process Waste	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U
	Dup	SM-WDA-105-A	Y5RT7	3/5/10	Surface		Process Waste	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U	3.9	U
		SM-WDA-005-B	Y5RT5	3/5/10	5	-	Process Waste	4.5	U	4.5	U	4.5	U	4.5	U	4.5	J	4.5	U	4.5	U	4.5	U	4.5	U
	Dup	SM-WDA-105-B	Y5RT8	3/5/10	5	-	Process Waste	4	U	4	U	4	U	4	U	4	U	4	U	4	U	4	U	4	U
WDA-006		SM-WDA-006-A	Y5RW0	3/11/10	Surface		Process Waste	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U	4.6	U
		SM-WDA-006-B	Y5RW1	3/11/10	5	-	Process Waste	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U	4.3	U
Waste Management Unit																									
WMU-001		SM-WMU-001-A	Y5RM2	3/3/10	Surface		Process Waste	4.3	U	4.3	U	4.3	U	4.3	U	15		4.3	U	4.3	U	4.3	U	4.3	U
		SM-WMU-001-B	Y5RM3	3/3/10	6		Process Waste	4.4	UJ	4.4	UJ	4.4	UJ	4.4	UJ	8.6	J	4.4	UJ	4.4	UJ	4.4	UJ	4.4	UJ
WMU-002		SM-WMU-002-A	Y5RM7	3/3/10	Surface		Process Waste	5.2	U	5.2	U	5.2	U	5.2	U	18	J	5.2	U	5.2	U	5.2	U	5.2	U
		SM-WMU-002-B	Y5RM8	3/3/10	5		Process Waste	3.7	U	3.7	U	3.7	U	3.7	U	74		3.7	U	3.7	U	3.7	U	3.7	U
WMU-003		SM-WMU-003-A	Y5RN2	3/3/10	Surface		Process Waste	4.8	U	4.8	U	4.8	U	4.8	U	36	J	4.8	U	4.8	U	4.8	U	4.8	U
		SM-WMU-003-B	Y5RN3	3/3/10	5		Process Waste	4	U	4	U	4	U	4	U	4	U	4	U	4	U	4	U	4	U
WMU-004		SM-WMU-004-A	Y5RN7	3/4/10	Surface		Process Waste	4.3	UR	4.3	UR	4.3	UR	4.3	UR	58	J	4.3	UR	4.3	UR	4.3	UR	4.3	UR
		SM-WMU-004-B	Y5RN8	3/4/10	5		Process Waste	4.3	UR	4.3	UR	4.3	UR	4.3	UR	44	J	4.3	UR	4.3	UR	4.3	UR	4.3	UR
		SM-WMU-004-C	Y5RN9	3/4/10	30	-	Process Waste	210	UR	210	UR	210	UR	210	UR	510	J	210	UR	210	UR	210	UR	210	UR
		SM-WMU-004-D	Y5RP0	3/4/10	35	-	Process Waste	4.1	UR	4.1	UR	4.1	UR	4.1	UR	1000	J	4.1	UR	4.1	UR	4.1	UR	4.1	UR
		SM-WMU-004-E	Y5RP1	3/4/10	44	-	Native	4.7	UR	4.7	UR	4.7	UR	4.7	UR	4.7	UR	4.7	UR	4.7	UR	4.7	UR	4.7	UR
WMU-005		SM-WMU-005-A	Y5RP2	3/4/10	Surface		Process Waste	4.5	UR	4.5	UR	4.5	UR	4.5	UR	110	J	4.5	UR	4.5	UR	4.5	UR	4.5	UR
	Dup	SM-WMU-105-A	Y5RP7	3/4/10	5		Process Waste	4.6	UR	4.6	UR	4.6	UR	4.6	UR	4.6	UR	57	J	4.6	UR	4.6	UR	4.6	UR
		SM-WMU-005-B	Y5RP3	3/4/10	Surface		Process Waste	4.5	UR	4.5	UR	4.5	UR	4.5	UR	4.5	UR	71	J	4.5	UR	4.5	UR	4.5	UR
	Dup	SM-WMU-105-B	Y5RP8	3/4/10	5		Process Waste	4.4	UR	4.4	UR	4.4	UR	4.4	UR	91	J	4.4	UR	4.4	UR	4.4	UR	4.4	UR
WMU-006		SM-WMU-006-A	Y5RQ2	3/4/10	Surface		Process Waste	5.2	UR	5.2	UR	5.2	UR	5.2	UR	5.2	UR	61	J	5.2	UR	5.2	UR	5.2	UR
		SM-WMU-006-B	Y5RQ3	3/4/10	5		Process Waste	4.2	UR	4.2	UR	4.2	UR	4.2	UR	85	J	4.2	UR	4.2	UR	4.2	UR	4.2	UR
		SM-WMU-006-C	Y5RQ4	3/4/10	30	-	Process Waste	6.1	UR	6.1	UR	6.1	UR	6.1	UR	18	J	6.1	UR	6.1	UR	6.1	UR	6.1	UR
		SM-WMU-006-D	Y5RQ5	3/4/10	35	-	Process Waste	5.9	UR	5.9	UR	5.9	UR	5.9	UR	310	J	5.9	UR	5.9	UR	5.9	UR	5.9	UR
		SM-WMU-006-E	Y5RQ6	3/4/10	44	-	Native	4.2	UR	4.2	UR	4.2	UR	4.2	UR	24	J	4.2	UR	4.2	UR	4.2	UR	4.2	UR
WMU-007		SM-WMU-007-A	Y5RQ7	3/4/10	Surface		Process Waste	4.5	UR	4.5	UR	4.5	UR	4.5	UR	64	J	4.5	UR	4.5	UR	4.5	UR	4.5	UR
		SM-WMU-007-B	Y5RQ8	3/4/10	5		Process Waste	3.8	UR	3.8	UR	3.8	UR	3.8	UR	18	J	3.8	UR	3.8	UR	3.8	UR	3.8	UR
WMU-008		SM-WMU-008-A	Y5RR2	3/4/10	Surface		Process Waste	5.3	UR	5.3	UR	5.3	UR	5.3	UR	94	J	5.3	UR	5.3	UR	5.3	UR	5.3	UR
		SM-WMU-008-B	Y5RR3	3/4/10	5		Process Waste	4.5	UR	4.5	UR	4.5	UR	4.5	UR	53	J	4.5	UR	4.5	UR	4.5	UR	4.5	UR
WMU-009		SM-WMU-009-A	Y5RR7	3/5/10	Surface		Process Waste	5	U	5	U	5	U	5	U	18		5	U	5	U	5	U	5	U
		SM-WMU-009-B	Y5RR8	3/5/10	5		Process Waste	5	U	5	U	5	U	5	U	22	J	5	U	5	U	5	U	5	U

Notes:

Units are in µg/kg

bgs = below ground surface
A/C = asphalt/concrete

Data Qualifiers (Q):

U = The analyte was analyzed for, but was not detected at a level greater than or equal to the detection limit listed in this table.
J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (because quality control criteria were not met, or the concentration of the analyte was below the reporting limit).
UJ = The analyte was not detected at a level greater than or equal to the detection limit. The reported detection limit is approximate.
R = The data did not meet quality control criteria and are rejected as unusable. The analyte may or may not be present in the sample

TABLE 7
Dioxin and Furan Analytical Results, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	2,3,7,8-TCDD Result	Q	2,3,7,8-TCDF Result	Q	1,2,3,7,8-PeCDF Result	Q	1,2,3,7,8-PeCDD Result	Q	2,3,4,7,8-PeCDF Result	Q	1,2,3,4,7,8-HxCDF Result	Q	1,2,3,6,7,8-HxCDF Result	Q	1,2,3,4,7,8-HxCDD Result	Q	1,2,3,6,7,8-HxCDD Result	Q	1,2,3,7,8,9-HxCDD Result	Q	2,3,4,6,7,8-HxCDF Result	Q	1,2,3,7,8,9-HxCDF Result	Q	1,2,3,4,6,7,8-HpCDF Result	Q	1,2,3,4,6,7,8-HpCDD Result	Q	1,2,3,4,7,8,9-HpCDF Result	Q	OCDD Result	Q	OCDF Result	Q	Effective 2,3,7,8-TCDD Concen-tration
WHO 2005 TEF							**1**		**0.1**		**0.03**		**1**		**0.3**		**0.1**		**0.1**		**0.1**		**0.1**		**0.1**		**0.1**		**0.1**		**0.01**		**0.01**		**0.01**		**0.0003**		**0.0003**		
Smelter Parcel - Southeast and Process Area																																								
SPS-002		SM-SPS-002-A	3/9/10	Surface	-	Process Waste	2	J	30	J	47.4	J	10.7	J	89.9	J	304	J	124	J	12.6	J	37.5	J	41.1	J	130	J	8.66	J	594	J	242	J	91.3	J	677	J	694	J	119.56
	Dup	SM-SPS-102-A	3/9/10	Surface	-	Process Waste	2.11	J	37.7	J	25.6	J	9.39	J	50.3	J	74.8	J	50.1	J	9.37	J	59.1	J	39.1	J	73.2	J	1.68	J	221	J	521	J	16.5	J	1,680	J	140	J	69.99
		SM-SPS-002-B	3/9/10	5	-	Process Waste	2.53	J	157	J	159	J	9.45	J	94.6	J	301	J	89.7	J	8.27	J	28.1	J	27.7	J	46.6	J	2.42	J	184	J	265	J	9.2	J	931	J	33	J	116.08
	Dup	SM-SPS-102-B	3/9/10	5	-	Process Waste	4.57	J	285	J	188	J	29	J	188	J	222	J	106	J	14.6	J	49	J	60.1	J	84.7	J	6.53	J	246	J	212	J	29.5	J	231	J	78.2	J	183.37
		SM-SPS-002-C	3/9/10	10	-	Process Waste	0.248	J	0.36	J	0.319	UJ	0.165	UJ	0.051	UJ	0.219	J	0.158	UJ	0.052	UJ	0.137	J	0.121	J	0.141	UJ	0.173	UJ	0.177	UJ	0.162	UJ	0.103	UJ	0.097	UJ	0.104	J	0.33
	Dup	SM-SPS-102-C	3/9/10	10	-	Process Waste	0.038	UJ	0.312	J	0.0721	UJ	0.036	UJ	0.107	J	0.0796	UJ	0.0585	UJ	0.0414	UJ	0.0717	UJ	0.12	UJ	0.0662	J	0.0302	J	0.106	UJ	0.422	J	0.031	UJ	2	J	0.172	UJ	0.08
		SM-SPS-002-D	3/9/10	14	-	Process Waste	0.164	J	0.409	J	0.053	UJ	0.218	UJ	0.051	UJ	0.4	J	0.028	UJ	0.198	UJ	0.402	UJ	0.347	UJ	0.027	UJ	0.143	J	0.033	UJ	0.056	UJ	0.174	J	9.9	J	0.823	J	0.26
		SM-SPS-002-E	3/9/10	18	-	Native	0.133	J	0.198	J	0.062	UJ	0.069	UJ	0.059	UJ	0.236	J	0.029	UJ	0.153	UJ	0.15	J	0.15	J	0.028	UJ	0.158	J	0.022	UJ	0.236	UJ	0.127	J	0.039	UJ	0.204	J	0.22
	Dup	SM-SPS-102-E	3/9/10	18	-	Native	0.03	UJ	0.252	UJ	0.0821	J	0.0749	J	0.154	UJ	0.021	UJ	0.113	J	0.026	UJ	0.0518	UJ	0.0617	J	0.132	J	0.022	UJ	0.032	UJ	0.224	J	0.044	UJ	1.54	J	0.031	UJ	0.11
SPS-004		SM-SPS-004-A	3/10/10	Surface	-	Process Waste	6.12	J	91.4	J	49.7	J	16	J	77.2	J	77.7	J	55.3	J	13.6	J	69.8	J	61.6	J	69.6	J	2.1	J	282	J	1790	J	19.4	J	13,400	J	412	J	115.94
		SM-SPS-004-B	3/10/10	5	-	Burn Dump	1.05	J	14	J	20.4	J	5.27	J	25.8	J	47.4	J	33.2	J	4.72	J	8.58	J	14.6	J	32.4	J	1.56	J	195	J	140	J	14.3	J	870	J	141	J	34.11
		SM-SPS-004-C	3/10/10	10	-	Burn Dump	0.225	J	0.429	J	0.029	UJ	0.037	UJ	0.028	UJ	0.541	J	0.032	UJ	0.041	UJ	1.67	J	0.62	J	0.033	UJ	0.208	UJ	5.27	J	82.3	J	0.301	UJ	812	J	19.6	J	1.68
		SM-SPS-004-D	3/10/10	14	-	Native	0.36	UJ	0.46	UJ	0.3	UJ	0.35	UJ	0.23	UJ	0.31	UJ	0.32	UJ	0.29	UJ	0.31	UJ	0.757	J	0.34	UJ	0.49	UJ	0.27	UJ	0.4	UJ	0.41	UJ	0.7	UJ	0.78	UJ	0.08
SPS-010		SM-SPS-010-A	3/10/10	Surface	-	Process Waste	0.43	UJ	5.13	J	8.52	J	4.73	J	23.3	J	40.2	J	29.3	J	6	J	9.73	J	16.8	J	41.7	J	1.6	UJ	148	J	88.7	J	36.6	J	293	J	234	J	29.75
		SM-SPS-010-B	3/10/10	5	-	Process Waste	1.89	J	5.42	J	7.02	J	4.87	J	10	J	16.6	J	10.3	J	1.1	J	10	J	8.05	J	10.8	J	1.5	UJ	60.3	J	40.1	J	9.88	J	138	J	104	J	17.37
		SM-SPS-010-C	3/10/10	10	-	Burn Dump	3.36	J	17.8	J	22.8	J	12.5	J	28.1	J	68.7	J	37.3	J	3.32	J	19.6	J	18.1	J	24.1	J	1.8	UJ	144	J	129	J	21.6	J	360	J	206	J	46.98
		SM-SPS-010-D	3/10/10	14.5	-	Native	0.28	UJ	0.39	UJ	0.21	UJ	0.42	UJ	0.19	UJ	0.33	UJ	0.28	UJ	0.25	UJ	0.24	UJ	0.24	UJ	0.26	UJ	0.41	UJ	0.3	UJ	0.6	UJ	0.46	UJ	1	UJ	0.68	UJ	-
SPS-012		SM-SPS-012-A	3/9/10	Surface	-	Process Waste	3.07	J	29.8	J	53.3	J	24	J	114	J	292	J	126	J	36.1	J	60.5	J	120	J	162	J	2.7	UJ	498	J	526	J	79.9	J	972	J	554	J	157.01
		SM-SPS-012-B	3/9/10	5	-	Process Waste	0.35	UJ	23.3	J	45.1	J	23.2	J	79	J	125	J	88.9	J	6.41	J	19.6	J	32.3	J	68.9	J	2.7	UJ	241	J	98.4	J	30.7	J	254	J	206	J	88.53
		SM-SPS-012-C	3/9/10	10	-	Process Waste	3.9	J	26.1	J	34.6	J	17.7	J	57.4	J	159	J	118	J	6.84	J	30.3	J	29.4	J	84.7	J	6.2	UJ	486	J	183	J	48.1	J	603	J	372	J	92.76
		SM-SPS-012-D	3/9/10	18.5	-	Process Waste	0.44	UJ	0.74	J	1.3	UJ	0.42	UJ	0.868	UJ	1.7	UJ	1.35	UJ	0.71	UJ	0.76	UJ	0.74	UJ	1.02	UJ	2.4	UJ	4.83	J	2.67	J	0.61	UJ	12.2	J	0.8	UJ	0.15
		SM-SPS-012-E	3/9/10	24.5	-	Native	0.19	UJ	0.24	UJ	0.614	J	0.28	UJ	0.27	UJ	0.4	UJ	0.35	UJ	0.37	UJ	0.42	UJ	0.4	UJ	0.34	UJ	0.47	UJ	0.829	UJ	1.48	J	1.02	UJ	1.1	UJ	2.81	UJ	0.03
SPS-014		SM-SPS-014-A	3/10/10	0.5	Concrete	Gen Fill	0.59	UJ	17.4	J	10.9	J	2.91	J	26.3	J	64.3	J	21.7	J	3.77	J	11.5	J	9.71	J	30.2	J	2.2	UJ	121	J	347	J	11.4	J	4,100	J	217	J	33.07
		SM-SPS-014-B	3/10/10	5	-	Burn Dump	6.78	J	70.9	J	70.3	J	23	J	103	J	403	J	123	J	18.9	J	51	J	62	J	163	J	3.4	UJ	807	J	679	J	62	J	1,830	J	498	J	168.15
		SM-SPS-014-C	3/10/10	10	-	Burn Dump	1.44	J	21.7	J	13.3	J	3.46	J	17.5	J	29.7	J	13.1	J	1.89	UJ	8.18	J	8.82	J	16.1	J	0.6	J	57.2	J	197	J	2.34	J	1,680	J	39	J	23.45
		SM-SPS-014-D	3/10/10	14.5	-	Native	0.26	UJ	0.32	UJ	0.32	UJ	0.27	UJ	0.25	UJ	0.25	UJ	0.25	UJ	0.25	UJ	0.24	UJ	0.24	UJ	0.28	UJ	0.34	UJ	0.23	UJ	0.47	UJ	0.38	UJ	0.82	UJ	0.36	UJ	-
SPS-016		SM-SPS-016-A	3/10/10	0.5	Concrete	Gen Fill	0.56	UJ	69.6	J	66.7	J	12.9	J	170	J	429	J	157	J	10.4	J	23.6	J	36.5	J	185	J	2.6	UJ	408	J	256	J	38.9	J	1,050	J	293	J	164.44
		SM-SPS-016-B	3/10/10	5	-	Burn Dump	3.75	J	61.7	J	44	J	14.3	J	93.9	J	220	J	69.2	J	10.1	J	29.6	J	34.2	J	85.4	J	3.2	UJ	285	J	416	J	17.4	J	1,940	J	150	J	106.37
		SM-SPS-016-C	3/10/10	10	-	Burn Dump	2.89	J	28.6	J	19.6	J	8.93	J	38.4	J	93.1	J	32.8	J	6.6	J	21	J	30.3	J	52.3	J	2.5	UJ	155	J	290	J	10.3	J	911	J	56.5	J	55.24
		SM-SPS-016-D	3/10/10	14.5	-	Native	0.24	J	0.043	UJ	0.083	UJ	0.144	UJ	0.061	UJ	0.31	UJ	0.188	UJ	0.101	UJ	0.068	UJ	0.247	UJ	0.071	UJ	0.086	UJ	0.059	UJ	0.069	UJ	0.206	UJ	0.089	UJ	0.052	UJ	0.24
SPS-020		SM-SPS-020-A	3/8/10	0.5	Concrete	Burn Dump	0.38	UJ	2.62	J	2.08	J	0.58	UJ	4.81	J	3.63	J	3.37	J	0.325	UJ	0.778	UJ	1.32	UJ	4.85	J	1.7	UJ	14.3	J	29.4	J	1.3	UJ	242	J	24.3	J	3.47
		SM-SPS-020-B	3/8/10	5	-	Burn Dump	1.91	J	23	J	14.9	J	5.46	J	33.3	J	71.5	J	23.3	J	2.94	J	9.46	J	11.6	J	32.1	J	1.3	UJ	93.3	J	77.3	J	6.31	J	292	J	40.3	J	37.07
		SM-SPS-020-C	3/8/10	10	-	Burn Dump	2.76	J	37.5	J	16.6	J	7.63	J	27.4	J	53.2	J	18.4	J	5.48	J	17.4	J	25.6	J	22.9	J	1.4	UJ	77.5	J	367	J	5.65	J	1,400	J	57.8	J	42.09
		SM-SPS-020-D	3/8/10	15	-	Burn Dump	0.87	J	6.92	J	3.71	J	2.86	J	5.77	J	11.6	J	4.64	J	0.05	UJ	12	J	11.6	J	6.53	J	0.494	J	42.9	J	264	J	0.13	UJ	3,920	J	1,000	J	15.50
		SM-SPS-020-E	3/8/10	19.5	-	Native	0.0376	UJ	0.132	J	0.0597	J	0.0532	J	0.0801	UJ	0.024	UJ	0.0577	J	0.025	UJ	0.0667	J	0.154	J	0.0569	UJ	0.0465	UJ	0.021	UJ	0.578	J	0.027	UJ	5.44	J	0.041	UJ	0.10

TABLE 7

Dioxin and Furan Analytical Results, Smelter Parcel and Waste Management Areas

Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	2,3,7,8-TCDD Result	Q	2,3,7,8-TCDF Result	Q	1,2,3,7,8-PeCDF Result	Q	1,2,3,7,8-PeCDD Result	Q	2,3,4,7,8-PeCDF Result	Q	1,2,3,4,7,8-HxCDF Result	Q	1,2,3,6,7,8-HxCDF Result	Q	1,2,3,4,7,8-HxCDD Result	Q	1,2,3,6,7,8-HxCDD Result	Q	1,2,3,7,8,9-HxCDD Result	Q	2,3,4,6,7,8-HxCDF Result	Q	1,2,3,7,8,9-HxCDF Result	Q	1,2,3,4,6,7,8-HpCDF Result	Q	1,2,3,4,6,7,8-HpCDD Result	Q	1,2,3,4,7,8,9-HpCDF Result	Q	OCDD Result	Q	OCDF Result	Q	Effective 2,3,7,8-TCDD Concen-tration
WHO 2005 TEF							**1**		**0.1**		**0.03**		**1**		**0.3**		**0.1**		**0.1**		**0.1**		**0.1**		**0.1**		**0.1**		**0.1**		**0.01**		**0.01**		**0.01**		**0.0003**		**0.0003**		
Waste Disposal Area																																								
WDA-001		SM-WDA-001-A	3/5/10	Surface		Process Waste	0.248	J	1.97	J	2.31	J	1.12	J	3.95	J	5.26	J	4.97	J	0.042	UJ	2.85	J	3.82	J	5.65	J	0.448	J	24.5	J	39.7	J	0.031	UJ	235	J	40.3	J	5.84
		SM-WDA-001-B	3/5/10	5	-	Process Waste	5.01	J	28.8	J	43.6	J	23.3	J	85.9	J	86.4	J	97	J	22.2	J	48.7	J	72.3	J	118	J	7.88	J	377	J	297	J	57.6	J	496	J	318	J	111.08
WDA-002		SM-WDA-002-A	3/5/10	Surface		Process Waste	0.163	J	0.908	J	1.38	J	0.566	J	2.27	J	6.44	J	2.96	J	0.031	UJ	2.03	J	2.13	J	2.78	J	0.248	J	13.8	J	28.2	J	0.047	UJ	189	J	23.5	J	3.68
		SM-WDA-002-B	3/5/10	5	-	Process Waste	0.608	J	5.03	J	9.27	J	4.32	J	18.8	J	21.5	J	20.8	J	5.33	J	10.3	J	15.5	J	27.3	J	1.79	J	88.7	J	77.1	J	12.8	J	215	J	86.9	J	23.48
WDA-003		SM-WDA-003-A	6/29/10	Surface		Process Waste	0.522	J	3.1	J	5.12	J	2.53	J	10.1	J	13.2	J	14.4	J	0.038	UJ	6.18	J	8.34	J	15.8	J	1.06	J	75.4	J	59.9	J	8.8	J	319	J	197	J	14.04
		SM-WDA-003-B	6/29/10	5	-	Process Waste	1.9	J	7.65	J	14.2	J	7.63	J	24.9	J	32.4	J	33.8	J	5.99	J	16.1	J	20.8	J	34.7	J	2.65	J	143	J	97.1	J	20.4	J	192	J	158	J	35.55
WDA-004		SM-WDA-004-A	3/5/10	Surface		Process Waste	0.245	J	1.45	J	2.51	J	1.03	J	4.22	J	5.5	J	5.35	J	1.03	UJ	2.47	J	3.41	J	5.43	J	0.532	J	20.7	J	18.2	J	0.081	UJ	46.8	J	23.9	J	5.44
		SM-WDA-004-B	3/5/10	5	-	Process Waste	0.108	UJ	0.54	J	0.709	J	0.33	J	1.37	J	0.032	UJ	1.52	J	0.025	UJ	0.64	J	0.825	J	1.73	J	0.174	J	7.85	J	4.13	J	0.033	UJ	13.2	J	13.9	J	1.43
WDA-005		SM-WDA-005-A	3/5/10	Surface		Process Waste	0.208	J	1.17	J	2.04	J	0.95	J	3.67	J	6.07	J	5.52	J	0.029	UJ	2.82	J	3.35	J	5.88	J	0.427	UJ	33.6	J	37.5	J	0.052	UJ	335	J	88.4	J	5.64
	Dup	SM-WDA-105-A	3/5/10	Surface		Process Waste	0.221	J	1.13	J	1.98	J	0.93	J	3.4	J	0.059	UJ	5.03	J	0.041	UJ	2.67	J	3.14	J	5.38	J	0.423	J	39.8	J	33.8	J	0.05	UJ	295	J	156	J	4.88
		SM-WDA-005-B	3/5/10	5	-	Process Waste	0.29	J	1.49	J	2.98	J	1.25	J	4.87	J	9.71	J	10	J	0.024	UJ	3.48	J	4.21	J	8.23	J	0.624	J	44.6	J	36.7	J	4.73	J	260	J	88.3	J	7.83
	Dup	SM-WDA-105-B	3/5/10	5	-	Process Waste	0.311	J	1.95	J	3.39	J	1.59	J	6.49	J	8.53	J	9.94	J	0.044	UJ	4.49	J	5.85	J	10.9	J	0.708	J	62.1	J	60.8	J	7.27	J	451	J	131	J	9.66
WDA-006		SM-WDA-006-A	3/11/10	Surface		Process Waste	0.0699	J	0.658	J	0.258	J	0.128	J	0.376	J	0.031	UJ	0.678	J	0.025	UJ	0.389	J	0.444	J	0.597	J	0.11	J	0.018	UJ	2.44	J	0.023	UJ	5.37	J	0.037	UJ	0.63
		SM-WDA-006-B	3/11/10	5	-	Process Waste	0.36	J	2.68	J	4.79	J	2.19	J	9.94	J	11.7	J	11.3	J	0.034	UJ	5.09	J	6.6	J	13	J	0.953	J	48.7	J	33.9	J	6.58	J	77.1	J	64	J	11.74
Waste Management Unit																																								
WMU-001		SM-WMU-001-A	3/3/10	Surface		Process Waste	8.42	J	28.2	J	54	J	33	J	101	J	258	J	146	J	24.1	J	48.7	J	83.2	J	166	J	5.01	J	580	J	404	J	75.9	J	852	J	676	J	160.32
		SM-WMU-001-B	3/3/10	6		Process Waste	2.68	J	13	J	21.8	J	11.4	J	52.2	J	136	J	51.5	J	13.9	J	24.1	J	29.4	J	65.8	J	3.4	UJ	283	J	181	J	43.8	J	396	J	374	J	69.07
WMU-002		SM-WMU-002-A	3/3/10	Surface		Process Waste	0.8	UJ	16	J	25.7	J	10.2	J	57.5	J	168	J	69.8	J	17.3	J	29.2	J	45.4	J	88.2	J	3.3	UJ	351	J	247	J	56.2	J	670	J	635	J	78.54
		SM-WMU-002-B	3/3/10	5		Process Waste	0.53	UJ	12.9	J	7.97	J	2.01	UJ	19	J	51.8	J	21.5	J	2.66	J	4.19	J	7.15	J	30.2	J	2.2	UJ	99.9	J	55.6	J	12.1	J	329	J	124	J	20.79
WMU-003		SM-WMU-003-A	3/3/10	Surface		Process Waste	0.74	UJ	24.5	J	34.9	J	18.1	J	85.9	J	242	J	103	J	21.5	J	40	J	64.5	J	129	J	5.4	UJ	488	J	324	J	69.4	J	889	J	866	J	116.71
		SM-WMU-003-B	3/3/10	5		Process Waste	0.64	UJ	2.75	J	4.68	J	1.93	J	8.89	J	22.4	J	9.7	J	0.865	J	3.61	J	4.57	J	9.17	J	1.7	UJ	30.5	J	37.2	J	4.43	J	226	J	40.8	J	10.85
WMU-004		SM-WMU-004-A	3/4/10	Surface		Process Waste	0.51	UJ	7.1	J	12.1	J	4.68	J	27	J	66.7	J	34.5	J	6.75	J	10.5	J	14	J	36.1	J	2.6	UJ	130	J	89.6	J	17	J	262	J	223	J	33.22
		SM-WMU-004-B	3/4/10	5		Process Waste	0.57	UJ	4.73	J	8.01	J	2.42	J	20	J	82	J	25.2	J	1.96	J	4.71	J	6.83	J	44.1	J	1.3	UJ	141	J	42.2	J	20.1	J	214	J	281	J	27.79
		SM-WMU-004-C	3/4/10	30	-	Process Waste	4.5	J	39.8	J	52.1	J	23.3	J	128	J	257	J	110	J	22.1	J	38.2	J	69.3	J	144	J	6.97	J	405	J	286	J	55	J	493	J	309	J	144.20
		SM-WMU-004-D	3/4/10	35	-	Process Waste	1.72	J	16.2	J	19.8	J	10.5	J	43.8	J	115	J	54.7	J	7.09	J	21.1	J	27.8	J	64.4	J	4.4	UJ	230	J	140	J	29.5	J	475	J	210	J	60.78
		SM-WMU-004-E	3/4/10	44	-	Native	0.28	UJ	0.681	UJ	0.34	UJ	0.3	UJ	0.29	UJ	0.474	UJ	0.5	UJ	0.35	UJ	0.38	UJ	0.36	UJ	0.43	UJ	0.79	UJ	0.29	UJ	0.36	UJ	0.41	UJ	0.69	UJ	1.48	UJ	-
WMU-005		SM-WMU-005-A	3/4/10	Surface		Process Waste	2.89	J	14.9	J	19.8	J	12.1	J	50.1	J	145	J	57.2	J	14.8	J	48.5	J	56.8	J	69.7	J	3.8	UJ	340	J	320	J	46.5	J	700	J	709	J	78.79
	Dup	SM-WMU-105-A	3/4/10	5		Process Waste	2.13	J	16.9	J	28.4	J	11.9	J	55.4	J	156	J	63.3	J	12.3	J	27.1	J	39.1	J	83.5	J	5.35	J	351	J	210	J	48.9	J	594	J	569	J	78.30
		SM-WMU-005-B	3/4/10	Surface		Process Waste	0.243	UJ	11.5	J	17.4	J	7.73	J	35.8	J	119	J	57	J	11.7	J	13	J	27.9	J	56.1	J	12	UJ	245	J	133	J	44.3	J	439	J	436	J	53.10
	Dup	SM-WMU-105-B	3/4/10	5		Process Waste	1.27	J	9.96	J	18.1	J	7.56	J	36.2	J	109	J	48.8	J	8.52	J	17.3	J	27.9	J	57.7	J	0.26	UJ	236	J	145	J	34.6	J	355	J	301	J	52.50
WMU-006		SM-WMU-006-A	3/4/10	Surface		Process Waste	1.31	J	23.7	J	37.7	J	18.5	J	84.6	J	271	J	114	J	28.3	J	51.2	J	90.2	J	148	J	5.91	J	613	J	492	J	94.5	J	1,090	J	1040	J	132.19
		SM-WMU-006-B	3/4/10	5		Process Waste	0.224	UJ	16.2	J	28	J	9.55	J	58.4	J	170	J	67.6	J	8.38	J	24.6	J	40.2	J	91.6	J	5.3	UJ	367	J	197	J	47.4	J	581	J	502	J	76.21
		SM-WMU-006-C	3/4/10	30	-	Process Waste	1.4	UJ	25.9	J	40.6	J	13.9	J	90.8	J	177	J	97.8	J	22.4	J	33.6	J	44.4	J	100	J	5.73	J	247	J	247	J	41.5	J	483	J	428	J	98.67
		SM-WMU-006-D	3/4/10	35	-	Process Waste	0.485	UJ	124	J	97.1	J	21.5	J	180	J	512	J	232	J	17.5	J	72.1	J	31.5	J	301	J	5.96	J	1280	J	484	J	141	J	1,940	J	1,690	J	228.16
		SM-WMU-006-E	3/4/10	44	-	Native	0.54	UJ	0.83	UJ	0.54	UJ	0.56	UJ	0.47	UJ	0.42	UJ	0.41	UJ	0.47	UJ	0.57	UJ	0.53	UJ	0.41	UJ	0.53	UJ	1.72	UJ	0.6	UJ	0.93	UJ	1	UJ	2.57	UJ	-
WMU-007		SM-WMU-007-A	3/4/10	Surface		Process Waste	0.73	UJ	7.31	J	11.9	J	1.6	UJ	27.7	J	74.7	J	33.5	J	8.35	J	11.6	J	21.7	J	39.5	J	3	UJ	152	J	89.1	J	19.3	J	221	J	251	J	31.08
		SM-WMU-007-B	3/4/10	5		Process Waste	0.26	UJ	1.23	J	1.26	J	0.77	UJ	3.72	J	13.7	J	4.99	J	1.2	UJ	1	UJ	1.84	J	6.29	J	1.3	UJ	22.3	J	11.3	J	4.02	J	46	J	55.1	J	4.37
WMU-008		SM-WMU-008-A	3/4/10	Surface		Process Waste	2.29	J	13.5	J	23.7	J	12.1	J	46.6	J	135	J	58.8	J	12.4	J	27.7	J	42.1	J	74.3	J	5.13	J	299	J	198	J	39.3	J	401	J	307	J	71.55
		SM-WMU-008-B	3/4/10	5		Process Waste	1.26	J	7.61	J	15.8	J	4.86	J	34	J	114	J	48.5	J	6.17	J	14.5	J	20.5	J	61	J	0.37	UJ	266	J	117	J	37.7	J	369	J	359	J	48.45

Notes:

Units are in ng/kg

bgs = below ground surface

WHO 2005 TEF = Word Health Organization 2005 Toxicity Equivalency Factor

A/C = asphalt/concrete

Data Qualifiers (Q):

U = The analyte was analyzed for, but was not detected at a level greater than or equal to the detection limit listed in this table.

J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (because quality control criteria were not met, or the concentration of the analyte was below the reporting limit).

UJ = The analyte was not detected at a level greater than or equal to the detection limit. However, the reported detection limit is approximate.

TABLE 8
TPH Analytical Results, Solid Matrix, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	TPH as Gasoline		TPH as Diesel		TPH as Motor Oil	
							Result	Q	Result	Q	Result	Q
Smelter Parcel - North Area												
SPN-002		SM-SPN-002-A	3/1/10	0.5	Concrete	Gen Fill	6.2	U	6	U	19	J
		SM-SPN-002-B	3/1/10	2	-	Burn Dump	5.5	U	11		350	
SPN-003		SM-SPN-003-A	3/1/10	Surface	-	Gen Fill	5	U	30		440	
	Dup	SM-SPN-103-A	3/1/10	Surface	-	Gen Fill	5.1	U	10		190	
		SM-SPN-003-B	3/1/10	2	-	Burn Dump	4.6	U	130		5,000	
	Dup	SM-SPN-103-B	3/1/10	2	-	Burn Dump	4.8	U	110	U	1,300	
Smelter Parcel - Parking Area												
SPP-003		SM-SPP-003-A	3/1/10	0.5	Asphalt	Gen fill	5.3	U	5.7	U	66	
		SM-SPP-003-B	3/1/10	2	-	Burn Dump	5.1	U	540	U	3,100	
SPP-004		SM-SPP-004-A	3/1/10	0.5	Asphalt	Gen fill	5.4	U	5.4	U	150	
		SM-SPP-004-B	3/1/10	2	-	Burn Dump	4.8	U	22		520	
Smelter Parcel - Southeast and Process Area												
SPS-002		SM-SPS-002-A	3/9/10	Surface	-	Process Waste	8.9	U	10	U	26	
	Dup	SM-SPS-102-A	3/9/10	Surface	-	Process Waste	8.9	U	3.5		24	
		SM-SPS-002-B	3/9/10	5	-	Process Waste	10	U	7.9	U	32	U
	Dup	SM-SPS-102-B	3/9/10	5	-	Process Waste	7.7	U	13	U	250	
		SM-SPS-002-C	3/9/10	10	-	Process Waste	9.4	U	7.5	U	30	U
	Dup	SM-SPS-102-C	3/9/10	10	-	Process Waste	9.2	U	4.6		30	U
		SM-SPS-002-D	3/9/10	14	-	Process Waste	6	U	6	U	16	
		SM-SPS-002-E	3/9/10	18	-	Native	6.1	U	6	U	24	U
	Dup	SM-SPS-102-E	3/9/10	18	-	Native	6.3	U	6	U	24	U
SPS-004		SM-SPS-004-A	3/10/10	Surface	-	Process Waste	6.4	U	64		450	
		SM-SPS-004-B	3/10/10	5	-	Burn Dump	8.1	U	28		170	
		SM-SPS-004-C	3/10/10	10	-	Burn Dump	6.7	U	41		240	
		SM-SPS-004-D	3/10/10	14	-	Native	6	U	6.1	U	24	U
SPS-006		SM-SPS-006-A	3/10/10	0.5	Concrete	Process Waste	7.9	U	8.7	U	410	
		SM-SPS-006-B	3/10/10	5	-	Process Waste	5.6	U	33		2,400	
		SM-SPS-006-C	3/10/10	14	-	Native	7.9	U	7.2	U	29	U
SPS-007		SM-SPS-007-A	3/2/10	0.5	Concrete	Gen Fill	5.1	U	3.2	J	38	
		SM-SPS-007-B	3/2/10	4.5	-	Gen Fill	5.3	U	7.7		69	
		SM-SPS-007-C	3/2/10	9.5	-	Native	5.6	U	840		140	
SPS-008		SM-SPS-008-A	3/10/10	0.5	Concrete	Gen Fill	4.9	U	7.7	U	220	
		SM-SPS-008-B	3/10/10	5	-	Gen Fill	5.4	U	14	U	320	
		SM-SPS-008-C	3/10/10	9.5	-	Native	4.6	U	18		55	
SPS-010		SM-SPS-010-A	3/10/10	Surface	-	Process Waste	6.1	U	14	U	150	
		SM-SPS-010-B	3/10/10	5	-	Process Waste	9.9	U	6.9	U	52	
		SM-SPS-010-C	3/10/10	10	-	Burn Dump	7	U	13		120	
		SM-SPS-010-D	3/10/10	14.5	-	Native	8.6	U	3.8		29	U
SPS-012		SM-SPS-012-A	3/9/10	Surface	-	Process Waste	6.1	U	130	U	2,800	
		SM-SPS-012-B	3/9/10	5	-	Process Waste	7.5	U	13	U	180	
		SM-SPS-012-C	3/9/10	10	-	Process Waste	9.8	U	14	U	300	
		SM-SPS-012-D	3/9/10	18.5	-	Process Waste	12	U	8.6	U	34	U
		SM-SPS-012-E	3/9/10	24.5	-	Native	7	U	6.8	U	17	
SPS-014		SM-SPS-014-A	3/10/10	0.5	Concrete	Gen Fill	4.7	U	390		3,800	
		SM-SPS-014-B	3/10/10	5	-	Burn Dump	6.1	U	97		1,600	
		SM-SPS-014-C	3/10/10	10	-	Burn Dump	7.3	U	7.2	U	26	
		SM-SPS-014-D	3/10/10	14.5	-	Native	5.3	U	5.6	U	22	U

TABLE 8
TPH Analytical Results, Solid Matrix, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	TPH as Gasoline		TPH as Diesel		TPH as Motor Oil	
							Result	Q	Result	Q	Result	Q
SPS-015		SM-SPS-015-A	3/2/10	0.5	Concrete	Process Waste	7.3	U	52		1,100	
	Dup	SM-SPS-115-A	3/2/10	0.5	-	Process Waste	6.3	U	170	U	450	
		SM-SPS-015-B	3/2/10	6	-	Burn Dump	5.3	U	830		480	
	Dup	SM-SPS-115-B	3/2/10	6	-	Burn Dump	4.8	U	550		510	
		SM-SPS-015-C	3/2/10	10	-	Gen Fill	5.9	U	7.9		32	
	Dup	SM-SPS-115-C	3/2/10	10	-	Gen Fill	5.7	U	21		340	
		SM-SPS-015-D	3/2/10	14.5	-	Native	7	U	6.8	U	27	U
	Dup	SM-SPS-115-D	3/2/10	14.5	-	Native	7.6	U	7	U	14	
SPS-016		SM-SPS-016-A	3/10/10	0.5	Concrete	Gen Fill	5.5	U	27	U	700	
		SM-SPS-016-B	3/10/10	5	-	Burn Dump	5.9	U	13		95	
		SM-SPS-016-C	3/10/10	10	-	Burn Dump	7.6	U	7.1	U	39	
		SM-SPS-016-D	3/10/10	14.5	-	Native	8.9	U	6.1	U	24	U
SPS-018		SM-SPS-018-A	3/2/10	0.5	Concrete	Process Waste	5.6	U	7.2		120	
		SM-SPS-018-B	3/2/10	4.5	-	Burn Dump	3.6	J	140		1,300	
		SM-SPS-018-C	3/2/10	9.5	-	Native	6.6	U	6.6	U	26	U
SPS-020		SM-SPS-020-A	3/8/10	0.5	Concrete	Burn Dump	4.7	U	30		410	
		SM-SPS-020-B	3/8/10	5	-	Burn Dump	4.8	U	110		1,800	
		SM-SPS-020-C	3/8/10	10	-	Burn Dump	5.8	U	6		21	
		SM-SPS-020-D	3/8/10	15	-	Burn Dump	9.2	U	7.8	U	31	U
		SM-SPS-020-E	3/8/10	19.5	-	Native	6	U	6	U	24	U
SPS-022		SM-SPS-022-A	3/8/10	0.5	Concrete	Burn Dump	5.1	U	24		510	
		SM-SPS-022-B	3/8/10	5	-	Burn Dump	6.7	U	14		150	
		SM-SPS-022-C	3/8/10	10	-	Burn Dump	7.5	U	12		42	
		SM-SPS-022-D	3/8/10	15	-	Burn Dump	11	U	33		280	
		SM-SPS-022-E	3/8/10	19.5	-	Native	6.1	U	5.8	U	23	U
SPS-024		SM-SPS-024-A	3/2/10	0.5	Concrete	Burn Dump	5.7	U	22		260	
		SM-SPS-024-B	3/2/10	3	-	Burn Dump	6	U	64		390	
		SM-SPS-024-C	3/2/10	9.5	-	Native	5.7	U	9.3	U	37	U
SPS-026		SM-SPS-026-A	3/2/10	0.5	Concrete	Process Waste	5.2	U	11	U	260	
		SM-SPS-026-B	3/2/10	5	-	Burn Dump	2.7	J	26		350	
		SM-SPS-026-C	3/2/10	10	-	Burn Dump	6.1	U	9.7	U	60	
		SM-SPS-026-D	3/2/10	16	-	Burn Dump	8.4	U	19		40	
		SM-SPS-026-E	3/2/10	19.5	-	Native	9.8	U	7.6	U	30	U
Waste Disposal Area												
WDA-001		SM-WDA-001-A	3/5/10	Surface		Process Waste	8	U	6.3	U	43	
		SM-WDA-001-B	3/5/10	5	-	Process Waste	6.4	U	6.8	U	85	
WDA-002		SM-WDA-002-A	3/5/10	Surface		Process Waste	7	U	6.6	U	50	
		SM-WDA-002-B	3/5/10	5	-	Process Waste	6.1	U	6.4	U	20	
WDA-003		SM-WDA-003-A	6/29/10	Surface		Process Waste	5.8	U	6.2	U	290	
		SM-WDA-003-B	6/29/10	5	-	Process Waste	7.8	U	6.8	U	30	
WDA-004		SM-WDA-004-A	3/5/10	Surface		Process Waste	9.9	U	14	U	500	
		SM-WDA-004-B	3/5/10	5	-	Process Waste	9.6	U	7.7	U	31	U
WDA-005		SM-WDA-005-A	3/5/10	Surface		Process Waste	6.1	U	6.1	U	38	
	Dup	SM-WDA-105-A	3/5/10	Surface		Process Waste	5.4	U	6	U	58	
		SM-WDA-005-B	3/5/10	5	-	Process Waste	5.7	U	12	U	170	
	Dup	SM-WDA-105-B	3/5/10	5	-	Process Waste	8	U	6.8	U	48	
WDA-006		SM-WDA-006-A	3/11/10	Surface		Process Waste	9.5	U	21	U	65	
		SM-WDA-006-B	3/11/10	5	-	Process Waste	8.8	U	6.8	U	16	

TABLE 8
TPH Analytical Results, Solid Matrix, Smelter Parcel and Waste Management Areas
Halaco Site Remedial Investigation, Oxnard, California

Location ID	Duplicate (Dup)	Sample ID	Sample Date	Depth (ft, bgs)	A/C at Surface	Material Type	TPH as Gasoline		TPH as Diesel		TPH as Motor Oil	
							Result	Q	Result	Q	Result	Q
Waste Management Unit												
WMU-001		SM-WMU-001-A	3/3/10	Surface		Process Waste	8.3	U	6.7	U	39	
		SM-WMU-001-B	3/3/10	6		Process Waste	7.6	U	6.6	U	41	
WMU-002		SM-WMU-002-A	3/3/10	Surface		Process Waste	8.9	U	7	U	82	
		SM-WMU-002-B	3/3/10	5		Process Waste	6.4	U	11	U	64	
		SM-WMU-002-C	3/3/10	30	-	Process Waste	5.7	J	8.7		22	
		SM-WMU-002-D	3/3/10	35	-	Process Waste	8.3	U	7.1	U	31	
		SM-WMU-002-E	3/3/10	44	-	Native	6.8	U	6.4	U	26	U
WMU-003		SM-WMU-003-A	3/3/10	Surface		Process Waste	8.7	U	14	U	110	
		SM-WMU-003-B	3/3/10	5		Process Waste	7.4	U	19	U	560	
WMU-004		SM-WMU-004-A	3/4/10	Surface		Process Waste	8.8	U	13	U	140	
		SM-WMU-004-B	3/4/10	5		Process Waste	11	U	6.9	U	120	
		SM-WMU-004-C	3/4/10	30	-	Process Waste	9	U	48		220	
		SM-WMU-004-D	3/4/10	35	-	Process Waste	8.3	U	28		190	
		SM-WMU-004-E	3/4/10	44	-	Native	8.1	U	7	U	28	U
WMU-005		SM-WMU-005-A	3/4/10	Surface		Process Waste	7.3	U	14		110	
	Dup	SM-WMU-105-A	3/4/10	5		Process Waste	8.4	U	6.7		71	
		SM-WMU-005-B	3/4/10	Surface		Process Waste	8.3	U	7.1	U	38	
	Dup	SM-WMU-105-B	3/4/10	5		Process Waste	7.3	U	6.7		84	
WMU-006		SM-WMU-006-A	3/4/10	Surface		Process Waste	9	U	16		230	
		SM-WMU-006-B	3/4/10	5		Process Waste	7.5	U	22		170	
		SM-WMU-006-C	3/4/10	30	-	Process Waste	6	J	15		99	
		SM-WMU-006-D	3/4/10	35	-	Process Waste	14	U	9.3	U	37	U
		SM-WMU-006-E	3/4/10	44	-	Native	7.4	U	6.9	U	28	U
WMU-007		SM-WMU-007-A	3/4/10	Surface		Process Waste	8	U	6.6	U	48	
		SM-WMU-007-B	3/4/10	5		Process Waste	11	U	32		440	
WMU-008		SM-WMU-008-A	3/4/10	Surface		Process Waste	8.6	U	12		140	
		SM-WMU-008-B	3/4/10	5		Process Waste	13	U	8.8	U	43	
		SM-WMU-008-C	3/4/10	30	-	Process Waste	17	U	7.4		53	
		SM-WMU-008-D	3/4/10	35	-	Process Waste	7.1	U	6.3	U	63	
		SM-WMU-008-E	3/4/10	44	-	Native	5.2	U	5.8	U	23	U
WMU-009		SM-WDA-009-A	3/5/10	Surface		Process Waste	9.5	U	16		150	
		SM-WDA-009-B	3/5/10	5		Process Waste	10	U	8.3	U	42	

Notes:

Units are in mg/kg

bgs = below ground surface

Data Qualifiers (Q):

U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the

TABLE 9

VOC Analytical Results, Soil Gas Matrix, Smelter Parcel and Waste Management Areas

Halaco Site Remedial Investigation, Oxnard, California

	Waste Management Unit				Smelter Parcel							
	Process Waste				Process Waste				Burn Dump Fill			General Fill
	SG-WSG-001-A 3/3/10 12:15	SG-WSG-001-C 3/3/10 10:33	SG-WSG-101-C 3/3/10 10:40	SG-WSG-002-C 3/4/10 8:40	SG-SSG-001-A 3/3/10 15:40	SG-SSG-002-A 3/3/10 14:05	SG-SSG-102-A 3/3/10 14:10	SG-SSG-003-A 3/4/10 11:35	SG-SSG-004-A 3/4/10 13:25	SG-SSG-005-A 3/4/10 14:45	SG-SSG-006-A 3/15/10 9:58	SG-SSG-007-A 3/15/10 11:37
Analyte	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q	Result Q
1,1,1-Trichloroethane	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
1,1,2,2-Tetrachloroethane	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
1,1,2-Trichloro-1,2,2-trifluoroethane	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
1,1,2-Trichloroethane	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
1,1-Dichloroethane	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
1,1-Dichloroethene	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	1.3 J	2.8	2.5	2.2 U
1,2,4-Trichlorobenzene	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
1,2,4-Trimethylbenzene	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.8	1 J	1 J	2.5 U	2.2 U
1,2-Dibromoethane (EDB)	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
1,2-Dichlorobenzene	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
1,2-Dichloroethane	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
1,2-Dichloropropane	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
1,2-Dichlorotetrafluoroethane	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
1,3,5-Trimethylbenzene	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
1,3-Dichlorobenzene	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
1,4-Dichlorobenzene	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
Benzene	1.9 U	20 U	20 U	20 U	1.9 U	3.3	3.3	2.3	5.2	5.1	3.9	2.2 U
Bromomethane	1.9 U	20 U	20 U	20 U	1.9 U	1.8 J	1.8 J	1.6 U	2 U	2 U	2.5 U	2.2 U
Carbon tetrachloride	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
Chlorobenzene	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
Chloroethane	1.9 U	20 U	20 U	20 U	1.9 U	2	2	1.3 J	2 U	2 U	2.4 J	2.2 U
Chloroform	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
Chloromethane	1.9 U	24	21	20 U	3	120	150	14	2 U	2 U	1.4 J	2.2 U
cis-1,2-Dichloroethene	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	38	3.8	2.8	2.2 U
cis-1,3-Dichloropropene	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
Dichloromethane	1.9 U	11 J	12 J	11 J	1.9 U	1.9 U	1.9 U	0.8 J	2 U	2 U	2.5 U	2.2 U
Ethylbenzene	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	1.8 J	2.2 U
Hexachlorobutadiene	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
m&p-Xylene	3.8 U	39 U	39 U	40 U	3.8 U	3.8 U	3.9 U	2.1 J	3.9 U	3.9 U	4.4 J	4.5 U
o-Xylene	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1 J	1.2 J	2 U	2.5 U	2.2 U
Styrene	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
Tetrachloroethene	3.1	20 U	20 U	20 U	1.4 J	1.9 U	1 J	6.8	110	1.8 J	2.9	3.6

TABLE 9

VOC Analytical Results, Soil Gas Matrix, Smelter Parcel and Waste Management Areas

Halaco Site Remedial Investigation, Oxnard, California

	Waste Management Unit				Smelter Parcel							
	Process Waste				Process Waste				Burn Dump Fill			General Fill
Analyte	SG-WSG-001-A 3/3/10 12:15 Result Q	SG-WSG-001-C 3/3/10 10:33 Result Q	SG-WSG-101-C 3/3/10 10:40 Result Q	SG-WSG-002-C 3/4/10 8:40 Result Q	SG-SSG-001-A 3/3/10 15:40 Result Q	SG-SSG-002-A 3/3/10 14:05 Result Q	SG-SSG-102-A 3/3/10 14:10 Result Q	SG-SSG-003-A 3/4/10 11:35 Result Q	SG-SSG-004-A 3/4/10 13:25 Result Q	SG-SSG-005-A 3/4/10 14:45 Result Q	SG-SSG-006-A 3/15/10 9:58 Result Q	SG-SSG-007-A 3/15/10 11:37 Result Q
Toluene	1.9 U	20 U	20 U	20 U	1.9 U	2.3	2.1	2.4	1 J	1.7 J	3.6	2.2 U
trans-1,3-Dichloropropene	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	2.2 U
Trichloroethene	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	28	1.2 J	2.1 J	2.2 U
Trichlorofluoromethane	1.9 U	20 U	20 U	20 U	1.9 U	1.9 U	1.9 U	1.6 U	2 U	2 U	2.5 U	100
Vinyl chloride	1.9 U	29	35	20 U	1.9 U	1.9 U	1.9 U	1.6 U	8.3	2.8	1.3 J	2.2 U
Tentatively Identified Compounds (TICs)												
Butane	44 J	3200 J	3700 J	1600 J	16 J	56 J	56 J	44 J	45 J	52 J	160 J	-
Butane, methyl-	-	740 J	940 J	370 J	-	-	-	-	16 J	16 J	65 J	-
Isobutane	8.6 J	760 J	930 J	570 J	-	-	-	-	-	16 J	55 J	-
Pentane	-	710 J	890 J	470 J	-	-	-	-	27 J	12 J	49 J	-
Propene, hexafluoro-	-	260 J	-	2000 J	8.3 J	72 J	84 J	57 J		-	-	-
Pentane, methyl-	-	-	290 J	140 J	-	-	-	-	-	-	-	-
Cyclopropane, dimethyl-, cis-	-	-	-	130 J	-	-	-	-	-	-	-	-
Acetonitrile	-	-	-	-	-	-	-	30 J	-	-	-	-
Total hydrocarbon	-	-	-	-	-	-	-	-	100 J	88 J	150 J	-
unknown hydrocarbon (01)	-	-	-	-	-	-	-	-	14 J	11 J	9.5 J	-
unknown hydrocarbon (02)	-	-	-	-	-	-	-	-	15 J	17 J	-	-
unknown hydrocarbon (03)	-	-	-	-	-	-	-	-	12 J	14 J	-	-
Cyclohexane, tetramethyl-	-	-	-	-	-	-	-	-	-	-	9.5 J	-
Cyclopentane, methyl-	-	-	-	-	-	-	-	-	-	-	9.6 J	-
Pentane, methyl- (01)	-	-	-	-	-	-	-	-	-	-	12 J	-
Pentane, methyl- (02)	-	-	-	-	-	-	-	-	-	-	25 J	-

Notes:

Units are in parts per billion by volume (ppbv)

ND = Not detected above the laboratory quantitation limit.
TIC = Tentatively Identified Compound. Identification and quantitation is considered tentative and presumptive.

Data Qualifiers (Q):

U = The analyte was analyzed for, but was not detected above the reported sample quantitation limit listed in the table.
J = The result is an estimated quantity. The reported concentration is below the quantitation limit.

TABLE 10

Non-VOC Analytical Results, Soil Gas Matrix, Smelter Parcel and Waste Management Areas

Halaco Site Remedial Investigation, Oxnard, California

Station ID	Sample ID	Sample Type	Depth (feet)	Sample Date	Summa Canister						Adsorbent Tube	Tedlar Bag
					Methane (%)	Carbon Dioxide (%)	Carbon Monoxide (%)	Acetylene (%)	Hydrogen (%)	Oxygen (%)	Ammonia (µg/L of air)	Hydrogen Sulfide (ppbv)
WASTE MANAGEMENT AREA												
Smelter Waste												
WSG-001	SG-WSG-001-A		5	3/3/10	ND<0.00022	0.087	ND<0.022	ND<0.0022	ND<0.022	15	ND<0.039	n/a
	SG-WSG-001-C		30	3/3/10	0.25	ND<0.021	ND<0.021	ND<0.0021	ND<0.021	2.2	287	n/a
	SG-WSG-101-C	Duplicate	30	3/3/10	0.26	ND<0.022	ND<0.022	ND<0.0022	ND<0.022	1.8	ND<0.039	n/a
WSG-002	SG-WSG-002-C		30	3/4/10	0.18	ND<0.022	ND<0.022	ND<0.0022	ND<0.022	2.1	ND<0.039	n/a
SMELTER PARCEL												
Smelter Waste												
SSG-001	SG-SSG-001-A		5	3/3/10	0.00046	ND<0.020	ND<0.020	ND<0.0020	ND<0.020	19	2.89	ND<4.0
SSG-002	SG-SSG-002-A		5	3/3/10	0.0016	ND<0.022	ND<0.022	ND<0.0022	ND<0.022	17	ND<0.039	ND<4.0
	SG-SSG-102-A	Duplicate	5	3/3/10	0.0019	ND<0.020	ND<0.020	ND<0.0020	ND<0.020	16	7.19	ND<4.0
SSG-003	SG-SSG-003-A		5	3/4/10	0.0024	ND<0.021	ND<0.021	ND<0.0021	0.028	7.6	102	ND<4.0
Burn Dump Fill												
SSG-004	SG-SSG-004-A		5	3/4/10	0.014	8.6	ND<0.021	ND<0.0021	ND<0.021	6.4	ND<0.039	2600
SSG-005	SG-SSG-005-A		5	3/4/10	0.016	6.1	ND<0.022	ND<0.0022	ND<0.022	2.4	ND<0.039	ND<4.1
SSG-006	SG-SSG-006-A		5	3/15/10	0.022	1.8	ND<0.023	ND<0.0023	ND<0.023	2.9	0.845	ND<4.0
General Fill												
SSG-007	SG-SSG-007-A		5	3/15/10	ND<0.00024	1.9	ND<0.024	ND<0.0024	ND<0.024	13	n/a	ND<4.0

Notes:

µg/L = microgram(s) per liter

n/a = not analyzed

ND = Not detected above the laboratory reporting limit.

ppbv - part(s) per billion by volume

TABLE 11

Metals Concentrations Detected in WMU Process Waste, Smelter Parcel Burn Dump Waste and Background Soils

Halaco Site Remedial Investigation, Oxnard, California

Area (samples)	Material	Depth (bgs)	Locations	Samples	Value	Magnesium	Aluminum	Iron	Calcium	Sodium	Barium	Potassium	Manganese	Copper	Zinc	Lead	Chromium	Nickel	Vanadium	Beryllium	Antimony	Arsenic	Cadmium	Cobalt	Silver	Selenium	Mercury	Thallium
Process Waste Fill - Waste Management Unit																												
WMU	Waste	0, 5, 30, and 35 feet	9	36	High	248,000	214,000	10,300	16,500	14,500	15,500	12,300	14,400	10,100	7,100	577	891	515	114	151	76.9	28.0	26.5	16.6	26.2	3.6	0.093	0.094
(WMU-1 through -9,					Median	119,500	94,850	6,685	4,775	4,425	4,145	3,790	3,245	2,530	2,120	297	244	116	59.3	20.5	11.8	5.9	5.7	5.6	5.1	2.4	0.040	0.031
A/B/C/D intervals)					Average	125,211	110,592	6,902	5,753	4,925	4,485	4,162	3,607	3,037	2,308	299	285	138	60.1	28.6	13.5	8.7	6.1	5.8	8.2	2.2	0.045	0.039
					Low	12,700	6,120	3,770	1,580	145	537	353	340	97.6	138	23.7	13.7	11.6	12.5	4.6	1.3	1.3	0.57	1.0	0.38	0.35	0.019	0.015
Burn Dump Fill - Smelter Parcel																												
Smelter Parcel	Burn	5 and 10 feet, except SPS-3 which is 10 and 15 feet	11	22	High	8,780	25,900	221,000	57,000	4,000	2,630	7,610	1,330	3,980	37,800	18,100	160	257	36.4	1.5	690.0	60.7	17.3	85.5	13.0	4.2	0.730	0.240
SPN-12, SPS-3,	Dump				Median	5,155	9,705	62,550	27,850	1,675	521	4,390	598	468	2,380	1,545	47	57	21.0	0.2	8.8	22.3	8.4	11.8	2.9	1.0	0.180	0.074
-4, -11, -13, -14,					Average	5,217	10,633	75,050	30,736	1,872	762	4,522	669	769	5,088	2,505	57	66	22.1	0.3	56.5	25.5	8.9	16.2	3.6	1.4	0.243	0.080
-16, -19, -22, -25,																												
-26, B/C/D intervals)					Low	2,280	3,870	17,300	12,900	565	279	1,600	238	220	1,090	442	21.2	26.3	12.4	0.025	2.4	9.8	3.3	5.9	0.76	0.67	0.022	0.028
Potential Background Soil Concentrations																												
Beach Dunes	Sand	Surface, 2 feet	14	14	High	1,780	1,790	6,200	10,100	482	148	433	92	3.7	12.1	3.4	14.5	4.3	32.8	0.11	0.16	2.2	0.11	1.5	ND	ND	0.060	0.090
and Wetlands					Median	1,040	1,460	4,020	5,130	188	33	356	49	2.3	8.9	1.8	4.2	3.7	5.7	0.08	0.08	1.6	0.08	1.1	ND	ND	0.026	0.031
(BBG-1A --> -6A)					Average	1,149	1,486	4,212	5,697	204	46	351	61	2.3	9.0	1.9	5.5	3.4	10.6	0.08	0.10	1.5	0.08	1.1	ND	ND	0.028	0.043
(WLE-1B--> -8B)					Low	643	965	2,570	2,650	62	10	238	35	1.4	6.0	0.9	2.1	2.3	3.4	0.06	0.08	0.9	0.04	0.7	ND	ND	0.011	0.019
NCL North	Silt and clay	Surface, 0.1 foot	9	12	High	4,910	8,640	16,100	6,220	1,100	137	3,540	282	18.6	64.2	12.2	15.4	15.9	28.8	0.49	0.33	2.9	0.76	6.0	8.3	0.80	0.051	0.210
(NNB-1A --> -6A)					Median	4,350	7,165	14,550	5,480	261	112	3,340	248	15.3	57.7	10.5	13.3	14.1	24.0	0.40	0.24	2.5	0.69	5.3	8.3	0.58	0.035	0.150
(NNL-1A-->3A)					Average	4,337	7,273	14,383	5,398	402	115	3,303	232	15.6	57.7	10.1	13.0	13.8	23.6	0.39	0.23	2.5	0.68	5.2	8.3	0.58	0.031	0.139
(NNL-1B-->3B)					Low	3,550	6,080	12,700	4,590	153	102	2,980	131	13.7	52.0	7.5	10.9	11.3	20.0	0.33	0.15	2.2	0.62	4.3	8.3	0.44	0.015	0.087
NCL North/East	Silt and clay	2 feet	8	8	High	8,140	12,800	23,000	27,200	6,470	146	3,880	399	19.5	59.2	8.1	15.4	20.6	30.3	0.59	0.30	3.9	0.87	8.2	0.2	0.76	0.052	0.230
(NNL-1C --> -4C)					Median	6,595	8,990	17,900	13,700	3,760	124	3,285	272	15.2	47.5	5.7	14.3	17.3	27.6	0.46	0.21	3.4	0.66	6.7	0.2	0.48	0.022	0.200
(NEL-53C --> 54C)					Average	6,679	9,331	18,350	15,159	3,705	123	3,326	298	15.2	49.0	6.0	14.2	17.1	27.3	0.47	0.20	3.3	0.71	6.5	0.2	0.52	0.029	0.200
(NEL-60C --> -61C)					Low	5,780	7,390	15,200	8,470	1,220	96	2,920	249	12.1	43.3	4.9	12.7	13.9	24.2	0.37	0.11	2.6	0.60	5.3	0.2	0.45	0.016	0.170
Sand[a]				20	95% UTL	1,900	2,000	6,500	11,000	1,100	135	510	104	3.4	13.3	3.4	14.0	4.3	32.8	0.13	0.79	2.7	0.14	1.6	NA	NA	0.11	0.10
Soil (Silt and Clay)[b]				20	95% UTL	8,430	12,100	22,300	27,200	9,550	149	3,910	399	20.2	69.7	14.4	17.0	21.2	32.5	0.60	0.37	4.0	0.87	8.1	NA	0.80	0.05	0.27
Ratio Between WMU Process Waste and Smelter Parcel Burn Dump Fill																												
					High	28	8.3	0.047	0.29	3.6	5.9	1.6	11	2.5	0.19	0.032	5.6	2.0	3.1	101	0.11	0.46	1.5	0.19	2.0	0.86	0.13	1.0
					Median	23	9.8	0.11	0.17	2.6	8.0	0.86	5.4	5.4	0.89	0.19	5.2	2.0	2.8	89	1.3	0.27	0.68	0.47	1.8	2.4	0.22	0.21
Ratio Between WMU Process Waste and Potential Background Soil Concentrations																												
Beach Dunes	Sand	Surface, 2 feet	14	14	Median	115	65	1.7	0.93	24	124	11	67	1100	238	165	58	31	10	247	142	3.7	71	5.0	NA	NA	1.6	1.0
NCL North	Silt/Clay	Surface, 0.1 foot	9	12	Median	27	13	0.5	0.87	17	37	1.1	13	166	37	28	18	8.2	2.5	51	50	2.4	8.3	1.0	0.61	4.1	1.1	0.21
NCL North/East	Silt/Clay	2 feet	8	8	Median	18	11	0.4	0.35	1.2	33	1.2	12	167	45	52	17	6.7	2.2	45	58	1.7	8.6	0.83	26	5.0	1.8	0.16

[a]Sand 95% UTL calculated from the 14 samples listed in this table and also the following 6 samples from the Integrated Assessment: SDB31 through SDB36.

[b]Soil 95% UTL calculated from the 20 samples listed in this table.

Notes:

Units are in mg/kg.

95% UTL = 95 Percent Upper Tolerance Limit

NA = not applicable

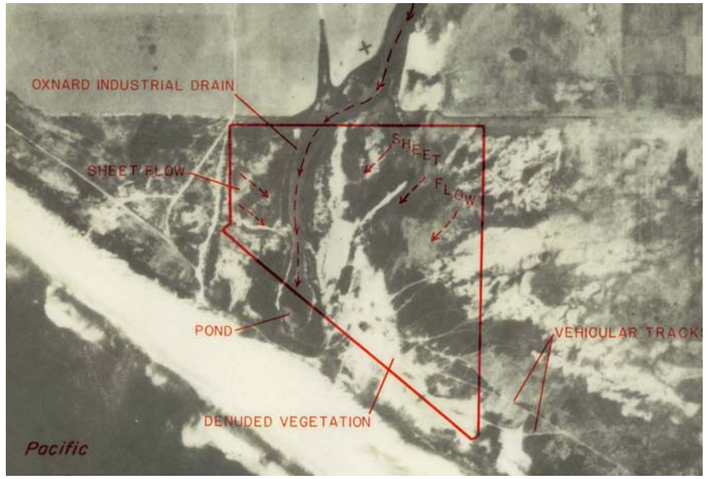
ND = not detected

Figures

Aerial image © Google Earth, 2007. Annotation by CH2M HILL, 2008.

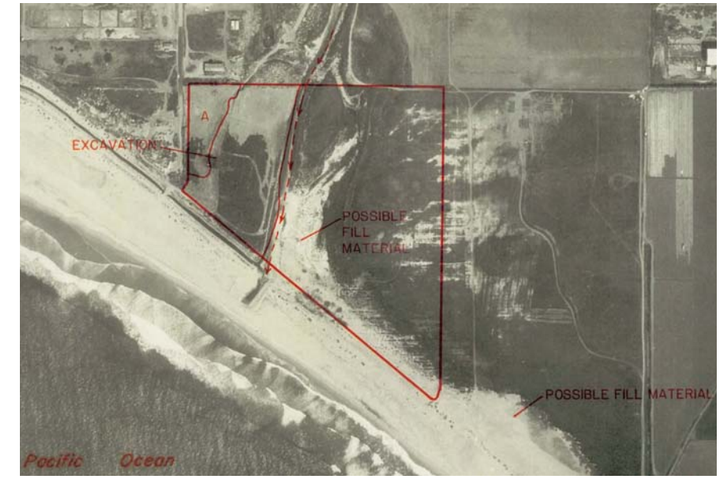
FIGURE 1a
Halaco Superfund Site Areas
Halaco Site Remedial Investigation
Oxnard, California

CH2MHILL

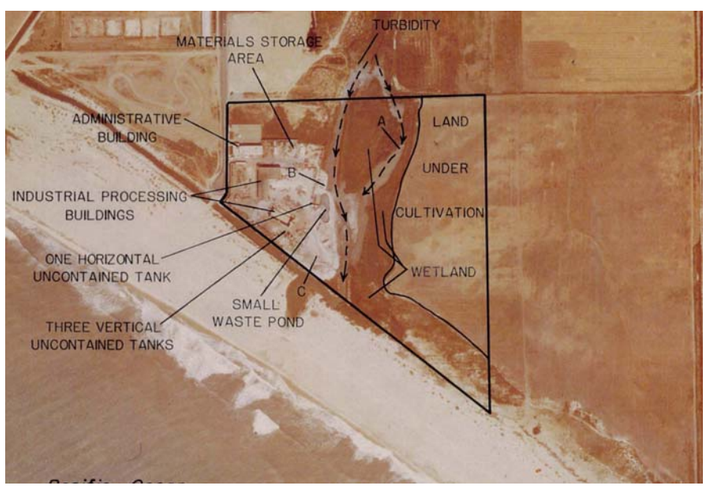


1929 – Predevelopment conditions

1959 – OID realigned, dump activities at smelter parcel

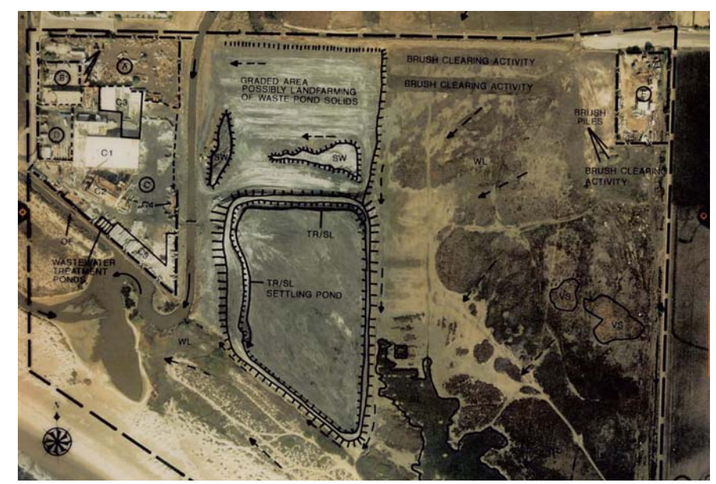


1965 – Preparation for Halaco smelter facilities



1969 – Halaco operations at smelter parcel with process waste discharge to OID and small pond

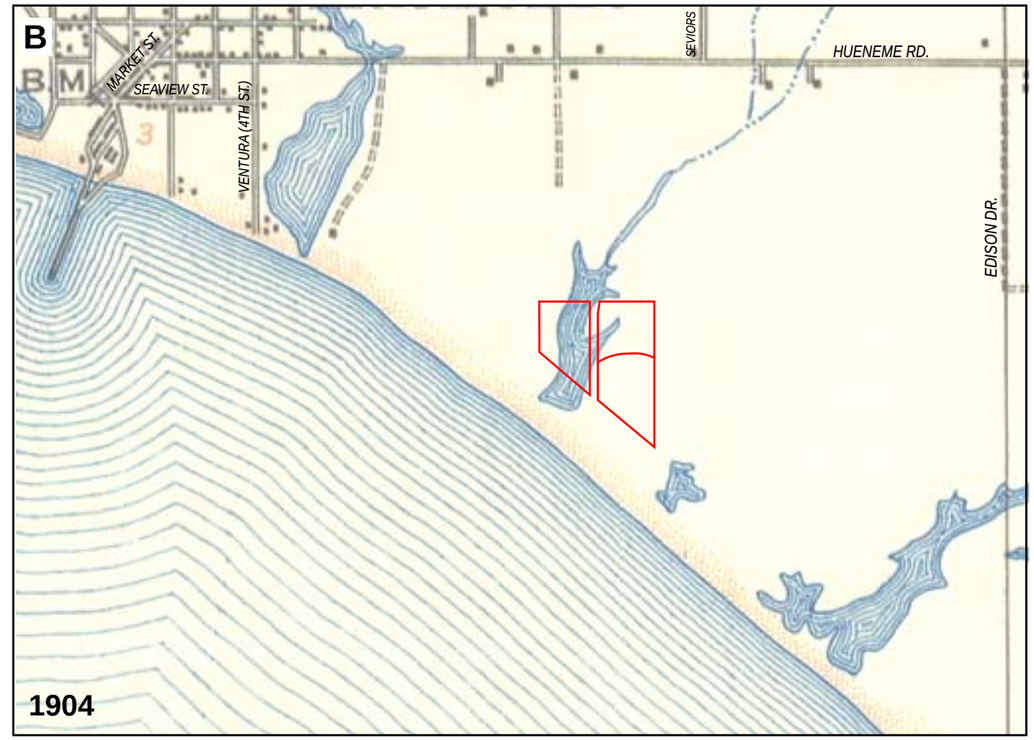
1971 – OID realigned, Halaco operations at smelter parcel with process waste discharged to WMU

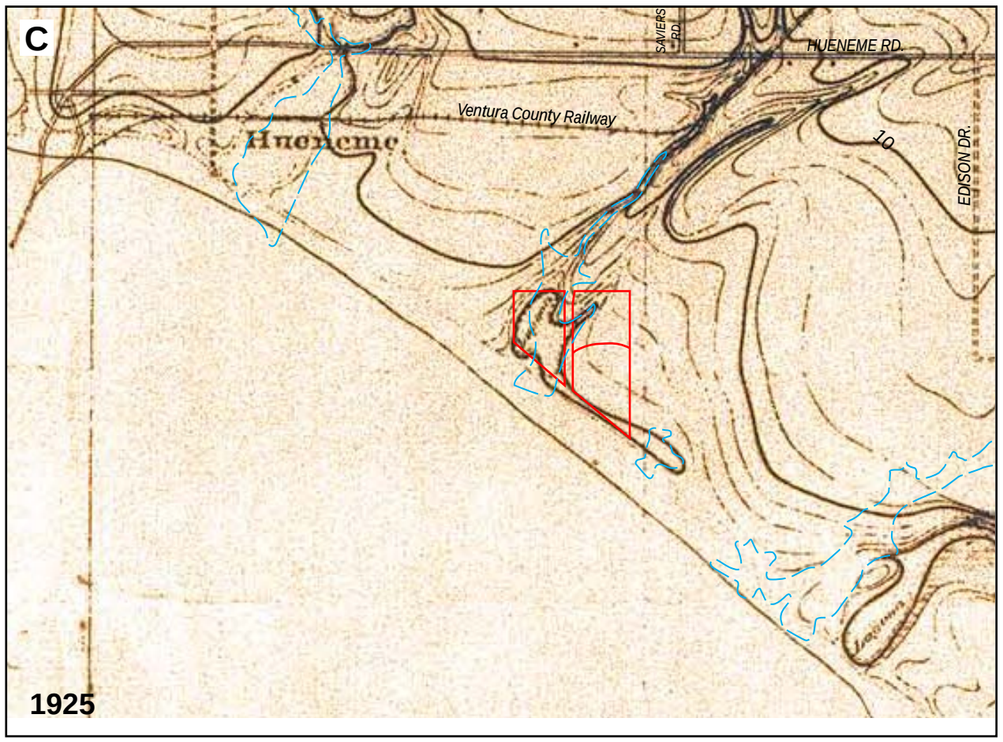


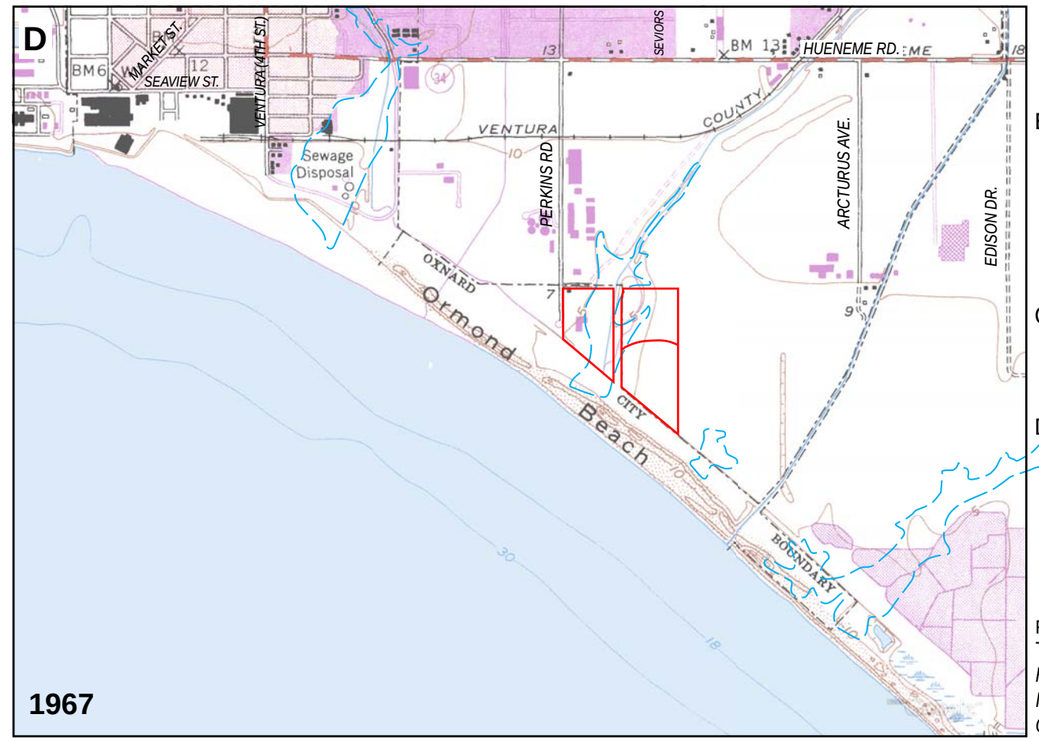
1991 – Halaco operations at smelter parcel with process waste discharged to WMU and WDA

FIGURE 1b
Aerial Photograph Chronology
Halaco Site Remedial Investigation
Oxnard, California

CH2MHILL







Legend:

Surface water features identified in 1855/1857 Coastal Survey (A) and 1904 USGS Topographic Map (B)

Halaco Site

A. US Coast Survey. River Santa Clara southward to Hueneme (1855) and Hueneme eastward to Point Mugu (1857).

B. US Geological Survey. Hueneme 15 minute Quadrangle (1904, Reprinted 1947). Annotated by CH2M HILL, 2007.

C. Ventura County. Topographic Map of the Oxnard Plain (1925).

D. US Geological Survey. Oxnard 7.5 minute Quadrangle (1949). Photo revised (1967). Annotated by CH2M HILL, 2007.

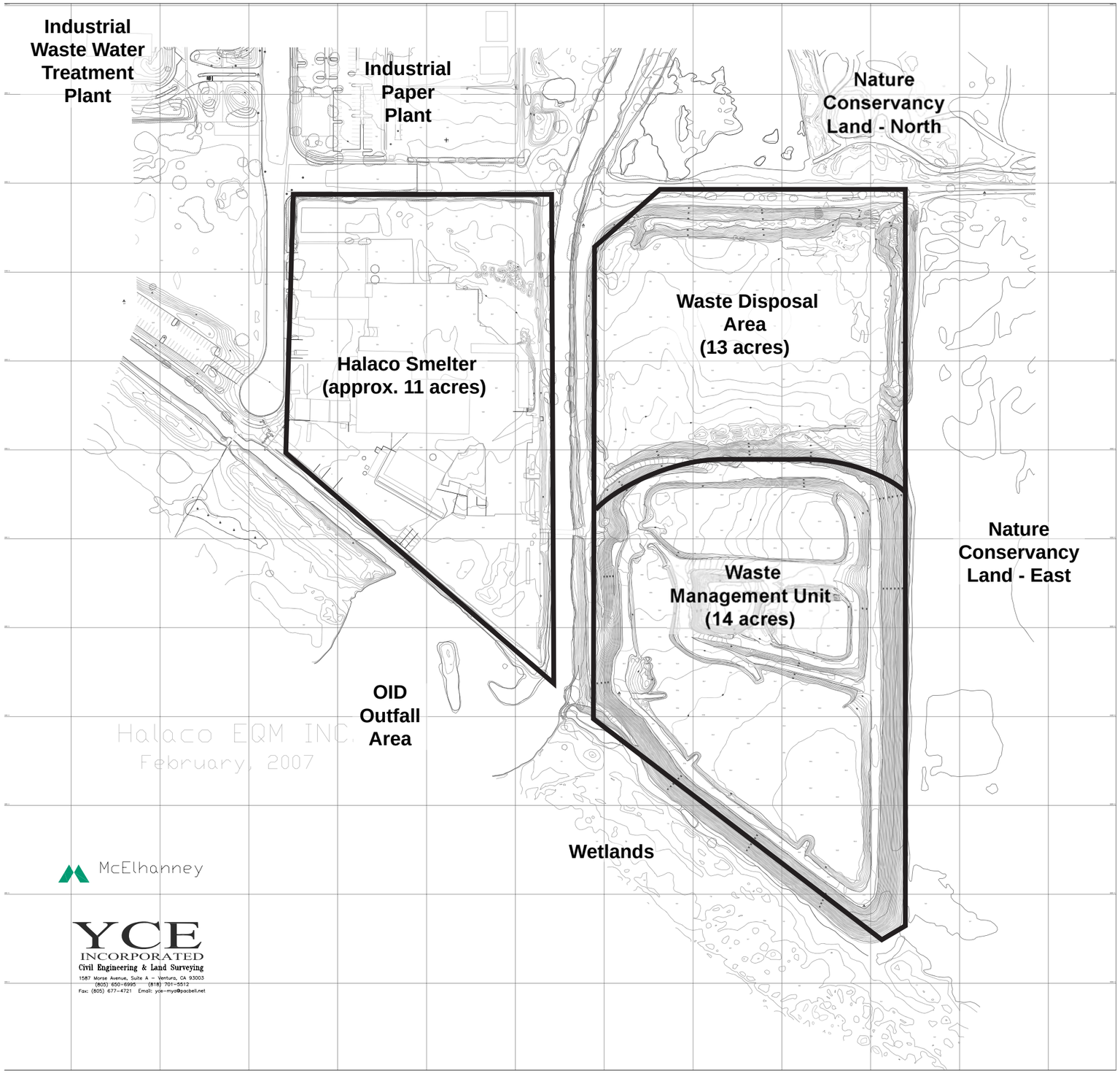
FIGURE 1c
Topographic Map Chronology
Halaco Site Remedial Investigation
Oxnard, California

FIGURE 1d
Aerial Photograph before EPA
Removal Action - February 2007
Halaco Site Remedial Investigation
Oxnard, California

FIGURE 1e
Aerial Photograph after
EPA Removal Action - April 2007
Halaco Site Remedial Investigation
Oxnard, California

CH2MHILL

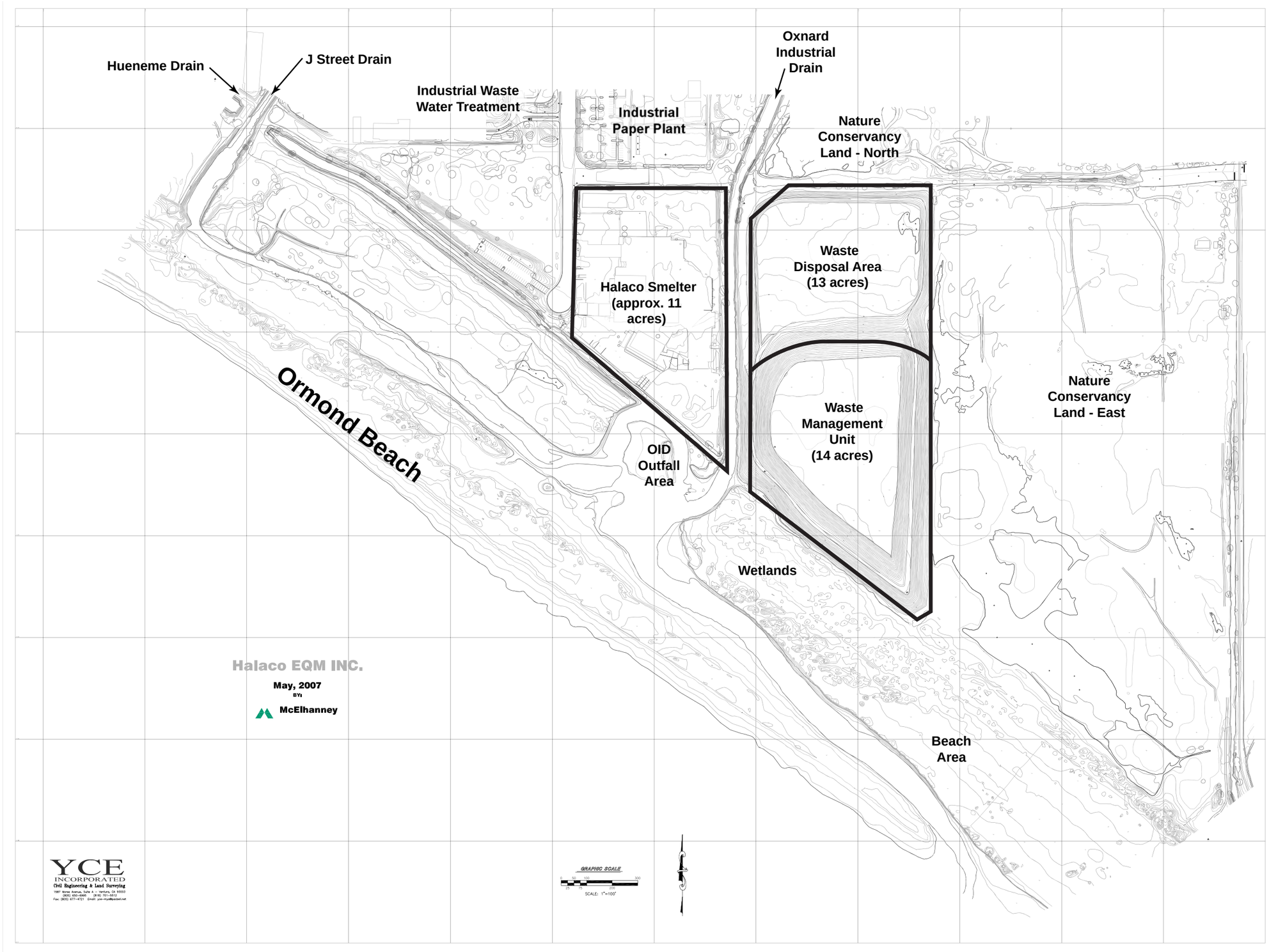
WBG110210203057SCO385135.DE.01 Halaco_aerialafter5.ai 8/11



Contour interval = 1 foot

FIGURE 1f
Topographic Map before EPA
Removal Action - February 2007
Halaco Site Remedial Investigation
Oxnard, California

CH2MHILL



Contour interval = 1 foot

FIGURE 1g
Topographic Map after EPA Removal Action - May 2007
Halaco Site Remedial Investigation
Oxnard, California

FIGURE 1h
Overview of Halaco Operations,
Undated Aerial Photograph
Halaco Site Remedial Investigation
Oxnard, California

CH2MHILL

WB012009003SCO385135.DE.01 Halaco_overview.ai 8/11

LEGEND

Historical OID Alignment

- 1929 OID
- 1959 OID
- 1969 Pond

Ground Elevation Contours (ft msl) (AMEC, 2006)

- 2 ft Contour
- 10 ft Contour

N

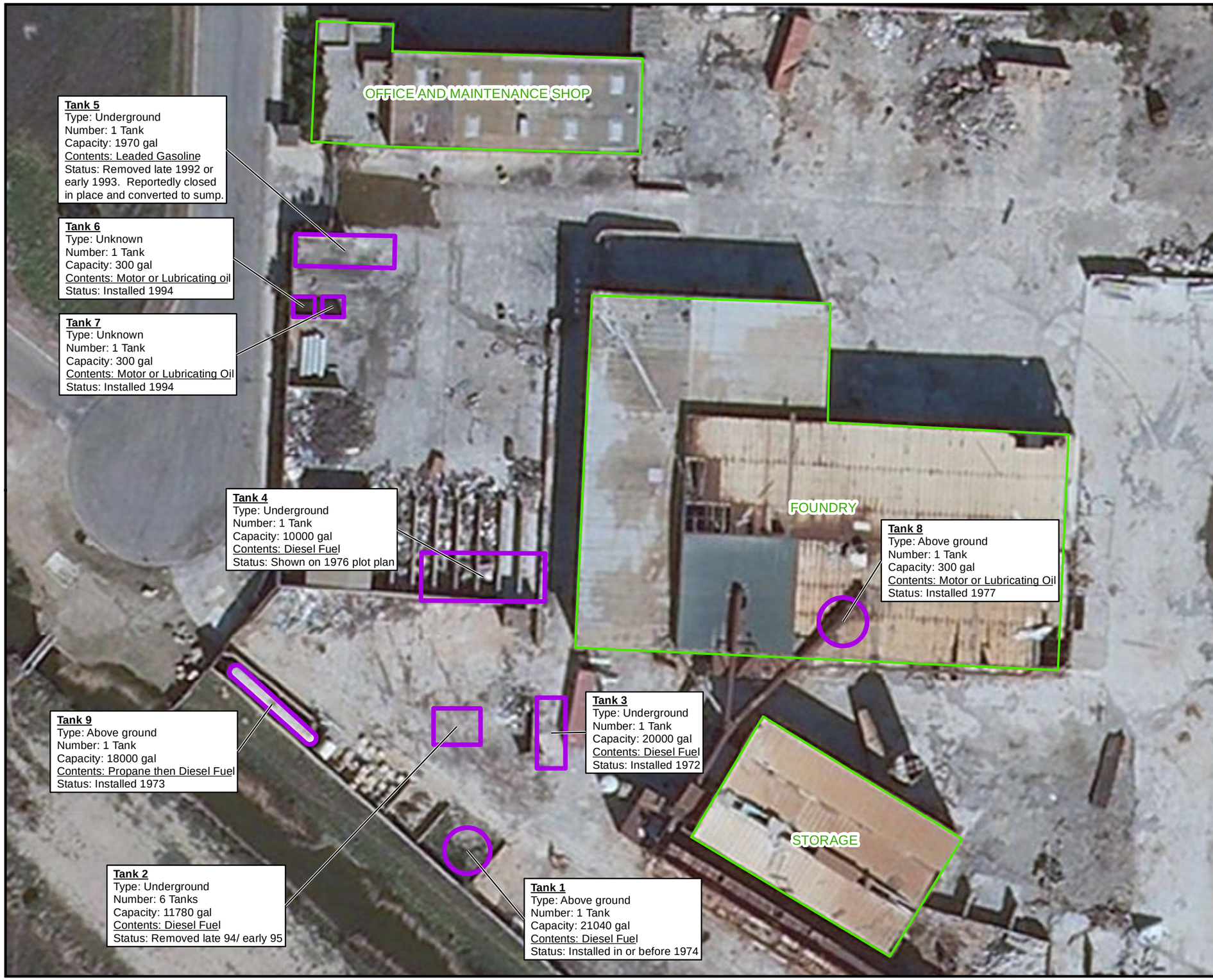
0 100 200

Feet

1 inch = 200 feet

FIGURE 1i
Investigation Areas,
Smelter and Waste Management Areas
HALACO SITE REMEDIAL INVESTIGATION
OXNARD, CALIFORNIA

\\ICONIA\GROUPS\EMS\PROJECTS\HALACO\MAPFILES\REPORTS\SMELTER_WASTE\HALACO_FIG1I_SMELTER_WMU_INVESTIGATIONAREAS.MXD SWOLFSKI 3/8/2011 10:21:10



LEGEND

- StorageTanks
- Buildings

N

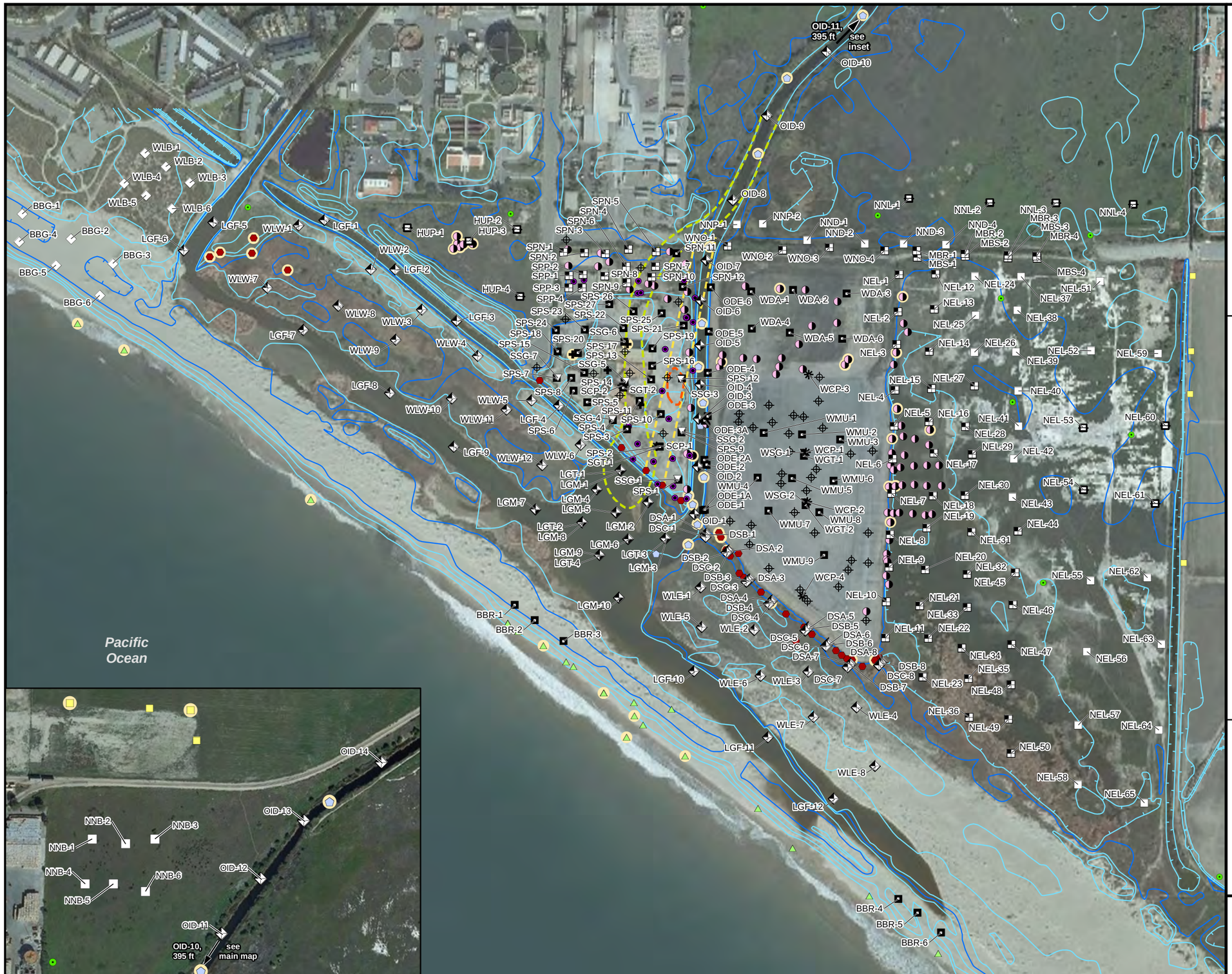
0 25 50

Feet

1 inch = 50 feet

FIGURE 1j
Approximate Locations of Former and Current Oil and Fuel Tanks (1965-2004)
HALACO SITE REMEDIAL INVESTIGATION
OXNARD, CALIFORNIA

\\ICONIA\GROUPS\EMS\PROJECTS\Halaco\MapFiles\REPORTS\SMELTER_WASTE\Halaco_Smelter_WMU_FIG1j_OilTanks.mxd SWOLFSKI 8/1/2011 3:30:04 PM



LEGEND

2010 Remedial Investigation Locations

	Matrix	Sample Depth (ft bgs)
□	Soil	0
◇	Sediment	0
⊞	Soil	0,2
◆	Sediment	0,2
⊟	Soil	0,0,2
■	Soil	Deep
◆	Sediment	0,2,4
▽	Soil Gas	5
▼	Soil Gas	5,15,30
✱	CPT	Continuous

Historical Sample Locations

Integrated Assessment Report Investigation (Weston, 2007)

- Surface Sediment Sample (SDF)
- Residential Sample (SSR)
- Agricultural Sample (SSA)
- Soil Sample (SSN)
- Soil Boring (SSN)
- Soil Boring (SW)
- Wetlands Sediment Sample (SWL)
- Beach Sediment Sample (SDB)
- Waste Samples from Smelter Area (SWF)
- Surface Sample analyzed by lab

Southeast Smelter Investigation (EPA, 2007)

- SE Smelter Sample Location

Ormand Beach Wetlands Restoration Investigation (AMEC, 2006)

- AMEC Sample Location

Historical OID Alignment

- 1929 OID
- 1959 OID
- 1969 Pond

Ground Elevation Contours (ft msl) (AMEC, 2006)

- 2 ft Contour
- 10 ft Contour

N

0 200 400

Feet

1 inch = 400 feet

FIGURE 2
Solid Matrix and Soil Gas Sample Locations, All RI Locations

HALACO SITE REMEDIAL INVESTIGATION
OXNARD, CALIFORNIA

\\ICONIA\GROUPS\EMS\PROJECTS\HALACO\MAPFILES\REPORTS\HALACO_FIG2_SOILSAMPLES.MXD SWOLFSKI 1/11/2011 16:20:16

LEGEND

2010 Remedial Investigation Locations

	Matrix	Sample Depth (ft bgs)
◪	Soil	0,2
◘	Soil	Deep
◆	Sediment	0,2,4
▽	Soil Gas	5
▼	Soil Gas	5,15,30
✳	CPT	Continuous

Historical Sample Locations
Integrated Assessment Report Investigation (Weston, 2007)

- Soil Sample (SSN)
- Soil Boring (SSN)
- Soil Boring (SW)
- Waste Samples from Smelter Area (SWF)
- Surface Sample analyzed by lab

Southeast Smelter Investigation (EPA, 2007)

- SE Smelter Sample Location

Historical OID Alignment

- 1929 OID
- 1959 OID
- 1969 Pond

Ground Elevation Contours (ft msl) (AMEC, 2006)

- 2 ft Contour
- 10 ft Contour

DSA-1
3.42

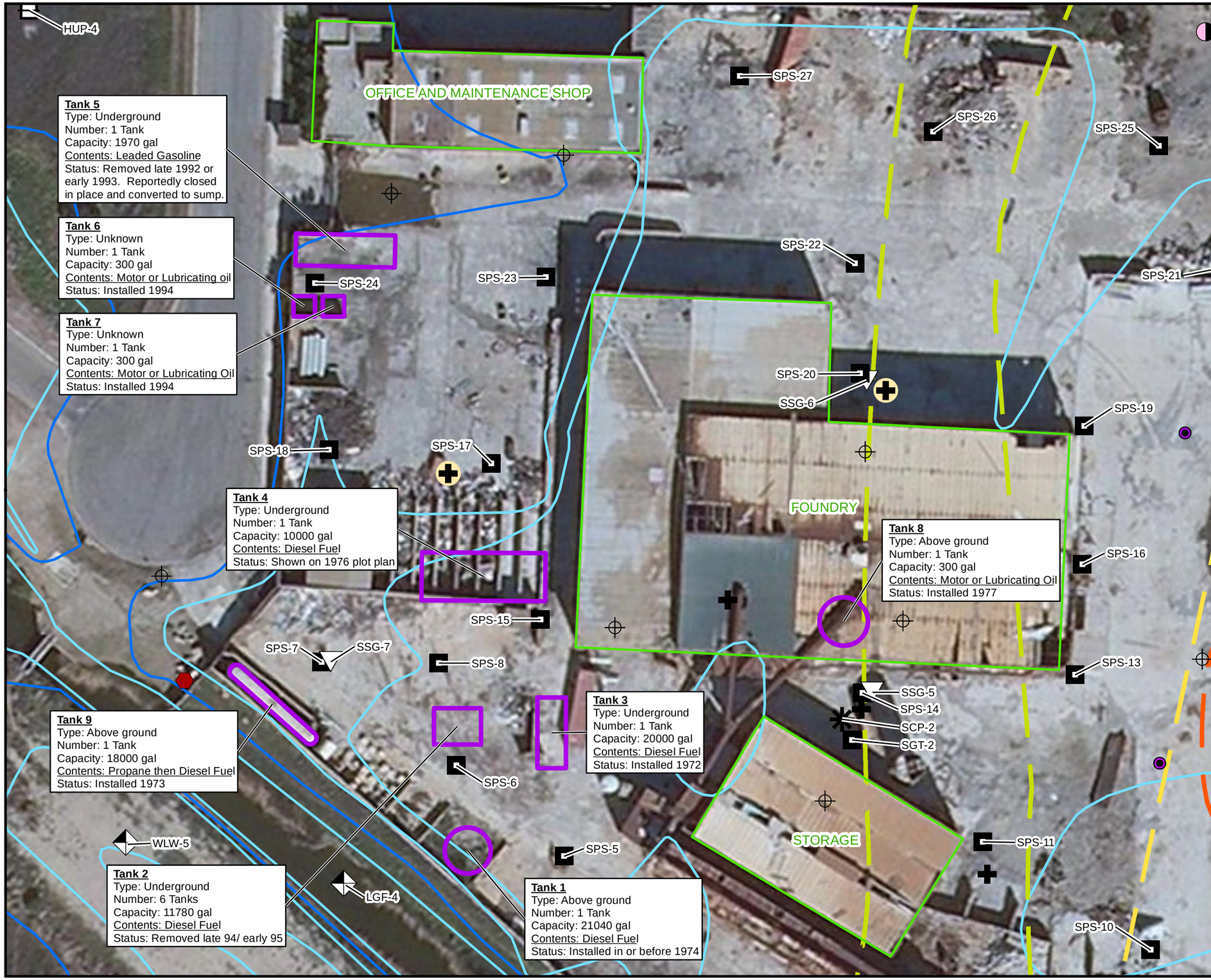
Sample Location ID
Water Depth during Sample Collection (ft)

N

0 100 200
Feet
1 inch = 200 feet

FIGURE 3a
Solid Matrix Sample Locations, Smelter and Waste Management Areas
HALACO SITE REMEDIAL INVESTIGATION
OXNARD, CALIFORNIA

\\ICONIA\GROUPS\EMS\PROJECTS\HALACO\MAPFILES\REPORTS\SMELTER_WASTE\HALACO_FIG3A_SMELTER_WMU_WATERDEPTH.MXD SWOLFSKI 3/8/2011 10:21:10



LEGEND

- StorageTanks
- Buildings

2010 Remedial Investigation Locations

Matrix	Sample Depth (ft bgs)
Soil	0,2
Sediment	0,2
Soil	0,0,2
Soil	Deep
Sediment	0,2,4
Soil Gas	5
CPT	Continuous

Historical Sample Locations
Integrated Assessment Report Investigation (Weston, 2007)

- Surface Sediment Sample (SDF)
- Soil Sample (SSN)
- Soil Boring (SSN)
- Soil Boring (SW)
- Wetlands Sediment Sample (SWL)
- Waste Samples from Smelter Area (SWF)
- Surface Sample analyzed by lab

Southeast Smelter Investigation (EPA, 2007)

- SE Smelter Sample Location

Historical OID Alignment

- 1929 OID
- 1959 OID
- 1969 Pond

Ground Elevation Contours (ft msl) (AMEC, 2006)

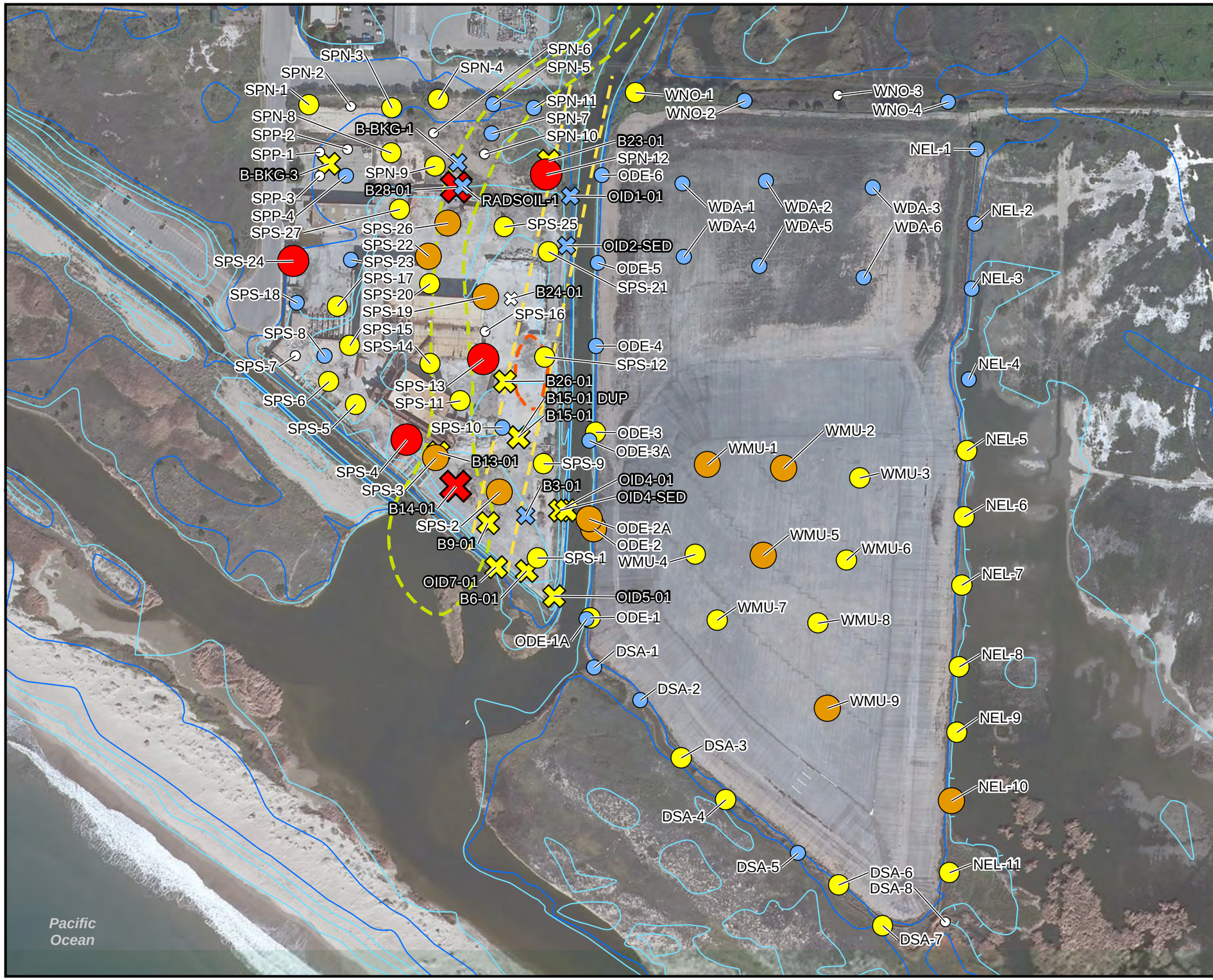
- 2 ft Contour
- 10 ft Contour

N

0 25 50
Feet

1 inch = 50 feet

FIGURE 3b
Solid Matrix and Soil Gas Sample Locations, Former and Current Oil and Fuel Tanks (1965-2004)
HALACO SITE REMEDIAL INVESTIGATION
OXNARD, CALIFORNIA



LEGEND

Lead Concentrations (mg/kg)

2010 RI Sample Locations

- <14
- 14 - 100
- 100 - 400
- 400 - 800
- >800

Historical Sample Locations

- <14
- 14 - 100
- 100 - 400
- 400 - 800
- >800

Historical OID Alignment

- 1929 OID
- 1959 OID
- 1969 Pond

Ground Elevation Contours (ft msl) (AMEC, 2006)

- 2 ft Contour
- 10 ft Contour

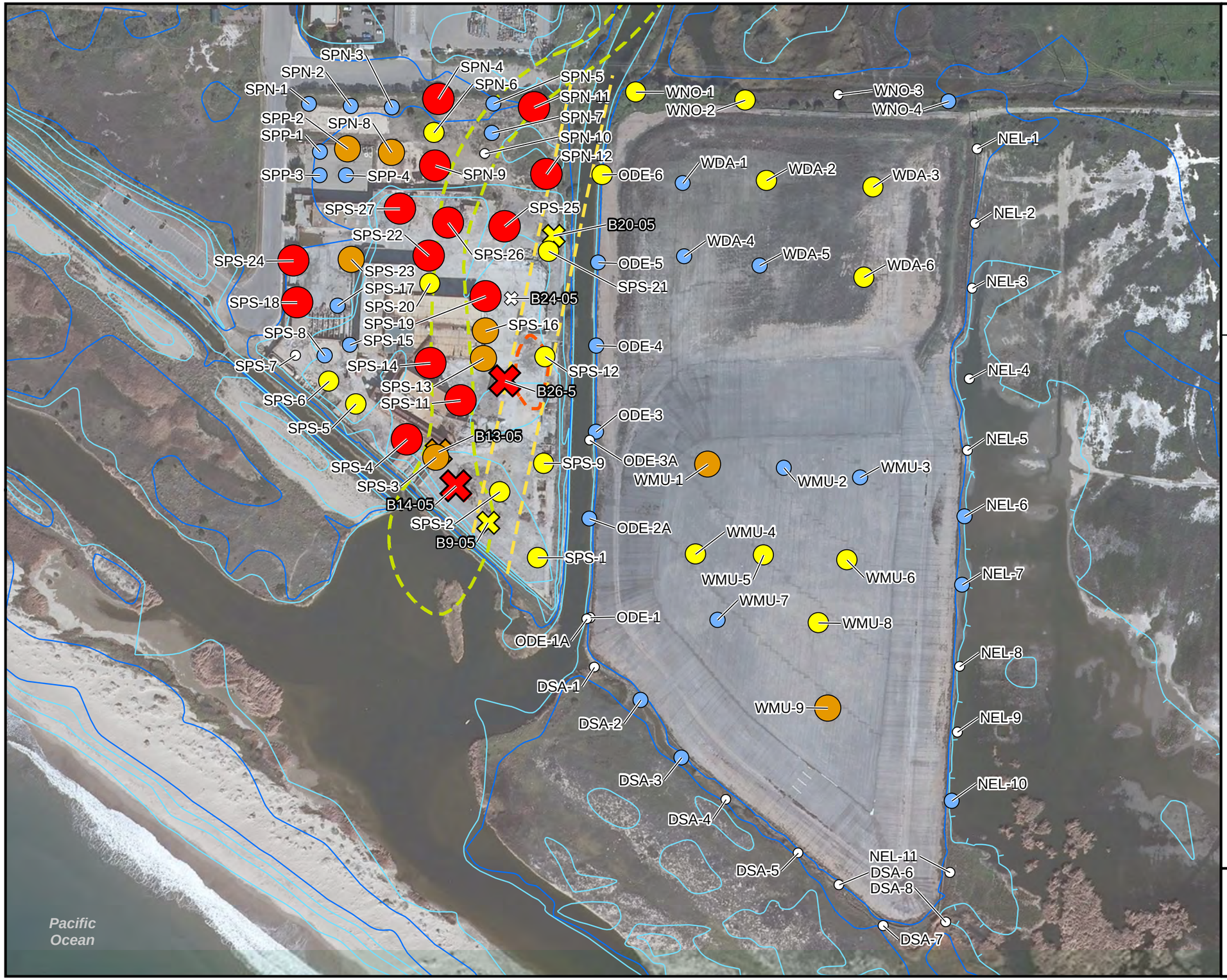
Notes:
- See Table 1a for RI sample depths and material types.
- Surface samples collected at or near surface up to approximately 1 foot bgs.
- Samples collected beneath asphalt or concrete, if present.

N

0 100 200
Feet
1 inch = 200 feet

FIGURE 4a
Lead Solid Matrix Concentrations, Smelter and Waste Management Areas, Surface Samples
HALACO SITE REMEDIAL INVESTIGATION
OXNARD, CALIFORNIA

\\ICONIA\GROUPS\EMS\PROJECTS\HALACO\MAPFILES\REPORTS\SMELTER_WASTE\HALACO_FIG4A_SMELTER_WMU_LEADSURFACE.MXD SWOLFSKI 2/23/2011 16:03:14



LEGEND

Lead Concentrations (mg/kg)

2010 RI Sample Locations

- <14
- 14 - 100
- 100 - 400
- 400 - 800
- >800

Historical Sample Locations

- <14
- 14 - 100
- 100 - 400
- 400 - 800
- >800

Historical OID Alignment

- 1929 OID
- 1959 OID
- 1969 Pond

Ground Elevation Contours (ft msl) (AMEC, 2006)

- 2 ft Contour
- 10 ft Contour

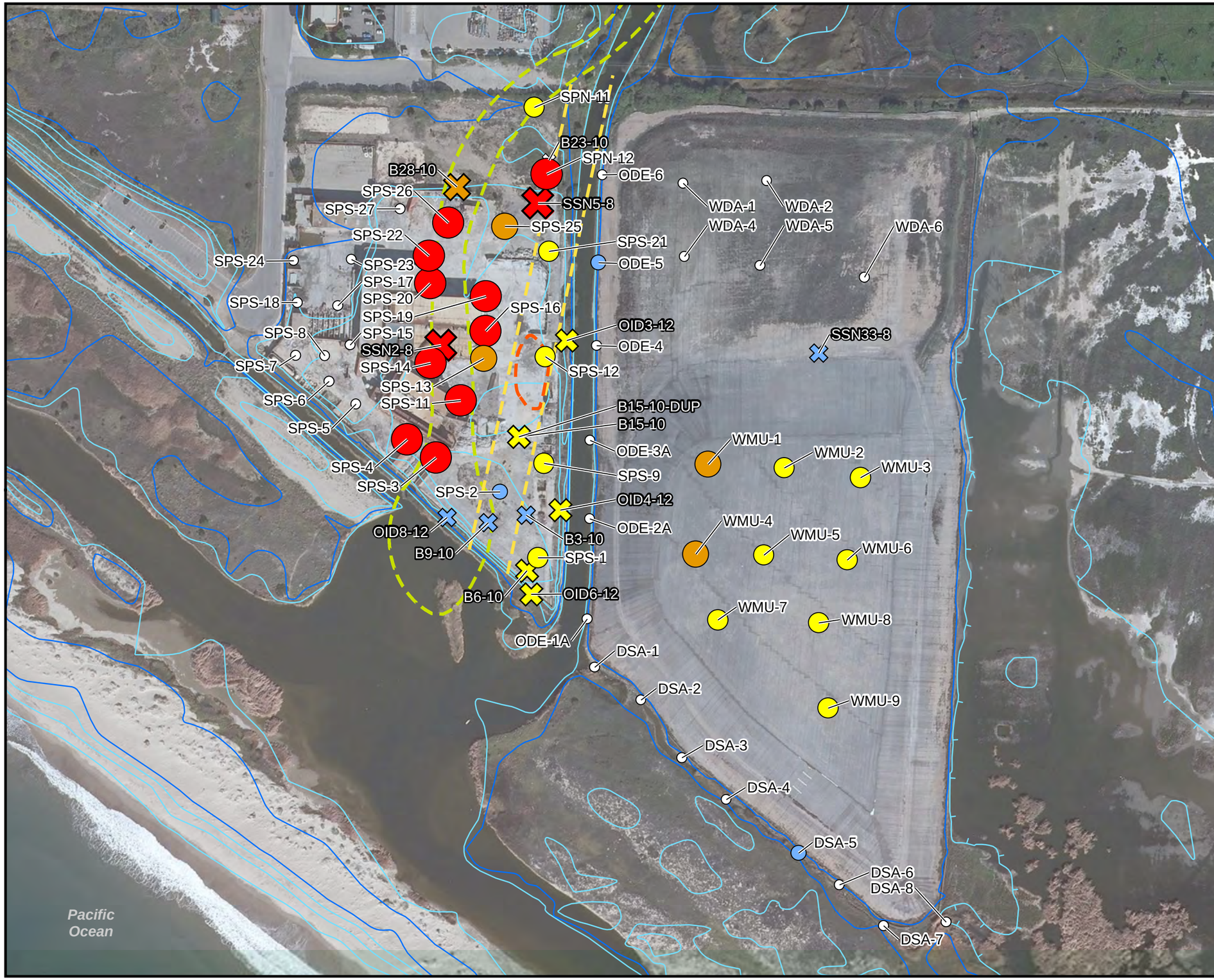
Notes:
- See Table 1a for RI sample depths and material types.
- Subsurface samples collected at depths of approximately 2 or 5 feet bgs.

N

0 100 200
Feet
1 inch = 200 feet

FIGURE 4b
Lead Solid Matrix Concentrations, Smelter and Waste Management Areas, B Interval
HALACO SITE REMEDIAL INVESTIGATION
OXNARD, CALIFORNIA

\\ICONIA\GROUPS\EMS\PROJECTS\HALACO\MAPFILES\REPORTS\SMELTER_WASTE\HALACO_FIG4B_SMELTER_WMU_LEADB.MXD SWOLFSKI 8/2/2011 17:44:55



LEGEND

Lead Concentrations (mg/kg)

2010 RI Sample Locations

- <14
- 14 - 100
- 100 - 400
- 400 - 800
- >800

Historical Sample Locations

- <14
- 14 - 100
- 100 - 400
- 400 - 800
- >800

Historical OID Alignment

- 1929 OID
- 1959 OID
- 1969 Pond

Ground Elevation Contours (ft msl) (AMEC, 2006)

- 2 ft Contour
- 10 ft Contour

Notes:
- See Table 1a for RI sample depths and material types.
- Subsurface samples collected at depths ranging from approximately 8 to 15 feet bgs at the Smelter Parcel, 15 feet bgs at the WDA, and 30 feet bgs at the WMU.

N

0 100 200
Feet
1 inch = 200 feet

FIGURE 4c
Lead Solid Matrix Concentrations, Smelter and Waste Management Areas, C Interval
HALACO SITE REMEDIAL INVESTIGATION
OXNARD, CALIFORNIA

\\ICONIA\GROUPS\EMS\PROJECTS\HALACO\MAPFILES\REPORTS\SMELTER_WASTE\HALACO_FIG4C_SMELTER_WMU_LEADC.MXD SWOLFSKI 3/2/2011 15:37:48

LEGEND

Lead Concentrations (mg/kg)

2010 RI Sample Locations

- <14
- 14 - 100
- 100 - 400
- 400 - 800
- >800

Historical Sample Locations

- <14
- 14 - 100
- 100 - 400
- 400 - 800
- >800

Historical OID Alignment

- 1929 OID
- 1959 OID
- 1969 Pond

Ground Elevation Contours (ft msl) (AMEC, 2006)

- 2 ft Contour
- 10 ft Contour

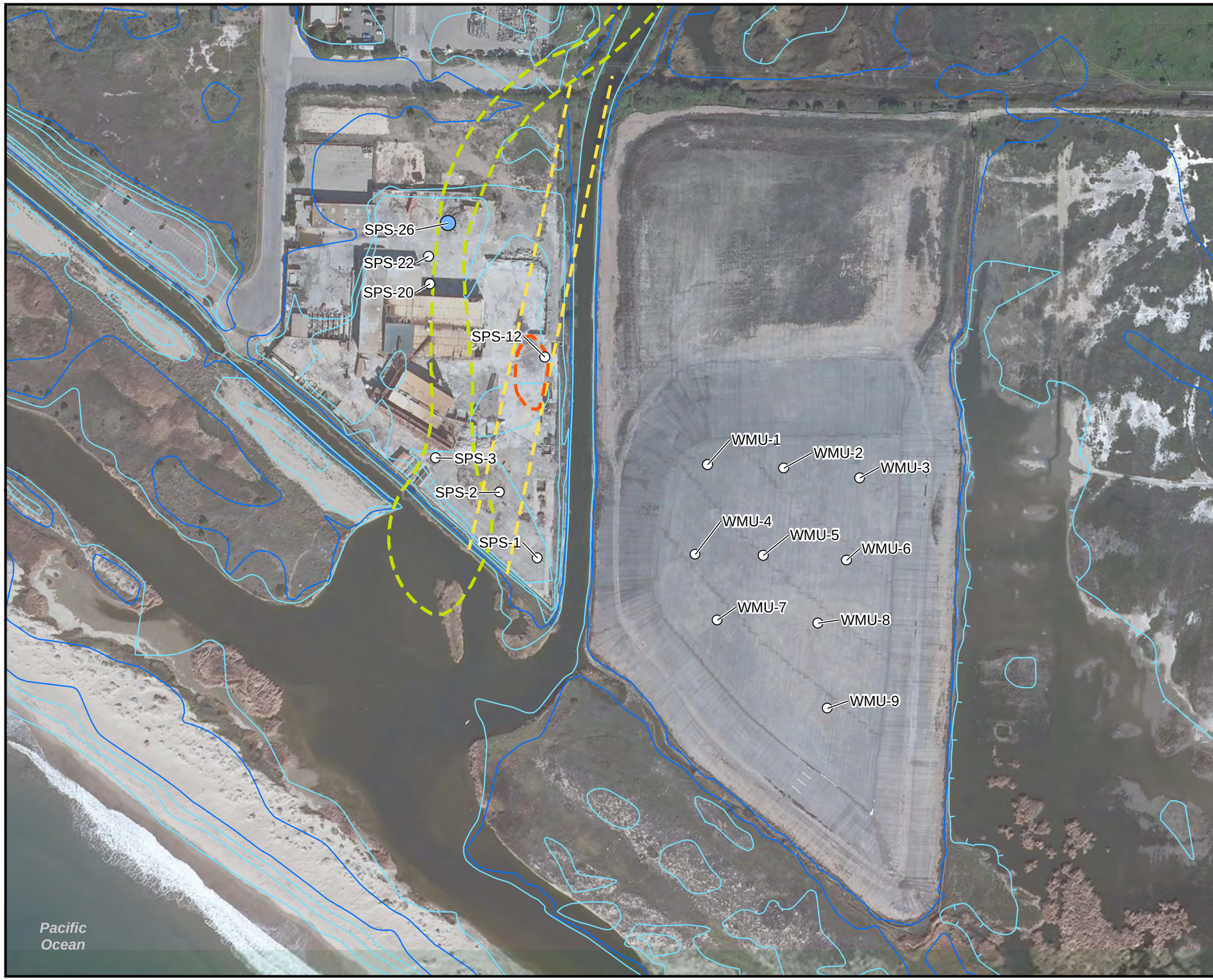
Notes:
- See Table 1a for RI sample depths and material types.
- Subsurface samples collected at depths ranging from approximately 13 to 20 feet bgs at the Smelter Parcel and 35 feet bgs at the WMU.

N

0 100 200
Feet
1 inch = 200 feet

FIGURE 4d
Lead Solid Matrix Concentrations, Smelter and Waste Management Areas, D Interval
HALACO SITE REMEDIAL INVESTIGATION
OXNARD, CALIFORNIA

\\ICONIA\GROUPS\EMS\PROJECTS\HALACO\MAPFILES\REPORTS\SMELTER_WASTE\HALACO_FIG4D_SMELTER_WMU_LEADD.MXD SWOLFSKI 8/2/2011 15:52:53



LEGEND

Lead Concentrations (mg/kg)

2010 RI Sample Locations

- <14
- 14 - 100
- 100 - 400
- 400 - 800
- >800

Historical OID Alignment

- 1929 OID
- 1959 OID
- 1969 Pond

Ground Elevation Contours (ft msl) (AMEC, 2006)

- 2 ft Contour
- 10 ft Contour

Notes:
- See Table 1a for RI sample depths and material types.
- Subsurface samples collected at depths ranging from approximately 18 to 24 feet bgs at the Smelter Parcel and 44 feet bgs at the WMU.

N

0 100 200
Feet
1 inch = 200 feet

FIGURE 4e
Lead Solid Matrix Concentrations, Smelter and Waste Management Areas, E Interval
HALACO SITE REMEDIAL INVESTIGATION
OXNARD, CALIFORNIA

LEGEND

Thorium 232 Activities (pCi/g)

2010 RI Sample Locations

- <2
- 2 - 5
- 5 - 10
- 10 - 30
- >30

Historical Sample Locations

- <2
- 2 - 5
- 5 - 10
- 10 - 30
- >30

Historical OID Alignment

- 1929 OID
- 1959 OID
- 1969 Pond

Ground Elevation Contours (ft msl) (AMEC, 2006)

- 2 ft Contour
- 10 ft Contour

Notes:

- See Table 1a for RI sample depths and material types.
- Surface samples collected at or near surface up to approximately 1 foot bgs.
- Samples collected beneath asphalt or concrete, if present.
- Samples at the WMU were collected at approximately 5 and 10 feet bgs in 2006, before EPA regraded the waste pile in 2007. These sample depths are no longer accurate and the results are intended to generally represent Th 232 activities in the upper part of the WMU.

N

0 100 200

Feet

1 inch = 200 feet

FIGURE 5a
Thorium 232 Solid Matrix Activities, Smelter and Waste Management Areas, Surface Samples

HALACO SITE REMEDIAL INVESTIGATION
OXNARD, CALIFORNIA

\\ICONIA\GROUPS\EMS\PROJECTS\HALACO\MAPFILES\REPORTS\SMELTER_WASTE\HALACO_FIG5A_SMELTER_WMU_RADSURFACE.MXD SWOLFSKI 3/3/2011 10:59:39

LEGEND

Thorium 232 Activities (pCi/g)

2010 RI Sample Locations

- <2
- 2 - 5
- 5 - 10
- 10 - 30
- >30

Historical Sample Locations

- <2
- 2 - 5
- 5 - 10
- 10 - 30
- >30

Historical OID Alignment

- 1929 OID
- 1959 OID
- 1969 Pond

Ground Elevation Contours (ft msl) (AMEC, 2006)

- 2 ft Contour
- 10 ft Contour

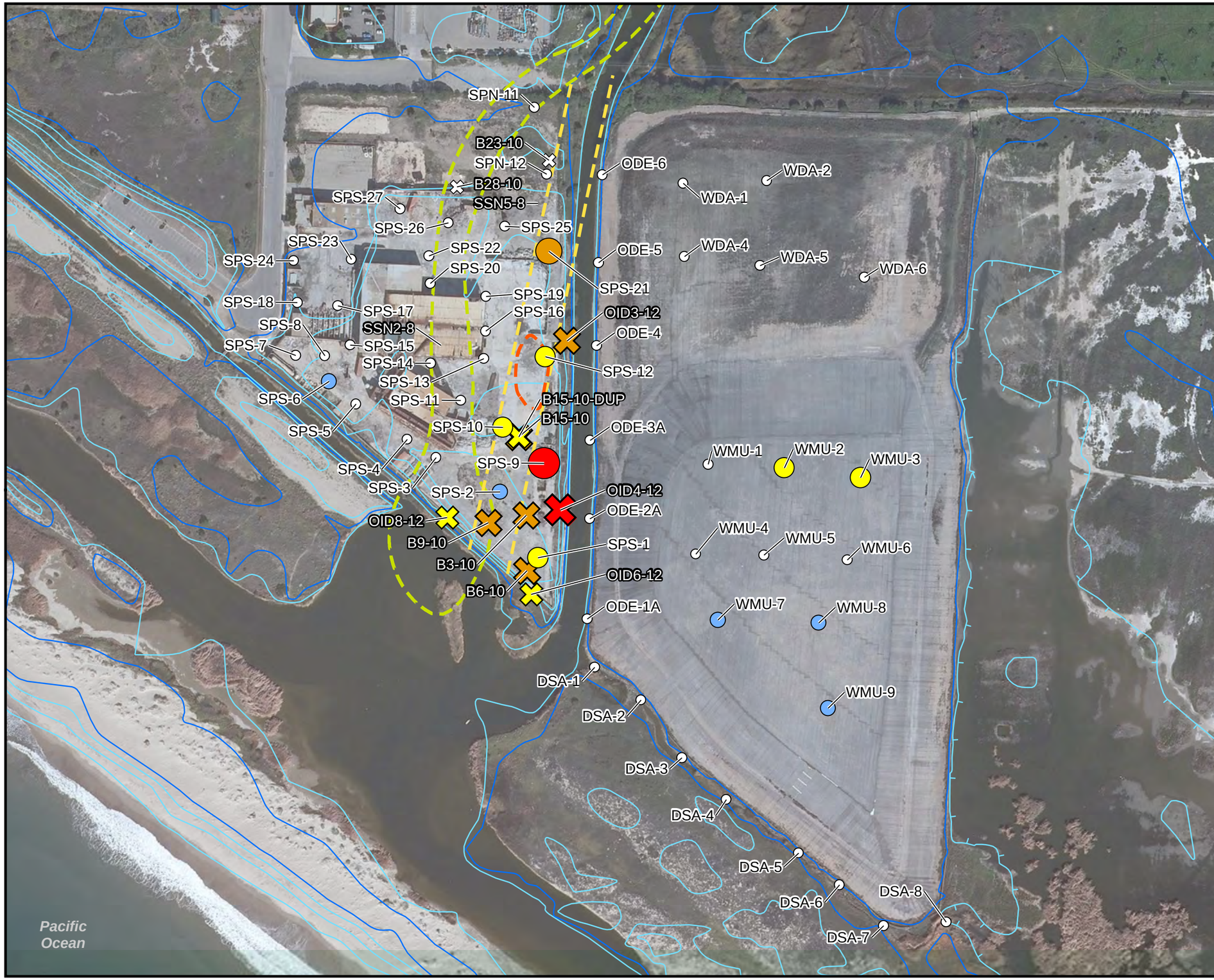
Notes:
- See Table 1a for RI sample depths and material types.
- Subsurface samples collected at depths of approximately 2 or 5 feet bgs.
- Samples at the WMU were collected at approximately 15 and 20 feet bgs in 2006, before EPA regraded the waste pile in 2007. These sample depths are no longer accurate and the results are intended to generally represent Th 232 activities in the upper part of the WMU.

N

0 100 200
Feet
1 inch = 200 feet

FIGURE 5b
Thorium 232 Solid Matrix Activities, Smelter and Waste Management Areas, B Interval
HALACO SITE REMEDIAL INVESTIGATION
OXNARD, CALIFORNIA

\\ICONIA\GROUPS\EMS\PROJECTS\HALACO\MAPFILES\REPORTS\SMELTER_WASTE\HALACO_FIG5B_SMELTER_WMU_RADB.MXD SWOLFSKI 3/3/2011 13:39:37



LEGEND

Thorium 232 Activities (pCi/g)

2010 RI Sample Locations

- <2
- 2 - 5
- 5 - 10
- 10 - 30
- >30

Historical Sample Locations

- <2
- 2 - 5
- 5 - 10
- 10 - 30
- >30

Historical OID Alignment

- 1929 OID
- 1959 OID
- 1969 Pond

Ground Elevation Contours (ft msl) (AMEC, 2006)

- 2 ft Contour
- 10 ft Contour

Notes:
- See Table 1a for RI sample depths and material types.
- Subsurface samples collected at depths ranging from approximately 8 to 15 feet bgs at the Smelter Parcel, 15 feet bgs at the WDA, and 30 feet bgs at the WMU.

N

0 100 200
Feet
1 inch = 200 feet

FIGURE 5c
Thorium 232 Solid Matrix Activities, Smelter and Waste Management Areas, C Interval
HALACO SITE REMEDIAL INVESTIGATION
OXNARD, CALIFORNIA

\\ICONIA\GROUPS\EMS\PROJECTS\HALACO\MAPFILES\REPORTS\SMELTER_WASTE\HALACO_FIG5C_SMELTER_WMU_RADC.MXD SWOLFSKI 3/4/2011 09:32:56

LEGEND

Thorium 232 Activities (pCi/g)

2010 RI Sample Locations

- <2
- 2 - 5
- 5 - 10
- 10 - 30
- >30

Historical Sample Locations

- <2
- 2 - 5
- 5 - 10
- 10 - 30
- >30

Historical OID Alignment

- 1929 OID
- 1959 OID
- 1969 Pond

Ground Elevation Contours (ft msl) (AMEC, 2006)

- 2 ft Contour
- 10 ft Contour

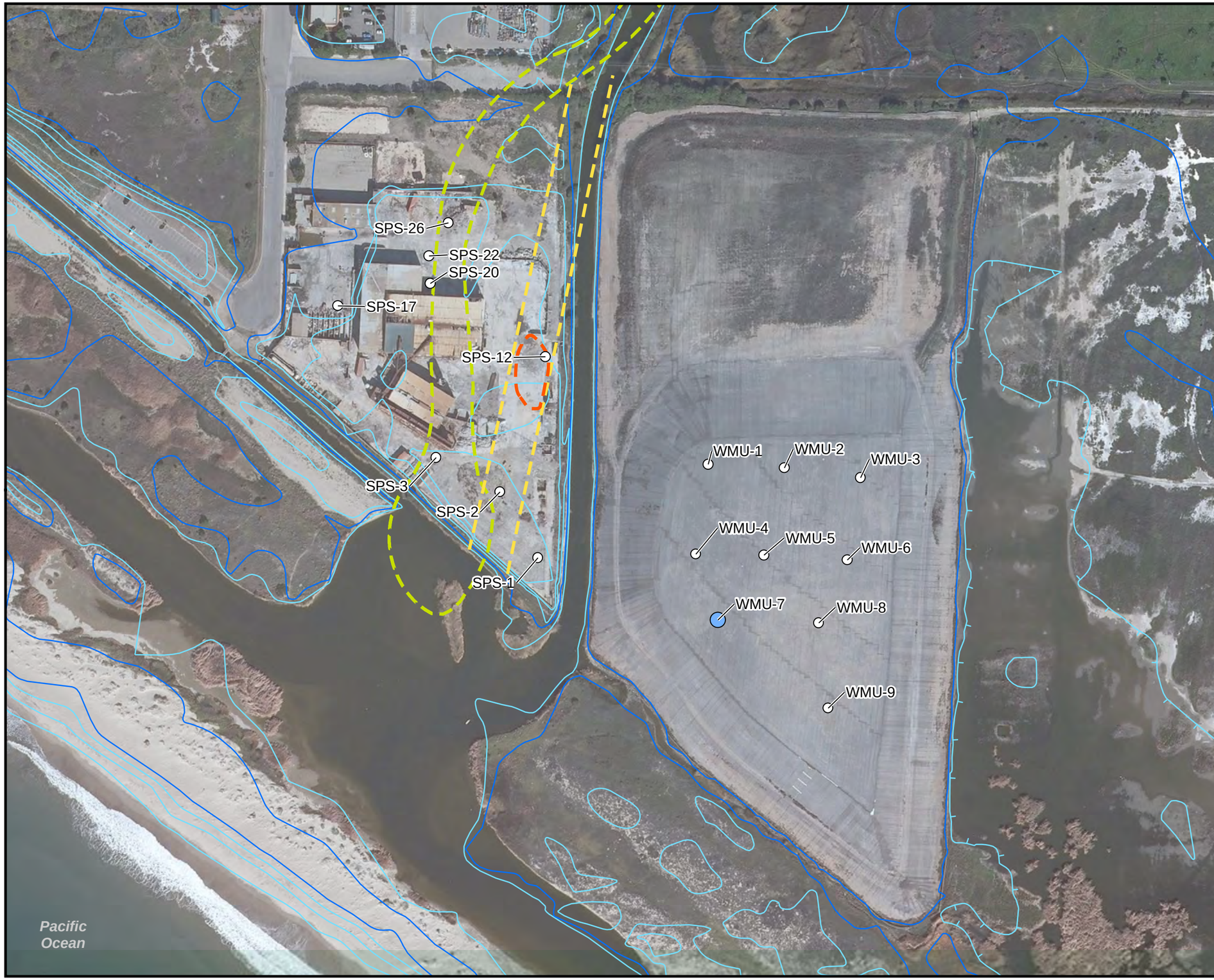
Notes:
- See Table 1a for RI sample depths and material types.
- Subsurface samples collected at depths ranging from approximately 13 to 20 feet bgs at the Smelter Parcel and 35 feet bgs at the WMU.

N

0 100 200
Feet
1 inch = 200 feet

FIGURE 5d
Thorium 232 Solid Matrix Activities, Smelter and Waste Management Areas, D Interval
HALACO SITE REMEDIAL INVESTIGATION
OXNARD, CALIFORNIA

\\ICONIA\GROUPS\EMS\PROJECTS\HALACO\MAPFILES\REPORTS\SMELTER_WASTE\HALACO_FIG5D_SMELTER_WMU_RADD.MXD SWOLFSKI 8/2/2011 09:54:29



LEGEND

Thorium 232 Activities (pCi/g)

2010 RI Sample Locations

- <2
- 2 - 5
- 5 - 10
- 10 - 30
- >30

Historical OID Alignment

- 1929 OID
- 1959 OID
- 1969 Pond

Ground Elevation Contours (ft msl) (AMEC, 2006)

- 2 ft Contour
- 10 ft Contour

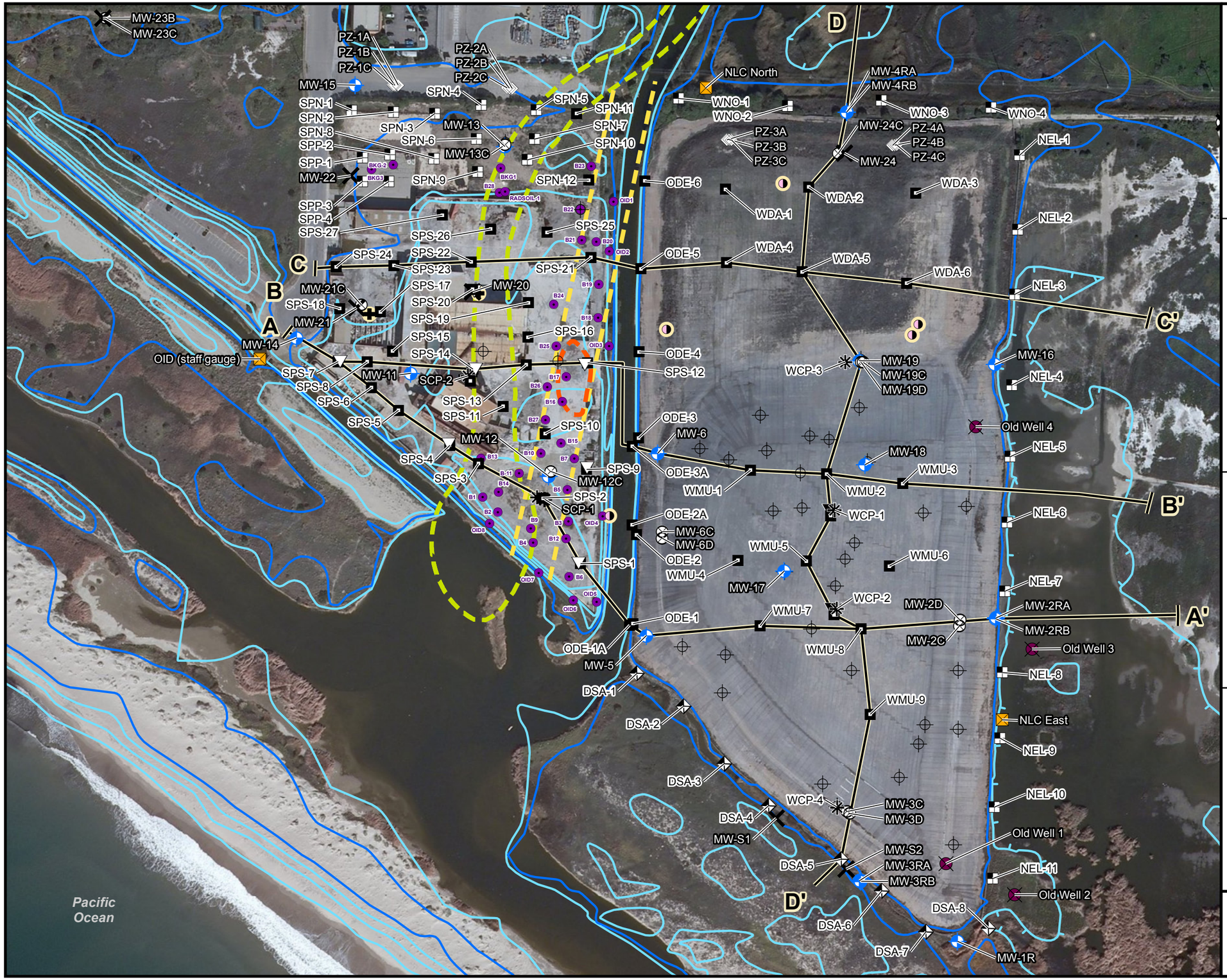
Notes:
- See Table 1a for RI sample depths and material types.
- Subsurface samples collected at depths ranging from approximately 18 to 24 feet bgs at the Smelter Parcel and 44 feet bgs at the WMU.

N

0 100 200
Feet
1 inch = 200 feet

FIGURE 5e
Thorium 232 Solid Matrix Activities, Smelter and Waste Management Areas, E Interval
HALACO SITE REMEDIAL INVESTIGATION
OXNARD, CALIFORNIA

\\CONIA\GROUPS\EMS\PROJECTS\HALACO\MAPFILES\REPORTS\SMELTER_WASTE\HALACO_FIG5E_SMELTER_WMU_RADE.MXD SWOLFSKI 8/2/2011 10:05:33



LEGEND

2010 Remedial Investigation Locations

Matrix	Sample Depth (ft bgs)
Soil	0,2
Soil	Deep
Sediment	0,2,4
Soil Gas	5
Soil Gas	5,15,30
CPT	Continuous

Groundwater Monitoring Locations

- USGS Regional Monitoring Well
- Existing Shallow Groundwater Monitoring Well
- New Shallow Well, Water Quality
- New Deeper Well, Water Quality
- Shallow CPT Boring
- Deep CPT Boring
- New Piezometer Cluster, Water Level
- Former Monitoring Well (Destroyed)
- Surface Water Gauging Station

Historical Sample Locations

Integrated Assessment Report Investigation (Weston, 2007)

- Soil Sample (SSN)
- Soil Boring (SSN)
- Soil Boring (SW)
- Waste Samples from Smelter Area (SWF)
- Surface Sample analyzed by lab

Southeast Smelter Investigation (EPA, 2007)

- SE Smelter Sample Location

Historical OID Alignment

- 1929 OID
- 1959 OID
- 1969 Pond

Ground Elevation Contours (ft msl) (AMEC, 2006)

- 2 ft Contour
- 10 ft Contour

N

0 100 200

Feet

1 inch = 200 feet

FIGURE 6

Geologic Cross Section Locations

HALACO SITE REMEDIAL INVESTIGATION
OXNARD, CALIFORNIA

\\ICONIA\GROUPS\EMS\PROJECTS\HALACO\MAPFILES\REPORTS\SMELTER_WASTE\HALACO_FIG3_SMELTER_WMU_WATERDEPTH.MXD SWOLFSKI 3/8/2011 10:21:10

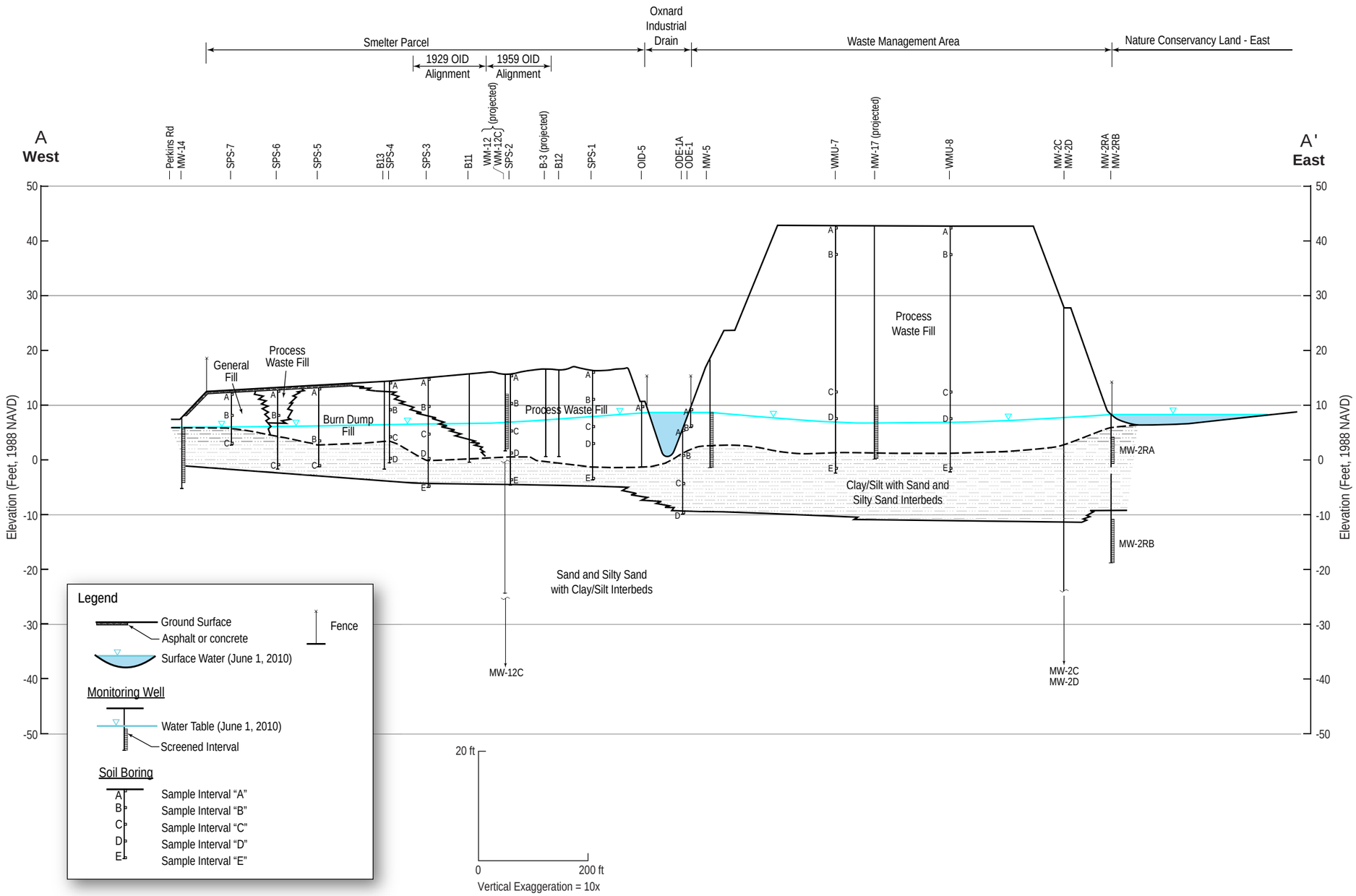


FIGURE 7a
Geologic Cross Section A - A'
Halaco Site Remedial Investigation
Oxnard, California

CH2MHILL

WBG110210203057SCO385135.DE.01 HSRI_Geologic_crossAA'.ai 6/11

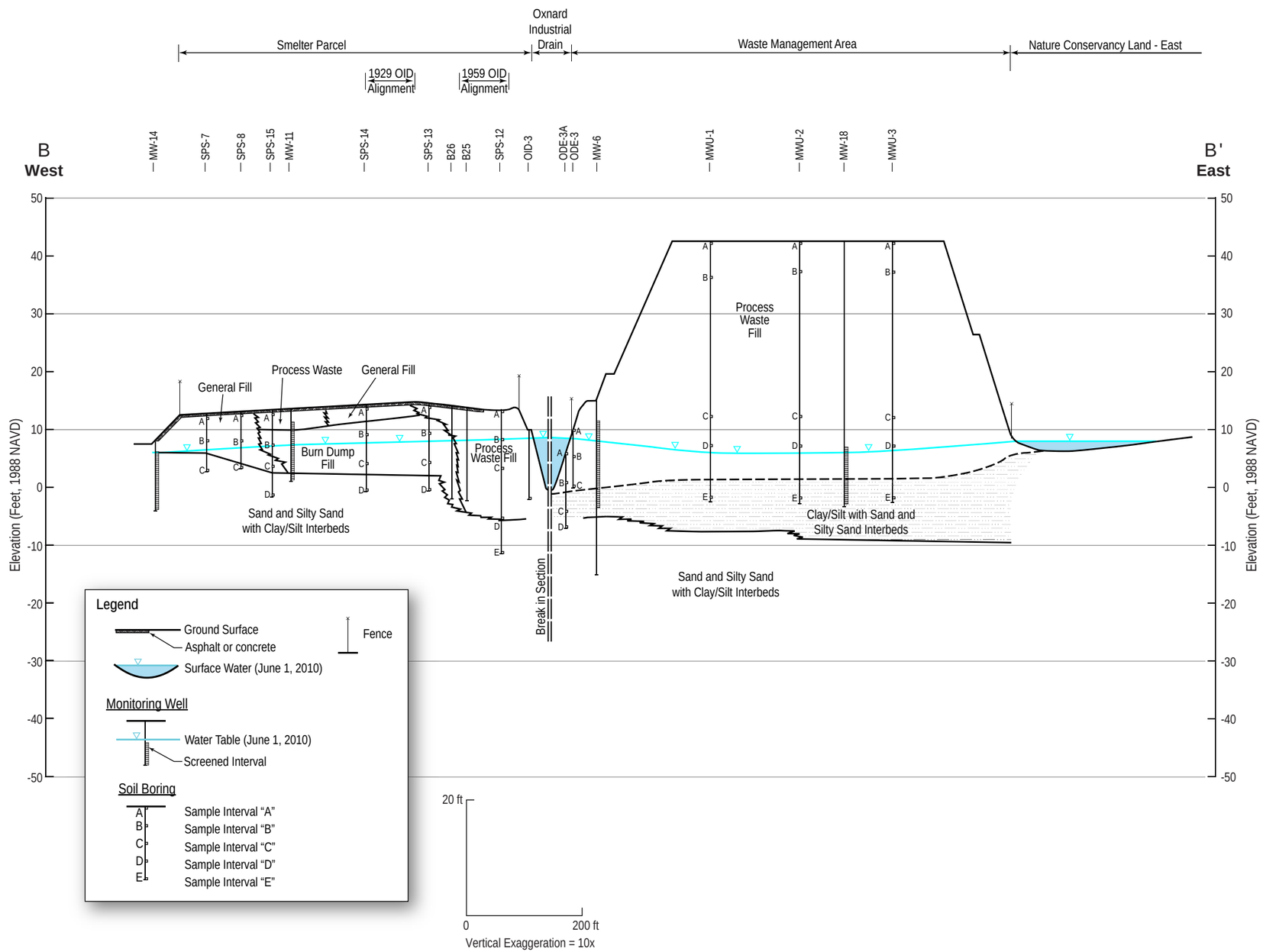


FIGURE 7b
Geologic Cross Section B - B'
Halaco Site Remedial Investigation
Oxnard, California

CH2MHILL

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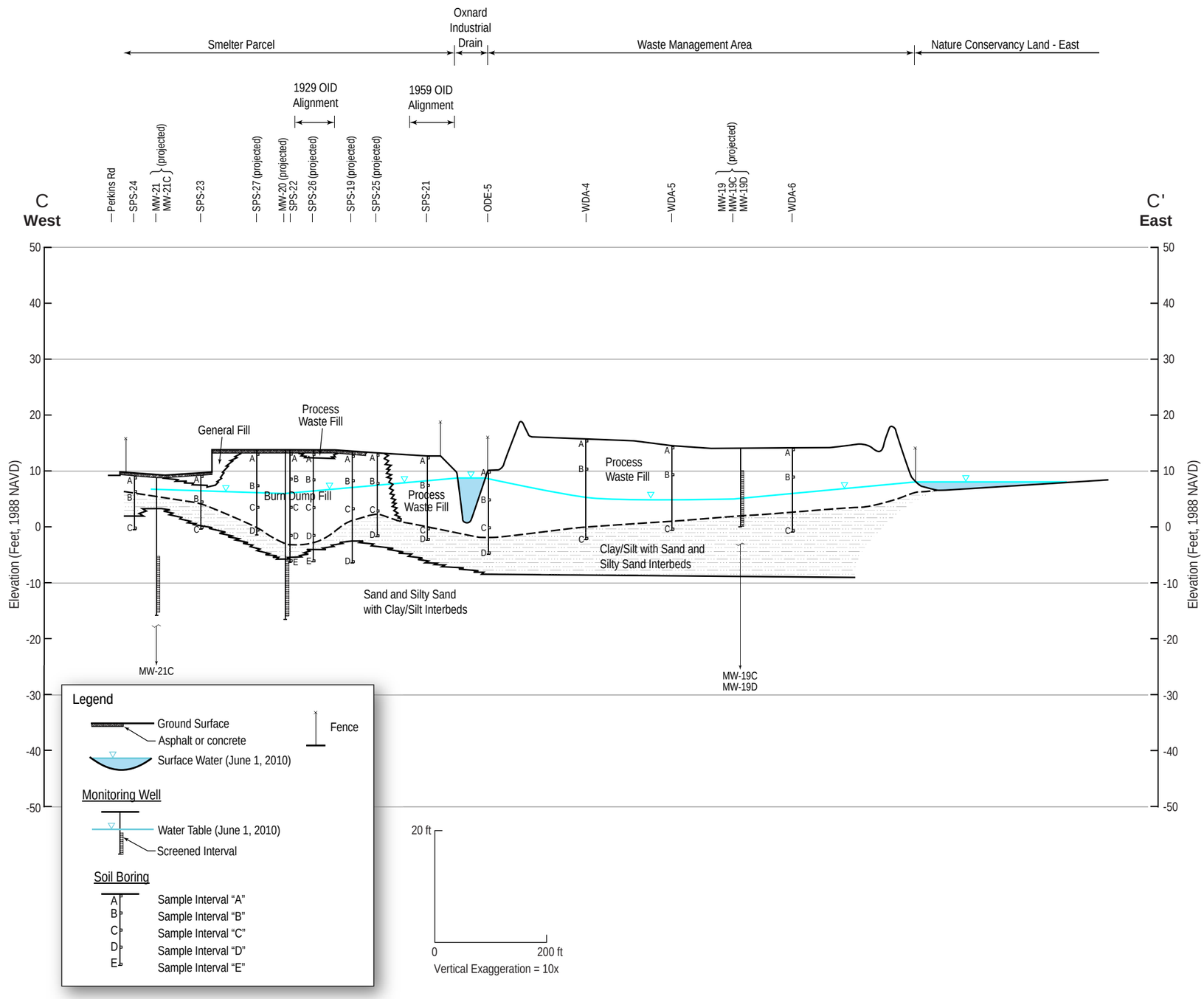

FIGURE 7c
Geologic Cross Section C - C'
Halaco Site Remedial Investigation
Oxnard, California

CH2MHILL

WBG110210203057SCO385135.DE.01 HSRI_Geologic_crossCC'.ai 6/11

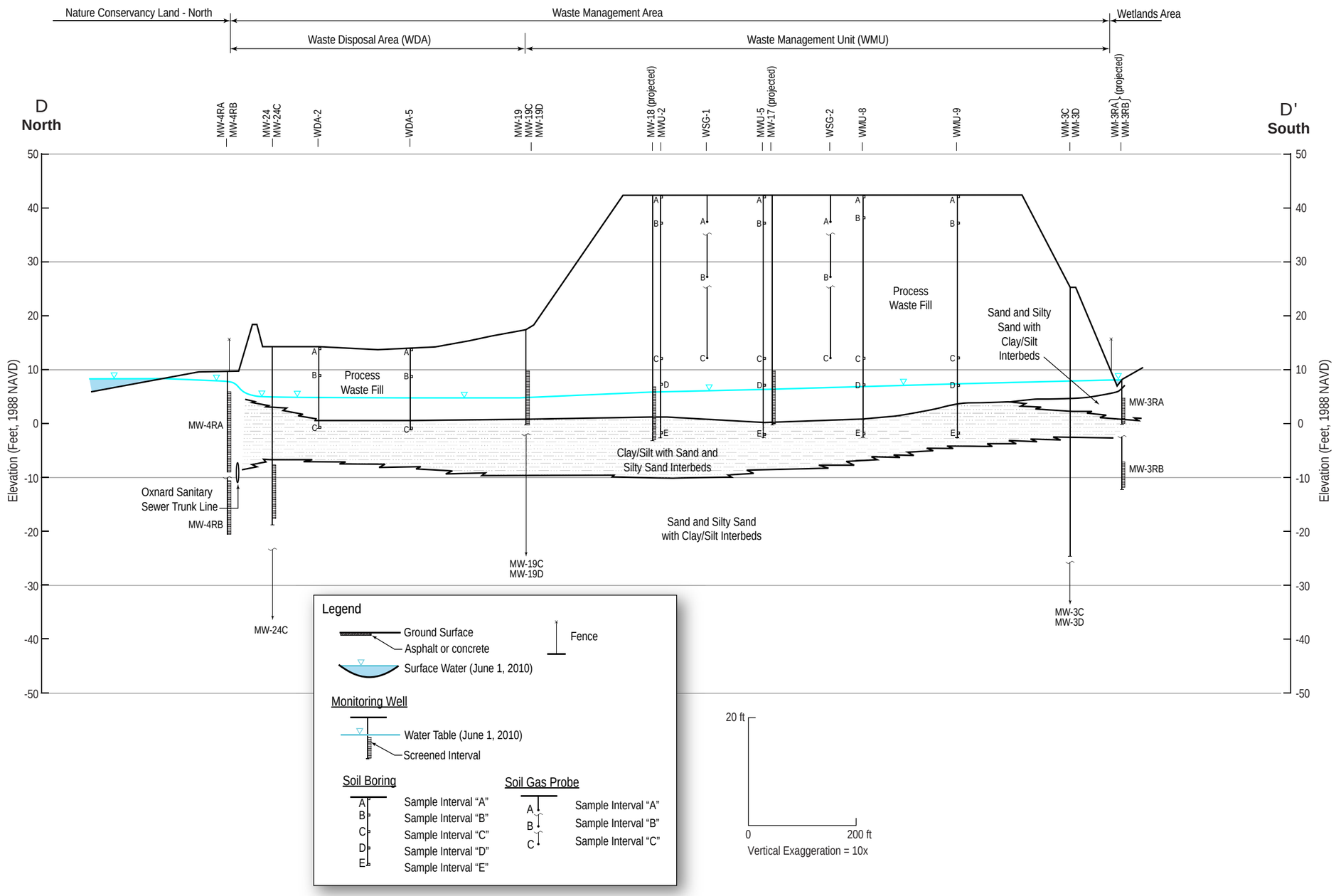

FIGURE 7d
Geologic Cross Section D - D'
Halaco Site Remedial Investigation
Oxnard, California

CH2MHILL

WBG110210203057SCO385135.DE.01 HSRI_Geologic_crossDD'.ai 6/11

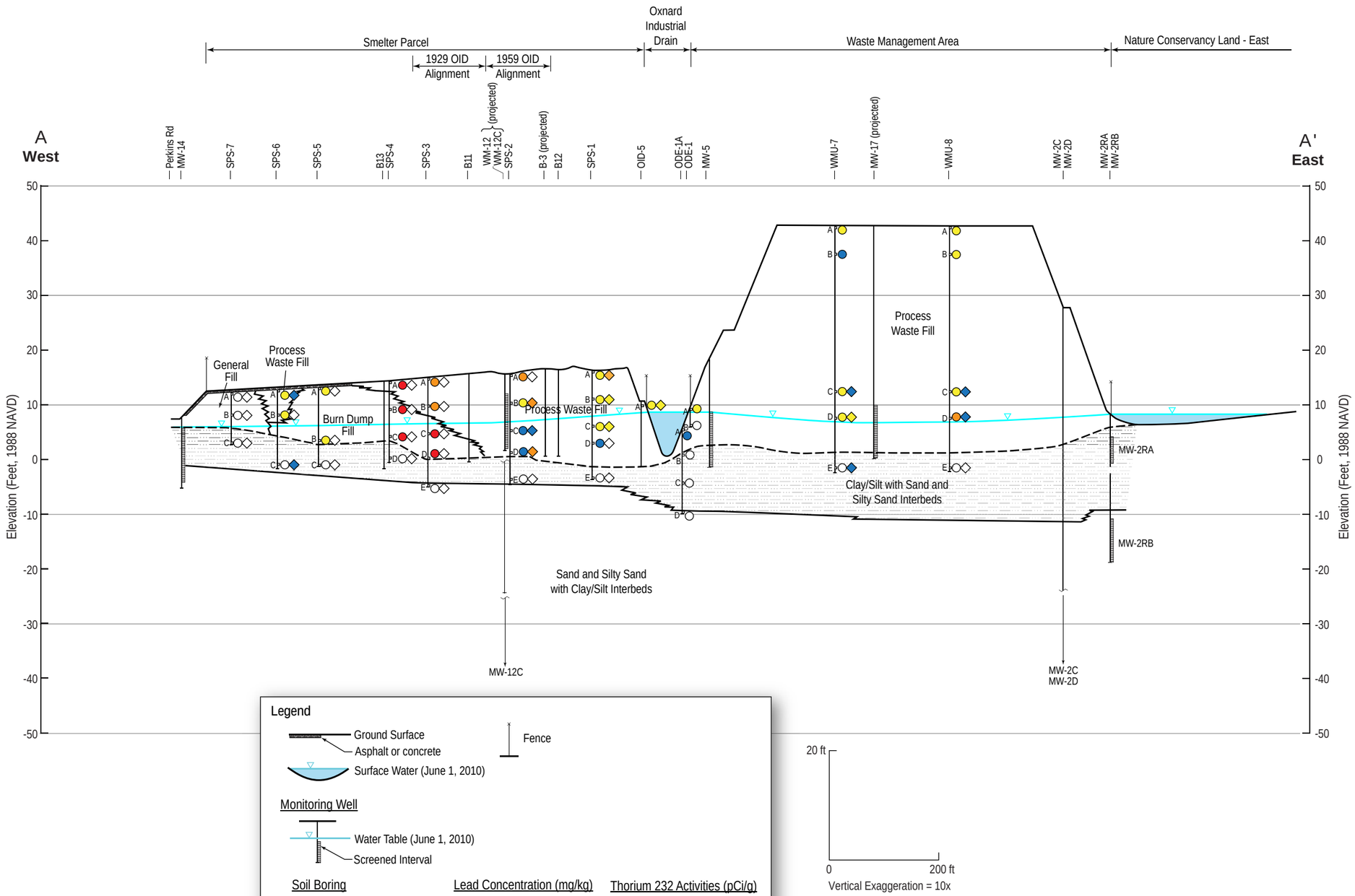

FIGURE 8a
Geologic Cross Section A - A' with Lead and Thorium 232 Levels
Halaco Site Remedial Investigation
Oxnard, California

WBG110210203057SCO385135.DE.01 HSRI_Geologic_crossAA'_levels.ai 6/11

CH2MHILL

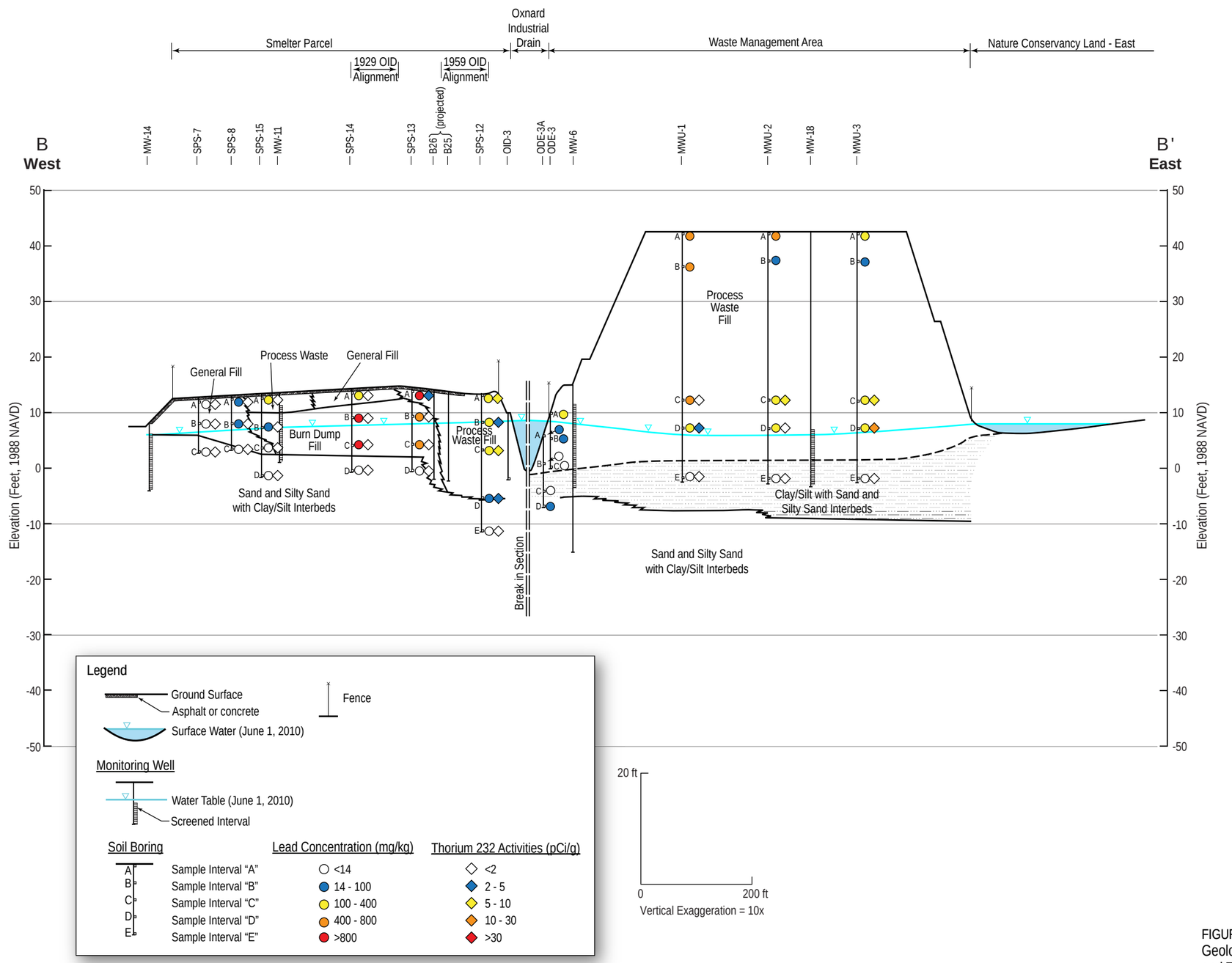

FIGURE 8b
Geologic Cross Section B - B' with Lead and Thorium 232 Levels
Halaco Site Remedial Investigation
Oxnard, California

CH2MHILL

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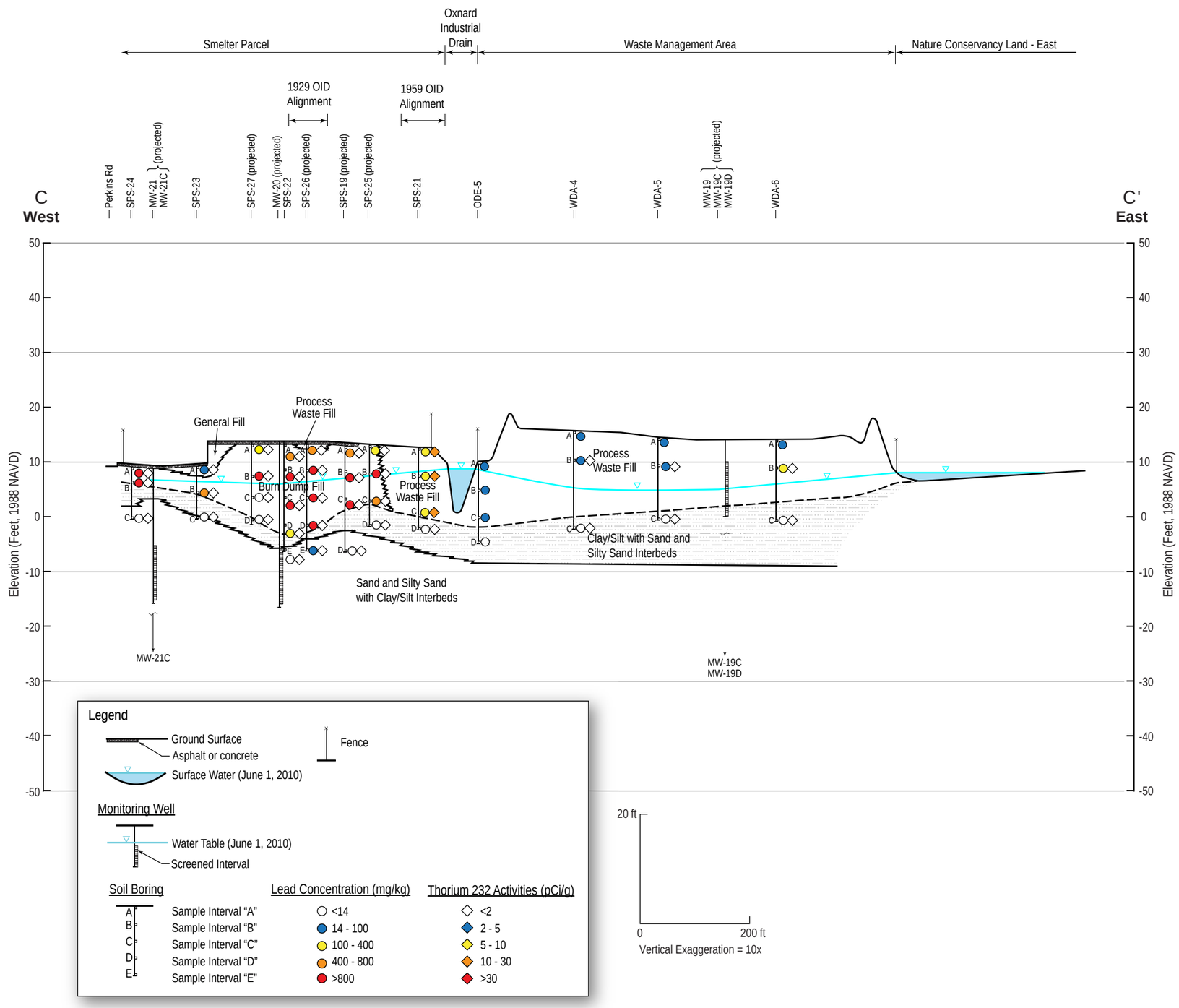

FIGURE 8c
Geologic Cross Section C - C' with Lead and Thorium 232 Levels
Halaco Site Remedial Investigation
Oxnard, California

CH2MHILL

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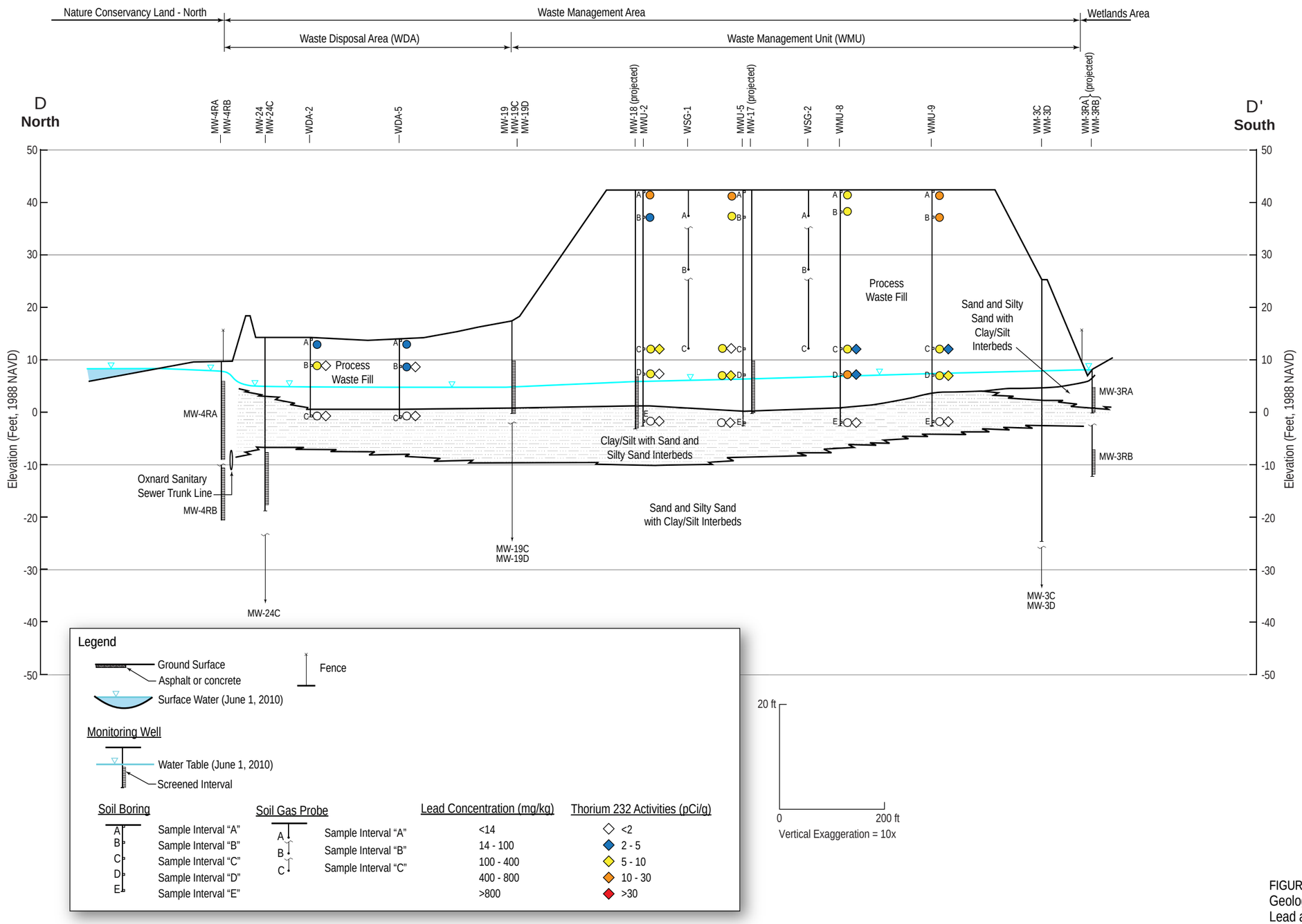
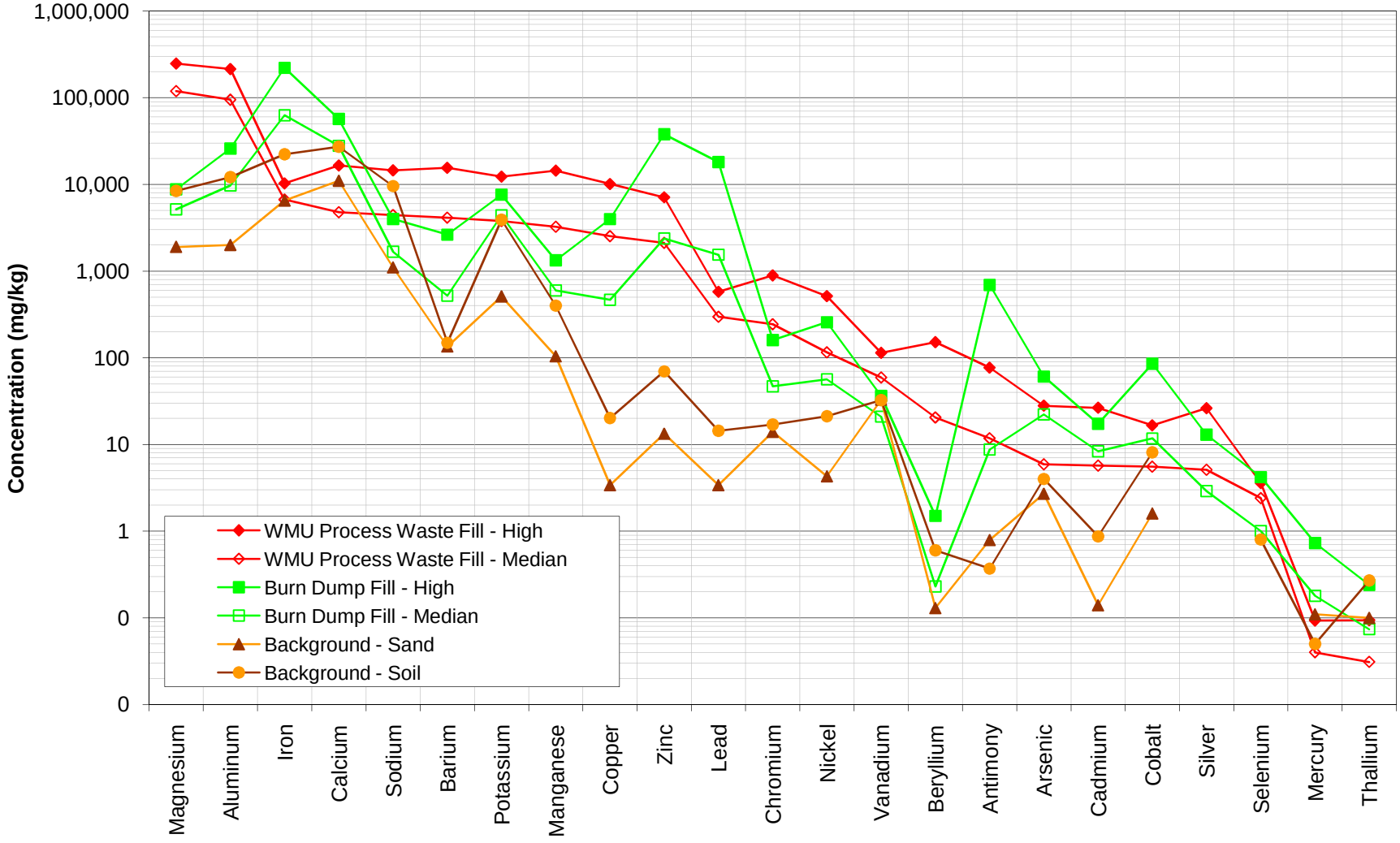


FIGURE 8d
Geologic Cross Section D - D' with
Lead and Thorium 232 Levels
Halaco Site Remedial Investigation
Oxnard, California

WBG110210203057SCO385135.DE.01 HSRI_Geologic_crossDD'_levels.ai 6/11

CH2MHILL

Figure 9
Metals Concentrations in Process Waste, Burn Dump Waste, and Background Soils



(a) Process Waste Fill, SPS-12 at depth of approximately 17 feet below ground surface and 12 feet below the water table measured on June 1, 2010.

(b) Burn Dump Waste Fill, SPS-13 at depth of approximately 12 feet below ground surface and 6 feet below the water table measured on June 1, 2010.

FIGURE 10
Process Waste and Burn
Dump Waste Core Photographs
Halaco Site Remedial Investigation
Oxnard, California

CH2MHILL

Attachment A
Historical Aerial Photographs

TS-AMD-82043
May 1982

PHOTOGRAPHIC ANALYSIS OF A WASTE DISPOSAL SITE

Ventura County, California

by

D. R. Williams
Environmental Programs
Lockheed Engineering and Management Services Company, Inc.
Las Vegas, Nevada 89114

Contract No. 68-03-3049

Project Officer

C. E. Lake
Advanced Monitoring Systems Division
Environmental Monitoring Systems Laboratory
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ENVIRONMENTAL MONITORING SYSTEMS LABORATORY
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
LAS VEGAS, NEVADA 89114

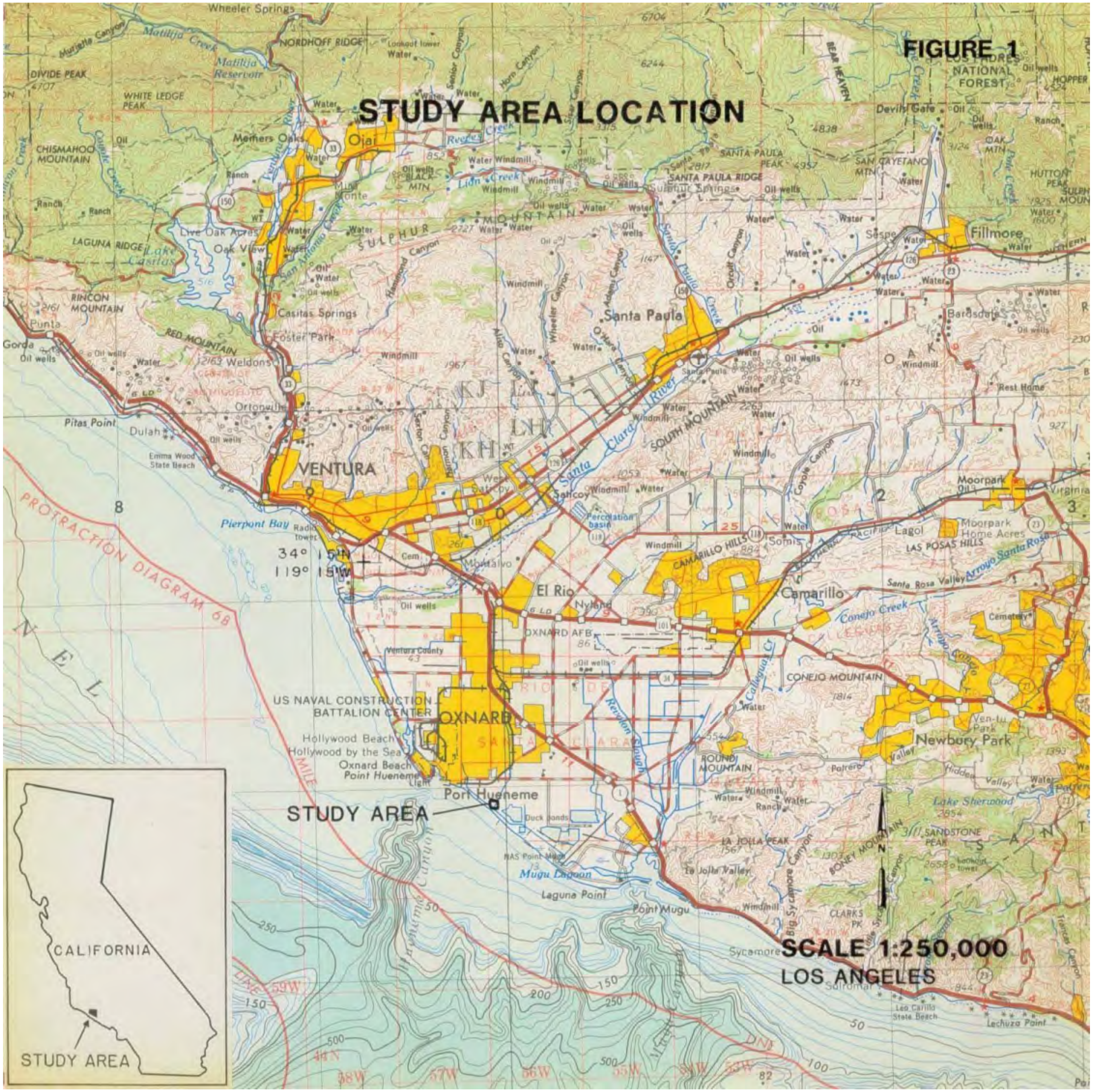


FIGURE 1
STUDY AREA LOCATION
SCALE 1:250,000
LOS ANGELES
STUDY AREA
CALIFORNIA
STUDY AREA
34° 15'N
119° 15'W
VENTURA
OXNARD
Ojai
Santa Paula
Fillmore
Moorpark
Camarillo
Newbury Park
El Rio
Port Hueneme
Pierpont Bay
US NAVAL CONSTRUCTION
BATTALION CENTER
Point Mugu
Mugu Lagoon
Laguna Point
Hollywood Beach
Hollywood by the Sea
Oxnard Beach
Point Hueneme
OXNARD AFB
CONEJO MOUNTAIN
SOUTH MOUNTAIN
PROTRACTION DIAGRAM 6B

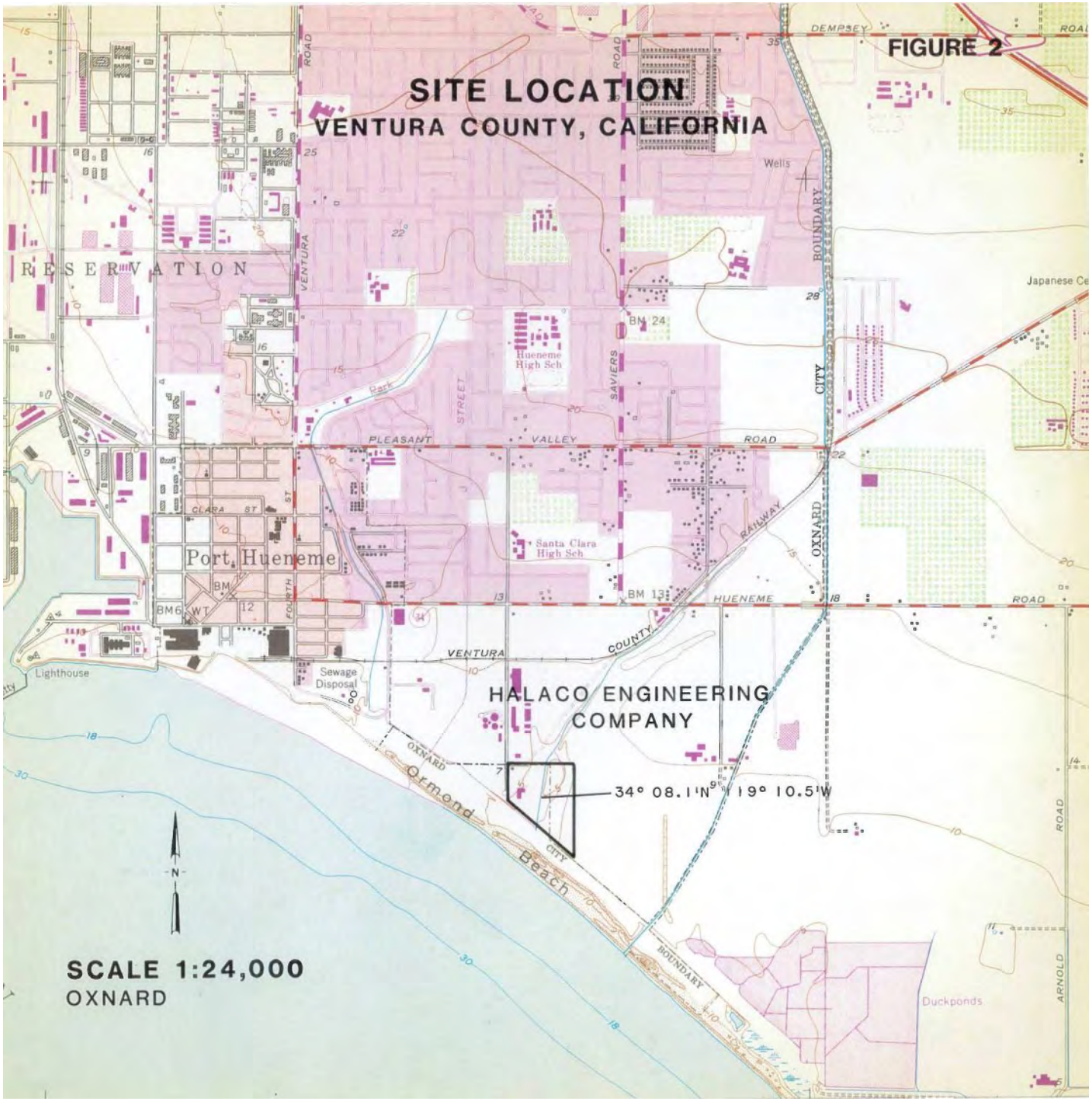
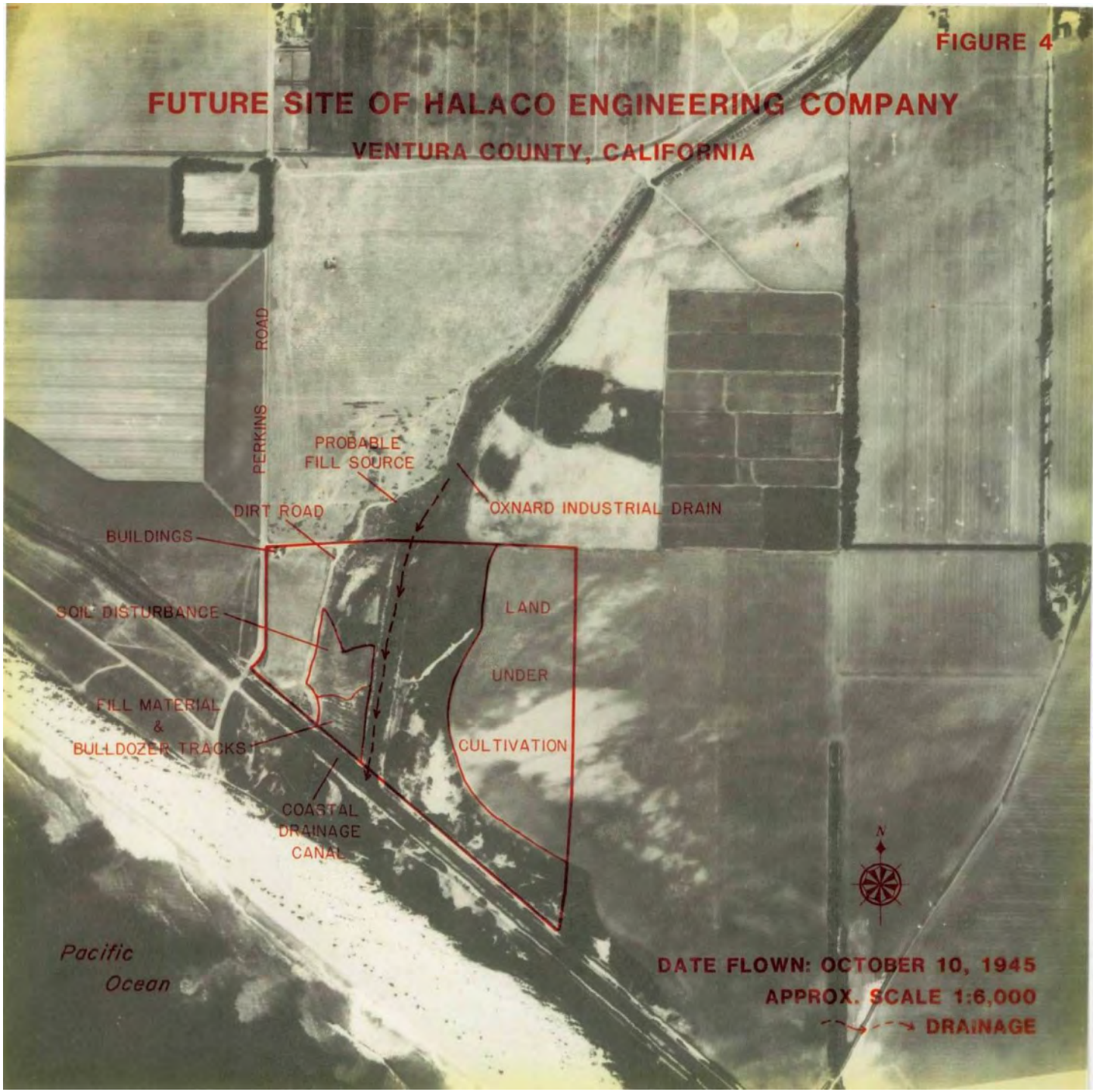


FIGURE 2
SITE LOCATION
VENTURA COUNTY, CALIFORNIA
RESERVATION
Port Hueneme
Hueneme High Sch
Santa Clara High Sch
Wells
Japanese Ce
Lighthouse
Sewage Disposal
HALACO ENGINEERING COMPANY
34° 08.1'N 119° 10.5'W
Ormond Beach
Duckponds
DEMPSEY
PLEASANT VALLEY ROAD
HUENEME ROAD
VENTURA COUNTY
OXNARD BOUNDARY
CITY
SAVIERS ROAD
VENTURA ROAD
CLARA ST
FOURTH ST
RAILWAY
ARNOLD ROAD
N
SCALE 1:24,000
OXNARD

1929

FIGURE 3
FUTURE SITE OF HALACO ENGINEERING COMPANY
VENTURA COUNTY, CALIFORNIA
OXNARD INDUSTRIAL DRAIN
SHEET FLOW
SHEET FLOW
POND
VEHICULAR TRACKS
DENUDED VEGETATION
Pacific
Ocean
N
DATE FLOWN: 1929
APPROX. SCALE 1:6,000
DRAINAGE



October 10, 1945

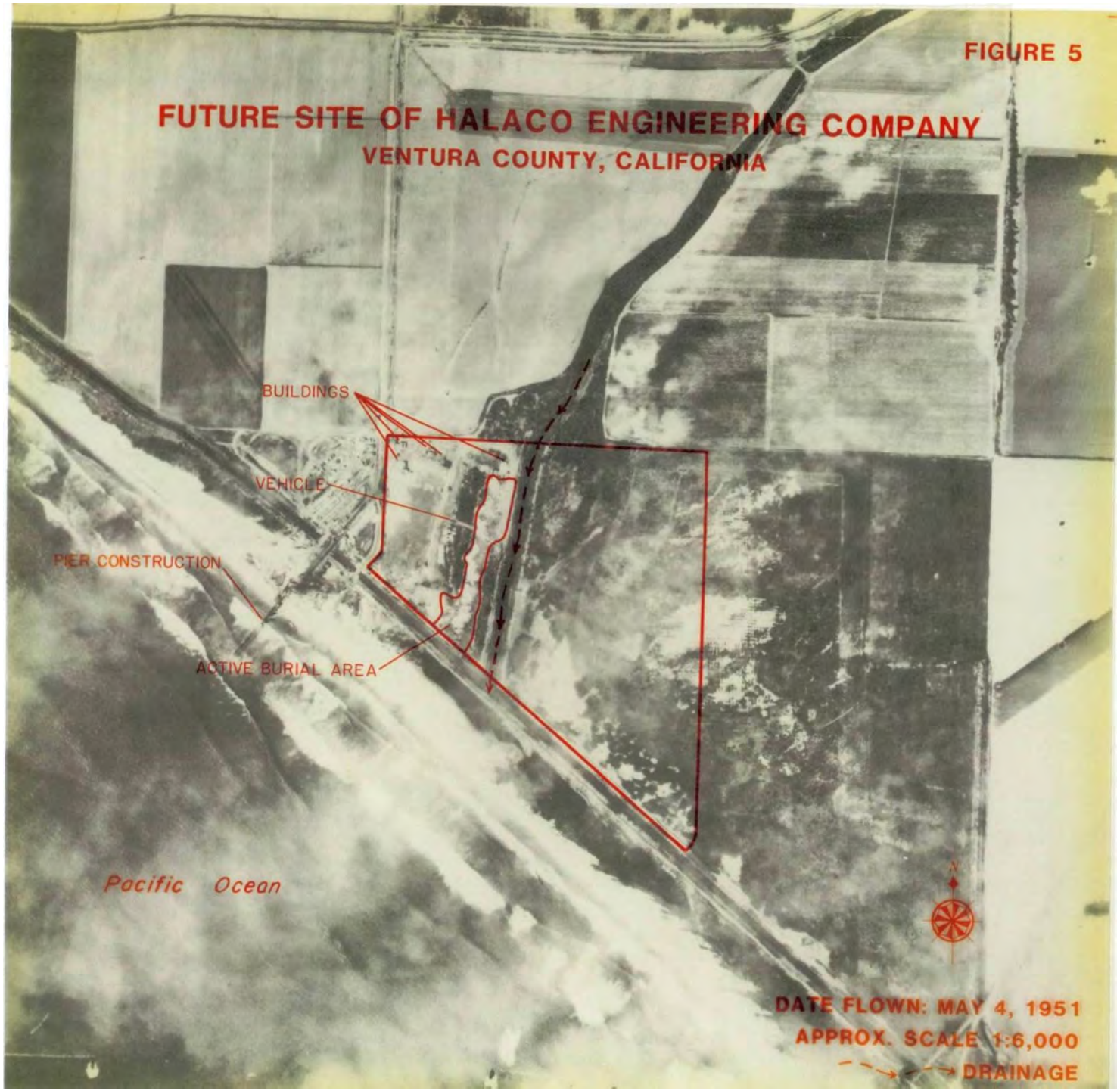
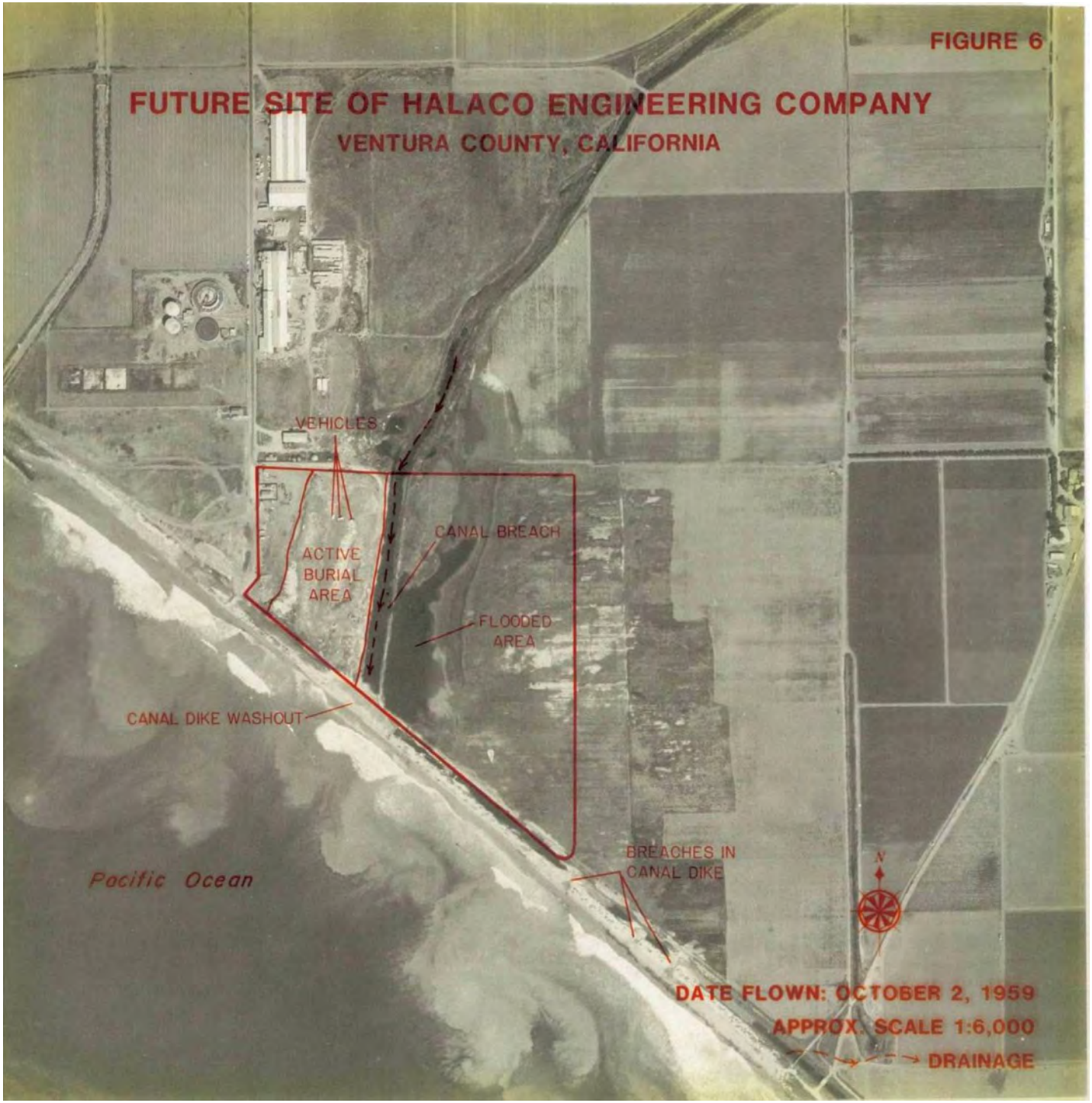


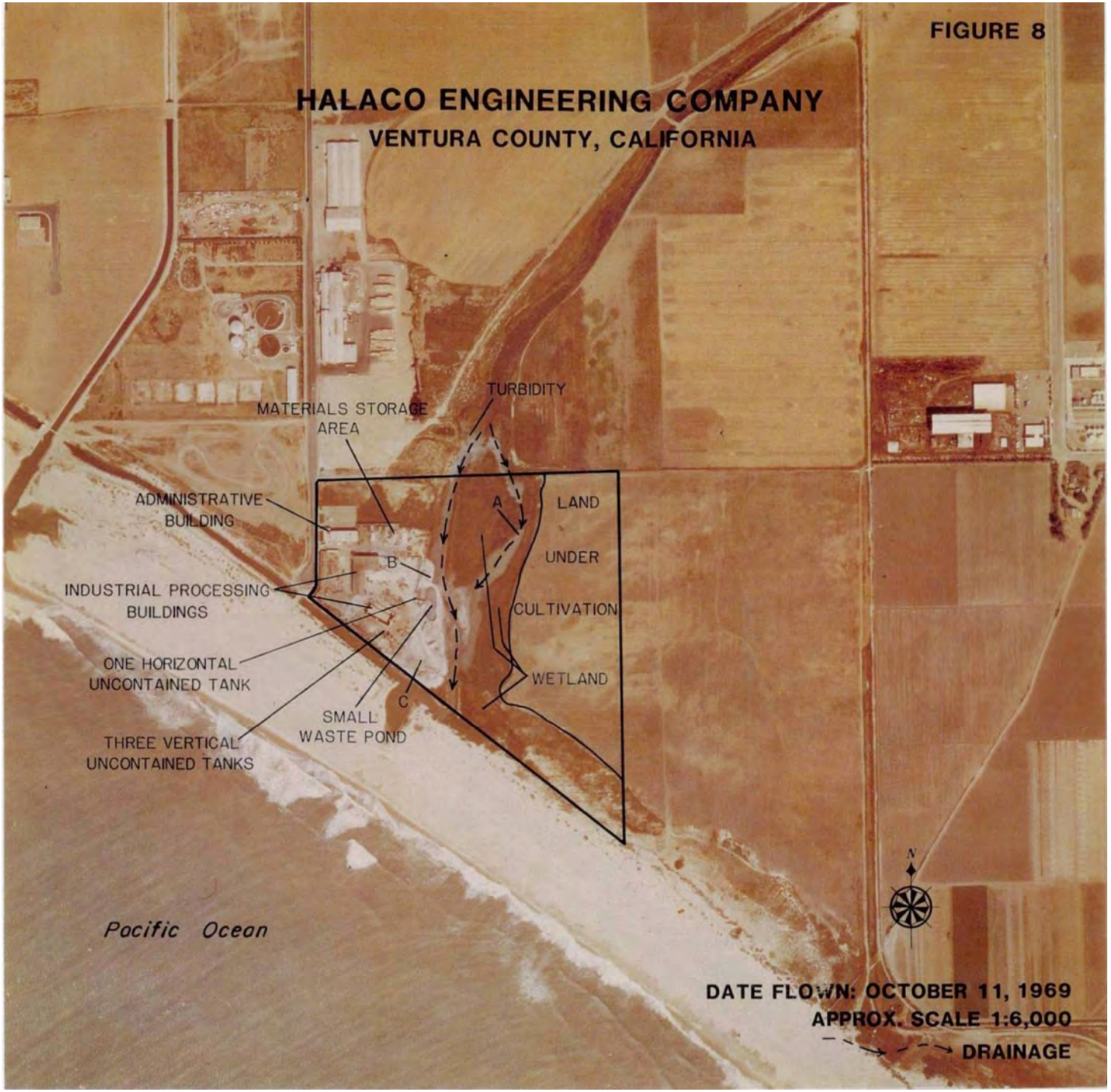
FIGURE 5
FUTURE SITE OF HALACO ENGINEERING COMPANY
VENTURA COUNTY, CALIFORNIA
BUILDINGS
VEHICLE
PIER CONSTRUCTION
ACTIVE BURIAL AREA
Pacific Ocean
N
DATE FLOWN: MAY 4, 1951
APPROX. SCALE 1:6,000
DRAINAGE

May 4, 1951

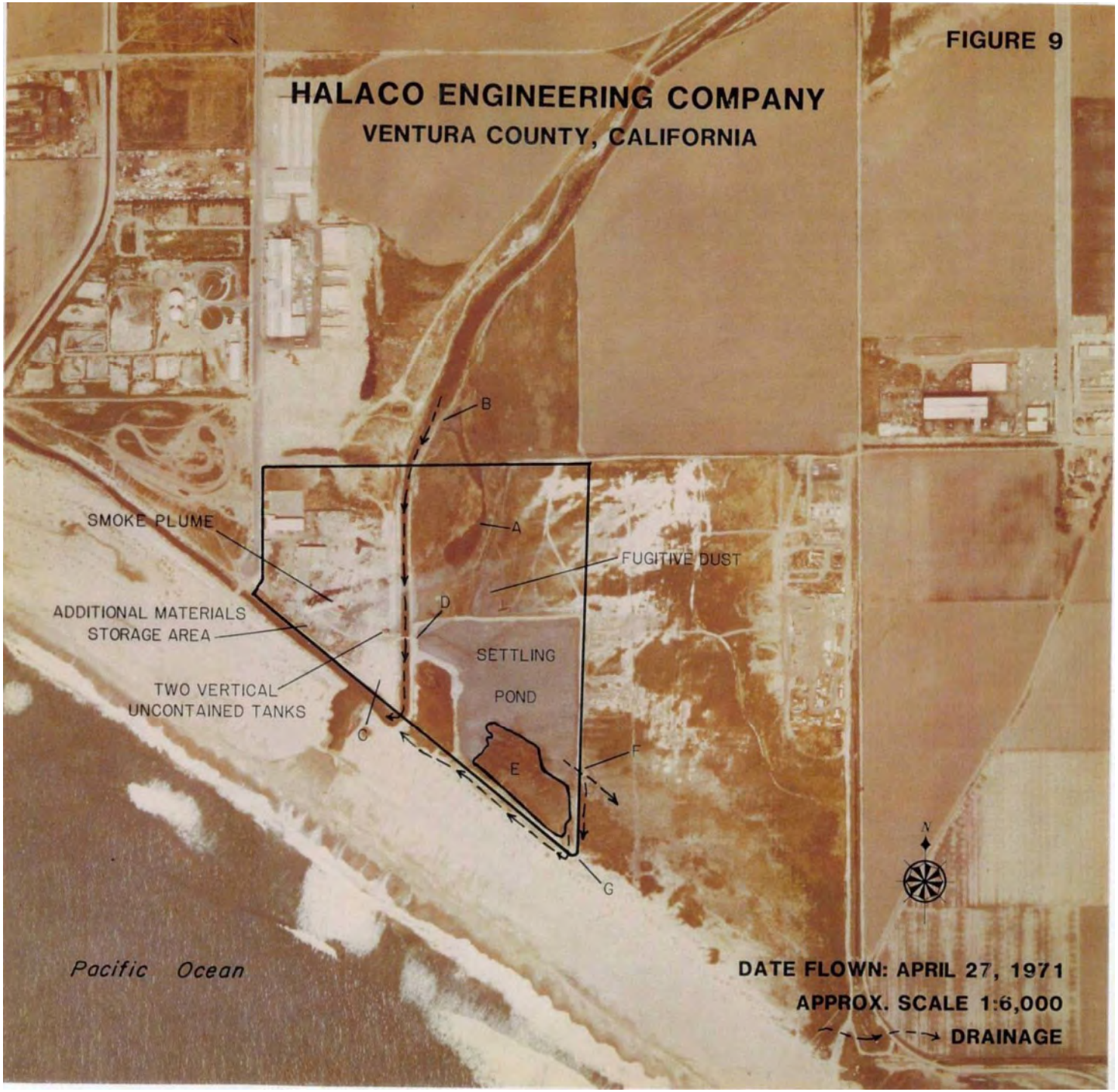


October 2, 1959

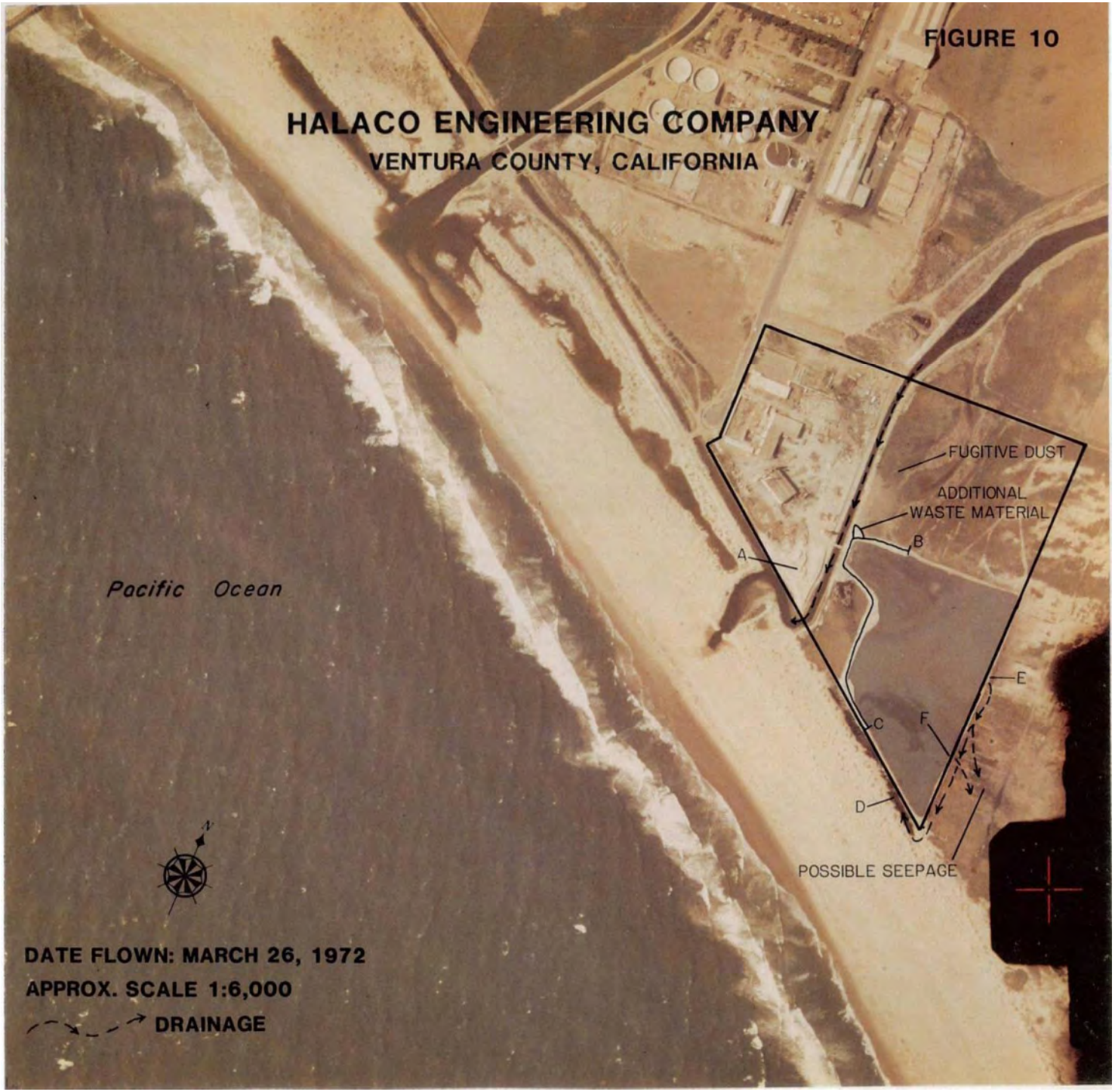
September 20, 1965



October 11, 1969



April 27, 1971



March 26, 1972

August 23, 1973

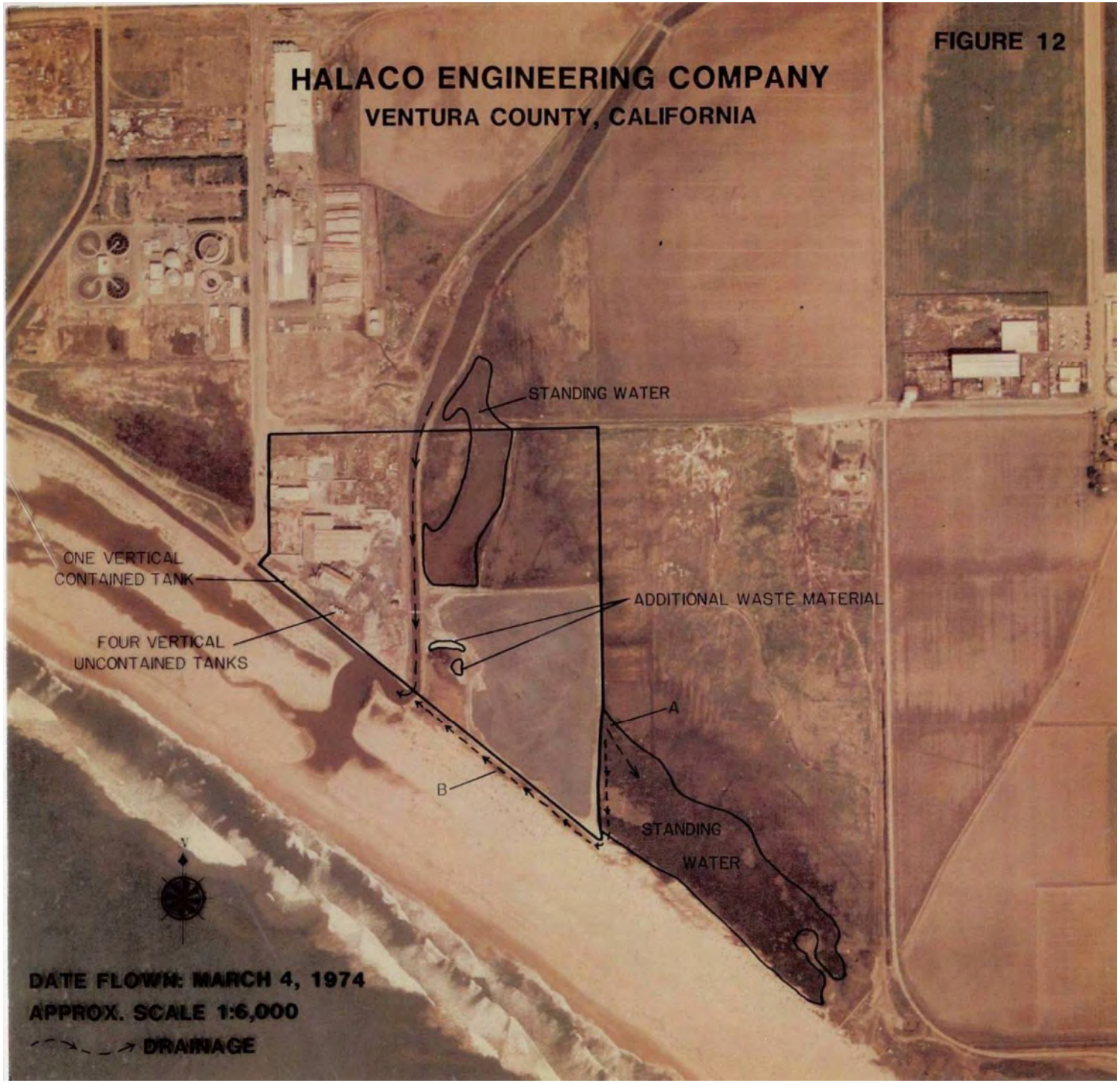


FIGURE 12
HALACO ENGINEERING COMPANY
VENTURA COUNTY, CALIFORNIA
STANDING WATER
ONE VERTICAL
CONTAINED TANK
FOUR VERTICAL
UNCONTAINED TANKS
ADDITIONAL WASTE MATERIAL
A
B
STANDING
WATER
N
DATE FLOWN: MARCH 4, 1974
APPROX. SCALE 1:6,000
DRAINAGE

March 4, 1974

October 7, 1975

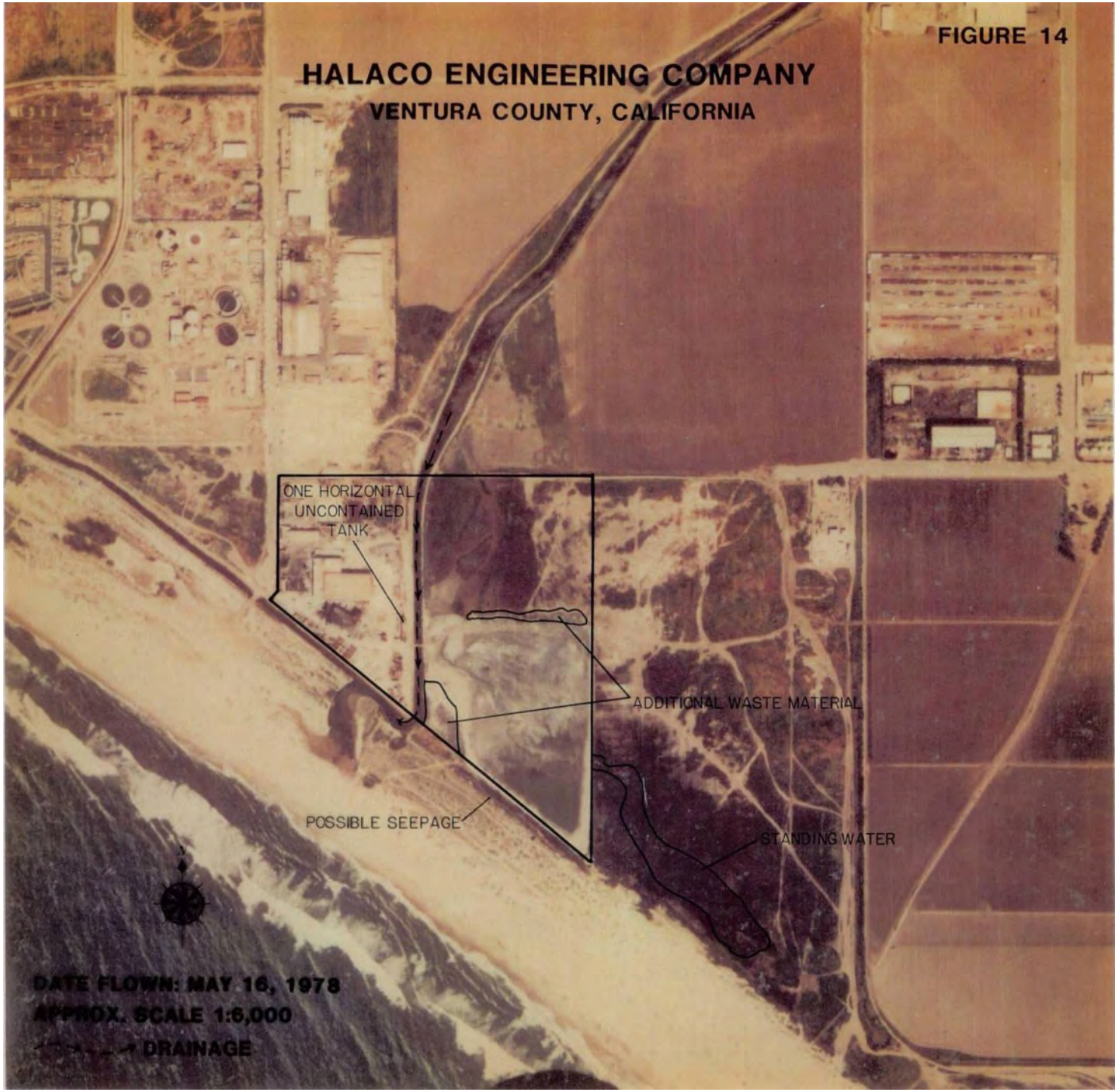


FIGURE 14
HALACO ENGINEERING COMPANY
VENTURA COUNTY, CALIFORNIA
ONE HORIZONTAL UNCONTAINED TANK
ADDITIONAL WASTE MATERIAL
POSSIBLE SEEPAGE
STANDING WATER
N
DATE FLOWN: MAY 16, 1978
APPROX. SCALE 1:6,000
DRAINAGE

May 16, 1978

FIGURE 15
HALACO ENGINEERING COMPANY
VENTURA COUNTY, CALIFORNIA
BULLDOZER TRACKS
ADDITIONAL WASTE MATERIAL
DRUM STORAGE
STANDING WATER
ONE HORIZONTAL CONTAINED TANK
WASTEWATER OUTFALL
WATER TREATMENT EQUIPMENT
FIVE VERTICAL UNCONTAINED TANKS
FORMER FILL AREA
Ocean
N
DATE FLOWN: JUNE 22, 1981

June 22, 1981

TS-PIC-91730
February 1991

AERIAL PHOTOGRAPHIC ANALYSIS OF THE MALACO ENGINEERING FACILITY

Oxnard, California

by

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Environmental Programs
Lockheed Engineering and Sciences Company
Las Vegas, Nevada 89193-3478

Contract No. 68-C0-0050

Project Officer

P. A. Arberg
Advanced Monitoring Systems Division
Environmental Monitoring Systems Laboratory
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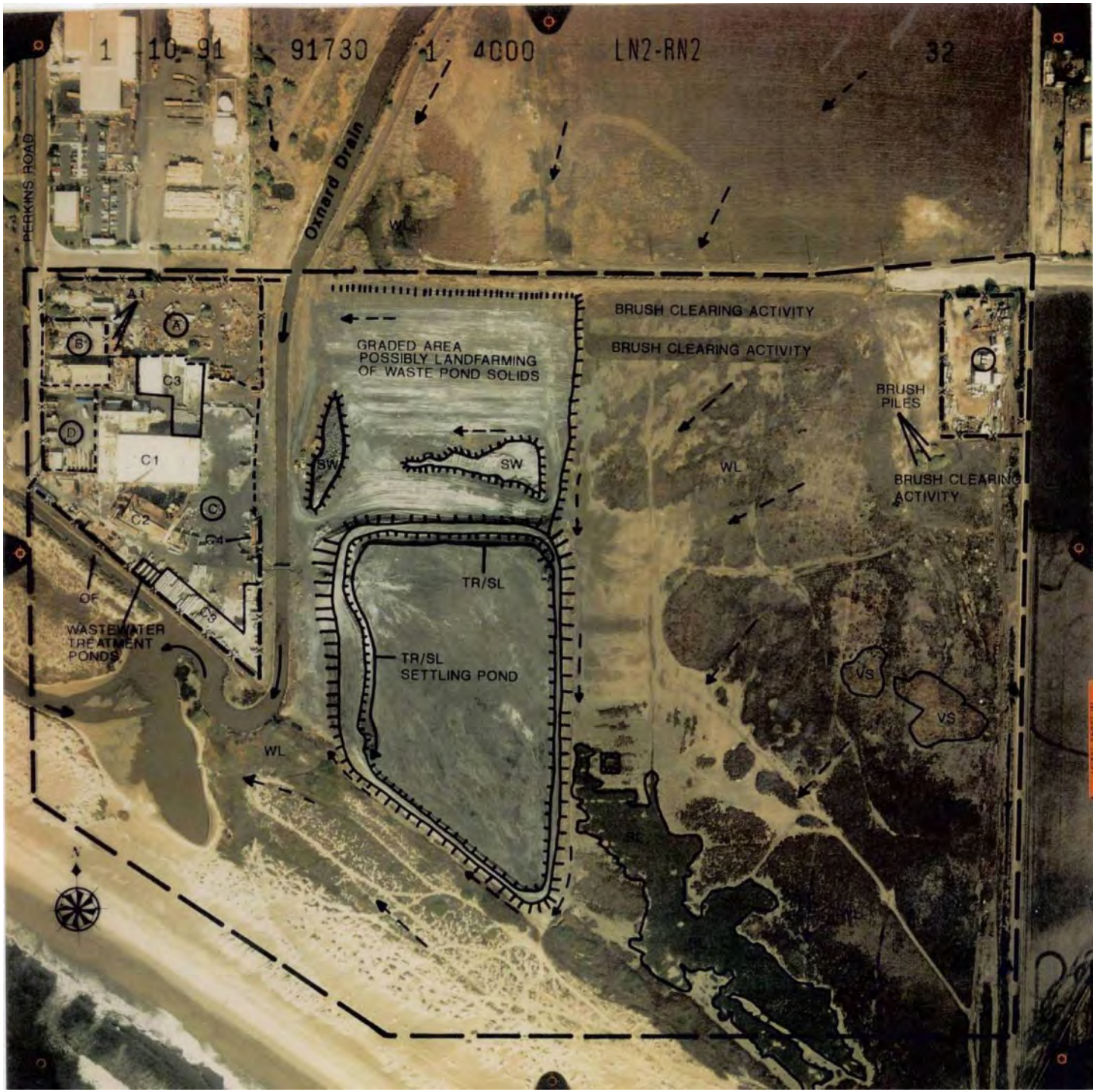
ENVIRONMENTAL MONITORING SYSTEMS LABORATORY
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
LAS VEGAS, NEVADA 89193-3478



January 10, 1991

Attachment B
Photographs of Soil and Waste Sampling at the Smelter Parcel and Waste Management Areas

PHOTO 1
Soil sampling with direct push rig on top of the Waste Management Unit.

PHOTO 2
Soil sampling with direct push rig at the Smelter Parcel.

PHOTO 3
Soil sampling with hand auger at the edge of the Waste Management Unit.

PHOTO 4
Soil sampling with vibracore barge in OID next to Waste Management Area.

PHOTO 5
Soil core in acetate liner from soil sampling with direct push rig.

PHOTO 6
Soil core in soft polyethylene liner from vibracore sampling.

Attachment C
Photographs of Direct Push Cores at the Smelter Parcel and Waste Management Areas

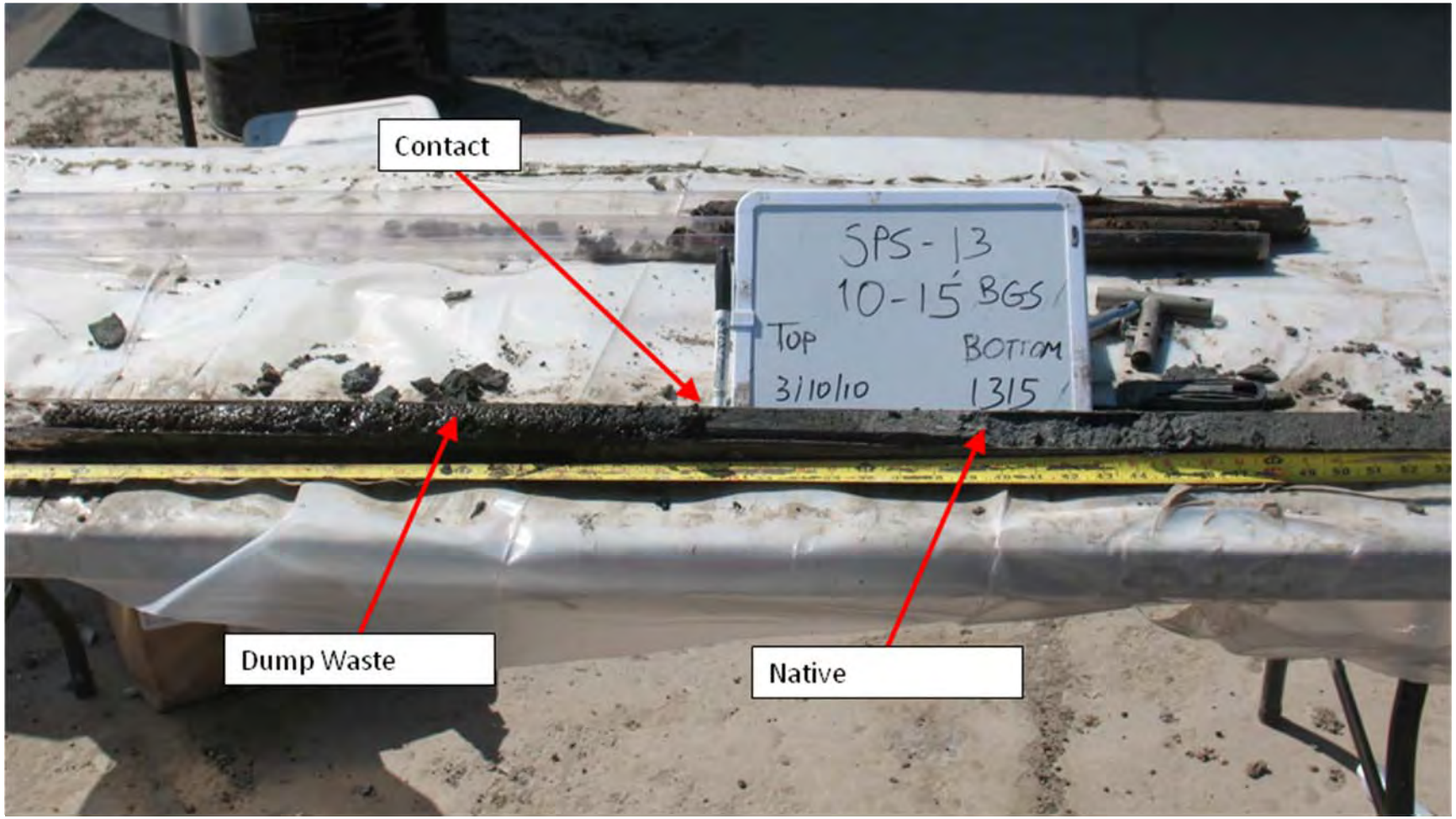


PHOTO 1
Burn dump fill/native soil contact, SPS-13 at Smelter Parcel.

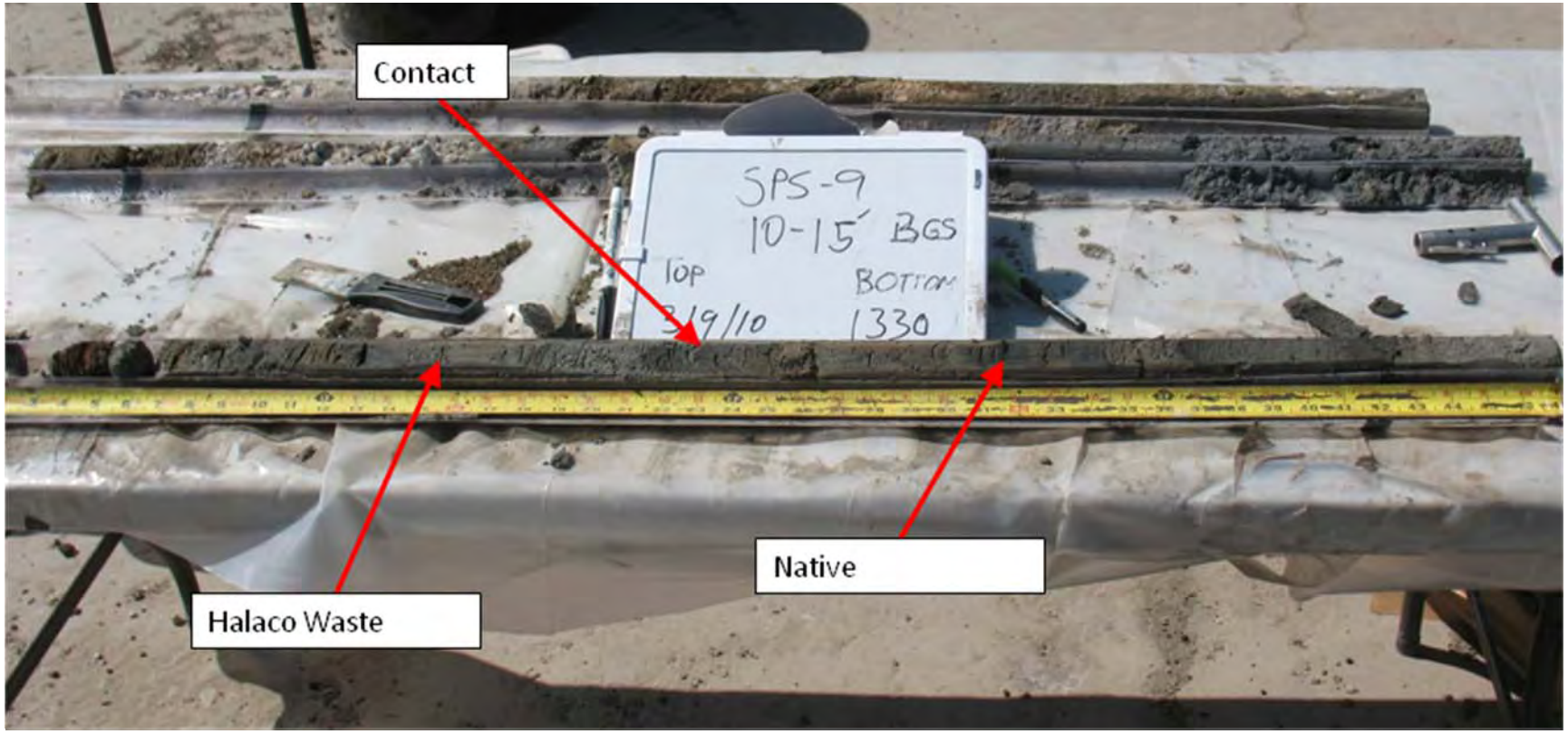


PHOTO 2
Process waste fill/native soil contact, SPS-9 at Smelter Parcel.

PHOTO 3
Process waste fill/native soil contact, WMU-3 at Waste Management Area.

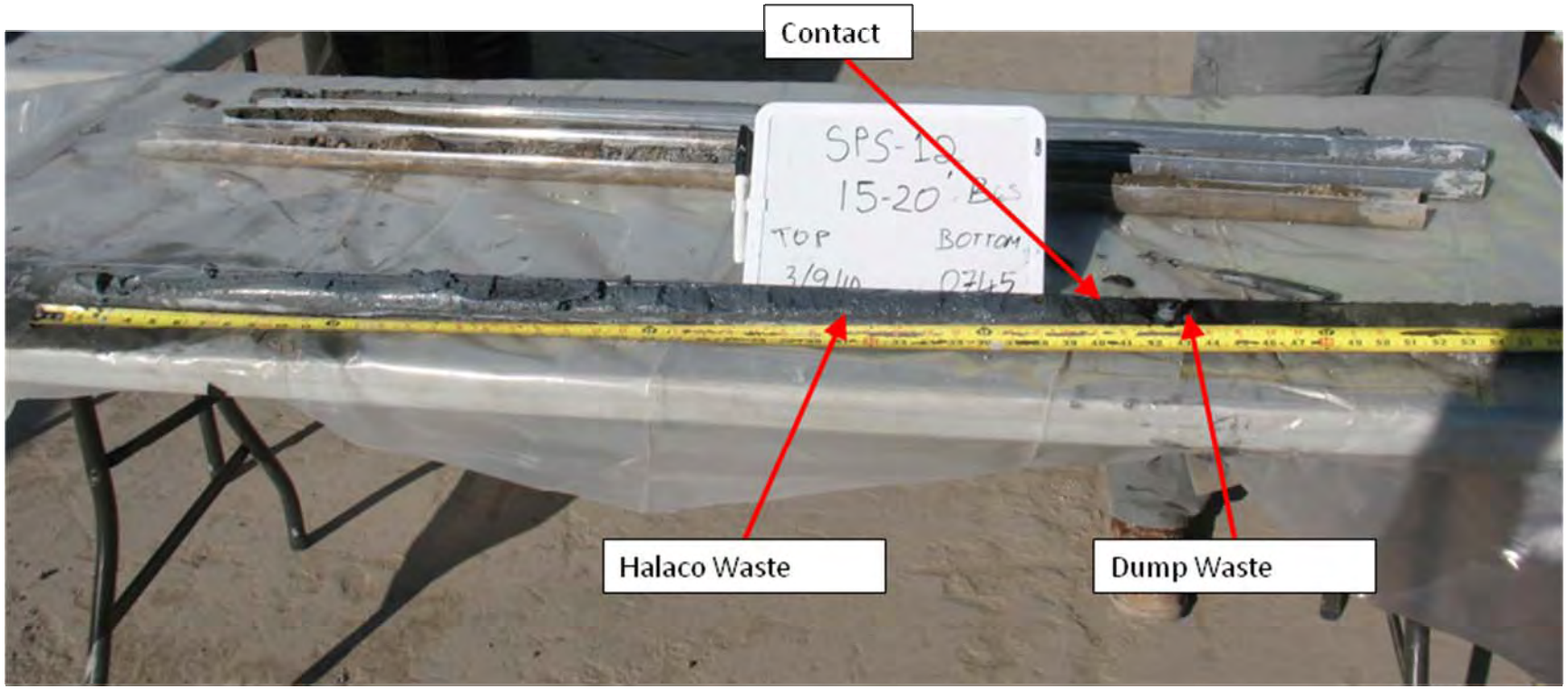


PHOTO 4
Process waste fill/burn dump fill contact, SPS-12, Smelter Parcel.

Attachment D
Lithologic Descriptions of Soil and Waste Samples at the Smelter Parcel and Waste Management Areas

ATTACHMENT D

Lithologic Descriptions of Soil and Waste Samples at the Smelter Parcel and Waste Management Areas

Contents

Attachment D1: Lithologic Descriptions for Smelter Parcel and Waste Management Area

Smelter Parcel

- SPN-1 through SPN-12
- SPP-1 through SPP-4
- SPS-1 through SPS-27

Waste Management Area

- WDA-1 through WDA-6
- WMU-1 through WMU-9
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Geotechnical Borings

- SGT-2
- WGT-1 and WGT-2

Attachment D2: Lithologic Descriptions for OID Area

- ODE-1A through ODE-3A

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPN-01*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 2.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/1/2010	**DATE COMPLETED:** 3/1/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: NW side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		75						**CONCRETE**			SM-SPN-001-A (0.5-1')
					0	20	80	**FILL** SILT WITH SAND (ML), Dark olive brown (2.5Y 3/3), wet, soft, homogeneous, no odor, no staining, strong HCL reaction. FINES: medium plasticity, slow dilatancy. SAND: fine grained.			
1									0		
											Brick pieces
2									0		SM-SPN-001-B (1.5-2')

Boring Terminated at 2 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPN-02*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 2.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/1/2010	**DATE COMPLETED:** 3/1/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: NW of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		100						**CONCRETE**			
1					0	20	80	**FILL** SILT WITH SAND (ML), Dark olive brown (2.5Y 3/3), wet, soft, homogeneous, no odor, no staining, strong HCL reaction. FINES: medium plasticity, slow dilatancy. SAND: fine grained.			SM-SPN-002-A (0.5-1') SM-SPN-002-A-MS/MSD (0.5-1')
2					0	20	80	**FILL** SILT WITH SAND (ML), black (2.5Y 2.5/1), moist, medium stiff, no odor, iron oxide staining, strong HCL reaction. FINES: non plastic, low dry strength, no toughness. SAND: fine to medium grained. With brick and glass. BURN DUMP WASTE.			SM-SPN-002-B (1.5-2') SM-SPN-002-B-MS/MSD (1.5-2')

Boring Terminated at 2 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPN-03*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 2.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/1/2010	**DATE COMPLETED:** 3/1/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: North side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		100			0	70	30	**FILL** SILTY SAND (SM), dark olive brown (2.5Y 3/3), wet, homogeneous, no odor, no staining, strong HCL reaction. SAND: fine grained. FINES: medium plasticity, slow dilatancy. With glass.			SM-SPN-003-A (0-0.5') SM-SPN-103-A (0-0.5')
1					0	20	80	**FILL** SILT WITH SAND (ML), black (2.5Y 2.5/1), moist, medium stiff, no odor, iron oxide staining, strong HCL reaction. FINES: non plastic, low dry strength, no toughness. SAND: fine to medium grained. With brick and glass. BURN DUMP WASTE.			
2					0	20	80	**FILL** SILT WITH SAND (ML), black (2.5Y 2.5/1), moist, medium stiff, no odor, iron oxide staining, strong HCL reaction. FINES: non plastic, low dry strength, no toughness. SAND: fine to medium grained. With significant glass. BURN DUMP WASTE.			SM-SPN-003-B (1.5-2') SM-SPN-103-B (1.5-2')

Boring Terminated at 2 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPN-04*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 2.25	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/1/2010	**DATE COMPLETED:** 3/1/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: North side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		90			0	20	80	**FILL** SILT WITH SAND (ML), Dark olive brown (2.5Y 3/3), wet, soft, homogeneous, no odor, no staining, strong HCL reaction. FINES: medium plasticity, slow dilatancy. SAND: fine grained.			SM-SPN-004-A (0-0.5')
1					0	20	80	**FILL** SILT WITH SAND (ML), black (2.5Y 2.5/1), moist, medium stiff, no odor, iron oxide staining, strong HCL reaction. FINES: non plastic, low dry strength, no toughness. SAND: fine to medium grained. With brick and glass. BURN DUMP WASTE.	0		
					70	0	30				
					0	20	80				
2								**FILL** SILTY GRAVEL (GM), black (2.5Y 2.5/1), moist, loose, dessicated, no odor, iron oxide staining, strong HCL reaction. GRAVEL: angular. FINES: non plastic, low dry strength, no toughness. With significant brick. BURN DUMP WASTE.	0		SM-SPN-004-B (1.75-2.25')
								FILL SILT WITH SAND (ML), black (2.5Y 2.5/1), moist, medium stiff, no odor, iron oxide staining, strong HCL reaction. FINES: non plastic, low dry strength, no toughness. SAND: fine to medium grained. With brick and glass. BURN DUMP WASTE.			

Boring Terminated at 2.25 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPN-05*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 2.25	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/1/2010	**DATE COMPLETED:** 3/1/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: NE side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		100			0	20	80	**FILL** SILT WITH SAND (ML), Dark olive brown (2.5Y 3/3), wet, soft, homogeneous, no odor, no staining, strong HCL reaction. FINES: medium plasticity, slow dilatancy. SAND: fine grained. Some medium to coarse gravel.			SM-SPN-005-A (0-0.5')
1									0		
					0	20	80	**FILL** SILT WITH SAND (ML), black (2.5Y 2.5/1), moist, medium stiff, no odor, iron oxide staining, strong HCL reaction. FINES: non plastic, low dry strength, no toughness. SAND: fine to medium grained. Trace brick and glass. BURN DUMP WASTE.			
2					0	60	40	**SILTY SAND (SM)** dark olive brown (2.5Y 3/3), very loose. SAND: fine to medium grained. FINES: non plastic. Little fine gravel.	0		SM-SPN-005-B (1.75-2.25')

Boring Terminated at 2.25 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPN-06*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 2.25	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/1/2010	**DATE COMPLETED:** 3/1/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: North side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		100			0	40	60	**FILL** SILT WITH SAND (ML), black (2.5Y 2.5/1), damp, medium stiff, no odor, iron oxide staining, strong HCL reaction. FINES: non plastic, low dry strength, slow dilatancy, no toughness. SAND: fine grained. Some medium to coarse gravel and trace glass. BURN DUMP WASTE OR GENERAL FILL (???).			SM-SPN-006-A (0-0.5')
1									0		
2											SM-SPN-006-B (1.75-2.25')

Boring Terminated at 2.25 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPN-07*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 2.25	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/1/2010	**DATE COMPLETED:** 3/1/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: NE side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		100			0	20	80	**FILL** SILT WITH SAND (ML), Dark olive brown (2.5Y 3/3), moist, medium stiff, homogeneous, no odor, no staining, strong HCL reaction. FINES: medium plasticity, slow dilatancy. SAND: fine grained. Trace glass.			SM-SPN-007-A (0-0.5')
1					0	20	80	With fractured sandstone pieces.	0		
					0	20	80	**FILL** SILT WITH SAND (ML), black (2.5Y 2.5/1), moist, medium stiff, no odor, iron oxide staining, strong HCL reaction. FINES: non plastic, low dry strength, no toughness. SAND: fine to medium grained. Little brick and glass. BURN DUMP WASTE.			
2									0		SM-SPN-007-B (1.75-2.25')

Boring Terminated at 2.25 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPN-08*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 2.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/1/2010	**DATE COMPLETED:** 3/1/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: North side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	OVM (ppm): HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		90			0	20	80	**FILL** SILT WITH SAND (ML), Dark olive brown (2.5Y 3/3), wet, soft, homogeneous, no odor, no staining, strong HCL reaction. FINES: medium plasticity, slow dilatancy. SAND: fine grained.			SM-SPN-008-A (0-0.5')
					0	20	80	**FILL** SILT WITH SAND (ML), black (2.5Y 2.5/1), moist, medium stiff, no odor, iron oxide staining, strong HCL reaction. FINES: non plastic, low dry strength, no toughness. SAND: fine to medium grained. With brick and glass. BURN DUMP WASTE.	0		
1					0	20	80	**FILL** SILT WITH SAND (ML), Dark olive brown (2.5Y 3/3), wet, soft, homogeneous, no odor, no staining, strong HCL reaction. FINES: medium plasticity, slow dilatancy. SAND: fine grained.	0		SM-SPN-008-B (1.5-2')
2					0	20	80	**FILL** SILT WITH SAND (ML), black (2.5Y 2.5/1), moist, medium stiff, no odor, iron oxide staining, strong HCL reaction. FINES: non plastic, low dry strength, no toughness. SAND: fine to medium grained. Little brick and with significant glass. BURN DUMP WASTE.			

Boring Terminated at 2 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPN-09*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 2.25	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/1/2010	**DATE COMPLETED:** 3/1/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: North side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		100			0	20	80	**FILL** SILT WITH SAND (ML), Dark olive brown (2.5Y 3/3), wet, medium stiff, homogeneous, no odor, no staining, strong HCL reaction. FINES: medium plasticity, slow dilatancy. SAND: fine grained. Some brick and glass. GENERAL FILL OR DUMP WASTE (???).	0		SM-SPN-009-A (0-0.5')
1											
					0	20	80	**FILL** SILT WITH SAND (ML), black (2.5Y 2.5/1), moist, medium stiff, no odor, iron oxide staining, strong HCL reaction. FINES: non plastic, low dry strength, no toughness. SAND: fine to medium grained. With brick, glass, and construction debris. DUMP WASTE.			SM-SPN-009-B (1.75-2')
2											

Boring Terminated at 2.25 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPN-10*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 2.25	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/1/2010	**DATE COMPLETED:** 3/1/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: NE side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		90			10	70	20	**FILL** SILTY SAND (SM), brown (10YR 4/3), moist, no odor, no staining, strong HCL reaction. SAND: fine grained, subangular. GRAVEL: fine to medium grained, subrounded.			SM-SPN-010-A (0-0.5')
1					10	20	70	**FILL** SILT WITH SAND (ML), black (2.5Y 2.5/1), moist, medium stiff, no odor, iron oxide staining, strong HCL reaction. FINES: non plastic, low dry strength, no toughness. SAND: fine to medium grained. GRAVEL: fine and coarse grained, subangular. LIKELY BURN DUMP WASTE.	0		
2									0		SM-SPN-010-B (1.75-2.25')

Boring Terminated at 2.25 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPN-11*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/8/2010	**DATE COMPLETED:** 3/8/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: NE side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		70			10	70	20	**FILL** SILTY SAND (SM), brown (10YR 4/3), moist, no odor, no staining, strong HCL reaction. SAND: fine grained, subangular. GRAVEL: fine to medium grained, subrounded.			SM-SPN-011-A (0-0.5')
1											
2											
3											
4											
5					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), black (2.5Y 2.5/1), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and glass. BURN DUMP WASTE.			
		80									SM-SPN-011-B (5-5.5')
6											
7											
8											
9											
10					0	0	100	**SILTY SAND (SM)** Light olive brown (2.5Y 5/3), stiff. FINES: low plasticity, slow dilatancy. Some fine to medium sand and locally thin layers of fat clay.			
		100									SM-SPN-011-C (10-10.5')
11					0	90	10	**POORLY GRADED SAND WITH SILT (SP-SM)** Very dark gray (2.5Y 3/1), loose. SAND: fine grained.			
12											
13					0	0	100	**ELASTIC SILT (MH)** Very dark gray (2.5Y 3/1), medium stiff. FINES: low plasticity, rapid dilatancy.			
14					0	100	0				
					20	60	20	**POORLY GRADED SAND (SP)** Very dark gray (2.5Y 3/1), very loose. SAND: medium to coarse grained.			
15											SM-SPN-011-D (14.5-15')
								FILL SILTY SAND WITH GRAVEL (SM), black (2.5Y 2.5/1), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and glass. LIKELY BURN DUMP WASTE.			
								Boring Terminated at 15 feet bgs			

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*SPN-12*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/2/2010	**DATE COMPLETED:** 3/2/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: NE side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		80			10	70	20	**FILL** SILTY SAND (SM), brown (10YR 4/3), moist, no odor, no staining, strong HCL reaction. SAND: fine grained, subangular. GRAVEL: fine to medium grained, subrounded.			SM-SPN-012-A (0-0.5') SM-SPN-112-A (0-0.5')
1					10	0	90				
2								**FILL** LEAN CLAY (CL), dark grayish brown (2.5Y 4/2), stiff, homogeneous, iron oxide staining. FINES: high plasticity, no dilatancy. GRAVEL: fine grained, subangular.			
3					20	60	20				
4								**FILL** SILTY SAND WITH GRAVEL (SM), black (2.5Y 2.5/1), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and significant glass. BURN DUMP WASTE.			
5											
		80									SM-SPN-012-B (5-5.5') SM-SPN-112-B (5-5.5')
6											
7											
8											
											SM-SPN-012-C (8-9') SM-SPN-112-C (8-9')
9											
10					0	0	100	**SILT (ML)** Light olive brown (2.5Y 5/3), stiff. FINES: low plasticity, slow dilatancy. some fine to medium sand, and locally thin layers of fat clay.			Lens of fine sand
		80									
11											
12											
											SM-SPN-012-D (12-12.5') SM-SPN-112-D (12-12.5')
13											
14											
15											

Boring Terminated at 15 feet bgs

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPP-01*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 2.25	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/1/2010	**DATE COMPLETED:** 3/1/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Asphalt parking lot on north side of office building			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
								ASPHALT			
		100			0	100	0	**FILL** WELL GRADED SAND (SW), light olive brown (2.5Y 5/3), wet, loose, homogeneous. SAND: medium to coarse grained, subrounded, hard hardness. Little fine to medium sand.			SM-SPP-001-A (0.25-0.5')
1					0	20	80	**FILL** SILT WITH SAND (ML), black (2.5Y 2.5/1), moist, medium stiff, no odor, iron oxide staining, strong HCL reaction. FINES: non plastic, low dry strength, no toughness. SAND: fine to medium grained. With brick and glass. BURN DUMP WASTE.	0		
2									0		SM-SPP-001-B (1.75-2.25')

Boring Terminated at 2.25 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPP-02*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 2.25	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/1/2010	**DATE COMPLETED:** 3/1/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Asphalt parking lot on north side of office building			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
								ASPHALT			
		100			0	100	0	**FILL** WELL GRADED SAND (SW), light olive brown (2.5Y 5/3), wet, loose, homogeneous. SAND: medium to coarse grained, subrounded, hard hardness. Little fine to medium sand.			SM-SPP-002-A (0.25-0.5')
1					0	20	80	**FILL** SILT WITH SAND (ML), black (2.5Y 2.5/1), moist, medium stiff, no odor, iron oxide staining, strong HCL reaction. FINES: non plastic, low dry strength, no toughness. SAND: fine to medium grained. With brick and glass. BURN DUMP WASTE.	0		
2									0		SM-SPP-002-B (1.75-2.25')

Boring Terminated at 2.25 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPP-03*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 2.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/1/2010	**DATE COMPLETED:** 3/1/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Asphalt parking lot on north side of office building			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
								ASPHALT			
		100			0	100	0	**FILL** WELL GRADED SAND (SW), light olive brown (2.5Y 5/3), wet, loose, homogeneous. SAND: medium to coarse grained, subrounded, hard hardness. Little fine to medium sand.			SM-SPP-003-A (0.25-0.5')
1					0	20	80	**FILL** SILT WITH SAND (ML), black (2.5Y 2.5/1), moist, medium stiff, no odor, iron oxide staining, strong HCL reaction. FINES: non plastic, low dry strength, no toughness. SAND: fine to medium grained. With brick and glass. BURN DUMP WASTE.			
2											SM-SPP-003-B (1.5-2')

Boring Terminated at 2 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPP-04*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 2.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/1/2010	**DATE COMPLETED:** 3/1/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Asphalt parking lot on north side of office building			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
								ASPHALT			
		100			0	100	0	**FILL** WELL GRADED SAND (SW), light olive brown (2.5Y 5/3), wet, loose, homogeneous. SAND: medium to coarse grained, subrounded, hard hardness. Little fine to medium sand.			SM-SPP-004-A (0.25-0.5')
1					0	20	80	**FILL** SILT WITH SAND (ML), black (2.5Y 2.5/1), moist, medium stiff, no odor, iron oxide staining, strong HCL reaction. FINES: non plastic, low dry strength, no toughness. SAND: fine to medium grained. With brick and glass. BURN DUMP WASTE.			
					0	10	90	With decreasing sand.			
					0	20	80	With increasing sand.			SM-SPP-004-B (1.5-2')
2											

Boring Terminated at 2 feet bgs

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*SPS-01*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY	**HOLE DEPTH (ft):** 20.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/9/2010 / **DATE COMPLETED:** 3/9/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push	**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: SE side of Smelter Parcel		**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		70			20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), brown (10YR 5/3), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With white soft granular deposits. HALACO WASTE.			SM-SPS-001-A (0-0.5')
1											
2											
3											
4											
5											
		75									SM-SPS-001-B (5-5.5')
6											
7											Observed rad measurement ~1,000 counts above background. Background = 9,600 cpm (counts per minute).
8											
9											
10											
		85									SM-SPS-001-C (10-10.5')
11											
12					0	100	0	POORLY GRADED SAND (SP), brown (10YR 5/3), dense, homogeneous. SAND: fine to medium grained. HALACO WASTE.			
13					0	100	0	Same but very dark greenish gray (GLEY 1 3/5GY).			SM-SPS-001-D (13-14')
14					0	10	90	SILT WITH SAND (ML), bluish gray (GLEY 2 5/10B), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy. SAND: fine grained. HALACO WASTE.			
15					0	100	0	POORLY GRADED SAND (SP), bluish gray (GLEY 2 6/10B), dense, homogeneous. SAND: fine to medium grained. HALACO WASTE.			
		100									
16											
17					0	10	90	SILT WITH SAND (ML), bluish gray (GLEY 2 5/10B), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy. SAND: fine grained. HALACO WASTE.			
					0	100	0				
18					0	0	100	**POORLY GRADED SAND (SP)** Brown (10YR 5/3), dense, homogeneous. SAND: fine to medium grained.			
19								**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy.			
20											SM-SPS-001-E (19.5-20')

Boring Terminated at 20 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-02*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY	**HOLE DEPTH (ft):** 20.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/9/2010 / **DATE COMPLETED:** 3/9/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push	**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: SE side of Smelter Parcel		**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		70			20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), brown (10YR 5/3), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With white soft granular deposits. HALACO WASTE.			SM-SPS-002-A (0-3') SM-SPS-102-A (0-3')
1											
2											
3											
4											
5											
		60									Average reading ~11,000-15,000 cpm (counts per minute). Background = 9,600 cpm. SM-SPS-002-B (5-8') SM-SPS-102-B (5-8')
6											
7											
8											
9											
10											
		100			0	0	100	LEAN CLAY (CL), dark gray (5Y 4/1), moist, stiff, chemical odor. HALACO WASTE.			Average readings ~10,500-13,500 cpm. At 14 ft bgs, reading is 21,000. Background is 9,600 cpm. SM-SPS-002-C (10-12.5') SM-SPS-102-C (10-12.5')
11											
12											
13											
14											
					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), black (2.5Y 2.5/1), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and significant glass. HALACO WASTE OR BURN DUMP WASTE (???).			SM-SPS-002-D (14-15')
15											
		100			0	100	0				
16					0	0	100				
17								**POORLY GRADED SAND (SP)** Very pale brown (10YR 7/4), loose. SAND: medium to coarse grained, subangular.			
18					0	100	0	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy.			
19								**POORLY GRADED SAND (SP)** very pale brown (10YR 7/4), loose. SAND: fine grained, subangular.			SM-SPS-002-E (18-20') SM-SPS-102-E (18-20')
20											

Boring Terminated at 20 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-03*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 20.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/9/2010	**DATE COMPLETED:** 3/9/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: South side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
1		50			20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), very dark gray (10YR 3/1), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick. HALACO WASTE.			SM-SPS-003-A (0-0.5')
2											
3											
4											
5											
6		80									SM-SPS-003-B (5-5.5')
7					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), black (GLEY 1 2.5/N), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and significant glass. BURN DUMP WASTE.			
8											
9											
10		90									SM-SPS-003-C (10-10.5')
11											
12											
13											
14					0	10	90	**SILT WITH SAND (ML)** Bluish gray (GLEY 2 5/10B), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy. SAND: fine grained.			
15		95									SM-SPS-003-D (14.5-15')
16											
17											
18											
19											
20					0	100	0	**POORLY GRADED SAND (SP)** Bluish gray (GLEY 2 6/10B), dense, homogeneous. SAND: fine to medium grained.			SM-SPS-003-E (19.5-20')

Boring Terminated at 20 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-04*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY	**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/10/2010 / **DATE COMPLETED:** 3/10/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push	**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: South side of Smelter Parcel		**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
1		60			20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), very dark gray (10YR 3/1), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick. HALACO WASTE.			SM-SPS-004-A (0-1') SM-SPS-004-A-MS/MSD (0-1')
2											
3											
4					20	60	20	Same but black (GLEY 1 2.5/N). POSSIBLY BURN DUMP WASTE.			
5		90									SM-SPS-004-B (5-6') SM-SPS-004-B-MS/MSD (5-6')
6											
7											
8											
9											
10		300			20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), black (GLEY 1 2.5/N), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and significant glass. BURN DUMP WASTE.			SM-SPS-004-C (10-11') SM-SPS-004-C-MS/MSD (10-11')
11					0	0	100				
12								**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy. With thin lenses of fine sands.			
13											
14					0	10	90	**SILT WITH SAND (ML)** Bluish gray (GLEY 2 5/10B), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy. SAND: fine to medium grained.			SM-SPS-004-D (14-15') SM-SPS-004-D-MS/MSD (14-15')
15											

Boring Terminated at 15 feet bgs

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*SPS-05*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY	**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/9/2010 / **DATE COMPLETED:** 3/9/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push	**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: South side of Smelter Parcel		**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		30						Concrete.			
1					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), very dark gray (10YR 3/1), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. with brick. BURN DUMP WASTE.			SM-SPS-005-A (0.5-1')
2											
3					0	100	0				
4								**FILL** POORLY GRADED SAND (SP), very pale brown (10YR 7/4), loose. SAND: medium to coarse grained, subangular.			
5											
		0						No recovery.			
6											
7											
8											
9											
10											
		100			20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), very dark gray (10YR 3/1), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. with brick. BURN DUMP WASTE.			SM-SPS-005-B (10-10.5')
11					0	70	30				
12											
13					0	0	100	**SILTY SAND (SM)** Grayish brown (10YR 5/2), loose. SAND: fine grained, subangular.			
14					0	70	30	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, soft, no odor, no staining. FINES: high plasticity, no dilatancy.			
					0	0	100	**SILTY SAND (SM)** Grayish brown (10YR 5/2), loose. SAND: fine grained, subangular.			
15								**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, soft, no odor, no staining. FINES: high plasticity, no dilatancy.			SM-SPS-005-C (14.5-15')

Boring Terminated at 15 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-06*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/10/2010	**DATE COMPLETED:** 3/10/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: SW side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		50						Concrete.			
1					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), very dark gray (10YR 3/1), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. HALACO WASTE.			SM-SPS-006-A (0.5-1')
2											
3											
4											
5		80									SM-SPS-006-B (5-5.5')
6					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), black (GLEY 1 2.5/N), moist, dense, no odor, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick. BURN DUMP WASTE.			
7											
8											
9					0	0	100	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy. With thin lenses of fine sands.			
10		100									
11											
12											
13											
14											
15											SM-SPS-006-C (14-15')

Boring Terminated at 15 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-07*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 10.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/2/2010	**DATE COMPLETED:** 3/2/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: SW side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		40						Concrete.			
1					0	100	0	**FILL** WELL GRADED SAND (SW), pale brown (10YR 6/3), medium dense, homogeneous. SAND: fine to coarse grained, subrounded.			SM-SPS-007-A (0.5-1')
2											
3					0	0	100	**FILL** ELASTIC SILT (MH), dark grayish brown (10YR 4/2), medium stiff, homogeneous. FINES: low plasticity, slow dilatancy.	0		
4											
5		70									SM-SPS-007-B (4.5-5')
6									0		
7					0	90	10	**WELL GRADED SAND (SW)** Pale brown (10YR 6/3), moist, medium dense, homogeneous, no odor. SAND: fine to coarse grained, subrounded. Some fine gravel.			wood
8									0		
9					0	90	10	Same but hydrocarbon odor and dark staining.			
10											SM-SPS-007-C (9.5-10')
									9.2		

Boring Terminated at 10 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-08*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 10.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/10/2010	**DATE COMPLETED:** 3/10/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: SW side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		80						Concrete.			
1					0	100	0	**FILL** POORLY GRADED SAND (SP), brown (10YR 4/3), medium dense. SAND: fine grained.			SM-SPS-008-A (0.75-1.25')
2											
3											
4											
5		80									SM-SPS-008-B (5-5.5')
6											
7											
8											
9					20	80	0	**POORLY GRADED SAND WITH GRAVEL (SP)** Bluish gray (GLEY 2 6/10B), loose. SAND: fine to coarse grained, subangular. GRAVEL: fine to medium grained, subrounded.			
10											SM-SPS-008-C (9.5-10')

Boring Terminated at 10 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-09*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/9/2010	**DATE COMPLETED:** 3/9/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: SE side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		70						Crushed stone.			
1					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), brown (10YR 5/3), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With white soft granular deposits. POSSIBLE HALACO WASTE.			SM-SPS-009-A (0.5-1')
2											
3											
4											
5											
		90									SM-SPS-009-B (5-5.5')
6											
								Crushed stone.			
7					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), bluish gray (GLEY 2 6/5B), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness With minor white soft granular deposits. HALACO WASTE.			
8											
9											
10											
		80									SM-SPS-009-C (10-10.5')
11											
12					0	0	100	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy. With thin lenses of fine sands.			
13											
14											
15											SM-SPS-009-D (14.5-15')

Boring Terminated at 15 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-10*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/10/2010	**DATE COMPLETED:** 3/10/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: East side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		100			0	20	80	**FILL** SILT WITH SAND (ML), brown (10YR 5/3), moist, soft, no odor, iron oxide staining, weak HCL reaction. FINES: non plastic. SAND: fine grained, subangular. With white soft granular deposits. HALACO WASTE.			SM-SPS-010-A (0-0.5')
1											
2											
3											
4											
5											
		70									SM-SPS-010-B (5-5.5')
6											
7					0	0	100	**FILL** LEAN CLAY (CL), dark gray (5Y 4/1), moist, stiff, chemical odor. HALACO WASTE.			
8											
9					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), black (2.5Y 2.5/1), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and glass. DUMP WASTE.			
10											
		100									SM-SPS-010-C (10-10.5')
11					0	0	100	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy. With thin lenses of fine sands.			
12											
13											
14											
15											SM-SPS-010-D (14.5-15')

Boring Terminated at 15 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-11*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 12.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/9/2010	**DATE COMPLETED:** 3/9/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Center of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		100			0	20	80	**FILL** SILT WITH SAND (ML), brown (10YR 5/3), moist, soft, no odor, iron oxide staining, weak HCL reaction. FINES: non plastic. SAND: fine grained, subangular. With white soft granular deposits. HALACO WASTE.			SM-SPS-011-A (0-0.5')
1											
2					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), black (2.5Y 2.5/1), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and significant glass. BURN DUMP WASTE.			
		70									
3											
4											
5											
											SM-SPS-011-B (5-5.5')
6											
7											
		100									
8											
9											
10											
											SM-SPS-011-C (10-10.5')
11					0	90	10	**POORLY GRADED SAND WITH SILT (SP-SM)** Yellowish brown (10YR 5/4), dense, homogeneous. SAND: fine to medium grained.			
12											SM-SPS-011-D (11.5-12')

Boring Terminated at 12 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-12*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 25.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/9/2010	**DATE COMPLETED:** 3/9/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: East side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
1		90			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			SM-SPS-012-A (0-0.5')
2											
3											
4											
5											
6		100									SM-SPS-012-B (5-5.5')
7					0	20	80	**FILL** LEAN CLAY (CL), dark gray (5Y 4/1), moist, stiff, no odor. SAND: coarse grained. HALACO WASTE.			
8											
9											
10											
11		100									SM-SPS-012-C (10-10.5')
12											
13											
14											
15											
16		100									
17											
18											
19					0	0	100	**FILL**			
20					0	20	80	ORGANIC SOIL (OL/OH), black (2.5YR 2.5/1), saturated, very soft, no odor. FINES: non plastic. With glass. HALACO WASTE OR BURN DUMP WASTE (???).			SM-SPS-012-D (18.5-19')
21		100						**SILT WITH SAND (ML)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy. SAND: fine grained.			
22											
23											
24					0	100	0	**POORLY GRADED SAND (SP)** Yellowish brown (10YR 5/4), dense, homogeneous. SAND: fine grained.			
25											SM-SPS-012-E (24.5-25')

Boring Terminated at 25 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-13*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/10/2010	**DATE COMPLETED:** 3/10/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: East side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		50						Concrete.			
1					0	20	80	**FILL** SILT WITH SAND (ML), brown (10YR 5/3), moist, soft, no odor, iron oxide staining, weak HCL reaction. FINES: non plastic. SAND: fine grained, subangular. With white soft granular deposits. HALACO WASTE.			SM-SPS-013-A (0.5-1')
2											
3											
4											
5					0	20	80	Same but with little glass and no white deposits. Increasing moisture with depth from damp to saturated. POSSIBLY BURN DUMP WASTE.			
		40									SM-SPS-013-B (5-5.5')
6											
7											
8											
9											
10											
		90									SM-SPS-013-C (10-10.5')
11											
12											
13					0	100	0	**POORLY GRADED SAND (SP)** Bluish gray (GLEY 2 6/10B), loose. SAND: fine to medium grained, subangular.			
14											
15											SM-SPS-013-D (14.5-15')

Boring Terminated at 15 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-14*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/10/2010	**DATE COMPLETED:** 3/10/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Center of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		60						Concrete.			
1					0	20	80	**FILL** SILT WITH SAND (ML), brown (10YR 5/3), damp, soft, no odor, iron oxide staining, weak HCL reaction. FINES: non plastic. SAND: fine grained, subangular. With white soft granular deposits. GENERAL FILL.			SM-SPS-014-A (0.5-1')
2											
3											
4					0	20	80	**FILL** SILT WITH SAND (ML), black (2.5Y 2.5/1), moist, soft, no odor, iron oxide staining, weak HCL reaction. FINES: non plastic. SAND: fine grained, subangular. BURN DUMP WASTE.			
5		65									SM-SPS-014-B (5-5.5')
6											
7											
8											
9											
10		100									SM-SPS-014-C (10-10.5')
11											
12					0	0	100	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy. With thin lenses of fine sands.			
13											
14					0	100	0	**POORLY GRADED SAND (SP)** Bluish gray (GLEY 2 6/10B), loose. SAND: fine to medium grained, subangular.			
15											SM-SPS-014-D (14.5-15')

Boring Terminated at 15 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-15*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/2/2010	**DATE COMPLETED:** 3/2/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: SW side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		60						Concrete.			
1					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), very dark grayish brown (2.5Y 3/2), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. HALACO WASTE OR GENERAL FILL (???).			SM-SPS-015-A (0.5-1') SM-SPS-115-A (0.5-1')
2											
3									0		
4					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), black (2.5Y 2.5/1), moist, dense, hydrocarbon odor, hydrocarbon staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and glass. BURN DUMP WASTE.			
5		80									
6									0		
7											SM-SPS-015-B (6-7') SM-SPS-115-B (6-7')
8									4.5		
9					0	0	100	**SILT (ML)** Light olive brown (2.5Y 5/3), stiff. FINES: low plasticity, slow dilatancy. Some organic staining and locally thin layers of fat clay.			
10		80			20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), very dark grayish brown (2.5Y 3/2), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and glass. GENERAL FILL OR BURN DUMP WASTE (???).	0		SM-SPS-015-C (10-10.5') SM-SPS-115-C (10-10.5')
11					0	90	10				
12											
13								**POORLY GRADED SAND WITH SILT (SP-SM)** Dark greenish gray (GLEY 1 4/10Y), saturated, medium dense, homogeneous, no odor. SAND: fine grained, subangular.	0		
14											
15					0	100	0	**POORLY GRADED SAND (SP)** Olive gray (5Y 4/2), medium dense, homogeneous. SAND: fine grained, subrounded.	0		SM-SPS-015-D (14.5-15') SM-SPS-115-D (14.5-15')

Boring Terminated at 15 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-16*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/10/2010	**DATE COMPLETED:** 3/10/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: East side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		70						Concrete.			
1					0	20	80	**FILL** SILT WITH SAND (ML), brown (10YR 5/3), moist, soft, no odor, iron oxide staining, weak HCL reaction. FINES: non plastic. SAND: fine grained, subangular. With white soft granular deposits. GENERAL FILL.			SM-SPS-016-A (0.5-1')
2											
3											
4											
5					0	20	80	Same but black (2.5Y 2.5/1) with some glass and no granular deposits. POSSIBLY BURN DUMP WASTE.			
		50									SM-SPS-016-B (5-5.5')
6											
7					0	20	80	Same but brown (10YR 5/3) with some brick. Possibly HALACO OR BURN DUMP WASTE (???).			
8											
9											
10											
		90									SM-SPS-016-C (10-10.5')
11											
12					0	100	0	**POORLY GRADED SAND (SP)** Bluish gray (GLEY 2 6/10B), loose. SAND: fine to medium grained, subangular.			
13											
14											
15											SM-SPS-016-D (14.5-15')

Boring Terminated at 15 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-17*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 10.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/2/2010	**DATE COMPLETED:** 3/2/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: West side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		60						Concrete.			
1					0	100	0	**FILL** WELL GRADED SAND (SW), olive gray (5Y 4/2), medium dense, homogeneous. SAND: fine grained, subrounded.			SM-SPS-017-A (0.5-1')
2					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), black (2.5Y 2.5/1), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. with brick, and glass. BURN DUMP WASTE.			
3									0		
4											
5											SM-SPS-017-B (4.5-5')
		100							0		
6					0	0	100	**SILT (ML)** Light olive brown (2.5Y 5/3), stiff. FINES: low plasticity, slow dilatancy. Some fine to medium sand and locally thin layers of fat clay.			
7											
8									0		
9											Fine sand lens
10					0	80	20	**SILTY SAND (SM)** gray (2.5Y 5/1), dense. SAND: fine grained.			SM-SPS-017-C (9.5-10')
									0		
								Boring Terminated at 10 feet bgs			

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*SPS-18*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY	**HOLE DEPTH (ft):** 10.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/2/2010 / **DATE COMPLETED:** 3/2/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push	**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: West side of Smelter Parcel		**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	OVM (ppm): HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		70						Concrete.			
1					0	100	0	**FILL** WELL GRADED SAND (SW), olive gray (5Y 4/2), medium dense, homogeneous. SAND: fine grained, subrounded.			SM-SPS-018-A (0.5-1')
2					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), black (2.5Y 2.5/1), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and glass. BURN DUMP WASTE.			
3									0		
4											
5											SM-SPS-018-B (4.5-5')
		80									
6					0	0	100	**SILT (ML)** Light olive brown (2.5Y 5/3), stiff. FINES: low plasticity, slow dilatancy. Some fine to medium sand and locally thin layers of fat clay.	0		
7											
8									0		
9											zone of fine sand
10					0	80	20	**SILTY SAND (SM)** Gray (2.5Y 5/1), dense. SAND: fine grained.	0		SM-SPS-018-C (9.5-10')

Boring Terminated at 10 feet bgs

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*SPS-19*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY	**HOLE DEPTH (ft):** 20.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/10/2010 / **DATE COMPLETED:** 3/10/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push	**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: East side of Smelter Parcel		**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		80						Concrete.			
1					0	20	80	**FILL** SILT WITH SAND (ML), brown (10YR 5/3), moist, soft, no odor, iron oxide staining, weak HCL reaction. FINES: non plastic. SAND: fine grained, subangular. With white soft granular deposits. BURN DUMP WASTE.			SM-SPS-019-A (0.5-1')
2											
3											
4											
5		70									SM-SPS-019-B (5-5.5')
6											
7											
8											
9											
10		100									SM-SPS-019-C (10-10.5')
11											
12					0	100	0	**POORLY GRADED SAND (SP)** Bluish gray (GLEY 2 6/10B), loose. SAND: fine to medium grained, subangular.			
13					0	0	100	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy. With thin lenses of fine sands.			
14											
15		100									
16					0	100	0	**POORLY GRADED SAND (SP)** Bluish gray (GLEY 2 6/10B), loose. SAND: fine to medium grained, subangular.			
17											
18											
19											
20											SM-SPS-019-D (19.5-20')

Boring Terminated at 20 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-20*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 20.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/8/2010	**DATE COMPLETED:** 3/8/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Center of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		80						Concrete.			
1					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), very dark grayish brown (2.5Y 3/2), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and significant glass. BURN DUMP WASTE.			SM-SPS-020-A (0.5-1')
2											
3											
4											
5					90	10	0	**FILL**			
		60			20	60	20	POORLY GRADED GRAVEL (GP), light gray (2.5Y 7/1), very loose. GRAVEL: coarse grained.			SM-SPS-020-B (5-5.5')
6								**FILL** SILTY SAND WITH GRAVEL (SM), black (2.5Y 2.5/1), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and significant glass. BURN DUMP WASTE.			
7											
8											
9											
10											
		70									SM-SPS-020-C (10-10.5')
11											
12											
13											
14											
15											
		100			0	0	100	**FILL** ORGANIC SOIL (OL/OH) Black (2.5YR 2.5/1), saturated, very soft, no odor. FINES: non plastic. With glass. POSSIBLY BURN DUMP WASTE.			SM-SPS-020-D (15-15.5')
16											
17					0	0	100	**ELASTIC SILT (MH)** Very dark gray (2.5Y 3/1), medium stiff. FINES: low plasticity, rapid dilatancy.			
18											
19					0	100	0	**POORLY GRADED SAND (SP)** Very dark gray (2.5Y 3/1), very loose. SAND: medium to coarse grained.			
20											SM-SPS-020-E (19.5-20')

Boring Terminated at 20 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-21*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/9/2010	**DATE COMPLETED:** 3/9/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: East side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		100			0	20	80	**FILL** SILT WITH SAND (ML), black (5Y 2.5/1), moist, medium stiff, no odor. SAND: fine to medium grained. HALACO WASTE.			SM-SPS-021-A (0-0.5')
1											
2											
3											
4											
5											
		90									SM-SPS-021-B (5-5.5')
6											
7											
8											
9											
10											
		100									
11											
12											
13					0	0	100	**FILL** ORGANIC SOIL (OL/OH), black (2.5YR 2.5/1), saturated, very soft, no odor. FINES: non plastic. With glass. HALACO WASTE MIXED ZONE.			SM-SPS-021-C (12.5-13')
					0	100	0				
14								**POORLY GRADED SAND (SP)** Yellowish brown (10YR 5/4), dense, homogeneous. SAND: fine grained.			
15											SM-SPS-021-D (14.5-15')

Boring Terminated at 15 feet bgs

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*SPS-22*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY	**HOLE DEPTH (ft):** 20.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/8/2010 / **DATE COMPLETED:** 3/8/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push	**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Center of Smelter Parcel		**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		90						Concrete.			
1					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), very dark grayish brown (2.5Y 3/2), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and significant glass. BURN DUMP WASTE.			SM-SPS-022-A (0.5-1')
2											
3											
4											
5					90	10	0	**FILL** POORLY GRADED GRAVEL (GP) Light gray (2.5Y 7/1), very loose. GRAVEL: coarse grained.			
		70									SM-SPS-022-B (5-5.5')
6					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), black (2.5Y 2.5/1), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and significant glass. BURN DUMP WASTE.			
7											
8											
9											
10											
		80									SM-SPS-022-C (10-10.5')
11											
12											
13					0	0	100	**ELASTIC SILT (MH)** Very dark gray (2.5Y 3/1), medium stiff. FINES: low plasticity, rapid dilatancy.			
14											
15					0	0	100	**FILL** ORGANIC SOIL (OL/OH), black (2.5YR 2.5/1), saturated, very soft, no odor. FINES: non plastic. With glass. BURN DUMP WASTE.			SM-SPS-022-D (15-15.5')
		100									
16											
17					0	0	100	**ELASTIC SILT (MH)** Very dark gray (2.5Y 3/1), medium stiff. FINES: low plasticity, rapid dilatancy.			
18											
19					0	100	0	**POORLY GRADED SAND (SP)** Very dark gray (2.5Y 3/1), very loose. SAND: medium to coarse grained.			
20											SM-SPS-022-E (19.5-20')

Boring Terminated at 20 feet bgs

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-23*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 10.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/2/2010	**DATE COMPLETED:** 3/2/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: West side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		90						Concrete.			
1					0	100	0	**FILL** WELL GRADED SAND (SW), olive gray (5Y 4/2), medium dense, homogeneous. SAND: fine grained, subrounded.			SM-SPS-023-A (0.5-1')
2											
3					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), black (2.5Y 2.5/1), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and glass. BURN DUMP WASTE.	0		
4											
5											
		80									
6					0	0	100	**SILT (ML)** Light olive brown (2.5Y 5/3), stiff. FINES: low plasticity, slow dilatancy. Some fine to medium sand and locally thin layers of fat clay.	0		SM-SPS-023-B (5-5.5')
7											
8									0		
9											Fine sand lens
10					0	80	20	**SILTY SAND (SM)** Gray (2.5Y 5/1), dense. SAND: fine grained.	0		SM-SPS-023-C (9.5-10')

Boring Terminated at 10 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-24*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 10.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/2/2010	**DATE COMPLETED:** 3/2/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: West side of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		80						Concrete.			
1					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), very dark grayish brown (2.5Y 3/2), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and significant glass. BURN DUMP WASTE.			SM-SPS-024-A (0.5-1')
2											
3									0		
4					0	0	100	**SILT (ML)** Light olive brown (2.5Y 5/3), stiff. FINES: low plasticity, slow dilatancy. Some fine to medium sand and locally thin layers of fat clay.			SM-SPS-024-B (3-3.5')
5		90									
6									0		
7											
8					0	90	10	**POORLY GRADED SAND WITH SILT (SP-SM)** Dark greenish gray (GLEY 1 4/10Y), saturated, medium dense, homogeneous, no odor. SAND: fine grained, subangular.	0		
9											
10											SM-SPS-024-C (9.5-10')
									0		

Boring Terminated at 10 feet bgs

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*SPS-25*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY	**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/8/2010 / **DATE COMPLETED:** 3/8/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push	**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: East side of Smelter Parcel		**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		60			20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), black (2.5Y 2.5/1), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and significant glass. BURN DUMP WASTE.			SM-SPS-025-A (0-0.5')
1											
2											
3											
4											
5											
		60									SM-SPS-025-B (5-5.5')
6											
7											
8											
9											
10											
		70									SM-SPS-025-C (10-10.5')
11					0	0	100	**SILT (ML)** Light olive brown (2.5Y 5/3), stiff. FINES: low plasticity, slow dilatancy. Some fine to medium sand and locally thin layers of fat clay.			
12					0	100	0				
					0	0	100	**POORLY GRADED SAND (SP)** Very dark gray (2.5Y 3/1), very loose. SAND: medium to coarse grained.			
13					0	90	10				
					0	0	100	**ELASTIC SILT (MH)** Very dark gray (2.5Y 3/1), medium stiff. FINES: low plasticity, rapid dilatancy.			
14					0	100	0				
15								**POORLY GRADED SAND WITH SILT (SP-SM)** Very dark gray (2.5Y 3/1), loose. SAND: fine grained.			SM-SPS-025-D (14.5-15')
								ELASTIC SILT (MH) Very dark gray (2.5Y 3/1), medium stiff. FINES: low plasticity, rapid dilatancy.			
								POORLY GRADED SAND (SP) Very dark gray (2.5Y 3/1), very loose. SAND: medium to coarse grained.			
								Boring Terminated at 15 feet bgs			

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SPS-26*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 20.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/2/2010	**DATE COMPLETED:** 3/2/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Center of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		80						Concrete.			
1					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), very dark grayish brown (2.5Y 3/2), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and significant glass. BURN DUMP WASTE.			SM-SPS-026-A (0.5-1')
2											
3									0		
4											
5		90							0		SM-SPS-026-B (5-5.5')
6											
7											
8									0		
9					20	60	20	Same but black (2.5Y 2.5/1).			
10		50							0		SM-SPS-026-C (10-10.5')
11											
12											
13									0		
14											
15		80							0		
16					0	0	100	**FAT CLAY (CH)** Very dark gray (2.5Y 3/1), wet, soft, homogeneous, organic odor, strong HCL reaction. FINES: high plasticity, no dilatancy. Some glass. BURN DUMP WASTE.			SM-SPS-026-D (16-16.5')
17					0	100	0				
18					0	0	100	**WELL GRADED SAND (SW)** Dark greenish gray (GLEY 1 4/10Y), saturated, very loose, homogeneous, no odor. SAND: medium to coarse grained, subangular.	0		
19											
20								**FAT CLAY (CH)** Olive gray (5Y 4/2), wet, soft, no odor. FINES: high plasticity, no dilatancy.	0		SM-SPS-026-E (19.5-20')

Boring Terminated at 20 feet bgs

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*SPS-27*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/2/2010	**DATE COMPLETED:** 3/2/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Center of Smelter Parcel			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		80						Concrete.			
1					20	60	20	**FILL** SILTY SAND WITH GRAVEL (SM), very dark grayish brown (2.5Y 3/2), moist, dense, no odor, iron oxide staining, weak HCL reaction. SAND: medium/coarse grained, subangular. GRAVEL: fine to medium grained, angular. FINES: non plastic, low dry strength, no toughness. With brick and significant glass. BURN DUMP WASTE.			SM-SPS-027-A (0.5-1')
2											
3									0		
4											
5											
		65									
6									0		
7											SM-SPS-027-B (6-7')
8									0		
9					0	0	100	**FILL** FAT CLAY (CH), black (2.5Y 2.5/1), wet, soft, homogeneous, organic odor, strong HCL reaction. FINES: high plasticity, no dilatancy. Some glass. BURN DUMP WASTE.			
10											
		80			0	0	100	Same but very dark gray (2.5Y 3/1).	0		SM-SPS-027-C (10-10.5')
11											
12											
13									0		
14					0	90	10	**POORLY GRADED SAND WITH SILT (SP-SM)** Dark greenish gray (GLEY 1 4/10Y), saturated, medium dense, homogeneous, no odor. SAND: fine grained, subangular.			SM-SPS-027-D (14-14.5')
15									0		

Boring Terminated at 15 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *WDA-01*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY	**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/5/2010 / **DATE COMPLETED:** 3/5/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push	**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: North side of Waste Management Area		**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		90			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			SM-WDA-001-A (0-0.5')
1											
2											
3											
4											
5											
		80									SM-WDA-001-B (5-5.5')
6											
7											
8											
9											
10											
		100									
11					0	0	100	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy.			
12											
13											
14											
15											SM-WDA-001-C (14.5-15')
								Boring Terminated at 15 feet bgs			

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *WDA-02*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/5/2010	**DATE COMPLETED:** 3/5/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: North side of Waste Management Area			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		90			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			SM-WDA-002-A (0-0.5')
1											
2											
3											
4											
5											
		100									SM-WDA-002-B (5-5.5')
6											
7					0	90	10	**POORLY GRADED SAND WITH SILT (SP-SM)** Greenish gray (GLEY 2 6/10BG), moist, dense, no odor. SAND: fine to medium grained, subrounded.			
8					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
9											
10											
		90									
11											
12											
13											
14					0	90	10	**POORLY GRADED SAND WITH SILT (SP-SM)** Greenish gray (GLEY 2 6/10BG), moist, medium dense, no odor. SAND: fine to medium grained, subrounded.			
15											SM-WDA-002-C (14.5-15')

Boring Terminated at 15 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *WDA-03*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 5.50	**DRILLING CONTRACTOR:** CH2M HILL	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 6/29/2010	**DATE COMPLETED:** 6/29/2010
WATER LEVEL: ---	**DRILLING METHOD:** Hand Auger		**DRILLING EQUIPMENT:** N/A	
LOCATION: North side of Waste Management Area			**LOGGED BY:** G. KAMALI	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		100						**FILL** Silt (ML), pale brown (10YR 6/3), moist, 100% fines, low plasticity. POSSIBLE HALACO WASTE			SM-WDA-003-A (0-0.5')
1											
2											
3											
4											
5								**FILL** Silt (ML), olive gray (5Y 4/2) to very dark gray (Gley1 3/N), moist, mixture of silt and slag material HALACO WASTE			SM-WDA-003-B (5-5.5')

Boring Terminated at 5.5 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *WDA-04*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 18.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/5/2010	**DATE COMPLETED:** 3/5/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: North side of Waste Management Area			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		90			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			SM-WDA-004-A (0-0.5') SM-WDA-004-A-MS/MSD (0-0.5')
1											
2											
3											
4											
5											
		100									SM-WDA-004-B (5-5.5') SM-WDA-004-B-MS/MSD (5-5.5')
6											
7											
8											
9											
10											
		100									
11											
12											
13											
14											
15					0	90	10	**POORLY GRADED SAND WITH SILT (SP-SM)** Greenish gray (GLEY 2 6/10BG), moist, medium dense, no odor. SAND: fine to medium grained, subrounded.			
		100									
16					0	0	100	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy.			
17											
18											SM-WDA-004-C (17-18') SM-WDA-004-C-MS/MSD (17-18')

Boring Terminated at 18 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *WDA-05*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/5/2010	**DATE COMPLETED:** 3/5/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: North side of Waste Management Area			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		80			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			SM-WDA-005-A (0-0.5') SM-WDA-105-A (0-0.5')
1											
2											
3											
4											White mottles
5											
		100									SM-WDA-005-B (5-5.5') SM-WDA-105-B (5-5.5')
6											
7											
8											
9											
10											
		80									
11											
12											
13					0	90	10	**POORLY GRADED SAND WITH SILT (SP-SM)** Greenish gray (GLEY 2 6/10BG), moist, dense, no odor. SAND: fine to medium grained, subrounded.			
14					0	0	100	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy.			
15											SM-WDA-005-C (14.5-15') SM-WDA-105-C (14.5-15')

Boring Terminated at 15 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *WDA-06*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/11/2010	**DATE COMPLETED:** 3/11/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: North side of Waste Management Area			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		100			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			SM-WDA-006-A (0-0.5')
1											
2											
3											
4											
5											
		100									SM-WDA-006-B (5-5.5')
6											
7											
8											
9											
10											
		100									
11											
12					0	0	100	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy.			
13											
14											
15											SM-WDA-006-C (14.5-15')
								Boring Terminated at 15 feet bgs			

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-01*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/3/2010	**DATE COMPLETED:** 3/3/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Top of waste pile, north side			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		90			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			SM-WMU-001-A (0-1')
1											
2											
3											
4											
5											
		100							0		
6											
											SM-WMU-001-B (6-7')
7											
8											
9											
10					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
		80			0	40	60		0		
11					0	90	10	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
12								**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
13											
14											
15											
		90							0		
16											
17											
18											
19											
20											
		100							0		
21											
22											
23					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			ammonia odors
24											
25											

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-01*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/3/2010 / **DATE COMPLETED:** 3/3/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000
LOCATION: Top of waste pile, north side			**LOGGED BY:** J. BALE

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
26		100			0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.		30	
27											
28											
29											
30											
31		80							0		SM-WMU-001-C (30-31')
32											
33											
34											
35											
36		80			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.		50.2	SM-WMU-001-D (35-36')
37											
38											
39											
40											
41		100			60	40	0	**FILL** POORLY GRADED GRAVEL WITH SAND (GP), black (5Y 2.5/1), moist, chemical odor. GRAVEL: fine grained, angular. SAND: fine to coarse grained. HALACO WASTE.		36	
42					0	0	100	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy.			
43											
44											
45											SM-WMU-001-E (44-45')

Boring Terminated at 45 feet bgs

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-02*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/3/2010	**DATE COMPLETED:** 3/3/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Top of waste pile, north side			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
1		100			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			SM-WMU-002-A (0-1')
2											
3											
4											
5											
6		80			0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.	0		SM-WMU-002-B (5-6')
7											
8											
9											
10											
11		90							0		
12					0	20	80	**FILL** ELASTIC SILT WITH SAND (MH), black (5Y 2.5/1), moist, very soft, no odor. FINES: low plasticity, rapid dilatancy. SAND: fine grained. HALACO WASTE.			
13											
14											
15											
16		100							0.2		
17											
18											
19											
20											
21		100			0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.	0.2		
22					0	20	80	**FILL** SANDY ELASTIC SILT, black (5Y 2.5/1), moist, medium stiff, chemical odor. SAND: fine grained. HALACO WASTE.			
23											
24											
25											

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-02*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/3/2010 / **DATE COMPLETED:** 3/3/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000
LOCATION: Top of waste pile, north side			**LOGGED BY:** J. BALE

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
26		100								23.2	
27					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
28					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
29											
30		80								11.7	SM-WMU-002-C (30-31')
31					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
32					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
33											
34											
35		100								9.6	SM-WMU-002-D (35-36')
36					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
37					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, medium stiff, no odor. SAND: fine grained. HALACO WASTE.			
38					0	0	100	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy.			
39											
40		100			60	40	0	**FILL** POORLY GRADED GRAVEL WITH SAND (GP), black (5Y 2.5/1), moist, chemical odor. GRAVEL: fine grained, angular. SAND: fine to coarse grained. HALACO WASTE.			
41					0	0	100	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy.			
42											
43											
44											
45											SM-WMU-002-E (44-45')

Boring Terminated at 45 feet bgs

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-03*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/3/2010	**DATE COMPLETED:** 3/3/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Top of waste pile, north side			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
1		100			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			SM-WMU-003-A (0-1')
2											
3											
4					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
5		60			0	40	60	**FILL** SANDY ELASTIC SILT (MH), olive gray (5Y 4/2), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.	0		SM-WMU-003-B (5-6')
6											
7											
8											
9					0	40	60	**FILL** SANDY ELASTIC SILT (MH), bluish gray (GLEY 2 5/10B), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
10		90							0		
11					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, medium stiff, no odor. SAND: fine grained. HALACO WASTE.			
12											
13											
14											
15											
16		100							0		
17					0	10	90	**FILL** SANDY ELASTIC SILT, black (5Y 2.5/1), wet, very soft, no odor. SAND: fine grained. HALACO WASTE.			
18											
19					0	10	90	**FILL** SANDY ELASTIC SILT, black (5Y 2.5/1), wet, very soft, no odor. SAND: fine grained. HALACO WASTE.			
20		100							0		
21											
22											
23					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
24											
25											

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-03*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY	**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/3/2010 / **DATE COMPLETED:** 3/3/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push	**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Top of waste pile, north side		**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		90							0		
26					20	70	10	**FILL** POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), very dark gray (5Y 3/1), moist, very loose, no odor. SAND: fine to medium grained, subrounded. GRAVEL: fine grained. HALACO WASTE.			
27											
28					20	70	10	**FILL** POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), very dark gray (5Y 3/1), moist, very loose, no odor. SAND: fine to medium grained, subrounded. GRAVEL: fine grained. HALACO WASTE.			
29											
30											
31									0		SM-WMU-003-C (30-31')
32											
33											
34											
35											
		100								13.2	SM-WMU-003-D (35-36')
36					0	10	90	**FILL** SANDY ELASTIC SILT, black (5Y 2.5/1), wet, very soft, no odor. SAND: fine grained. HALACO WASTE.			
37											
38											
39					0	100	0	**POORLY GRADED SAND (SP)** Yellowish brown (10YR 5/4), dense, homogeneous. SAND: fine grained.			
40											
		100							0		
41					0	0	100	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy.			
42											
43											
44											
45											SM-WMU-003-E (44-45')

Boring Terminated at 45 feet bgs

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-04*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/4/2010	**DATE COMPLETED:** 3/4/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Top of waste pile, center			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
1		100			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			SM-WMU-004-A (0-1')
2											
3					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.		
4											
5											
6		90							0		SM-WMU-004-B (5-6')
7											
8											
9					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
10		100							0		
11											
12											
13											
14											
15		100							0		
16					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
17					0	0	100	**FILL** LEAN CLAY (CL), black (5Y 2.5/1), moist, medium stiff, chemical odor. FINES: medium plasticity, no dilatancy, no toughness. HALACO WASTE.			
18					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
19											
20		80							0		
21											
22											
23											
24											
25											

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-04*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/4/2010 / **DATE COMPLETED:** 3/4/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000
LOCATION: Top of waste pile, center			**LOGGED BY:** J. BALE

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		80								5.6	
26											
27											
28											
29											
30											
		100			10	30	60	**FILL** SANDY ELASTIC SILT, black (5Y 2.5/1), moist, stiff, chemical odor. SAND: fine to coarse grained. GRAVEL: fine grained. HALACO WASTE.		30.6	SM-WMU-004-C (30-31')
31											
32											
33											
34											
35											
		100								8.9	SM-WMU-004-D (35-36')
36											
37											
38											
39											
40											
		100							3.2		
41											
42					0	100	0	**POORLY GRADED SAND (SP)** Yellowish brown (10YR 5/4), dense, homogeneous. SAND: fine grained.			
43					0	0	100	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy.			
44											
45											SM-WMU-004-E (44-45')
									0		

Boring Terminated at 45 feet bgs

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-05*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/4/2010	**DATE COMPLETED:** 3/4/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Top of waste pile, center			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		100			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			SM-WMU-005-A (0-1') SM-WMU-105-A (0-1')
1											
2											
3											
4											
5											
		100									SM-WMU-005-B (5-6') SM-WMU-105-B (5-6')
6											
7											
8											
9											
10											
		100									
11											
12											
13											
14											
15											
		70									
16											
17											
18											
19											
20											
		90									
21					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
22											
23					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
24					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2			
25											

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-05*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/4/2010	**DATE COMPLETED:** 3/4/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Top of waste pile, center			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		90						6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
26											
27											
28											
29											
30		100									SM-WMU-005-C (30-31') SM-WMU-105-C (30-31')
31					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, stiff, no odor. SAND: fine grained. HALACO WASTE.			
32											
33											
34											
35		100									
36					0	0	100	**FILL** LEAN CLAY (CL), dark gray (5Y 4/1), moist, stiff, chemical odor. HALACO WASTE.			SM-WMU-005-D (35-36') SM-WMU-105-D (35-36')
37											
38											
39											
40		100			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
41											
42					0	0	100	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, stiff, no odor, no staining. FINES: high plasticity, no dilatancy.			
43											
44											
45											SM-WMU-005-E (44-45') SM-WMU-105-E (44-45')

Boring Terminated at 45 feet bgs

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-06*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY	**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/4/2010 / **DATE COMPLETED:** 3/4/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push	**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Top of waste pile, center		**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
1		100			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			SM-WMU-006-A (0-1')
2											
3					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
4											
5											
6		100							0		SM-WMU-006-B (5-6')
7											
8											
9											
10											
11		100							0		
12											
13					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
14											
15											
16		100							0		
17					0	0	100	**FILL** LEAN CLAY (CL), dark gray (5Y 4/1), moist, stiff, chemical odor. HALACO WASTE.			
18											
19											
20					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
21		100								38.9	
22											
23											
24											
25											

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-06*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/4/2010 / **DATE COMPLETED:** 3/4/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000
LOCATION: Top of waste pile, center			**LOGGED BY:** J. BALE

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		80			0	0	100	**FILL** LEAN CLAY (CL), dark gray (5Y 4/1), moist, stiff, chemical odor. HALACO WASTE.		86.9	
26											
27											
28					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
29											
30		100								72.9	SM-WMU-006-C (30-31')
31											
32											
33											
34											
35		100								13.3	SM-WMU-006-D (35-36')
36											
37											
38					0	0	100	**FILL** LEAN CLAY (CL), dark gray (5Y 4/1), moist, stiff, no odor. HALACO WASTE.			
39					0	100	0	**POORLY GRADED SAND (SP)** Yellowish brown (10YR 5/4), dense, homogeneous. SAND: fine grained. POSSIBLE HALACO WASTE?			
40		100			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
41											
42					0	0	100	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, soft, no odor, no staining. FINES: high plasticity, no dilatancy.			
43											
44											
45											SM-WMU-006-E (44-45')

Boring Terminated at 45 feet bgs

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-07*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY	**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/4/2010 / **DATE COMPLETED:** 3/4/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push	**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Top of waste pile, south side		**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
1		80			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			SM-WMU-007-A (0-1')
2											
3											
4											
5											
6		80			0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.	0		SM-WMU-007-B (5-6')
7											
8											
9											
10											
11		100							0		
12											
13											
14											
15											
16		100							0		
17											
18											
19					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), black (N 2.5/), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
20		80			0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.		46.8	
21											
22					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), black (N 2.5/), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
23											
24											
25											

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-07*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/4/2010 / **DATE COMPLETED:** 3/4/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000
LOCATION: Top of waste pile, south side			**LOGGED BY:** J. BALE

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION (USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.)	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		80								45.5	
26											
27											
28											
29											
30											
		90								18.6	SM-WMU-007-C (30-31')
31											
32											
33											
34											
35											
		100								19.8	SM-WMU-007-D (35-36')
36					0	0	100	**FILL** LEAN CLAY (CL), dark gray (5Y 4/1), moist, stiff, chemical odor. HALACO WASTE.			
37											
38											
39											
40					0	100	0	**POORLY GRADED SAND (SP)** Yellowish brown (10YR 5/4), dense, homogeneous. SAND: fine grained. POSSIBLE HALACO WASTE?			
		90			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
41											
42					0	0	100	**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, soft, no odor, no staining. FINES: high plasticity, no dilatancy.			
43											
44											
45											SM-WMU-007-E (44-45')

Boring Terminated at 45 feet bgs

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-08*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/4/2010	**DATE COMPLETED:** 3/4/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Top of waste pile, south side			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		90			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			SM-WMU-008-A (0-1')
1											
2											
3											
4											
5											
		100									SM-WMU-008-B (5-6')
6											
7											
8											
9											
10											
		20			0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
11											
12											
13											
14											
15											
		70									
16											
17					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
18											
19											
20					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
		30									
21											
22											
23											
24											
25											

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-08*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/4/2010 / **DATE COMPLETED:** 3/4/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000
LOCATION: Top of waste pile, south side			**LOGGED BY:** J. BALE

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
26		100									
27					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, soft, no odor. SAND: fine grained. HALACO WASTE.			
28											
29											
30		100									SM-WMU-008-C (30-31')
31											
32											
33											
34					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
35		100									SM-WMU-008-D (35-36')
36					0	0	100	**FILL** LEAN CLAY (CL), dark gray (5Y 4/1), moist, stiff, chemical odor. HALACO WASTE.			
37											
38											
39											
40		100									
41					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
42					0	0	100	**FAT CLAY (CH)**, very dark grayish brown (10YR 3/2), moist, soft, no odor, no staining. FINES: high plasticity, no dilatancy.			
43											
44											
45											SM-WMU-008-E (44-45')

Boring Terminated at 45 feet bgs

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-09*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/5/2010	**DATE COMPLETED:** 3/5/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: Top of waste pile, south side			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		100			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			SM-WMU-009-A (0-1')
1											
2											
3											
4											
5											
		100							0		SM-WMU-009-B (5-6')
6											
7											
8					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
9											
10											
		100							0		
11					0	10	90	**FILL** LEAN CLAY, dark gray (5Y 4/1), moist, stiff, chemical odor. HALACO WASTE.			
12											
13											
14											
15											
		100							0		
16					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
17											
18											
19											
20											
		100								38	
21											
22					0	10	90	**FILL** LEAN CLAY, dark gray (5Y 4/1), moist, stiff, chemical odor. HALACO WASTE.			
23											
24											
25											

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WMU-09*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 45.00	**DRILLING CONTRACTOR:** Water Development Corp.
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/5/2010 / **DATE COMPLETED:** 3/5/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000
LOCATION: Top of waste pile, south side			**LOGGED BY:** J. BALE

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
26		100								9.8	
27											
28											
29					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
30		80									
31										7	SM-WMU-009-C (30-31')
32					0	10	90	**FILL** LEAN CLAY, dark gray (5Y 4/1), moist, stiff, chemical odor. HALACO WASTE.			
33											
34					0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			
35		100									
36					0	10	90	**FILL** LEAN CLAY, dark gray (5Y 4/1), moist, stiff, chemical odor. HALACO WASTE.		5.6	SM-WMU-009-D (35-36')
37											
38											
					0	90	10	**FILL**			
39					0	0	100	POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
40		100						**FAT CLAY (CH)** Very dark grayish brown (10YR 3/2), moist, soft, no odor, no staining. FINES: high plasticity, no dilatancy.	0		
41											
42											
43											
44											
45											SM-WMU-009-E (44-45')
									0		

Boring Terminated at 45 feet bgs

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *ODE-04*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/11/2010	**DATE COMPLETED:** 3/11/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: East bank of OID inside WMU fence line			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
1		80			0	40	60	**FILL** SANDY ELASTIC SILT (MH), black (5Y 2.5/1), moist, very soft, no odor. SAND: fine grained. HALACO WASTE.			SM-ODE-004-A SM-ODE-104-A
2											
3											
4											
5											
6		80									SM-ODE-004-B SM-ODE-104-B
7											
8					0	20	80	**FILL** SANDY ELASTIC SILT (MH), very dark gray (10YR 3/1), damp, very soft, no odor. SAND: fine grained. HALACO WASTE.			
9											
10					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
11		100									SM-ODE-004-C SM-ODE-104-C
12											
13					0	90	10	**FILL** POORLY GRADED SAND WITH SILT (SP-SM), greenish gray (GLEY 2 6/10BG), moist, very loose, no odor. SAND: fine to medium grained, subrounded. HALACO WASTE.			
14											
15					0	0	100	**FAT CLAY (CH)** very dark grayish brown (10YR 3/2), moist, soft, no odor, no staining. FINES: high plasticity, no dilatancy.			SM-ODE-004-D SM-ODE-104-D

Boring Terminated at 15 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *ODE-05*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 15.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/11/2010	**DATE COMPLETED:** 3/11/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: East bank of OID inside WMU fence line			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		80			0	15	85	**SILT WITH SAND (ML)**, yellowish brown (10YR 5/4), soft. SAND: fine grained.			
1											
2											
3					0	20	80	**SANDY ELASTIC SILT**, very dark gray (10YR 3/1), damp, soft, no odor. SAND: fine grained.			
4											
5		80									
6											
7					0	0	100	**FAT CLAY (CH)**, very dark grayish brown (10YR 3/2), moist, soft, no odor, no staining. FINES: high plasticity, no dilatancy.			
8											
9					0	90	10	**POORLY GRADED SAND WITH SILT (SP-SM)**, (10BG 6/), moist, very loose, no odor. SAND: fine to medium grained, subrounded.			
10					0	100	0	**POORLY GRADED SAND (SP)**, dark reddish gray (5YR 4/2), medium dense. SAND: fine grained.			
		90			0	20	80	**SANDY ELASTIC SILT**, very dark gray (10YR 3/1), damp, soft, no odor. SAND: fine grained.			
11					0	90	10	**POORLY GRADED SAND WITH SILT (SP-SM)**, (10BG 6/), moist, very loose, no odor. SAND: fine to medium grained, subrounded.			
12					0	25	75	**SILT WITH SAND**, yellowish brown (10YR 5/4), medium stiff. SAND: fine grained.			
13											
14											
15											

Boring Terminated at 15 feet bgs

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *ODE-06*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 10.00	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 3/11/2010	**DATE COMPLETED:** 3/11/2010
WATER LEVEL: ---	**DRILLING METHOD:** Direct Push		**DRILLING EQUIPMENT:** Geoprobe 6000	
LOCATION: East bank of OID inside WMU fence line			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
		100			0	15	85	**SILT WITH SAND (ML)**, yellowish brown (10YR 5/4), soft. SAND: fine grained.			
1											
2											
3											
4					0	20	80	**SANDY ELASTIC SILT**, very dark gray (10YR 3/1), damp, very soft, no odor. SAND: fine grained.			
5											
		60									
6											
7					0	25	75	**SILT WITH SAND**, yellowish brown (10YR 5/4), soft. SAND: fine grained.			
8											
9											
10											
								Boring Terminated at 10 feet bgs			

CH2MHILL

SHEET 1 of 1	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *SGT-2*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY	**HOLE DEPTH (ft):** 16.50	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 11/10/2009 / **DATE COMPLETED:** 11/10/2009
WATER LEVEL: ---	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING EQUIPMENT:** CME 85	
LOCATION: South Center of Smelter Parcel		**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
								SGT-02 co-located with SPS-14. See SPS-14 boring log.			
1											
2											
3											
4											
5											
6		87		44-18-20 (38)							
7											
8											
9											
10											
11		100		17-17-12 (29)							
12											
13											
14											
15											
16				12-17-21 (38)							

Boring Terminated at 16.5 feet bgs

CH2MHILL

SHEET 1 of 2	PROJECT NUMBER: 385135.FI.01	BORING NUMBER: *WGT-1*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY	**HOLE DEPTH (ft):** 31.50	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 11/10/2009 / **DATE COMPLETED:** 11/10/2009
WATER LEVEL: ---	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING EQUIPMENT:** CME 85	
LOCATION: North center of top of waste pile		**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
								FILL/HALACO WASTE from ground surface to total boring depth.			
1	–										
2	–										
3	–										
4	–										
5											
6	X	100		18-24-26 (50)							
7	–										
8	–										
9	–										
10											
11	X	100		16-21-28 (49)							
12	–										
13	–										
14	–										
15											
16	X	100		14-16-20 (36)							
17	–										
18	–										
19	–										
20											
21	X	100		20-26-36 (62)							
22	–										
23	–										
24	–										
25											

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WGT-1*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 31.50	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 11/10/2009	**DATE COMPLETED:** 11/10/2009
WATER LEVEL: ---	**DRILLING METHOD:** Hollow Stem Auger		**DRILLING EQUIPMENT:** CME 85	
LOCATION: North center of top of waste pile			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
26		100		21-32-44 (76)							
27											
28											
29											
30											
31		100		18-35-46 (81)							

Boring Terminated at 31.5 feet bgs

CH2MHILL

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WGT-2*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY	**HOLE DEPTH (ft):** 31.50	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 11/10/2009 / **DATE COMPLETED:** 11/10/2009
WATER LEVEL: ---	**DRILLING METHOD:** Hollow Stem Auger	**DRILLING EQUIPMENT:** CME 85	
LOCATION: South center of top of waste pile		**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION: USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
								FILL/HALACO WASTE from ground surface to total boring depth.			
1	–										
2	–										
3	–										
4	–										
5											
6	X	100		4-6-7 (13)							
7	–										
8	–										
9	–										
10											
11	X	100		6-8-20 (28)							
12	–										
13	–										
14	–										
15											
16	X	100		17-19-23 (42)							
17	–										
18	–										
19	–										
20											
21	X	100		18-21-25 (46)							
22	–										
23	–										
24	–										
25											

PROJECT NUMBER:	BORING NUMBER:
385135.FI.01	*WGT-2*

SOIL BORING LOG

PROJECT NAME: HALACO ENGINEERING COMPANY		**HOLE DEPTH (ft):** 31.50	**DRILLING CONTRACTOR:** Water Development Corp.	
SURFACE ELEVATION: ---	**NORTHING (CCS NAD83 Z2):** ---	**EASTING (CCS NAD83 Z2):** ---	**DATE STARTED:** 11/10/2009	**DATE COMPLETED:** 11/10/2009
WATER LEVEL: ---	**DRILLING METHOD:** Hollow Stem Auger		**DRILLING EQUIPMENT:** CME 85	
LOCATION: South center of top of waste pile			**LOGGED BY:** J. BALE	

DEPTH (ft bgs)	INTERVAL (feet)	RECOVERY (%)	#TYPE	SPT RESULTS 6"-6"-6" (N)	SIZE DISTRIBUTION %G	%S	%F	SOIL DESCRIPTION USCS GROUP NAME (USCS GROUP SYMBOL): color, moisture, mineralogy, density, structure, cementation, staining/odor, reaction with HCL. COARSE FRACTION: grain size, angularity, hardness, shape. FINE FRACTION: plasticity, dry strength, toughness, dilatancy. Additional comments.	OVM (ppm): BREATHING ZONE	HEAD SPACE	COMMENTS (e.g.: DRILLING FLUID LOSS, TESTS, OR DRILLER COMMENTS, ETC.)
26		100		14-15-23 (38)							
27											
28											
29											
30		100		13-18-26 (44)							
31											

Boring Terminated at 31.5 feet bgs

CH2MHILL

ATTACHMENT D2

Lithologic Descriptions of Solid Matrix Samples for OID Area

Halaco Site Remedial Investigation, Oxnard, California

Sample ID	Depth (ft bgs)	Lithologic Description
ODE-001A-A	0	Sand with Silt (SP-SM), grayish brown (2.5Y 5/2), wet, 20% fine sand, 70% medium sand, 10% nonplastic fines
ODE-001A-B	5	Silt (ML), light olive brown (2.5Y 5/3), wet, 95% nonplastic fines, 5% fine sand as thin lenses, trace mica, locally iron oxide stringers
ODE-001A-C	10	Clay (CL), olive gray (5Y 5/2), wet, 100% fines, medium plasticity
ODE-001A-D	16	Poorly Graded Sand (SP), dark olive gray (5Y 3/2), wet, 40% fine sand, 60% medium sand, contact with silt above at 15.9', total advanced depth = 16'
ODE-002A-A	0	Silty Sand (SM), dark grayish brown (2.5Y 4/2), wet, 40% fines, 60% fine to medium sand, a few small fragments of gray material resembling slag from smelter waste
ODE-002A-B	5	Silt with Sand (ML), olive gray (5Y 4/2), wet, 80% nonplastic fines, 20% fine sand as thin lenses, some iron oxide spots
ODE-002A-C	10	Lean Clay (CL), olive gray (5Y 4/2), wet, 100% fines, low plasticity, some organic matter as decayed plants, etc.
ODE-002A-D	14	Sandy Silt (ML), dark olive gray (5Y 3/2), wet, 70% nonplastic fines, 30% fine sand, trace fine mica
ODE-003A-A	0	Gravelly Silt (ML), dark grayish brown (2.5Y 4/2), wet, 70% low plasticity fines, 30% fine to coarse gravel, subangular
ODE-003A-B	5	Clayey Silt (ML), olive gray (5Y 4/2), wet, 100% fines, trace fine mica, locally brownish organic spots, low plasticity
ODE-003A-C	10	Lean Clay (CL), dark greenish gray (Gley1 4/10Y), wet, 100% fines, locally olive spots of possibly organic matters, medium plasticity
ODE-003A-D	13	Fat Clay (CH), very dark greenish gray (Gley1 3/10Y), wet, 100% fines, high plasticity

Note:

ft bgs = feet below ground surface

Attachment E
Analyte List and CRQLs for Metals, VOCs, SVOCs, PCBs, and Dioxins/Furans

ATTACHMENT E-1

Contract Required Quantitation Limit for Total Metals in Soil

Halaco Site Remedial Investigation, Oxnard, California

No.	Parameter	ICP AES	ICP MS
1	Aluminum	20.0	NA
2	Antimony	6.0	2.0
3	Arsenic	1.0	1.0
4	Barium	20.0	10.0
5	Beryllium	0.50	1.0
6	Cadmium	0.50	1.0
7	Calcium	500	NA
8	Chromium	1.0	2.0
9	Cobalt	5.0	1.0
10	Copper	2.5	2.0
11	Iron	10.0	NA
12	Lead	1.0	1.0
13	Magneseum	500	NA
14	Manganese	1.5	1.0
15	Mercury	0.10	
16	Nickel	4.0	1.0
17	Potassium	500	NA
18	Selenium	3.5	5.0
19	Silver	1.0	1.0
20	Sodium	500	NA
21	Thallium	2.5	1.0
22	Vanadium	5.0	1.0
23	Zinc	6.0	2.0

Notes:

Units are in mg/kg

ICP AES = Inductively Coupled Plasma Atomic Emission Spectroscopy
ICP MS = Inductively Coupled Plasma Mass Spectrometer

ATTACHMENT E-2

Contract Required Quantitation Limit for VOCs in Soil

Halaco Site Remedial Investigation, Oxnard, California

No.	Volatiles	CRQL	No.	Volatiles	CRQL
1	Dichlorodifluoromethane	5.0	27	Methylcyclohexane	5.0
2	Chloromethane	5.0	28	1,2-Dichloropropane	5.0
3	Vinyl chloride	5.0	29	Bromodichloromethane	5.0
4	Bromomethane	5.0	30	cis-1,3-Dichloropropene	5.0
5	Chloroethane	5.0	31	4-Methyl-2-Pentanone	10
6	Trichlorofluoromethane	5.0	32	Toluene	5.0
7	1,1-Dichloroethene	5.0	33	trans-1,3-Dichloropropene	5.0
8	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	34	1,1,2-Trichloroethane	5.0
9	Acetone	10	35	Tetrachloroethene	5.0
10	Carbon disulfide	5.0	36	2-Hexanone	10
11	Methyl acetate	5.0	37	Dibromochloromethane	5.0
12	Methylene chloride	5.0	38	1,2-Dibromoethane	5.0
13	trans-1,2-Dichloroethene	5.0	39	Chlorobenzene	5.0
14	Methyl tert-butyl ether	5.0	40	Ethylbenzene	5.0
15	1,1-Dichloroethane	5.0	41	o-Xylene	5.0
16	cis-1,2-Dichloroethene	5.0	42	m,p-Xylene	5.0
17	2-Butanone	10	43	Styrene	5.0
18	Bromochloromethane	5.0	44	Bromoform	5.0
19	Chloroform	5.0	45	Isopropylbenzene	5.0
20	1,1,1-Trichloroethane	5.0	46	1,1,2,2-Tetrachloroethane	5.0
21	Cyclohexane	5.0	47	1,3-Dichlorobenzene	5.0
22	Carbon tetrachloride	5.0	48	1,4-Dichlorobenzene	5.0
23	Benzene	5.0	49	1,2-Dichlorobenzene	5.0
24	1,2-Dichloroethane	5.0	50	1,2-Dibromo-3-chloropropane	5.0
25	1,4-Dioxane	100	51	1,2,4-Trichlorobenzene	5.0
26	Trichloroethene	5.0	52	1,2,3-Trichlorobenzene	5.0

Note:

Units are in µg/kg

ATTACHMENT E-3

Contract Required Quantitation Limit for SVOCs in Soil

Halaco Site Remedial Investigation, Oxnard, California

No.	Semivolatiles	CRQL	No.	Semivolatiles	CRQL
1	Benzaldehyde	170	35	4-Nitrophenol	330
2	Phenol	170	36	Dibenzofuran	170
3	Bis(2-chloroethyl)ether	170	37	2,4-Dinitrotoluene	170
4	2-Chlorophenol	170	38	Diethylphthalate	170
5	2-Methylphenol	170	39	Fluorene	170
6	2,2'-Oxybis(1-chloropropane)	170	40	4-Chlorophenyl-phenylether	170
7	Acetophenone	170	41	4-Nitroaniline	330
8	4-Methylphenol	170	42	4,6-Dinitro-2-methylphenol	330
9	N-Nitroso-di-n-propylamine	170	43	N-Nitrosodiphenylamine	170
10	Hexachloroethane	170	44	1,2,4,5-Tetrachlorobenzene	170
11	Nitrobenzene	170	45	4-Bromophenyl-phenylether	170
12	Isophorone	170	46	Hexachlorobenzene	170
13	2-Nitrophenol	170	47	Atrazine	170
14	2,4-Dimethylphenol	170	48	Pentachlorophenol	330
15	Bis(2-chloroethoxy)methane	170	49	Phenanthrene	170
16	2,4-Dichlorophenol	170	50	Anthracene	170
17	Naphthalene	170	51	Carbazole	170
18	4-Chloroaniline	170	52	Di-n-butylphthalate	170
19	Hexachlorobutadiene	170	53	Fluoranthene	170
20	Caprolactam	170	54	Pyrene	170
21	4-Chloro-3-methylphenol	170	55	Butylbenzylphthalate	170
22	2-Methylnaphthalene	170	56	3,3'-Dichlorobenzidine	170
23	Hexachlorocyclopentadiene	170	57	Benzo(a)anthracene	170
24	2,4,6-Trichlorophenol	170	58	Chrysene	170
25	2,4,5-Trichlorophenol	170	59	Bis(2-ethylhexyl)phthalate	170
26	1,1'-Biphenyl	170	60	Di-n-octylphthalate	170
27	2-Chloronaphthalene	170	61	Benzo(b)fluoranthene	170
28	2-Nitroaniline	330	62	Benzo(k)fluoranthene	170
29	Dimethylphthalate	170	63	Benzo(a)pyrene	170
30	2,6-Dinitrotoluene	170	64	Indeno(1,2,3-cd)pyrene	170
31	Acenaphthylene	170	65	Dibenzo(a,h)anthracene	170
32	3-Nitroaniline	330	66	Benzo(g,h,i)perylene	170
33	Acenaphthene	170	67	2,3,4,6-Tetrachlorophenol	170
34	2,4-Dinitrophenol	330			

Note:

Units are in µg/kg

ATTACHMENT E-4

Contract Required Quantitation Limit for PCB Aroclors in Soil

Halaco Site Remedial Investigation, Oxnard, California

No.	Aroclors	CRQL
1	Aroclor-1016	3.3
2	Aroclor-1221	3.3
3	Aroclor-1232	3.3
4	Aroclor-1242	3.3
5	Aroclor-1248	3.3
6	Aroclor-1254	3.3
7	Aroclor-1260	3.3
8	Aroclor-1262	3.3
9	Aroclor-1268	3.3

Note:

Units are in µg/kg

ATTACHMENT E-5

Contract Required Quantitation Limit for Dioxins/Furans in Soil

Halaco Site Remedial Investigation, Oxnard, California

No.	Analyte	CRQL
1	2,3,7,8-TCDD	0.910
2	2,3,7,8-TCDF	0.910
3	1,2,3,7,8-PeCDF	4.60
4	1,2,3,7,8-PeCDD	4.60
5	2,3,4,7,8-PeCDF	4.60
6	1,2,3,4,7,8-HxCDF	4.60
7	1,2,3,6,7,8-HxCDF	4.60
8	1,2,3,4,7,8-HxCDD	4.60
9	1,2,3,6,7,8-HxCDD	4.60
10	1,2,3,7,8,9-HxCDD	4.60
11	2,3,4,6,7,8-HxCDF	4.60
12	1,2,3,7,8,9-HxCDF	4.60
13	1,2,3,4,6,7,8-HpCDF	4.60
14	1,2,3,4,6,7,8-HpCDD	4.60
15	1,2,3,4,7,8,9-HpCDF	4.60

Note:

Units are in ng/kg

Attachment F
Geotechnical Laboratory Results for Smelter Parcel and Waste Management Areas

PTS Laboratories, Inc.

8100 Secura Way • Santa Fe Springs, CA 90670
Telephone (562) 347-2500 • Fax (562) 907-3610

December 18, 2009

Mark Wuttig
CH2M Hill
325 East Hillcrest Drive, Suite 125
Thousand Oaks, CA 91360

Re: PTS File No: 39966
Physical Properties Data
385135.F1.01

Dear Mr. Wuttig:

Please find enclosed report for Physical Properties analyses conducted upon cores received from your 385135.F1.01 project. All analyses were performed by applicable ASTM, EPA, or API methodologies. An electronic version of the report has previously been sent to your attention via the internet. The samples are currently in storage and will be retained for thirty days past completion of testing at no charge. Please note that the samples will be disposed of at that time. You may contact me regarding storage, disposal, or return of the samples.

PTS Laboratories appreciates the opportunity to be of service. If you have any questions or require additional information, please give me a call at (562) 347-2504.

Sincerely,
PTS Laboratories

Rachel Spitz
Project Manager

Encl.

PTS Laboratories

Project Name: N/A
Project Number: 385135.F1.01

PTS File No: 39966
Client: CH2M Hill

TEST PROGRAM

CORE ID	Depth ft.	Core Recovery ft.	Grain Size Analyses	Atterberg Limits ASTM D4318	Moisture Content ASTM D2216	Dry Bulk Density ASTM D2937	*Direct Shear ASTM D3080	*Modified Proctor ASTM D1557		Notes
		Plugs:	Grab	Grab	Whole Core		2.5"x6"	5-gallons		Keep core frozen
Rcvd. 11/11/09										
SM-SGT-002-A	5-6	N/A	X	X	X	X	X			
SM-SGT-002-B	10-11	N/A	X	X	X	X		X		
SM-SGT-002-C	15-16	N/A	X	X	X	X				
SM-WGT-001-A	10-11	N/A	X	X	X	X	X			
SM-WGT-001-B	20-21	N/A	X	X	X	X		X		
SM-WGT-001-C	30-31	N/A	X	X	X	X	X			
SM-WGT-002-A	10-11	N/A	X	X	X	X	X			
SM-WGT-002-B	20-21	N/A	X	X	X	X		X		
SM-WGT-002-C	30-31	N/A	X	X	X	X	X			
TOTALS:	9 Samples		9	9	9	9	5	3		

Laboratory Test Program Notes

*Testing is provided through PTS alliance partners.

PTS File No: 39966
Client: CH2M Hill

DRY BULK DENSITY OF IN-PLACE SOIL

(METHODOLOGY: ASTM D2937)

PROJECT NAME: N/A
PROJECT NO: 385135.F1.01

SAMPLE ID.	DEPTH, ft.	TOTAL SAMPLE VOLUME, cc	MOISTURE CONTENT, % wt	VOLUMETRIC MOISTURE CONTENT, fraction Vb	DRY BULK DENSITY, g/cc
SM-SGT-002-A	5-6	447.43	19.1	0.263	1.37
SM-SGT-002-B	10-11	439.86	42.2	0.512	1.21
SM-SGT-002-C	15-16	455.66	59.7	0.613	1.02
SM-WGT-001-A	10-11	444.21	38.6	0.450	1.16
SM-WGT-001-B	20-21	444.21	127.8	0.669	0.52
SM-WGT-001-C	30-31	440.15	67.6	0.499	0.74
SM-WGT-002-A	10-11	440.44	51.5	0.508	0.98
SM-WGT-002-B	20-21	440.58	20.9	0.228	1.09
SM-WGT-002-C	30-31	443.92	67.6	0.526	0.78

* Vb = Bulk Volume

PTS File No: 39966
Client: CH2M Hill

ATTERBERG LIMITS DATA - FINE FRACTION < No. 40 SIEVE

(METHODOLOGY: ASTM D4318)

PROJECT NAME: N/A
PROJECT NO: 385135.F1.01

SAMPLE ID.	DEPTH, ft.	ATTERBERG LIMITS			USCS / PLASTICITY CHART SYMBOL (Fines: <#40 Sieve)
		LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
SM-SGT-002-A	5-6	23.4	23.3	0.1	ML
SM-SGT-002-B	10-11	27.9	27.8	0.1	ML
SM-SGT-002-C	15-16	69.4	31.8	37.6	CH
SM-WGT-001-A	10-11	64.0	30.1	33.9	CH
SM-WGT-001-B	20-21	128.7	75.8	52.9	MH
SM-WGT-001-C	30-31	73.6	29.8	43.8	CH
SM-WGT-002-A	10-11	54.4	28.1	26.3	CH
SM-WGT-002-B	20-21	88.4	37.0	51.4	CH
SM-WGT-002-C	30-31	69.8	32.0	37.8	CH

PTS Laboratories, Inc.

CH2M Hill
PTS File No: 39966

PARTICLE SIZE SUMMARY

(METHODOLOGY: ASTM D422/D4464M)

PROJECT NAME: N/A
PROJECT NO: 385135.F1.01

Sample ID	Depth, ft.	Mean Grain Size Description (1)	Median Grain Size mm	Particle Size Distribution, wt. percent						Silt & Clay
				Gravel	Sand Size			Silt	Clay	
					Coarse	Medium	Fine			
SM-SGT-002-A	5-6	Fine sand	0.056	0.00	0.00	22.05	23.13	41.76	13.07	54.82
SM-SGT-002-B	10-11	Medium sand	0.328	0.00	0.00	46.87	19.18	24.83	9.13	33.96
SM-SGT-002-C	15-16	Silt	0.018	0.00	0.00	0.00	12.40	65.61	21.98	87.60
SM-WGT-001-A	10-11	Fine sand	0.033	0.00	0.00	17.01	22.44	38.44	22.10	60.54
SM-WGT-001-B	20-21	Silt	0.009	0.00	0.00	0.00	3.75	71.21	25.04	96.25
SM-WGT-001-C	30-31	Fine sand	0.058	0.00	0.00	8.80	35.55	41.54	14.10	55.65
SM-WGT-002-A	10-11	Fine sand	0.057	0.00	0.00	19.08	26.54	41.30	13.08	54.37
SM-WGT-002-B	20-21	Silt	0.015	0.00	0.00	0.00	16.10	59.47	24.42	83.90
SM-WGT-002-C	30-31	Silt	0.051	0.00	0.00	6.40	31.92	51.31	10.37	61.68

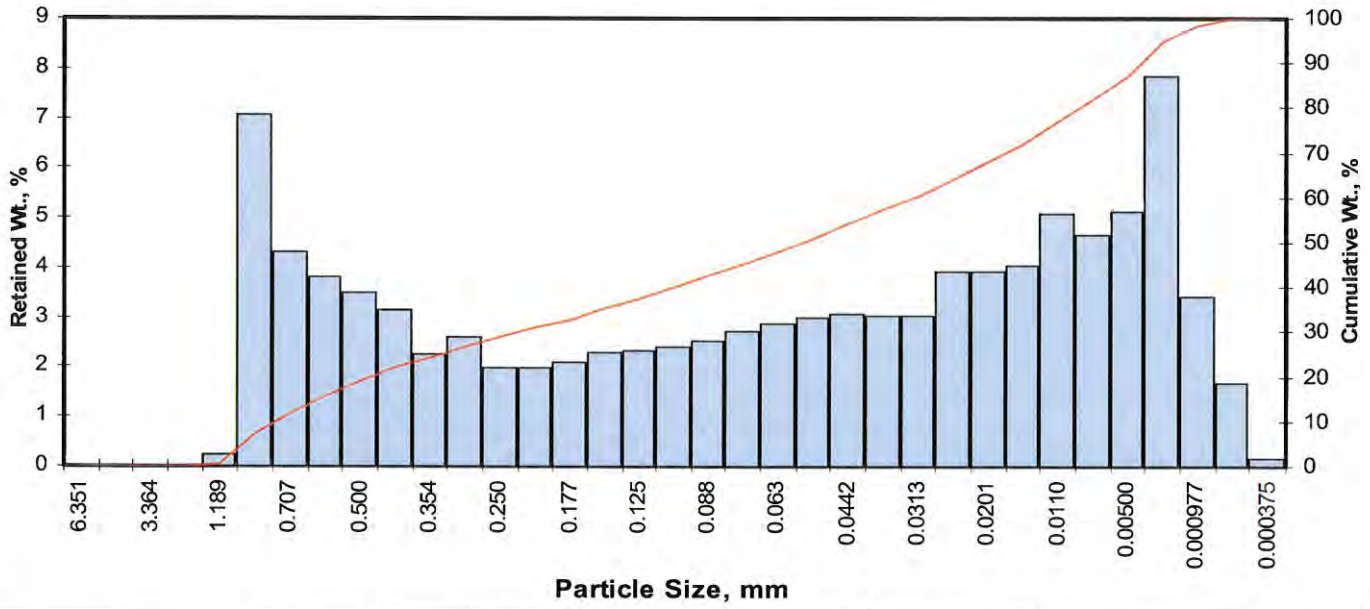
(1) Based on Mean from Trask

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client:	CH2M Hill	**PTS File No:**	39966
Project:	N/A	**Sample ID:**	SM-SGT-002-A
Project No:	385135.F1.01	**Depth, ft:**	5-6

Grv	Sand Size			Silt	Clay
	crs	medium	fine		



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.23	0.23	0.23
0.0331	0.841	0.25	20	7.07	7.07	7.30
0.0278	0.707	0.50	25	4.30	4.30	11.60
0.0234	0.595	0.75	30	3.80	3.80	15.40
0.0197	0.500	1.00	35	3.51	3.51	18.91
0.0166	0.420	1.25	40	3.14	3.14	22.05
0.0139	0.354	1.50	45	2.25	2.25	24.30
0.0117	0.297	1.75	50	2.61	2.61	26.91
0.0098	0.250	2.00	60	1.97	1.97	28.88
0.0083	0.210	2.25	70	1.96	1.96	30.84
0.0070	0.177	2.50	80	2.11	2.11	32.95
0.0059	0.149	2.75	100	2.28	2.28	35.23
0.0049	0.125	3.00	120	2.34	2.34	37.57
0.0041	0.105	3.25	140	2.39	2.39	39.96
0.0035	0.088	3.50	170	2.52	2.52	42.48
0.0029	0.074	3.75	200	2.70	2.70	45.18
0.0025	0.063	4.00	230	2.88	2.88	48.06
0.0021	0.053	4.25	270	3.00	3.00	51.05
0.00174	0.0442	4.50	325	3.05	3.05	54.10
0.00146	0.0372	4.75	400	3.03	3.03	57.13
0.00123	0.0313	5.00	450	3.03	3.03	60.16
0.000986	0.0250	5.32	500	3.93	3.93	64.09
0.000790	0.0201	5.64	635	3.92	3.92	68.01
0.000615	0.0156	6.00		4.05	4.05	72.06
0.000435	0.0110	6.50		5.09	5.09	77.15
0.000308	0.00781	7.00		4.64	4.64	81.79
0.000197	0.00500	7.65		5.14	5.14	86.93
0.000077	0.00195	9.00		7.83	7.83	94.76
0.000038	0.000977	10.00		3.40	3.40	98.16
0.000019	0.000488	11.00		1.67	1.67	99.83
0.000015	0.000375	11.38		0.17	0.17	100.00
TOTALS				100.00	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	0.09	0.0371	0.941
10	0.41	0.0297	0.754
16	0.79	0.0227	0.577
25	1.57	0.0133	0.337
40	3.25	0.0041	0.105
50	4.16	0.0022	0.056
60	4.99	0.0012	0.032
75	6.29	0.0005	0.013
84	7.28	0.0003	0.006
90	8.18	0.0001	0.003
95	9.07	0.0001	0.002

Measure	Trask	Inman	Folk-Ward
Median, phi	4.16	4.16	4.16
Median, in.	0.0022	0.0022	0.0022
Median, mm	0.056	0.056	0.056
Mean, phi	2.51	4.03	4.08
Mean, in.	0.0069	0.0024	0.0023
Mean, mm	0.175	0.061	0.059
Sorting	5.136	3.242	2.982
Skewness	1.176	-0.039	0.027
Kurtosis	0.216	0.385	0.780
Grain Size Description (ASTM-USCS Scale)		Fine sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	22.05
Fine Sand	200	23.13
Silt	>0.005 mm	41.76
Clay	<0.005 mm	13.07
	Total	100

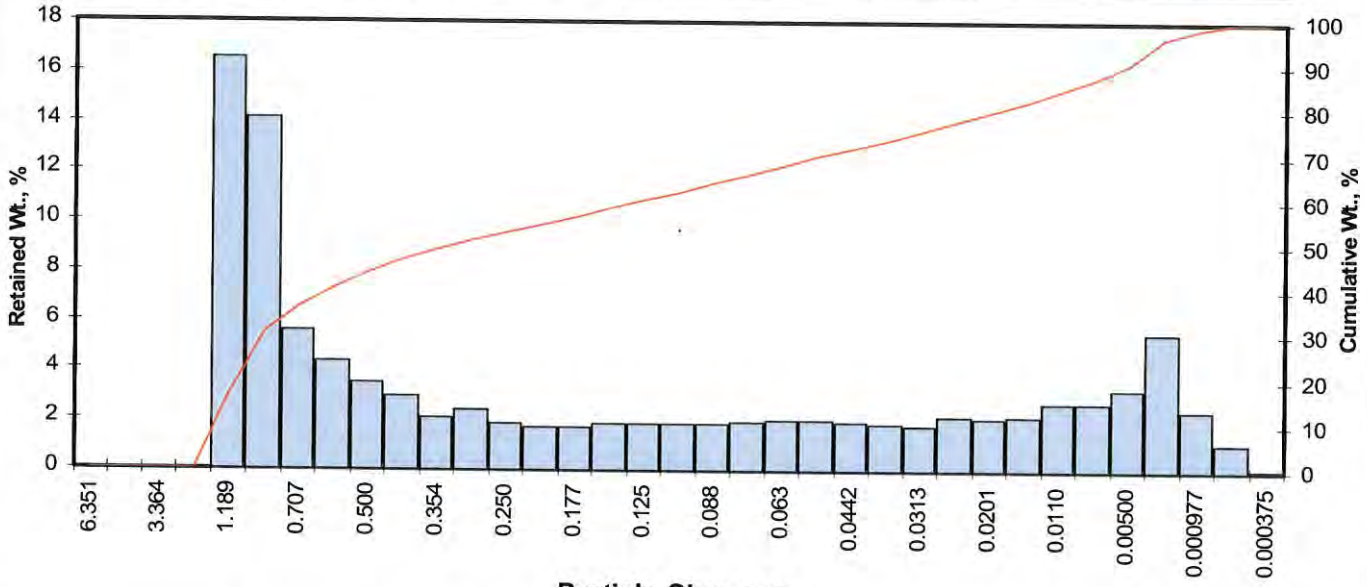
PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client: CH2M Hill
Project: N/A
Project No: 385135.F1.01

PTS File No: 39966
Sample ID: SM-SGT-002-B
Depth, ft: 10-11

Grv	Sand Size			Silt	Clay
	crs	medium	fine		



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	16.50	16.50	16.50
0.0331	0.841	0.25	20	14.10	14.10	30.60
0.0278	0.707	0.50	25	5.58	5.58	36.18
0.0234	0.595	0.75	30	4.32	4.32	40.50
0.0197	0.500	1.00	35	3.46	3.46	43.96
0.0166	0.420	1.25	40	2.91	2.91	46.87
0.0139	0.354	1.50	45	2.07	2.07	48.94
0.0117	0.297	1.75	50	2.43	2.43	51.36
0.0098	0.250	2.00	60	1.83	1.83	53.19
0.0083	0.210	2.25	70	1.73	1.73	54.92
0.0070	0.177	2.50	80	1.74	1.74	56.66
0.0059	0.149	2.75	100	1.83	1.83	58.49
0.0049	0.125	3.00	120	1.88	1.88	60.37
0.0041	0.105	3.25	140	1.87	1.87	62.24
0.0035	0.088	3.50	170	1.87	1.87	64.11
0.0029	0.074	3.75	200	1.93	1.93	66.04
0.0025	0.063	4.00	230	2.01	2.01	68.05
0.0021	0.053	4.25	270	2.01	2.01	70.06
0.00174	0.0442	4.50	325	1.95	1.95	72.01
0.00146	0.0372	4.75	400	1.86	1.86	73.87
0.00123	0.0313	5.00	450	1.79	1.79	75.66
0.000986	0.0250	5.32	500	2.21	2.21	77.87
0.000790	0.0201	5.64	635	2.11	2.11	79.98
0.000615	0.0156	6.00		2.15	2.15	82.13
0.000435	0.0110	6.50		2.75	2.75	84.88
0.000308	0.00781	7.00		2.71	2.71	87.59
0.000197	0.00500	7.65		3.28	3.28	90.87
0.000077	0.00195	9.00		5.53	5.53	96.40
0.000038	0.000977	10.00		2.40	2.40	98.80
0.000019	0.000488	11.00		1.09	1.09	99.89
0.000015	0.000375	11.38		0.11	0.11	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-0.77	0.0673	1.708
10	-0.55	0.0575	1.459
16	-0.27	0.0476	1.208
25	0.05	0.0380	0.965
40	0.72	0.0239	0.607
50	1.61	0.0129	0.328
60	2.95	0.0051	0.129
75	4.91	0.0013	0.033
84	6.34	0.0005	0.012
90	7.47	0.0002	0.006
95	8.66	0.0001	0.002

Measure	Trask	Inman	Folk-Ward
Median, phi	1.61	1.61	1.61
Median, in.	0.0129	0.0129	0.0129
Median, mm	0.328	0.328	0.328
Mean, phi	1.00	3.03	2.56
Mean, in.	0.0197	0.0048	0.0067
Mean, mm	0.499	0.122	0.170
Sorting	5.381	3.306	3.082
Skewness	0.547	0.431	0.463
Kurtosis	0.320	0.426	0.796
Grain Size Description (ASTM-USCS Scale)		Medium sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	46.87
Fine Sand	200	19.18
Silt	>0.005 mm	24.83
Clay	<0.005 mm	9.13
	Total	**100**

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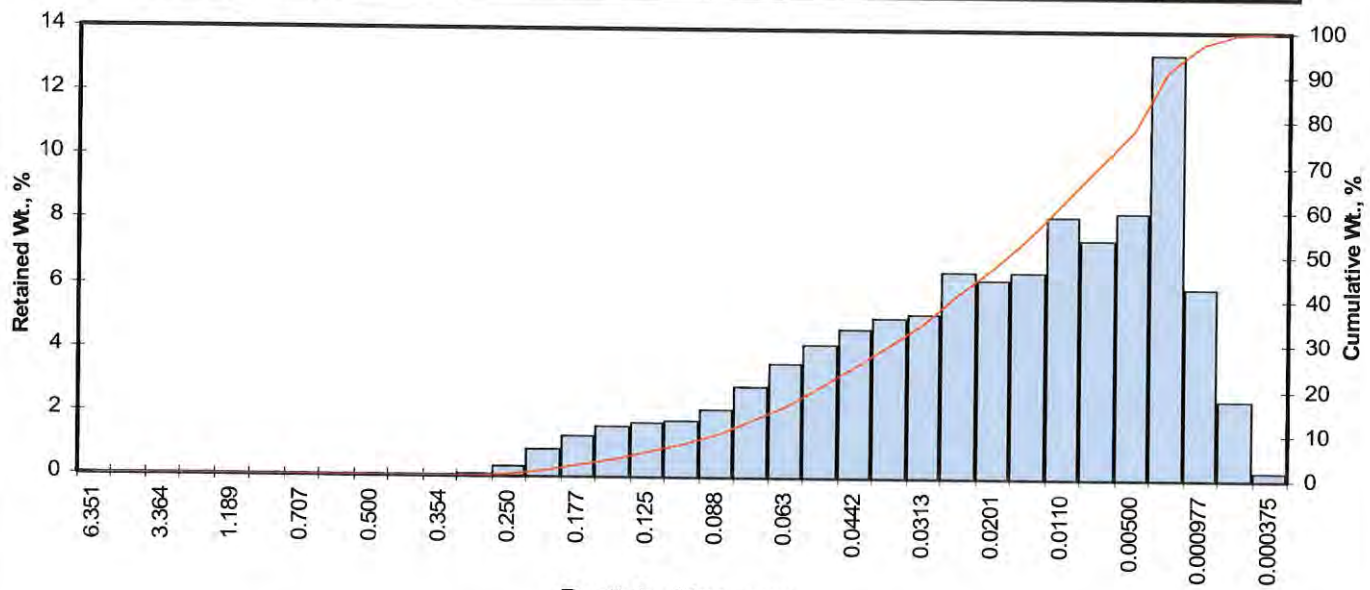
PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client: CH2M Hill
Project: N/A
Project No: 385135.F1.01

PTS File No: 39966
Sample ID: SM-SGT-002-C
Depth, ft: 15-16

Grv	Sand Size			Silt	Clay
	crs	medium	fine		



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.00	0.00	0.00
0.0166	0.420	1.25	40	0.00	0.00	0.00
0.0139	0.354	1.50	45	0.00	0.00	0.00
0.0117	0.297	1.75	50	0.05	0.05	0.05
0.0098	0.250	2.00	60	0.33	0.33	0.38
0.0083	0.210	2.25	70	0.82	0.82	1.20
0.0070	0.177	2.50	80	1.26	1.26	2.46
0.0059	0.149	2.75	100	1.56	1.56	4.02
0.0049	0.125	3.00	120	1.67	1.67	5.68
0.0041	0.105	3.25	140	1.76	1.76	7.44
0.0035	0.088	3.50	170	2.13	2.13	9.57
0.0029	0.074	3.75	200	2.83	2.83	12.40
0.0025	0.063	4.00	230	3.59	3.59	15.99
0.0021	0.053	4.25	270	4.17	4.17	20.16
0.00174	0.0442	4.50	325	4.65	4.65	24.81
0.00146	0.0372	4.75	400	4.98	4.98	29.79
0.00123	0.0313	5.00	450	5.13	5.13	34.92
0.000986	0.0250	5.32	500	6.45	6.45	41.37
0.000790	0.0201	5.64	635	6.20	6.20	47.56
0.000615	0.0156	6.00		6.46	6.46	54.02
0.000435	0.0110	6.50		8.20	8.20	62.22
0.000308	0.00781	7.00		7.46	7.46	69.68
0.000197	0.00500	7.65		8.34	8.34	78.02
0.000077	0.00195	9.00		13.30	13.30	91.31
0.000038	0.000977	10.00		5.99	5.99	97.30
0.000019	0.000488	11.00		2.48	2.48	99.78
0.000015	0.000375	11.38		0.22	0.22	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	2.90	0.0053	0.134
10	3.54	0.0034	0.086
16	4.00	0.0025	0.062
25	4.51	0.0017	0.044
40	5.25	0.0010	0.026
50	5.78	0.0007	0.018
60	6.36	0.0005	0.012
75	7.41	0.0002	0.006
84	8.25	0.0001	0.003
90	8.87	0.0001	0.002
95	9.62	0.0001	0.001

Measure	Trask	Inman	Folk-Ward
Median, phi	5.78	5.78	5.78
Median, in.	0.0007	0.0007	0.0007
Median, mm	0.018	0.018	0.018
Mean, phi	5.33	6.13	6.01
Mean, in.	0.0010	0.0006	0.0006
Mean, mm	0.025	0.014	0.016
Sorting	2.734	2.127	2.082
Skewness	0.880	0.165	0.154
Kurtosis	0.226	0.579	0.949
Grain Size Description (ASTM-USCS Scale)		Silt (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.00
Fine Sand	200	12.40
Silt	>0.005 mm	65.61
Clay	<0.005 mm	21.98
	Total	**100**

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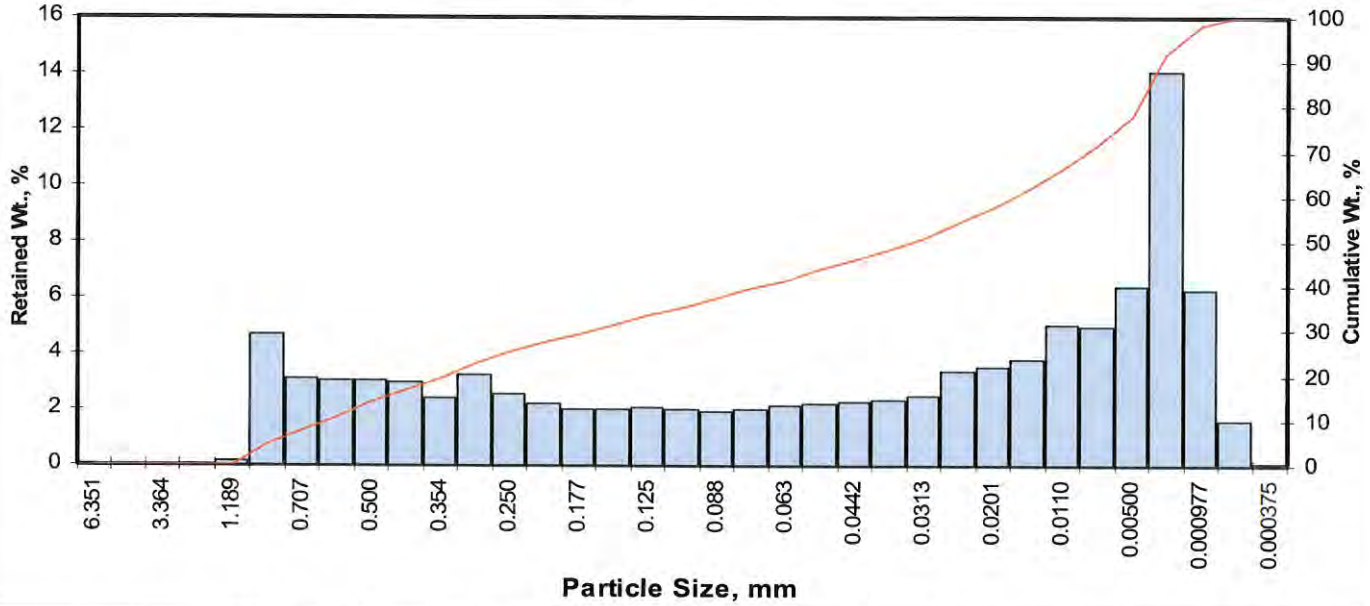
PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client: CH2M Hill
Project: N/A
Project No: 385135.F1.01

PTS File No: 39966
Sample ID: SM-WGT-001-A
Depth, ft: 10-11

Grv	Sand Size			Silt	Clay
	crs	medium	fine		



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.16	0.16	0.16
0.0331	0.841	0.25	20	4.72	4.72	4.88
0.0278	0.707	0.50	25	3.07	3.07	7.95
0.0234	0.595	0.75	30	3.02	3.02	10.97
0.0197	0.500	1.00	35	3.05	3.05	14.02
0.0166	0.420	1.25	40	3.00	3.00	17.01
0.0139	0.354	1.50	45	2.42	2.42	19.43
0.0117	0.297	1.75	50	3.23	3.23	22.66
0.0098	0.250	2.00	60	2.56	2.56	25.22
0.0083	0.210	2.25	70	2.24	2.24	27.46
0.0070	0.177	2.50	80	1.98	1.98	29.44
0.0059	0.149	2.75	100	1.99	1.99	31.43
0.0049	0.125	3.00	120	2.07	2.07	33.50
0.0041	0.105	3.25	140	2.03	2.03	35.53
0.0035	0.088	3.50	170	1.95	1.95	37.48
0.0029	0.074	3.75	200	1.98	1.98	39.46
0.0025	0.063	4.00	230	2.11	2.11	41.57
0.0021	0.053	4.25	270	2.20	2.20	43.77
0.00174	0.0442	4.50	325	2.26	2.26	46.03
0.00146	0.0372	4.75	400	2.33	2.33	48.36
0.00123	0.0313	5.00	450	2.48	2.48	50.83
0.000986	0.0250	5.32	500	3.37	3.37	54.20
0.000790	0.0201	5.64	635	3.49	3.49	57.69
0.000615	0.0156	6.00		3.78	3.78	61.47
0.000435	0.0110	6.50		5.05	5.05	66.52
0.000308	0.00781	7.00		4.96	4.96	71.48
0.000197	0.00500	7.65		6.42	6.42	77.90
0.000077	0.00195	9.00		14.10	14.10	91.99
0.000038	0.000977	10.00		6.31	6.31	98.30
0.000019	0.000488	11.00		1.61	1.61	99.91
0.000015	0.000375	11.38		0.09	0.09	100.00
TOTALS				100.00	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	0.26	0.0329	0.835
10	0.67	0.0247	0.629
16	1.17	0.0176	0.446
25	1.98	0.0100	0.254
40	3.81	0.0028	0.071
50	4.92	0.0013	0.033
60	5.86	0.0007	0.017
75	7.35	0.0002	0.006
84	8.23	0.0001	0.003
90	8.81	0.0001	0.002
95	9.48	0.0001	0.001

Measure	Trask	Inman	Folk-Ward
Median, phi	4.92	4.92	4.92
Median, in.	0.0013	0.0013	0.0013
Median, mm	0.033	0.033	0.033
Mean, phi	2.94	4.70	4.77
Mean, in.	0.0051	0.0015	0.0014
Mean, mm	0.130	0.039	0.037
Sorting	6.443	3.533	3.163
Skewness	1.189	-0.061	-0.036
Kurtosis	0.198	0.304	0.703
Grain Size Description (ASTM-USCS Scale)		Fine sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	17.01
Fine Sand	200	22.44
Silt	>0.005 mm	38.44
Clay	<0.005 mm	22.10
	Total	100

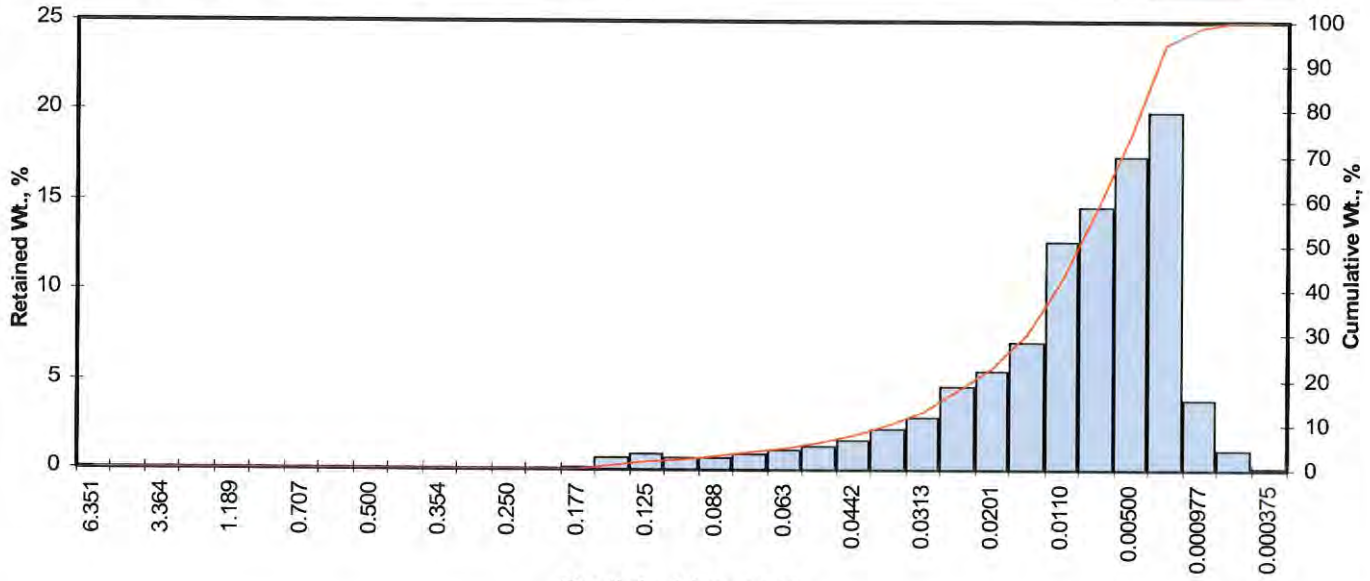
PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client: CH2M Hill
Project: N/A
Project No: 385135.F1.01

PTS File No: 39966
Sample ID: SM-WGT-001-B
Depth, ft: 20-21

Grv	Sand Size			Silt	Clay
	crs	medium	fine		



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.00	0.00	0.00
0.0166	0.420	1.25	40	0.00	0.00	0.00
0.0139	0.354	1.50	45	0.00	0.00	0.00
0.0117	0.297	1.75	50	0.00	0.00	0.00
0.0098	0.250	2.00	60	0.00	0.00	0.00
0.0083	0.210	2.25	70	0.01	0.01	0.01
0.0070	0.177	2.50	80	0.15	0.15	0.16
0.0059	0.149	2.75	100	0.61	0.61	0.77
0.0049	0.125	3.00	120	0.83	0.83	1.60
0.0041	0.105	3.25	140	0.68	0.68	2.28
0.0035	0.088	3.50	170	0.63	0.63	2.91
0.0029	0.074	3.75	200	0.84	0.84	3.75
0.0025	0.063	4.00	230	1.08	1.08	4.83
0.0021	0.053	4.25	270	1.26	1.26	6.09
0.00174	0.0442	4.50	325	1.61	1.61	7.70
0.00146	0.0372	4.75	400	2.23	2.23	9.93
0.00123	0.0313	5.00	450	2.95	2.95	12.88
0.000986	0.0250	5.32	500	4.63	4.63	17.51
0.000790	0.0201	5.64	635	5.48	5.48	22.99
0.000615	0.0156	6.00		7.15	7.15	30.15
0.000435	0.0110	6.50		12.70	12.70	42.85
0.000308	0.00781	7.00		14.70	14.70	57.55
0.000197	0.00500	7.65		17.40	17.40	74.96
0.000077	0.00195	9.00		19.90	19.90	94.86
0.000038	0.000977	10.00		3.92	3.92	98.78
0.000019	0.000488	11.00		1.12	1.12	99.90
0.000015	0.000375	11.38		0.10	0.10	100.00
TOTALS				100.00	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	4.03	0.0024	0.061
10	4.76	0.0015	0.037
16	5.22	0.0011	0.027
25	5.74	0.0007	0.019
40	6.39	0.0005	0.012
50	6.74	0.0004	0.009
60	7.09	0.0003	0.007
75	7.65	0.0002	0.005
84	8.26	0.0001	0.003
90	8.67	0.0001	0.002
95	9.04	0.0001	0.002

Measure	Trask	Inman	Folk-Ward
Median, phi	6.74	6.74	6.74
Median, in.	0.0004	0.0004	0.0004
Median, mm	0.009	0.009	0.009
Mean, phi	6.40	6.74	6.74
Mean, in.	0.0005	0.0004	0.0004
Mean, mm	0.012	0.009	0.009
Sorting	1.937	1.523	1.519
Skewness	1.034	-0.003	-0.043
Kurtosis	0.198	0.643	1.075
Grain Size Description (ASTM-USCS Scale)		Silt (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.00
Fine Sand	200	3.75
Silt	>0.005 mm	71.21
Clay	<0.005 mm	25.04
	Total	100

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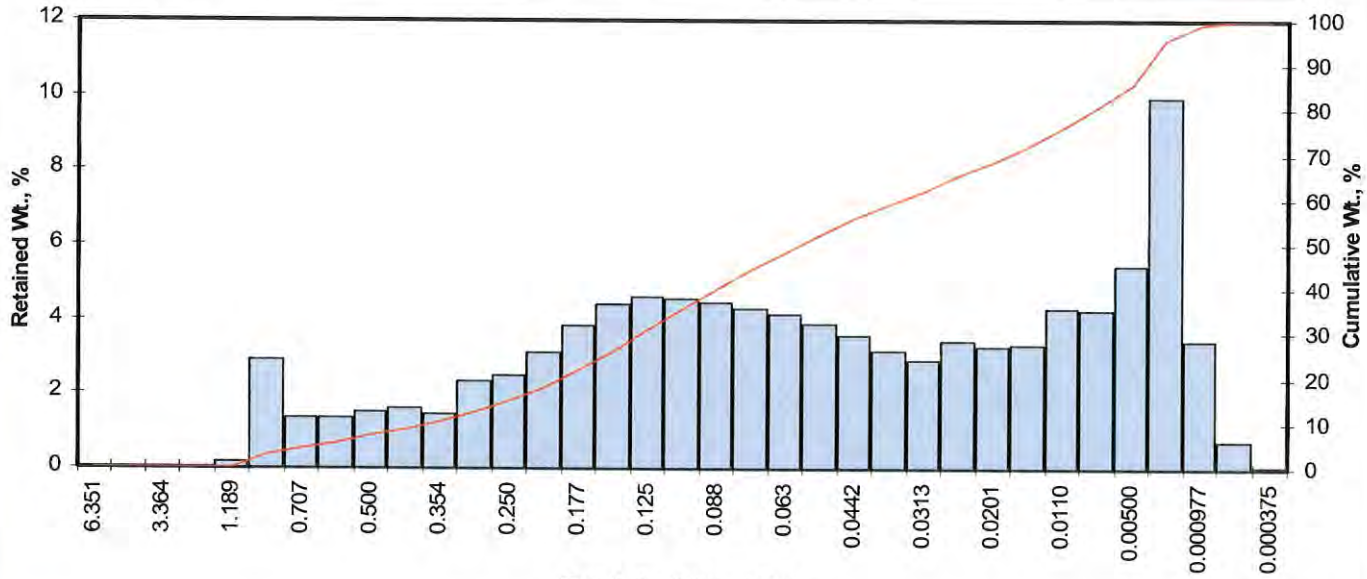
PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client: CH2M Hill
Project: N/A
Project No: 385135.F1.01

PTS File No: 39966
Sample ID: SM-WGT-001-C
Depth, ft: 30-31

Grv	Sand Size			Silt	Clay
	crs	medium	fine		



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.13	0.13	0.13
0.0331	0.841	0.25	20	2.91	2.91	3.04
0.0278	0.707	0.50	25	1.36	1.36	4.40
0.0234	0.595	0.75	30	1.32	1.32	5.72
0.0197	0.500	1.00	35	1.48	1.48	7.20
0.0166	0.420	1.25	40	1.60	1.60	8.80
0.0139	0.354	1.50	45	1.45	1.45	10.25
0.0117	0.297	1.75	50	2.35	2.35	12.60
0.0098	0.250	2.00	60	2.49	2.49	15.09
0.0083	0.210	2.25	70	3.12	3.12	18.21
0.0070	0.177	2.50	80	3.82	3.82	22.03
0.0059	0.149	2.75	100	4.41	4.41	26.44
0.0049	0.125	3.00	120	4.60	4.60	31.04
0.0041	0.105	3.25	140	4.56	4.56	35.60
0.0035	0.088	3.50	170	4.44	4.44	40.04
0.0029	0.074	3.75	200	4.31	4.31	44.35
0.0025	0.063	4.00	230	4.13	4.13	48.48
0.0021	0.053	4.25	270	3.87	3.87	52.35
0.00174	0.0442	4.50	325	3.55	3.55	55.91
0.00146	0.0372	4.75	400	3.18	3.18	59.09
0.00123	0.0313	5.00	450	2.89	2.89	61.98
0.000986	0.0250	5.32	500	3.42	3.42	65.40
0.000790	0.0201	5.64	635	3.24	3.24	68.64
0.000615	0.0156	6.00		3.32	3.32	71.96
0.000435	0.0110	6.50		4.27	4.27	76.23
0.000308	0.00781	7.00		4.23	4.23	80.46
0.000197	0.00500	7.65		5.44	5.44	85.90
0.000077	0.00195	9.00		9.93	9.93	95.83
0.000038	0.000977	10.00		3.39	3.39	99.22
0.000019	0.000488	11.00		0.74	0.74	99.96
0.000015	0.000375	11.38		0.04	0.04	100.00
TOTALS				100.00	100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	0.61	0.0257	0.654
10	1.46	0.0143	0.364
16	2.07	0.0094	0.238
25	2.67	0.0062	0.157
40	3.50	0.0035	0.089
50	4.10	0.0023	0.058
60	4.83	0.0014	0.035
75	6.36	0.0005	0.012
84	7.42	0.0002	0.006
90	8.20	0.0001	0.003
95	8.89	0.0001	0.002

Measure	Trask	Inman	Folk-Ward
Median, phi	4.10	4.10	4.10
Median, in.	0.0023	0.0023	0.0023
Median, mm	0.058	0.058	0.058
Mean, phi	3.56	4.75	4.53
Mean, in.	0.0033	0.0015	0.0017
Mean, mm	0.085	0.037	0.043
Sorting	3.590	2.674	2.590
Skewness	0.750	0.243	0.200
Kurtosis	0.201	0.547	0.919
Grain Size Description (ASTM-USCS Scale)		Fine sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	8.80
Fine Sand	200	35.55
Silt	>0.005 mm	41.54
Clay	<0.005 mm	14.10
	Total	100

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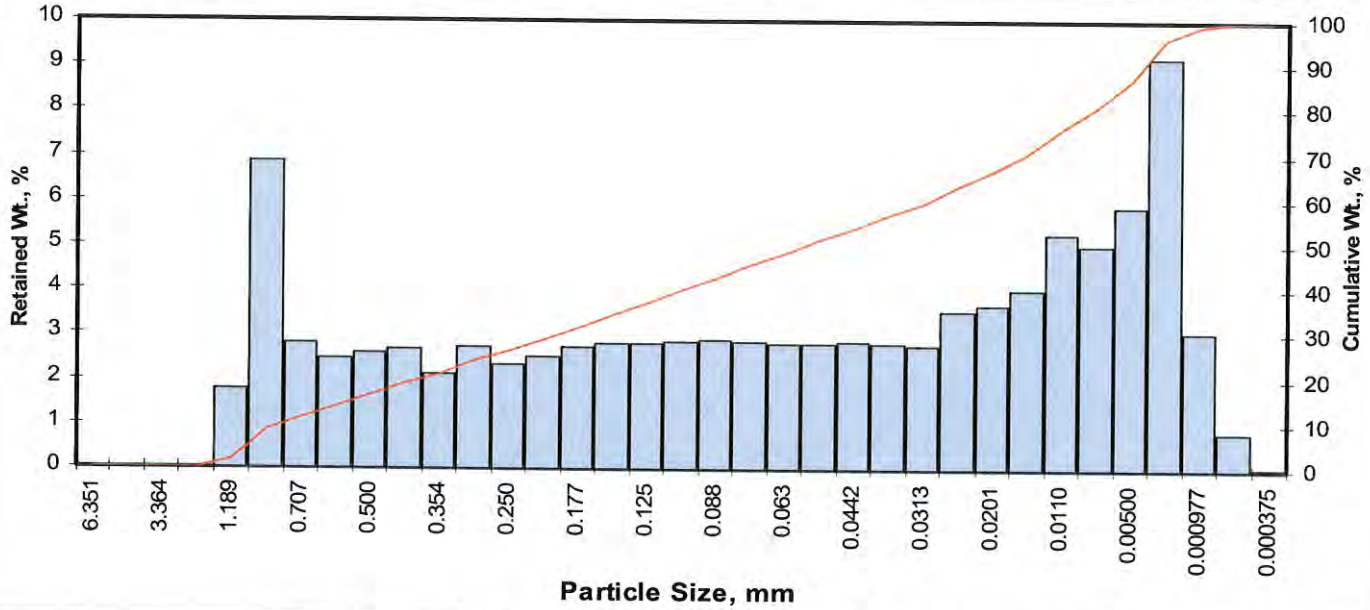
Particle Size Analysis - ASTM D4464M

Client: CH2M Hill
Project: N/A
Project No: 385135.F1.01

PTS File No: 39966
Sample ID: SM-WGT-002-A
Depth, ft: 10-11

Grv	Sand Size			Silt	Clay
	crs	medium	fine		



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	1.76	1.76	1.76
0.0331	0.841	0.25	20	6.84	6.84	8.60
0.0278	0.707	0.50	25	2.78	2.78	11.38
0.0234	0.595	0.75	30	2.47	2.47	13.85
0.0197	0.500	1.00	35	2.57	2.57	16.42
0.0166	0.420	1.25	40	2.66	2.66	19.08
0.0139	0.354	1.50	45	2.13	2.13	21.21
0.0117	0.297	1.75	50	2.73	2.73	23.94
0.0098	0.250	2.00	60	2.32	2.32	26.26
0.0083	0.210	2.25	70	2.51	2.51	28.77
0.0070	0.177	2.50	80	2.71	2.71	31.49
0.0059	0.149	2.75	100	2.79	2.79	34.28
0.0049	0.125	3.00	120	2.80	2.80	37.08
0.0041	0.105	3.25	140	2.85	2.85	39.93
0.0035	0.088	3.50	170	2.87	2.87	42.80
0.0029	0.074	3.75	200	2.83	2.83	45.63
0.0025	0.063	4.00	230	2.78	2.78	48.41
0.0021	0.053	4.25	270	2.78	2.78	51.19
0.00174	0.0442	4.50	325	2.83	2.83	54.02
0.00146	0.0372	4.75	400	2.82	2.82	56.84
0.00123	0.0313	5.00	450	2.77	2.77	59.61
0.000986	0.0250	5.32	500	3.54	3.54	63.15
0.000790	0.0201	5.64	635	3.65	3.65	66.80
0.000615	0.0156	6.00		4.01	4.01	70.81
0.000435	0.0110	6.50		5.27	5.27	76.08
0.000308	0.00781	7.00		4.99	4.99	81.07
0.000197	0.00500	7.65		5.85	5.85	86.92
0.000077	0.00195	9.00		9.16	9.16	96.09
0.000038	0.000977	10.00		3.05	3.05	99.14
0.000019	0.000488	11.00		0.81	0.81	99.95
0.000015	0.000375	11.38		0.05	0.05	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	-0.01	0.0397	1.009
10	0.38	0.0303	0.771
16	0.96	0.0203	0.514
25	1.86	0.0108	0.275
40	3.26	0.0041	0.105
50	4.14	0.0022	0.057
60	5.04	0.0012	0.030
75	6.40	0.0005	0.012
84	7.32	0.0002	0.006
90	8.10	0.0001	0.004
95	8.84	0.0001	0.002

Measure	Trask	Inman	Folk-Ward
Median, phi	4.14	4.14	4.14
Median, in.	0.0022	0.0022	0.0022
Median, mm	0.057	0.057	0.057
Mean, phi	2.80	4.14	4.14
Mean, in.	0.0056	0.0022	0.0022
Mean, mm	0.143	0.057	0.057
Sorting	4.812	3.182	2.932
Skewness	1.009	-0.001	0.030
Kurtosis	0.171	0.391	0.800
Grain Size Description (ASTM-USCS Scale)		Fine sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	19.08
Fine Sand	200	26.54
Silt	>0.005 mm	41.30
Clay	<0.005 mm	13.08
	Total	**100**

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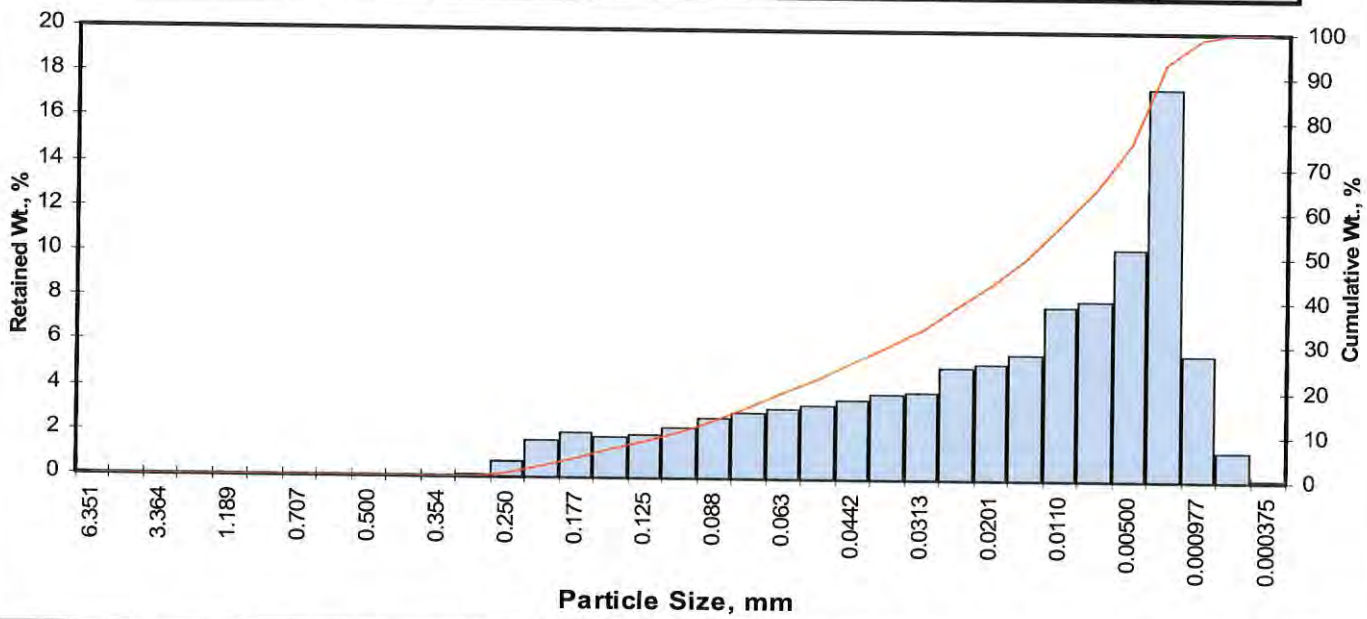
PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client: CH2M Hill
Project: N/A
Project No: 385135.F1.01

PTS File No: 39966
Sample ID: SM-WGT-002-B
Depth, ft: 20-21

Grv	Sand Size			Silt	Clay
	crs	medium	fine		



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.00	0.00	0.00
0.0166	0.420	1.25	40	0.00	0.00	0.00
0.0139	0.354	1.50	45	0.00	0.00	0.00
0.0117	0.297	1.75	50	0.10	0.10	0.10
0.0098	0.250	2.00	60	0.73	0.73	0.83
0.0083	0.210	2.25	70	1.65	1.65	2.48
0.0070	0.177	2.50	80	1.98	1.98	4.46
0.0059	0.149	2.75	100	1.83	1.83	6.30
0.0049	0.125	3.00	120	1.89	1.89	8.19
0.0041	0.105	3.25	140	2.27	2.27	10.46
0.0035	0.088	3.50	170	2.68	2.68	13.14
0.0029	0.074	3.75	200	2.96	2.96	16.10
0.0025	0.063	4.00	230	3.13	3.13	19.23
0.0021	0.053	4.25	270	3.31	3.31	22.55
0.00174	0.0442	4.50	325	3.57	3.57	26.12
0.00146	0.0372	4.75	400	3.75	3.75	29.87
0.00123	0.0313	5.00	450	3.86	3.86	33.74
0.000986	0.0250	5.32	500	5.03	5.03	38.77
0.000790	0.0201	5.64	635	5.13	5.13	43.90
0.000615	0.0156	6.00		5.58	5.58	49.49
0.000435	0.0110	6.50		7.73	7.74	57.22
0.000308	0.00781	7.00		8.04	8.05	65.27
0.000197	0.00500	7.65		10.30	10.31	75.58
0.000077	0.00195	9.00		17.50	17.51	93.09
0.000038	0.000977	10.00		5.57	5.57	98.66
0.000019	0.000488	11.00		1.26	1.26	99.92
0.000015	0.000375	11.38		0.08	0.08	100.00
TOTALS				**99.90**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	2.57	0.0066	0.168
10	3.20	0.0043	0.109
16	3.74	0.0029	0.075
25	4.42	0.0018	0.047
40	5.40	0.0009	0.024
50	6.03	0.0006	0.015
60	6.67	0.0004	0.010
75	7.61	0.0002	0.005
84	8.30	0.0001	0.003
90	8.76	0.0001	0.002
95	9.34	0.0001	0.002

Measure	Trask	Inman	Folk-Ward
Median, phi	6.03	6.03	6.03
Median, in.	0.0006	0.0006	0.0006
Median, mm	0.015	0.015	0.015
Mean, phi	5.27	6.02	6.02
Mean, in.	0.0010	0.0006	0.0006
Mean, mm	0.026	0.015	0.015
Sorting	3.018	2.278	2.165
Skewness	1.012	-0.006	-0.014
Kurtosis	0.195	0.486	0.870
Grain Size Description (ASTM-USCS Scale)		Silt (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.00
Fine Sand	200	16.10
Silt	>0.005 mm	59.47
Clay	<0.005 mm	24.42
	Total	**100**

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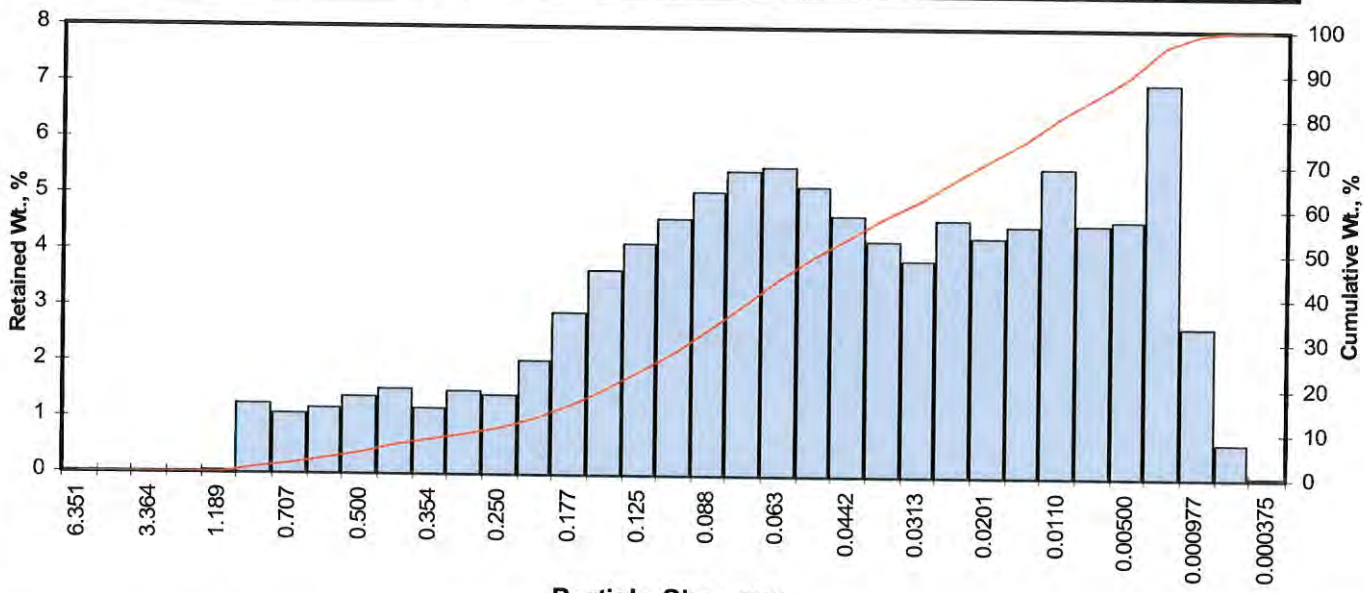
Particle Size Analysis - ASTM D4464M

Client: CH2M Hill
Project: N/A
Project No: 385135.F1.01

PTS File No: 39966
Sample ID: SM-WGT-002-C
Depth, ft: 30-31

Grv	Sand Size			Silt	Clay
	crs	medium	fine		



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Increment Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.03	0.03	0.03
0.0331	0.841	0.25	20	1.24	1.24	1.27
0.0278	0.707	0.50	25	1.08	1.08	2.35
0.0234	0.595	0.75	30	1.17	1.17	3.52
0.0197	0.500	1.00	35	1.38	1.38	4.90
0.0166	0.420	1.25	40	1.50	1.50	6.40
0.0139	0.354	1.50	45	1.18	1.18	7.58
0.0117	0.297	1.75	50	1.47	1.47	9.05
0.0098	0.250	2.00	60	1.43	1.43	10.48
0.0083	0.210	2.25	70	2.04	2.04	12.52
0.0070	0.177	2.50	80	2.89	2.89	15.41
0.0059	0.149	2.75	100	3.65	3.65	19.06
0.0049	0.125	3.00	120	4.15	4.15	23.21
0.0041	0.105	3.25	140	4.59	4.59	27.80
0.0035	0.088	3.50	170	5.07	5.07	32.87
0.0029	0.074	3.75	200	5.45	5.45	38.32
0.0025	0.063	4.00	230	5.50	5.50	43.82
0.0021	0.053	4.25	270	5.17	5.17	48.99
0.00174	0.0442	4.50	325	4.67	4.67	53.66
0.00146	0.0372	4.75	400	4.19	4.19	57.85
0.00123	0.0313	5.00	450	3.85	3.85	61.70
0.000986	0.0250	5.32	500	4.57	4.57	66.27
0.000790	0.0201	5.64	635	4.29	4.29	70.56
0.000615	0.0156	6.00		4.48	4.48	75.04
0.000435	0.0110	6.50		5.51	5.51	80.55
0.000308	0.00781	7.00		4.51	4.51	85.06
0.000197	0.00500	7.65		4.57	4.57	89.63
0.000077	0.00195	9.00		7.02	7.02	96.65
0.000038	0.000977	10.00		2.69	2.69	99.34
0.000019	0.000488	11.00		0.63	0.63	99.97
0.000015	0.000375	11.38		0.03	0.03	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	1.02	0.0195	0.494
10	1.92	0.0104	0.265
16	2.54	0.0068	0.172
25	3.10	0.0046	0.117
40	3.83	0.0028	0.070
50	4.30	0.0020	0.051
60	4.89	0.0013	0.034
75	6.00	0.0006	0.016
84	6.88	0.0003	0.008
90	7.72	0.0002	0.005
95	8.68	0.0001	0.002

Measure	Trask	Inman	Folk-Ward
Median, phi	4.30	4.30	4.30
Median, in.	0.0020	0.0020	0.0020
Median, mm	0.051	0.051	0.051
Mean, phi	3.92	4.71	4.58
Mean, in.	0.0026	0.0015	0.0017
Mean, mm	0.066	0.038	0.042
Sorting	2.731	2.171	2.247
Skewness	0.845	0.188	0.165
Kurtosis	0.194	0.765	1.083
Grain Size Description (ASTM-USCS Scale)		Silt (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	6.40
Fine Sand	200	31.92
Silt	>0.005 mm	51.31
Clay	<0.005 mm	10.37
	Total	**100**

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Environmental
Geotechnology
Laboratory, Inc.

December 16, 2009

PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670

Attn: Ms. Rachel Spitz

RE: LABORATORY TEST RESULTS/REPORT
Project Name: PO No. 09-423
Project No.: 385135.F1.01
EGL Job No.: 09-064-005

Dear Ms. Spitz:

We have completed the testing program conducted on samples from the above project. The tests were performed in accordance with testing procedures as follows:

TEST	METHOD
Direct Shear	ASTM D3080
Modified Proctor (4-inch mold)	ASTM D1557-A

Enclosed is Summary of Laboratory Test Results.

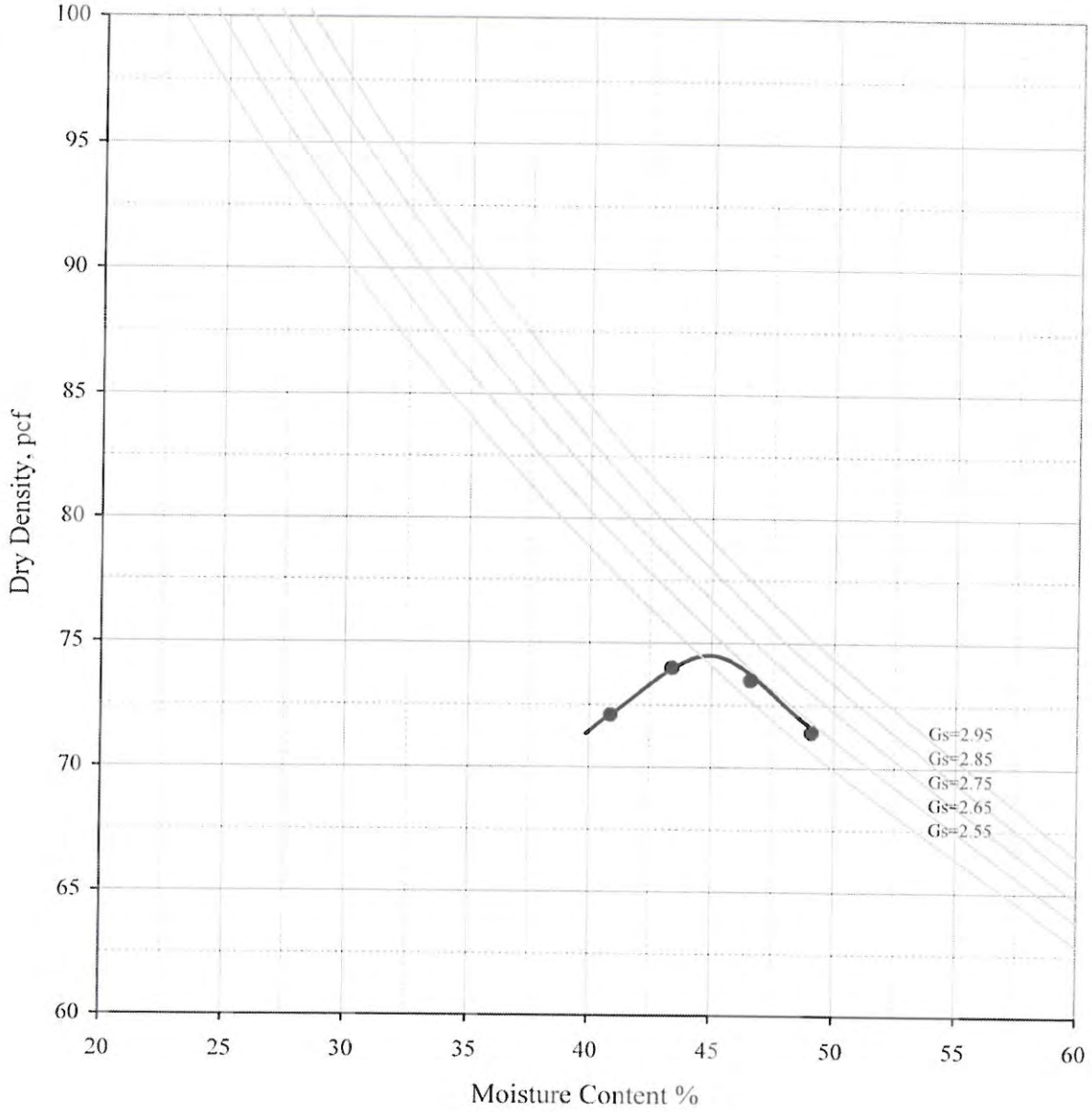
We appreciate the opportunity to provide testing services to PTS Laboratories, Inc. Should you have any questions, please call the undersigned.

Sincerely yours,
Environmental Geotechnology Laboratory, Inc.

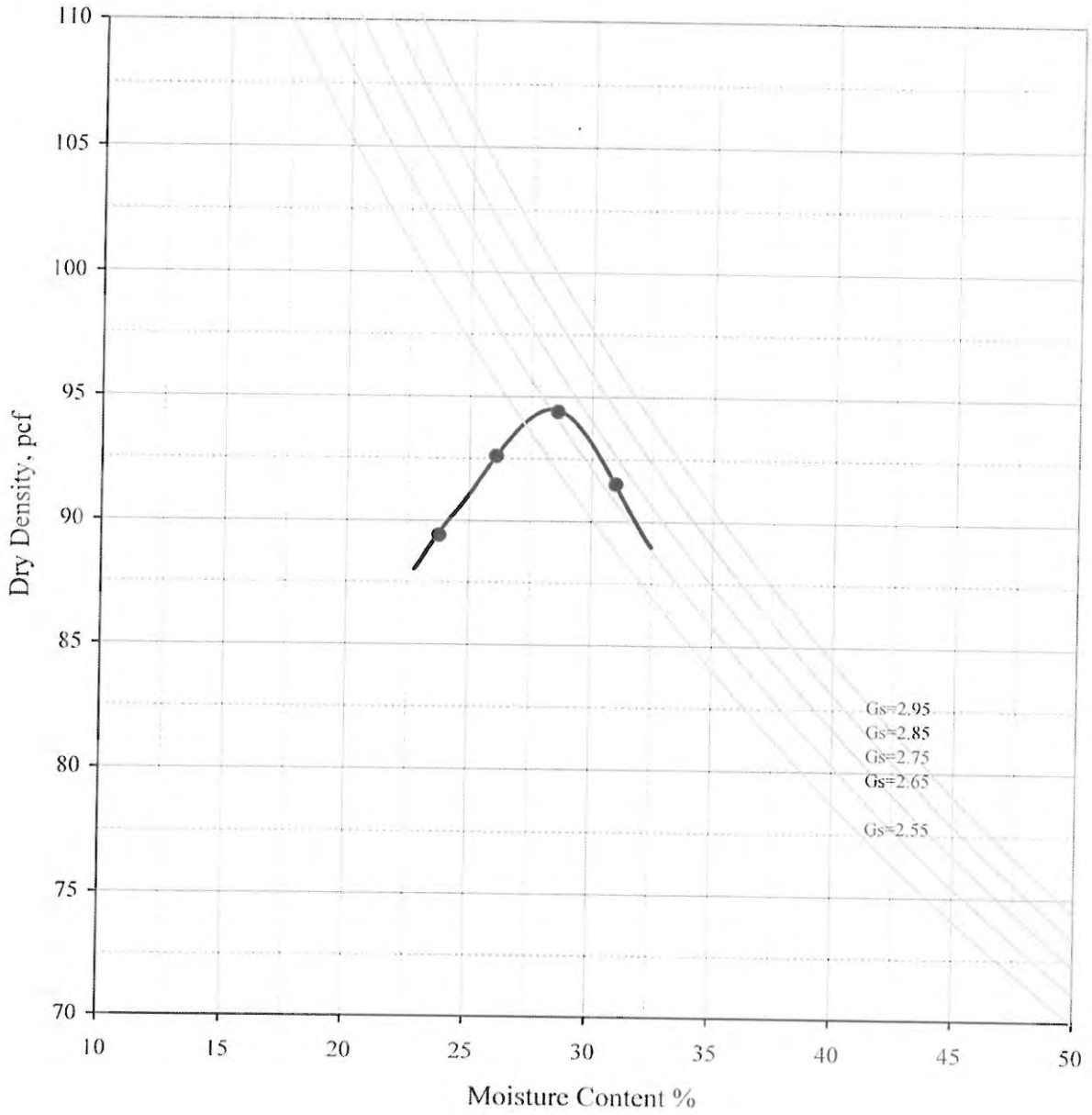
Hank Jong, PE, GE
President

Enclosure

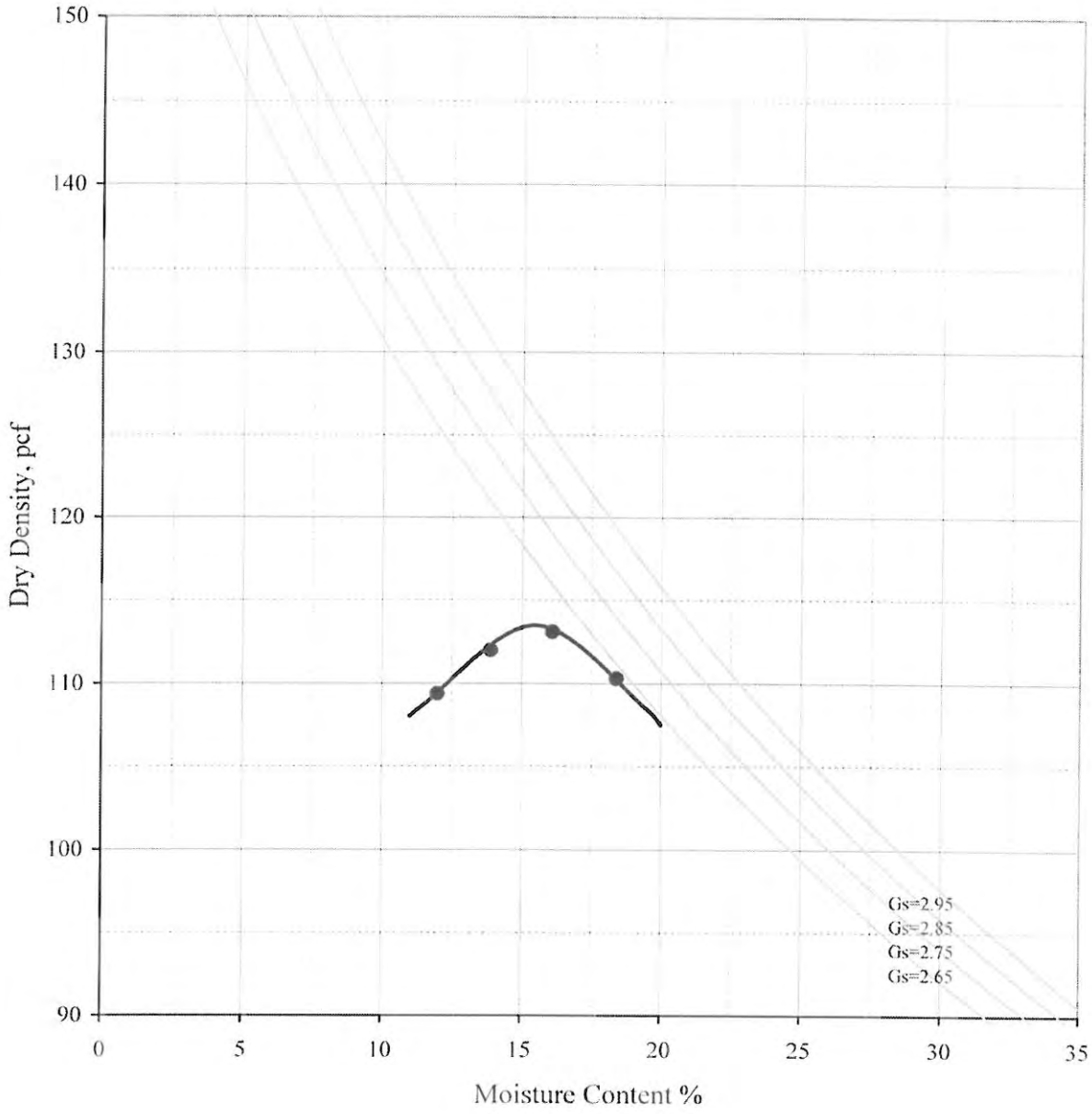
11819 Goldring Road, Suite A, Arcadia, CA 91006 • Tel.: (626) 263-3588, Fax: (626) 263-3599
E-MAIL: MAIL@EGLAB.COM



Maximum Dry Density = 74.5 pcf	Boring : N/A
	Sample: SM-WGT-001-B
	Depth : 20 feet
Optimum Moisture Content = 45 %	Description : Dark Gray Silty Clay (CL)
Environmental Geotechnology Laboratory	Project Name: N/A
	Client Name: PTS Laboratories, Inc.
Modified Proctor	Job No: 09-423
	EGL Project No.: 09-064-005
(ASTM D1557)	Date : Dec-09 Figure

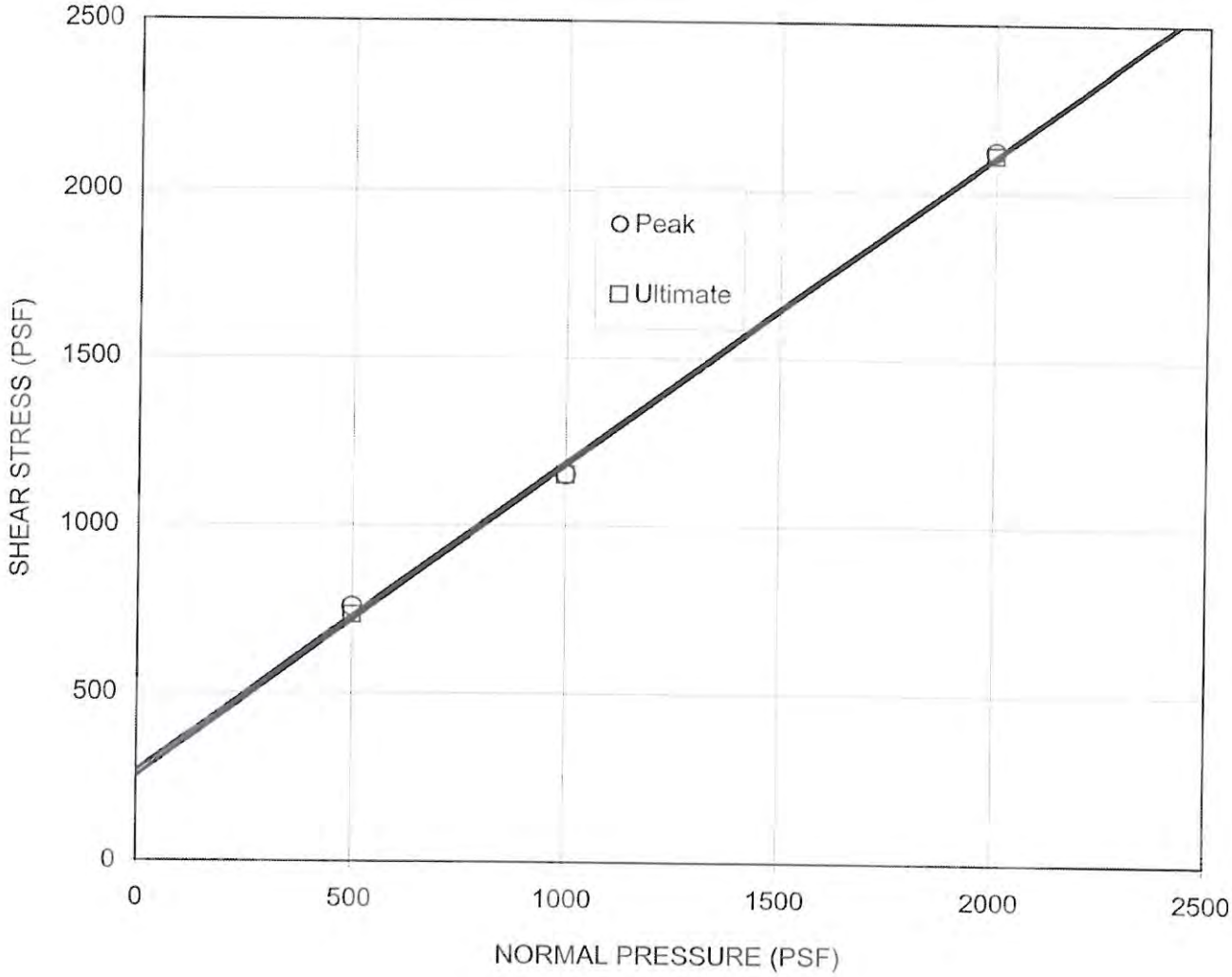


Maximum Dry Density = 94.5 pcf	Boring : N/A
	Sample: SM-WGT-002-B
	Depth : 20 feet
Optimum Moisture Content = 28.5 %	Description : Dark Gray Clayey Sand (SC)
Environmental Geotechnology Laboratory	Project Name: N/A
	Client Name: PTS Laboratories, Inc.
Modified Proctor	Job No: 09-423
	EGL Project No.: 09-064-005
(ASTM D1557)	Date : Dec-09 Figure



Maximum Dry Density = 113.5 pcf	Boring No: N/A
	Sample: SM-SGT-002-B
	Depth : 20 feet
Optimum Moisture Content = 15.5 %	Description : Black Silty Sand (SM)

Environmental Geotechnology Laboratory	Project Name:	N/A
	Client Name:	PTS Laboratories, Inc.
Modified Proctor	Job No:	09-423
	EGL Project No.:	09-064-005
(ASTM D1557)	Date : Dec-09	Figure



Boring No.:	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
N/A	SM-SGT002A	10	Tube	SM	○	270	43
					□	252	43

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)
500	21.7	57.2
1000	21.7	55.5
2000	21.7	52.4

ENVIRONMENTAL GEOTECHNOLOGY LABORATORY

Project Address: N/A

Client: PTS Laboratories, Inc

Project No: 09-423

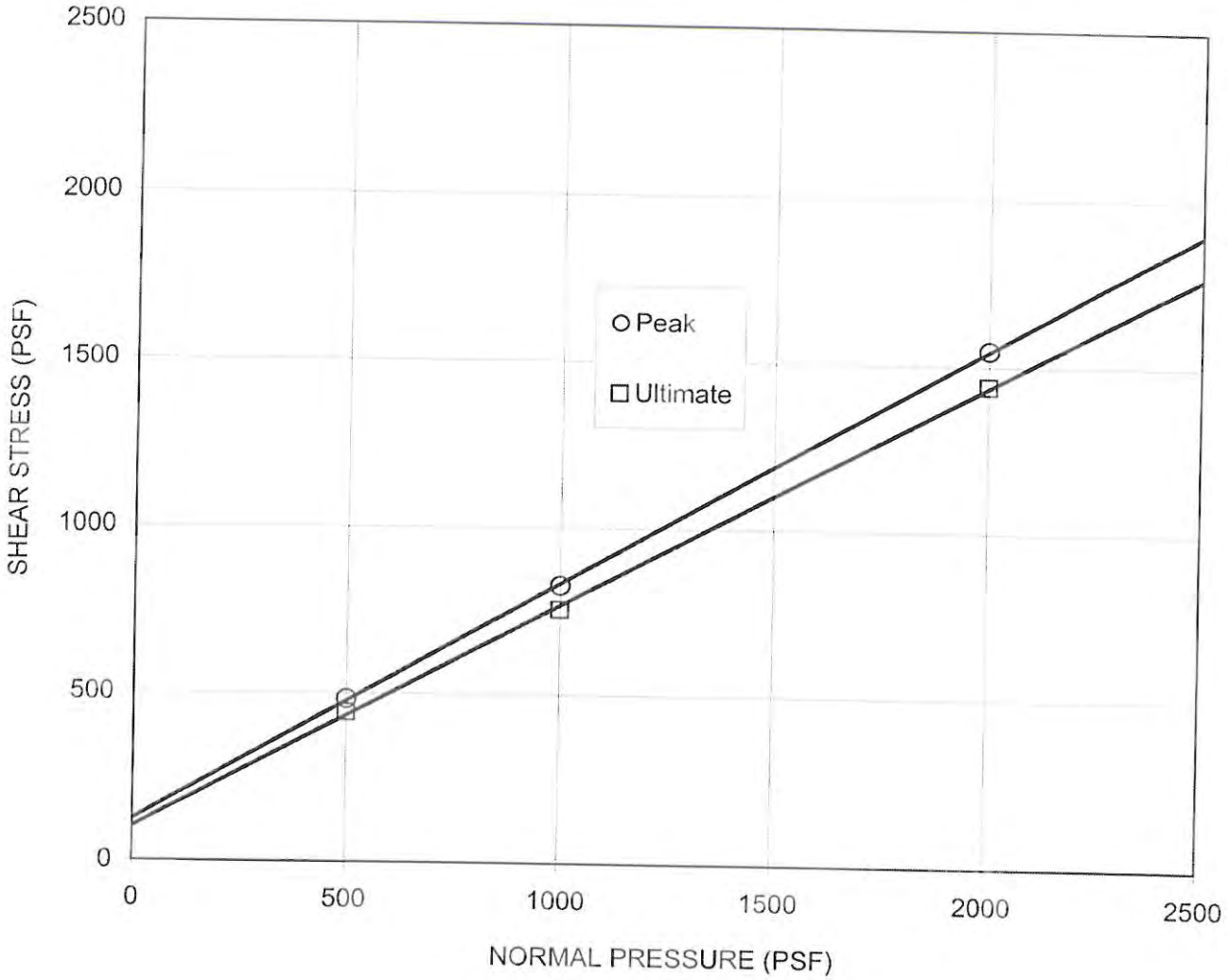
EGL Project No: 09-064-005

DIRECT SHEAR

(ASTM D3080)

12/09

Figure



Boring No.:	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
N/A	SM-WGT001A	10	Tube	CL	○	124	35
					□	102	34

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)
500	39.1	51.2
1000	39.1	49.0
2000	39.1	46.6

ENVIRONMENTAL GEOTECHNOLOGY LABORATORY

Project Address: N/A

Client: PTS Laboratories, Inc

Project No: 09-423

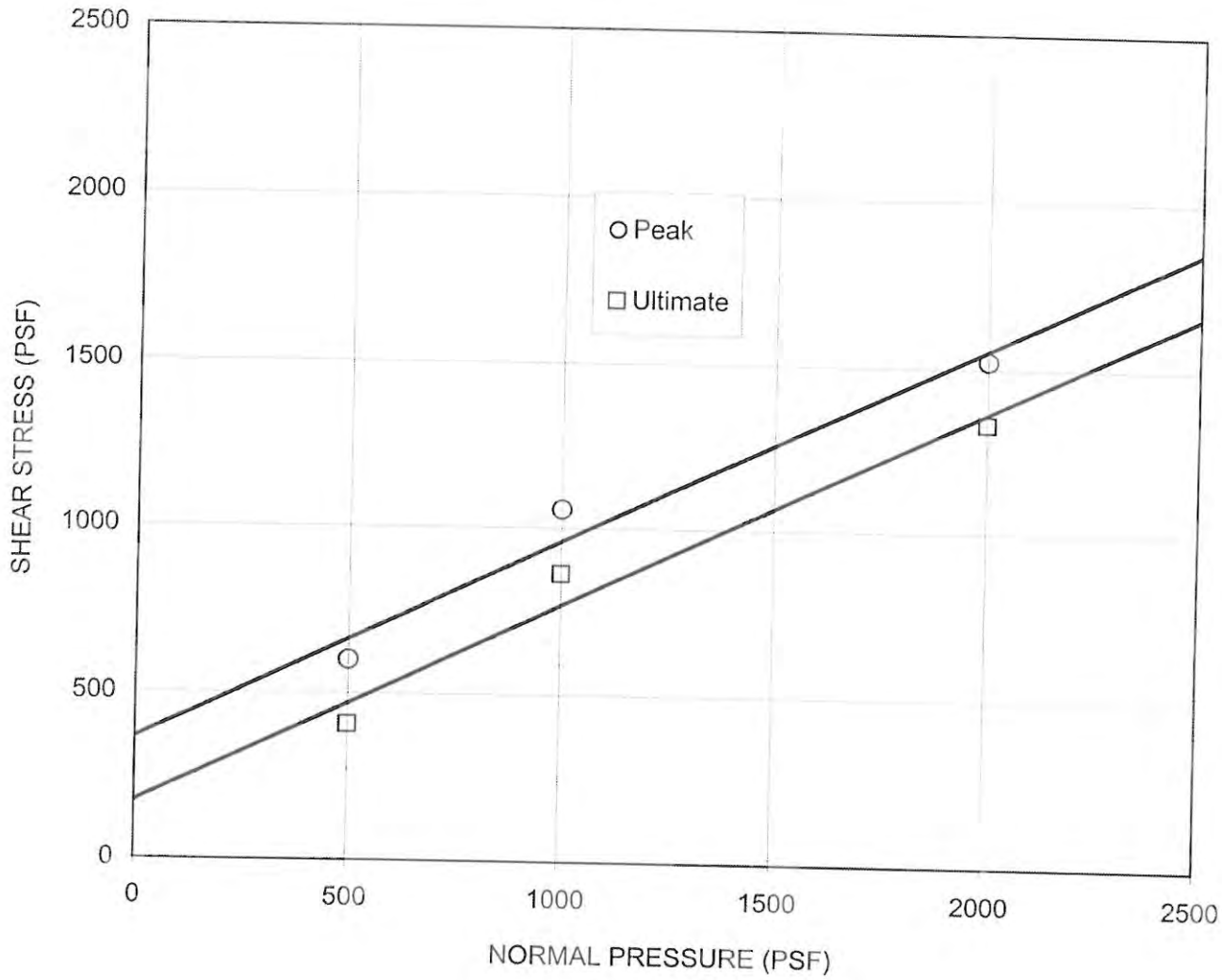
EGL Project No: 09-064-005

DIRECT SHEAR

(ASTM D3080)

12/09

Figure



Boring No.:	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
N/A	SM-WGT002A	10	Tube	CL	○	366	31
					□	174	31

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)
500	41.9	55.1
1000	41.9	53.3
2000	41.9	51.5

ENVIRONMENTAL GEOTECHNOLOGY LABORATORY

Project Address: N/A

Client: PTS Laboratories, Inc

Project No: 09-423

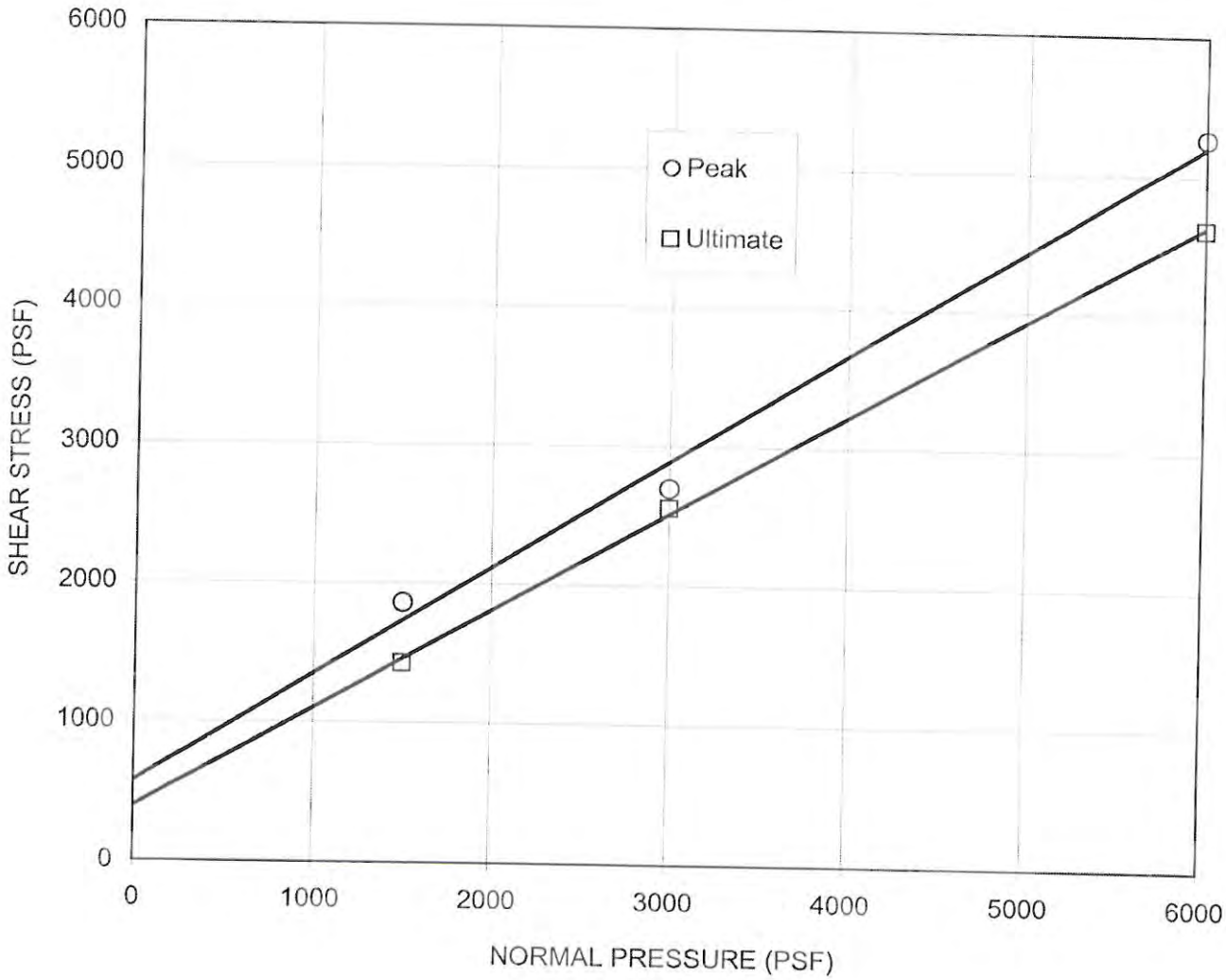
EGL Project No: 09-064-005

DIRECT SHEAR

(ASTM D3080)

12/09

Figure



Boring No.:	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
N/A	SM-WGT001C	30	Tube	CL	○	575	38
					□	395	35

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)
1500	79.0	93.3
3000	79.0	90.8
6000	79.0	87.9

ENVIRONMENTAL GEOTECHNOLOGY LABORATORY

Project Address: N/A

Client: PTS Laboratories, Inc

Project No: 09-423

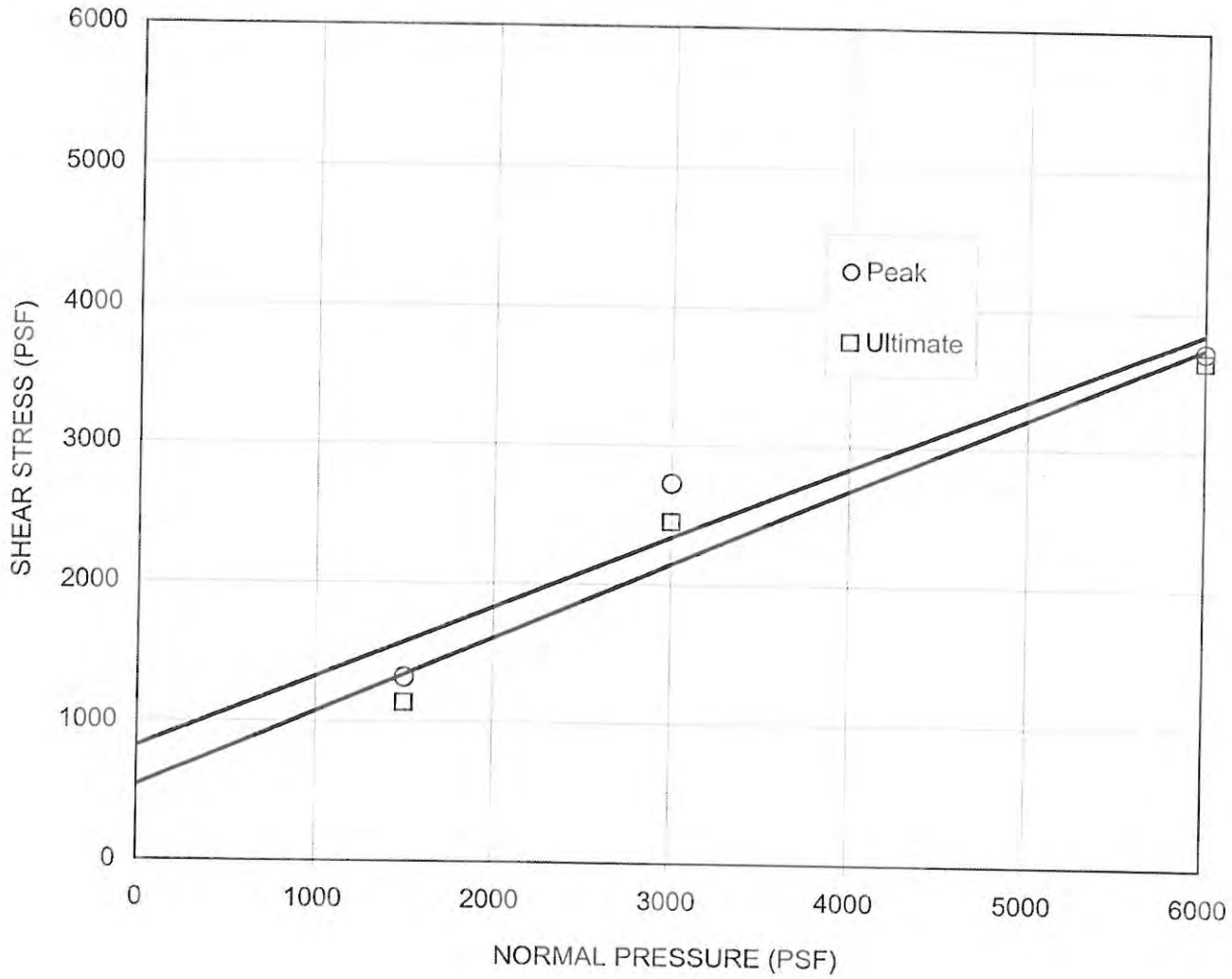
EGL Project No: 09-064-005

DIRECT SHEAR

(ASTM D3080)

12/09

Figure



Boring No.:	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
N/A	SM-WGT002C	30	Tube	CL	○	822	27
					□	540	28

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)
1500	102.3	124.5
3000	102.3	122.1
6000	102.3	118.2

ENVIRONMENTAL GEOTECHNOLOGY LABORATORY

Project Address: N/A

Client: PTS Laboratories, Inc

Project No: 09-423

EGL Project No: 09-064-005

DIRECT SHEAR

(ASTM D3080)

12/09

Figure

HALACO SITE
CH2M HILL

USEPA Contract Laboratory Program
Generic Chain of Custody

Reference Case
Client No: 385135.F1.01
SDG No:

L

Date Shipped: 11/11/2009	**Chain of Custody Record**		Sampler Signature:		**For Lab Use Only**
Carrier Name: Courier	Relinquished By	(Date / Time)	Received By	(Date / Time)	Lab Contract No:
Airbill:	1	11/10/09 1040		11/11/09 1158	Unit Price:
Shipped to: PTS Laboratories, Inc. 8100 Secura Way Santa Fe Springs CA 90670 (562) 347-2500	2				Transfer To:
	3				Lab Contract No:
	4				Unit Price:

SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME	FOR LAB USE ONLY Sample Condition On Receipt
SM-SGT-002-A	Subsurface Soil (>12")/ JOSH BALE	/G	GS/ATTER (21), MOIST/DEN (21), SHEAR (21)	(1)	SM-SGT-002-A	S: 11/10/2009 14:50	
SM-SGT-002-B	Subsurface Soil (>12")/ JOSH BALE	/G	GS/ATTER (21), MOIST/DEN (21), PROCT (21), ~~SHEAR (21)~~	(1)	SM-SGT-002-B	S: 11/10/2009 14:55	
SM-SGT-002-C	Subsurface Soil (>12")/ JOSH BALE	/G	GS/ATTER (21), MOIST/DEN (21), ~~SHEAR (21)~~	(1)	SM-SGT-002-C	S: 11/10/2009 15:00	
SM-WGT-001-A	Subsurface Soil (>12")/ JOSH BALE	/G	GS/ATTER (21), MOIST/DEN (21), SHEAR (21)	(1)	SM-WGT-001-A	S: 11/10/2009 11:55	
SM-WGT-001-B	Subsurface Soil (>12")/ JOSH BALE	/G	GS/ATTER (21), MOIST/DEN (21), PROCT (21), ~~SHEAR (21)~~	(1)	SM-WGT-001-B	S: 11/10/2009 12:10	
SM-WGT-001-C	Subsurface Soil (>12")/ JOSH BALE	/G	GS/ATTER (21), MOIST/DEN (21), SHEAR (21)	(1)	SM-WGT-001-C	S: 11/10/2009 12:30	
SM-WGT-002-A	Subsurface Soil (>12")/ JOSH BALE	/G	GS/ATTER (21), MOIST/DEN (21), SHEAR (21)	(1)	SM-WGT-002-A	S: 11/10/2009 10:00	
SM-WGT-002-B	Subsurface Soil (>12")/ JOSH BALE	/G	GS/ATTER (21), MOIST/DEN (21), PROCT (21), ~~SHEAR (21)~~	(1)	SM-WGT-002-B	S: 11/10/2009 10:20	
SM-WGT-002-C	Subsurface Soil (>12")/ JOSH BALE	/G	GS/ATTER (21), MOIST/DEN (21), SHEAR (21)	(1)	SM-WGT-002-C	S: 11/10/2009 10:35	

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Cooler Temperature Upon Receipt: N/A	Chain of Custody Seal Number: N/A
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Custody Seal Intact? ___	Shipment Iced? ___

GS/ATTER = Grain Size, Atterburg, MOIST/DEN = Moisture,Density, PROCT = Mod. Proctor, SHEAR = Direct Shear

TR Number: 9-173516087-111009-0001

LABORATORY COPY

PR provides preliminary results. Requests for preliminary results will increase analytical costs.
Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 703/818-4602