Draft Report

Human Health Risk Assessment

AMCO Chemical Superfund Site

Prepared for

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Executive Summary

This report presents the methodology, findings, and conclusions of a human health risk assessment (HHRA) prepared as part of the Remedial Investigation (RI) for the AMCO Chemical Superfund Site (the Site). This HHRA includes a quantitative evaluation of the potential adverse health effects to people resulting from exposure to hazardous chemicals in soil at the former AMCO facility and adjacent parcels (on- and off-facility locations) and in groundwater at the Site. In addition, a screening level evaluation of potential exposure to contaminated soil gas and air (ambient and crawlspace), was performed for on- and off-facility locations as well as residential parcels adjacent to the former AMCO facility and South Prescott Park. Screening level evaluations were also performed to assess potential exposure to residential contaminated soil, and homegrown produce. Results from this HHRA will be one of the factors that the EPA uses to determine if cleanup actions are warranted at the Site.

An ecological risk assessment (ERA) was not performed for the Site. Due to the residential and industrial land use in the vicinity of the former AMCO facility, there are no significant populations of ecological receptors or individuals of special status species on the Site. In addition, there are no reasonable and unambiguous pathways for contaminant transport from the Site to any wildlife or sensitive habitats, including Oakland harbor (EPA 2004d). Under current conditions, birds and small mammals may be exposed to site-related chemicals that have been taken up by homegrown produce. This pathway, while potentially complete, was not quantitatively evaluated in this HHRA and is considered to be insignificant compared to exposure by other receptors (humans) and pathways.

ES.1 Study Area

Four separate industrial/commercial exposure areas within the AMCO study area are evaluated as part of this HHRA. These areas are referred to as follows: former AMCO facility, parking lot, small vacant lot, and large vacant lot. Each of these areas is currently paved. The concrete was encountered in solid thicknesses ranging from 0.5 foot to more than 3.7 feet. However, for this assessment it was assumed that no pavement would be present to preclude direct contact with soil.

The groundwater underneath the Site is not being used for drinking or other potable uses. It is extremely unlikely that residents would drink groundwater underneath the Site in the future; however, in accordance with input from the community and regulatory agencies, the potential risk of using groundwater underneath the Site as drinking water is evaluated.

Additionally, ambient air, soil gas, and crawlspace air samples were collected from eight separate nearby residential locations. Ambient air samples were collected to evaluate the vapor intrusion pathway. Soil gas and crawlspace air samples were collected to determine preferential migration pathways and the potential for vapor intrusion. Soil was sampled at six residential parcels in the immediate vicinity of the facility.

Produce samples were collected from four residences that have gardens and fruit trees to evaluate the potential for chemical exposure through ingestion of this produce.

ES.2 Risk Assessment Methodology

This HHRA was prepared in a manner consistent with EPA's *Risk Assessment Guidance for Superfund, Part A* (EPA 1989), *Part B* (EPA 1991b) and *Part E* (EPA 2004b) and supporting documents and guidelines published by the California Environmental Protection Agency (CalEPA). The assumptions provided for the general public by EPA and incorporated into this HHRA are conservative (i.e., representative highest exposure that is reasonably expected to occur at a site) and thus, health-protective.

This HHRA including both the quantitative and screening level assessments is a baseline evaluation which assumes exposure to contaminated media under current conditions without consideration of future remediation or natural attenuation of chemicals.

Data Collection and Data Evaluation

Data were evaluated separately for each of the different industrial and residential site locations. In addition to new data, data from previous investigations were reviewed to gain a better understanding of the site characteristics.

For the industrial areas, soil data collected from depths of 0 to 7 feet below the bottom of the concrete was evaluated. The groundwater evaluation was based on six quarters of groundwater monitoring data. Exposure point concentrations (EPCs) were calculated for soil and groundwater data. For soil and groundwater the EPC was either the 95 percent upper confidence limit on the mean (95 UCL) or the maximum detected concentration for chemicals with the 95 UCL exceeding the maximum concentration. For soil gas, ambient air, crawlspace air and produce data, the detected concentrations from each sample/media were compared to their appropriate screening levels.

All chemicals reported in at least one sample at concentrations greater than the sample detection limit were included as constituents of potential concern (COPCs). Chemicals were not excluded based on comparison to background concentrations. The approach used to evaluate COPCs is appropriate for a conservative baseline HHRA.

Exposure Assessment

The objective of the exposure assessment is to estimate the type and magnitude of exposures to COPCs that are present at or migrating from a site. An exposure-based conceptual site model (CSM) was prepared to identify potential exposure media, exposed populations, and exposure pathways (Figure 1). The exposed populations included on-facility and off-facility adult and child residents, outdoor commercial/industrial workers, construction workers, and excavation/trench workers.

The exposure pathways evaluated included direct contact (incidental ingestion, dermal contact) with soil and groundwater, as well as inhalation of dusts and vapors in ambient air from soil and groundwater. In addition, direct contact with groundwater and outdoor inhalation of vapors from groundwater was evaluated for excavation/trench workers. For residents, ingestion of chemicals in homegrown produce was evaluated by comparing the concentrations detected in the produce collected from backyards occupying the same city

block as the former facility to background levels and soil screening levels. Residential soil gas, ambient air, and crawlspace air data were compared to risk-based screening levels as well as background concentrations.

Toxicity Assessment

The objective of the toxicity assessment is to evaluate evidence regarding the potential for COPCs to cause adverse effects in exposed individuals. Toxicity values published in EPA's Integrated Risk Information System (IRIS) were used for the toxicity assessment. Other sources, including those provided in the EPA Region 9 Preliminary Remediation Goals (PRG) table were used for chemicals not found in IRIS.

Exposure to lead in soil for residents was evaluated using a site-specific screening level calculated using the California Department of Toxic Substances Control's (DTSC) Lead Risk Assessment Spreadsheet Version 7, LeadSpread 7 (CalEPA 1999). This model calculates a screening level that represents a concentration of lead in soil for children that is protective for a combined exposure to lead in air, drinking water, food, and soil. The most conservative (health-protective) screening level available from this model was selected (99th percentile) based on protection of children's health. Exposure to lead in soil for industrial workers was evaluated using the Region 9 PRG of 800 mg/kg for a commercial/industrial scenario.

EPA uses the Adult Lead Model to estimate PRGs for an industrial setting. This PRG is intended to protect a fetus that may be carried by a pregnant female worker. It is assumed that a cleanup goal that is protective of a fetus will also afford protection for male or female adult workers. The model equations were developed to calculate cleanup goals such that there would be no more than a 5 percent probability that fetuses exposed to lead would exceed a blood lead (PbB) of 10 µg/deciliter. The updated screening level for soil lead at commercial/industrial (i.e. nonresidential) sites of 800 mg/kg is based on an analysis of the combined phases of the third National Health and Nutrition Examination Survey (NHANES III) that chooses a cleanup goal protective of all subpopulations. NHANES III is one program within the National Center for Health Statistics (NCHS) which is part of the Center for Disease Control and Prevention (CDC). The survey was designed to obtain nationally representative information on the health and nutritional status of the population of the United States through interviews and direct physical examinations.

Risk Characterization

Excess lifetime cancer risk (ELCR) and non-cancer hazard index (HI) were calculated for both residents and industrial/commercial workers for each exposure area in soil and site wide for groundwater. Human health risks are compared against EPA's target risk range of 10^{-6} to 10^{-4} for cancer risks and the HI benchmark of 1 for non-cancer hazards (EPA 1991b). Exposure areas with ELCRs less than 10^{-6} or HI less than 1 are characterized as not posing a threat to human health for the evaluated exposed populations and pathways.

For the ambient air, soil gas, and crawlspace air samples, results are compared against screening levels. Screening levels used for comparison to the ambient air and crawlspace air sample results are the EPA Region 9 ambient air PRGs. Screening levels for soil gas sample results were developed based on an attenuation factor of ten which is the recommended attenuation factor for shallow soil gas in OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion

Guidance) (EPA 2002). The attenuation factor represents the ratio between indoor air concentration and soil gas concentration, as follows:

$$\alpha = \frac{C_{indoor}}{C_{soil\ gas}}$$

Where:
C_{indoor} = Indoor air concentration (ug/m^3)
$C_{soil\ gas}$ = Soil gas concentration (ug/m^3)

In addition, ambient air and crawlspace air sample results were compared to acute reference exposure levels (RELs) developed by California EPA's Office of Environmental Health Hazard Assessment (OEHHA) and the Agency for Toxic Substances and Disease Registry's (ATSDR) acute minimal risk level (MRLs) for hazardous substances.

Data from residential soil were compared against background levels and Region 9 residential PRGs for soil. Results from the homegrown produce samples were compared against background levels based on an evaluation of relevant scientific literature.

ES.3 Results of Quantitative Risk Evaluation

Soil

The ELCRs and HIs for on- and off-facility soil exposure areas are calculated based on all detected compounds except lead. The risks from lead are evaluated by calculating a lead EPC and comparing it to the industrial PRG (industrial and commercial workers) or a site-specific screening level (residents). As a result, in the following sections, the risks associated with lead are discussed separately from the cancer risks and non-cancer hazards for all other contaminants.

Former AMCO Facility

The chemicals that contribute the most to the cancer risk and non-cancer hazards in this area are arsenic, vinyl chloride, TCE, cis-1,2-dichloroethene, naphthalene, aldrin and dieldrin.

For the industrial worker RME scenario, the ELCR is $1x10^{-4}$ for exposure to shallow soil and $2x10^{-4}$ for exposure to deep soil. HIs for exposure to both the shallow soil and deep soil are 2.

For the construction worker RME scenario, the ELCR is $1x10^{-5}$ for exposure to shallow soil and $2x10^{-5}$ for exposure to deep soil. The HI for exposure to shallow soil is 4 and the HI for exposure to deep soil is 5.

For the future on-site residential RME scenario, for both shallow and deep soil the ELCR is $4x10^{-4}$. The HI for the child is 14 for exposure to shallow soil and 15 for exposure to deep soil. For the adult, the HIs for exposure to both the shallow and deep soil are 3.

The lead EPC for shallow soil is 640 mg/kg and for deep soil 605 mg/kg; both of these concentrations exceed the AMCO site-specific residential lead screening levels of 194 mg/kg including ingestion of homegrown produce and 340 mg/kg excluding ingestion of homegrown produce. However, these lead concentrations are below the PRG for an industrial scenario (800 mg/kg).

Parking Lot

The chemicals that contribute the most to the risk in the parking lot are lead, arsenic, benzo(a)pyrene and antimony.

For the industrial worker RME scenario, the ELCR is $1x10^{-4}$ for exposure to shallow soil and $2x10^{-4}$ for exposure to deep soil. The HIs are 1 for exposure to both shallow and deep soil.

For the construction worker RME scenario, the ELCR is $2x10^{-5}$ for exposure to shallow soil and $3x10^{-5}$ for exposure to deep soil. HIs for exposure to both the shallow and deep soil HIs are 2.

For the future on-site residential RME scenario, the ELCR is $4x10^{-4}$ for exposure to shallow soil and $5x10^{-4}$ for exposure to deep soil. The HI for the child is 28 for exposure to shallow soil and 27 for exposure to deep soil. For the adult, HIs for exposure to both the shallow and deep soil are 4.

The lead EPC for shallow soil is 2,170 mg/kg and for deep soil 1,450 mg/kg; both of these concentrations exceed the AMCO site-specific screening levels for residential scenarios and the PRG for an industrial scenario.

Large Vacant Lot

The chemicals that contribute the most to the risks and hazards at the large vacant lot are lead, arsenic, DDT and benzo(a)pyrene.

For the industrial worker RME scenario, the ELCR is $2x10^{-4}$ for exposure to shallow soil and $1x10^{-4}$ for exposure to deep soil. HIs for exposure to both the shallow and deep soil HIs are less than 1.

For the construction worker RME scenario, the ELCR is $2x10^{-5}$ for exposure to shallow soil and $2x10^{-5}$ for exposure to deep soil. The HI for exposure to shallow soil is 3, and the HI for exposure to deep soil HI is 2.

For the future on-site residential RME scenario, the ELCR is $6x10^{-4}$ for exposure to shallow soil and $4x10^{-4}$ for exposure to deep soil . The HI for the child is 11 for exposure to shallow soil and 8 for exposure to deep soil. For the adult, the HIs for exposure to both the shallow and deep soil are less than 1.

The lead EPC for shallow soil is 4,360 mg/kg and for deep soil 2,750 mg/kg; both of these concentrations exceed the AMCO site-specific screening levels for lead for residential scenarios and the PRG for an industrial scenario.

Small Vacant Lot

Due to the shallow water table at this exposure area, only shallow soil samples were collected. The chemicals that contribute the most to the risks and hazards at the small vacant lot are arsenic, dieldrin, and DDT.

For the industrial worker RME scenario, the ELCR is $1x10^{-4}$ for exposure to shallow soil. The HI is less than 1.

For the construction worker RME scenario, the ELCR for exposure to shallow soil is $1x10^{-5}$. The HI for exposure to shallow soil is 1.

For the potential on-site residential RME scenario, the ELCR for exposure to shallow soil is $3x10^{-4}$. The HI for exposure to shallow soil for the child is 12. For the adult the HI is less than 1.

The lead EPC for shallow soil is 386 mg/kg, which exceeds the AMCO site-specific screening level of 194 mg/kg including ingestion of homegrown produce and slightly exceeds 340 mg/kg excluding ingestion of homegrown produce but is well below the PRG of 800 mg/kg for an industrial worker.

Groundwater

The chemicals that contribute the most to the risk through exposure to groundwater are vinyl chloride, arsenic, cis-1, 2-dichloroethene, benzo(a)pyrene, and aroclor-1260.

For the potential residential RME scenario, the ELCR is $1x10^{-1}$ for exposure to groundwater. The HI for the child is 1153; and the HI for the adult is 484.

In addition, at the request of the community's technical advisor, a trench worker's risk from dermal contact with groundwater underneath the Site was evaluated. For the trench worker RME scenario, the ELCR is $1x10^{-4}$ for exposure to groundwater. The HI for the trench worker is 34.

ES.4 Results for Screening Level Risk Evaluation

Residential Soil Gas, Ambient Air, and Crawlspace Air

Several volatile organic compounds (VOCs) were detected above screening levels in the soil gas, ambient air, and crawlspace samples. Of the VOCs detected above screening levels, many are also detected at background locations, indicating that not all resident VOC exposure may be coming from the Site. None of the VOCs detected had concentrations above the OEHHA acute RELs and ATSDR acute MRLs indicating no immediate health threat to residents.

Residential Soil

All residential soil borings were completed in areas where there was no concrete or asphalt surface cover. Shallow samples were collected from 0.5 to 1 foot bgs; deeper samples were generally collected from between 2.5 and 3 feet bgs, although one sample was collected from between 2 and 2.5 feet bgs due to obstructions. Subsequent to the collection of the residential soil samples, a soil removal action to address high concentrations of lead was performed at residential properties adjacent to and near the former AMCO facility. These properties include 1428, 1432, and 1436 3rd Street, and 320, 326, 356, 360, and 366/368 Center Street. The soil was excavated until the confirmation sampling indicated that the remaining soil was below the site-specific action level of 390 mg/kg, or to a 3-foot maximum depth. The excavation depth was generally between one and three feet. Small areas were excavated to a depth of less than 1 foot in locations where valuable trees or plants might have been damaged by deeper excavation. As a result, the samples collected during the RI are no longer representative of the soil conditions at these properties. The following discussion explains samples results **before** the removal action.

Before the removal action, several chemicals exceeded screening levels in residential soil samples. Lead exceeded the site-specific screening level for soil at each of the residential properties. Polynuclear aromatic hydrocarbons (PAHs), pesticides (DDT, DDE, dieldrin, and heptachlor epoxide), antimony, and iron also exceed soil screening levels in at least one property.

Homegrown Produce

To evaluate the ingestion of homegrown produce pathway, 15 fruits and vegetables from four gardens were collected and analyzed for selected metals (arsenic, chromium, and lead) and VOCs. Analytical results may reflect soil and dust deposited on the plant surface and possible uptake from soil into the edible portions of the plants.

Of the 47 VOCs analyzed, only methyl acetate and styrene were detected. Methyl acetate was detected in figs, mint, and red chiles. Styrene was detected only in cactus. Both methyl acetate and styrene have been detected in ripening produce in concentrations ranging from 0.04 to 0.24 mg/kg (Heikes et al. 1995). Volatile organic compounds like methyl acetate are naturally produced by ripening fruits at less than 1 mg/kg (Fountain et al. 1984).

Produce was also analyzed for selected inorganic compounds of concern: arsenic, chromium, and lead. Concentrations of lead in produce range from 0.16 to 8.47 mg/kg. Lead naturally occurs in all plants at concentrations ranging from 0.1 to 10 mg/kg (Kabata-Pendias and Pendias 2001). The maximum arsenic concentration was detected in the pomegranate sample at 0.08 mg/kg and chromium concentrations in produce range from 0.39 to 1.07 mg/kg. Both arsenic and chromium are found in plants at concentrations ranging from 0.009 to 1.5 mg/kg and 0.02 to 1.5 mg/kg respectively (Kabata-Pendias and Pendias 2001).

ES.8 Uncertainty Evaluation

Uncertainties, which arise at every step in the risk assessment process, are evaluated to provide an indication of the relative degree of conservatism associated with a risk estimate. The uncertainties in this risk assessment can be grouped into three main categories as listed below.

Environmental Sampling and Analysis

Errors in sampling results can arise from the field sampling, laboratory analyses, and data analyses. Errors in laboratory analysis procedures are possible, although the impacts of these sorts of errors on the risk estimates are likely to be low. The environmental sampling at a site is one source of uncertainty in the evaluation. The number and location of samples at each exposure area are considered adequate for the calculation of EPCs at most of the industrial areas and for groundwater. However, the number of samples collected from shallow soil at the small vacant lot and the parking lot are less than what is generally needed to calculate a 95 UCL; therefore, the maximum concentration was used to represent the EPC in these areas. A larger sample size would allow for the calculation of a more representative EPC, and thus decrease uncertainty regarding chemical concentrations used for risk assessment at these locations.

Because of the long history of industrial use at the Site and the associated history of construction and filling, all primary sources may not have been identified. Hot spots and localized areas of contamination in soil or soil vapor that were not sampled may remain unknown in on-facility and off-facility areas. The existence of unknown contamination could lead to an increase in the health risks beyond what has been reported in this document. Data collected from known hot spots have been included in the risk assessment.

Exposure Pathways and Assumptions

Uncertainties can arise from the types of exposures examined, the points of potential human exposure, the concentrations of COPCs at the points of human exposure, and the intake assumptions. For instance, exposure parameters (e.g., exposure frequency, exposure duration, soil ingestion rates, and skin surface areas) are selected as reasonable maximum exposure (RME) assumptions, resulting in the likely overestimation of risk for most potential exposed populations.

The exposure pathways selected are another source of uncertainty. Exposure routes which were not considered in this evaluation could exist for a particular activity. Such exposures, however, are expected to be lower than the risks associated with the pathways considered. Dermal exposure has greater uncertainty resulting from uncertainty in several of the inputs including the amount of skin surface area available for exposure and the degree to which soil adheres to skin. Uncertainty in the inhalation route results from the method used for estimating resuspended dust from soil concentrations.

The vapor intrusion pathway is complex and data are variable (i.e., volatile chemicals are detected in one crawlspace sampling event but not in others) causing uncertainty in the evaluation of this pathway.

Characteristics of the COPCs can also present a source of uncertainty. For instance, the amount that each of the COPCs might be absorbed into the body may be quite different from the amount of chemical that is actually contacted (i.e., bioavailability).

Toxicity Criteria and Factors

The availability and quality of toxicological data is another source of uncertainty in the risk assessment. Uncertainties associated with animal and human studies could influence the toxicity criteria. Carcinogenic criteria are classified according to the amount of evidence available that suggests human carcinogenicity. In the establishment of the non-carcinogenic criteria, conservative multipliers, known as uncertainty and modifying factors, are used.

For a number of chemicals detected in the Site media, toxicity values have not been established by EPA or California EPA. Toxicity values based on surrogate chemicals with similar structural and behavioral properties were used where appropriate. If a surrogate chemical was not available, these chemicals were not evaluated quantitatively.

ES.9 Summary and Conclusions

This HHRA evaluates potential health risks to workers, as well as future adult and child residents, from exposure to COPCs in soil and groundwater at the former AMCO facility. Because this is a baseline evaluation which assumes exposure to contaminated media under current conditions without consideration of future remediation or natural attenuation of

chemicals, estimated risks and hazards to current and future workers is the same. A screening level risk evaluation was conducted on the soil, soil gas, air, and homegrown produce in the surrounding residential neighborhood.

Consistent with the CSM, the predominant exposure pathways for workers at the Site are incidental ingestion of soil, inhalation of particulates and vapors, and dermal contact with soil. Current and future residents in the vicinity may be exposed to contaminants through the same pathways described for workers. Groundwater at the Site is not currently used as a potable water source, nor is it likely to be in the future. Oakland residents have their drinking water supplied by the East Bay Municipal Utility District. However, should groundwater be used as a potable water source, residents could be exposed to contaminants through ingestion of groundwater and dermal contact with groundwater while showering or bathing.

Quantitative Risk Estimates

Soil samples were divided into the following four exposure areas: former AMCO facility, parking lot, large vacant lot, and small vacant lot. Risk and hazard estimates for each receptor and exposure area are discussed below.

Industrial Worker: Estimated cancer risks are at the upper end of the risk range for exposure to either shallow or deep soil at each of the four exposure areas. HIs exceed the non-cancer threshold of 1 only at the former AMCO facility.

Construction Worker: Estimated cancer risks are within the risk range of 10^{-6} to 10^{-4} for exposure to shallow or deep soil at each of the four exposure areas. HIs exceeds the non-cancer threshold of 1 at the former AMCO facility, parking lot, and large vacant lot.

Future Residents: Estimated cancer risks are within the risk range for exposure to shallow or deep soil at all four of the exposure areas. HIs also exceed the non-cancer threshold of 1 at all four exposure areas.

Groundwater Risk Estimates

The cancer risks and non-cancer HIs exceed the risk range and noncancer threshold of 1 when residential use of groundwater is considered. However, it is unlikely that groundwater will be used as a source of drinking water in the future.

Screening Level Evaluation

The screening level risk evaluation was performed for the current or future off-facility resident or park user. Potential pathways include:

- Soil (incidental ingestion, direct contact, outdoor dust and vapor inhalation, indoor vapor inhalation)
- Homegrown Produce (ingestion of homegrown produce)
- Ambient Air (vapor inhalation)
- Crawlspace Air (vapor inhalation)
- Soil Gas (vapor inhalation).

Residential Soil Gas, Ambient Air and Crawlspace Air

Several VOCs, including PCE, TCE, vinyl chloride, carbon tetrachloride, chloroform, benzene, and naphthalene were detected above screening levels in the soil gas, ambient air, and crawlspace samples. Concentrations of these VOCs generally ranged from not detected to almost 10 times the screening level in ambient air and crawlspace air; however, the concentration of vinyl chloride in one crawlspace air sample collected in November 2006 was approximately 100 times the screening level. For both TCE and carbon tetrachloride, the concentrations detected in ambient and crawlspace air were within the range of concentrations detected in the background samples. None of the VOCs detected exceeds its acute reference concentration, indicating that there is no immediate health threat to residents. Of the VOCs detected above screening levels, many are also detected at background locations, indicating that not all resident VOC exposure may be coming from the Site.

Residential Soil

At each of the residential properties, lead exceeds the site-specific screening level for soil based on residential exposure. PAHs, pesticides (DDT, DDE, dieldrin, and heptachlor epoxide), antimony, and iron also exceed soil screening levels in at least one property.

All residential soil borings were completed in areas where there was no concrete or asphalt surface cover. Shallow samples were collected from 0.5 to 1 foot bgs; deeper samples were generally collected from between 2.5 and 3 feet bgs, although one sample was collected from between 2 and 2.5 feet bgs due to obstructions. Subsequent to the collection of the residential soil samples, a soil removal action to address high concentrations of lead was performed at residential properties adjacent to and near the former AMCO facility. These properties include 1428, 1432, and 1436 3rd Street, and 320, 326, 356, 360, and 366/368 Center Street. The soil was excavated until the confirmation sampling indicated that the remaining soil was below the site-specific action level of 390 mg/kg, or to a 3-foot maximum depth. The excavation depth was generally between one and three feet. Small areas were excavated to a depth of less than 1 foot in locations where valuable trees or plants might have been damaged by deeper excavation. As a result, the samples collected during the RI are no longer representative of the soil conditions at these properties.

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Produce was also analyzed for selected inorganic compounds of concern: arsenic, chromium, and lead. Concentrations of lead in produce range from 0.16 to 8.47 mg/kg. Lead naturally occurs in all plants at concentrations ranging from 0.1 to 10 mg/kg (Kabata-

Pendias and Pendias 2001). The maximum arsenic concentration was detected in the pomegranate sample at 0.08 mg/kg and chromium concentrations in produce range from 0.39 to 1.07 mg/kg. Both arsenic and chromium are found in plants at concentrations ranging from 0.009 to 1.5 mg/kg and 0.02 to 1.5 mg/kg respectively (Kabata-Pendias and Pendias 2001).

Because produce samples were analyzed for VOCs as well as metals, none of the produce samples were rinsed or washed before analysis. As a result, the metals concentrations could reflect dust or soil deposited on the plant surfaces in addition to metals that were taken up through the root system.

Contents

Tables

Figures

Attachments

Abbreviations and Acronyms

µg	Micrograms
ADD	average daily dose
ARAR	applicable or relevant and appropriate requirement
ATSDR	Agency for Toxic Substances and Disease Registry
BaP	Benzo(a)Pyrene
bgs	below ground surface
CalEPA	California Environmental Protection Agency
CDC	Centers for Disease Control and Prevention
CDHS	California Department of Health Services
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COPC	constituent of potential concern
CSBCA	Chester Street Block Club Association
CSF	cancer slope factor
CSM	conceptual site model
DHHS	U.S. Department of Health and Human Services
dL	deciliter
DTSC	California Department of Toxic Substances Control
ELCR	excess lifetime cancer risk
EPA	Environmental Protection Agency
EPC	exposure point concentration
ft	feet
HHRA	human health risk assessment
HI	hazard index
HQ	hazard quotient
hr	hour
IRIS	Integrated Risk Information System

kg	kilogram
L	liter
LADD	lifetime average daily dose
LMS	linearized multistage
LOAEL	Lowest Observed Adverse Effect Level
m	meter
m^3	cubic meter
mg	milligram
min	minute
MRL	Minimal Risk Level
NATA	National Air Toxics Assessment
NCEA	National Center for Environmental Assessment
NCHS	National Center for Health Statistics
NCP	National Contingency Plan
NEI	National Emissions Inventory
NHANES III	Third National Health and Nutrition Examination Survey
NOAEL	No Observed Adverse Effect Level
OEHHA	California EPA's Office of Environmental Health Hazard Assessment
PA/SI	Preliminary Assessment and Site Investigation
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PEA	Preliminary Endangerment Assessment
PEF	particulate-emission factor
PHA	public health assessment
PTTIL	Provisional Total Tolerable Intake Levels
ppm	parts per million
PRG	preliminary remediation goals
REL	reference exposure level

RfC	reference concentration
RfD	reference dose
RfDi	inhalation reference doses
RfDo	oral reference doses
RI	remediation investigation
RME	reasonable maximum exposure
s	second
SES	socioeconomic status
Site	AMCO Chemical Superfund Site
SPNA	South Prescott Street Neighborhood Association
SVOC	semivolatile organic compounds
SWDS	Solid Waste Disposal Site
TAG	Technical Advisor Grant
TCE	trichloroethylene
UCL	upper confidence level
VF	volatilization factor
VOC	volatile organic compound
WOA	West Oakland Alliance

1.0 Introduction

The Human Health Risk Assessment (HHRA) described in this appendix was prepared as part of the Remedial Investigation (RI) for the AMCO Chemical Superfund Site (the Site). This HHRA includes a quantitative evaluation of the potential adverse health effects to people from exposure to hazardous chemicals in soil at the former AMCO facility and adjacent parcels and in groundwater at the Site. In addition, a screening level evaluation of potential exposure to contaminated soil gas and air (ambient and crawlspace), was performed for on- and off-facility locations as well as residential parcels adjacent to the former AMCO facility and South Prescott Park. Screening level evaluations were also performed to assess potential exposure to contaminated soil and homegrown produce at the residential properties. Results from the HHRA will be one of the factors that EPA uses to determine if cleanup actions are warranted at the Site.

This HHRA was prepared in a manner consistent with EPA's *Risk Assessment Guidance for Superfund, Part A* (EPA 1989), *Part B* (EPA 1991b) and *Part E* (EPA 2004b) and supporting documents and guidelines published by the California Environmental Protection Agency (CalEPA). The assumptions provided for the general public by EPA and incorporated into this HHRA are conservative (i.e., representative highest exposure that is reasonably expected to occur at a site) and thus, health-protective.

As part of this HHRA, a conceptual site model (CSM) a schematic diagram that identifies the primary source of contamination in the environment (e.g. releases from leaking storage tank or waste material poured onto the ground) and shows how chemicals at the original point of release move in the environment (e.g. a chemical in soil might percolate into groundwater or might volatilize into air) and identifies the different types of human populations (e.g., residents and workers)who might come in contact with contaminated media. The models also lists the potential exposure pathways (e.g., ingestion of contaminated water) The CSM for the former AMCO facility is presented in Figure 1. The risk assessment will assist EPA in the following areas

- Evaluating the need for a comprehensive remedial action to address contaminated groundwater and soil.
- Provide a basis for performing a remedial action, including a no-action alternative
- Determine what exposure pathways need to be remediated.

The overall goals of the RI are to characterize site conditions, collect sufficient data to determine the nature and extent of contamination, and to support informed risk management decisions regarding human health and the environment.

In order to meet these objectives, six separate evaluations specific to each of these environmental media were conducted in this HHRA:

1. On-facility soil from the former AMCO facility and off-facility soil from the surrounding large vacant lot, small vacant lot, and parking lot

2. Groundwater beneath the former AMCO facility and surrounding areas
3. Soil gas, ambient air, and crawlspace air at six adjacent residential properties
4. Soil gas and ambient air at South Prescott Park
5. Off-facility soil at six adjacent residential properties
6. Homegrown produce at four adjacent residential properties

A description of the Site, as well as operational history, can be found in Section 1 of the RI report.

1.1 Previous Health Studies

The primary objective of this HHRA is to evaluate the extent to which exposure to hazardous chemicals increases the likelihood of adverse effects occurring in adult and child residents, industrial workers, construction workers, and trench workers at the former AMCO facility. Several previous studies have evaluated potential health issues associated with the Site, as described below. A brief summary of previous health studies conducted at the Site is presented in the following sections to provide relevant background and site history.

1.1.1 Public Health Assessment

The California Department of Health Services (CDHS) prepared a Public Health Assessment (PHA) for the AMCO Chemical Superfund Site under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR) (CDHS 2005). ATSDR is a federal agency within the U.S. Department of Health and Human Services (DHHS) and is authorized by Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund) to conduct PHAs at hazardous waste sites.

A PHA is conducted to evaluate potential adverse health impacts to people coming into contact with chemicals at hazardous waste sites. A health assessor derives an estimated dose of the substances that people in the community might be exposed to; this dose is compared to regulatory standards. A PHA may consider information from citizens about actual exposures, including any health data that might be available. CDHS collected community health concerns as part of the PHA process from a variety of sources including the South Prescott Street Neighborhood Association (SPNA), the Chester Street Block Club Association (CSBCA), and the West Oakland Alliance (WOA). The community expressed concerns including breathing problems, miscarriages, and cancer.

Using available data, CDHS concluded that the Site has four complete exposure pathways, two potentially complete exposure pathways, and four pathways that can be eliminated from consideration**.** The breathing of vapors from subsurface excavations by utility workers is considered a public health hazard. The potential present and future exposure to soil gas contamination at the facility office and abutting residences are considered indeterminate public health hazards. The potential future exposure to subsurface soil contamination at the Site is also considered an indeterminate public health hazard. On the basis of CDHS review of the site data and understanding of the neighborhood, CDHS is concerned that people may have already, or could potentially in the future, come into contact with chemicals at the

Site at levels that could result in adverse health effects. The concentrations of chemicals that remain at the Site could pose health risks to utility workers, on-facility workers, and neighboring residents in the future. Findings from the PHA helped define sampling areas of the HHRA.

1.1.2 National Air Toxics Assessment

In February 2006, EPA released the results of its national-scale assessment of 1999 air toxics emissions (http://www.epa.gov/ttn/atw/nata1999/). The purpose of the National Air Toxics Assessment (NATA) is to identify and prioritize air toxics, emission source types, and locations that could contribute most to population-wide health risks. A subset of 1999 NATA results for census tract 06001401900, which includes the vicinity of the former AMCO facility (Oakland, CA), is presented in Table 1 (note that all tables are located at the end of this report).

The national-scale assessment includes 177 air pollutants (a subset of the air toxics on the Clean Air Act's list of 187 air toxics plus diesel particulate matter). This study provides an indication of the background level for some chemicals of concern. Attribution of air pollution sources can be challenging in industrial areas such as West Oakland which have multiple potential release points. Despite this limitation, the NATA study provides an indication of the background level for some chemicals of relevance for the Site study area.

NATA is a screening level assessment, and is therefore most appropriately used as a relative indicator of air toxics concerns. NATA results are most accurate when comparing between census tracts and over large geographic areas. The NATA assessment includes the following four objectives:

1. Compiling a national emissions inventory of air toxics emissions from outdoor sources,
2. Estimating ambient concentrations of air toxics,
3. Estimating population exposures,
4. Characterizing potential public health risk due to inhalation of air toxics including both cancer and non-cancer effects.

EPA generally updates air toxics emissions inventories every 3 years. The data evaluated as part of this HHRA are from 1999 since these data are the most complete and up-to-date available. The next national-scale assessment, likely to be available in 2008, will focus on the 2002 emissions inventory which was completed in December 2005. The presentation of results for a single census tract is meant only to illustrate the magnitude of concentrations that may be expected in ambient air in the vicinity of the former AMCO facility, and the types of sources that may be contributing to those concentrations including potential sources coming from the facility.

Selected information from the 1999 National Emissions Inventory (NEI) for Alameda County is presented in Table 2. The NEI is a national database of air emissions prepared by EPA, based on input from State and local air agencies, tribes, and industry. The database includes estimates of annual emissions, by source, for every county in all 50 States, the District of Columbia, Puerto Rico, and the Virgin Islands.

With respect to the information presented below, it is important to note the following:

- Carbon tetrachloride is a global pollutant, with an atmospheric lifetime in excess of 50 years and minimal local sources throughout the United States. While sometimes considered a chemical of potential concern from a health perspective, the main contribution to ambient concentrations of carbon tetrachloride is global transport and nearly never local.
- Two other chemicals of potential concern, benzene and ethyl benzene, are emitted primarily by mobile sources, including on-road cars and trucks and non-road sources, such as aircraft, commercial marine, trains, lawn and garden, and construction equipment. While there could be impacts from local, stationary sources of these pollutants, the largest contribution to the widespread concentrations of these pollutants is likely to be mobile sources, especially in West Oakland, where there are several major freeways as well as truck, rail, and commercial marine vessels operating around the Port.
- Three of the chemicals of potential concern—chloroform, trichloroethylene (TCE), and vinyl chloride—are emitted nearly entirely by stationary sources, including both local contributions and long-range transport. Further information on the potential sources of these pollutants may be found in EPA's NEI (using EPA's Air Data web site, http://www.epa.gov/oar/data/) or California's state inventory (http://www.arb.ca.gov/ei/emissiondata.htm).

  The top five stationary sources for vinyl chloride in Alameda County in 1999 (EPA 1999) include:

  – Fiberboard Emeryville
  – Crow Canyon Solid Waste Disposal Site (SWDS) (Hayward)
  – Borden Chemical (Fremont)
  – Christy Concrete Products (Fremont)
  – Galbraith Golf Course (Oakland)

1.1.3 Preliminary Endangerment Assessment

In September 2001, the 7th Street McClymonds Corridor Neighborhood Improvement Initiative prepared a Preliminary Endangerment Assessment (PEA) for the Site (7th Street 2001). The objectives of the PEA included identification of potential pathways for human exposure, calculations of cancer risk and non-cancer health hazard for each of the contaminated media, and recommendations for further remedial action.

Based on the PEA results, exposure to contaminated groundwater represents nearly all the cancer risk and over 90% of the noncancer hazard. The primary contributor to risk is vinyl chloride. The potential excess cancer risk for the Site calculated using the California EPA Department of Toxic Substances Control (DTSC) PEA methodology is 2.7×10^{-1}, or nearly three cancers per ten persons with lifetime exposure to the Site. This is thousands of times higher than the target risk level of 1×10^{-6} (one per million persons with lifetime exposure). Similarly, the noncancer HI for the Site is calculated to be 940, nearly 1000 times higher than the noncancer threshold of 1.

1.1.4 Preliminary Assessment and Site Investigation Report

Community interest in the former AMCO facility began in 1996, when DTSC presented information on hazardous materials found on property related to the California Department of Transportation (Caltrans) Cypress Construction Project. Pacific Gas and Electric Company (PG&E) employees who had worked on the construction of a utility trench on Center Street in June of 1995 expressed concern over possible chemical exposure. Investigations conducted on behalf of PG&E and Caltrans in 1996 documented the presence of vinyl chloride and other chlorinated solvents in soil and groundwater at sample locations on 3rd Street, south of the former AMCO facility. Sampling conducted in 1996 on behalf of DC Metals documented the presence of vinyl chloride on the property (E&E 2001).

EPA Region 9 first became aware of the former AMCO facility in 1996, when DTSC requested assistance. To ensure that people living near the Site were protected, the EPA took immediate action under its Emergency Response program. The EPA conducted a Removal Assessment in October 1996 and initiated an Emergency Response action in December 1996, installing a groundwater and soil vapor treatment system that operated until July 1998. The treatment system was shut down in response to community concern over potential exposure to contaminants from the system's exhaust stack.

Following the shutdown of the treatment system, EPA conducted groundwater, soil, and air sampling in December 1998, September 1999, and April 2000 to verify that residents near the property were not at risk from contamination. The results of the investigation are presented in the Preliminary Assessment and Site Investigation [PA/SI] Report (E&E 2001). Additional sampling of groundwater, soil gas, and crawlspace air was conducted in August 2002 following the PA/SI.

The following are the most significant findings from EPA's investigation of the Site:

- Significant concentrations of chemicals have been found in soil on the on- and off-facility properties. However, the majority of the ground surface at these properties is covered with concrete. Therefore, the potential for workers and residents to come into direct contact with contaminated soil is minimized.

- Significant concentrations of vinyl chloride and other chemicals have been found in groundwater monitoring wells on and near the former AMCO facility that establish a release of chemicals to the regional groundwater. However, the regional groundwater is not used for drinking water, and there are no drinking water wells within 4 miles of the Site.

- A release to air of hazardous substances was observed in 1996, during the excavation of a trench for an on-facility treatment system. A sample collected at the time of the observed release documented that vinyl chloride, trichloroethene, and other volatile organic compounds (VOCs) were present in the vapor observed emanating from the trench.

- Sampling at nearby homes documented the presence of very low levels of vinyl chloride in crawlspace air and soil gas in September 1999. However, vinyl chloride was not detected in either soil gas or crawlspace air in sampling conducted in April 2000. The

EPA does not expect that the very low levels of vinyl chloride found in 1999 could affect the health of people living in the homes where samples were collected.

1.1.5 The West Oakland Environmental Indicators Project

The former AMCO facility is located in West Oakland, approximately one block south of the West Oakland BART Station. In 2002, a collaboration of grassroots advocacy groups, community residents, and a research organization released an independent report, "Neighborhood Knowledge for Change: The West Oakland Environmental Indicators Project". After in-depth discussion with a neighborhood-based steering committee, the Pacific Institute created a set of 17 indicators to track environmental conditions in West Oakland (Pacific Institute 2002).

The indicators look at issues ranging from air pollution and toxic contamination to gentrification and voting. The 17 indicators include: amount of air pollution released by large polluters, air pollution health risks to neighborhood residents, asthma rates, voting power, vulnerability to displacement/housing affordability, community stability/market trends, subsidized housing supply, new business development, illegal dumping, land use conflict, neighborhood toxic volumes, resident toxic exposure sensitive area toxic hazard exposure, lead poisoning, lead abatement, transit mobility, and bike-able streets.

The report states that residents of West Oakland face five times more toxic pollution per person than residents of the city of Oakland with nearly 82 percent living within 1/8 mile of an industrial area. Children in West Oakland were reportedly seven times more likely to be hospitalized for asthma than the average child in the state of California. In addition, only 31 percent of area residents can afford the median rent on available housing units.

1.1.6 Other Relevant Studies: Vulnerable Communities

In discussing the population near the Site, it is important to note that the socioeconomic profile for the surrounding community of West Oakland is characterized by low socioeconomic status and racial diversity (SES) (Census 2000). Characteristics of low SES include low income and associated conditions including poor housing and inadequate health care and education systems.

Research in the area of environmental justice suggests that chemical facilities that pose increased environmental health hazards are disproportionately located in communities characterized by low SES such as West Oakland (Arista et al. 2004). A proposed explanation for this discrepancy is the "diminished response capacity" among low-income and minority communities to resist toxic exposure or to participate in pollution production decisions (Heiman 1996). Based on exposure to chemical concentrations evaluated in the Preliminary Endangerment Assessment, the potential cancer risk for residents living near the Site is several orders of magnitude greater than the levels acceptable to the EPA.

In addition to having more exposure to toxic chemicals, it has been suggested that individuals in such communities are potentially more vulnerable to the effects of exposure to hazardous chemicals due to impaired body defenses. A recent study by deFur et al. (2007) evaluated factors that could hinder an individual's ability to resist adverse impacts associated with chemical exposures. Characteristics of an individual's household, their community and local institutions (e.g. schools and medical facilities) can impact an

individual's vulnerability to toxic agents. Typical stress factors associated with low SES neighborhoods include increased levels of family instability, crowding and incidents of violence and crime. Higher rates of disease and increased mortality among individuals living in low SES neighborhoods support the concept of increased vulnerability among these populations.

1.2 Methodology and Organization of the Risk Assessment

A health risk assessment is a formalized approach used to evaluate potential threats to human health or the environment that may result from exposure to contaminated soil, water, or air (EPA 1991b). Risk assessments are typically performed in following four steps:

1. Data collection and data evaluation
2. Exposure assessment
3. Toxicity assessment
4. Risk characterization

A summary of the four steps is presented below.

1.2.1 Data Collection and Data Evaluation

Samples of environmental media such as soil, water, air, and homegrown produce are collected in order to characterize the nature and extent of contamination at a site. The data evaluation step consists of reviewing and evaluating available data. Data evaluation allows for the identification of constituents of potential concern (COPCs). In addition to data collected for the RI, data from previous investigations were reviewed to gain a better understanding of the site characteristics. With the exception of residential soil sampling, homegrown produce sampling, and facility office crawlspace sampling, which were not included the original scope of the field investigation, the sampling activities were performed in accordance with the methods and rationale described in the SAP. EPA added sampling of residential soil, homegrown produce, and facility crawlspace air to the RI based on information collected during the course of the RI.

With the exception of groundwater data, data were evaluated separately for each of the on- and off-facility locations, as well as the residential locations. A quantitative evaluation was also performed for groundwater. A screening level risk evaluation was performed for residential soil gas, crawlspace air and ambient air, soil and homegrown produce.

All chemicals reported in at least one sample at concentrations greater than the sample detection limit were included as COPCs. Chemicals were not excluded based on comparison to background concentrations. The approach used to evaluate COPCs is appropriate for a conservative baseline HHRA.

1.2.2 Exposure Assessment

In the exposure assessment step, the potential exposure pathways for COPCs and the potential human populations that could be exposed to these constituents, either now or in the future are identified. Exposure point concentrations (EPCs) are estimated from measured or modeled concentrations, and pathway-specific intake (doses) are estimated for use in the subsequent risk calculations. People who might be exposed and how they are

exposed to each chemical are identified in this step. For the former AMCO facility, potential exposed populations included both current and future residents and workers.

1.2.3 Toxicity Assessment

The purpose of the toxicity assessment is to evaluate the potential for COPCs to cause adverse health effects. The derivation of toxicity values is a complex process which must evaluate many factors relating to toxicological data including the type of exposure route, duration of exposure, dose administered, physiology of the species tested, and the type of adverse health effect observed. In the toxicity assessment step, toxicity values are compiled that characterize potential adverse health effects from exposure to COPCs.

1.2.4 Risk Characterization

Risk characterization is the final step in the risk assessment process. It combines the results of the previous three steps to quantitatively characterize potential risks to human health associated with exposure to COPCs. Potential cancer risk, adverse non-cancer health effects, and an evaluation of potential effects from exposure to lead are estimated. Uncertainties associated with or inherent in risk assessments are also evaluated as part of the HHRA process. Section 6.0 presents a review of these uncertainties to provide context for interpreting the results of the HHRA. In addition, a screening level evaluation of potential exposure to contaminated soil gas and air (ambient and crawlspace), was performed for on- and off-facility locations as well as residential parcels adjacent to the former AMCO facility and South Prescott Park.

In the risk characterization, theoretical noncancer hazards and theoretical lifetime excess cancer risks (ELCR) associated with exposure to chemicals are estimated. Theoretical hazard for noncarcinogenic (i.e., not cancer causing) chemicals at a site are evaluated by comparison to a target-hazard index of 1 (unity). To evaluate cancer effects, EPA considers a target risk range of 10^{-6} to 10^{-4} to be "safe and protective of public health" (56 F.R. 3535), although EPA has discretion to take action in this range depending on site-specific circumstances. Even risks slightly greater than 1×10^{-4} may be considered adequately protective based on site-specific conditions, including any uncertainties about the nature and extent of contaminants and associated risks. The lifetime theoretical cancer excess cancer risk represents the additional, or excess, risk compared to the actual incidence of cancer that is unrelated to a site. The observed incidence of cancer cases in the United States is approximately 1-in-2 for men and 1-in-3 for women and is due to factors such as smoking, poor nutrition, excessive exposure to sunlight, and other causes including a person's genetics (American Cancer Society 2007).

1.2.5 Organization of the HHRA

Attachments to this document include the following:

- Attachment 1: Detailed Risk and Hazard Results for Exposure to Soil
- Attachment 2: Detailed Risk and Hazard Results for Exposure to Groundwater
- Attachment 3: Residential Neighborhood Screening Tables
- Attachment 4: ATSDR Toxicity Profiles for Compounds that Contribute the Most Risk/Hazard
- Attachment 5: Outputs from proUCL

2.0 Data Collection and Data Evaluation

Samples of environmental media such as soil, water, air, and homegrown produce are collected during the remedial investigation of a site in order to characterize the nature and extent of contamination. The data evaluation step consists of reviewing and evaluating available data.

This section describes the data collected to identify contaminant distribution at the former AMCO facility. A detailed discussion of the data collected for the site and used in this HHRA is presented in the RI Report. The analytical data were reviewed according to the data evaluation procedures specified in EPA guidance documents, including *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual, Part A* (EPA 1989) and *Guidance for Data Usability in Risk Assessment* (EPA 1990b). These procedures include the evaluation of analytical methods, quantitation limits, qualified data, blank contamination, and background concentrations.

2.1 Chemicals of Potential Concern

All chemicals reported in at least one sample at concentrations greater than the sample detection limit were included as COPCs. Chemicals were not excluded based on comparison to background soil concentrations. Potential risks associated with ambient levels of metals in soil were also calculated to provide an understanding of the total risks at the Site (i.e., potential risks from site-related COPCs and ambient levels of metals). Screening criteria were used to focus on chemicals that would contribute the most to the risk and were not used to eliminate or screen out chemicals. The approach used to evaluate COPCs is appropriate for a conservative baseline HHRA. Section 5.1 of the RI Report, Screening Level Determination, provides the rationale for the screening criteria selected for this Site. Table 3 presents the COPCs for each media.

All chemicals reported in at least one sample from the data sets compiled for this risk assessment were included as COPCs, except calcium, magnesium, potassium, and sodium, which are known to be essential human nutrients. Elements considered to be essential human nutrients were eliminated as COPCs. EPA and DTSC guidance state that these elements can be deleted from the list of COPCs because of their low toxicity when detected at ambient concentrations (EPA 1989; DTSC 1992). Even if these constituents are present at concentrations slightly above naturally-occurring levels, they are eliminated as COPCs because they are toxic only at very high doses.

2.1.1 Soil

Approximately 0.5 to 3.5 feet of concrete covers the soil in most areas of the on- and off-facility properties. Shallow soil samples were collected 0 to 2 feet below concrete, and deep samples were collected 2 to 7 feet below concrete. For this HHRA, soil samples were divided into the following four exposure areas:

- Former AMCO facility (includes 21 shallow and 11 deep samples),

- Parking lot (includes 3 shallow and 3 deep samples),
- Large vacant lot (includes 14 shallow and 9 deep samples),
- Small vacant lot (includes 2 shallow samples).

Sampling locations were approved by EPA prior to sample collection and were based on a 50-foot grid and historical aerial photographs. If contaminant concentrations greater than screening levels were detected, additional samples were collected to define the extent of contamination. The soil sampling locations for these four exposure areas are shown on Figure 2. Background concentrations for soil were obtained for naturally occurring metals from the city of Oakland (City of Oakland Urban Land Redevelopment Program 1995).

2.1.2 Groundwater

The groundwater sample results used for this HHRA are from first, third, and fourth quarters of 2005, and the first, second, and third quarters of 2006, and the grab groundwater samples (September 2004). VOC data from groundwater samples collected from second quarter 2005 were not used in the risk assessment data set due to quality issues (EPA 2006b). Groundwater samples were not collected from monitoring wells with floating non-aqueous phase liquids (NAPL) (MW-13 and MW-14). Evidence of NAPL was observed in the soil during the construction of on-facility wells in the central and south-central portion of the facility. Results of groundwater samples collected from locations with suspected NAPL were included in the data set that was used to calculate the exposure point concentrations used in the groundwater risk calculations. Groundwater sample locations are shown on Figure 3.

2.1.3 Residential Soil Gas, Crawlspace Air and Ambient Air

Soil gas sampling was conducted at six residential properties adjacent to or near the former AMCO facility. Air sampling (ambient and crawlspace) was also conducted at the six adjacent residences. Soil gas and ambient air samples were collected at South Prescott Park and at a background location within the South Prescott neighborhood. Two crawlspace air samples were collected in the office of 1414 3rd Street to evaluate current worker conditions. Soil gas and air sampling locations are shown on Figure 4.

2.1.4 Residential Soil and Homegrown Produce

Soil sampling was conducted at six residential properties adjacent to or near the facility. Soil sampling locations were sited either along the property boundary or in areas where produce was grown. Produce samples were collected from four of the residences with gardens. Produce samples were collected from backyards at 356 and 360 Center Street, and 1428 and 1432 3rd Street. No produce was present at 326 Center Street and 1428 3rd Street. No access was granted at 320 Center Street, therefore, no sampling was performed at this property. At each of the four residences where produce samples were collected, one sample was collected for each type of produce grown.

3.0 Exposure Assessment

Exposure assessment is the determination or estimation (qualitative or quantitative) of the magnitude, frequency, duration, and route of exposure. Exposure assessments may consider past, present, and future exposures, using varying assessment techniques for each phase. The objective of the exposure assessment is to estimate the type and magnitude of exposures to COPCs that are present at or migrating from a site.

The three primary steps in exposure assessment are site characterization, exposure pathway identification and quantification of exposure. A CSM is a tool used to assist with the identification of potential exposure media, human receptors, and exposure pathways.

3.1 Identification of People and Exposure Pathways

Exposure pathways are the different ways that a receptor may contact a chemical. Each of the following components must be present for an exposure pathway to be complete (EPA 1989):

- A potential source of a toxic substance in an environmental media, such as soil or air
- A potential receptor, such as a resident living near or on the potential source
- A contact point, such as a resident planting a garden in soil contaminated with some substance
- A route for the substance to enter the body, such as the inhalations of dust particles or the ingestion of soil particles by a resident working in a garden.

The exposure routes and pathways considered in this HHRA are described below. Figure 1 presents a CSM illustrating these exposure routes and pathways.

3.1.1 Exposed Populations

Potential exposed populations are members of a community who may be exposed to contaminated media during the course of daily living and working in the area of concern. The exposed populations evaluated in the HHRA were identified based on current land use and input from the South Prescott community via Spanish and English focus groups, the Technical Advisor Grant (TAG) recipient, and the technical advisor. Receptors evaluated quantitatively in the HHRA include adult and child residents who currently live immediately adjacent to the facility or may in the future live within the boundaries of the facility.

For the Site, use of a CSM (Figure 1) resulted in the identification of the following potential receptors:

- Future on-facility adult and child residents and current and future off-facility adult and child residents,
- Outdoor commercial/industrial workers,

- Construction workers, and
- Excavation/trench workers.

Potential exposure to workers is over a shorter period of time than residents. The assumed exposure for a worker is 250 days per year over 25 years, while a resident is assumed to be exposed for 350 days per year over 30 years. Based on the common assumption that workers take two weeks of vacation per year, EPA assumes that a resident will be away from home approximately 15 days per year.

Industrial, construction, and trench workers may be exposed to the same chemical concentrations as a resident (by the same pathways), but for a much shorter duration. Thus, the cumulative risk faced by workers from all exposure pathways might be significantly lower than residents for all exposure pathways and routes of exposure evaluated. Exposure assumptions for both future residents and workers are presented in Table 4 for exposure by workers and future residents to soil, Table 5 for exposure by future residents to groundwater, and Table 6 for exposure by trench workers to groundwater.

3.1.2 Exposure Pathways

An exposure pathway represents how a chemical moves through the environment from the source to a receptor. Exposure pathways are identified by analysis of the distribution of COPCs in the environment and the physical and chemical properties of each COPC. The following exposure pathways for residential, occupational, construction and trench worker scenarios at the Site are considered complete for this risk assessment:

- **Residential**: Current residents (adults and children) that are immediately adjacent to the former AMCO facility may be exposed to groundwater, soil, air, and produce that have been impacted by site-related chemicals. For future residents, this HHRA conservatively assumes that residential development would consist of single-family dwellings within the facility boundaries. This assumption is health-protective and yields conservative risk estimates that are greater than the risk estimates for multi-family dwellings such as apartments or condominiums.
- **Recreational**: Recreational exposure may occur in Prescott Park which is across the street from the former AMCO facility. Both adults and children visiting the park may be exposed to site-related chemicals by outdoor inhalation of VOCs that may emanate from groundwater and soil gas at the park.
- **Industrial**: Current commercial and industrial workers (non-construction) at the former AMCO facility may be exposed to site-related chemicals primarily through inhalation of VOCs emanating from soil, groundwater, and soil gas.
- **Construction/Trench worker**: Under current and future conditions, construction and excavation workers are assumed to be engaged in subsurface disturbance activities that may extend to 10 ft below ground surface (bgs). Such activities may include utility work, repairs, maintenance and construction. This is potentially the most significant exposure pathway for subsurface workers.
- **Ecological:** Under current conditions, birds and small mammals may be exposed to site-related chemicals that have been taken up by homegrown produce. This pathway, while

potentially complete, was not quantitatively evaluated in this HHRA but is considered to be insignificant compared to exposure by other pathways.

In addition, risks for unrestricted residential use of groundwater were also evaluated in accordance with input from the regulatory agencies and the community.

Residents/Workers could be exposed to COPCs through any of the following pathways:

- Incidental soil ingestion
- Dermal absorption due to direct soil contact
- Inhalation of airborne suspended soil particulates
- Inhalation of VOCs from soil or groundwater
- Ingestion of homegrown produce
- Dermal absorption due to direct groundwater contact (trench worker only)

Incidental soil ingestion by adults and children primarily occurs through hand-to-mouth contact as a result of hands and fingers being placed in the mouth after contact with soil while gardening or playing. This scenario assumes that adults ingest 100 milligrams of soil per day (mg/day), 350 days per year (EPA 1991a). A child resident that plays in the soil may ingest twice as much as the average adult (200 mg/day). Based on the common assumption that workers take two weeks of vacation per year, EPA assumes that a resident will be away from home approximately 15 days per year (EPA 1991a).

Dermal absorption of COPCs is a result of chemicals being absorbed into the body from soil particles after any direct skin contact with contaminated soil. Hands and fingers are typically the primary body parts in contact with soil. Chemicals absorbed through the skin are absorbed into the bloodstream. The soil adherence factor is based on gardening and play activities.

Inhalation of airborne suspended soil particles occurs when soil grains are picked up by the wind and dispersed into the air. Once these soil particles are airborne, people in the vicinity can inhale them. Particles typically less than 10 microns in size are inhaled. Once inhaled into the lungs, chemicals are absorbed from the soil particle and absorbed into the bloodstream. Larger particles do not reach the lungs but are coughed up and swallowed.

Inhalation of VOCs which volatilize from soil or groundwater into air can be absorbed into the bloodstream after being inhaled. Residents may be exposed to COPCs through **ingestion of homegrown produce.** Various types of produce are grown and consumed in the neighborhood adjacent to the former AMCO facility. Produce grown in the residential gardens include mint, figs, guava, cilantro, and grapes. Produce may take up COPCs into roots or have soil deposited on aboveground plant parts.

Oakland residents have their drinking water supplied by the East Bay Municipal Utility District. It is unlikely that residents would drink groundwater in the future; however, in accordance with input from the regulatory agencies and the community, groundwater use for drinking water and household use is included in the evaluation of future residential use of the AMCO property.

3.2 Exposure Point Concentrations

EPCs are representative of the concentration of the chemical of potential concern to which receptors may be exposed over a period of time. EPCs were calculated for on-facility soil and groundwater. Because a screening level risk evaluation was conducted on the residential soil, air, and soil gas sample results, UCLs were not required or calculated for these media. Detected concentrations from each sample/media were compared to their appropriate screening levels.

Exposure point concentration estimates do not include physical, chemical, or biological processes that could result in the reduction of chemical concentrations over time. The EPCs are assumed to remain constant at levels reflected in the analytical results. This general assumption of steady state conditions also applies to sources and contaminant release mechanisms. This assumption may result in a conservative evaluation of long-term exposure conditions.

3.2.1 Soil and Groundwater

The measure of exposure appropriate for a risk assessment is the average concentration of a contaminant throughout an area to which humans are exposed. The premise is based on the assumption that over a long enough period of time a receptor would contact all parts of the exposure area. A conservative estimate of the average concentration of a chemical across an exposure area is the 95 UCL on the mean; 95% UCLs were calculated for each dataset using ProUCL3 software (EPA 2004c). ProUCL outputs for each COPC in each medium are provided in Attachment 5.

ProUCL computes parametric UCLs based on normal, lognormal, or gamma distributions, and nonparametric UCLs using one of several nonparametric methods. The UCLs that are selected as the EPCs are based on the data distribution and the associated skewness. If the dataset contained two or fewer samples, the maximum sample concentration was used as the EPC because a 95% UCL could not be calculated. One-half of the sample quantitation limit was substituted as a proxy concentration for chemical concentrations reported as not detected. EPCs are the lesser of the maximum-detected concentration and the 95% UCL.

Table 7 summarizes the EPCs for each soil dataset. Table 8 summarizes the EPCs for the groundwater dataset.

3.2.2 Soil Gas, Crawlspace Air, and Ambient Air

Individual sample results were used for comparison to screening levels for soil gas, crawlspace air, and ambient air data. An ongoing assessment of the vapor intrusion pathway is being conducted, including continued monitoring. The results from the continued monitoring are being evaluated to assess whether a quantitative analysis risk approach is appropriate.

3.3 Estimation of Chemical Intake

Exposure (or intake) is defined as contact of an organism with a chemical. Intake is normalized for time and body weight and is expressed as milligrams of chemical per kilogram of body weight per day (mg/kg-day). Six basic factors are used to estimate intake:

chemical concentration, contact rate, exposure frequency, exposure duration, body weight, and averaging time.

Intake estimates are calculated for each COPC and exposure pathway. For noncarcinogenic effects, the intake is averaged over the period of time that receptors are exposed to the COPCs and is referred to as the average daily dose (ADD). For carcinogenic effects, the intake is averaged over a receptor's lifetime (i.e., assumed to be 70 years) and is referred to as the lifetime average daily dose (LADD).

The quantification of exposure intake considers chemical EPCs, as well as general exposure assumptions or parameters. The intake assumptions are based on information that is highly conservative in nature and are intended to overestimate exposure to be protective of sensitive members of the population such as children.

EPA guidance states that actions at Superfund sites should be based on an estimate of the "reasonable maximum exposure" (RME) (EPA 1989). The RME is defined as the "highest exposure that is reasonably expected to occur at a site." The intent of the RME is to estimate a conservative exposure case (i.e., well above the average case) that is still within the range of possible values. To the extent possible, the risk assessment has selected values for the exposure factors that result in an estimate of the RME scenario.

The parameters used to assess exposure in this HHRA are summarized in the sections below and are provided in Table 4 for soil and Tables 5 and 6 for groundwater (exposure by residents and trench workers, respectively). The parameters based on RME exposure are recommended values from EPA Region 9's *Preliminary Remediation Goals* (PRG) and California Department of Toxic Substances Control (DTSC) and Human and Ecological Risk Division (HERD) recommended default exposure factors for use in risk assessment at California Military Facilities (DTSC 2005).

3.3.1 General Exposure Assumptions

General exposure assumptions are used in the intake calculations for all exposure pathways evaluated in the HHRA. General exposure assumptions include exposure frequency, exposure duration, body weight, and averaging time. These assumptions are detailed below:

- **Exposure Frequency**—It was assumed that adult and child residents would be exposed to chemicals at the site 350 days per year (EPA 1991a). For workers the assumed exposure duration is 250 days per year (EPA 1991a).
- **Exposure Duration**—A total resident exposure of 30 years is assumed (i.e., 24 years for an adult and 6 years for a child). An industrial worker exposure of 25 years at the same location is assumed (EPA 1991a). The construction worker is assumed to be exposed for a period of 1 year.
- **Body Weight**—It was assumed that the body weight for an adult (for both resident and worker) is 70 kilograms (kg). A body weight of 15 kg is used for a child.
- **Averaging Time**—Intake calculations are averaged over a period of time. For noncarcinogenic effects, the averaging time is equal to the period of time that receptors are exposed to the COPC, or 365 days per year multiplied by the exposure duration. The

averaging time for noncarcinogenic effects for residential adults and children are 8,760 and 2,190 days, respectively (corresponding to 24 years for an adults and 6 years for a child). For workers, an averaging time of 1 year or 365 days, is assumed. For carcinogenic effects (for both resident and worker), the averaging time is equal to a receptor's lifetime of 365 days per year multiplied by 70 years. The averaging time for carcinogenic effects is 25,500 days.

3.3.2 Exposure Parameters and Equations for Soil Ingestion

To calculate intake by incidental ingestion of soil, soil ingestion rates were applied (Table 4). The soil ingestion rates identified for assessing a residential exposure are 100 mg/kg for an adult and 200 mg/kg for a child. Soil ingestion rates of 100 mg/kg and 330 mg/kg are assumed for the industrial worker and construction workers, respectively.

Chemical intake via ingestion of soil was estimated according to the following equation (EPA 1989):

Intake =

Where:

Intake	=	Intake, or dose for each chemical (mg/kg-day)
Cs	=	EPC in soil (mg/kg)
IngR	=	Ingestion Rate (mg/day)
EF	=	Exposure frequency (day/years)
ED	=	Exposure duration (years)
CF	=	Conversion factor (1×10^{-6} kg/mg)
BW	=	Body weight (kg)
AT	=	Averaging time (days)

3.3.3 Exposure Parameters and Equations for Dermal Contact with Soil

Exposure assumptions used in the intake calculations for the dermal contact with soil exposure pathways include body surface area and soil adherence factor (Table 4). Chemical specific dermal absorption factors are also applied. These factors are detailed below:

- **Body Surface Area—**The body surface area is the total amount of skin surface that can be exposed to contaminated soil. The adult resident was assumed to wear a short-sleeved shirt, shorts, and shoes with an exposed skin surface area of 5,700 cm^2 which included head, hands, forearm, and lower legs. The surface area for a child is 2,900 cm^2 which includes exposure to the head, hands, forearms, lower legs, and feet. Both industrial and construction workers are assumed to have an exposed skin surface area of 5,700 cm^2.

- **Soil-adherence Factor—**The soil-adherence factor is a measure of the amount of soil that can adhere to an area of skin surface. EPA's (2004b) recommended soil-adherence factor for adults is 0.07 mg/cm^2. This is based on the body-part specific adherence factor presented in Kissel et al. (1996) and Holmes et al. (1999). The activity pattern selected to be representative of the average urban suburban resident is the outdoor gardener. This scenario is considered to represent the most common residential activities, since it included activities as weeding, pruning, picking fruit, digging small irrigation trenches,

and cleaning up. The recommended soil-adherence factor for a child resident is 0.2 mg/cm^2 (EPA 1999a), and is used to represent a sensitive population with activity patterns that could contribute to increased exposure. The age group/activity used to determine the adherence factor is children at play. The assumed soil-adherence factor for industrial workers is 0.2 mg/cm^2; for construction workers, a soil-adherence factor of 0.8 mg/cm^2 is used.

- **Dermal–absorption Factor**—The dermal absorption factor is a chemical-specific factor that measures a chemical's ability to be absorbed into the human body. An absorption factor of 0.1 assumes that 10 percent of the chemical will be absorbed into the body and be bioavailable to cause a toxic effect. Dermal-absorption factors were obtained for all chemicals from EPA (1999). Dermal-absorption factors are compiled in Table 1-4 (located in Attachment 1).

Chemical Intake via dermal contact with soil was estimated according to the following equation (EPA 1989):

$$\text{Intake} = \frac{Cs \times SA \times EF \times ED \times AF \times ABS \times CF}{BW \times AT}$$

Where:

Intake	=	Intake, or dose for each chemical (mg/kg-day)
Cs	=	EPC in soil (mg/kg)
SA	=	Body Surface area (cm^2)
EF	=	Exposure frequency (day/years)
ED	=	Exposure duration (years)
AF	=	Soil-adherence factor (mg/cm^2)
ABS	=	Absorption factor
CF	=	Conversion factor (1 x 10^{-6} kg/mg)
BW	=	Body weight (kg)
AT	=	Averaging time (days)

3.3.4 Exposure Parameters and Equations for Inhalation of Particulates and Volatiles from Soil

There are two types of exposure pathways evaluated in this HHRA to address inhalation of chemicals. One is inhalation of particulates in which nonvolatile chemicals of potential concern (i.e., DDT and lead) are sorbed to airborne dust and subsequently inhaled by receptors. The other pathway evaluated is inhalation of volatile compounds that have migrated from soil to air. Exposure assumptions used in the intake calculations for the inhalation of particulates and volatiles from soil include inhalation rate and exposure time. A particulate emission factor (PEF) and chemical specific volatilization factors are also applied. These factors are detailed below and summarized in Table 4.

- **Inhalation Rate**—For adults (both workers and residents) the inhalation was assumed to be 0.83 cubic meters per hour (m^3/hr). For children 6 to 8 years of age, an inhalation rate of 0.42 m^3/hr is recommended. This is the highest recommended inhalation rate for a child within the age range of 1 through 6 years.

- **Exposure Time—**Inhalation pathways are unique in that an exposure time parameter can be applied to the intake estimates to account for the amount of time during one day that a receptor can potentially inhale chemicals. The exposure time is assumed to be 24 hours for both the adult and child resident, which is conservative given that residents are typically not exposed all day to chemicals in soil at their homes. For workers, an exposure time of 8 hours is assumed.
- **Particulate-emission and Volatilization Factors—**The inhalation pathways incorporate a PEF for nonvolatile chemicals and a chemical specific volatilization factor (VF) for volatile chemicals. These factors relate chemical concentrations in soil to chemical concentrations in air that can be inhaled by receptors. A PEF of 1.32×10^9 cubic meters per kilogram (m^3/kg) was applied. It was derived by assuming a continuous and contact emission rate over an extended period of time. This PEF was used to evaluate inhalation of the nonvolatile chemicals. When available for volatile chemicals, chemical-specific VFs were used.

Chemical intake via inhalation of particulates from soil is estimated according to the following equation (EPA 1989):

$$\text{Intake} = \frac{Cs \times InhR \times EF \times ET \times ED}{PEF \times BW \times AT}$$

Chemical intake via inhalation of volatiles from soil is estimated according to the following equation:

$$\text{Intake} = \frac{Cs \times InhR \times EF \times ET \times ED}{VF \times BW \times AT}$$

Where:

Intake	=	Intake, or dose for each chemical (mg/kg-day)
Cs	=	EPC in soil (mg/kg)
InhR	=	Inhalation Rate (m^3/day)
EF	=	Exposure frequency (day/years)
ET	=	Exposure time (hours)
ED	=	Exposure duration (years)
PEF	=	Particulate-emission factor (m^3/kg)
VF	=	Volatilization factor (m^3/kg)
BW	=	Body weight (kg)
AT	=	Averaging time (days)

3.3.5 Exposure Parameters and Equations for Ingestion of Groundwater

Specific equations used to estimate chemical exposures for each complete pathway are presented in Table 5 for exposure by residents and Table 6 for exposure by trench workers.

Although groundwater beneath the Site is not currently used by residents as a drinking water source, risks were calculated for a hypothetical exposure assuming that future residents might use the groundwater at the Site for drinking and for household use. The groundwater ingestion rates identified for assessing a residential exposure were 2 L/day for an adult and 1 L/day for a child.

Chemical intake from ingestion of chemicals in groundwater was calculated using the following equation (EPA 1989):

$$\text{Intake} = \frac{C_{gw} \times IngR \times EF \times ED}{BW \times AT}$$

Where:

Intake	=	Intake, or dose for each chemical (mg/kg-day)
Cgw	=	EPC in groundwater (mg/kg)
IngR	=	Ingestion Rate (L/day)
EF	=	Exposure frequency (day/years)
ED	=	Exposure duration (years)
BW	=	Body weight (kg)
AT	=	Averaging time (days)

3.3.6 Exposure Parameters and Equations for Dermal Contact with Groundwater

Dermal contact with groundwater used in the home as tap water could occur as a result of bathing or showering. Calculation of exposure through this pathway varies depending on the nature of the chemical involved as well as the length of the exposure and the amount of "lag time" assumed to occur following the exposure period.

The general chemical intake equation for dermal contact with groundwater is as follows (EPA 2004b):

$$\text{Intake} = \frac{DA_{event} \times SA \times EF \times ED}{BW \times AT}$$

Where:

Intake	=	Intake, or dose for each chemical (mg/kg-day)
DA_{event}	=	Absorbed dose per event per area of skin exposed (mg/cm^2-event)
SA	=	Body surface area (cm^2)
EF	=	Exposure frequency (day/years)
ED	=	Exposure duration (years)
BW	=	Body weight (kg)
AT	=	Averaging time (days)

DA_{event} is calculated differently for organic and inorganic chemicals.

For inorganic chemicals DA_{event} is calculated as follows:

$$DA_{event} = K_p \times C_{gw} \times t_{event}$$

For organic chemicals DA_{event} is calculated using the following equations:

If $t_{event} > t^*$

$$DA_{event} = FA \times K_p \times C_{gw} \left[\frac{t_{event}}{1+B} + 2t\tau \times \left(\frac{1 + 3B + 3B^2}{(1+B)^2} \right) \right]$$

If $t_{event} \leq t^*$

$$DA_{event} = 2\ FA \times K_p \times C_{gw} \sqrt{\frac{6\tau \times t_{event}}{\Pi}}$$

Where:

C_{gw}	=	EPC concentration in groundwater (mg/L)
FA	=	Fraction absorbed (unitless)
K_p	=	Skin permeability constant for chemicals in groundwater (cm/hour)
t_{event}	=	Exposure Time (hrs)
t*	=	Time to reach steady state (hrs)
τ	=	Lag time per event
□	=	Pi
B	=	Dimensionless coefficient (cm/hr)

3.3.7 Exposure Parameters and Equations for Inhalation of Vapors from Groundwater

Assuming that groundwater under the former AMCO facility is used in the home as tap water, volatile chemicals within this water that became airborne could be inhaled by residents within their homes during bathing or showering. Assumptions regarding exposure duration and frequency are the same as those used for the soil inhalation pathway described above with the exception that the inhalation pathway is only assumed to occur for volatile chemicals and the VF for each of these chemicals is assumed to be 0.5.

Inhalation of chemicals in groundwater was calculated using the following equation:

$$\text{Intake} = \frac{C_{gw} \times InhR \times VF \times ET \times EF \times ED}{BW \times AT}$$

Where:

Intake	=	Intake, or dose for each chemical (mg/kg-day)
C_{gw}	=	EPC in groundwater (mg/L)
InhR	=	Inhalation Rate (m^3/day)
VF	=	Volatilization factor (L/m^3)
ET	=	Exposure time (hours)
EF	=	Exposure frequency (day/years)
ED	=	Exposure duration (years)
BW	=	Body weight (kg)
AT	=	Averaging time (days)

Since the groundwater is present at the Site at depths less than 10 feet bgs, trench workers may be exposed to groundwater under the former AMCO facility, based on the assumption of standing groundwater in the ditch during digging. For estimating steady-state concentrations of VOCs released to ambient air during trenching activity, the following equations (EPA 1988, EPA 1994, EPA 1995a) were applied:

The chemical specific gas-phase mass-transfer coefficient, k_{iG} for each groundwater COPC is derived as follows:

$$k_{iG} = \left(\frac{MW_{H_2O}}{MW_i}\right)^{0.335} x \left(\frac{T}{298}\right)^{1,005} x k_{G,H_2O}$$

Where:

K_{iG}	=	Chemical-specific gas-phase mass-transfer coefficient (cm/s)
MW_{H2O}	=	Molecular weight of water (g/mol) 18
MW_i	=	Chemical-specific molecular weight (g/mol)
T	=	Average temperature (Kelvin)
k_{GH2O}	=	Gas phase mass transfer coefficient for water vapor at 25 degrees Centigrade (cm/s) 8.33E-01 (EPA 1995a)

The chemical-specific liquid-phase mass-transfer coefficient, K_{iL} for each groundwater COPC is derived as follows:

$$k_{iL} = \sqrt{\frac{MW_{O_2}}{MW_i}} \quad x \quad \frac{T}{298} \quad x \quad k_{L,O2}$$

Where:

K_{iL}	=	Chemical-specific liquid-phase mass-transfer coefficient, (cm/s)
MW_{O2}	=	Molecular weight of oxygen (g/mol) 32
MW_i	=	Chemical-specific molecular weight (g/mol)
T	=	Average temperature (Kelvin)
$k_{L,O2}$	=	Liquid phase mass transfer coefficient for oxygen at 25 degrees Centigrade (cm/s), 2.0E-03 (EPA 1995a)

The overall mass-transfer coefficient for each groundwater COPC is derived as follows:

$$\frac{1}{K_i} = \left(\frac{1}{k_{iL}}\right) + \left(\frac{RT}{H_i k_{IG}}\right)$$

Where:

K_i	=	Chemical-specific overall mass-transfer coefficient (cm/s)
k_{iL}	=	Chemical-specific liquid-phase mass-transfer coefficient (cm/s)
R	=	Gas constant, (atm-m^3/mol-K), 8.2E-05
T	=	Average temperature (Kelvin)
H_i	=	Chemical-specific Henry's Law Constant (atm-m^3/mol)
K_{iG}	=	Chemical-specific gas-phase mass-transfer coefficient (cm/s)

For a conservative risk evaluation, assume an infinite VOC source. At steady state, the emission rate for each VOC can be calculated as below:

$$E_i = K_i \times C_w \times A_w$$

Where:

E_i	=	Emission rate of the VOC (mg/s)
K_i	=	Overall mass-transfer coefficient (cm/s)
C_w	=	Concentration of VOC in groundwater (mg/cm^3)
A_w	=	Bottom area of the trench covered with contaminated water (cm^2)

The box model was used to estimate the concentration of VOCs in the breathing zone of the construction worker using the following equation:

$$C_{air} = \frac{E_i \times CF}{u \times H \times W}$$

Where:

C_{air}	=	Concentration of VOCs in breathing zone ($\mu g/m^3$)
E_i	=	VOC emission rate within the trench (mg/s)
CF	=	Conversion factor (µg/mg)
u	=	Assumed velocity of air in the trench (m/s)
H	=	Mixing height, adult breathing zone (m)
W	=	Width of the trench perpendicular to wind direction (m)

Trench dimensions are assumed to be 10 ft (w) x 10 ft (l) with 70% water coverage in the bottom of the trench assuming dewatering. The mixing height is assumed to be 6 feet. With respect to wind speed in the trench, 0.152 m/s (30 ft/min) is a reasonable lower bound on air flow in the trench (EPA 1994).

4.0 Toxicity Assessment

The toxicity assessment seeks to develop a reasonable association between the degree of exposure to a chemical and the possibility of adverse health effects. A chemical may not cause adverse toxic effects in biological systems unless the agent, or its metabolic byproducts, reach critical receptor sites in the body at specific levels and for a period of time sufficient to elicit a particular effect. Whether a toxic response occurs depends on the chemical and physical properties of the toxic agent, the degree of exposure to the agent, and the susceptibility of an individual to the particular effect. To characterize the toxicity of a particular chemical, the type of effects it can produce, and how much is needed to produce those effects must be known.

The toxicity assessment consists of two components:

- **Hazard Identification**—The process of determining what adverse human health effects, if any, could result from exposure to a particular chemical.
- **Dose-response Evaluation**—A quantitative examination of the relationship between the level of exposure and the probability of adverse health effects in an exposed population.

4.1 Hazard Identification

Health effects are divided into two categories—noncancer and cancer effects. The division is based on the different mechanisms of action associated with each category. Chemicals with noncancer effects may have cancer effects as well. These chemicals are assessed in both categories.

4.1.1 Noncancer Effects

Noncancer or systemic effects are assumed to occur only after a finite level of exposure (i.e., toxic threshold) is exceeded. Exposure levels below the threshold can be tolerated by the organisms without causing an adverse health effect. Noncancer health effects include a variety of toxicological end points and may include effects on specific organs (e.g., pulmonary toxicants affect lungs) or systems (e.g., neurotoxicants affect the nervous system).

Noncancer health effects fall in two basic categories—acute effects and chronic effects. Acute toxicological effects typically occur after a short exposure, and the effects are usually observed within 1 to 7 days. Chronic toxicological effects usually occur after repeated exposure and are observed weeks, months, or years after the initial exposure.

4.1.2 Cancer Effects

Carcinogenesis is generally thought to be a phenomenon for which risk evaluation based on presumption of a threshold is inappropriate. For carcinogens, it is assumed that a small number of molecular events can evoke changes in a single cell that can eventually lead to cancer. This hypothesized mechanism for carcinogenesis is referred to as "non-threshold,"

because there is assumed to be essentially no level of exposure that does not pose a finite probability, however small, of generating a carcinogenic response.

EPA has developed a carcinogen classification system (EPA 1989) that uses a weight-of-evidence approach to classify the likelihood of a chemical being a human carcinogen. Information considered in developing the classification includes human studies that associate cancer incidence with exposure. Also considered are long-term animal studies under controlled laboratory conditions. Other supporting evidence considered includes short-term tests for genotoxicity, metabolic and pharmacokinetics properties; toxicological effects other than cancer; structure-activity relationships; and physical and chemical properties of the chemical.

EPA classifies the chemical into one of the following groups, according to the weight-of-evidence from epidemiologic and animal studies:

- Carcinogenic to Humans
- Likely to be Carcinogenic to Humans
- Suggestive Evidence of Carcinogenic Potential
- Inadequate Information to Assess Carcinogenic Potential
- Not Likely to be Carcinogenic to Humans

The CSFs for COPCs are presented in Table 9.

4.2 Dose-Response Evaluation

Toxicity values are quantitative expressions of the dose-response relationship for a chemical. These values are expressed as cancer slope factors and noncancer reference doses, both of which are specific to the route of exposure.

4.2.1 Toxicity Values for Noncancer Effects

The toxicity value used to describe the dose-response relationship for noncancer health effects is the reference dose (RfD). The EPA defines the RfD as:

> ". . . an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily exposure to the human populations (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime" (EPA 1989).

The oral RfD is generally expressed in units of milligrams per kilogram of body weight per day (mg/kg-day). RfDs for effects associated with inhalation of a particular chemical are given as a reference concentration (RfC) (mg/m^3) that can be converted to an intake (RfD in terms of mg/kg-day).

Dose-response criteria for assessing the potential for noncancer health effects from exposure to chemicals have been developed by EPA on the principle supported by scientific data that noncancer health effects occur only after a threshold dose is reached. A threshold dose is the dose below which most people can be exposed without adverse effects occurring. This threshold dose is usually estimated from the No Observed Adverse Effect Level (NOAEL) or the Lowest Observed Adverse Effect Level (LOAEL) determined from long-term chronic animal studies. The NOAEL is defined as the highest dose at which no adverse effects are

observed, while the LOAEL is defined as the lowest dose at which adverse effects are observed.

Uncertainty factors or safety factors are applied to the NOAEL or LOAEL determined from animal studies and sometimes enhanced with human epidemiologic information to establish RfDs. A chronic RfD represents the dose to which human populations are continuously exposed and are likely to be without significant risk of adverse health effects over a lifetime.

In most cases, the RfD is extrapolated using nontoxic exposure levels in animals to humans and reduced further using individual uncertainty factors ranging from 1 to 10. Uncertainty factors are used in an attempt to account for limitations in the quality or quantity of available dose-response data. An uncertainty factor of 1 to 10 is applied to account for the application of high-dose animal toxicity endpoints to low-dose human exposure. If the toxic endpoints are based upon animal studies, but applied to humans an additional factor of 1 to 10 is applied. Ideally, the RfD is based upon the NOAEL; in those cases where only the LOAEL is available, another factor of 1 to 10 is applied. Similarly, if only subchronic data are available, then an uncertainty factor of 1 to 10 is applied. Finally, RfDs can be adjusted using a modifying factor of 1 to 10 to account for the quality of the toxicological studies or results. The uncertainty factors and the modifying factors provide an inherently more conservative RfD. If all uncertainty and modifying factors are applied at their maximum value, then the endpoints observed in animal studies may be reduced by an overall factor of 10,000.

- For DDT, the experimental NOAEL is 0.05 milligrams per kilogram per day (mg/kg-day). A cumulative uncertainty factor of 100 was applied to this NOAEL (10 for the uncertainty of interspecies conversion and 10 for the protection of sensitive human subpopulations). This results in a RfD for DDT of 0.0005 mg/kg-day (EPA 2006a).
- For Aroclor-1254, the LOAEL is 0.005 mg/kg-day. An uncertainty factor of 300 was applied to this LOAEL, which results in an RfD of 0.00002 mg/kg-day.
- For naphthalene, the adjusted LOAEL is 71 mg/kg-day. An uncertainty factor of 3000 was applied to the NOAEL (10 for extrapolation from rats to humans, 10 for protection of sensitive humans, 10 for extrapolation from subchronic to chronic exposure, and 3 to account for database deficiencies including the lack of chronic oral exposure studies and 2-generation reproductive toxicity studies). The resulting RfD is 0.02 mg/kg-day.
- For vinyl chloride, the NOAEL reported is 0.09 mg/kg-day. An uncertainty factor of 30 was applied to this NOAEL (10 for protection of sensitive human subpopulations and 3 for animal-to-human extrapolation) resulting in an RfD of 0.003 mg/kg-day.

RfDs developed by EPA are used to evaluate noncancer health hazards in the HHRA. The RfDs were complied from EPA's Integrated Risk Information System (IRIS) (EPA 2006a). The noncancer toxicity values for the chemicals of potential concern are listed in Table 9. This table also identifies the toxic endpoints observed in each investigation used to derive the RfD, as well as the cumulative uncertainty factor used to derive each RfD. Route-to-route extrapolations were frequently used when there were no toxicity values available for a given route of exposure. Oral reference doses (RfDo) were used for both oral and inhaled exposures for organic compounds lacking inhalation values. Inhalation reference doses (RfDi) were used for both inhaled and oral exposures for organic compounds lacking oral

values. Route extrapolations were not performed for inorganics due to portal of entry effects and known differences in absorption efficiency for the two routes of exposure. An additional route extrapolation is the use of oral toxicity values for evaluating dermal exposures. In general, dermal toxicity values are not listed in EPA databases and consequently must be estimated from oral toxicity information.

4.2.2 Toxicity Values for Carcinogens

The dose-response relationship for cancer effects is usually expressed as a cancer slope factor (CSF). Generally, the CSF is a plausible upper-bound estimate of the probability of a response per unit intake of a chemical over a lifetime. The CSF is usually, but not always, the upper 95 percent confidence limit of the slope of the dose-response curve and is expressed as the inverse of milligrams of chemical per kilogram of body weight per day $(mg/kg\text{-}day)^{-1}$.

Chemical carcinogens are generally divided into two classes based upon the mechanism by which they cause cancer. The two classes are genotoxic agents (capable of causing DNA damage) and nongenotoxic (toxic through mechanism not related to DNA damage). For genotoxic carcinogens, it is generally assumed that no threshold exists below which the agent cannot cause cancer. In other words, no matter how small the dose, there is some carcinogenic response, even if that response cannot be measured in animal experiments or in an exposed human population. In contrast, nongenotoxic carcinogens are likely to have a threshold dose, below which no adverse toxicological impact would be expected to occur.

The dose-response curve used by regulatory agencies is typically derived using the linearized multistage (LMS) model, which extrapolates the tumor response in animals exposed to high doses to a theoretical cancer risk for human exposed to low doses. EPA acknowledges that this approach likely overestimates cancer risks:

> "It should be emphasized that the linearized multistage procedure leads to a plausible upper limit to risk that is consistent with some proposed mechanisms of carcinogenesis. Such an estimate, however, does not necessarily give a realistic prediction of the risk. The true value of the risk is unknown and may be as low as zero. The range of risks defined by the upper limit given by the chosen model and the lower limit, which may be as low as zero, should be explicitly stated. An established procedure does not yet exist for making 'most likely' or 'best' estimated of risk within a range of uncertainty defined by the upper and lower limit estimates"(EPA 1986)

The linearized multistage procedure is used to develop chemical-specific CSFs. A CSF is a measure of the carcinogenic potency of a chemical. As the slope factor increases, the toxicity of the chemical also increases.

- For example, the CSF for vinyl chloride is 1.5 $(mg/kg\text{-}day)^{-1}$ based on the assumption of continuous lifetime exposure from birth.
- For aldrin, a CSF of 17 $(mg/kg\text{-}day)^{-1}$ was selected based on the geometric mean of 3 separated studies.
- For benzo[a]pyrene, a CSF of 7.3 $(mg/kg\text{-}day)^{-1}$ was calculated based on a geometric mean of four slope factors obtained by different modeling procedures.

There is uncertainty and conservatism built into the risk extrapolation approach. Cancer risks estimated by this method produce an estimate that provides a rough but plausible upper limit of risk (i.e., it is not likely that the true risk would be much more than the estimated risk, but could be considerably lower) (EPA 1989).

4.2.3 Toxicity Values for Lead

Intakes of lead are assessed differently than for other chemicals. Currently, EPA has not established CSFs or RfDs for lead. Much of the toxicological data collected on the effects of lead on the human body relates exposure and effect in terms of the amount of lead in blood associated with an observed effect, expressed as micrograms of lead per deciliter of blood (μg lead/dL blood). EPA and Centers for Disease Control and Prevention (CDC) have identified childhood blood levels of 10 μg/dL as the level of concern above which significant heath risks may occur (EPA 2003a).

Exposure to lead in soil was evaluated using DTSC's Lead Risk Assessment Spreadsheet Version 7, Lead Spread 7 (CalEPA 1999). This model calculates a screening level that represents a concentration of lead in soil for children that is protective for a combined exposure to lead in air, drinking water, food and soil. For the residential lead screening, the most conservative (health-protective) screening level available from the LeadSpread model was selected (99th percentile) based on protection of children's health.

Site-specific screening levels for lead in residential soil of 194 mg/kg including ingestion of homegrown produce and 340 mg/kg excluding homegrown produce were calculated, using local concentration for lead in ambient (outdoor) air and drinking water supply (Attachment 3, Table 3-50). No lead data was available for the Oakland Filbert Street Monitoring Station. The closest monitoring station to the AMCO neighborhood with ambient toxics data for lead is the San Francisco Arkansas Street station, approximately 15 miles west. The maximum lead concentration reported in the last 6 years, 0.055 μg/m^3, was selected as representative of lead in air (Attachment 3, Table 3-51, Table 3-52, and Table 3-53). The East Bay Municipal Utility District's Annual Water Quality Report, Year 2006 (EBMUD 2007) presents chemical concentrations in drinking water for the City of Oakland. For purposes of reporting, the value for lead is below the detectable levels of 5 μg/L.

For workers exposed to lead in soil, the screening level is assumed to be the Region 9 Industrial PRG of 800 mg/kg. EPA uses the Adult Lead Model to estimate PRGs for an industrial setting. This PRG is intended to protect a fetus that may be carried by a pregnant female worker. It is assumed that a cleanup goal that is protective of a fetus will also afford protection for male or female adult workers. The model equations were developed to calculate cleanup goals such that there would be no more than a 5% probability that fetuses exposed to lead would exceed a blood lead (PbB) of 10 μg/dL. An updated screening level for soil lead at commercial/industrial (i.e., nonresidential) sites of 800 mg/kg is based on a analysis of the combined phases of NHANES III that chooses a cleanup goal protective of all subpopulations.

4.2.4 Sources of Toxicity Criteria

The hierarchy of human health toxicity values used by EPA follows Directive 9.85.7-53 issued by EPA's Office of Solid Waste and Emergency Response on December 5, 2003 (EPA 2003b):

- Tier 1 – EPA's IRIS database
- Tier 2 – EPA's Provisional Peer Reviewed Toxicity Value (PPRTV)
- Tier 3 – Health Effects Assessment Summary Tables (EPA 1997), EPA's National Center for Environmental Assessment (NCEA), CalEPA

Slope factors developed by California EPA's Office of Environmental Health Hazard Assessment (OEHHA) and reference exposure levels developed by Air Toxics and Epidemiology Section of OEHHA were used if they were more health-protective than the federal toxicity values.

For the AMCO HHRA, toxicity values presented in the EPA Region 9 PRG tables (EPA 2004a) were used if other toxicity values were not available.

5.0 Risk Characterization

Information presented in the exposure assessment and toxicity assessment is integrated in this section to characterize risks to workers, residents, and recreational users exposed to COPCs from the Site. Theoretical noncancer hazards and lifetime-excess carcinogenic health risks are characterized and discussed. The critical uncertainties affecting risk calculations are discussed in Section 6.0.

In this risk characterization, numerical risk estimates calculated for each COPC and exposure pathway were combined to estimate noncancer HIs and, for carcinogens, total ELCR. In keeping with the most recent guidance, professional judgment has been relied upon to select the most significant uncertainties (those that define and explain the risk estimates) for discussion in the risk characterization.

Under RME conditions, the calculated risks are not likely to be exceeded by any member of the exposed population because of the health-protective exposure assumptions used. A risk assessment does not measure the actual health effects that hazardous substances at a site have on people. Conservative safety margins are built into a risk assessment analysis to ensure protection of the public. Therefore, people will not necessarily be affected even if they are exposed to chemicals at higher dose levels than those estimated in the HHRA. In other words, the most vulnerable people (e.g., children) are carefully considered to make sure all members of the public will be protected.

5.1 Noncarcinogenic Hazard

Noncarcinogenic effects for each exposure route and chemical are evaluated by comparing the average dose over a specified time period. The ratio of the average daily dose to RfD is called a hazard quotient (HQ), which is calculated as follows:

$$HQ = \frac{ADD}{RfD}$$

Where:

HQ = Theoretical noncancer hazard quotient for chemical and exposure pathway
ADD = Average Daily Dose (mg/kg-day) for chemical and exposure pathway
RfD = Reference Dose (mg/kg-day) for chemical and exposure pathway

The HQ assumes that there is a dose below which adverse health effects are unlikely (EPA 1989). If the average daily dose is below the threshold RfD (i.e., the ratio is less than 1), it is unlikely that noncarcinogenic effects would occur. To assess the overall potential for noncarcinogenic effects from a particular exposure scenario, HQ for the relevant individual soil exposure pathways (i.e., ingestion, dermal contact, and inhalation) and chemicals are summed to obtain the HI for the population evaluated:

HI = Sum of HQs for chemicals and pathways

When the total HI exceeds 1, a segregated HI analysis is used to further evaluate adverse noncancer health hazards associated with exposure to COPCs in soil and groundwater. Segregated HIs are prepared because adverse noncancer health effects of chemicals that affect different target organs are generally not additive (EPA 1989). Segregated HIs are the sums of chemical-specific HQs grouped according to affected target organ and corresponding to the lowest adverse-effect levels (that is, the critical effects) identified by EPA. A segregated HI that exceeds 1 indicates the potential for adverse noncancer health effects (EPA 1989). A segregated HI that does not exceed 1 indicates that no appreciable risk exists for adverse noncancer health effects.

For assessing noncancer hazards for a 30-year residential exposure, the child (6 year exposure) and adult (24-year exposure) residential HI are calculated separately. A 30-year exposure scenario is consistent with EPA national guidance, as explained in the Preamble to the NCP (55 Fed. Reg. 8710). The Preamble states that Superfund remedial projects will address lifetime excess cancer risks using a reasonable maximum exposure scenario. EPA national Superfund guidance calculates lifetime risk over 70 years based on a reasonable maximum exposure scenario, which is defined as a 30-year exposure in the case of residents and 25-year exposure in the case of workers. The concept of lifetime risk does not automatically imply exposure over an entire 70 year lifetime.

A HI at or below 1 indicates that there is unlikely to be any increased health risk even for sensitive populations. At the same time a HI greater than 1 does not necessarily indicate that adverse effects will occur, because the RfD used in the calculation contains substantial measure of conservatism. The RfD is conservative because it is typically derived by applying multiple safety factors to a level at which no adverse effects have been observed or to the lowest level at which effects have been observed in the most sensitive animal species that have been tested.

5.2 Cancer Risks

The theoretical lifetime-excess cancer risks associated with the lifetime average daily doses are calculated as the product of the LADD and the CSF for each chemical and exposure pathway as shown below:

Risk = CSF x LADD

Where:

Risk = Theoretical lifetime-excess cancer risk for chemical and pathway
CSF = Slope Factor for chemical and exposure pathway
LADD = Lifetime Average Daily Dose for chemical and exposure pathway

The quantitative risk estimates for suspected carcinogens are expressed as the lifetime-theoretical-excess (or additional) risk of contracting cancer above the background incidence of cancer if no exposure to chemicals occurs. In the U.S. population, the likelihood of developing cancer over one's lifetime is approximately 1-in-2 males and 1-in-3 females (American Cancer Society 2007). The total upper-bound theoretical excess cancer risk is calculated by combining the risks across pathways and chemicals as follows:

Total lifetime-theoretical-excess risk = Sum of risks for chemicals and pathways

For assessing excess cancer risk for a 30-year residential exposure, the child (6-year exposure) and adult (24-year exposure) residential cancer risks are summed.

5.2.1 Cancer Risk Perspective

EPA has provided guidance on the role of the risk assessment in federal Superfund remedy selection (EPA 1991b). EPA considers a target lifetime-theoretical-excess risk range of 10^{-6} to 10^{-4}, to be "safe and protective of public health" (56 F.R. 3535), although EPA has discretion to take action in this range depending on site-specific circumstances.

According to EPA, where the cumulative lifetime-theoretical-excess cancer risk to an individual based on RME assumptions is less than 10^{-4}, and the theoretical noncancer HI is less than 1, remedial action is generally not warranted unless there are other adverse environmental impacts or an applicable or relevant and appropriate requirement (ARAR) is exceeded. Even risks slightly greater than 1×10^{-4} may be considered adequately protective based on site-specific conditions, including any uncertainties about the nature and extent of contaminants and associated risks. Alternatively, on a case-by-case basis, action may be recommended for sites within the 10^{-6} to 10^{-4} risk range. Where remedial action is warranted, guidance for remedy selection is provided in the EPA directive entitled *Land Use in the CERCLA Remedy Selection Process* (EPA 1995b). The directive notes that it is not EPA's intent that acceptable risk standards be based solely on categories of land use (i.e., with residential cleanup at a 10^{-6} level or industrial at a 10^{-4} level). Rather, the risk range provides the risk manager with the necessary flexibility to address technical and cost limitations, and performance and risk uncertainties in all site remediation efforts.

When it is stated that exposure to cancer-causing chemicals results in a cancer risk of one-in-a-million, it means that each individual exposed to that chemical, at that level over his or her lifetime, has a one-in-a-million chance above the background risk of getting cancer from that particular exposure. In order to take into account the uncertainties in the science, the risk numbers are calculated using conservative assumptions, which results in conservative estimates of risk. The risk is the plausible upper limit of the true risk. In actuality, the extra risk is probably somewhat less than those calculated and presented in the following sections.

5.3 Risk Characterization Results

In this section, the quantitative evaluations of theoretical noncancer hazards and lifetime-theoretical excess cancer risks are presented for each scenario evaluated in the HHRA. Quantitative risks and hazards were estimated under RME conditions for the soil, groundwater, and soil gas datasets described in Section 2, Data Collection and Data Evaluation. In addition to the risk and hazards estimated for these datasets, a screening level risk evaluation was conducted for adjacent residential properties and Prescott Park.

Attachment 1 (Tables 1-7 through 1-126) provides detailed risk and hazard results for exposure to soil; Attachment 2 (Tables 2-1 through 2-27) provides detailed risk and hazard results for exposure to groundwater; and Attachment 3 (Tables 3-1 through 3-58) summarizes the results of the residential screening risk evaluation. Results are also summarized for soil in Table 10 and for groundwater in Table 11.

5.4 Soil Risk Evaluation

Throughout the following sections, shallow soil risk refers to risk from exposure to soil contamination in the upper 2 feet of soil. Approximately 0.5 to 3.5 feet of concrete covers the soil in most areas of the on- and off-facility properties. Deep soil risk or subsurface risk refers to risk from exposure to contamination from surface to the maximum sample depth of approximately 7 feet. It is important to note that the on- and off-facility properties are mostly paved so the potential for contact with the soil is minimized. The evaluation of RME risk for both commercial/industrial and construction workers assumes no pavement. The evaluation of RME risk for the future on-facility resident assumes the on- and off-facility properties are developed for homes and are not paved.

To evaluate the on-facility soil, soil samples were divided into the following four exposure areas: former AMCO facility, parking lot, large vacant lot, and small vacant lot.

5.4.1 Former AMCO Facility

One-hundred-ten chemicals were detected in soil samples collected from the former AMCO facility, including 18 metals, 17 pesticides or polychlorinated biphenyls (PCBs), 30 semivolatile organic compounds (SVOCs) , 30 VOCs and 15 dioxins or furans (Attachment 1, Table 1-1 and Table 1-2). At present, the former AMCO facility is paved, and concrete in some areas is present to a depth of approximately 3 feet. As with the other paved soil areas, it was assumed that no pavement would be present to preclude direct contact with soil. Theoretical excess lifetime-cancer risks and noncancer HI for all exposure scenarios are shown in Attachment 1, Table 1-109.

For the industrial worker RME scenario, the ELCR is 1×10^{-4} for the shallow soil and for deep soil is 2×10^{-4}. Both the shallow and deep soil HIs are 2.

For the construction worker RME scenario, the ELCR is 1×10^{-5} for the shallow soil. The ELCR calculated for deep soil is 2×10^{-5}. The shallow soil HI is 4 and deep soil HI is 5.

For the future on-facility residential RME scenario, for both shallow and deep soil, the ELCR is 4×10^{-4}. The HI for the child is 14 for the shallow soil and 15 for the deep soil. For the adult, both the shallow and deep soil HI is 3.

The lead exposure point concentration for shallow soil is 640 mg/kg and for deep soil 605 mg/kg (Attachment 1, Tables 1-5 and 1-6); both exceed the AMCO residential site-specific screening levels of 194 mg/kg including ingestion of homegrown produce and 340 mg/kg excluding homegrown produce. However, these lead concentrations are below the PRG for an industrial scenario (800 mg/kg).

The chemicals that contribute most to the risk include lead, arsenic, vinyl chloride, TCE, cis-1,2-dichloroethene, naphthalene, aldrin, and dieldrin (Attachment 1, Tables 1-11, 1-12, 1-17, 1-18, 1-23, 1-24, 1-29, and 1-30).

5.4.2 Parking Lot

In soil at the parking lot, there are 67 chemicals detected in soil, including 18 metals, 8 pesticides or PCBs, 18 SVOCs, 6 VOCs, and 17 dioxins or furans (Attachment 1, Table 1-1

and Table 1-2). At present the parking lot is paved. As with the other evaluated soil areas, it was assumed that no pavement would be present to preclude direct contact with soil.

For the industrial worker RME scenario, the ELCR is 1×10^{-4} for the shallow soil. The total ELCR for deep soil was 2×10^{-4}. Both the shallow and deep soil HI is 1.

For the construction worker RME scenario, the ELCR is 2×10^{-5}. The ELCR for deep soil was 3×10^{-5}. Both the shallow and deep soil HI is 4.

For the future on-facility residential RME scenario, the ELCR is 4×10^{-4} for shallow soil and 5×10^{-4} for deep soil. The HI for the child is 28 for the shallow soil and 27 for deep soil. For the adult, both the shallow and deep HI is 2.

The lead exposure point concentration for shallow soil is 2,170 mg/kg and for deep soil 1,450 mg/kg; both exceed the AMCO residential site-specific screening level for lead and the PRG for an industrial scenario (800 mg/kg) (Attachment 1, Tables 1-31 and 1-32).

The chemicals that contribute most to the risk include lead, arsenic, benzo(a)pyrene and antimony (Attachment 1, Tables 1-37, 1-38, 1-43, 1-44, 1-49, 1-50, 1-55, and 1-56).

5.4.3 Large Vacant Lot

In soil at the large vacant lot, there are 73 chemicals detected in soil, including 18 metals, 18 pesticides or PCBs, 23 SVOCs, and 14 VOCs (Attachment 1, Table 1-1 and Table 1-2).

At present the large vacant lot is paved. As with the other evaluated soil areas, it was assumed that no pavement would be present to preclude direct contact with soil.

For the industrial worker RME scenario, the ELCR is 2×10^{-4} for the shallow soil. The ELCR for deep soil is 1×10^{-4}. Both the shallow and deep soil HIs are less than 1.

For the construction worker RME scenario, the shallow soil ELCR is 2×10^{-5}. The ELCR for deep soil is 2×10^{-5}. The shallow soil HI is 3, and the deep soil HI is 2.

For the future on-facility residential RME scenario, the ELCR is 6×10^{-4} for shallow soil. The ELCR calculated for deep soil is 4×10^{-4}. The HI for the child is 11 for the shallow soil and 8 for the deep soil. For the adult, both the shallow and deep soil HIs are less than 1.

The lead EPC for shallow soil is 4,360 mg/kg and for deep soil 2,750 mg/kg; both exceed the AMCO site-specific residential screening level for lead and the PRG for an industrial scenario (800 mg/kg) (Attachment 1, Tables 1-57 and 1-58).

The chemicals that contribute most to the risk estimate are lead, arsenic, DDT, and benzo(a)pyrene (Attachment 1, Tables 1-63, 1-64, 1-69, 1-70, 1-75, 1-76, 1-81, and 1-82).

5.4.4 Small Vacant Lot

In soil at the small vacant lot property, there are 23 chemicals detected in soil, including 17 metals and 6 pesticides or PCBs (Attachment 1, Table 1-1). At present the small vacant lot is paved. As with the other evaluated soil areas, it is assumed that in the future no pavement would be present to preclude direct contact with soil. Only shallow soil samples were collected due to the shallowness of the water table at this location.

For the industrial worker RME scenario, the ELCR is 1 x 10^{-4} for the shallow soil. The HI is less than 1.

For the construction worker RME scenario, for shallow soil the ELCR is 1 x 10^{-5}. The shallow soil HI is 1.

For the potential on-facility residential RME scenario, the ELCR is 3 x 10^{-4} for shallow soil. The HI for the child is 12. For the adult, the HI is less than 1.

The lead exposure point concentration for shallow soil is 386 mg/kg (Attachment 1, Table 1-1), which exceeds the AMCO site-specific screening level of 194 mg/kg including ingestion of homegrown produce and 340 mg/kg excluding ingestion of homegrown produce. However, the EPC is below the PRG for an industrial scenario (800 mg/kg).

The chemicals that contribute most to the risk and HI are lead, arsenic, dieldrin, and DDT (Attachment 1, Tables 1-88, 1-89, 1-94, 1-95).

5.4.5 Background Soil Risk Evaluation

Many substances, such as metals, are naturally occurring elements in the environment and are commonly present in all environmental samples. For these constituents, it is important to determine what fraction of the concentration detected is due to the site-related contamination, and what fraction represents background for the former AMCO facility. Background refers to the average concentration of the chemical in similar nearby reference areas that have not been impacted by the Site.

Risks and hazards from exposure to background concentrations of metals in soil were estimated using the City of Oakland *Survey of Background Metal Concentration Studies* (City of Oakland 1995). For a child resident, the ELCR is 2 x 10^{-4}. Arsenic contributed over 99% of the total background risk. The HI is 10 for the child resident and 1 for the adult. Thallium contributed 89% to the total background HI.

For industrial workers the ELCR from exposure to background soil is 6 x 10^{-5}. The HI for industrial workers is less than 1. For construction workers the ELCR is 9 x 10^{-6}, and the HI is 3. As with the residential scenario, risks from exposure to background concentrations are driven by arsenic, while noncancer hazards are driven almost entirely by thallium.

Some naturally-occurring concentrations of metals (i.e., arsenic) in Oakland soils are higher than the thresholds calculated by risk-based models. In these cases, EPA typically conducts community outreach activities to educate and advise the community about the potential risks to the public and to communicate precautions that they might take to lower the risk from arsenic exposure. Superfund cleanups are not conducted where the sole or principal threat is from natural background sources.

5.5 Groundwater Risk Evaluation

Currently, residents are using drinking water supplied by the East Bay Municipal Utility District from Sierra Nevada. The groundwater underneath the Site is not being used for drinking or other potable uses. It is extremely unlikely that residents would drink groundwater underneath the Site in the future; however, in accordance with input from the

community and regulatory agencies the potential risk of using groundwater underneath the Site as drinking water is evaluated.

Total Dissolved Solids (TDS) is the water quality parameter typically used to determine whether groundwater is potentially of "beneficial use". TDS concentrations over 3,000 mg/L are considered too high for "beneficial use" as drinking water (RWQCB 2004). Across the RI area, TDS concentrations ranged from 730 to 53,000 mg/L. With the exception of RMW-03-15, which had a TDS concentration of 3,600 mg/L, all samples north of 3rd Street were below the drinking water threshold of 3,000 mg/L. TDS concentrations in all wells south of 3rd Street were above 3,000 mg/L.

5.5.1 Shallow Groundwater

For the potential residential RME scenario, the excess lifetime cancer risk is 1×10^{-1} for groundwater. The HI for the child was 1,153, and the HI for the adult was 484 (Attachment 2, Table 2-22).

In addition, at the request of the community's technical advisor, a trench worker's risk from contact with groundwater underneath the Site is evaluated. For the trench worker RME scenario, the total lifetime-excess cancer risk was 1×10^{-4} for groundwater (Table 2-14). The HI for the trench worker was 34 (Attachment 2, Table 2-15).

The chemicals that contribute most to the risk through exposure to groundwater include vinyl chloride, arsenic, cis-1, 2-dichloroethene, benzo(a)pyrene, and aroclor-1260 (Attachment 2, Tables 2-10, 2-11, 2-14 and 2-15).

5.5.2 Residential Irrigation Well

One of the residents living adjacent to the facility owns a well located in his backyard shed. According to the property owner, the well is primarily used for backyard irrigation. The well is not used as a source of drinking water. The residential irrigation well was sampled on three occasions: September 2, 2004; June 24, 2005; and October 12, 2005. A summary of the results is presented in Table 12.

As indicated on this table, the only analyte that exceeds the MCL is lead. However, boron, manganese, mercury, and sodium are at concentrations that exceed their agricultural water quality limit (Ayers and Westcot 1985).

5.6 Residential Soil Gas, Ambient Air, and Crawlspace Air

Ambient air samples were collected to evaluate the potential for vapor intrusion. Soil gas and crawlspace air samples were collected to determine preferential migration pathways for VOCs and the potential for vapor intrusion into buildings or residences. The inhalation exposure pathway from vapor intrusion differs from other exposure pathways in several respects. EPA has a draft guidance on vapor intrusion. EPA vapor intrusion guidance recommends a 3-tier screening process to evaluate the vapor intrusion pathway (EPA 2002).

Tier 1 (primary screening) is designed to help quickly screen out sites at which the vapor intrusion pathway does not ordinarily need further consideration, and point out the sites that do typically need further consideration. This evaluation involves determining whether any potential exists at a site for vapor intrusion to result in unacceptable indoor inhalation

risks and, if so, whether immediate action may be warranted. Tier 2 (secondary screening) involves comparing available measured or reasonably estimated concentrations of COPCs in groundwater and/or soil gas to target concentrations. Tier 3 involves more detailed studies including foundation and/or indoor air sampling and vapor intrusion modeling.

Assessing the vapor intrusion pathway is more complex because it may involve the use of indirect measurements and modeling (e.g., using soil gas or groundwater data) to assess the potential for indoor inhalation risks at the Tier 3 level. Estimating human health risk from indoor air exposure depends upon human exposure to the vapors. If contaminant vapors do not enter the building, the exposure pathway from the source of contamination to a person (receptor) is not complete, and in such circumstances the person cannot be considered to be at risk from indoor air exposure due to vapor intrusion. In other situations, vapors may enter the building, but be present at such low levels that the risk is considered negligible. However, in some cases, vapors may enter into a building and accumulate at levels that may pose an unacceptable risk to human health.

The CSM identifies the indoor air pathway as potentially complete for the commercial/ industrial worker (including an indoor worker), the future on-facility resident and the current and future off-facility resident. For residential properties bordering the former AMCO facility, a Tier 2 type of approach was conducted by comparing soil gas to Region 9 ambient air PRGs multiplied by an attenuation factor of 10 (recommended by EPA in the OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils – EPA 2002) and crawlspace air sample results to ambient air PRGs (EPA 2004a). A Tier 3 assessment was not conducted for this HHRA because results from the Tier 2 assessment were considered adequate for establishing COPCs and the presence of potential health risks.

The Tier 3 evaluation was not performed for the following reasons:

1. Crawlspace air sample results were used in the evaluation which may provide more accurate data than modeling VOC concentrations from groundwater to indoor air.

2. The Johnson & Ettinger Model for groundwater assumes that the groundwater is at least 5 feet below the ground surface. During the RI, the water table fluctuated between approximately 2.5 and 6.5 feet below ground surface (bgs). The majority of the water level measurements were shallower than 5 feet.

3. Based on the high groundwater VOC concentrations at the former AMCO facility and the VOCs found in the crawlspace, ambient air, and soil gas samples, it is clear that the VOCs are coming from the groundwater.

The screening level risk evaluation was conducted to assess whether there is an immediate health threat to residents and to determine whether the vapor intrusion pathway is significant. An ongoing assessment of the vapor intrusion pathway is being conducted, including continued monitoring. The results from the continued monitoring are being evaluated to assess whether a quantitative analysis risk approach is appropriate.

The screening level risk evaluation compares concentrations detected in ambient air, crawlspace air, and soil gas at the residential properties to screening levels. The exposure assumptions that were used to generate the screening levels for the exposure assessment are

for RME conditions (includes sensitive populations). Screening levels are specific concentrations of chemicals that are considered by EPA to be health protective for human populations. If a contaminant concentration is below the screening level, then no immediate action is necessary. If a contaminant is present at a concentration above the screening level, it does not necessarily mean that this chemical poses a significant health risk. However, further evaluation of possible exposure to that contaminant may be needed.

Screening levels for soil gas sample results were developed based on an attenuation factor of ten which is the recommended attenuation factor for shallow soil gas in the OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (EPA 2002). The attenuation factor represents the ratio between indoor air concentration and soil gas concentration, as follows:

$$\alpha = \frac{C_{indoor}}{C_{soil\ gas}}$$

Where:

C_{indoor} = Indoor air concentration (ug/m^3)
$C_{soil\ gas}$ = Soil gas concentration (ug/m^3)

A complicating factor in evaluating the potential chronic risk from vapor intrusion is the potential presence of some of these same chemicals in background outdoor (ambient) air. Background ambient air samples were collected during each residential monitoring event to enable the comparison of the ambient and crawlspace air samples collected at residential properties, South Prescott Park, and the on-facility office to background ambient air concentrations.

Comparisons were made between the results of residential air sampling and the results background ambient or outdoor air sampling conducted the same day. Neighborhood background samples which were collected at 329 Lewis St. (upwind of the former AMCO facility) in the morning and afternoon of the same day the residential samples were collected to put the results in perspective. This location was selected because it is sufficiently close to the former facility property so that concentrations of VOCs in ambient air at this location would be representative of area-wide concentrations, but is sufficiently distant from the site so that any VOCs related to the former AMCO facility would be unlikely to bias the sample.

In addition, ambient air and crawlspace air sample results were compared to acute reference exposure levels (RELs) developed by the OEHHA (2000) and acute MRLs developed by ATSDR. Acute health effects (those occurring after only a very short exposure; e.g., hours or days) typically develop only in response to much higher exposure concentrations (usually 100-fold or greater) than do chronic effects. Therefore, measured exposure concentrations which are below chronic screening levels are not expected to pose significant acute health risks.

To evaluate seasonable variability, residential soil gas sampling was conducted three times —twice during the dry season (September 2004 and October 2006) and once during the wet season (May 2005).

5.6.1 1428 3rd Street Soil Gas, Ambient Air, and Crawlspace Air Sampling Results

Figure 5 shows the soil gas, ambient air, and crawlspace air sampling locations and results that exceed screening levels. Soil gas samples were collected from 1428 3rd Street in September 2004 and November 2006. Because of the high soil moisture content during the May 2005 sampling event, soil gas samples could not be collected at this residential property. During May 2005, groundwater was between approximately two and three feet bgs, whereas during the other two soil gas sampling events groundwater was between roughly three and five feet bgs. Soil gas sample results from 2004 indicated 1,1-dichloroethane, chloroform, PCE, and TCE above screening levels (Attachment 3, Table 3-24). Soil gas sample results from 2006 indicated chloroform, PCE, and TCE above screening levels (Attachment 3, Table 3-37). The exceedances of soil gas screening levels for chloroform, PCE, and TCE were greater than an order of magnitude.

Ambient air samples were collected in 2004 (Attachment 3, Table 3-3), 2005 (Attachment 3, Table 3-9), and 2006 (Attachment 3, Table 3-17). Ambient air sample results from 2004 indicated 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1,4-dichlorobenzene, benzene, carbon tetrachloride, chloroform, PCE, and TCE above screening levels. The exceedances were generally slightly above screening levels. Crawlspace air samples indicated concentrations of benzene, carbon tetrachloride, chloroform, PCE, and TCE above screening levels (Attachment 3, Table 3-3). Of the nine VOCs detected above screening levels in ambient air and crawlspace air, neighborhood background air results for 2004 indicated four VOCs (benzene, carbon tetrachloride, chloroform, and TCE) above screening levels (Attachment 3, Table 3-2).

Ambient air samples in 2005 samples indicate 1,1,2,2-tetrachloroethane, benzene, carbon tetrachloride, chloroform, methylene chloride, and naphthalene above screening levels. Crawlspace air samples showed 1,4-dichlorobenzene, benzene, carbon tetrachloride, chloroform, methylene chloride, and TCE above screening levels (Attachment 3, Table 3-9). Of the six VOCs detected above screening levels, neighborhood background air results for 2005 indicated four VOCs (benzene, carbon tetrachloride, chloroform, and PCE) above screening levels (Attachment 3, Table 3-8).

Ambient air samples in 2006 samples indicate benzene, carbon tetrachloride, chloroform, PCE, and TCE above screening levels. Crawlspace air samples indicated 1,4-dichlorobenzene, benzene, carbon tetrachloride, chloroform, naphthalene, PCE, TCE, and vinyl chloride above screening levels (Attachment 3, Table 3-17). Vinyl chloride exceeded its screening level by two orders of magnitude in one of two crawlspace samples (1428CAc). Of the eight VOCs detected above screening levels, neighborhood background air results for 2006 indicated five VOCs (benzene, carbon tetrachloride, chloroform, TCE, and PCE) above screening levels (Attachment 3, Table 3-15). All detected VOCs were well below acute RELs and MRLs indicating no immediate health threats to residents.

5.6.2 1432 3rd Street Soil Gas, Ambient Air, and Crawlspace Air Sampling Results

Figure 6 shows the soil gas, ambient air, and crawlspace air sampling locations and results that exceed screening levels. Soil gas samples were collected from 1432 3rd Street in

September 2004 and November 2006. Soil gas sample results in 2004 indicated chloroform above screening levels (Attachment 3, Table 3-25) and in 2006 chloroform and PCE concentrations greater than screening levels (Attachment 3, Table 3-38). Chloroform was detected at concentrations ranging from 1.6 to 6.3 $\mu g/m^3$, all exceeding the soil gas screening level for chloroform of 0.83 $\mu g/m^3$. PCE was not detected in soil gas sample collected at this residence (reporting limit [RL] = 4.6 $\mu g/m^3$) in September 2004 but was detected at 11 $\mu g/m^3$ in November 2006, which is above the PCE screening level of 3.2 $\mu g/m^3$).

Ambient air samples were collected in 2004 (Attachment 3, Table 3-4), 2005 (Attachment 3, Table 3-10), and 2006 (Table 3-18). Ambient air samples in 2004 indicated benzene, carbon tetrachloride, chloroform, PCE, and TCE above screening levels. Crawlspace air samples indicated 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, 1,4-dichlorobenzene, benzene, carbon tetrachloride, chloroform, PCE, TCE, and vinyl chloride above screening levels. Of the nine VOCs detected above screening levels in the air samples collected at 1432 3rd Street, neighborhood background air results for 2004 indicated four of the VOCs (benzene, carbon tetrachloride, chloroform, and TCE) above screening levels (Attachment 3, Table 3-2).

Ambient air samples in 2005 samples indicate benzene, carbon tetrachloride, chloroform, and naphthalene above screening levels. Crawlspace air samples indicated 1,4-dichlorobenzene, benzene, carbon tetrachloride, and chloroform above screening levels (Attachment 3, Table 3-10). Of the five VOCs detected above screening levels, neighborhood background air results for 2005 detected four of them (benzene, carbon tetrachloride, chloroform, and PCE) above screening levels (Attachment 3, Table 3-8).

Ambient air samples in 2006 samples indicated benzene, carbon tetrachloride, chloroform, naphthalene, PCE, and TCE above screening levels. Crawlspace air samples indicated 1,4-dichlorobenzene, benzene, carbon tetrachloride, chloroform, naphthalene, PCE, TCE, and vinyl chloride above screening levels (Attachment 3, Table 3-18).

Neighborhood background air results for 2006 indicate benzene, carbon tetrachloride, chloroform, TCE, and PCE above screening levels (Attachment 3, Table 3-15). All detected VOCs were well below acute reference concentrations indicating no immediate health threats to residents.

5.6.3 1436 3rd Street Soil Gas and Air Sampling Results

Since this house is constructed with a 26-inch slab-on-grade foundation with no crawlspace, only ambient air and soil gas samples were collected at this location.

Figure 7 shows the soil gas and ambient air sampling locations and results that exceed screening levels. Soil gas samples were collected from 1436 3rd Street in September 2004 and November 2006. Soil gas sample results in 2004 indicated PCE above screening levels (Attachment 3, Table 3-26) and in 2006 chloroform concentrations exceeded screening levels (Attachment 3, Table 3-39). The soil gas concentration of chloroform (1.6 $\mu g/m^3$) was approximately 2 times the screening level (0.83 $\mu g/m^3$). PCE was detected in soil gas at 5.2 $\mu g/m^3$, which is only slightly higher than the screening level of 3.2 $\mu g/m^3$.

Ambient air samples were collected in 2004 (Attachment 3, Table 3-5), 2005 (Attachment 3, Table 3-11), and 2006 (Attachment 3, Table 3-19). Ambient air samples in 2004 indicated benzene, carbon tetrachloride, chloroform, and TCE above screening levels. All of the VOCs

detected in the ambient air samples above screening levels were also indicated in the neighborhood background air results for 2004 above screening levels (Attachment 3, Table 3-2).

Ambient air samples in 2005 indicated benzene, carbon tetrachloride, chloroform, methylene chloride, and naphthalene above screening levels. Five VOCs were detected above screening levels in neighborhood background air results for 2005 (benzene, carbon tetrachloride, chloroform, naphthalene, and PCE) (Attachment 3, Table 3-8).

Ambient air samples in 2006 indicated benzene, carbon tetrachloride, chloroform, methylene chloride, TCE, and vinyl chloride above screening levels. Neighborhood background air results for 2006 indicated benzene, carbon tetrachloride, chloroform, TCE, and PCE above screening levels (Attachment 3, Table 3-15). All detected VOCs were well below acute reference concentrations indicating no immediate health threats to residents.

5.6.4 326 Center Street Soil Gas, Ambient Air, and Crawlspace Sampling Results

Figure 8 shows the soil gas, ambient air, and crawlspace air sampling locations and results that exceed screening levels. Soil gas samples were collected from 326 Center Street in September 2004 and May 2005. Access to this parcel was not secured during the November 2006 sampling event so soil gas, ambient air, and crawlspace air samples were not collected. Soil gas sample results in 2004 indicated chloroform, PCE, and TCE above screening levels (Attachment 3, Table 3-27). Soil gas sample results in 2005 indicated chloroform and PCE above screening levels (Attachment 3, Table 3-32). During the September 2004 sampling event, the soil gas results were significantly higher than screening levels. Although some compounds exceeded their crawlspace air and ambient air screening levels, the concentrations detected were within the same range as the screening levels.

Ambient air samples were collected in 2004 (Attachment 3, Table 3-6) and 2005 (Attachment 3, Table 3-12). Ambient air samples in 2004 indicated 1,4-dichlorobenzene, benzene, carbon tetrachloride, and chloroform above screening levels. In crawlspace air 1,4-dichlorobenzene, benzene, and carbon tetrachloride were detected above screening levels. Neighborhood background air results for 2004 indicated benzene, carbon tetrachloride, chloroform, and TCE above screening levels (Attachment 3, Table 3-2)

Ambient air samples collected in 2005 indicated benzene, carbon tetrachloride, chloroform, and hexachlorbutadiene above screening levels. The crawlspace of this residence is well ventilated so crawlspace samples were not collected. Neighborhood background air results for 2005 detected benzene, carbon tetrachloride, chloroform, and PCE above screening levels (Attachment 3, Table 3-8). All detected VOCs were well below acute reference concentration indicating no immediate health threats to residents.

5.6.5 356 Center Street Soil Gas and Air Sampling Results

Figure 9 shows the soil gas and ambient air locations and results that exceed screening levels. Soil gas samples were collected from 356 Center Street in September 2004 (Attachment 3, Table 3-28), May 2005 (Attachment 3, Table 3-33), and November 2006 (Attachment 3, Table 3-40). There were no soil gas screening level exceedances in either September 2004 or May 2005 samples. In 2006, chloroform (1.2 $\mu g/m^3$) and PCE (3.3 $\mu g/m^3$) exceeded screening levels.

Ambient air samples were not collected at 356 Center Street because of the proximity of this residence to the ambient air sample collected at 360 Center Street.

5.6.6 360 Center Street Soil Gas and Ambient Air Sampling Results

Figure 10 shows the soil gas and ambient air sampling locations and results that exceed screening levels. Soil gas samples were collected from 360 Center Street in September 2004 (Attachment 3, Table 3-29), May 2005 (Attachment 3, Table 3-34), and November 2006 (Attachment 3, Table 3-41). Soil gas sample results in 2004 indicated benzene slightly above its screening level. Soil gas sample results in 2005 indicated 1,1,2,2-tetrachloroethene and chloroform slightly above screening levels. In 2006, the soil gas chloroform concentration was approximately 2 times its screening level.

Ambient air sample were collected in 2004 (Attachment 3, Table 3-7), 2005 (Attachment 3, Table 3-13) and 2006 (Attachment 3, Table 3-20). Ambient air samples in 2004 detected carbon tetrachloride above screening levels. Neighborhood background air results for 2004 indicated benzene, carbon tetrachloride, chloroform, and TCE above screening levels (Attachment 3, Table 3-2).

Ambient air samples in 2005 indicated benzene, carbon tetrachloride, and chloroform above screening levels. Neighborhood background air results for 2005 indicated these three compounds as well as PCE above screening levels (Attachment 3, Table 3-8).

Ambient air samples in 2006 indicated benzene, carbon tetrachloride, chloroform, PCE, and TCE above screening levels. Neighborhood background air results for 2006 indicated all these VOCs also above screening levels (Attachment 3, Table 3-15). All detected VOCs were well below acute reference concentrations indicating no immediate health threats to residents.

5.6.7 1414 3rd Street Crawlspace Air Sampling Results

Figure 11 shows the crawlspace air sampling locations and results that exceed residential and industrial screening levels. In 2006, crawlspace air samples were collected at 2 locations in the office (Attachment 3, Table 3-16). Crawlspace air samples indicated 1,1-dichloroethane, 1,4-dioxane, benzene, carbon tetrachloride, chloroform, cis-1,2-dichloroethene, naphthalene, PCE, TCE and vinyl chloride above residential screening levels. Crawlspace air samples indicated benzene, carbon tetrachloride, chloroform, cis-1,2-DCE, naphthalene, PCE, TCE, and vinyl chloride above industrial screening levels. All detected VOCs were well below acute reference concentrations indicating no immediate health threats to workers in the office.

5.6.8 Prescott Park Soil Gas and Ambient Air Sampling Results

Figure 12 shows the soil gas and ambient air sampling locations and results that exceed screening levels. Soil gas samples were collected from Prescott Park in September 2004 (Attachment 3, Table 3-30) and May 2005 (Attachment 3, Table 3-35). Soil gas sample results in 2004 indicated chloroform, PCE, and TCE above screening levels. Soil gas sample results in 2005 indicated 1,3-butadiene, benzene, chloroform, PCE, and TCE above screening levels.

Ambient air samples were collected in 2005 (Attachment 3, Table 3-14) and 2006 (Attachment 3, Table 3-21). In 2005, 1,4-dioxane, benzene, carbon tetrachloride, and

chloroform were detected slightly above screening levels. In 2006, benzene, carbon tetrachloride, chloroform, PCE, and TCE were detected slightly above screening levels. All detected VOCs were well below acute reference concentrations indicating no immediate health threats to children who play at the park.

5.7 Residential Screening Level Soil Evaluation

Subsequent to the collection of the residential soil samples during the RI investigation, a soil removal action was performed at residential properties adjacent to and near the former AMCO facility in August/September 2007. These properties include 1428, 1432, and 1436 3rd Street, and 320, 326, 356, 360, and 366/368 Center Street. The soil was generally excavated to a depth of approximately three feet; however, excavations were shallower in some areas if confirmation sampling indicated remaining lead concentrations were below screening levels. As a result, the soil samples collected during the RI are no longer representative of the soil conditions at these properties.

A screening level evaluation was performed on the soil data collected from the residential yards adjacent to or near the former AMCO facility. The concentrations detected in soil were compared to their respective screening levels to determine if they may pose a potential health risk. Screening levels are used to distinguish those substances that clearly do not pose a significant health threat because their concentrations in soil are low, from those that require additional evaluation for potential health risks. Screening levels selected for soil were Region 9 Residential PRGs.

The residential soil screening levels for arsenic are 0.062 mg/kg for cancer risks and 22 mg/kg for noncancer hazards. The noncancer screening level for arsenic was used in the residential screening evaluation because an arsenic level of 0.062 mg/kg is significantly less than what was found in background samples (14 mg/kg) (City of Oakland Urban Land Redevelopment Program 1995).

For mixtures of carcinogenic PAHs, the reference chemical is benzo(a)pyrene. Benzo(a)pyrene was chosen as the reference chemical because the toxicity of the chemical is well characterized. The toxicity equivalency factor for each carcinogenic PAH is an estimate of the relative toxicity (by an order of magnitude) of the congener compared to benzo(a)pyrene. A summary of PAH toxicity equivalence factors is provided below.

Toxicity Equivalence Factors for Carcinogenic PAHs

Carcinogenic PAHs	Toxicity Equivalency Factor*
Benzo(a)pyrene	1
Benzo(a)anthracene	0.1
Benzo(b)fluoranthene	0.1
Benzo(k)fluoranthene	0.1
Chrysene	0.01
Dibenzo(a,h)anthracene	0.4
Indeno(1,2,3-cd)pyrene	0.1

In the San Francisco Bay area, PAH cleanup levels of 0.9 mg/kg (DTSC 1998) and 1.8 mg/kg BaP Equivalents concentrations (U.S. Navy 2006) have been used for residential cleanup. These levels are considered safe for residential use.

Soil was sampled at six residential parcels in the immediate vicinity of the facility. Generally, within samples from each boring, the highest contaminant concentrations were observed in the shallow soil. VOCs were sparsely detected at concentrations below screening levels. Below is a brief summary of the findings by parcel.

5.7.1 1428 3rd Street

As described above, soil was removed from this property during the August/September 2007 removal action, therefore all exceedances discussed below are no longer representative of current conditions. Five locations were sampled at this residence, four locations along the property boundary and one in the center of the yard (Figure 13). The soil sampling at 1428 3rd Street indicated lead, PAHs, antimony, iron and 4,4'-DDT at levels above screening levels (Attachment 3, Table 3-43). The lead concentrations ranged from 224 to 4,170 mg/kg which is significantly above the site-specific screening levels (194 mg/kg for lead exposure including the homegrown produce pathway and 340 mg/kg without homegrown produce). Antimony and iron only exceeded in the shallow portion of two samples collected on the eastern boundary. Arsenic exceeded the noncancer screening level of 22 mg/kg in one sample at a concentration of 35.1 mg/kg. 4,4'-DDT slightly exceeded the screening level of 1.7 mg/kg in one shallow sample.

5.7.2 1432 3rd Street

As described above, soil was removed from this property during the August/September 2007 removal action, therefore all exceedances discussed below are no longer representative of current conditions. Three locations were sampled at this residence, two along the property boundary and one in the vegetable garden (Figure 14). The soil sampling at 1432 3rd Street indicated lead, PAHs, 4,4'-DDT, and iron at concentrations above screening levels (Attachment 3, Table 3-44). Lead concentrations range from 524 to 2,280 mg/kg which is significantly above the screening levels. Antimony, iron, and 4,4'-DDT slightly exceeded their screening levels in one shallow sample. BaP Equivalents exceeded its screening level in all the shallow samples.

5.7.3 1436 3rd Street

As described above, soil was removed from this property during the August/September 2007 removal action, therefore all exceedances discussed below are no longer representative of current conditions. Two locations were sampled at this residence, one in the vegetable garden and one next to the lemon tree (Figure 15). The soil sampling at 1436 3rd Street indicated lead, PAHs, dieldrin, and iron at levels above screening levels (Attachment 3, Table 3-45). Lead concentrations range from 216 to 3,630 mg/kg which is significantly above screening levels. Dieldrin significantly exceeds its screening level in one shallow sample and barely exceeds in the other shallow sample. Iron slightly exceeds its screening level in both shallow samples. BaP Equivalents exceeds its screening level in both shallow samples.

5.7.4 326 Center Street

As described above, soil was removed from this property during the August/September 2007 removal action, therefore all exceedances discussed below are no longer representative of current conditions. Five locations were sampled at this residence, four along the property boundary with the large vacant lot and one along the property boundary with the former facility (Figure 16). The soil sampling at 326 Center Street indicated lead, PAHs, dieldrin, 4,4'-DDT, 4,4'-DDE, iron, and arsenic at levels above screening levels (Attachment 3, Table 3-46). Lead was detected at concentrations ranging from 170 to 53,000 mg/kg. Three of the locations had samples with lead concentrations below the site-specific screening level of 390 mg/kg. However two of the locations had lead concentrations that significantly exceeded the screening level. Arsenic is also significantly above its screening level at one location (both shallow and deep). Iron is only slightly greater than its screening level in one shallow sample. 4,4'-DDE and dieldrin are slightly greater than their screening level in one shallow sample. 4,4'-DDT was detected at concentrations ranging from 0.59 to 11 mg/kg in two sample locations.

5.7.5 356 Center Street

As described above, soil was removed from this property during the August/September 2007 removal action, therefore all exceedances discussed below are no longer representative of current conditions. Three locations were sampled at this residence—one location was in a small yard behind the house, and two locations were in the dirt floor of a recently vacated chicken coop (Figure 17). The soil sampling at 356 Center Street indicated benzo(a)pyrene and lead at levels above screening levels (Attachment 3, Table 3-47). Lead was detected at concentrations ranging from 26.2 to 822 mg/kg. Of the six soil samples collected, five were above screening levels. Although three samples had benzo(a)pyrene that exceeded its screening level, none of the samples exceeded the BaP Equivalents criteria.

5.7.6 360 Center Street

As described above, soil was removed from this property during the August/September 2007 removal action, therefore all exceedances discussed below are no longer representative of current conditions. Two locations were sampled at this residence, one location along the northern parcel boundary, and one location in the southeastern corner (Figure 18). The soil sampling at 360 Center Street indicated lead, benzo(a)pyrene, Aroclor-1254, and heptachlor epoxide at levels above screening levels (Attachment 3, Table 3-48). Lead concentrations ranged from 193 to 2230 mg/kg which is significantly higher than the screening level. Aroclor-1254 (screening level of 0.22 mg/kg) was detected at 2.4 to 11 mg/kg at one location, and heptachlor epoxide (screening level of 0.53 mg/kg) was detected at 0.31 mg/kg in only the shallow sample at the same location.

5.7.7 Homegrown Produce Results

Four of the residents whose properties are adjacent to the former AMCO facility have gardens and fruit trees. The detection of TCE, PCE, and vinyl chloride in shallow groundwater and the potential for shallow groundwater to migrate into residential areas containing these gardens prompted concerns that contaminants from the Site could be taken up and transferred into edible fruit or vegetables. To evaluate the ingestion of the homegrown produce pathway, 15 fruits and vegetables from four gardens were collected

and analyzed for selected metals (arsenic, chromium, and lead) and VOCs. Because produce samples were analyzed for VOCs as well as metals, none of the produce were rinsed or washed before analysis.. As a result, the metals concentrations could reflect soil and dust deposited on the plant surfaces and possible uptake from soil through the roots into the edible portions of the plants. Produce samples collected and analyzed include:

Fruit: Apple (2), Cactus, Blackberries, Pomegranate, Grapes, Fig, Lemon

Fruiting Vegetables: Tomatillo, Tomatoes (2), Red Chile, Green Chile, Bell Pepper

Leafy Vegetables and Herbs: Mint

Root Vegetables: Root vegetables were not collected because none were available in the gardens that were sampled.

Results of the produce analyses are presented in Attachment 3, Tables 3-55, 3-56, 3-57 and 3-58. In summary, of the 47 VOCs analyzed, only methyl acetate and styrene were detected. Methyl acetate was detected in figs, mint, and red chiles. Styrene was detected only in cactus. Both methyl acetate and styrene have been detected in ripening produce in concentrations ranging from 0.04 - 0.24 mg/kg. (Heikes et al. 1995). Volatile organic compounds like methyl acetate are naturally produced by ripening fruits at less than 1 mg/kg (Fountain et al. 1984).

Urban gardens have been assessed extensively since the 1970s and provide the foundation for evaluating metals in garden soil. Plants absorb various metals from different soils related to the metals properties, soil properties (pH, metal concentration in soil, organic matter, cation exchange capacity, and level of other metals in soil) and plant properties (plant age, species, type of crop edible portion (leafy, root or garden fruit). Some metals, like zinc, cadmium, and selenium are easily absorbed and transferred to food chain plant tissues. Some metals like lead, iron, mercury, and chromium are strongly bound or precipitated in soil or in the root fibers and are not transferred to plant foliage in unsafe amounts even when soils are greatly enriched. Other metals like copper, nickel and arsenic are easily absorbed and transferred to plant foliage but phytotoxicity to the crop may limit plant levels of the metal. (Chaney et al 1984). Important to note; plants with higher surface areas green leafy vegetables such as lettuce, collard greens and swiss chard tend to easily attach dust and soil which may remain after rinsing.

Lead concentrations in the soil samples collected in the residential garden areas adjacent to the former AMCO facility ranged from 1,060 to 2,910 mg/kg with corresponding lead produce concentrations from 0.16 to 8.47 mg/kg. These lead concentrations reflect that none of the produce samples were rinsed or washed before analysis; thus, the lead concentrations could reflect dust or soil deposited on the plant surfaces in addition to lead that was taken up through the root system.

A study by Finster et al. (2003) investigated the relationship between lead concentrations in urban garden soils and homegrown produce grown in these soils, with a focus on the levels of lead detected in the edible portion of the plants. In this study, all produce were washed with water or detergent and detection limits were 10 mg/kg.

By comparison, the homegrown produce samples were not washed and the lead detection limits were 0.06 mg/kg. The lead soil concentrations in the Finster study ranged from 27 to 4,580 mg/kg. Concentrations of lead in residential shallow soils ranged from 167 to 28,600

mg/kg. The lead concentrations in the Finster study produce ranged from nondetect (ND) at 10 mg/kg to 81 mg/kg. The lead concentrations in the residential produce ranged from 0.15 to 8.47 mg/kg.

The risk posed by eating lead containing produce depends on the frequency and the amount of consumption. U.S. Food and Drug Administration (FDA) recommends Provisional Total Tolerable Intake Levels (PTTIL) for all age groups, which are defined at 6 μg lead/day for children up to 6 years of age, 15 μg lead/day for children 7 years and older, 25 μg lead/day for pregnant women and 75 μg lead/day for other adults (FDA 1993).

The highest lead concentrations in produce were detected in mint at 8.47 mg/kg. Mint is an extremely strong herb with 1 gram of mint equal to approximately 20 leaves (U.S. Department of Agriculture [USDA] 2002). Only two leaves of fresh mint, weighing 0.1 g, are needed for tea. Consider tea made with mint - 2 leaves fresh mint weighs 0.1 g x 8.47 μg/g = 0.847 μg lead/day. Even if this mint were ingested from the garden unwashed, lead levels would be below PTTIL.

Other metals analyzed in produce include arsenic and chromium. Arsenic concentrations in produce range from 0.06 to 0.08 mg/kg, Arsenic is commonly found in most plants from 0.009 to 1.7 mg/kg dry weight. (Kabatas-Pendias et al 2001). Leafy vegetables like lettuce or spinach contain more arsenic than fruits. Mushrooms are found to be relatively high arsenic accumulators. Chromium concentrations in produce range from 0.39 to 1.07 mg/kg, Levels of chromium commonly found in plants range from 0.02 to 1.5 mg/kg dry weight (Kabatas-Pendias et al 2001). All produce collected from residential gardens adjacent to or near the former AMCO facility had chromium concentrations within this range.

6.0 Uncertainty Evaluation

A risk characterization incorporates information on the uncertainty associated with the risk assessment, including data gaps in toxicological or exposure assessment information and the conservative assumptions or scientific judgments used to bridge these data gaps (EPA 1992). These uncertainties, which are associated with every step in the risk assessment process, are evaluated to provide an indication of the relative degree of conservatism associated with a risk estimate. This section presents a qualitative discussion of the uncertainties associated with the overall assessment process.

Risk assessments are not intended to estimate actual risks to a receptor associated with exposure to chemicals in the environment. In fact, estimating actual risks is impossible because of the variability in the exposed or potentially exposed populations. Therefore, risk assessment is a means of estimating the upper bound probability that an adverse health effect (e.g., cancer) may occur in a receptor at some point in the future. The multitude of conservative assumptions used in the process ensures that the risk results are not likely to be underestimated.

Risk estimates are calculated by combining site data, assumptions about individual receptor's exposures to impacted media, and toxicity data. The uncertainties in this risk assessment can be grouped into three main categories that correspond to these steps:

- Uncertainties in environmental sampling and analysis
- Uncertainties in assumptions concerning exposure scenarios
- Uncertainties in toxicity data and dose-response extrapolations

6.1 Environmental Sampling and Analysis

This risk assessment is based on the sampling results obtained from the remedial investigations at the Site. Errors in sampling results can arise from the field sampling, laboratory analyses, and data analyses. Errors in laboratory analysis procedures are possible, although the impacts of these sorts of errors on the risk estimates are likely to be low. The environmental sampling at a site is one source of uncertainty in the evaluation. The number and location of samples at the Site are considered adequate for input in the risk assessment. The type of contaminants and exposure concentrations identified are also considered representative of site conditions.

Because of the long history of the Site's industrial use and the associated history of construction and filling, all primary sources may not have been identified. Hot spots and localized areas of contamination in soil or soil vapor that were not sampled may remain unknown in on-facility and off-facility areas. The existence of unknown contamination could lead to an increase in the health risks beyond what has been reported in this document. Data collected from known hot spots have been included in the risk assessment.

The number and location of samples at each exposure area are considered adequate for the calculation of EPCs at most of the industrial areas and for groundwater. However, for the

small vacant lot and the parking lot, the number of samples varied from 2 to 6 for each of the chemicals analyzed. This sample size is less than what is generally needed to calculate a 95 UCL; therefore, the maximum concentration was used to represent the EPCs where UCLs could not be calculated. A larger sample size would allow for the calculation of a more representative EPC and thus decrease uncertainty regarding chemical concentrations used for risk assessment at these locations.

6.1.1 Laboratory and Sampling Results

Potential laboratory errors can also result in uncertainty in the chemical concentrations used in the exposure assessment. For well-designed analysis methods there should be no significant systematic error. However, uncertainty in measured concentrations due to random errors cannot be eliminated. These random errors result from:

- Precision of analytical measurements
- Random fluctuations in equipment performance
- Normal variations in analytical technique

These errors are expected to be small but nonetheless will affect the overall uncertainty in the results.

6.1.2 Reporting Limits

During the project planning phase, analytical methods are selected that provide sufficient sensitivity to meet the project screening levels. Positive results for all analytes were reported above the method detection limit. Because of the uncertainty that a specific analyte will be detected at concentrations below the reporting limit, analytes not detected are reported as not detected at the method reporting limit, generally 2 to 5 times higher than the method detection limit. In general, there are two reasons that the final analyte result is reported as not detected at a concentration above the screening limit:

1. The best available analytical methods does not provide the necessary sensitivity;
2. The sample contains high concentrations of one or more target analytes that require dilution, raising the final reporting limit for non-detected analytes above the screening level.

In both cases, some uncertainty exists whether the actual analyte concentration exceeds the screening level. The level of uncertainty is smaller in cases where the screening level is only slightly lower than the reporting limit. In addition, the level of uncertainty is mitigated in part because all positive results are reported to the method detection and in general, the method detection limit (MDL) is two to five times less than the reporting limit. As discussed in the following sections by media, this uncertainty is associated with a small number of analytes and there should be little or no effect on the final outcome of the risk assessment.

Soil

The failure to achieve the screening levels was due to both high concentrations of some target analytes in the sample that required dilution and percent moisture adjustments, raising the final reporting limit for non-detected analytes. However, three analytes were reported as not detected at a minimum reporting limit that exceeded the screening levels:

benzo(a)pyrene, dibenz(a,h)anthracene, and N-nitroso-di-n-propylamine. This is a method limitation because of the low concentration screening limit.

Groundwater

The failure to achieve the screening levels was primarily due to high concentrations of some target analytes in the sample that required dilution, thereby raising the reporting limit above the screening levels. Table 13 lists the minimum analyte reporting limits that were above the applicable groundwater screening level.

For 1,1,1,2-tetrachloroethane, 1,2,3-trichloropropane, bis(2-chloroethyl)ether, dibenz(a,h)anthracene, and N-nitroso-n-propylamine the required analytical method cannot achieve the screening levels. For the remaining analytes, dilution was required in many cases which elevated the reporting limit above the screening levels.

Air

The failure to achieve the screening levels for ambient air and crawlspace air samples was primarily due to method sensitivity limitations with respect to the very low concentration screening levels. Table 14 lists the minimum analyte reporting limits that were above the applicable ambient/crawlspace air screening level. Where the percentages are lower than 100 percent, the target analyte was detected in several of the samples.

Table 15 presents the results for residential soil gas. The screening level for soil gas is set as 10 times the ambient air/crawlspace air screening level based on a conservative attenuation factor. A number of soil gas results were reported as not detected above the screening level, but it should be noted that all of the soil gas samples were analyzed at a dilution. The dilution factor applied to these analyses ranged from 3 to 8.

6.2 Exposure Pathways and Assumptions

Risk assessments are designed to provide a margin of safety to protect public health and the environment by using conservative assumptions that assure risks are not underestimated. Actual human exposures and associated risks are likely to be less than those calculated for the risk assessment because each input value is conservative. Uncertainties can arise from the types of exposures examined, the points of potential human exposure, the concentrations of COPCs at the points of human exposure, and the intake assumptions.

- The exposure parameters—exposure frequency, exposure duration, soil ingestion rates, and skin surface areas—are selected as reasonable maximum exposure assumptions. To minimize the possibility of underestimating risk, such factors are generally conservative and represent the portion of the population with the greatest potential for exposure. For example, the potential future resident at the former AMCO facility is assumed to be present for 350 days of the year over a 30 years period including the sensitive childhood period from birth to the age of six. These potential residents are assumed to play or garden daily in the soil. Few people, including children, are likely to be home and in direct contact with the soil daily for the entire 30 years. The HHRA assumes that the potential resident lives in a home that has a backyard and is unpaved. However, the degree of direct soil exposure would be reduced if the potential resident lived in a condominium with a backyard that was paved.

- The selection of exposure pathways is a process, often based on professional judgment that attempts to identify the most probable potentially harmful exposure scenarios. In an evaluation, risks are sometimes not calculated for all of the exposure scenarios that may occur, possibly causing some underestimation of risk. In this evaluation, potential risks are estimated for residential and worker exposure scenarios at the Site. Risks to potential receptors are estimated for a number of different exposure pathways (e.g., inhalation of fugitive dust). While other exposure routes could exist for a particular activity, these exposures are expected to be lower than the risks associated with the pathways considered.

- The amount that each of the COPCs might be absorbed into the body may be quite different from the amount of chemical that is actually contacted (i.e., bioavailability). In this assessment, bioavailability of ingested and inhaled chemicals is conservatively assumed to be 100 percent. Actual chemical- and site-specific values are likely to be much less than this conservative default value.

- Many factors contribute to the uncertainty of dermal contact exposure in risk assessment. There are uncertainties associated with each of the input parameters used in the equations to estimate risk. Additional uncertainties originate from factors that are not sufficiently characterized to be included in the risk equations. These include issues related to the degree and uniformity with which soil adheres to skin, exposed body surfaces, the frequency and duration of exposure, and the rate and amount of contaminant absorption.

- The method for estimating resuspended dust from soil concentrations using a PEF introduces large uncertainties in the resulting air concentrations and subsequent risk estimates. The assumption that the dust concentration remains constant may over-estimate the amount of dust in the air over time and, consequently, the concentration of contaminants present in dust. This could result in an overestimate of the inhalation as a particulate.

6.3 Toxicity Criteria and Factors

The availability and quality of toxicological data is another source of uncertainty in the risk assessment. Carcinogenic criteria are classified according to the amount of evidence available that suggests human carcinogenicity. In the establishment of the non-carcinogenic criteria, conservative multipliers, known as uncertainty and modifying factors, are used.

6.3.1 Uncertainties in Animal and Human Studies

Extrapolation of toxicological data from animal tests is one of the largest sources of uncertainty in a risk assessment. There may be important, but unidentified, differences in uptake, metabolism, and distribution of chemicals in the body between the test species and humans. For the most part, these uncertainties are addressed through use of conservative assumptions in establishing values for RfDs and CSFs, which results in the likelihood that the risk is overstated.

Typically, animals are administered high doses (e.g., maximum tolerated dose) of a chemical in a standard diet or in air. Humans may be exposed to much lower doses in a highly variable diet, which may affect the toxicity of the chemical. In these studies, animals,

usually laboratory rodents, are exposed daily to the chemical agent for various periods of time up to their 2-year lifetimes. Humans are assumed to have an average 70-year lifetime and may be exposed either intermittently or regularly for an exposure period ranging from months to a full lifetime. Because of these differences, extrapolation error is a large source of uncertainty in a risk assessment.

6.3.2 Non-Carcinogenic Toxicity Criteria

In the establishment of the non-carcinogenic criteria, conservative multipliers, known as uncertainty factors, are used. Most of the chronic non-carcinogenic toxicity criteria that were located in the IRIS database have uncertainty factors of 1,000. This means that the dose corresponding to a toxicological endpoint (e.g., LOAEL was divided by 1,000). The purpose of the uncertainty factor is to account for the extrapolation of toxicity data from animals to humans and to insure the protection of sensitive individuals. However, in accomplishing these purposes, the uncertainty in the actual toxicity of the chemical in humans is greatly increased.

6.3.3 Carcinogenic Toxicity Criteria

For chemicals that are probable human carcinogens and lack human evidence of carcinogenicity, the EPA method for developing cancer slope factors extrapolates data from high-dose animal experiments to low-dose human exposures and thus is associated with a high potential for overestimating risk. Actual slope factors could be lower but are unlikely to be higher. The LMS assumes that there is no threshold for carcinogenic substances; that is, exposure to even one molecule of a carcinogen is sufficient to cause cancer. This is a highly conservative assumption because the body has several mechanisms to protect against cancer.

Toxicity values derived using the LMS are intended for chemicals with cancer risks below 1×10^{-2}. For scenarios producing risks greater than 1×10^{-2}, an alternative equation for calculating risk is suggested. The residential risk calculations from groundwater exceed 1×10^{-2} for arsenic and vinyl chloride, suggesting the use of an alternative risk characterization model. Use of such a model could slightly change the calculated ELCR. However, since the conclusions derived by using an alternate equation for these two chemicals would not change, the LMS method was retained (EPA 1989).

6.3.4 Additive vs. Synergistic vs. Antagonistic Properties of COPCs

When humans are exposed to more than one chemical in a medium, it is normally assumed that the adverse effects of the different chemicals are additive. However, in some cases, synergistic or antagonist interaction may occur. Although there are no data to suggest that synergistic or antagonist interactions occur between chemicals at this Site, this is a source of uncertainty in the HHRA. The term synergism describes the situation wherein the aggregated risks from simultaneous exposure to multiple chemicals is more than the sum of the risks from each alone. Antagonism is when the aggregated risks are less than the sum.

Synergism and antagonism represent complex interactions between two or more chemicals. Two chemicals may exert synergistic effects on one aspect of each other's toxicity, but not on other toxic effects. The synergy may be apparent within one range of exposure levels, but not within another range of exposure to the two chemicals. Addition of a third chemical may inhibit the synergy between the first two chemicals. Thus quantifying synergism or

antagonism in a risk assessment can be problematic and requires a thorough understanding of the potential interactions between multiple chemicals and the development of relevant risk/toxicity values.

Superfund risk assessment guidelines (RAGS, Part A, Section 8.4.2) notes that "[i]n the absence of adequate information, carcinogenic risks should be treated as additive and that non-cancer hazard indices should also be treated as additive." It is a goal of the EPA to incorporate synergistic and antagonistic effects into risk assessments when there is sufficient credible scientific evidence that either exists and appropriate risk assessment tools are available. However, there are very few data available on synergism or antagonism of specific mixtures that are useful in a risk assessment context.

6.3.5 TCE

Toxicity values are not currently available for TCE in EPA's Integrated Risk Information System (EPA 2006a). EPA withdrew its previously published toxicity values for TCE in 1988 because of uncertainties relating to the science of TCE toxicity. Thus, cancer risk TCE was estimated using an inhalation slope factor of 0.4 $(mg/kg\text{-}day)^{-1}$ from the EPA National Center of Environmental Assessment (EPA 2001), which is a Tier 3 source of toxicity criteria in EPA guidance on selecting toxicity factor for Superfund risk assessments (EPA 2003b). The guidance lists Tier 1 as IRIS, Tier 2 as PPRTV, and Tier 3 as other sources including NCEA and OEHHA. A more current inhalation factor of 0.007 $(mg/kg\text{-}day)^{-1}$ is available from another Tier 3 source (OEHHA 2006). This slope factor is nearly three orders of magnitude lower than the NCEA slope factor; thus the cancer risk would be correspondingly lower if the OEHHA TCE slope factor were used. As a conservative estimate, the NCEA slope factor of 0.4 $(mg/kg\text{-}day)^{-1}$ was used for this HHRA.

6.3.6 Surrogates

A number of chemicals detected in Site media do not have established toxicity criteria. Where available, appropriate surrogate toxicity factors were used for detected chemicals without toxicity factors. Use of surrogate toxicity factors assumes the toxicity of structurally similar compounds is equivalent, which may result in under- or over-estimate of risks. If a surrogate chemical was not available, these chemicals were not evaluated quantitatively. A list of chemicals used as surrogates is presented in Table 16.

7.0 Summary and Discussion of Human Health Risk Assessment Results

The HHRA described in this appendix evaluated potential health risks to current and future workers, as well as hypothetical future adult and child residents from exposure to chemicals of potential concern in soil and groundwater at the former AMCO facility. In addition, a screening level risk evaluation was conducted on the soil, soil gas, air, and homegrown produce from residential lots that are occupying the same city block as the former AMCO facility. The risk assessment results will be one of the factors that EPA uses to determine if cleanup actions are warranted at the former AMCO facility. Possible remedial actions in areas that have unacceptable risks will be addressed in the FS for the former AMCO facility. The baseline HHRA provides estimates of the human health risks that the former AMCO facility could pose if no action were taken. Standard EPA risk assessment procedures were used in the risk assessment.

Consistent with the conceptual site model, the predominant exposure pathways for current and future workers at the former AMCO facility would be incidental ingestion of soil, inhalation of particulates and vapors, and dermal contact with soil. Current and future residents in the vicinity may potentially be exposed to contaminants through the same pathways as listed above for workers. In addition, residents could potentially be exposed by ingestion of contaminated groundwater and dermal contact with groundwater while showering. Residents were also evaluated for ingestion of homegrown produce and exposure to indoor air (using crawlspace air data).

For carcinogens, risks are generally expressed as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the carcinogen. These risks are probabilities that usually are expressed in scientific notation (e.g., 1×10^{-6}). An excess lifetime cancer risk of 1×10^{-6} indicates that an individual has a 1 in 1,000,000 chance of developing cancer as a result of site-related exposure. This is referred to as an "excess lifetime cancer risk" because it would be in addition to the risks of cancer an individual faces from other causes, such as smoking or exposure to too much sun. The chance of an individual developing cancer from all other causes has been estimated to be as high as one in three. EPA's target risk range for site-related exposures is 10^{-6} to 10^{-4}. An excess lifetime cancer risk of 10^{-4} is the point at which action is generally required at a site (EPA 1991b).

The cancer risk estimates and noncancer HI calculated for each exposure scenario are summarized in Attachment 1, Table 1-109. The risk estimates are based on reasonable maximum exposure concentrations and were developed by taking into account various conservative assumptions about the frequency and duration of exposure to contaminated materials as well as the toxicity of the chemicals of potential concern.

7.1 On-Facility Quantitative Soil Risk Estimates

Soil samples were divided into the following four exposure areas: former AMCO facility, parking lot, large vacant lot, and small vacant lot. An exposure area is a portion of the

property that is contacted on a regular basis by a worker or resident. Risk estimates are discussed for each exposure area below.

Industrial Worker: Estimated cancer risks were at the upper end of the risk range or exceeded 1 x 10^{-4} for exposure to either shallow or deep soil at each of the four exposure areas. HI exceeded the noncancer threshold of 1 only at the former AMCO facility.

Construction Worker: Estimated cancer risks were within the risk range of 10^{-6} to 10^{-4} for exposure to shallow or deep soil at each of the 4 exposure areas. HIs exceeded the non-cancer threshold of 1 at the former AMCO facility, parking lot, and large vacant lot.

Residents: Estimated cancer risks are within the risk range for exposure to shallow or deep soil at all four of the exposure areas. HIs exceed the noncancer threshold of 1 at all four exposure areas.

7.2 Groundwater Risk Estimates

The cancer risks and noncancer hazards are above the risk range when residential use of groundwater is considered. However, it is extremely unlikely that groundwater will be used as a source of drinking water.

7.3 Irrigation Well Results

During the RI, a previously unidentified well was discovered at a residence near the former AMCO facility. According to the property owner, the well is primarily used for backyard irrigation. The well is not a source of drinking water. The residential irrigation well was sampled on three occasions: September 2, 2004, June 24, 2005, and October 12, 2005. A summary of the results is presented in Table 12. As indicated in this table, the only analyte that exceeds the screening level is lead. However, boron, manganese, mercury, and sodium are at concentrations that exceed their agricultural water quality limit.

7.4 Screening Level Evaluation on Residential Media

Air: The screening level risk evaluation was conducted to assess whether there is an immediate health threat to residents and to determine whether the vapor intrusion pathway is significant. An ongoing assessment of the vapor intrusion pathway is being conducted, including continued monitoring. The results from the continued monitoring are being evaluated to assess whether a quantitative analysis risk approach is appropriate.

Three sampling events have been conducted at the residences adjacent to or near the former AMCO facility. All VOCs detected are below acute RELs and acute MRLs indicating no immediate health threat to residents. Several VOCs were detected above screening levels in the soil gas, ambient air, and crawlspace samples. Of the VOCs detected above screening levels, many are also detected at background locations, indicating that not all resident VOC exposure may be coming from the Site.

Soil: At each residential property, lead exceeds the site-specific residential screening level therefore; a soil removal action was conducted. PAHs, pesticides (DDT, DDE, dieldrin, and heptachlor epoxide), antimony, and iron also exceed screening levels in at least one property. Generally, within samples from each boring, the highest contaminant

concentrations were observed in the shallow soil. VOCs were sparsely detected at concentrations below screening levels. Benzo(a)pyrene and lead were detected at all residential parcels at concentrations above the screening level.

Homegrown Produce: The detection of TCE, PCE, and vinyl chloride in shallow groundwater and the potential for shallow groundwater to migrate into residential areas containing gardens prompted concerns that contaminants from the Site could be taken up and transferred into edible fruit or vegetables. To evaluate the ingestion of the homegrown produce pathway, 15 fruits and vegetables from four gardens located adjacent to the Facility were collected and analyzed for selected metals (arsenic, chromium, and lead) and VOCs. Arsenic concentrations in produce range from 0.06 to 0.08 mg/kg Chromium concentrations in produce range from 0.39 to 1.07 mg/kg. The lead concentrations in the homegrown produce ranged from 0.15 to 8.47 mg/kg.

Of the 47 VOCs analyzed for, only methyl acetate and styrene were detected. Methyl acetate was detected in figs, mint and red chilies. Styrene was detected only in cactus. The highest lead concentrations in produce were detected in mint at 8.47 mg/kg. However, even if this mint were ingested from the garden unwashed, lead levels would be below the FDA's PTTIL.

8.0 References

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Tables

TABLE 1
1999 National Air Toxics Assessment, Predicted Ambient Air Concentrations for Census Tract 06001401900
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Predicted Concentration ($\mu g/m^3$)	Percent Contribution by Source Type				
		Stationary Sources		Mobile Sources		
		Major	Area & Other	On-Road	Non-Road	Back-ground
Chloroform	0.14	0.1%	67.6%	0.0%	0.0%	32.3%
1,4-Dichlorobenzene	0.13	1.1%	98.9%	0.0%	0.0%	0.0%
1,4-Dioxane	0.001	56.7%	43.3%	0.0%	0.0%	0.0%
Benzene	3.5	1.4%	5.6%	65.7%	14.0%	13.3%
Carbon tetrachloride	0.27	0.0%	0.3%	0.0%	0.0%	99.7%
Ethylbenzene	1.4	1.9%	10.6%	76.7%	10.8%	0.0%
Naphthalene	0.13	0.5%	46.0%	36.9%	16.6%	0.0%
Styrene	0.11	0.5%	3.0%	83.6%	12.9%	0.0%
1,1,2,2-Tetrachloroethane	0.098	9.2%	7.4%	0.0%	0.0%	83.3%
Toluene	9.8	7.7%	24.4%	60.6%	7.3%	0.0%
Trichloroethene	0.12	14.5%	23.9%	0.0%	0.0%	61.7%
Vinyl Chloride	0.12	18.3%	14.6%	0.0%	0.0%	67.2%
Xylenes	8.0	1.3%	12.2%	61.9%	22.5%	2.1%

Source: EPA's NATA web site, http://www.epa.gov/ttn/atw/nata1999/

TABLE 2
1999 National Emissions Inventory for Alameda County, CA
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

		Percent Contribution by Source Type			
		Point Sources		Mobile Sources	
	Emissions (tons/year)	Major	Area and Other	On-Road	Non-Road
Benzene	690	0.9%	12.0%	69.5%	17.6%
Ethylbenzene	360	2.0%	21.2%	64.0%	12.7%
Chloroform	43	0.0%	100.0%	0.0%	0.0%
Trichloroethylene	21	12.3%	87.7%	0.0%	0.0%
Vinyl Chloride	4.5	70.2%	29.8%	0.0%	0.0%

Source: EPA's AirData web site, http://www.epa.gov/oar/data/

TABLE 3
Chemicals of Potential Concern
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Site					Residential				
	Soil		Groundwater		Soil Gas	Soil		Soil Gas	Ambient Air	Crawl Space Air
	Shallow	Deep	Grab	MW		Shallow	Deep			
Metals										
Aluminum	X	X	---	X	---	X	X	---	---	---
Antimony	X	X	---	X	---	X	X	---	---	---
Arsenic	X	X	---	X	---	X	X	---	---	---
Barium	X	X	---	X	---	X	X	---	---	---
Beryllium	X	X	---	X	---	X	X	---	---	---
Boron	---	---	---	X	---	---	---	---	---	---
Cadmium	X	X	---	X	---	X	X	---	---	---
Chromium	X	X	---	X	---	X	X	---	---	---
Cobalt	X	X	---	X	---	X	X	---	---	---
Copper	X	X	---	X	---	X	X	---	---	---
Iron	X	X	---	X	---	X	X	---	---	---
Lead	X	X	---	X	---	X	X	---	---	---
Manganese	X	X	---	X	---	X	X	---	---	---
Mercury	---	---	---	X	---	X	X	---	---	---
Molybdenum	---	---	---	X	---	---	---	---	---	---
Nickel	X	X	---	X	---	X	X	---	---	---
Selenium	X	X	---	X	---	X	X	---	---	---
Silver	X	X	---	X	---	X	X	---	---	---
Thallium	X	X	---	X	---	X	X	---	---	---
Vanadium	X	X	---	X	---	X	X	---	---	---
Zinc	X	X	---	X	---	X	X	---	---	---
Hexavalent Chromium										
Chromium, hexavalent	---	---	---	X	---	---	---	---	---	---
Cyanide										
Cyanide	---	---	---	X	---	---	---	---	---	---
Organochlorine Pesticides										
4,4'-DDD	X	X	---	X	---	X	X	---	---	---
4,4'-DDE	X	X	---	X	---	X	X	---	---	---
4,4'-DDT	X	X	---	X	---	X	X	---	---	---
Aldrin	X	X	---	X	---	X	X	---	---	---
alpha-BHC	X	X	---	X	---	X	X	---	---	---
alpha-Chlordane	X	X	---	X	---	X	X	---	---	---
beta-BHC	X	X	---	X	---	X	X	---	---	---
delta-BHC	X	ND	---	X	---	X	X	---	---	---
Dieldrin	X	X	---	X	---	X	X	---	---	---
Endosulfan I	ND	X	---	X	---	X	X	---	---	---
Endosulfan II	ND	ND	---	X	---	X	X	---	---	---
Endosulfan sulfate	X	ND	---	X	---	X	X	---	---	---
Endrin	X	X	---	X	---	X	X	---	---	---
Endrin aldehyde	X	ND	---	X	---	X	X	---	---	---
Endrin ketone	X	X	---	X	---	X	X	---	---	---
gamma-BHC	X	X	---	X	---	X	X	---	---	---

TABLE 3
Chemicals of Potential Concern
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Site					Residential				
	Soil		Groundwater		Soil Gas	Soil		Soil Gas	Ambient Air	Crawl Space Air
	Shallow	Deep	Grab	MW		Shallow	Deep			
Organochlorine Pesticides										
gamma-Chlordane	X	X	---	X	---	X	X	---	---	---
Heptachlor	X	X	---	X	---	X	X	---	---	---
Heptachlor epoxide	X	ND	---	X	---	X	X	---	---	---
Methoxychlor	X	ND	---	X	---	X	X	---	---	---
Organophosphorus Pesticides										
Diazinon	---	---	---	X	---	---	---	---	---	---
Herbicides										
Atrazine	ND	ND	---	X	---	ND	ND	---	---	---
PCBs										
Aroclor-1254	ND	ND	---	ND	---	X	X	---	---	---
Aroclor-1260	X	X	---	X	---	ND	ND	---	---	---
Semivolatile Organic Compounds										
1,1'-Biphenyl	X	X	---	X	---	X	ND	---	---	---
1,4-Dioxane (p-dioxane)	ND	X	X	X	X	ND	X	ND	X	X
2,4,6-Trichlorophenol	ND	ND	---	X	---	ND	ND	---	---	---
2,4-Dimethylphenol	ND	ND	---	X	---	ND	ND	---	---	---
2,6-Dinitrotoluene	ND	ND	---	ND	---	X	X	---	---	---
2-Chlorophenol	ND	ND	---	X	---	ND	ND	---	---	---
2-Methylnaphthalene	X	X	---	X	---	X	X	---	---	---
2-Methylphenol	X	ND	---	X	---	ND	ND	---	---	---
2-Nitroaniline	ND	ND	---	X	---	ND	ND	---	---	---
3&4-Methylphenol	---	---	---	X	---	---	---	---	---	---
3-Nitroaniline	ND	ND	---	ND	---	X	ND	---	---	---
4-Chloro-3-methylphenol	X	ND	---	X	---	ND	ND	---	---	---
4-Methylphenol	X	X	---	X	---	ND	ND	---	---	---
4-Nitrophenol	ND	ND	---	ND	---	X	ND	---	---	---
Acenaphthene	X	X	---	X	---	X	ND	---	---	---
Acenaphthylene	X	X	---	X	---	X	X	---	---	---
Acetophenone	X	X	---	ND	---	ND	ND	---	---	---
Anthracene	X	X	---	X	---	X	X	---	---	---
Benzo(a)anthracene	X	X	---	X	---	X	X	---	---	---
Benzo(a)pyrene	X	X	---	X	---	X	X	---	---	---
Benzo(b)fluoranthene	X	X	---	X	---	X	X	---	---	---
Benzo(g,h,i)perylene	X	X	---	X	---	X	X	---	---	---
Benzo(k)fluoranthene	X	X	---	X	---	X	X	---	---	---
Benzyl butyl phthalate	X	X	---	ND	---	X	ND	---	---	---
bis(2-Chloroethoxy)methane	ND	ND	---	X	---	ND	ND	---	---	---
bis(2-Ethylhexyl)phthalate	X	X	---	X	---	X	X	---	---	---
Caprolactam	X	ND	---	X	---	ND	ND	---	---	---
Carbazole	X	ND	---	X	---	X	X	---	---	---
Chrysene	X	X	---	X	---	X	X	---	---	---
Dibenz(a,h)anthracene	X	X	---	X	---	ND	ND	---	---	---

TABLE 3
Chemicals of Potential Concern
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Site					Residential				
	Soil		Groundwater		Soil Gas	Soil		Soil Gas	Ambient Air	Crawl Space Air
	Shallow	Deep	Grab	MW		Shallow	Deep			
Semivolatile Organic Compounds										
Dibenzofuran	X	X	---	ND	---	X	X	---	---	---
Diethylphthalate	ND	ND	---	X	---	ND	ND	---	---	---
Di-n-butyl phthalate	X	ND	---	X	---	X	X	---	---	---
Di-n-octyl phthalate	ND	ND	---	ND	---	X	ND	---	---	---
Fluoranthene	X	X	---	X	---	X	X	---	---	---
Fluorene	X	X	---	X	---	X	X	---	---	---
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	X
Hexachloroethane	ND	ND	---	X	---	ND	ND	---	---	---
Indeno(1,2,3-c,d)pyrene	X	X	---	X	---	X	X	---	---	---
Naphthalene	X	X	X	X	X	X	X	ND	X	X
Nitrobenzene	ND	ND	---	X	---	ND	ND	---	---	---
N-Nitrosodi-n-propylamine	ND	ND	---	X	---	ND	ND	---	---	---
N-Nitrosodiphenylamine	ND	ND	---	X	---	ND	ND	---	---	---
Pentachlorophenol	ND	X	---	X	---	ND	ND	---	---	---
Phenanthrene	X	X	---	X	---	X	X	---	---	---
Phenol	ND	ND	---	X	---	ND	ND	---	---	---
Pyrene	X	X	---	X	---	X	X	---	---	---
Volatile Organic Compounds										
1,1,1-Trichloroethane	X	X	X	X	X	ND	ND	X	X	X
1,1,2,2-Tetrachloroethane	ND	ND	ND	X	X	ND	ND	X	X	ND
1,1,2-Trichloroethane	ND	ND	ND	X	X	ND	ND	X	ND	ND
1,1-Dichloroethane	X	X	X	X	X	ND	ND	X	ND	X
1,1-Dichloroethene	X	X	X	X	X	ND	ND	ND	X	X
1,2,3-Trichlorobenzene	---	---	X	X	---	ND	ND	---	---	---
1,2,4-Trichlorobenzene	X	X	X	X	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	---	---	X	X	X	ND	ND	X	X	X
1,2-Dibromo-3-chloropropane	ND	ND	X	ND	---	ND	ND	---	---	---
1,2-Dibromoethane	ND	ND	ND	ND	X	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	X	X	X	X	X	ND	ND	X	X	X
1,2-Dichloroethane	X	X	X	X	X	ND	ND	X	X	X
1,2-Dichloropropane	ND	ND	X	X	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	---	---	X	X	X	---	---	X	X	X
1,3-Butadiene	---	---	---	---	ND	---	---	X	---	---
1,3-Dichlorobenzene	X	X	X	X	ND	ND	ND	X	X	X
1,4-Dichlorobenzene	X	X	X	X	X	ND	ND	X	X	X
2,2,4-Trimethylpentane	---	---	---	---	X	---	---	X	---	---
2,2-Dichloropropane	---	---	ND	X	---	---	---	---	---	---
2-Chlorotoluene	---	---	X	ND	---	---	---	---	---	---
2-Hexanone	ND	ND	---	X	ND	ND	ND	ND	---	---
4-Ethyltoluene	---	---	---	---	X	---	---	X	---	---
Acetone	X	X	X	X	X	X	X	X	---	---
Benzene	X	X	X	X	X	ND	ND	X	X	X

TABLE 3
Chemicals of Potential Concern
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Site					Residential				
	Soil		Groundwater		Soil Gas	Soil		Soil Gas	Ambient Air	Crawl Space Air
	Shallow	Deep	Grab	MW		Shallow	Deep			
Volatile Organic Compounds										
Bromoform	ND	ND	ND	X	ND	ND	ND	ND	---	---
Bromomethane	ND	ND	ND	ND	X	ND	ND	ND	X	X
Carbon disulfide	X	X	---	X	X	ND	ND	X	---	---
Carbon tetrachloride	ND	ND	X	ND	X	ND	ND	X	X	X
Chlorobenzene	X	X	X	X	X	ND	ND	ND	X	X
Chloroethane	X	X	X	X	X	ND	ND	ND	X	X
Chloroform	ND	ND	X	X	X	ND	ND	X	X	X
Chloromethane	X	ND	X	X	X	ND	ND	X	X	X
cis-1,2-Dichloroethene	X	X	X	X	X	ND	ND	X	ND	X
cis-1,3-Dichloropropene	ND	ND	X	X	ND	ND	ND	ND	ND	ND
Cyclohexane	X	X	---	X	X	---	---	X	---	---
Ethanol	---	---	---	---	X	---	---	X	---	---
Ethyl tert-butyl ether	---	---	---	X	---	ND	ND	---	---	---
Ethylbenzene	X	X	X	X	X	ND	ND	X	X	X
Freon 11	ND	ND	ND	X	X	X	X	X	X	X
Freon 113	ND	ND	ND	ND	X	ND	ND	X	X	X
Freon 114	---	---	---	---	ND	---	---	ND	X	X
Freon 12	ND	ND	ND	ND	X	ND	ND	X	X	X
Freon 134a	---	---	---	---	X	---	---	X	---	---
Isopropanol	---	---	---	---	X	---	---	X	---	---
Isopropyl ether	---	---	---	X	---	ND	ND	---	---	---
Isopropylbenzene (cumene)	X	X	X	X	X	ND	ND	ND	---	---
Methyl acetate	ND	ND	---	X	---	---	---	---	---	---
Methyl ethyl ketone	X	X	X	X	X	ND	ND	X	---	---
Methyl isobutyl ketone	X	X	---	X	ND	ND	ND	ND	---	---
Methyl tert-butyl ether	X	ND	X	X	X	ND	ND	ND	ND	ND
Methylcyclohexane	X	X	---	X	---	---	---	---	---	---
Methylene chloride	X	X	X	X	X	ND	ND	X	X	X
n-Butylbenzene	---	---	X	X	---	---	---	---	---	---
n-Heptane	---	---	---	---	X	---	---	X	---	---
n-Propylbenzene	---	---	X	X	X	---	---	ND	---	---
p-Cymene (p-isopropyltoluene)	---	---	X	X	---	---	---	---	---	---
sec-Butylbenzene	---	---	X	X	---	---	---	---	---	---
Styrene	X	ND	ND	X	X	ND	ND	X	X	X
tert-Butyl alcohol	ND	ND	---	X	---	ND	ND	---	---	---
tert-Butylbenzene	---	---	ND	X	---	---	---	---	---	---
Tetrachloroethene	X	X	X	X	X	X	X	X	X	X
Tetrahydrofuran	---	---	---	---	X	---	---	X	---	---
Toluene	X	X	X	X	X	ND	ND	X	X	X
Total hexanes	---	---	---	---	X	---	---	X	---	---
trans-1,2-Dichloroethene	X	X	X	X	X	ND	ND	X	ND	X
trans-1,3-Dichloropropene	ND	ND	ND	X	ND	ND	ND	ND	ND	ND

TABLE 3
Chemicals of Potential Concern
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Site					Residential				
	Soil		Groundwater		Soil Gas	Soil		Soil Gas	Ambient Air	Crawl Space Air
	Shallow	Deep	Grab	MW		Shallow	Deep			
Volatile Organic Compounds										
Trichloroethene	X	X	X	X	X	X	ND	X	X	X
Vinyl chloride	X	X	X	X	X	ND	ND	X	X	X
Xylenes, total	X	X	---	X	---	---	---	---	---	---
Dioxins/Furans										
1,2,3,4,6,7,8-HpCDD	X	---	---	X	---	---	---	---	---	---
1,2,3,4,6,7,8-HpCDF	X	---	---	X	---	---	---	---	---	---
1,2,3,4,7,8,9-HpCDF	X	---	---	X	---	---	---	---	---	---
1,2,3,4,7,8-HxCDD	X	---	---	X	---	---	---	---	---	---
1,2,3,4,7,8-HxCDF	X	---	---	X	---	---	---	---	---	---
1,2,3,6,7,8-HxCDD	X	---	---	X	---	---	---	---	---	---
1,2,3,6,7,8-HxCDF	X	---	---	X	---	---	---	---	---	---
1,2,3,7,8,9-HxCDD	X	---	---	X	---	---	---	---	---	---
1,2,3,7,8,9-HxCDF	X	---	---	X	---	---	---	---	---	---
1,2,3,7,8-PeCDD	X	---	---	X	---	---	---	---	---	---
1,2,3,7,8-PeCDF	X	---	---	X	---	---	---	---	---	---
2,3,4,6,7,8-HxCDF	X	---	---	X	---	---	---	---	---	---
2,3,4,7,8-PeCDF	X	---	---	X	---	---	---	---	---	---
2,3,7,8-TCDD	X	---	---	ND	---	---	---	---	---	---
2,3,7,8-TCDF	X	---	---	X	---	---	---	---	---	---
OCDD	X	---	---	X	---	---	---	---	---	---
OCDF	X	---	---	X	---	---	---	---	---	---

MW Monitoring Well
X Detected
--- Not analyzed
ND Not detected

Table 4
Soil Exposure Assumptions
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

			Reasonable Maximum Exposure (RME) Scenario								
			Occupational		Construction		Residential		Residential		
Exposure Parameter		**Units**	**Worker**		**Worker**		**Adult**		**Child**		**Intake Equation**
Incidental Ingestion of Soil											
Concentration in Soil	C_s	mg/kg	Chemical specific		Chemical specific		Chemical specific		Chemical specific		
Ingestion Rate	IngR	mg/day	100	EPA, 1989	330	EPA, 1989	100	EPA, 1989	200	EPA, 1989	
Exposure Frequency	EF	days/yr	250	EPA, 1989	250	EPA, 1989	350	EPA, 1989	350	EPA, 1989	$\frac{Cs \times IngR \times EF \times ED \times CF}{BW \times AT}$
Exposure Duration	ED	years	25	EPA, 1989	1	EPA, 1989	24	EPA, 1989	6	EPA, 1989	
Conversion Factor	CF	kg/mg	1.00E-06		1.00E-06		1.00E-06		1.00E-06		
Body Weight	BW	kg	70	EPA, 1989	70	EPA, 1989	70	EPA, 1989	15	EPA, 1989	
Averaging Time for carcinogens	AT_C	days	25,550	EPA, 1989	25,550	EPA, 1989	25,550	EPA, 1989	25,550	EPA, 1989	
Averaging Time for noncarcinogens	AT_{NC}	days	9,125	EPA, 1989	365	EPA, 1989	8,760	EPA, 1989	2,190	EPA, 1989	
Inhalation of Particulates											
Concentration in Soil	C_s	mg/kg	Chemical specific		Chemical specific		Chemical specific		Chemical specific		
Inhalation Rate	InhR	m^3/day	20	EPA, 1989	20	EPA, 1989	20	EPA, 1989	10	EPA, 1989	
Exposure Frequency	EF	days/yr	250	EPA, 1989	250	EPA, 1989	350	EPA, 1989	350	EPA, 1989	$\frac{Cs \times InhR \times EF \times ED \times \left[\left(1/PEF\right)+\left(1/VF\right)\right]}{BW \times AT}$
Exposure Duration	ED	years	25	EPA, 1989	1	EPA, 1989	24	EPA, 1989	6	EPA, 1989	
1/Particulate Emission Factor	1/PEF	kg/m^3	7.60E-10	EPA, 1996	7.60E-10	EPA, 1996	7.60E-10	EPA, 1996	7.60E-10	EPA, 1996	
1/Volatilization Factor	1/VF	kg/m^3	Chemical specific	EPA, 2004	Chemical specific	EPA, 2004	Chemical specific	EPA, 2004	Chemical specific	EPA, 2004	
Body Weight	BW	kg	70	EPA, 1989	70	EPA, 1989	70	EPA, 1989	15	EPA, 1989	
Averaging Time for carcinogens	AT_C	days	25,550	EPA, 1989	25,550	EPA, 1989	25,550	EPA, 1989	25,550	EPA, 1989	
Averaging Time for noncarcinogens	AT_{NC}	days	9,125	EPA, 1989	365	EPA, 1989	8,760	EPA, 1989	2,190	EPA, 1989	
Dermal Contact with Soil											
Concentration in Soil	C_s	mg/kg	Chemical specific		Chemical specific		Chemical specific		Chemical specific		
Exposure Frequency	EF	days/yr	250	EPA, 1989	250	EPA, 1989	350	EPA, 1989	350	EPA, 1989	
Exposure Duration	ED	years	25	EPA, 1989	1	EPA, 1989	24	EPA, 1989	6	EPA, 1989	
Skin Surface Area	SA	cm^2	5700	CalEPA, 2005	5700	CALEPA, 2005	5700	CalEPA, 2005	2900	CalEPA, 2005	$\frac{Cs \times SA \times EF \times ED \times AF \times ABS \times CF}{BW \times AT}$
Soil-Skin Adherence Factor	AF	mg/cm^2/day	0.2	CalEPA, 2005	0.8	CALEPA, 2005	0.07	CalEPA, 2005	0.2	CalEPA, 2005	
Absorption Factor	ABS	unitless	Chemical specific	CalEPA, 2005	Chemical specific	CalEPA, 2005	Chemical specific	CalEPA, 2005	Chemical specific	CalEPA, 2005	
Conversion Factor	CF	kg/mg	1.00E-06		1.00E-06		1.00E-06		1.00E-06		
Body Weight	BW	kg	70	EPA, 1989	70	EPA, 1989	70	EPA, 1989	15	EPA, 1989	
Averaging Time for carcinogens	AT_C	days	25,550	EPA, 1989	25,550	EPA, 1989	25,550	EPA, 1989	25,550	EPA, 1989	
Averaging Time for noncarcinogens	ATnc	days	9,125	EPA, 1989	365	EPA, 1989	8,760	EPA, 1989	2,190	EPA, 1989	

Notes:
AT_C = 70 years x 365 days/year
AT_{NC} = ED (years) x 365 days/year
PEF = 1.32E-09 m^3/kg
RME = Reasonable maximum exposure.
EPA, 1989: Risk Assessment Guidance for Superfund (RAGS) Volume I Human Health Evaluation Manual Part A.
EPA, 1996: Soil Screening Guidance.
EPA, 2004: User's Guide and Background Technical Document for Preliminary Remediation Goals (PRG). Region 9. October.
CalEPA, DTSC, HERD, 2005: Recommended DTSC Default Exposure Factors for Use in Risk Assessment at California Military Facilities.

Table 5
Groundwater Exposure Assumptions - Future Residents
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Parameter		Units	Reasonable Maximum Exposure (RME) Scenario: Residential Adult		Residential Child		Intake Equation
Ingestion of Groundwater							
Concentration in Groundwater	C_{gw}	mg/L	Chemical specific		Chemical specific		
Ingestion Rate	IngR	L/day	2	EPA, 1989	1	EPA, 1989	
Exposure Frequency	EF	days/year	350	EPA, 1989	350	EPA, 1989	$\frac{C_{gw} \times IngR \times EF \times ED}{BW \times AT}$
Exposure Duration	ED	years	24	EPA, 1989	6	EPA, 1989	
Body Weight	BW	kg	70	EPA, 1989	15	EPA, 2004[b]	
Averaging Time for carcinogens	AT_C	days	25,550	EPA, 1989	25,550	EPA, 1989	
Averaging Time for noncarcinogens	AT_{NC}	days	8,760	EPA, 1989	2,190	EPA, 1989	
Inhalation of VOCs in Groundwater							
Concentration in Groundwater	C_{gw}	mg/L	Chemical specific		Chemical specific		
Inhalation Rate	InhR	m^3/day	20	EPA, 1989	10	EPA, 1989	
Volatilization Factor	VF	L/m^3	0.5	EPA, 2004[b]	0.5	EPA, 2004[b]	$\frac{C_{gw} \times InhR \times VF \times ET \times EF \times ED}{BW \times AT}$
Exposure Time	ET	hours/day	24	EPA, 1989	24	EPA, 1989	
Exposure Frequency	EF	days/year	350	EPA, 1989	350	EPA, 1989	
Exposure Duration	ED	years	24	EPA, 1989	6	EPA, 1989	
Body Weight	BW	kg	70	EPA, 1989	15	EPA, 1989	
Averaging Time for carcinogens	AT_C	days	25,550	EPA, 1989	25,550	EPA, 1989	
Averaging Time for noncarcinogens	AT_{NC}	days	8,760	EPA, 1989	2,190	EPA, 1989	
Dermal Contact with Groundwater While Showering							
Concentration in Groundwater	C_{gw}	mg/L	Chemical specific		Chemical specific		$\frac{DA_{event} \times SA \times EF \times ED}{BW \times AT}$
Absorbed dose per event per area of skin exposed	DA_{event}	mg/cm^2-event	Chemical specific	EPA, 2004“	Chemical specific	EPA, 2004“	Where for Organics:
Event Duration	t_{event}	hours/event	0.58	EPA, 2004“	1	EPA, 2004“	
Time to reach steady state	t*	hours	Chemical specific	EPA, 2004[a]	Chemical specific	EPA, 2004[a]	
Skin Permeability Constant for chemicals in groundwater	K_P	cm/hour	Chemical specific	EPA, 2004“	Chemical specific	EPA, 2004“	If $t_{event} > t^*$
Lag time per event	τ	hours/event	Chemical specific	EPA, 2004[a]	Chemical specific	EPA, 2004[a]	$DA_{event} = FA \times K_P \times C_{gw} \left[\frac{t_{event}}{1+B} + 2\tau \times \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right]$
Dimensionless coefficient	B	cm/hour	Chemical specific	EPA, 2004[a]	Chemical specific	EPA, 2004[a]	
Fraction Absorbed	FA	unitless	Chemical specific	EPA, 2004[a]	Chemical specific	EPA, 2004[a]	
Skin Surface Area	SA	cm^2/day	18,000	EPA, 1997	6,600	EPA, 2004[a]	If $t_{event} < t^*$
Exposure Frequency	EF	days/year	350	EPA, 1989	350	EPA, 1989	$DA_{event} = 2\ FA \times K_p \times C_{gw} \sqrt{\frac{6\tau \times t_{event}}{\Pi}}$
Exposure Duration	ED	years	24	EPA, 1989	6	EPA, 1989	
Body Weight	BW	kg	70	EPA, 1997	15	EPA, 1989	For Inorganics:
Averaging Time for carcinogens	AT_C	days	25,550	EPA, 1989	25,550	EPA, 1989	$DA_{event} = K_p \times C_{gw} \times t_{event}$
Averaging Time for noncarcinogens	AT_{NC}	days	8,760	EPA, 1989	2,190	EPA, 1989	

Notes:

AT_C = 70 years x 365 days/year

AT_{NC} = ED (years) x 365 days/year

RME = Reasonable maximum exposure.

EPA, 1989: Risk Assessment Guidance for Superfund (RAGS) Volume I Human Health Evaluation Manual Part A.

EPA, 1997: Exposure Factors Handbook. Volume I, General Factors. August.

EPA, 2004[a]: RAGS Part E, Supplemental Guidance for Dermal Risk Assessment.

EPA, 2004[b]: User's Guide and Background Technical Document for Preliminary Remediation Goals Table. Region 9. October.

Table 6
Groundwater Exposure Assumptions - Trench Workers
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

		Reasonable Maximum Exposure (RME) Scenario			
		Units	Trench Worker		Intake Equation
Inhalation of VOCs in Groundwater While Working in a Trench					
Concentration in Groundwater	C_{gw}	mg/L	Chemical specific		$\frac{C_{air} \times InhR \times ET \times EF \times ED \times CF_1}{BW \times AT}$
Concentration (VOCs) in breathing zone	C_{air}	ug/m^3	Chemical specific	CalEPA, 2006	
Total emission rate	Ei	mg/s	Chemical specific	CalEPA, 2006	
Inhalation Rate	InhR	m^3/hour	2.5	CalEPA, 2005	
Assumed velocity of air in the trench	u	m/s	0.152	CalEPA, 2006	
Mixing Height (adult breating zone)	H	m	1.83	CalEPA, 2006	
Width of trench perpendicular to wind direction	W	m	3.05	CalEPA, 2006	
Overall mass transfer coefficient	Ki	cm/s	Chemical specific	CalEPA, 2006	$C_{air} = \frac{E_i \times CF_2}{u \times H \times W}$
Bottom area of the trench covered with contaminated water	A_w	cm^2	65,032	CalEPA, 2006	
Exposure Time	ET	hours/day	8	CalEPA, 2005	
Exposure Frequency	EF	days/year	90	CalEPA, 2006	
Exposure Duration	ED	years	1	CalEPA, 2006	
Conversion Factor$_1$	CF_1	mg/ug	0.001		$E_i = K_i \times A_w \times C_{gw}$
Conversion Factor$_2$	CF_2	ug/mg	1000		
Body Weight	BW	kg	70	EPA, 1989	
Averaging Time for carcinogens	ATc	days	25,550	EPA, 1989	
Averaging Time for noncarcinogens	ATnc	days	365	CalEPA, 2006	
Dermal Contact with Groundwater While Working in a Trench					
Concentration in Groundwater	C_{gw}	mg/L	Chemical specific		$\frac{DA_{event} \times SA \times EF \times ED}{BW \times AT}$
Absorbed dose per event per area of skin exposed	DA_{event}	mg/cm^2-event	Chemical specific	EPA, 2004	
Event Duration	t_{event}	hours/event	8	CalEPA, 2005	For Organics:
Time to reach steady state	t*	hours	Chemical specific	EPA, 2004	
groundwater	K_P	cm/hour	Chemical specific	EPA, 2004	If $t_{event} < t^*$
Lag time per event	τ	hours/event	Chemical specific	EPA, 2004	$DA_{event} = FA \times K_P C_{gw} \left[\frac{t_{event}}{1+B} + 2\tau \times \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right]$
Dimensionless coefficient	B	cm/hour	Chemical specific	EPA, 2004	
Fraction Absorbed	FA	unitless	Chemical specific	EPA, 2004	
Skin Surface Area	SA	cm^2/day	5,700	CalEPA, 2005	If $t_{event} > t^*$
Exposure Frequency	EF	days/year	90	CalEPA, 2006	$DA_{event} = 2\ FA \times K_p \times C_{gw} \sqrt{\frac{6\tau \times t_{event}}{\Pi}}$
Exposure Duration	ED	years	1	CalEPA, 2006	
Body Weight	BW	kg	70	EPA, 1989	For Inorganics:
Averaging Time for carcinogens	ATc	days	25,550	EPA, 1989	$DA_{event} = K_p \times C_{gw} \times t_{event}$
Averaging Time for noncarcinogens	ATnc	days	365	CalEPA, 2006	

Notes:
RME = Reasonable maximum exposure.
EPA, 1989: Risk Assessment Guidance for Superfund (RAGS) Volume I Human Health Evaluation Manual Part A.
EPA, 2004: RAGS Part E, Supplemental Guidance for Dermal Risk Assessment.
CalEPA, DTSC, HERD, 2005: Recommended DTSC Default Exposure Factors for Use in Risk Assessment at California Military Facilities.
CalEPA, DTSC, HERD, 2006: Memorandum: Risk Assessment Issues, PAHs and Exposure Routes…,T.Taros, Staff Toxicologist, DTSC, 8810 Cal Center Drive, Sacramento, CA. August 11.

Table 7
Exposure Point Concentrations for Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
Former AMCO Chemical Facility - Shallow			
Metals			
Aluminum	mg/kg	12,600	95% Student's-t UCL
Antimony	mg/kg	14	95% Chebyshev (MVUE) UCL
Arsenic	mg/kg	8	95% Approximate Gamma UCL
Barium	mg/kg	513	95% Approximate Gamma UCL
Beryllium	mg/kg	0.6	95% Approximate Gamma UCL
Cadmium	mg/kg	2	95% H-UCL
Chromium	mg/kg	1,410	99% Chebyshev (Mean, Sd) UCL
Cobalt	mg/kg	9	95% Approximate Gamma UCL
Copper	mg/kg	229	95% Chebyshev (MVUE) UCL
Iron	mg/kg	26,100	95% Approximate Gamma UCL
Lead	mg/kg	640	95% Approximate Gamma UCL
Manganese	mg/kg	1,140	95% Chebyshev (Mean, Sd) UCL
Nickel	mg/kg	42	95% Student's-t UCL
Selenium	mg/kg	3	Maximum Result
Silver	mg/kg	0.8	95% Approximate Gamma UCL
Thallium	mg/kg	3	95% Chebyshev (Mean, Sd) UCL
Vanadium	mg/kg	42	95% Approximate Gamma UCL
Zinc	mg/kg	591	95% Approximate Gamma UCL
Pesticides/PCBs			
4,4'-DDD	ug/kg	9,160	95% Adjusted Gamma UCL
4,4'-DDE	ug/kg	3,560	95% Adjusted Gamma UCL
4,4'-DDT	ug/kg	325	99% Chebyshev (Mean, Sd) UCL
Aldrin	ug/kg	1,290	99% Chebyshev (Mean, Sd) UCL
alpha-BHC	ug/kg	26	Maximum Result
alpha-Chlordane	ug/kg	40	95% Chebyshev (MVUE) UCL
beta-BHC	ug/kg	35	Maximum Result
delta-BHC	ug/kg	4	Maximum Result
Dieldrin	ug/kg	1,340	95% Adjusted Gamma UCL
Endosulfan sulfate	ug/kg	2	Maximum Result
Endrin	ug/kg	5	Maximum Result
Endrin aldehyde	ug/kg	1.1	Maximum Result
Endrin ketone	ug/kg	12	Maximum Result
gamma-Chlordane	ug/kg	109	99% Chebyshev (Mean, Sd) UCL
Heptachlor	ug/kg	9	Maximum Result
Methoxychlor	ug/kg	4	Maximum Result
Aroclor-1260	ug/kg	640	Maximum Result
SVOCs/VOCs			
1,2,4-Trichlorobenzene	ug/kg	1,540	99% Chebyshev (Mean, Sd) UCL
1,2-Dichlorobenzene	ug/kg	54,700	95% Hall's Bootstrap UCL
1,3-Dichlorobenzene	ug/kg	2,020	99% Chebyshev (Mean, Sd) UCL
1,4-Dichlorobenzene	ug/kg	25,500	99% Chebyshev (Mean, Sd) UCL
2-Methylnaphthalene	ug/kg	114,000	95% Hall's Bootstrap UCL
2-Methylphenol	ug/kg	990	Maximum Result
4-Chloro-3-methylphenol	ug/kg	7,200	Maximum Result
4-Methylphenol	ug/kg	3,600	Maximum Result
Acenaphthene	ug/kg	9,180	99% Chebyshev (Mean, Sd) UCL
Anthracene	ug/kg	1,100	Maximum Result

Table 7
Exposure Point Concentrations for Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
Benzo(a)anthracene	ug/kg	550	Maximum Result
Benzo(a)pyrene	ug/kg	500	Maximum Result
Benzo(b)fluoranthene	ug/kg	420	Maximum Result
Benzo(g,h,i)perylene	ug/kg	430	Maximum Result
Benzo(k)fluoranthene	ug/kg	430	Maximum Result
Benzyl butyl phthalate	ug/kg	7,600	Maximum Result
Biphenyl (diphenyl)	ug/kg	4,400	Maximum Result
bis(2-Ethylhexyl)phthalate	ug/kg	9,850	99% Chebyshev (Mean, Sd) UCL
Caprolactam	ug/kg	95	Maximum Result
Carbazole	ug/kg	1,100	Maximum Result
Chrysene	ug/kg	910	Maximum Result
Dibenz(a,h)anthracene	ug/kg	120	Maximum Result
Dibenzofuran	ug/kg	4,100	Maximum Result
Di-n-butyl phthalate	ug/kg	2,900	Maximum Result
Fluoranthene	ug/kg	4,200	Maximum Result
Fluorene	ug/kg	8,310	99% Chebyshev (Mean, Sd) UCL
Indeno(1,2,3-c,d)pyrene	ug/kg	440	Maximum Result
Naphthalene	ug/kg	52,800	99% Chebyshev (Mean, Sd) UCL
Phenanthrene	ug/kg	12,100	99% Chebyshev (Mean, Sd) UCL
Pyrene	ug/kg	3,970	95% Approximate Gamma UCL
1,1,1-Trichloroethane	ug/kg	25	95% Chebyshev (Mean, Sd) UCL
1,1-Dichloroethane	ug/kg	10,100	99% Chebyshev (Mean, Sd) UCL
1,1-Dichloroethene	ug/kg	68	95% Chebyshev (Mean, Sd) UCL
1,2-Dichloroethane	ug/kg	61	95% Chebyshev (Mean, Sd) UCL
Acetone	ug/kg	226	95% Approximate Gamma UCL
Benzene	ug/kg	1,930	99% Chebyshev (Mean, Sd) UCL
Carbon disulfide	ug/kg	6	95% Student's-t UCL
Chlorobenzene	ug/kg	10,100	99% Chebyshev (Mean, Sd) UCL
Chloroethane	ug/kg	24	95% Chebyshev (Mean, Sd) UCL
Chloromethane	ug/kg	127	95% Chebyshev (Mean, Sd) UCL
cis-1,2-Dichloroethene	ug/kg	149,000	95% Hall's Bootstrap UCL
Cyclohexane	ug/kg	2,550	99% Chebyshev (Mean, Sd) UCL
Ethylbenzene	ug/kg	22,400	95% Hall's Bootstrap UCL
Isopropylbenzene (cumene)	ug/kg	5,350	95% Hall's Bootstrap UCL
Methyl ethyl ketone	ug/kg	314	99% Chebyshev (Mean, Sd) UCL
Methyl isobutyl ketone	ug/kg	5,740	99% Chebyshev (Mean, Sd) UCL
Methyl tert-butyl ether	ug/kg	4	Maximum Result
Methylcyclohexane	ug/kg	10,200	95% Hall's Bootstrap UCL
Methylene chloride	ug/kg	8	95% Student's-t UCL
Styrene	ug/kg	514	99% Chebyshev (Mean, Sd) UCL
Tetrachloroethene	ug/kg	88	99% Chebyshev (Mean, Sd) UCL
Toluene	ug/kg	116,000	95% Hall's Bootstrap UCL
trans-1,2-Dichloroethene	ug/kg	638	99% Chebyshev (Mean, Sd) UCL
Trichloroethene	ug/kg	521	99% Chebyshev (Mean, Sd) UCL
Vinyl chloride	ug/kg	1,280	99% Chebyshev (Mean, Sd) UCL
Xylenes, total	ug/kg	157,000	95% Hall's Bootstrap UCL

Table 7
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Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
Dioxins/Furans			
1,2,3,4,6,7,8-HpCDD	ng/kg	972	95% Student's-t UCL
1,2,3,4,6,7,8-HpCDF	ng/kg	160	95% Student's-t UCL
1,2,3,4,7,8,9-HpCDF	ng/kg	8	95% Student's-t UCL
1,2,3,4,7,8-HxCDD	ng/kg	16	Maximum Result
1,2,3,4,7,8-HxCDF	ng/kg	2	95% Student's-t UCL
1,2,3,6,7,8-HxCDD	ng/kg	74	Maximum Result
1,2,3,6,7,8-HxCDF	ng/kg	15	95% Student's-t UCL
1,2,3,7,8,9-HxCDD	ng/kg	41	Maximum Result
1,2,3,7,8,9-HxCDF	ng/kg	9	Maximum Result
1,2,3,7,8-PeCDD	ng/kg	15	Maximum Result
2,3,4,6,7,8-HxCDF	ng/kg	15	95% Student's-t UCL
2,3,4,7,8-PeCDF	ng/kg	37	95% Student's-t UCL
2,3,7,8-TCDF	ng/kg	5	95% Student's-t UCL
OCDD	ng/kg	8,200	95% Student's-t UCL
OCDF	ng/kg	325	95% Student's-t UCL

Former AMCO Chemical Facility - Deep

Metals			
Aluminum	mg/kg	12,500	95% Student's-t UCL
Antimony	mg/kg	21	99% Chebyshev (Mean, Sd) UCL
Arsenic	mg/kg	8	95% Approximate Gamma UCL
Barium	mg/kg	555	95% H-UCL
Beryllium	mg/kg	0.6	95% Approximate Gamma UCL
Cadmium	mg/kg	2	95% Chebyshev (Mean, Sd) UCL
Chromium	mg/kg	495	95% Chebyshev (Mean, Sd) UCL
Cobalt	mg/kg	8	95% Approximate Gamma UCL
Copper	mg/kg	145	95% Approximate Gamma UCL
Iron	mg/kg	23,400	95% Approximate Gamma UCL
Lead	mg/kg	605	95% Approximate Gamma UCL
Manganese	mg/kg	843	95% Chebyshev (Mean, Sd) UCL
Nickel	mg/kg	37	95% Student's-t UCL
Selenium	mg/kg	3	95% Chebyshev (Mean, Sd) UCL
Silver	mg/kg	1	95% Approximate Gamma UCL
Thallium	mg/kg	3	95% Chebyshev (Mean, Sd) UCL
Vanadium	mg/kg	41	95% Approximate Gamma UCL
Zinc	mg/kg	441	95% Approximate Gamma UCL
Pesticides/PCBs			
4,4'-DDD	ug/kg	8,400	95% Hall's Bootstrap UCL
4,4'-DDE	ug/kg	5,640	99% Chebyshev (Mean, Sd) UCL
4,4'-DDT	ug/kg	247	99% Chebyshev (Mean, Sd) UCL
Aldrin	ug/kg	924	99% Chebyshev (Mean, Sd) UCL
alpha-BHC	ug/kg	26	Maximum Result
alpha-Chlordane	ug/kg	70	99% Chebyshev (Mean, Sd) UCL
beta-BHC	ug/kg	35	Maximum Result
delta-BHC	ug/kg	4	Maximum Result
Dieldrin	ug/kg	2,080	99% Chebyshev (Mean, Sd) UCL
Endosulfan sulfate	ug/kg	2	Maximum Result
Endrin	ug/kg	5	Maximum Result
Endrin aldehyde	ug/kg	1	Maximum Result

Table 7
Exposure Point Concentrations for Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
Endrin ketone	ug/kg	12	Maximum Result
gamma-BHC	ug/kg	3	Maximum Result
gamma-Chlordane	ug/kg	88	99% Chebyshev (Mean, Sd) UCL
Heptachlor	ug/kg	9	Maximum Result
Methoxychlor	ug/kg	4	Maximum Result
Aroclor-1260	ug/kg	980	Maximum Result
SVOCs/VOCs			
1,2,4-Trichlorobenzene	ug/kg	1,050	99% Chebyshev (Mean, Sd) UCL
1,2-Dichlorobenzene	ug/kg	40,200	95% Hall's Bootstrap UCL
1,3-Dichlorobenzene	ug/kg	1,380	99% Chebyshev (Mean, Sd) UCL
1,4-Dichlorobenzene	ug/kg	17,600	99% Chebyshev (Mean, Sd) UCL
1,4-Dioxane (p-dioxane)	ug/kg	872	95% Chebyshev (Mean, Sd) UCL
2-Methylnaphthalene	ug/kg	402,000	99% Chebyshev (Mean, Sd) UCL
2-Methylphenol	ug/kg	990	Maximum Result
4-Chloro-3-methylphenol	ug/kg	7,200	Maximum Result
4-Methylphenol	ug/kg	3,600	Maximum Result
Acenaphthene	ug/kg	8,320	99% Chebyshev (Mean, Sd) UCL
Acetophenone	ug/kg	8,730	99% Chebyshev (Mean, Sd) UCL
Anthracene	ug/kg	1,100	Maximum Result
Benzo(a)anthracene	ug/kg	550	Maximum Result
Benzo(a)pyrene	ug/kg	500	Maximum Result
Benzo(b)fluoranthene	ug/kg	420	Maximum Result
Benzo(g,h,i)perylene	ug/kg	430	Maximum Result
Benzo(k)fluoranthene	ug/kg	430	Maximum Result
Benzyl butyl phthalate	ug/kg	7,600	Maximum Result
Biphenyl (diphenyl)	ug/kg	7,100	Maximum Result
bis(2-Ethylhexyl)phthalate	ug/kg	8,860	99% Chebyshev (Mean, Sd) UCL
Caprolactam	ug/kg	95	Maximum Result
Carbazole	ug/kg	1,100	Maximum Result
Chrysene	ug/kg	3,500	Maximum Result
Dibenz(a,h)anthracene	ug/kg	120	Maximum Result
Dibenzofuran	ug/kg	4,100	Maximum Result
Di-n-butyl phthalate	ug/kg	2,900	Maximum Result
Fluoranthene	ug/kg	5,900	Maximum Result
Fluorene	ug/kg	8,100	99% Chebyshev (Mean, Sd) UCL
Indeno(1,2,3-c,d)pyrene	ug/kg	440	Maximum Result
Naphthalene	ug/kg	51,000	99% Chebyshev (Mean, Sd) UCL
Pentachlorophenol	ug/kg	6,700	Maximum Result
Phenanthrene	ug/kg	15,100	99% Chebyshev (Mean, Sd) UCL
Pyrene	ug/kg	7,300	99% Chebyshev (Mean, Sd) UCL
1,1,1-Trichloroethane	ug/kg	23	95% Chebyshev (Mean, Sd) UCL
1,1-Dichloroethane	ug/kg	7,300	99% Chebyshev (Mean, Sd) UCL
1,1-Dichloroethene	ug/kg	53	95% Chebyshev (Mean, Sd) UCL
1,2-Dichloroethane	ug/kg	43	95% Chebyshev (Mean, Sd) UCL
Acetone	ug/kg	209	95% Approximate Gamma UCL
Benzene	ug/kg	1,420	99% Chebyshev (Mean, Sd) UCL
Carbon disulfide	ug/kg	7	95% Student's-t UCL
Chlorobenzene	ug/kg	6,890	99% Chebyshev (Mean, Sd) UCL
Chloroethane	ug/kg	19	95% Chebyshev (Mean, Sd) UCL
Chloromethane	ug/kg	88	95% Chebyshev (Mean, Sd) UCL

Table 7
Exposure Point Concentrations for Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
cis-1,2-Dichloroethene	ug/kg	134,000	95% Hall's Bootstrap UCL
Cyclohexane	ug/kg	2,380	99% Chebyshev (Mean, Sd) UCL
Ethylbenzene	ug/kg	25,200	95% Hall's Bootstrap UCL
Isopropylbenzene (cumene)	ug/kg	14,700	99% Chebyshev (Mean, Sd) UCL
Methyl ethyl ketone	ug/kg	281	99% Chebyshev (Mean, Sd) UCL
Methyl isobutyl ketone	ug/kg	4,190	99% Chebyshev (Mean, Sd) UCL
Methyl tert-butyl ether	ug/kg	4	Maximum Result
Methylcyclohexane	ug/kg	16,200	95% Hall's Bootstrap UCL
Methylene chloride	ug/kg	9	95% Student's-t UCL
Styrene	ug/kg	174	95% Chebyshev (Mean, Sd) UCL
Tetrachloroethene	ug/kg	509	99% Chebyshev (Mean, Sd) UCL
Toluene	ug/kg	494,000	95% Hall's Bootstrap UCL
trans-1,2-Dichloroethene	ug/kg	529	99% Chebyshev (Mean, Sd) UCL
Trichloroethene	ug/kg	2,630	99% Chebyshev (Mean, Sd) UCL
Vinyl chloride	ug/kg	895	99% Chebyshev (Mean, Sd) UCL
Xylenes, total	ug/kg	140,000	95% Hall's Bootstrap UCL
Dioxins/Furans			
1,2,3,4,6,7,8-HpCDD	ng/kg	972	95% Student's-t UCL
1,2,3,4,6,7,8-HpCDF	ng/kg	160	95% Student's-t UCL
1,2,3,4,7,8,9-HpCDF	ng/kg	8	95% Student's-t UCL
1,2,3,4,7,8-HxCDD	ng/kg	16	Maximum Result
1,2,3,4,7,8-HxCDF	ng/kg	2	95% Student's-t UCL
1,2,3,6,7,8-HxCDD	ng/kg	74	Maximum Result
1,2,3,6,7,8-HxCDF	ng/kg	15	95% Student's-t UCL
1,2,3,7,8,9-HxCDD	ng/kg	41	Maximum Result
1,2,3,7,8,9-HxCDF	ng/kg	9	Maximum Result
1,2,3,7,8-PeCDD	ng/kg	15	Maximum Result
2,3,4,6,7,8-HxCDF	ng/kg	15	95% Student's-t UCL
2,3,4,7,8-PeCDF	ng/kg	37	95% Student's-t UCL
2,3,7,8-TCDF	ng/kg	5	95% Student's-t UCL
OCDD	ng/kg	8,200	95% Student's-t UCL
OCDF	ng/kg	325	95% Student's-t UCL

Parking Lot - Shallow

Metals			
Aluminum	mg/kg	13,500	Maximum Result
Antimony	mg/kg	216	Maximum Result
Arsenic	mg/kg	20	Maximum Result
Barium	mg/kg	3,800	Maximum Result
Beryllium	mg/kg	1	Maximum Result
Cadmium	mg/kg	11	Maximum Result
Chromium	mg/kg	102	Maximum Result
Cobalt	mg/kg	15	Maximum Result
Copper	mg/kg	418	Maximum Result
Iron	mg/kg	74,500	Maximum Result
Lead	mg/kg	2,170	Maximum Result
Manganese	mg/kg	1,110	Maximum Result
Nickel	mg/kg	72	Maximum Result
Selenium	mg/kg	5	Maximum Result
Silver	mg/kg	1	Maximum Result

Table 7
Exposure Point Concentrations for Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
Thallium	mg/kg	5	Maximum Result
Vanadium	mg/kg	64	Maximum Result
Zinc	mg/kg	8,030	Maximum Result
Pesticides/PCBs			
4,4'-DDD	ug/kg	10	Maximum Result
4,4'-DDE	ug/kg	4	Maximum Result
4,4'-DDT	ug/kg	10	Maximum Result
Endrin	ug/kg	6	Maximum Result
Endrin ketone	ug/kg	14	Maximum Result
gamma-Chlordane	ug/kg	2	Maximum Result
Methoxychlor	ug/kg	10	Maximum Result
SVOCs/VOCs			
2-Methylnaphthalene	ug/kg	170	Maximum Result
Acenaphthylene	ug/kg	690	Maximum Result
Anthracene	ug/kg	860	Maximum Result
Benzo(a)anthracene	ug/kg	1,300	Maximum Result
Benzo(a)pyrene	ug/kg	2,600	Maximum Result
Benzo(b)fluoranthene	ug/kg	1,700	Maximum Result
Benzo(g,h,i)perylene	ug/kg	2,300	Maximum Result
Benzo(k)fluoranthene	ug/kg	1,500	Maximum Result
Biphenyl (diphenyl)	ug/kg	160	Maximum Result
Chrysene	ug/kg	1,800	Maximum Result
Fluoranthene	ug/kg	3,000	Maximum Result
Fluorene	ug/kg	500	Maximum Result
Indeno(1,2,3-c,d)pyrene	ug/kg	2,300	Maximum Result
Naphthalene	ug/kg	160	Maximum Result
Phenanthrene	ug/kg	4,400	Maximum Result
Pyrene	ug/kg	4,400	Maximum Result
Acetone	ug/kg	50	Maximum Result
cis-1,2-Dichloroethene	ug/kg	2	Maximum Result
Methyl ethyl ketone	ug/kg	21	Maximum Result
Methylene chloride	ug/kg	4	Maximum Result
Toluene	ug/kg	9	Maximum Result
Xylenes, total	ug/kg	5	Maximum Result
Dioxins/Furans			
1,2,3,4,6,7,8-HpCDD	ng/kg	35	Maximum Result
1,2,3,4,6,7,8-HpCDF	ng/kg	31	Maximum Result
1,2,3,4,7,8,9-HpCDF	ng/kg	3	Maximum Result
1,2,3,4,7,8-HxCDD	ng/kg	3	Maximum Result
1,2,3,4,7,8-HxCDF	ng/kg	17	Maximum Result
1,2,3,6,7,8-HxCDD	ng/kg	6	Maximum Result
1,2,3,6,7,8-HxCDF	ng/kg	11	Maximum Result
1,2,3,7,8,9-HxCDD	ng/kg	4	Maximum Result
1,2,3,7,8,9-HxCDF	ng/kg	4	Maximum Result
1,2,3,7,8-PeCDD	ng/kg	3	Maximum Result
1,2,3,7,8-PeCDF	ng/kg	4	Maximum Result
2,3,4,6,7,8-HxCDF	ng/kg	16	Maximum Result
2,3,4,7,8-PeCDF	ng/kg	33	Maximum Result
2,3,7,8-TCDD	ng/kg	1	Maximum Result
2,3,7,8-TCDF	ng/kg	8	Maximum Result

Table 7
Exposure Point Concentrations for Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
OCDD	ng/kg	357	Maximum Result
OCDF	ng/kg	19	Maximum Result
Parking Lot - Deep			
Metals			
Aluminum	mg/kg	13,000	95% Student's-t UCL
Antimony	mg/kg	216	Maximum Result
Arsenic	mg/kg	13	95% Student's-t UCL
Barium	mg/kg	3,500	95% Approximate Gamma UCL
Beryllium	mg/kg	0.7	95% Approximate Gamma UCL
Cadmium	mg/kg	11	Maximum Result
Chromium	mg/kg	80	95% Student's-t UCL
Cobalt	mg/kg	12	95% Approximate Gamma UCL
Copper	mg/kg	307	95% Student's-t UCL
Iron	mg/kg	57,400	95% Approximate Gamma UCL
Lead	mg/kg	1,450	95% Student's-t UCL
Manganese	mg/kg	857	95% Approximate Gamma UCL
Nickel	mg/kg	59	95% Student's-t UCL
Selenium	mg/kg	4	95% Approximate Gamma UCL
Silver	mg/kg	0.8	95% Student's-t UCL
Thallium	mg/kg	4	95% Approximate Gamma UCL
Vanadium	mg/kg	50	95% Student's-t UCL
Zinc	mg/kg	8,030	Maximum Result
Pesticides/PCBs			
4,4'-DDD	ug/kg	61	95% Approximate Gamma UCL
4,4'-DDE	ug/kg	24	95% Chebyshev (Mean, Sd) UCL
4,4'-DDT	ug/kg	9	95% Chebyshev (Mean, Sd) UCL
Dieldrin	ug/kg	9	95% Chebyshev (Mean, Sd) UCL
Endrin	ug/kg	4	95% Approximate Gamma UCL
Endrin ketone	ug/kg	13	95% Chebyshev (Mean, Sd) UCL
gamma-Chlordane	ug/kg	1	95% Approximate Gamma UCL
Methoxychlor	ug/kg	10	Maximum Result
SVOCs/VOCs			
2-Methylnaphthalene	ug/kg	1,910	95% Chebyshev (Mean, Sd) UCL
Acenaphthylene	ug/kg	1,200	Maximum Result
Anthracene	ug/kg	940	Maximum Result
Benzo(a)anthracene	ug/kg	4,140	95% Approximate Gamma UCL
Benzo(a)pyrene	ug/kg	8,900	Maximum Result
Benzo(b)fluoranthene	ug/kg	5,600	Maximum Result
Benzo(g,h,i)perylene	ug/kg	9,000	Maximum Result
Benzo(k)fluoranthene	ug/kg	3,400	95% Approximate Gamma UCL
Biphenyl (diphenyl)	ug/kg	160	Maximum Result
Chrysene	ug/kg	6,500	Maximum Result
Dibenz(a,h)anthracene	ug/kg	1,020	95% Chebyshev (Mean, Sd) UCL
Fluoranthene	ug/kg	12,000	Maximum Result
Fluorene	ug/kg	423	95% Approximate Gamma UCL
Indeno(1,2,3-c,d)pyrene	ug/kg	8,300	Maximum Result
Naphthalene	ug/kg	799	95% Chebyshev (Mean, Sd) UCL
Phenanthrene	ug/kg	4,400	Maximum Result
Pyrene	ug/kg	16,000	Maximum Result

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Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
Acetone	ug/kg	34	95% Student's-t UCL
cis-1,2-Dichloroethene	ug/kg	2	Maximum Result
Methyl ethyl ketone	ug/kg	19	95% Chebyshev (Mean, Sd) UCL
Methylene chloride	ug/kg	4	Maximum Result
Toluene	ug/kg	8	95% Student's-t UCL
Xylenes, total	ug/kg	5	Maximum Result
Dioxins/Furans			
1,2,3,4,6,7,8-HpCDD	ng/kg	35	Maximum Result
1,2,3,4,6,7,8-HpCDF	ng/kg	31	Maximum Result
1,2,3,4,7,8,9-HpCDF	ng/kg	3	Maximum Result
1,2,3,4,7,8-HxCDD	ng/kg	3	Maximum Result
1,2,3,4,7,8-HxCDF	ng/kg	17	Maximum Result
1,2,3,6,7,8-HxCDD	ng/kg	6	Maximum Result
1,2,3,6,7,8-HxCDF	ng/kg	11	Maximum Result
1,2,3,7,8,9-HxCDD	ng/kg	4	Maximum Result
1,2,3,7,8,9-HxCDF	ng/kg	4	Maximum Result
1,2,3,7,8-PeCDD	ng/kg	3	Maximum Result
1,2,3,7,8-PeCDF	ng/kg	4	Maximum Result
2,3,4,6,7,8-HxCDF	ng/kg	16	Maximum Result
2,3,4,7,8-PeCDF	ng/kg	33	Maximum Result
2,3,7,8-TCDD	ng/kg	1	Maximum Result
2,3,7,8-TCDF	ng/kg	8	Maximum Result
OCDD	ng/kg	357	Maximum Result
OCDF	ng/kg	19	Maximum Result
Large Vacant Lot - Shallow			
Metals			
Aluminum	mg/kg	9,210	95% Approximate Gamma UCL
Antimony	mg/kg	4	95% Approximate Gamma UCL
Arsenic	mg/kg	27	95% Approximate Gamma UCL
Barium	mg/kg	937	95% Chebyshev (Mean, Sd) UCL
Beryllium	mg/kg	0	95% Student's-t UCL
Cadmium	mg/kg	2	95% Chebyshev (Mean, Sd) UCL
Chromium	mg/kg	154	95% Approximate Gamma UCL
Cobalt	mg/kg	7	95% Student's-t UCL
Copper	mg/kg	149	95% Approximate Gamma UCL
Iron	mg/kg	24,900	95% Approximate Gamma UCL
Lead	mg/kg	4,360	99% Chebyshev (Mean, Sd) UCL
Manganese	mg/kg	360	95% Student's-t UCL
Nickel	mg/kg	26	95% Student's-t UCL
Selenium	mg/kg	3	Maximum Result
Silver	mg/kg	0.5	95% Approximate Gamma UCL
Thallium	mg/kg	3	Maximum Result
Vanadium	mg/kg	33	95% Approximate Gamma UCL
Zinc	mg/kg	453	95% Approximate Gamma UCL
Pesticides/PCBs			
4,4'-DDD	ug/kg	9,090	95% Adjusted Gamma UCL
4,4'-DDE	ug/kg	5,260	95% Adjusted Gamma UCL
4,4'-DDT	ug/kg	140,000	Maximum Result
alpha-BHC	ug/kg	6	Maximum Result

Table 7
Exposure Point Concentrations for Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
alpha-Chlordane	ug/kg	81	Maximum Result
beta-BHC	ug/kg	24	Maximum Result
Dieldrin	ug/kg	86	Maximum Result
Endosulfan sulfate	ug/kg	4	Maximum Result
Endrin	ug/kg	14	Maximum Result
Endrin aldehyde	ug/kg	5	Maximum Result
Endrin ketone	ug/kg	7	Maximum Result
gamma-BHC	ug/kg	347	99% Chebyshev (Mean, Sd) UCL
gamma-Chlordane	ug/kg	83	Maximum Result
Heptachlor	ug/kg	1	Maximum Result
Heptachlor epoxide	ug/kg	3	Maximum Result
Methoxychlor	ug/kg	7	Maximum Result
Aroclor-1260	ug/kg	33	Maximum Result
SVOCs/VOCs			
1,2-Dichlorobenzene	ug/kg	8	95% Student's-t UCL
1,4-Dichlorobenzene	ug/kg	2	Maximum Result
2-Methylnaphthalene	ug/kg	3,870	99% Chebyshev (Mean, Sd) UCL
Acetophenone	ug/kg	260	95% Student's-t UCL
Benzo(a)anthracene	ug/kg	488	95% H-UCL
Benzo(a)pyrene	ug/kg	651	95% H-UCL
Benzo(b)fluoranthene	ug/kg	640	95% Chebyshev (Mean, Sd) UCL
Benzo(g,h,i)perylene	ug/kg	660	95% H-UCL
Benzo(k)fluoranthene	ug/kg	623	95% Chebyshev (Mean, Sd) UCL
bis(2-Ethylhexyl)phthalate	ug/kg	1,070	95% Chebyshev (Mean, Sd) UCL
Caprolactam	ug/kg	230	Maximum Result
Chrysene	ug/kg	797	95% Chebyshev (Mean, Sd) UCL
Dibenz(a,h)anthracene	ug/kg	313	95% Student's-t UCL
Fluoranthene	ug/kg	668	95% H-UCL
Indeno(1,2,3-c,d)pyrene	ug/kg	694	95% H-UCL
Naphthalene	ug/kg	283	95% Student's-t UCL
Phenanthrene	ug/kg	378	95% H-UCL
Pyrene	ug/kg	1,350	95% Chebyshev (Mean, Sd) UCL
Acetone	ug/kg	150	Maximum Result
Chlorobenzene	ug/kg	22	95% Chebyshev (Mean, Sd) UCL
cis-1,2-Dichloroethene	ug/kg	21	95% Chebyshev (Mean, Sd) UCL
Ethylbenzene	ug/kg	21	95% Chebyshev (Mean, Sd) UCL
Isopropylbenzene (cumene)	ug/kg	338	99% Chebyshev (Mean, Sd) UCL
Methyl ethyl ketone	ug/kg	24	95% Chebyshev (Mean, Sd) UCL
Methyl isobutyl ketone	ug/kg	7	95% Student's-t UCL
Methylcyclohexane	ug/kg	346	99% Chebyshev (Mean, Sd) UCL
Methylene chloride	ug/kg	7	95% Student's-t UCL
Tetrachloroethene	ug/kg	7	95% Student's-t UCL
Toluene	ug/kg	69	95% Chebyshev (Mean, Sd) UCL
Trichloroethene	ug/kg	4	Maximum Result
Xylenes, total	ug/kg	291	99% Chebyshev (Mean, Sd) UCL
Large Vacant Lot - Deep			
Metals			
Aluminum	mg/kg	8,240	95% Student's-t UCL
Antimony	mg/kg	3	95% H-UCL

Table 7
Exposure Point Concentrations for Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
Arsenic	mg/kg	18	95% Approximate Gamma UCL
Barium	mg/kg	652	95% Chebyshev (Mean, Sd) UCL
Beryllium	mg/kg	0.3	95% Approximate Gamma UCL
Cadmium	mg/kg	2	95% Chebyshev (Mean, Sd) UCL
Chromium	mg/kg	166	95% Chebyshev (Mean, Sd) UCL
Cobalt	mg/kg	6	95% Student's-t UCL
Copper	mg/kg	114	95% Approximate Gamma UCL
Iron	mg/kg	21,400	95% Approximate Gamma UCL
Lead	mg/kg	2,750	99% Chebyshev (Mean, Sd) UCL
Manganese	mg/kg	324	95% Student's-t UCL
Nickel	mg/kg	25	95% Student's-t UCL
Selenium	mg/kg	4	Maximum Result
Silver	mg/kg	0.5	95% H-UCL
Thallium	mg/kg	3	Maximum Result
Vanadium	mg/kg	29	95% Approximate Gamma UCL
Zinc	mg/kg	321	95% Approximate Gamma UCL
Pesticides/PCBs			
4,4'-DDD	ug/kg	3,790	95% Adjusted Gamma UCL
4,4'-DDE	ug/kg	2,100	95% Adjusted Gamma UCL
4,4'-DDT	ug/kg	80,500	99% Chebyshev (MVUE) UCL
alpha-BHC	ug/kg	6	Maximum Result
alpha-Chlordane	ug/kg	81	Maximum Result
beta-BHC	ug/kg	24	Maximum Result
Dieldrin	ug/kg	86	Maximum Result
Endosulfan I	ug/kg	1	Maximum Result
Endosulfan sulfate	ug/kg	4	Maximum Result
Endrin	ug/kg	14	Maximum Result
Endrin aldehyde	ug/kg	5	Maximum Result
Endrin ketone	ug/kg	7	Maximum Result
gamma-BHC	ug/kg	216	99% Chebyshev (Mean, Sd) UCL
gamma-Chlordane	ug/kg	83	Maximum Result
Heptachlor	ug/kg	1	Maximum Result
Heptachlor epoxide	ug/kg	3	Maximum Result
Methoxychlor	ug/kg	7	Maximum Result
Aroclor-1260	ug/kg	33	Maximum Result
SVOCs/VOCs			
1,1-Dichloroethane	ug/kg	7	95% Student's-t UCL
1,2-Dichlorobenzene	ug/kg	1,050	99% Chebyshev (Mean, Sd) UCL
1,3-Dichlorobenzene	ug/kg	2	Maximum Result
1,4-Dichlorobenzene	ug/kg	74	95% Chebyshev (Mean, Sd) UCL
2-Methylnaphthalene	ug/kg	1,360	95% Chebyshev (Mean, Sd) UCL
Acetophenone	ug/kg	236	95% Student's-t UCL
Anthracene	ug/kg	81	Maximum Result
Benzo(a)anthracene	ug/kg	495	95% Chebyshev (Mean, Sd) UCL
Benzo(a)pyrene	ug/kg	617	95% Chebyshev (Mean, Sd) UCL
Benzo(b)fluoranthene	ug/kg	501	95% Chebyshev (Mean, Sd) UCL
Benzo(g,h,i)perylene	ug/kg	581	95% Chebyshev (Mean, Sd) UCL
Benzo(k)fluoranthene	ug/kg	495	95% Chebyshev (Mean, Sd) UCL
Benzyl butyl phthalate	ug/kg	270	Maximum Result
bis(2-Ethylhexyl)phthalate	ug/kg	904	95% Chebyshev (Mean, Sd) UCL

Table 7
Exposure Point Concentrations for Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
Caprolactam	ug/kg	230	Maximum Result
Chrysene	ug/kg	597	95% Chebyshev (Mean, Sd) UCL
Dibenz(a,h)anthracene	ug/kg	267	95% Student's-t UCL
Fluoranthene	ug/kg	735	95% Chebyshev (Mean, Sd) UCL
Indeno(1,2,3-c,d)pyrene	ug/kg	600	95% Chebyshev (Mean, Sd) UCL
Naphthalene	ug/kg	249	95% Student's-t UCL
Phenanthrene	ug/kg	308	95% Student's-t UCL
Pyrene	ug/kg	1,020	95% Chebyshev (Mean, Sd) UCL
Acetone	ug/kg	61	95% Approximate Gamma UCL
Chlorobenzene	ug/kg	2,240	99% Chebyshev (Mean, Sd) UCL
cis-1,2-Dichloroethene	ug/kg	18	95% Chebyshev (Mean, Sd) UCL
Ethylbenzene	ug/kg	10	95% Student's-t UCL
Isopropylbenzene (cumene)	ug/kg	105	95% Chebyshev (Mean, Sd) UCL
Methyl ethyl ketone	ug/kg	18	95% Chebyshev (Mean, Sd) UCL
Methyl isobutyl ketone	ug/kg	7	95% Student's-t UCL
Methylcyclohexane	ug/kg	107	95% Chebyshev (Mean, Sd) UCL
Methylene chloride	ug/kg	6	95% Student's-t UCL
Tetrachloroethene	ug/kg	6	95% Student's-t UCL
Toluene	ug/kg	44	95% Chebyshev (Mean, Sd) UCL
Trichloroethene	ug/kg	4	Maximum Result
Vinyl chloride	ug/kg	1.0	Maximum Result
Xylenes, total	ug/kg	91	95% Chebyshev (Mean, Sd) UCL
Small Vacant Lot - Shallow			
Metals			
Aluminum	mg/kg	8,020	Maximum Result
Arsenic	mg/kg	14	Maximum Result
Barium	mg/kg	278	Maximum Result
Beryllium	mg/kg	0.3	Maximum Result
Cadmium	mg/kg	2	Maximum Result
Chromium	mg/kg	34	Maximum Result
Cobalt	mg/kg	7	Maximum Result
Copper	mg/kg	96	Maximum Result
Iron	mg/kg	16,300	Maximum Result
Lead	mg/kg	386	Maximum Result
Manganese	mg/kg	312	Maximum Result
Nickel	mg/kg	24	Maximum Result
Selenium	mg/kg	1.2	Maximum Result
Silver	mg/kg	0.7	Maximum Result
Thallium	mg/kg	1.0	Maximum Result
Vanadium	mg/kg	27	Maximum Result
Zinc	mg/kg	736	Maximum Result
Pesticides/PCBs			
4,4'-DDD	ug/kg	6	Maximum Result
4,4'-DDE	ug/kg	18	Maximum Result
4,4'-DDT	ug/kg	45	Maximum Result
alpha-Chlordane	ug/kg	8	Maximum Result
Dieldrin	ug/kg	1.3	Maximum Result
gamma-Chlordane	ug/kg	6	Maximum Result

Table 8
Exposure Point Concentrations for Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical	Units	Exposure Point Concentration	EPC Basis
Metals			
Aluminum	ug/L	9,398	97.5% Chebyshev (Mean, Sd) UCL
Antimony	ug/L	1.5	95% Student's-t UCL
Arsenic	ug/L	287	95% H-UCL
Barium	ug/L	168	95% H-UCL
Beryllium	ug/L	0.8	95% Chebyshev (Mean, Sd) UCL
Boron	ug/L	4,307	95% Approximate Gamma UCL
Cadmium	ug/L	1.3	95% Chebyshev (Mean, Sd) UCL
Chromium	ug/L	36	97.5% Chebyshev (Mean, Sd) UCL
Chromium (VI)	ug/L	0.4	Maximum Result
Cobalt	ug/L	8.9	95% Approximate Gamma UCL
Copper	ug/L	47	95% H-UCL
Iron	ug/L	53,504	95% Chebyshev (MVUE) UCL
Lead	ug/L	40	95% H-UCL
Manganese	ug/L	4,331	95% Approximate Gamma UCL
Mercury	ug/L	0.1	95% Student's-t UCL
Molybdenum	ug/L	5.6	95% Chebyshev (Mean, Sd) UCL
Nickel	ug/L	55	95% H-UCL
Selenium	ug/L	19	95% Chebyshev (Mean, Sd) UCL
Silver	ug/L	0.1	Maximum Result
Thallium	ug/L	0.1	Maximum Result
Vanadium	ug/L	32	97.5% Chebyshev (Mean, Sd) UCL
Zinc	ug/L	303	95% H-UCL
Cyanide	ug/L	63	Maximum Result
Pesticides/PCBs			
4,4'-DDD	ug/L	5.0	99% Chebyshev (Mean, Sd) UCL
4,4'-DDE	ug/L	0.8	97.5% Chebyshev (Mean, Sd) UCL
4,4'-DDT	ug/L	0.2	Maximum Result
Aldrin	ug/L	0.4	97.5% Chebyshev (Mean, Sd) UCL
alpha-BHC	ug/L	0.3	Maximum Result
alpha-Chlordane	ug/L	0.3	97.5% Chebyshev (Mean, Sd) UCL
Atrazine	ug/L	2.0	Maximum Result
beta-BHC	ug/L	0.4	97.5% Chebyshev (Mean, Sd) UCL
delta-BHC	ug/L	0.2	Maximum Result
Diazinon	ug/L	0.3	95% Chebyshev (Mean, Sd) UCL
Dieldrin	ug/L	0.9	97.5% Chebyshev (Mean, Sd) UCL
Endosulfan I	ug/L	0.3	97.5% Chebyshev (Mean, Sd) UCL
Endosulfan II	ug/L	0.2	Maximum Result
Endosulfan sulfate	ug/L	0.1	Maximum Result
Endrin	ug/L	0.6	97.5% Chebyshev (Mean, Sd) UCL
Endrin aldehyde	ug/L	0.1	Maximum Result
Endrin ketone	ug/L	0.2	Maximum Result
gamma-BHC	ug/L	0.3	97.5% Chebyshev (Mean, Sd) UCL
gamma-Chlordane	ug/L	0.3	Maximum Result
Heptachlor	ug/L	0.1	97.5% Chebyshev (Mean, Sd) UCL
Heptachlor epoxide	ug/L	0.1	Maximum Result

Chemical	Units	Exposure Point Concentration	EPC Basis
Methoxychlor	ug/L	0.1	Maximum Result
Aroclor-1260	ug/L	1.0	95% Chebyshev (Mean, Sd) UCL
SVOCs/VOCs			
1,4-Dioxane (p-dioxane)	ug/L	780	Maximum Result
2,4,6-Trichlorophenol	ug/L	7	97.5% Chebyshev (Mean, Sd) UCL
2,4-Dimethylphenol	ug/L	79	97.5% Chebyshev (Mean, Sd) UCL
2-Chlorophenol	ug/L	4.3	Maximum Result
2-Methylnaphthalene	ug/L	226	99% Chebyshev (Mean, Sd) UCL
2-Methylphenol	ug/L	123	97.5% Chebyshev (Mean, Sd) UCL
2-Nitroaniline	ug/L	10	Maximum Result
3,4-methylphenol	ug/L	840	Maximum Result
4-Chloro-3-methylphenol	ug/L	24	95% Chebyshev (Mean, Sd) UCL
4-Methylphenol	ug/L	194	97.5% Chebyshev (Mean, Sd) UCL
Acenaphthene	ug/L	4.5	Maximum Result
Acenaphthylene	ug/L	10	97.5% Chebyshev (Mean, Sd) UCL
Anthracene	ug/L	3.2	Maximum Result
Benzo(a)anthracene	ug/L	0.9	Maximum Result
Benzo(a)pyrene	ug/L	0.5	Maximum Result
Benzo(b)fluoranthene	ug/L	0.8	Maximum Result
Benzo(g,h,i)perylene	ug/L	0.2	Maximum Result
Benzo(k)fluoranthene	ug/L	0.5	Maximum Result
Biphenyl (Diphenyl)	ug/L	1.3	Maximum Result
bis(2-Chloroethoxy)methane	ug/L	0.2	Maximum Result
bis(2-Ethylhexyl)phthalate	ug/L	17	97.5% Chebyshev (Mean, Sd) UCL
Bromoform	ug/L	12	Maximum Result
Caprolactam	ug/L	2.4	Maximum Result
Carbazole	ug/L	13	99% Chebyshev (Mean, Sd) UCL
Chrysene	ug/L	1.1	Maximum Result
Dibenz(a,h)anthracene	ug/L	0.0	Maximum Result
Diethylphthalate	ug/L	10	95% Chebyshev (Mean, Sd) UCL
Di-n-butyl phthalate	ug/L	12	95% Chebyshev (Mean, Sd) UCL
Fluoranthene	ug/L	2.4	Maximum Result
Fluorene	ug/L	2.6	Maximum Result
Hexachloroethane	ug/L	1.0	Maximum Result
Indeno(1,2,3-c,d)pyrene	ug/L	0.2	Maximum Result
Naphthalene	ug/L	136	99% Chebyshev (Mean, Sd) UCL
Nitrobenzene	ug/L	2.0	Maximum Result
N-Nitrosodi-n-propylamine	ug/L	2.0	Maximum Result
N-Nitrosodiphenylamine	ug/L	1.2	Maximum Result
Pentachlorophenol	ug/L	11	97.5% Chebyshev (Mean, Sd) UCL
Phenanthrene	ug/L	6.0	Maximum Result
Pyrene	ug/L	2.4	Maximum Result
1,1-Dichloroethane	ug/L	557	99% Chebyshev (Mean, Sd) UCL
1,1-Dichloroethene	ug/L	42	97.5% Chebyshev (Mean, Sd) UCL
1,1,1-Trichloroethane	ug/L	118	97.5% Chebyshev (Mean, Sd) UCL
1,1,2-Trichloroethane	ug/L	13	97.5% Chebyshev (Mean, Sd) UCL
1,1,2,2-Tetrachloroethane	ug/L	13	97.5% Chebyshev (Mean, Sd) UCL
1,2,3-Trichlorobenzene	ug/L	2.7	97.5% Chebyshev (Mean, Sd) UCL
1,2,4-Trichlorobenzene	ug/L	15	97.5% Chebyshev (Mean, Sd) UCL
1,2,4-Trimethylbenzene	ug/L	278	99% Chebyshev (Mean, Sd) UCL

Chemical	Units	Exposure Point Concentration	EPC Basis
1,2-Dibromo-3-chloropropane	ug/L	2.4	Maximum Result
1,2-Dichlorobenzene	ug/L	734	99% Chebyshev (Mean, Sd) UCL
1,2-Dichloroethane	ug/L	14	97.5% Chebyshev (Mean, Sd) UCL
1,2-Dichloropropane	ug/L	5.1	Maximum Result
1,3-Dichlorobenzene	ug/L	27	97.5% Chebyshev (Mean, Sd) UCL
1,3,5-Trimethylbenzene	ug/L	110	99% Chebyshev (Mean, Sd) UCL
1,4-Dichlorobenzene	ug/L	218	97.5% Chebyshev (Mean, Sd) UCL
2-Chlorotoluene	ug/L	2.9	97.5% Chebyshev (Mean, Sd) UCL
2-Hexanone	ug/L	24	95% Chebyshev (Mean, Sd) UCL
2,2-Dichloropropane	ug/L	0.5	Maximum Result
Acetone	ug/L	485	97.5% Chebyshev (Mean, Sd) UCL
Benzene	ug/L	400	99% Chebyshev (Mean, Sd) UCL
Carbon disulfide	ug/L	3.1	Maximum Result
Carbon tetrachloride	ug/L	0.3	Maximum Result
Chlorobenzene	ug/L	674	99% Chebyshev (Mean, Sd) UCL
Chloroethane	ug/L	97	99% Chebyshev (Mean, Sd) UCL
Chloroform	ug/L	4.4	Maximum Result
Chloromethane	ug/L	7.4	Maximum Result
cis-1,2-Dichloroethene	ug/L	13,720	99% Chebyshev (Mean, Sd) UCL
cis-1,3-Dichloropropene	ug/L	4.2	Maximum Result
Cyclohexane	ug/L	18	Maximum Result
Ethyl tert-butyl ether (ETBE)	ug/L	1.2	Maximum Result
Ethylbenzene	ug/L	449	99% Chebyshev (Mean, Sd) UCL
Isopropyl ether	ug/L	430	Maximum Result
Isopropylbenzene (cumene)	ug/L	27	97.5% Chebyshev (Mean, Sd) UCL
Methyl acetate	ug/L	23	97.5% Chebyshev (Mean, Sd) UCL
Methyl ethyl ketone	ug/L	430	97.5% Chebyshev (Mean, Sd) UCL
Methyl isobutyl ketone	ug/L	4,858	99% Chebyshev (Mean, Sd) UCL
Methyl tert-butyl ether	ug/L	20	97.5% Chebyshev (Mean, Sd) UCL
Methylcyclohexane	ug/L	25	97.5% Chebyshev (Mean, Sd) UCL
Methylene chloride	ug/L	8.2	97.5% Chebyshev (Mean, Sd) UCL
n-Butylbenzene	ug/L	6.1	97.5% Chebyshev (Mean, Sd) UCL
n-Propylbenzene	ug/L	56	99% Chebyshev (Mean, Sd) UCL
p-Cymene (p-isopropyltoluene)	ug/L	79	99% Chebyshev (Mean, Sd) UCL
Phenol	ug/L	48	97.5% Chebyshev (Mean, Sd) UCL
sec-Butylbenzene	ug/L	5.6	97.5% Chebyshev (Mean, Sd) UCL
Styrene	ug/L	14	97.5% Chebyshev (Mean, Sd) UCL
tert-Butylbenzene	ug/L	2.1	Maximum Result
tert-Butyl alcohol	ug/L	117	97.5% Chebyshev (Mean, Sd) UCL
Tetrachloroethene	ug/L	12	Maximum Result
Toluene	ug/L	6,112	99% Chebyshev (Mean, Sd) UCL
trans-1,2-Dichloroethene	ug/L	401	99% Chebyshev (Mean, Sd) UCL
trans-1,3-Dichloropropene	ug/L	4.1	Maximum Result
Trichloroethene	ug/L	57	97.5% Chebyshev (Mean, Sd) UCL
Vinyl chloride	ug/L	1,627	99% Chebyshev (Mean, Sd) UCL
m,p-Xylene	ug/L	944	99% Chebyshev (Mean, Sd) UCL
o-Xylene	ug/L	445	99% Chebyshev (Mean, Sd) UCL
Xylenes, total	ug/L	1,600	99% Chebyshev (Mean, Sd) UCL
Dioxans/Furans			
1,2,3,4,6,7,8-HpCDD	pg/L	464	99% Chebyshev (Mean, Sd) UCL

Chemical	Units	Exposure Point Concentration	EPC Basis
1,2,3,4,6,7,8-HpCDF	pg/L	95	99% Chebyshev (Mean, Sd) UCL
1,2,3,4,7,8,9-HpCDF	pg/L	10	99% Chebyshev (Mean, Sd) UCL
1,2,3,4,7,8-HxCDD	pg/L	2.6	95% Chebyshev (Mean, Sd) UCL
1,2,3,4,7,8-HxCDF	pg/L	8.5	99% Chebyshev (Mean, Sd) UCL
1,2,3,6,7,8-HxCDD	pg/L	13	99% Chebyshev (Mean, Sd) UCL
1,2,3,6,7,8-HxCDF	pg/L	1.6	95% Chebyshev (Mean, Sd) UCL
1,2,3,7,8,9-HxCDD	pg/L	4.4	95% Chebyshev (Mean, Sd) UCL
1,2,3,7,8,9-HxCDF	pg/L	3.9	99% Chebyshev (Mean, Sd) UCL
1,2,3,7,8-PeCDD	pg/L	1.1	95% H-UCL
1,2,3,7,8-PeCDF	pg/L	2.3	95% Chebyshev (Mean, Sd) UCL
2,3,4,6,7,8-HxCDF	pg/L	3.9	99% Chebyshev (Mean, Sd) UCL
2,3,4,7,8-PeCDF	pg/L	2.6	95% Chebyshev (Mean, Sd) UCL
2,3,7,8-TCDF	pg/L	1.7	95% Chebyshev (Mean, Sd) UCL
OCDF	pg/L	744	99% Chebyshev (Mean, Sd) UCL
OCDD	pg/L	2180	95% Hall's Bootstrap UCL

Table 9
Cancer and Noncancer Toxicity Values for COPCs
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Oral RfD (mg/kg-day)	References	REL or Reference Conc (mg/m^3)	Inhalation RFD (mg/kg-day)	References	Primary Target Organ/Efftect	Uncertainty/ Modifying Factors	Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References	Inhalation Unit Risk $(mg/m^3)^{-1}$	Inhalation Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References
Aluminum	1	PPRTV	--	0.0014	PPRTV	NA	--	--	--	--	--	--
Antimony	0.0004	IRIS	--	--	--	Blood (glucose), Mortality	--	--	--	--	--	--
Arsenic	0.0003	IRIS	--	--	--	Skin, Circulatory System	--	1.5	IRIS	0.0043	15.1	IRIS
Arsenic	--	--	0.03	0.000009	OEHHA	--	--	9.5	OEHHA	0.0033	11.6	OEHHA
Barium	0.07	IRIS	--	0.00014	HEAST	Kidney	--	--	--	--	--	--
Beryllium	0.002	IRIS	--	0.000006	IRIS	GI (Small intestinal lesions)	--	--	--	--	8.4	IRIS
Beryllium	--	--	0.07	0.00002	OEHHA	--	--	--	--	0.0024	8.4	OEHHA
Boron	0.2	IRIS	--	0.0057	HEAST	Testes	--	--	--	--	--	--
Cadmium	0.0005	IRIS	--	--	--	Kidney	--	--	--	--	6.3	IRIS
Cadmium	0.000011	OEHHA*	0.02	0.000006	OEHHA	--	--	0.38	OEHHA	0.0042	14.7	OEHHA
Chromium	--	--	--	--	--	--	--	--	--	--	42	IRIS
Hexavalent Chromium	0.003	IRIS	--	0.0000022	IRIS	NOAEL	--	--	--	--	290	IRIS
Cobalt	0.02	PPRTV	--	0.0000057	PPRTV	Circulatory	--	--	--	--	9.8	PPRTV
Copper	0.04	HEAST	--	--	--	GI	--	--	--	--	--	--
Iron	0.3	NCEA	--	--	--	NA	--	--	--	--	--	--
Lead	--	--	--	--	--	--	--	--	--	--	--	--
Manganese	0.024	IRIS	--	0.000014	IRIS	CNS	--	--	--	--	--	--
Manganese	0.03	OEHHA*	0.2	0.000057	OEHHA	--	--	--	--	--	--	--
Mercury	0.0003	IRIS	--	--	--	CNS	--	--	--	--	--	--
Molybdenum	0.005	IRIS	--	--	--	Kidney	--	--	--	--	--	--
Nickel	0.02	IRIS	--	--	--	Whole body	--	--	--	--	--	--
Nickel	0.011	OEHHA*	0.05	0.000014	OEHHA	--	--	--	--	0.00026	0.91	OEHHA
Selenium	0.005	IRIS	20	0.0057	OEHHA	Respiratory system - selenosis	--	--	--	--	--	--
Silver	0.005	IRIS	--	--	--	Skin	--	--	--	--	--	--
Thallium	0.000066	IRIS	--	--	--	NA	3000/1	--	--	--	--	--
Vanadium	0.001	NCEA	--	--	--	NA	--	--	--	--	--	--
Zinc	0.3	IRIS	--	--	--	Red blood cells	--	--	--	--	--	--
Cyanide	0.02	IRIS	--	--	--	Weight loss, thyroid effects and myelin degeneration	100/5	--	--	--	--	--
4,4'-DDD	--	--	--	--	--	--	--	0.24	IRIS	0.000069	0.24	OEHHA/ Route Extrapolation
4,4'-DDE	--	--	--	--	--	--	--	0.34	IRIS	0.000097	0.34	OEHHA/ Route Extrapolation
4,4'-DDT	0.0005	IRIS	--	0.0005	Route Extrapolatio	Liver	--	0.34	IRIS	0.000097	0.34	IRIS
Aldrin	0.00003	IRIS	--	0.00003	Route Extrapolatio	Liver	1000/1	17	IRIS	0.0049	17.2	IRIS/OEHHA
alpha-BHC	0.0005	NCEA	--	0.0005	Route Extrapolatio	NA	NA	6.3	IRIS	--	6.3	IRIS
alpha-BHC	--	--	--	--	--	--	NA	2.7	OEHHA	0.00077	2.7	OEHHA
alpha-Chlordane	0.0005	IRIS	--	0.0002	IRIS	Liver	300/1	0.35	IRIS	--	0.35	IRIS

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alpha-Chlordane	0.000033	OEHHA*	--	--	--	--	300/1	1.2	OEHHA	0.00034	1.2	OEHHA
beta-BHC	--	--	--	--	--	--	NA	1.8	OEHHA	--	1.8	OEHHA
beta-BHC	--	--	--	--	--	--	NA	1.5	OEHHA	0.00043	1.5	OEHHA
delta-BHC	--	--	--	--	--	--	NA	--	--	--	--	--
Diazinon	0.0009	HEAST	--	0.0009	Route Extrapolatio	Liver	--	--	--	--	--	--
Dieldrin	0.00005	IRIS	--	0.00005	Route Extrapolatio	Liver	100/1	16	IRIS	0.0046	16.1	IRIS
Endosulfan I	0.006	IRIS	--	0.006	Route Extrapolatio	Reduced body weight	100/1	--	--	--	--	--
Endosulfan II	0.006	IRIS	--	0.006	Route Extrapolatio	Reduced body weight	100/1	--	--	--	--	--
Endosulfan sulfate	0.006	IRIS	--	0.006	Route Extrapolatio	Reduced body weight	100/1	--	--	--	--	--
Endrin	0.0003	IRIS	--	0.0003	Route Extrapolatio	Liver	100/1	--	--	--	--	--
Endrin aldehyde	0.0003	IRIS	--	0.0003	Route Extrapolatio	Liver	100/1	--	--	--	--	--
Endrin ketone	0.0003	IRIS	--	0.0003	Route Extrapolatio	Liver	100/1	--	--	--	--	--
gamma-BHC	0.0003	IRIS	--	0.0003	Route Extrapolatio	Liver	1000/1	1.3	HEAST	--	1.3	Route Extrapolatior
gamma-BHC	--	--	--	--	--	--	1000/1	1.1	OEHHA	0.00031	1.1	OEHHA
gamma-Chlordane	0.0005	IRIS	--	0.0002	IRIS	Liver	300/1	0.35	IRIS	--	0.35	IRIS
gamma-Chlordane	0.000033	OEHHA*	--	--	--	--	300/1	1.2	OEHHA	0.00034	1.2	OEHHA
Heptachlor	0.0005	IRIS	--	0.0005	Route Extrapolatio	Liver	300/1	4.5	IRIS	--	4.55	IRIS
Heptachlor	0.00003	OEHHA*	--	--	--	--	300/1	4.1	OEHHA	--	4.1	OEHHA
Heptachlor epoxide	0.000013	IRIS	--	0.000013	Route Extrapolatio	Liver	1000/1	9.1	IRIS	--	9.1	IRIS
Heptachlor epoxide	0.000013	OEHHA*	--	--	--	--	1000/1	5.5	OEHHA	--	5.5	OEHHA
Methoxychlor	0.005	IRIS	--	0.005	Route Extrapolatio	Reproductive	1000/1	--	--	--	--	--
Methoxychlor	0.00002	OEHHA*		0.00002	Route Extrapolation							
Toxaphene	--	--	--	--	--	--	NA	1.1	IRIS	--	1.1	IRIS
Toxaphene	--	--	--	--	--	--	NA	1.2	OEHHA	0.00034	1.2	OEHHA
Aroclor-1016	0.00007	IRIS	--	0.00007	Route Extrapolatio	Reduced birth weight	100/1	0.07	IRIS	--	0.07	IRIS
Aroclor-1221	0.00002	Surrogate	--	0.00002	Surrogate	--	--	2	IRIS	--	2	IRIS
Aroclor-1232	0.00002	Surrogate	--	0.00002	Surrogate	--	--	2	IRIS	--	2	IRIS
Aroclor-1242	0.00002	Surrogate	--	0.00002	Surrogate	--	--	2	IRIS	--	2	IRIS
Aroclor-1248	0.00002	Surrogate	--	0.00002	Surrogate	--	--	2	IRIS	--	2	IRIS
Aroclor-1254	0.00002	IRIS	--	0.00002	Route Extrapolatio	Eyes	300/1	2	IRIS	--	2	IRIS
Aroclor-1260	0.00002	Surrogate	--	0.00002	Surrogate	Eyes	300/1	2	IRIS	--	2	IRIS
1,2,4,5-Tetrachlorobenzene	0.0003	IRIS	--	0.0003	Route Extrapolatio	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	0.1	IRIS	--	0.1	Route Extrapolatio	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	0.0001	NCEA	--	0.0001	Route Extrapolatio	--	--	0.011	IRIS	--	0.011	IRIS
2,4,6-Trichlorophenol	--	--	--	--	--	--	--	0.07	OEHHA	0.00002	0.07	OEHHA
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	0.003	IRIS	--	0.003	Route Extrapolatio	Decreased delayed hypersensitivity response	100/1	--	--	--	--	--
2,4-Dimethylphenol	0.02	IRIS	--	0.02	Route Extrapolatio	Clinical signs (lethargy, prostration, ataxia) and hematological changes	3000/1	--	--	--	--	--

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2,4-Dinitrophenol	0.002	IRIS	--	0.002	Route Extrapolatio	Cataract formation	1000/1	--	--	--	--	--
2,4-Dinitrotoluene	0.002	IRIS	--	0.002	Route Extrapolatio	Neurotoxicity, Heinz bodies and biliary tract hyperplasia	100/1	0.68	IRIS	--	0.68	Route Extrapolation
2,4-Dinitrotoluene	--	--	--	--	--	--	100/1	0.31	OEHHA	0.000089	0.31	OEHHA
2,6-Dinitrotoluene	0.001	HEAST	--	0.001	Route Extrapolatio	--	--	0.68	IRIS	--	0.68	Route Extrapolation
2-Chloronaphthalene	0.08	IRIS	--	0.08	Route Extrapolatio	Dyspnea, abnormal appearance, liver enlargement	3000/1	--	--	--	--	--
2-Chlorophenol	0.005	IRIS	--	0.005	Route Extrapolatio	Reproductive effects	1000/1	--	--	--	--	--
2-Chlorotoluene	0.02	IRIS	--	2.0E-02	Route Extrapolatio	Decrease in body weight gain	1000/1	--	--	--	--	--
2-Methylnaphthalene	0.004	IRIS	--	--	--	Pulmonary alveolar proteinosis	1000/1	--	--	--	--	--
2-Methylphenol	0.05	IRIS	--	0.05	Route Extrapolatio	Decreased body weight & Neurotoxicity	1000/1	--	--	--	--	--
2-Nitroaniline	0.003	PPRTV	--	0.00003	PPRTV	NA	--	--	--	--	--	--
2-Nitrophenol	--	--	--	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	--	--	--	--	--	--	--	0.45	IRIS	--	0.45	Route Extrapolation
3,3'-Dichlorobenzidine	--	--	--	--	--	--	--	1.2	OEHHA	0.00034	1.2	OEHHA
3,4-Methylphenol	0.05	IRIS	--	0.05	Route Extrapolatio	Decreased body weights and neurotoxicity	1000/1	--	--	--	--	--
3-Nitroaniline	0.0003	PPRTV	--	0.0003	PPRTV	--	--	0.021	PPRTV	--	0.021	Route Extrapolation
4,6-Dinitro-2-methylphenol	0.0001	PPRTV	--	0.0001	Route Extrapolatio	--	--	--	--	--	--	--
4-Bromophenylphenyl ethe	--	--	--	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	--	--	--	--	--	--	--	--	--	--	--	--
4-Chloroaniline	0.004	IRIS	--	0.004	Route Extrapolatio	Nonneoplastic lesions of splenic capsule	3000/1	--	--	--	--	--
4-Chlorophenylphenyl ethe	--	--	--	--	--	--	--	--	--	--	--	--
4-Methylphenol	0.005	HEAST	--	0.005	Route Extrapolatio	--	--	--	--	--	--	--
4-Nitroaniline	0.003	PPRTV	--	0.001	PPRTV	--	--	0.021	PPRTV	--	0.021	Route Extrapolation
4-Nitrophenol	0.008	R9	--	--	--	--	--	--	--	--	--	--
Acenaphthene	0.06	IRIS	--	0.06	Route Extrapolatio	Hepatotoxicity	3000/1	--	--	--	--	--
Acenaphthylene	--	--	--	--	--	--	--	--	--	--	--	--
Acetophenone	0.1	IRIS	--	--	--	General toxicity	3000/1	--	--	--	--	--
Anthracene	0.3	IRIS	--	0.3	Route Extrapolatio	No observed effects	3000/1	--	--	--	--	--

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Atrazine	0.035	IRIS	--	0.035	Route Extrapolatio	Decreased body weight gain	100/1	0.222	HEAST	--	0.222	Route Extrapolation
Atrazine	--	--	--	--	--	--	100/1	0.23	OEHHA	--	--	--
Benzaldehyde	0.1	IRIS	--	0.1	Route Extrapolatio	Forestomach lesions, kidney toxicity	1000/1	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--	--	--	0.73	NCEA	--	0.73	Route Extrapolation
Benzo(a)anthracene	--	--	--	--	--	--	--	1.2	OEHHA	0.00011	0.39	OEHHA
Benzo(a)pyrene	--	--	--	--	--	--	--	7.3	IRIS	--	7.3	Route Extrapolation
Benzo(a)pyrene	--	--	--	--	--	--	--	12	OEHHA	0.0011	3.85	OEHHA
Benzo(b)fluoranthene	--	--	--	--	--	--	--	0.73	NCEA	--	0.73	Route Extrapolation
Benzo(b)fluoranthene	--	--	--	--	--	--	--	1.2	OEHHA	0.00011	0.39	OEHHA
Benzo(g,h,i)perylene	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	--	--	--	--	--	--	--	0.073	NCEA	--	0.073	Route Extrapolation
Benzo(k)fluoranthene	--	--	--	--	--	--	--	1.2	OEHHA	0.00011	0.39	OEHHA
Benzyl butyl phthalate	0.2	IRIS	--	0.2	Route Extrapolatio	Significantly increased liver-to body weight and liver-to-brain weight ratios	1000/1	--	--	--	--	--
Biphenyl (diphenyl)	0.05	IRIS	--	0.05	Route Extrapolatio	Kidney damage	100/10	--	--	--	--	--
bis(2-Chloroethoxy)methan	--	--	--	--	--	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	--	--	--	--	--	--	--	1.1	IRIS	--	1.1	IRIS
bis(2-Chloroethyl)ether	--	--	--	--	--	--	--	2.5	OEHHA	0.00071	2.5	OEHHA
bis(2-Ethylhexyl)phthalate	0.02	IRIS	--	0.02	Route Extrapolatio	Increased relative liver weight	1000/1	0.014	IRIS	--	0.014	Route Extrapolation
bis(2-Ethylhexyl)phthalate	--	--	--	--	--	--	1000/1	0.003	OEHHA	0.0000024	0.0084	OEHHA
Caprolactam	0.5	IRIS	--	0.5	Route Extrapolatio	Reduced offspring body weight	100/1	--	--	--	--	--
Carbazole	--	--	--	--	--	--	--	0.02	HEAST	--	0.02	Route Extrapolation
Chrysene	--	--	--	--	--	--	--	0.0073	NCEA	--	0.0073	Route Extrapolation
Chrysene	--	--	--	--	--	--	--	0.12	OEHHA	0.000011	0.039	OEHHA
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	7.3	NCEA	--	7.3	Route Extrapolation
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	4.1	OEHHA	0.0012	4.2	OEHHA
Dibenzofuran	0.002	NCEA	--	0.002	Route Extrapolatio	--	--	--	--	--	--	--
Diethylphthalate	0.8	IRIS	--	0.8	Route Extrapolatio	Decreased growth rate, food consumption and altered organ weights	1000/1	--	--	--	--	--
Dimethylphthalate	10	HEAST	--	10	Route Extrapolatio	--	--	--	--	--	--	--
Di-n-butyl phthalate	0.1	IRIS	--	0.1	Route Extrapolatio	Increased mortality	1000/1	--	--	--	--	--
Di-n-octyl phthalate	0.04	PPRTV	--	0.04	Route Extrapolatio	--	--	--	--	--	--	--

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Fluoranthene	0.04	IRIS	--	0.04	Route Extrapolatio	Kidney, Liver, Circulatory	3000/1	--	--	--	--	--
Fluorene	0.04	IRIS	--	0.04	Route Extrapolatio	Kidney, Liver, Circulatory	3000/1	--	--	--	--	--
Hexachlorobenzene	0.0008	IRIS	--	0.0008	Route Extrapolatio	Liver effects	100/1	1.6	IRIS	--	1.6	IRIS
Hexachlorobenzene	--	--	--	--	--	--	100/1	1.8	OEHHA	0.00051	1.8	OEHHA
Hexachlorobutadiene	0.0003	NCEA	--	0.0003	Route Extrapolatio	--	--	0.078	IRIS	--	0.078	IRIS
Hexachlorocyclopentadiene	0.006	IRIS	--	0.000057	IRIS	Chronic irritation	1000/1	--	--	--	--	--
Hexachloroethane	0.001	IRIS	--	0.001	Route Extrapolatio	Atrophy and degeneration of the	1000/1	0.014	IRIS	--	0.014	IRIS
Hexachloroethane	--	--	--	--	--	--	1000/1	0.039	OEHHA	0.00011	0.39	OEHHA
Indeno(1,2,3-c,d)pyrene	--	--	--	--	--	--	--	0.73	NCEA	--	0.73	Route Extrapolation
Indeno(1,2,3-c,d)pyrene	--	--	--	--	--	--	--	0.039	OEHHA	0.00011	0.39	OEHHA
Isophorone	0.2	IRIS	--	0.2	Route Extrapolatio	No observed effects	1000/1	0.00095	IRIS	--	0.00095	Route Extrapolation
p-Cymene (p-Isopropyltolu	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	0.02	IRIS	--	0.00086	IRIS	Decreased body weight	3000/1	--	--	--	--	--
Naphthalene	--	--	9	0.0026	OEHHA	--	3000/1	0.12	OEHHA	0.000034	0.12	OEHHA
Nitrobenzene	0.0005	IRIS	--	0.00057	HEAST	Hematologic, adrenal, renal and hepatic lesions	10000/1	--	--	--	--	--
N-Nitrosodi-n-propylamine	--	--	--	--	--	--	--	7	IRIS	0.002	7	OEHHA
N-Nitrosodiphenylamine	0.02	PPRTV	--	0.02	PPRTV	--	--	0.0049	IRIS	--	0.0049	Route Extrapolation
N-Nitrosodiphenylamine	--	--	--	--	--	--	--	0.009	OEHHA	0.0000026	0.009	OEHHA
Pentachlorophenol	0.03	IRIS	--	0.03	Route Extrapolatio	Liver and kidney pathology	100/1	0.12	IRIS	--	0.12	Route Extrapolation
Pentachlorophenol	0.003	OEHHA*	--	--	--	--	--	0.081	OEHHA	0.0000046	0.016	OEHHA
Phenanthrene	--	--	--	--	--	--	--	--	--	--	--	--
Phenol	0.3	IRIS	--	0.3	Route Extrapolatio	Decreased maternal weight gain	300/1	--	--	--	--	--
Phenol	--	--	200	0.057	OEHHA	--	300/1	--	--	--	--	--
n-Propylbenzene	0.04	NCEA	--	0.04	Route Extrapolatio	--	--	--	--	--	--	--
Pyrene	0.03	IRIS	--	0.03	Route Extrapolatio	Kidney effects	3000/1	--	--	--	--	--
1,1,1-Trichloroethane	0.28	NCEA	--	0.63	PPRTV	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	0.06	PPRTV	--	0.06	Route Extrapolatio	--	--	0.2	IRIS	--	0.2	IRIS
1,1,2,2-Tetrachloroethane	--	--	--	--	--	--	--	0.27	OEHHA	0.000058	0.2	OEHHA
1,1,2-Trichloroethane	0.004	IRIS	--	0.004	Route Extrapolatio	Clinical serum	1000/1	0.057	IRIS	--	0.056	IRIS
1,1,2-Trichloroethane	--	--	--	--	--	--	1000/1	0.072	OEHHA	0.000016	0.056	OEHHA
1,1-Dichloroethane	0.1	HEAST	--	0.14	HEAST	--	--	0.0057	OEHHA	0.0000016	0.0056	OEHHA
1,1-Dichloroethene	0.02	IRIS	--	0.057	IRIS	--	--	0.091	IRIS	--	0.091	IRIS
1,1-Dichloroethene	--	--	70	0.02	OEHHA	--	--	--	--	--	--	--
1,2,3-Trichlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--

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Chemical of Potential Concern	Oral RfD (mg/kg-day)	References	REL or Reference Conc (mg/m^3)	Inhalation RFD (mg/kg-day)	References	Primary Target Organ/Efftect	Uncertainty/ Modifying Factors	Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References	Inhalation Unit Risk $(mg/m^3)^{-1}$	Inhalation Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References
1,2,4-Trichlorobenzene	0.01	IRIS	--	0.001	PPRTV	Increased adrenal weights; vacuolization of zona fasciculata in the cortex	1000/1	0.0036	OEHHA	--	--	--
1,2,4-Trimethylbenzene	0.05	PPRTV	--	0.0017	PPRTV	NA	--	--	--	--	--	--
1,2-Dibromo-3-chloropropa	0.000057	oute Extrapolati	--	0.000057	IRIS	--	--	1.4	HEAST	--	0.0024	withdrawn
1,2-Dibromo-3-chloropropa	--	--	--	--	--	--	--	7	OEHHA	0.0019	6.7	OEHHA
1,2-Dibromoethane	0.009	IRIS	--	0.0026	IRIS	Testicular	3000/1	2	IRIS	--	2	IRIS
1,2-Dibromoethane	--	--	--	--	--	--	3000/1	3.6	OEHHA	0.000071	0.25	OEHHA
1,2-Dichlorobenzene	0.09	IRIS	--	0.057	HEAST	No adverse	1000/1	--	--	--	--	--
1,2-Dichloroethane	0.02	NCEA	--	0.0014	NCEA	--	--	0.091	IRIS	--	0.091	IRIS
1,2-Dichloroethane	--	--	--	--	--	--	--	0.047	OEHHA	0.000021	0.074	OEHHA
1,2-Dichloropropane	0.0011	oute Extrapolati	--	0.0011	IRIS	--	--	0.068	HEAST	--	0.068	Route Extrapolation
1,2-Dichloropropane	--	--	--	--	--	--	--	0.036	OEHHA	0.00001	0.035	OEHHA
1,3-Butadiene	0.00057	oute Extrapolati	--	0.00057	IRIS	--	--	0.11	Route Extrapolatio	--	0.11	IRIS
1,3-Butadiene			20	0.0057	OEHHA	--	--	3.4	OEHHA	0.00017	0.6	OEHHA
1,3-Dichlorobenzene	0.03	NCEA	--	0.03	Route Extrapolatio	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	0.05	PPRTV	--	0.0017	PPRTV	NA	--	--	--	--	--	--
1,4-Dichlorobenzene	0.03	NCEA	--	0.23	IRIS	--	--	0.024	HEAST	--	0.022	NCEA
1,4-Dichlorobenzene	--	--	800	0.23	OEHHA	--	--	0.0054	OEHHA	0.000011	0.04	OEHHA
1,4-Dioxane (p-dioxane)	--	--	--	--	--	--	--	0.011	IRIS	--	0.011	Route Extrapolation
1,4-Dioxane (p-dioxane)	--	--	3000	0.86	OEHHA	--	--	0.027	OEHHA	0.0000077	0.027	OEHHA
2-Hexanone	--	--	--	--	--	--	--	--	--	--	--	--
Acetone	0.9	IRIS	--	0.9	Route Extrapolatio	Nephropathy	1000/1	--	--	--	--	--
Benzene	0.004	IRIS	30	0.0086	IRIS	Immune system (decreased lymphocyte count)	300/1	0.055	IRIS	0.0000078	0.0273	IRIS
Benzene	--	--	60	0.017	OEHHA	--	300/1	0.1	OEHHA	0.000029	0.1	OEHHA
Bromodichloromethane	0.02	IRIS	--	0.02	Route Extrapolatio	Renal cytomegaly	1000/1	0.062	IRIS	--	0.062	Route Extrapolation
Bromodichloromethane	--	--	--	--	--	--	1000/1	0.13	OEHHA	0.000037	0.1	OEHHA
Bromoform	0.02	IRIS	--	0.02	Route Extrapolatio	Hepatic lesions	1000/1	0.0079	IRIS	--	0.00385	IRIS
Bromomethane	0.0014	IRIS	--	0.0014	IRIS	Epithelial hyperplasia of the forestomach	1000/1	--	--	--	--	--
Carbon disulfide	0.1	IRIS	--	0.2	IRIS	Fetal toxicity/ malformations	100/1	--	--	--	--	--
Carbon disulfide	--	--	800	0.23	OEHHA	--	100/1	--	--	--	--	--
Carbon tetrachloride	0.0007	IRIS	--	0.0007	Route Extrapolatio	Liver lesions	1000/1	0.13	IRIS	--	0.0525	IRIS
Carbon tetrachloride	--	--	40	0.011	OEHHA	--	1000/1	0.15	OEHHA	0.000042	0.15	OEHHA
Chlorobenzene	0.02	IRIS	--	0.017	NCEA	Histopathologic changes in liver	1000/1	--	--	--	--	--
Chlorobenzene	--	--	1000	0.29	OEHHA	--	1000/1	--	--	--	--	--
Chloroethane	0.4	NCEA	--	2.86	IRIS	--	--	0.0029	NCEA	--	0.0029	Route Extrapolation

Table 9
Cancer and Noncancer Toxicity Values for COPCs
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AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Oral RfD (mg/kg-day)	References	REL or Reference Conc (mg/m^3)	Inhalation RFD (mg/kg-day)	References	Primary Target Organ/Efftect	Uncertainty/ Modifying Factors	Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References	Inhalation Unit Risk $(mg/m^3)^{-1}$	Inhalation Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References
Chloroform	0.01	IRIS	--	0.014	NCEA	Moderate/marked fatty cyst formation in the liver and elevated SGPT	100/1	--	--	--	0.081	IRIS
Chloroform	--	--	300	0.086	OEHHA	--	100/1	0.031	OEHHA	0.0000053	0.019	OEHHA
Chloromethane	0.026	oute Extrapolati	--	0.026	IRIS	Brain (cerebellar lesions)	1000/1	--	--	--	--	--
cis-1,2-Dichloroethene	0.01	PPRTV	--	0.01	Route Extrapolatio	Decreased hematocrit and hemoglobin (Blood)	--	--	--	--	--	--
cis-1,3-Dichloropropene	0.03	IRIS	--	0.0057	IRIS	Chronic irritation	100/1	0.1	IRIS	--	0.014	IRIS
cis-1,3-Dichloropropene	--	--	--	--	--	--	100/1	0.091	OEHHA	0.000016	0.056	OEHHA
Cyclohexane	1.7	oute Extrapolati	--	1.7	IRIS	--	--	--	--	--	--	--
Dibromochloromethane	0.02	IRIS	--	0.02	Route Extrapolatio	Hepatic lesions	1000/1	0.084	IRIS	--	0.084	Route Extrapolatior
Dibromochloromethane	--	--	--	--	--	--	1000/1	0.094	OEHHA	0.000027	0.095	OEHHA
Ethyl tertiary butyl ether	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	0.1	IRIS	--	0.29	IRIS	Liver and kidney toxicity	1000/1	--	--	--	--	--
Ethylbenzene	--	--	2000	0.57	OEHHA	--	1000/1	--	--	--	--	--
Freon 11	0.3	IRIS	--	0.2	HEAST	Survival and histopathology	1000/1	--	--	--	--	--
Freon 113	30	IRIS	--	8.57	HEAST	Psychomotor impairment	10/1	--	--	--	--	--
Freon 12	0.2	IRIS	--	0.057	HEAST	Reduced body weight	100/1	--	--	--	--	--
Isopropylbenzene (cumene	0.1	IRIS	--	0.11	IRIS	Increased kidney weights in female rats and adrenal weights in male and female rats	1000/1	--	--	--	--	--
Isopropyl ether	--	--	--	--	--	--	--	--	--	--	--	--
Methyl acetate	1	HEAST	--	1	Route Extrapolatio	--	--	--	--	--	--	--
Methyl ethyl ketone	0.6	IRIS	--	1.4	IRIS	Decreased pup body weight	1000/1	--	--	--	--	--
Methyl isobutyl ketone	0.08	HEAST	--	0.86	IRIS	--	--	--	--	--	--	--
Methyl tert-butyl ether	0.857	oute Extrapolati	--	0.86	IRIS	--	--	--	--	--	--	--
Methyl tert-butyl ether	--	--	8000	2.3	OEHHA	--	--	0.0018	OEHHA	0.00000026	0.00091	OEHHA
Methylcyclohexane	0.86	oute Extrapolati	--	0.86	HEAST	--	--	--	--	--	--	--
Methylene chloride	0.06	IRIS	--	0.86	HEAST	Liver toxicity	100/1	0.0075	IRIS	--	0.0016	IRIS
Methylene chloride	--	--	400	0.11	OEHHA	--	100/1	0.014	OEHHA	0.000001	0.0035	OEHHA
n-Butylbenzene	0.04	NCEA	--	0.04	Reg 9 (RE)	--	--	--	--	--	--	--
Styrene	0.2	IRIS	--	0.29	IRIS	Red blood cell and liver effects	1000/1	--	--	--	--	--
Styrene	--	--	900	0.26	OEHHA	--	1000/1	--	--	--	--	--
sec-Butylbenzene	0.04	NCEA	--	0.04	Route Extrapolation	--	--	--	--	--	--	--

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Chemical of Potential Concern	Oral RfD (mg/kg-day)	References	REL or Reference Conc (mg/m^3)	Inhalation RFD (mg/kg-day)	References	Primary Target Organ/Efftect	Uncertainty/ Modifying Factors	Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References	Inhalation Unit Risk $(mg/m^3)^{-1}$	Inhalation Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References
tert-Butyl alcohol	0.1	IRIS	--	0.0026	NCEA	--	--	--	--	--	--	--
tert-Butylbenzene	0.04	NCEA		0.04	Reg 9 (RE)	--	--	--	--	--	--	--
Tetrachloroethene	0.01	IRIS	35	0.01	OEHHA	Hepatotoxicity in mice, weight gain in rats	1000/1	0.54	OEHHA	0.0000059	0.021	OEHHA
Toluene	0.2	IRIS	--	0.11	IRIS	Kidney	3000/1	--	--	--	--	--
Toluene	--	--	300	0.086	OEHHA	--	3000/1	--	--	--	--	--
trans-1,2-Dichloroethene	0.02	IRIS	--	0.02	Route Extrapolatio	Increased serum alkaline phosphatase in male mice	1000/1	--	--	--	--	--
trans-1,3-Dichloropropene	0.03	IRIS	--	0.0057	IRIS	--	--	0.1	IRIS	--	0.014	IRIS
trans-1,3-Dichloropropene	--	--	--	--	--	--	--	0.091	OEHHA	0.000016	0.056	OEHHA
Trichloroethene	0.0003	NCEA	--	0.01	NCEA	NA	--	0.4	NCEA	--	0.4	NCEA
Trichloroethene	--	--	600	0.17	OEHHA	--	--	0.013	OEHHA	0.000002	0.007	OEHHA
Vinyl chloride	0.003	IRIS	100	0.029	IRIS	Liver	30/1	1.5	IRIS	--	0.031	IRIS
Vinyl chloride	--	--	--	--	--	--	30/1	0.27	OEHHA	0.000078	0.27	OEHHA
o-Xylene	0.2	IRIS	--	0.029	IRIS	Decreased body weight, increased mortality	1000/1	--	--	--	--	--
o-Xylenes	--	--	700	0.2	OEHHA	--	1000/1	--	--	--	--	--
m,p-Xylenes	0.2	IRIS	--	0.029	IRIS	Decreased body weight, increased mortality	1000/1	--	--	--	--	--
m,p-Xylenes	--	--	700	0.2	OEHHA	--	1000/1	--	--	--	--	--
Xylenes, total	0.2	IRIS	--	0.029	IRIS	Decreased body weight, increased mortality	1000/1	--	--	--	--	--
Xylenes, total	--	--	700	0.2	OEHHA	--	1000/1	--	--	--	--	--
1,2,3,4,6,7,8-HpCDD	--	--	--	--	--	--	--	1500	calc using TEF	--	1500	calc using TEF
1,2,3,4,6,7,8-HpCDD	--	--	0.00004	0.00000001	OEHHA	--	--	1300	OEHHA	0.38	1300	OEHHA
1,2,3,4,6,7,8-HpCDF	--	--	--	--	--	--	--	1500	calc using TEF	--	1500	calc using TEF
1,2,3,4,6,7,8-HpCDF	--	--	0.00004	0.00000001	OEHHA	--	--	1300	OEHHA	0.38	1300	OEHHA
1,2,3,4,7,8,9-HpCDF	--	--	--	--	--	--	--	1500	calc using TEF	--	1500	calc using TEF
1,2,3,4,7,8,9-HpCDF	--	--	0.00004	0.00000001	OEHHA	--	--	1300	OEHHA	0.38	1300	OEHHA
1,2,3,4,7,8-HxCDD	--	--	--	--	--	--	--	15000	calc using TEF	--	15000	calc using TEF
1,2,3,4,7,8-HxCDD	--	--	0.00004	0.00000001	OEHHA	--	--	13000	OEHHA	3.8	13000	OEHHA
1,2,3,4,7,8-HxCDF	--	--	--	--	--	--	--	15000	calc using TEF	--	15000	calc using TEF
1,2,3,4,7,8-HxCDF	--	--	0.00004	0.00000001	OEHHA	--	--	13000	OEHHA	3.8	13000	OEHHA
1,2,3,6,7,8-HxCDD	--	--	--	--	--	--	--	15000	calc using TEF	--	15000	calc using TEF
1,2,3,6,7,8-HxCDD	--	--	0.00004	0.00000001	OEHHA	--	--	13000	OEHHA	3.8	13000	OEHHA
1,2,3,6,7,8-HxCDF	--	--	--	--	--	--	--	15000	calc using TEF	--	15000	calc using TEF
1,2,3,6,7,8-HxCDF	--	--	0.00004	0.00000001	OEHHA	--	--	13000	OEHHA	3.8	13000	OEHHA
1,2,3,7,8,9-HxCDD	--	--	--	--	--	--	--	15000	calc using TEF	--	15000	calc using TEF
1,2,3,7,8,9-HxCDD	--	--	0.00004	0.00000001	OEHHA	--	--	13000	OEHHA	3.8	13000	OEHHA
1,2,3,7,8,9-HxCDF	--	--	--	--	--	--	--	15000	calc using TEF	--	15000	calc using TEF
1,2,3,7,8,9-HxCDF	--	--	0.00004	0.00000001	OEHHA	--	--	13000	OEHHA	3.8	13000	OEHHA

Table 9
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1,2,3,7,8-PeCDD	--	--	--	--	--	--	--	150000	calc using TEF	--	150000	calc using TEF
1,2,3,7,8-PeCDD	--	--	0.00004	0.00000001	OEHHA	--	--	6500	OEHHA	38	130000	OEHHA
1,2,3,7,8-PeCDF	--	--	--	--	--	--	--	7500	calc using TEF	--	7500	calc using TEF
1,2,3,7,8-PeCDF	--	--	0.00004	0.00000001	OEHHA	--	--	6500	OEHHA	1.9	6500	OEHHA
2,3,4,6,7,8-HxCDF	--	--	--	--	--	--	--	15000	calc using TEF	--	15000	calc using TEF
2,3,4,6,7,8-HxCDF	--	--	0.00004	0.00000001	OEHHA	--	--	13000	OEHHA	3.8	13000	OEHHA
2,3,4,7,8-PeCDF	--	--	--	--	--	--	--	75000	calc using TEF	--	75000	calc using TEF
2,3,4,7,8-PeCDF	--	--	0.00004	0.00000001	OEHHA	--	--	65000	OEHHA	19	65000	OEHHA
2,3,7,8-TCDD	--	--	--	--	--	--	--	150000	HEAST	--	150000	HEAST
2,3,7,8-TCDD	--	--	0.00004	0.00000001	OEHHA	--	--	130000	OEHHA	38	130000	OEHHA
2,3,7,8-TCDF	--	--	--	--	--	--	--	15000	calc using TEF	--	15000	calc using TEF
2,3,7,8-TCDF	--	--	0.00004	0.00000001	OEHHA	--	--	13000	OEHHA	3.8	13000	OEHHA
OCDD	--	--	--	--	--	--	--	15	calc using TEF	--	15	calc using TEF
OCDD	--	--	0.00004	0.00000001	OEHHA	--	--	13	OEHHA	0.0038	13	OEHHA
OCDF	--	--	--	--	--	--	--	15	calc using TEF	--	15	calc using TEF
OCDF	--	--	0.00004	0.00000001	OEHHA	--	--	13	OEHHA	0.0038	13	OEHHA

References

HEAST: Health Effects Assessment Summary Tables (1997)

IRIS: Integrated Risk Information System (EPA 2006)

NCEA: National Center for Environmental Assessment (as cited on the Region 9 PRG Table, 2004)

OEHHA: California Office of Environmental Health Hazard Assessment. Toxicity Criteria Database (2005)

OEHHA*: California Office of Environmental Health Hazard Assessment. Child Reference Dose (2007)

PPRTV : Provisional Peer Reviewed Toxicity Value (as cited on the Region 9 PRG Table, 2004)

Region 9 Preliminary Remediation Goals (PRG) Table (October 2004)

Route Extrapolation: Route to route extrapolation

Shaded values are State of California toxicity values

Table 10

Summary of Cancer Risks and Noncancer Hazards - Soil

Baseline Human Health Risk Assessment

AMCO Chemical Superfund Site, Oakland, California

	Main Property		Parking Lot		Large Vacant Lot		Small Vacant Lot		Background	
Exposure Scenario/ Receptor	**Cancer**	**Noncancer**	**Cancer**	**Noncancer**	**Cancer**	**Noncancer**	**Cancer**	**Noncancer**	**Cancer**	**Noncancer**
Worker										
Industrial Worker										
Shallow Soil	1E-04	2	1E-04	1	2E-04	0.7	1E-04	0.4	6E-05	0.8
Deep Soil	2E-04	2	2E-04	1	1E-04	0.6				
Future Construction Worker										
Shallow Soil	1E-05	4	2E-05	4	2E-05	3	1E-05	1	9E-06	3
Deep Soil	2E-05	5	3E-05	4	2E-05	2				
Hypothetical Resident										
Future Adult Resident (24 years)										
Shallow Soil	2E-04	3	1E-04	2	2E-04	0.9	1E-04	0.5	7E-05	1
Deep Soil	2E-04	3	2E-04	2	1E-04	0.7				
Future Child Resident (6 years)										
Shallow Soil	2E-04	14	3E-04	28	4E-04	11	2E-04	12	2E-04	11
Deep Soil	3E-04	15	4E-04	27	3E-04	8				
Sum of Adult plus Child (30 years)										
Shallow Soil	4E-04		4E-04		6E-04		3E-04		2E-04	
Deep Soil	4E-04		5E-04		4E-04					

Table 11
Summary of Cancer Risks and Noncancer Hazards - Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario/ Receptor	Cancer	Noncancer
Trench Worker	2E-04	38
Hypothetical Resident		
Future Adult Resident (24 years)	8E-02	484
Future Child Resident (6 years)	5E-02	1153
Sum of Adult plus Child (30 years)	1E-01	

TABLE 12
Irrigation Well Detected Analytical Results
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Screening Level	Agricultural Water Quality Limit	Units	9/2/2004	6/24/2005	10/12/2005
Volatile Organic Compounds						
Acetone	5,500	NE	µg/L	ND (4)	4 J	---
cis-1,2-Dichloroethene	6	NE	µg/L	0.6	ND (0.5)	---
Methyl tert-butyl ether	13	NE	µg/L	0.6	ND (0.5)	---
trans-1,2-Dichloroethene	10	NE	µg/L	0.2 J	ND (0.5)	---
Trichloroethene	5	NE	µg/L	0.3 J	ND (0.5)	---
Semivolatile Organic Compounds						
1,4-Dioxane (p-dioxane)	6.1	NE	µg/L	1.1	ND (1)	---
bis(2-Ethylhexyl)phthalate	4.8	NE	µg/L	1.8	---	---
Metals						
Aluminum	1,000	5,000	µg/L	320	---	---
Antimony	6	NE	µg/L	4.2	---	---
Arsenic	10	100	µg/L	2.3	---	---
Barium	1,000	NE	µg/L	170	---	---
Boron	7,300	700	µg/L	2,800	---	---
Cadmium	5	10	µg/L	2.2	---	---
Calcium	NA	NE	µg/L	190,000	---	---
Chromium	50	NE	µg/L	3.2	---	---
Cobalt	730	50	µg/L	2.2	---	---
Copper	1,300	200	µg/L	40	---	---
Iron	11,000	5,000	µg/L	1,400	---	---
Lead	15	5,000	µg/L	**79**	---	---
Magnesium	NA	NE	µg/L	34,000	---	---
Manganese	880	200	µg/L	390	---	---
Mercury	2	NE	µg/L	0.23	---	---
Molybdenum	180	10	µg/L	6.2	---	---
Nickel	100	200	µg/L	25	---	---
Potassium	NA	NE	µg/L	33,000	---	---
Sodium	NA	69,000	µg/L	150,000	---	---
Zinc	11,000	2,000	µg/L	520	---	---
Organochlorine Pesticides/PCBs						
4,4'-DDD	0.28	NE	µg/L	---	0.004 J	---
4,4'-DDT	0.2	NE	µg/L	---	0.003 J	---
Water Quality Indicators						
Hardness (as CaCO3)	NA	NE	µg/L	610,000	---	---

Notes:
Only Organophosphorus Pesticides were analyzed for the sample collected on 10/12/2005 and none of the results were detected above the reporting limit.
Screening levels are the lower of the Federal or California Primary MCL, or EPA Region 9 tap water PRG, if a Primary MCL is not available.
Agricultural Water Quality Limit - suitability of water for irrigation of plants/crops (Ayers, R.S., and D.W. Westcot, 1985)
Results greater than the Screening Level ae bolded.

--- not analyzed
NA not applicable
NE not established
µg/L micrograms per liter
ND not detected above the reporting limit
J estimated value

TABLE 13
Minimum Analyte Reporting Limits Above Applicable Groundwater Screening Level
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Minimum RL (µg/L)	Screening Levels (µg/L)	Number that Exceeded Screening Level (%)	Total Number of Samples
1,1,1,2-Tetrachloroethane	0.5	0.43	118 (100)	118
1,2,3-Trichloropropane	0.5	0.0056	118 (100)	118
1,4-Dioxane (p-dioxane)	1000	6.1	64 (80)	80
Naphthalene	0.2	0.093	81 (69)	118
bis(2-Chloroethyl)ether	0.08	0.01	111 (100)	111
Dibenz(a,h)anthracene	0.01	0.0092	111 (100)	111
Naphthalene	0.1	0.093	88 (81)	109
N-Nitrosodi-n-propylamine	0.01	0.0096	106 (96)	110
Aldrin	0.01	0.004	80 (80)	100
Dieldrin	0.02	0.0042	62 (63)	98

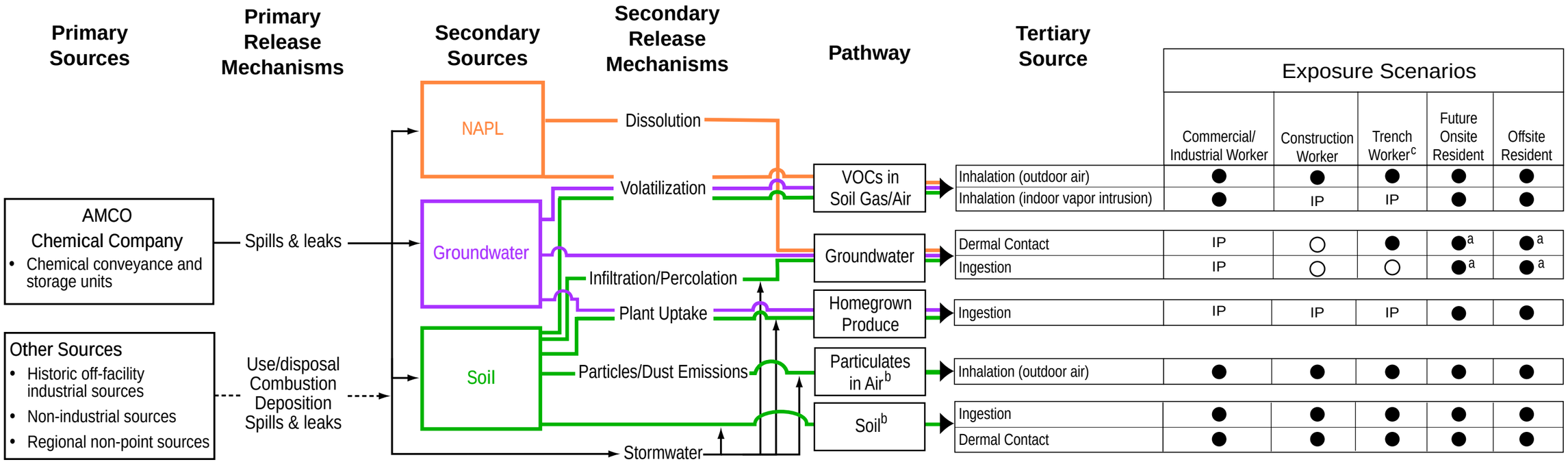
TABLE 14
Minimum Analyte Reporting Limits Above Applicable Ambient/Crawlspace Air Screening Level
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Minimum RL ($\mu g/m^3$)	Screening Levels ($\mu g/m^3$)	Number that Exceeded Screening Level (%)	Total Number of Samples
AMBIENT AIR				
1,1,1,2-Tetrachloroethane	0.19	0.43	21 (99)	22
1,2-Dibromoethane	0.21	0.033	22 (100)	22
1,2-Dichloroethane	0.11	0.0034	19 (86)	22
Benzene	0.59	0.074	1 (4)	22
Chloroform	0.16	0.25	4 (18)	22
Hexachlorobutadiene	1.5	0.083	22 (100)	22
Naphthalene	3.6	0.086	6 (43)	14
Trichloroethene	0.028	0.056	11 (50)	22
CRAWLSPACE AIR				
1,1,1,2-Tetrachloroethane	0.19	0.43	21 (99)	22
1,2-Dibromoethane	0.21	0.033	22 (100)	22
1,2-Dichloroethane	0.11	0.0034	19 (86)	22
Chloroform	0.16	0.25	4 (18)	22
Hexachlorobutadiene	1.5	0.083	22 (100)	22
Naphthalene	3.6	0.086	6 (43)	14
Trichloroethene	0.028	0.056	11 (50)	22

TABLE 15
Minimum Analyte Reporting Limits Above Applicable Residential Soil Gas Screening Level
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Minimum RL ($\mu g/m^3$)	**Screening Levels ($\mu g/m^3$)**	**Number that Exceeded Screening Level (%)**	**Total Number of Samples**
1,2-Dibromoethane	0.2	0.034	73 (100)	73
1,3-Butadiene	1.5	0.11	18 (99)	19
Benzyl Chloride	3.5	0.4	19 (100)	19
Bromodichloromethane	4.5	1.1	19 (100)	19
Dibromochloromethane	5.7	0.8	19 (100)	19
Hexachlorobutadiene	1.4	0.86	73 (100)	73
Naphthalene	2.6	0.56	17 (100)	17

Figures



LEGEND:

- ● = Potentially complete pathway
- ○ = Potentially complete pathway but not considered a significant source of risk
- IP = Incomplete pathway
- NAPL = Non-aqueous Phase Liquid

NOTES:

a Groundwater is designated for Municipal and Domestic Supply Beneficial Use by default; however, there are no domestic water wells within 1 mile of the site, and there are no municipal water wells within 4 miles of the site

b Assuming no pavement

c Groundwater exposure for a Landscape Worker is accounted for by this pathway

FIGURE 1
CONCEPTUAL SITE MODEL DIAGRAM
HUMAN HEALTH RISK ASSESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

CH2MHILL

ES122006002BAO_Fig 1 ConceptSiteModelDiagram.ai 10-09-07 dash

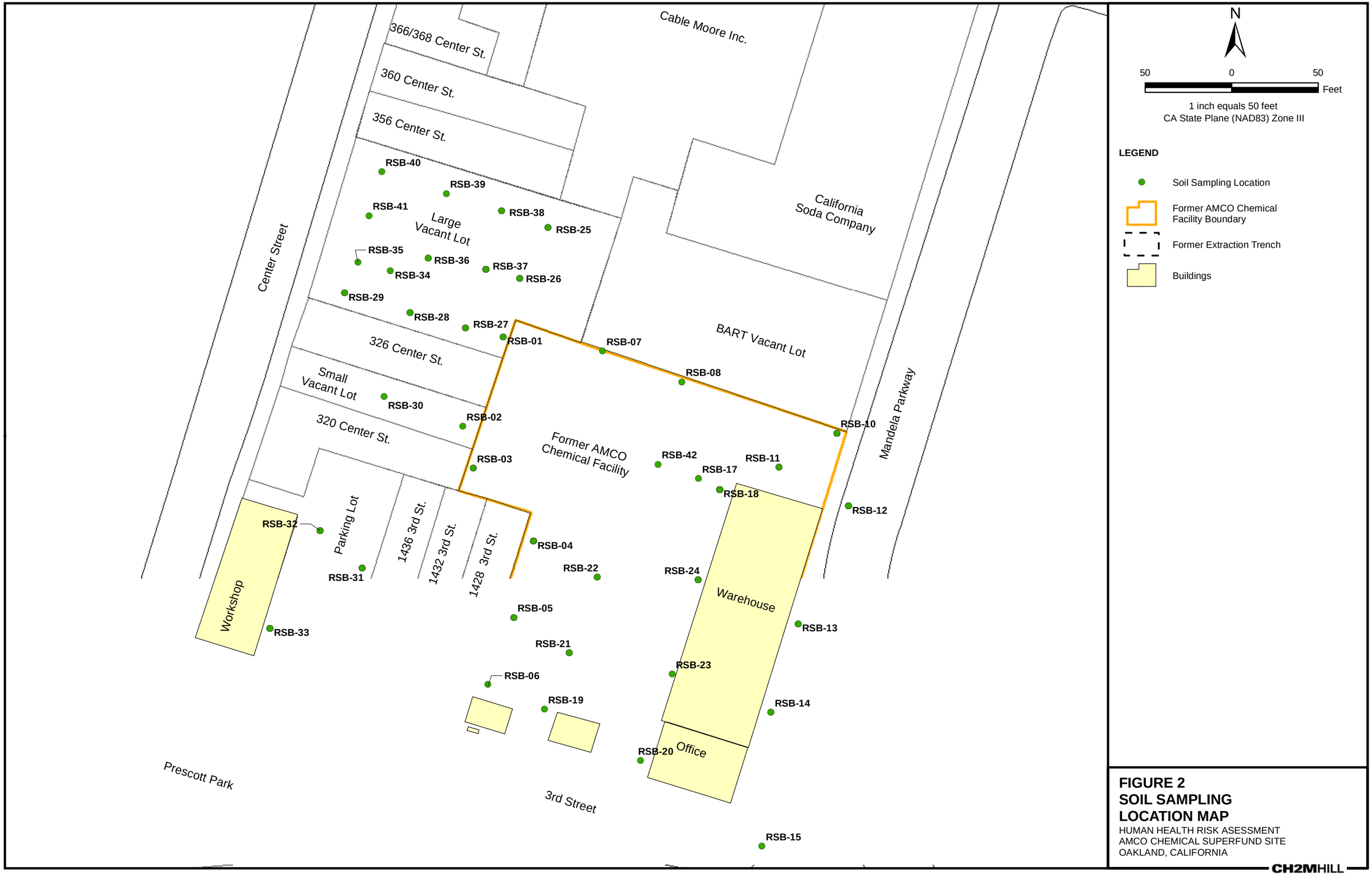


FIGURE 2
SOIL SAMPLING LOCATION MAP
HUMAN HEALTH RISK ASESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

CH2MHILL

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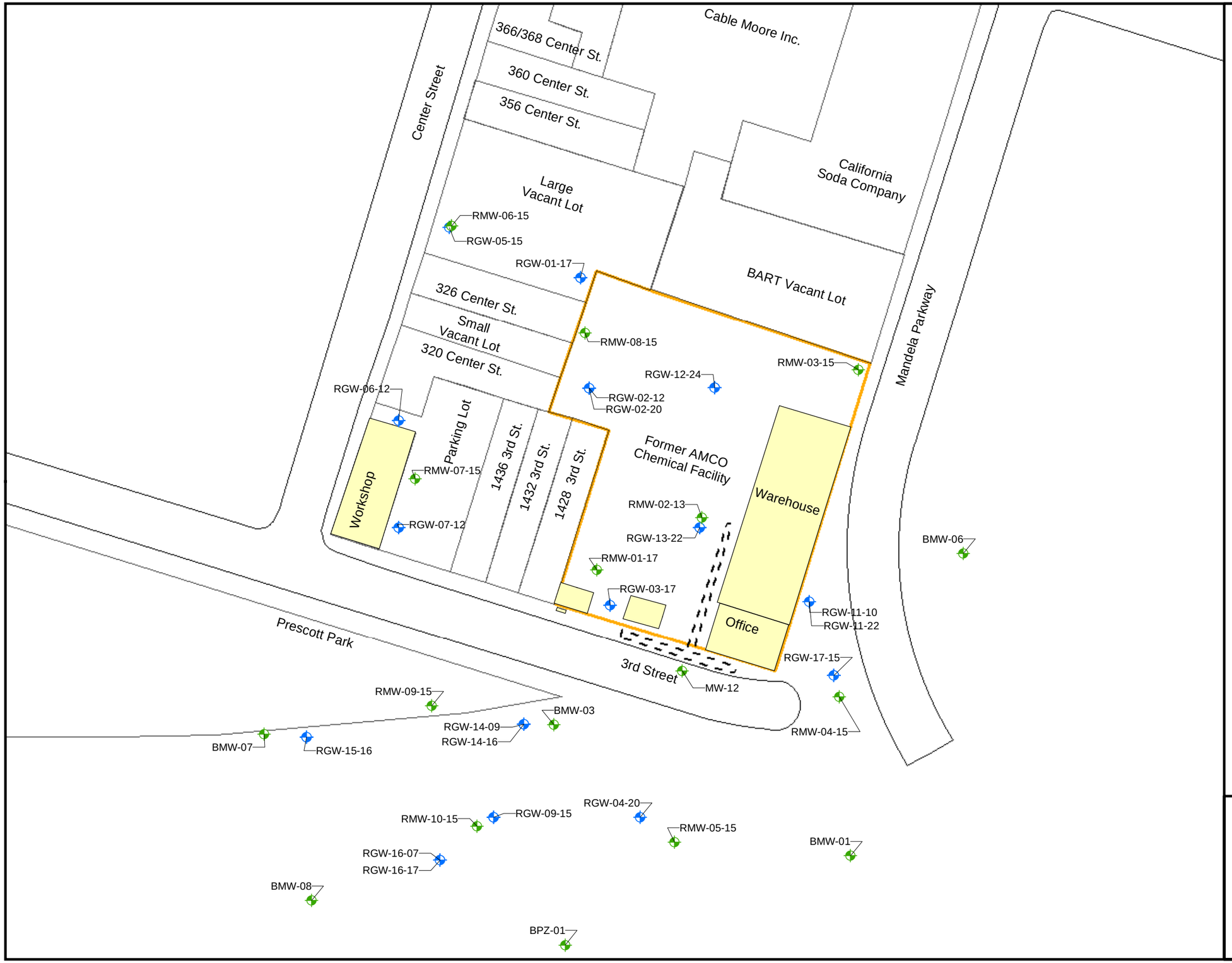


N

50 0 50 Feet

1 inch equals 66.7 feet
CA State Plane (NAD83) Zone III

LEGEND

- Groundwater Monitoring Wells
- Grab Groundwater Wells
- Buildings
- Former Extraction Trench
- Former AMCO Chemical Facility Boundary

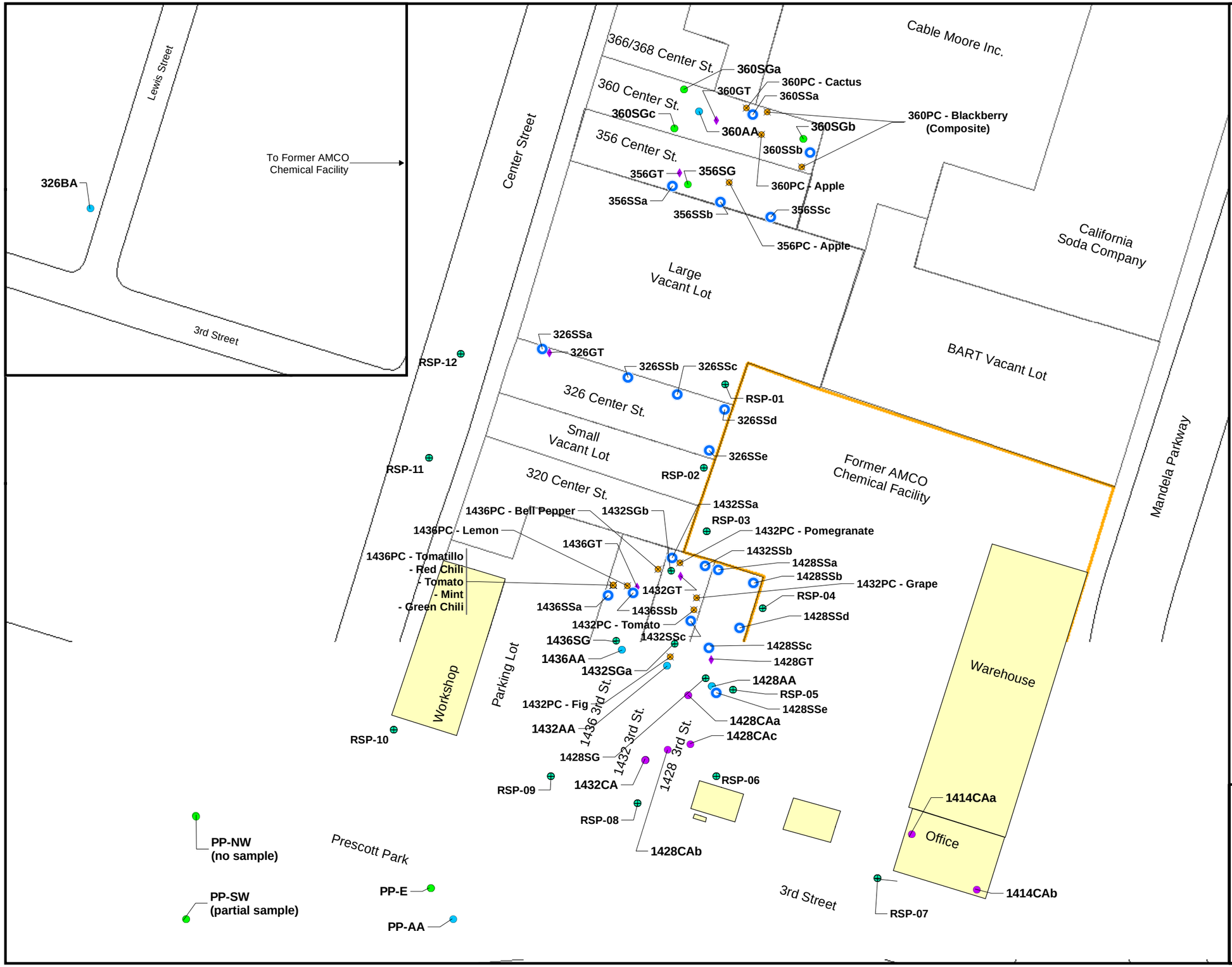
Notes:
1. Data from 2005qtr2 was not used in the risk assessment because of insufficient quality.
2. Data from deep wells were not used in risk assessment calculations as the exposure pathway is incomplete.

DRAFT

FIGURE 3
GRAB AND MONITORING WELL SAMPLE LOCATIONS FOR SHALLOW WELLS USED IN THE RISK ASSESSMENT

HUMAN HEALTH RISK ASESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

CH2MHILL

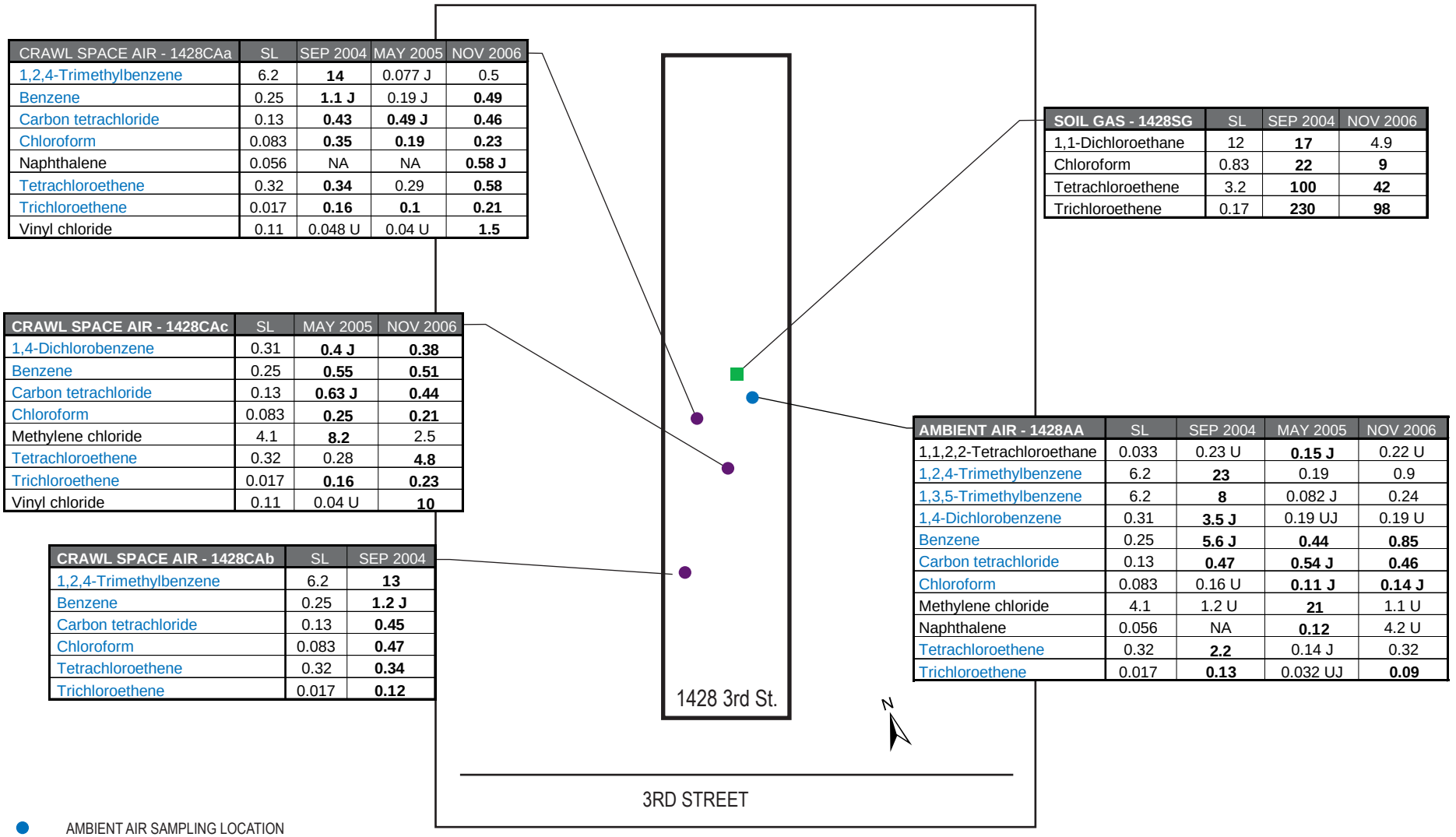


DRAFT

FIGURE 4
RESIDENTIAL AMBIENT AIR, CRAWLSPACE AIR, PRODUCE, AND SOIL GAS SAMPLE LOCATIONS

HUMAN HEALTH RISK ASESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

CH2MHILL



CRAWL SPACE AIR - 1428CAa	SL	SEP 2004	MAY 2005	NOV 2006
1,2,4-Trimethylbenzene	6.2	**14**	0.077 J	0.5
Benzene	0.25	**1.1 J**	0.19 J	**0.49**
Carbon tetrachloride	0.13	**0.43**	**0.49 J**	**0.46**
Chloroform	0.083	**0.35**	**0.19**	**0.23**
Naphthalene	0.056	NA	NA	**0.58 J**
Tetrachloroethene	0.32	**0.34**	0.29	**0.58**
Trichloroethene	0.017	**0.16**	**0.1**	**0.21**
Vinyl chloride	0.11	0.048 U	0.04 U	**1.5**

SOIL GAS - 1428SG	SL	SEP 2004	NOV 2006
1,1-Dichloroethane	12	**17**	4.9
Chloroform	0.83	**22**	**9**
Tetrachloroethene	3.2	**100**	**42**
Trichloroethene	0.17	**230**	**98**

CRAWL SPACE AIR - 1428CAc	SL	MAY 2005	NOV 2006
1,4-Dichlorobenzene	0.31	**0.4 J**	**0.38**
Benzene	0.25	**0.55**	**0.51**
Carbon tetrachloride	0.13	**0.63 J**	**0.44**
Chloroform	0.083	**0.25**	**0.21**
Methylene chloride	4.1	**8.2**	2.5
Tetrachloroethene	0.32	0.28	**4.8**
Trichloroethene	0.017	**0.16**	**0.23**
Vinyl chloride	0.11	0.04 U	**10**

AMBIENT AIR - 1428AA	SL	SEP 2004	MAY 2005	NOV 2006
1,1,2,2-Tetrachloroethane	0.033	0.23 U	**0.15 J**	0.22 U
1,2,4-Trimethylbenzene	6.2	**23**	0.19	0.9
1,3,5-Trimethylbenzene	6.2	**8**	0.082 J	0.24
1,4-Dichlorobenzene	0.31	**3.5 J**	0.19 UJ	0.19 U
Benzene	0.25	**5.6 J**	**0.44**	**0.85**
Carbon tetrachloride	0.13	**0.47**	**0.54 J**	**0.46**
Chloroform	0.083	0.16 U	**0.11 J**	**0.14 J**
Methylene chloride	4.1	1.2 U	**21**	1.1 U
Naphthalene	0.056	NA	**0.12**	4.2 U
Tetrachloroethene	0.32	**2.2**	0.14 J	0.32
Trichloroethene	0.017	**0.13**	0.032 UJ	**0.09**

CRAWL SPACE AIR - 1428CAb	SL	SEP 2004
1,2,4-Trimethylbenzene	6.2	**13**
Benzene	0.25	**1.2 J**
Carbon tetrachloride	0.13	**0.45**
Chloroform	0.083	**0.47**
Tetrachloroethene	0.32	**0.34**
Trichloroethene	0.017	**0.12**

- AMBIENT AIR SAMPLING LOCATION
- CRAWL SPACE AIR SAMPLING LOCATION
- SOIL GAS SAMPLING LOCATION

Chemical Detected in background during NOV 2006 Air Sampling Event

All results and screening levels in µg/m^3
Bold - detected above screening levels
J - estimated
U - not detected at listed reporting limit
UJ - not detected at estimated reporting limit
NA - not analyzed
Maximum value between field duplicate (FD) & primary sample is shown
SL - Screening Level

Notes:
1. Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations).
2. Concentrations are only shown for locations that had result(s) exceeding the screening levels during at least one sampling event.

FIGURE 5
1428 3rd STREET SOIL GAS/CRAWLSPACE/ AMBIENT AIR SAMPLING LOCATIONS

HUMAN HEALTH RISK ASSESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

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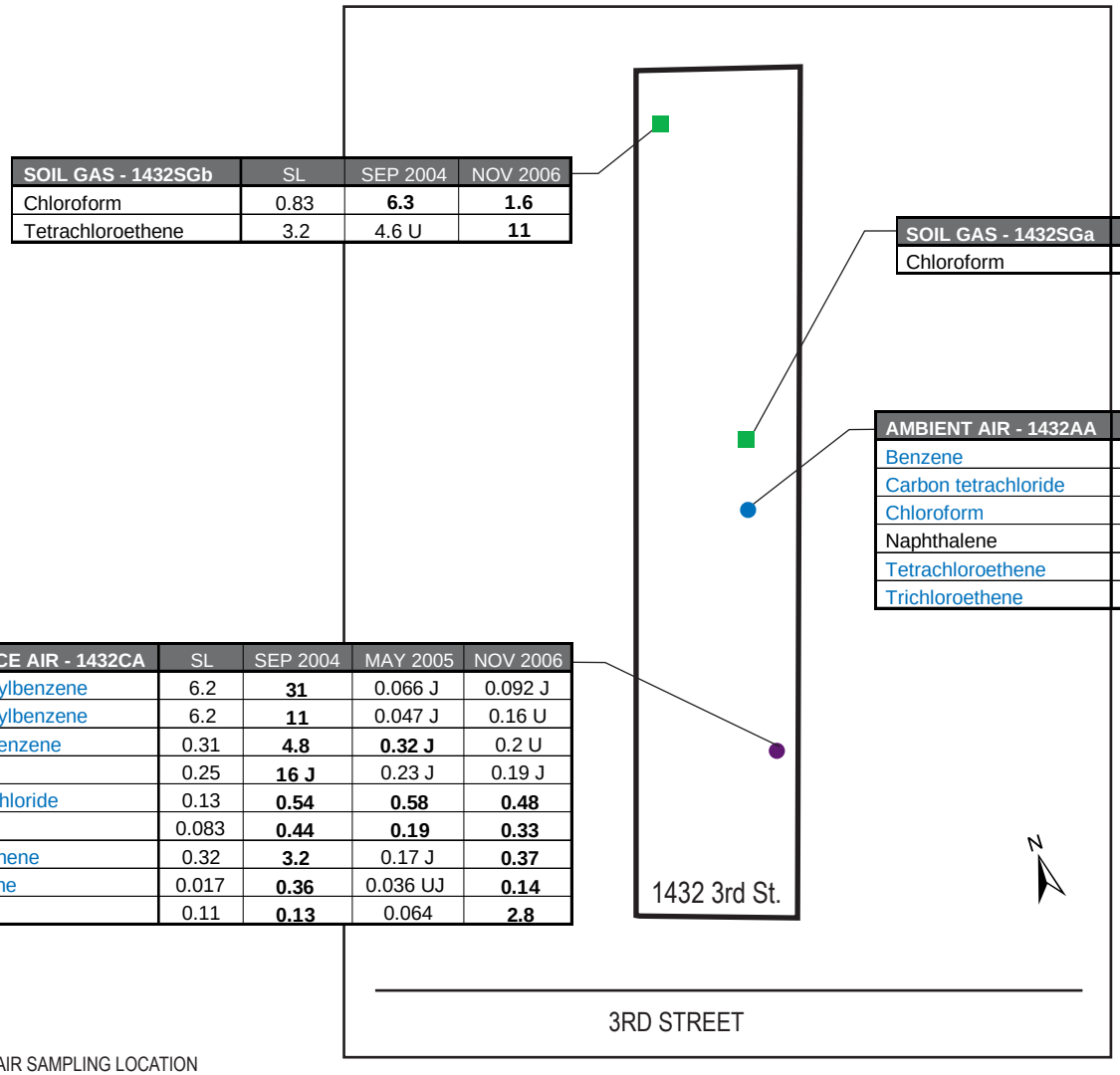


SOIL GAS - 1432SGb	SL	SEP 2004	NOV 2006
Chloroform	0.83	**6.3**	**1.6**
Tetrachloroethene	3.2	4.6 U	**11**

SOIL GAS - 1432SGa	SL	SEP 2004	NOV 2006
Chloroform	0.83	**6.3**	**1.4**

AMBIENT AIR - 1432AA	SL	SEP 2004	MAY 2005	NOV 2006
Benzene	0.25	**0.74 J**	**0.55**	**0.81**
Carbon tetrachloride	0.13	**0.53**	**0.6**	**0.45**
Chloroform	0.083	**0.3**	**0.18**	**0.15 J**
Naphthalene	0.056	NA	**0.27**	**0.46 J**
Tetrachloroethene	0.32	**0.36**	0.22 J	0.3
Trichloroethene	0.017	**0.046**	0.057 UJ	**0.079**

CRAWL SPACE AIR - 1432CA	SL	SEP 2004	MAY 2005	NOV 2006
1,2,4-Trimethylbenzene	6.2	**31**	0.066 J	0.092 J
1,3,5-Trimethylbenzene	6.2	**11**	0.047 J	0.16 U
1,4-Dichlorobenzene	0.31	**4.8**	**0.32 J**	0.2 U
Benzene	0.25	**16 J**	0.23 J	0.19 J
Carbon tetrachloride	0.13	**0.54**	**0.58**	**0.48**
Chloroform	0.083	**0.44**	**0.19**	**0.33**
Tetrachloroethene	0.32	**3.2**	0.17 J	**0.37**
Trichloroethene	0.017	**0.36**	0.036 UJ	**0.14**
Vinyl chloride	0.11	**0.13**	0.064	**2.8**

AMBIENT AIR SAMPLING LOCATION
CRAWL SPACE AIR SAMPLING LOCATION
SOIL GAS SAMPLING LOCATION

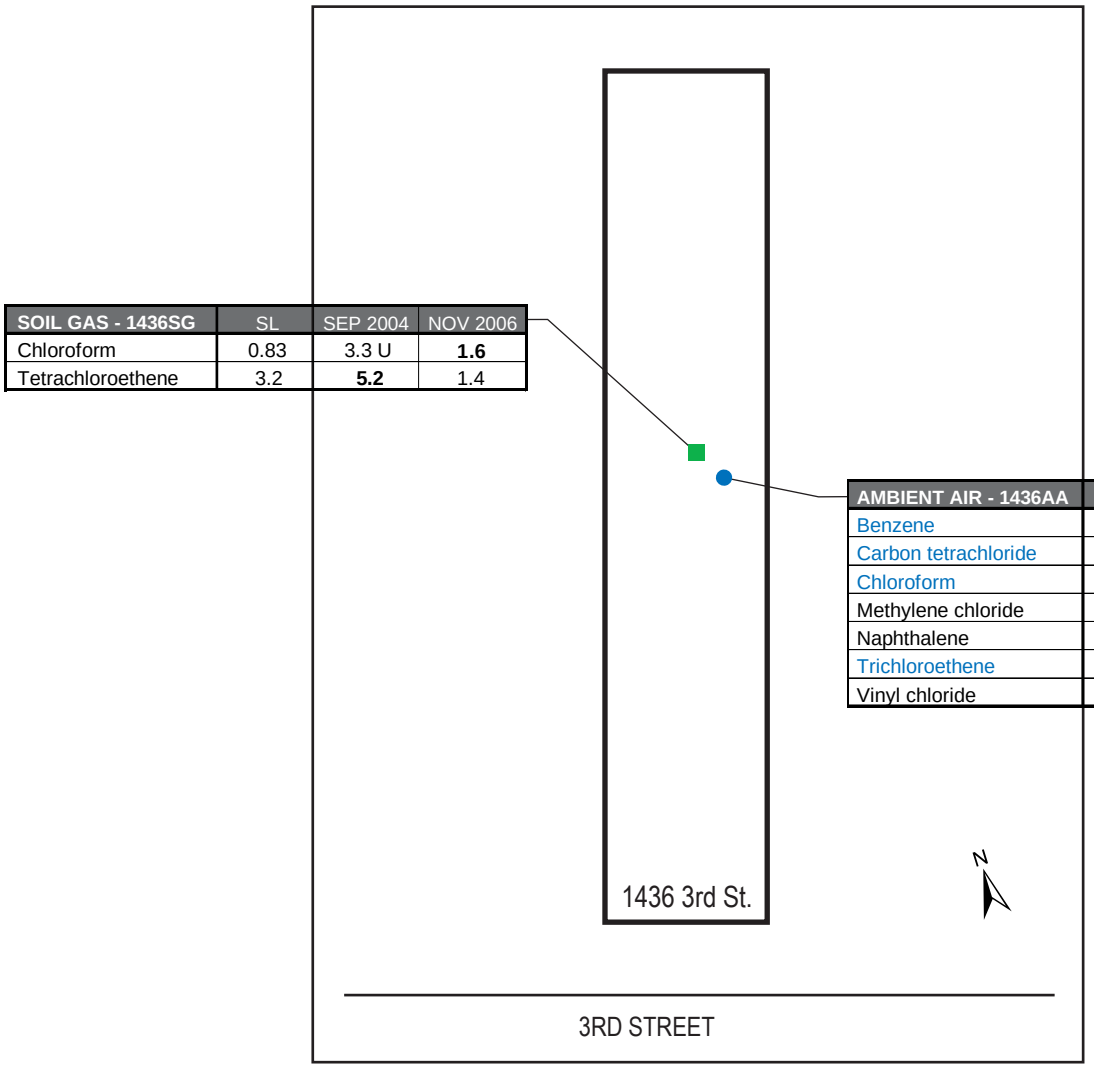
Chemical Detected in background during NOV 2006 Air Sampling Event
All results and screening levels in µg/m³
Bold - detected above screening levels
J - estimated
U - not detected at listed reporting limit
UJ - not detected at estimated reporting limit
NA - not analyzed
Maximum value between field duplicate (FD) & primary sample is shown
SL - Screening Level

Notes:
1. Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations).
2. Concentrations are only shown for locations that had result(s) exceeding the screening levels during at least one sampling event.

FIGURE 6
1432 3rd STREET SOIL GAS/CRAWLSPACE/ AMBIENT AIR SAMPLING LOCATIONS

HUMAN HEALTH RISK ASSESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

CH2MHILL



SOIL GAS - 1436SG	SL	SEP 2004	NOV 2006
Chloroform	0.83	3.3 U	**1.6**
Tetrachloroethene	3.2	**5.2**	1.4

AMBIENT AIR - 1436AA	SL	SEP 2004	MAY 2005	NOV 2006
Benzene	0.25	**0.79 J**	**0.48**	**1.2**
Carbon tetrachloride	0.13	**0.48**	**0.63**	**0.48**
Chloroform	0.083	**0.16**	**0.11 J**	**0.14**
Methylene chloride	4.1	1.1 U	**11**	**4.5 J**
Naphthalene	0.056	NA	**0.069**	3.6 U
Trichloroethene	0.017	**0.058**	0.043 UJ	**0.17**
Vinyl chloride	0.11	0.04 U	0.04 U	**0.7 J**

AMBIENT AIR SAMPLING LOCATION

SOIL GAS SAMPLING LOCATION

Chemical Detected in background during NOV 2006 Air Sampling Event

All results and screening levels in µg/m^3

Bold - detected above screening levels

J - estimated

U - not detected at listed reporting limit

UJ - not detected at estimated reporting limit

NA - not analyzed

Maximum value between field duplicate (FD) & primary sample is shown

SL - Screening Level

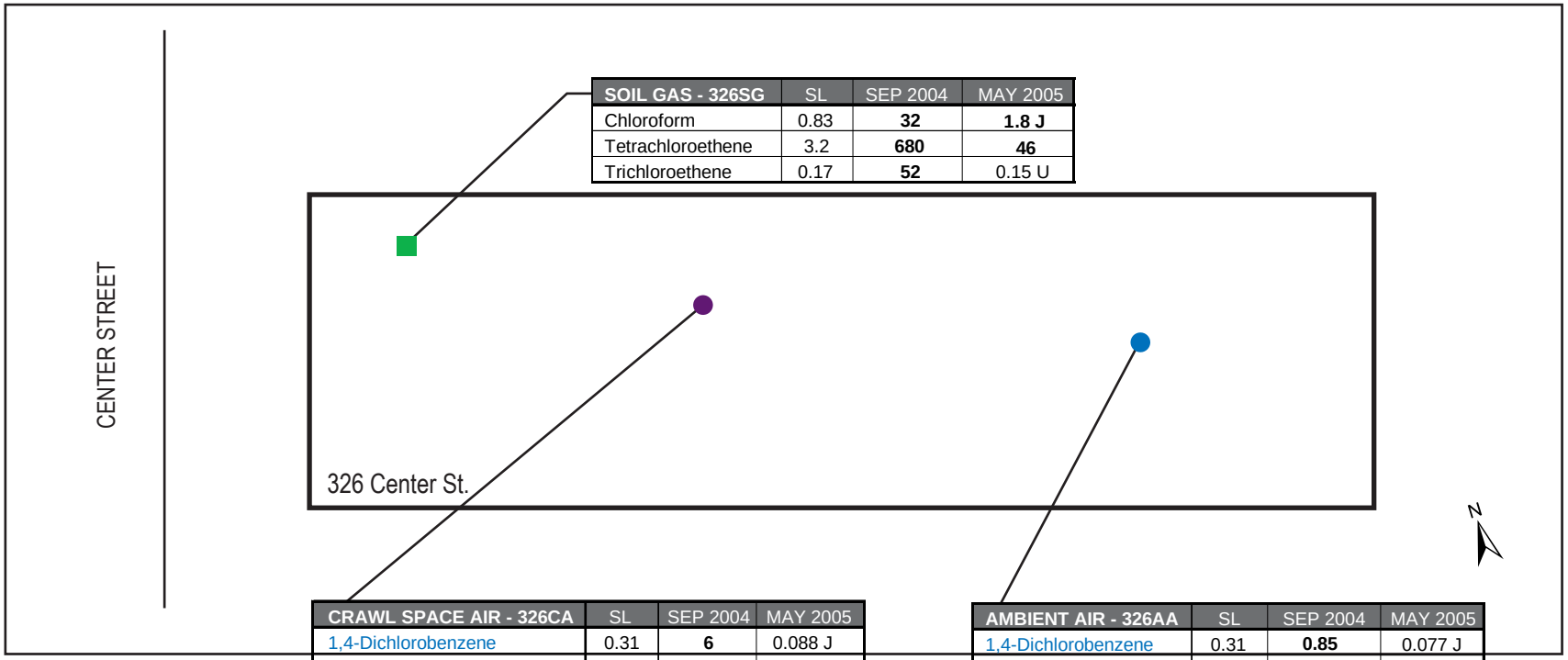
Notes:

1. Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations).
2. Concentrations are only shown for locations that had result(s) exceeding the screening levels during at least one sampling event.

FIGURE 7
1436 3rd STREET SOIL GAS/AMBIENT AIR SAMPLING LOCATIONS

HUMAN HEALTH RISK ASSESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

CH2MHILL



SOIL GAS - 326SG	SL	SEP 2004	MAY 2005
Chloroform	0.83	**32**	**1.8 J**
Tetrachloroethene	3.2	**680**	**46**
Trichloroethene	0.17	**52**	0.15 U

CRAWL SPACE AIR - 326CA	SL	SEP 2004	MAY 2005
1,4-Dichlorobenzene	0.31	**6**	0.088 J
Benzene	0.25	**0.65 J**	**0.51**
Carbon tetrachloride	0.13	**0.48**	**0.55**
Chloroform	0.083	0.16 U	**0.099 J**
Hexachlorobutadiene	0.086	1.8 UJ	**0.68 J**

AMBIENT AIR - 326AA	SL	SEP 2004	MAY 2005
1,4-Dichlorobenzene	0.31	**0.85**	0.077 J
Benzene	0.25	**0.66 J**	**0.42**
Carbon tetrachloride	0.13	**0.46**	**0.53**
Chloroform	0.083	0.17 U	**0.1 J**

- AMBIENT AIR SAMPLING LOCATION
- CRAWL SPACE AIR SAMPLING LOCATION
- SOIL GAS SAMPLING LOCATION

Chemical Detected in background during NOV 2006 Air Sampling Event

All results and screening levels in µg/m^3
Bold - detected above screening levels
J - estimated
U - not detected at listed reporting limit
UJ - not detected at estimated reporting limit
NA - not analyzed
Maximum value between field duplicate (FD) & primary sample is shown
SL - Screening Level

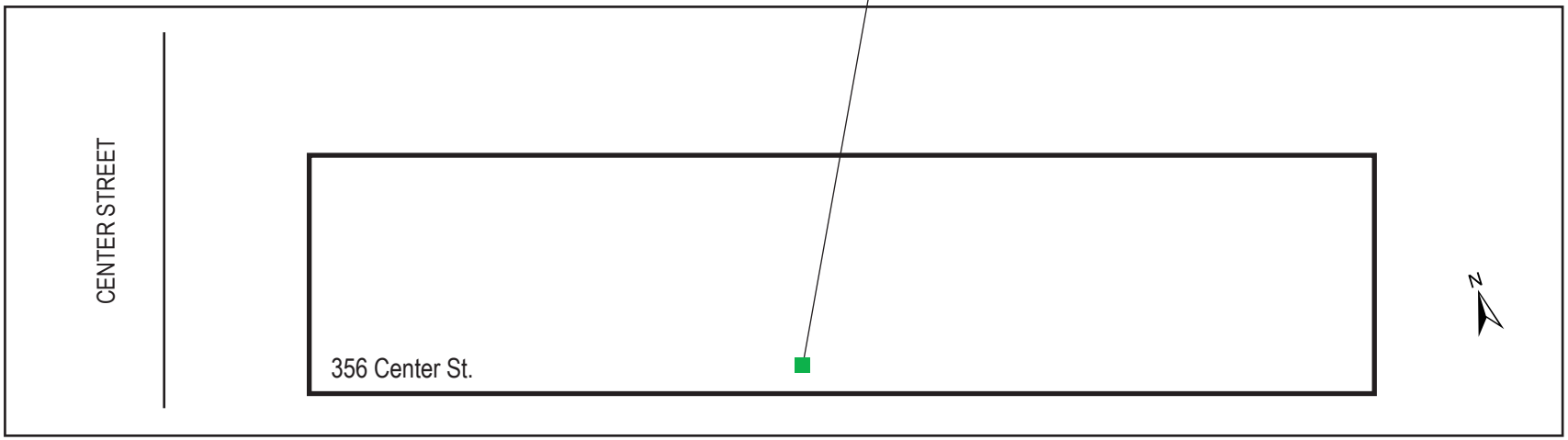
Notes:
1. Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations).
2. Concentrations are only shown for locations that had result(s) exceeding the screening levels during at least one sampling event.

FIGURE 8
326 CENTER STREET SOIL GAS/CRAWLSPACE/ AMBIENT AIR SAMPLING LOCATIONS

HUMAN HEALTH RISK ASSESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

CH2MHILL

SOIL GAS - 356SG	SL	SEP 2004	MAY 2005	NOV 2006
Chloroform	0.83	3.3 U	12 U	**1.2**
Tetrachloroethene	3.2	4.6 U	17 U	**3.3**



SOIL GAS SAMPLING LOCATION

All results and screening levels in µg/m³
Bold - detected above screening levels
J - estimated
U - not detected at listed reporting limit
UJ - not detected at estimated reporting limit
NA - not analyzed
Maximum value between field duplicate (FD) & primary sample is shown
SL - Screening Level

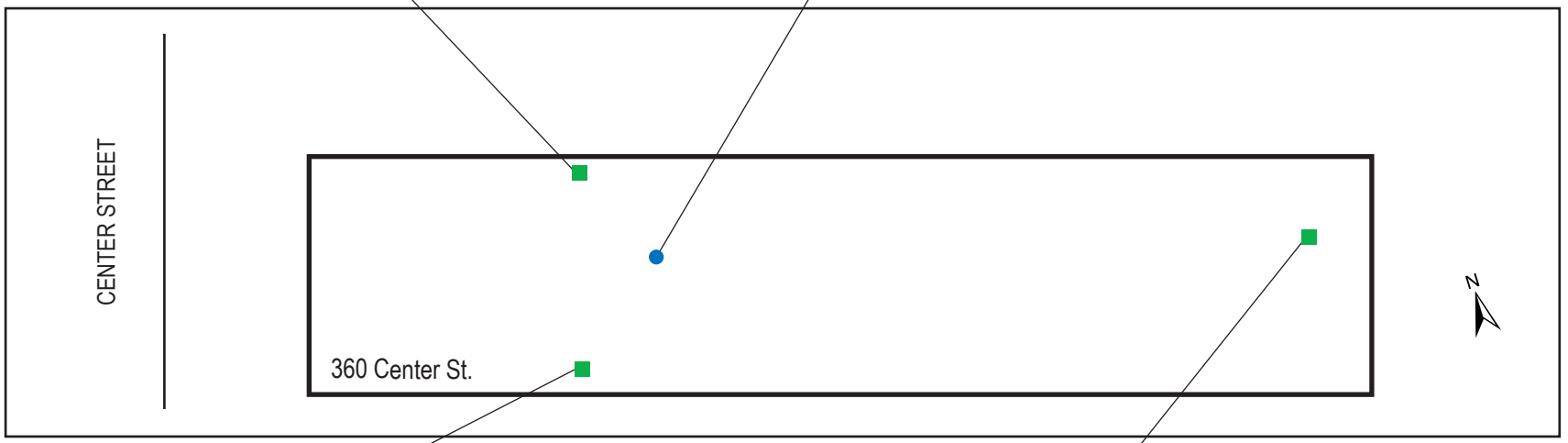
Notes:
1. Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations).
2. Concentrations are only shown for locations that had result(s) exceeding the screening levels during at least one sampling event.

FIGURE 9
356 CENTER STREET
SOIL GAS
SAMPLING LOCATION
HUMAN HEALTH RISK ASSESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

CH2MHILL

SOIL GAS - 360SGa	SL	SEP 2004	MAY 2005	NOV 2006
1,1,2,2-Tetrachloroethane	0.33	0.19 U	**0.34**	0.46 U
Benzene	2.5	**3.6**	1.6 J	1.9 J
Chloroform	0.83	3.3 U	**1.1 J**	**2**

AMBIENT AIR - 360AA	SL	SEP 2004	MAY 2005	NOV 2006
Benzene	0.25	0.59 UJ	**1.2**	**1.2**
Carbon tetrachloride	0.13	**0.53**	**0.83**	**0.46**
Chloroform	0.083	0.18 U	**0.093 J**	**0.16 J**
Tetrachloroethene	0.32	0.25 U	0.2 J	**0.4**
Trichloroethene	0.017	0.03 U	0.032 UJ	**0.23**



SOIL GAS - 360SGc	SL	SEP 2004	MAY 2005	NOV 2006
Chloroform	0.83	3.3 U	**1.4 J**	0.64 U

SOIL GAS - 360SGb	SL	SEP 2004	MAY 2005	NOV 2006
Chloroform	0.83	3.3 U	**1.2 J**	**3.9**

AMBIENT AIR SAMPLING LOCATION

SOIL GAS SAMPLING LOCATION

Chemical Detected in background during NOV 2006 Air Sampling Event

All results and screening levels in µg/m^3

Bold - detected above screening levels

J - estimated

U - not detected at listed reporting limit

UJ - not detected at estimated reporting limit

NA - not analyzed

Maximum value between field duplicate (FD) & primary sample is shown

SL - Screening Level

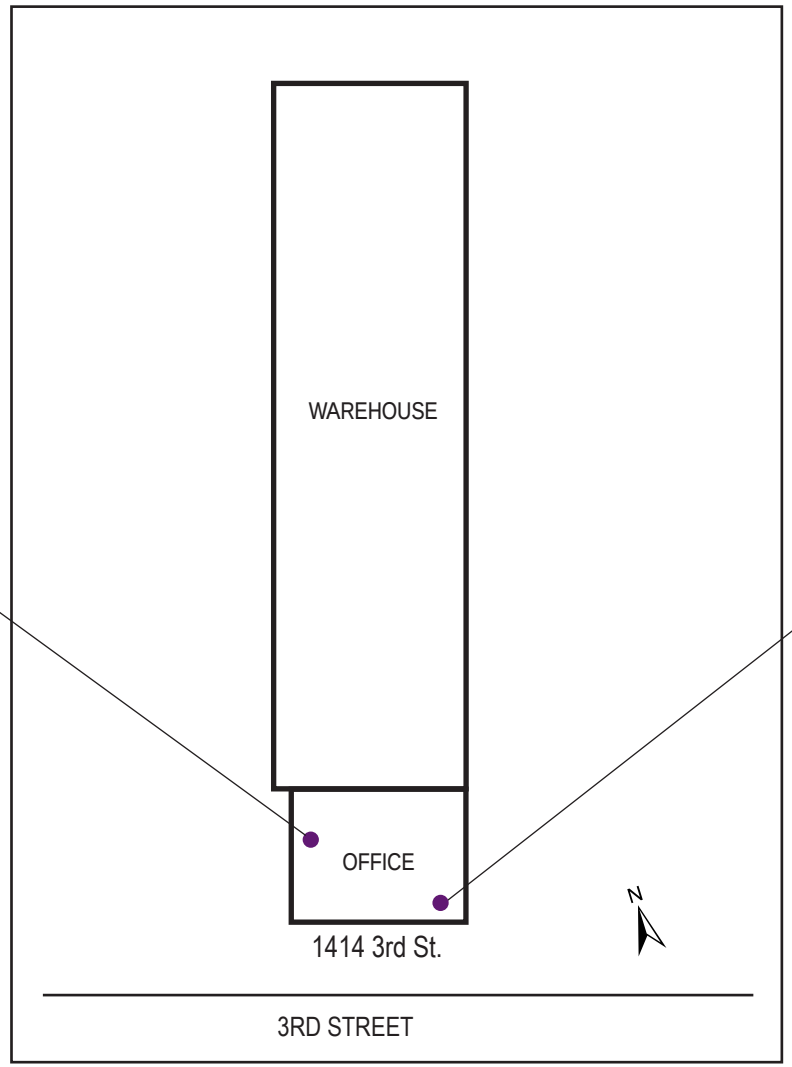
Notes:

1. Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations).
2. Concentrations are only shown for locations that had result(s) exceeding the screening levels during at least one sampling event.

FIGURE 10
360 CENTER STREET SOIL GAS/AMBIENT AIR SAMPLING LOCATIONS

HUMAN HEALTH RISK ASSESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

CH2MHILL



CRAWL SPACE AIR - 1414CAa	Residential SL	Industrial SL	NOV 2006
1,1-Dichloroethane	1.2	3.3	**28**
1,4-Dioxane (p-dioxane)	0.61	1.7	1.3 J
Benzene	0.25	0.7	**0.99 J**
Carbon tetrachloride	0.13	0.4	**0.47 J**
Chloroform	0.083	0.2	**0.66 J**
cis-1,2-Dichloroethene	37	68	**400**
Naphthalene	0.056	0.2	**0.41 J**
Tetrachloroethene	0.32	0.4	**19**
Trichloroethene	0.017	0.05	**26**
Vinyl chloride	0.11	1.2	**1.8**

CRAWL SPACE AIR - 1414CAb	Residential SL	Industrial SL	NOV 2006
Benzene	0.25	0.7	**0.55**
Carbon tetrachloride	0.13	0.4	0.38
Chloroform	0.083	0.2	**0.22**
Naphthalene	0.056	0.2	**0.53 J**
Tetrachloroethene	0.32	0.9	**3**
Trichloroethene	0.017	0.05	**3.1**
Vinyl chloride	0.11	1.2	**7.6**

● CRAWL SPACE AIR SAMPLING LOCATION

Chemical Detected in background during NOV 2006 Air Sampling Event

All results and screening levels in µg/m^3

Bold - detected above screening levels

J - estimated

U - not detected at listed reporting limit

UJ - not detected at estimated reporting limit

NA - not analyzed

Maximum value between field duplicate (FD) & primary sample is shown

SL - Screening Level

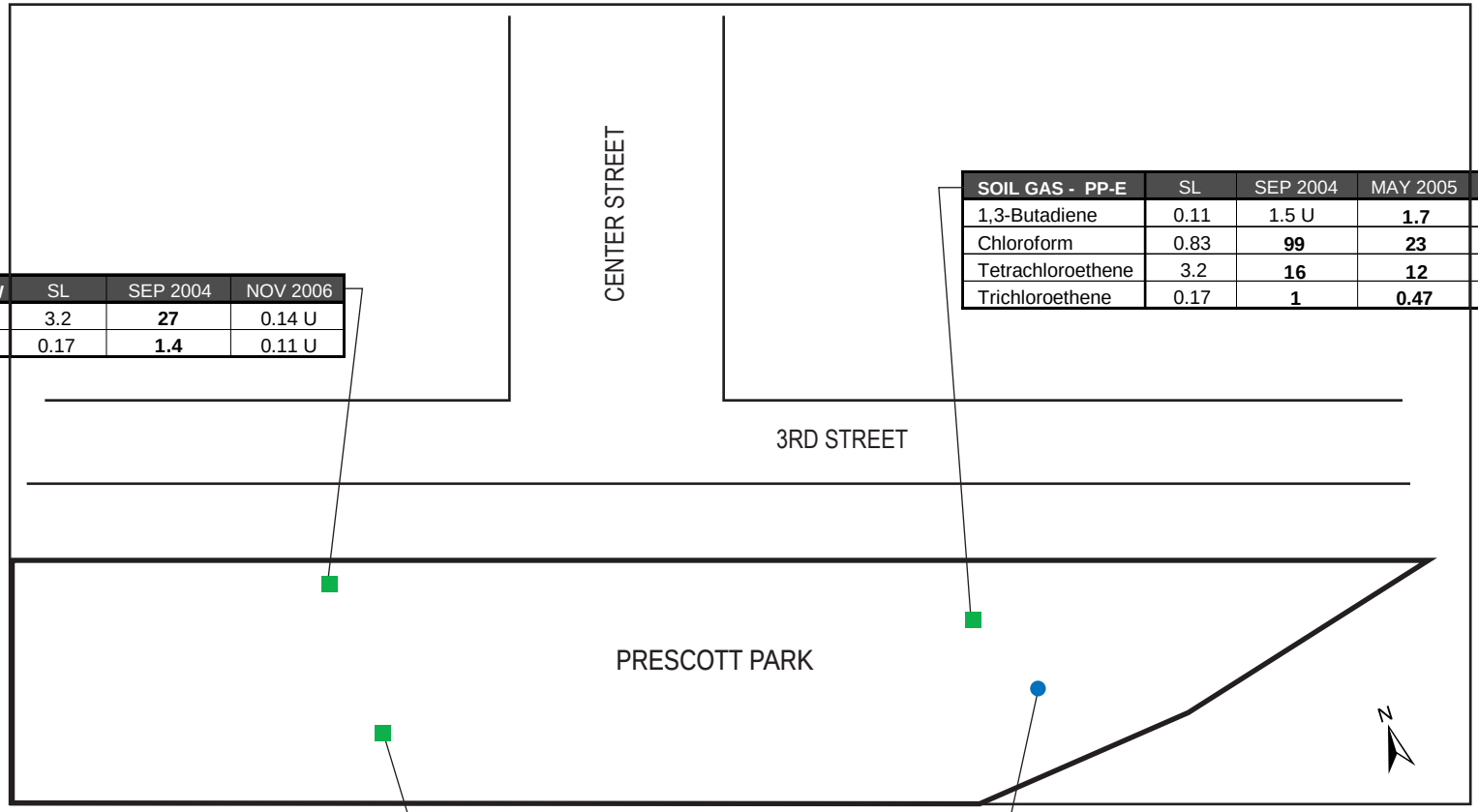
Notes:

1. Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations).
2. Concentrations are only shown for compounds that had result(s) exceeding the screening levels during at least one sampling event.

FIGURE 11
1414 3rd STREET CRAWLSPACE AIR SAMPLING LOCATIONS

HUMAN HEALTH RISK ASSESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

CH2MHILL



SOIL GAS - PP-NW	SL	SEP 2004	NOV 2006
Tetrachloroethene	3.2	**27**	0.14 U
Trichloroethene	0.17	**1.4**	0.11 U

SOIL GAS - PP-E	SL	SEP 2004	MAY 2005	NOV 2006
1,3-Butadiene	0.11	1.5 U	**1.7**	NA
Chloroform	0.83	**99**	**23**	**61**
Tetrachloroethene	3.2	**16**	**12**	**7.6**
Trichloroethene	0.17	**1**	**0.47**	**0.42**

SOIL GAS - PP-SW	SL	MAY 2005	NOV 2006
Benzene	2.5	2.3 U	**14**
Chloroform	0.83	**22**	7.3 U

AMBIENT AIR - PP-AA	SL	MAY 2005	NOV 2006
1,4-Dioxane (p-dioxane)	0.61	**0.96**	0.56 U
Benzene	0.25	**0.46**	**0.86**
Carbon tetrachloride	0.13	**0.55 J**	**0.48**
Chloroform	0.083	**0.093 J**	**0.51**
Tetrachloroethene	0.32	0.14 J	**0.42**
Trichloroethene	0.017	0.03 UJ	**0.087**

AMBIENT AIR SAMPLING LOCATION

SOIL GAS SAMPLING LOCATION

Chemical Detected in background during NOV 2006 Air Sampling Event

All results and screening levels in µg/m^3

Bold - detected above screening levels

J - estimated

U - not detected at listed reporting limit

UJ - not detected at estimated reporting limit

NA - not analyzed

Maximum value between field duplicate (FD) & primary sample is shown

SL - Screening Level

Notes:

1. Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations).
2. Concentrations are only shown for locations that had result(s) exceeding the screening levels during at least one sampling event.

FIGURE 12
PRESCOTT PARK
SOIL GAS/AMBIENT AIR SAMPLING LOCATIONS
HUMAN HEALTH RISK ASSESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

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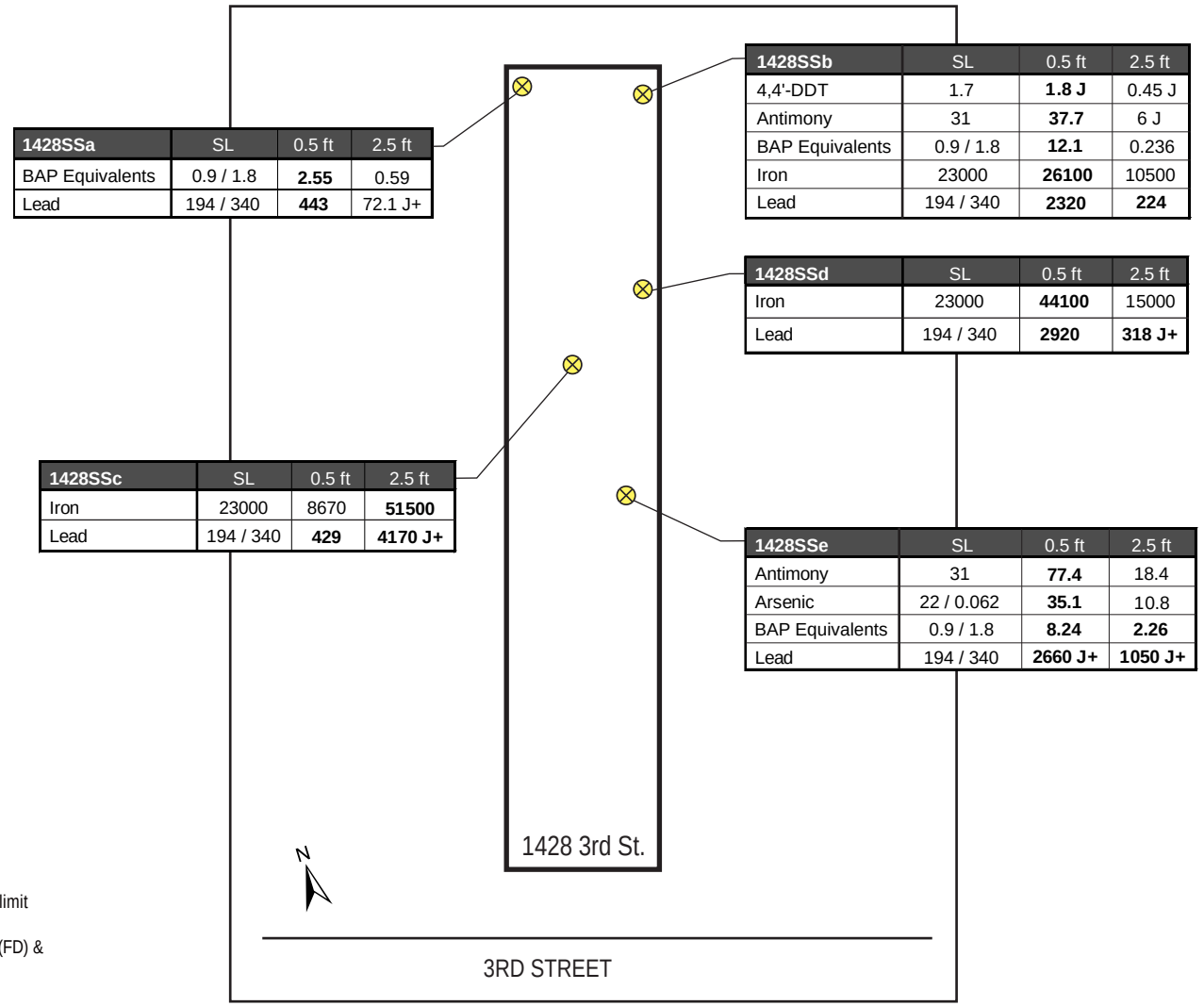
ES032007001BAO_AMCO PrescottPark_soil_soilgas_sample_locs_v2.ai 10-09-07 dash



1428SSa	SL	0.5 ft	2.5 ft
BAP Equivalents	0.9 / 1.8	**2.55**	0.59
Lead	194 / 340	**443**	72.1 J+

1428SSb	SL	0.5 ft	2.5 ft
4,4'-DDT	1.7	**1.8 J**	0.45 J
Antimony	31	**37.7**	6 J
BAP Equivalents	0.9 / 1.8	**12.1**	0.236
Iron	23000	**26100**	10500
Lead	194 / 340	**2320**	**224**

1428SSc	SL	0.5 ft	2.5 ft
Iron	23000	8670	**51500**
Lead	194 / 340	**429**	**4170 J+**

1428SSd	SL	0.5 ft	2.5 ft
Iron	23000	**44100**	15000
Lead	194 / 340	**2920**	**318 J+**

1428SSe	SL	0.5 ft	2.5 ft
Antimony	31	**77.4**	18.4
Arsenic	22 / 0.062	**35.1**	10.8
BAP Equivalents	0.9 / 1.8	**8.24**	**2.26**
Lead	194 / 340	**2660 J+**	**1050 J+**

⊗ SOIL SAMPLING LOCATION

All results and screening levels in mg/kg
ft - feet below ground surface
Bold - detected above screening levels
J - estimated
U - not detected at listed reporting limit
UJ - not detected at estimated reporting limit
NA - not analyzed
Maximum value between field duplicate (FD) & primary sample is shown
SL - Screening Level

Notes:
1. Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations).
2. Concentrations are only shown for locations that had result(s) exceeding the screening levels during at least one sampling event.
3. For arsenic, 22 mg/kg was used for screening because the cancer endpoint of 0.062 mg/kg is below background levels.
4. Lead screening level in soil was evaluated using Department Toxic Substance Control's Lead Risk Assessment Spreadsheet Version 7 (Lead Spread 7, Cal/EPA 1999). Lead screening level of 194 mg/kg includes homegrown produce pathway.

FIGURE 13
1428 3rd STREET
SOIL/PRODUCE
SAMPLING LOCATIONS
HUMAN HEALTH RISK ASSESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

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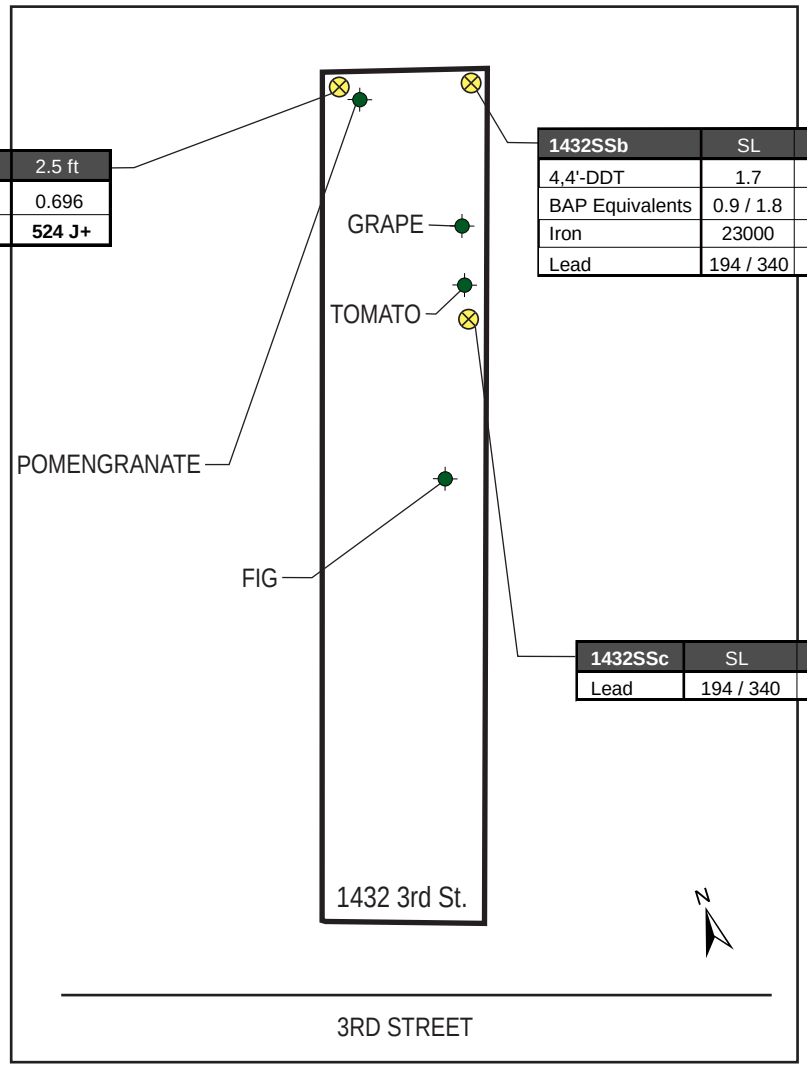

1432SSa	SL	0.5 ft	2.5 ft
BAP Equivalents	0.9 / 1.8	**2.67**	0.696
Lead	194 / 340	**1060**	**524 J+**

1432SSb	SL	0.5 ft	2.5 ft
4,4'-DDT	1.7	**3.1 J**	0.51 J
BAP Equivalents	0.9 / 1.8	**3.75**	**1**
Iron	23000	**28200**	22900
Lead	194 / 340	**1830**	**1500 J+**

1432SSc	SL	0.5 ft	2.5 ft
Lead	194 / 340	**2280 J**	**983**

PRODUCE SAMPLING LOCATION

SOIL SAMPLING LOCATION

All results and screening levels in mg/kg
ft - feet below ground surface
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U - not detected at listed reporting limit
UJ - not detected at estimated reporting limit
NA - not analyzed
Maximum value between field duplicate (FD) & primary sample is shown
SL - Screening Level

Notes:
1. Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations).
2. Concentrations are only shown for locations that had result(s) exceeding the screening levels during at least one sampling event.
3. For arsenic, 22 mg/kg was used for screening because the cancer endpoint of 0.062 mg/kg is below background levels.
4. Lead screening level in soil was evaluated using Department Toxic Substance Control's Lead Risk Assessment Spreadsheet Version 7 (Lead Spread 7, Cal/EPA 1999). Lead screening level of 194 mg/kg includes homegrown produce pathway.

FIGURE 14
1432 3rd STREET SOIL/PRODUCE SAMPLING LOCATIONS
HUMAN HEALTH RISK ASSESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

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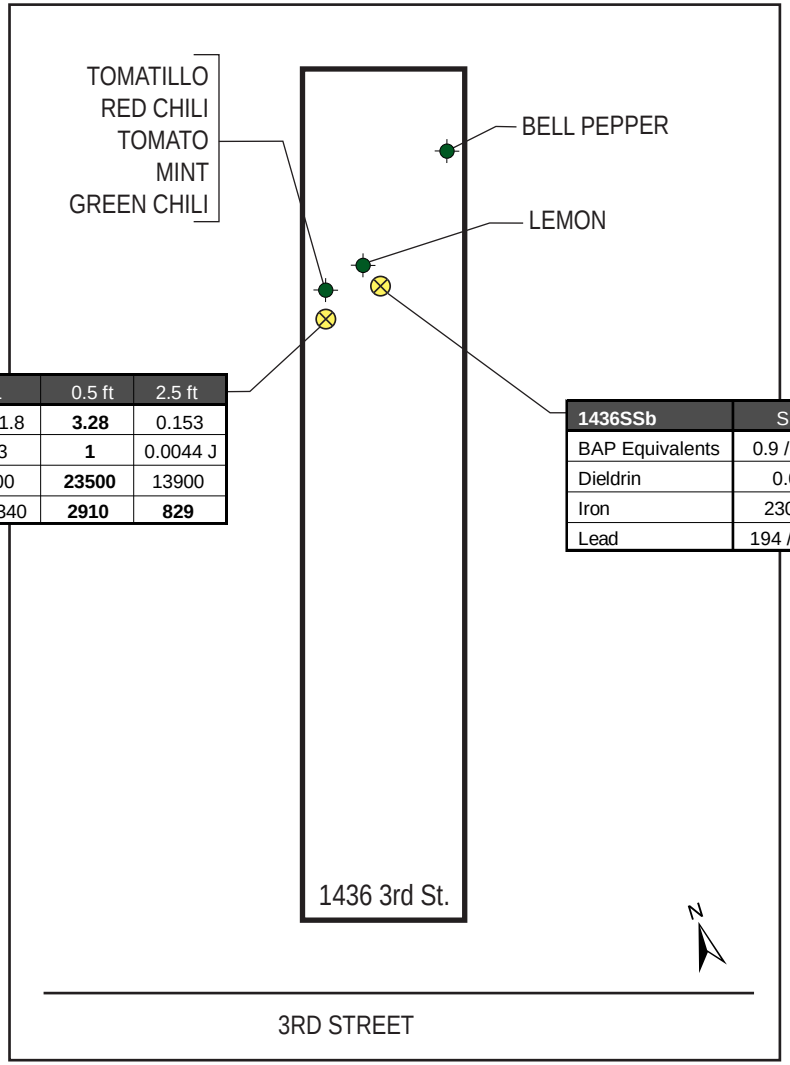

1436SSa	SL	0.5 ft	2.5 ft
BAP Equivalents	0.9 / 1.8	**3.28**	0.153
Dieldrin	0.03	**1**	0.0044 J
Iron	23000	**23500**	13900
Lead	194 / 340	**2910**	**829**

1436SSb	SL	0.5 ft	2.5 ft
BAP Equivalents	0.9 / 1.8	**1.85**	0.136
Dieldrin	0.03	**0.036**	0.0002 J
Iron	23000	**27700**	9290
Lead	194 / 340	**3630**	**216 J+**

PRODUCE SAMPLING LOCATION

SOIL SAMPLING LOCATION

All results and screening levels in mg/kg
ft - feet below ground surface
Bold - detected above screening levels
J - estimated
U - not detected at listed reporting limit
UJ - not detected at estimated reporting limit
NA - not analyzed
Maximum value between field duplicate (FD) & primary sample is shown
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Notes:
1. Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations).
2. Concentrations are only shown for locations that had result(s) exceeding the screening levels during at least one sampling event.
3. For arsenic, 22 mg/kg was used for screening because the cancer endpoint of 0.062 mg/kg is below background levels.
4. Lead screening level in soil was evaluated using Department Toxic Substance Control's Lead Risk Assessment Spreadsheet Version 7 (Lead Spread 7, Cal/EPA 1999). Lead screening level of 194 mg/kg includes homegrown produce pathway.

FIGURE 15
1436 3rd STREET
SOIL/PRODUCE
SAMPLING LOCATIONS
HUMAN HEALTH RISK ASSESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

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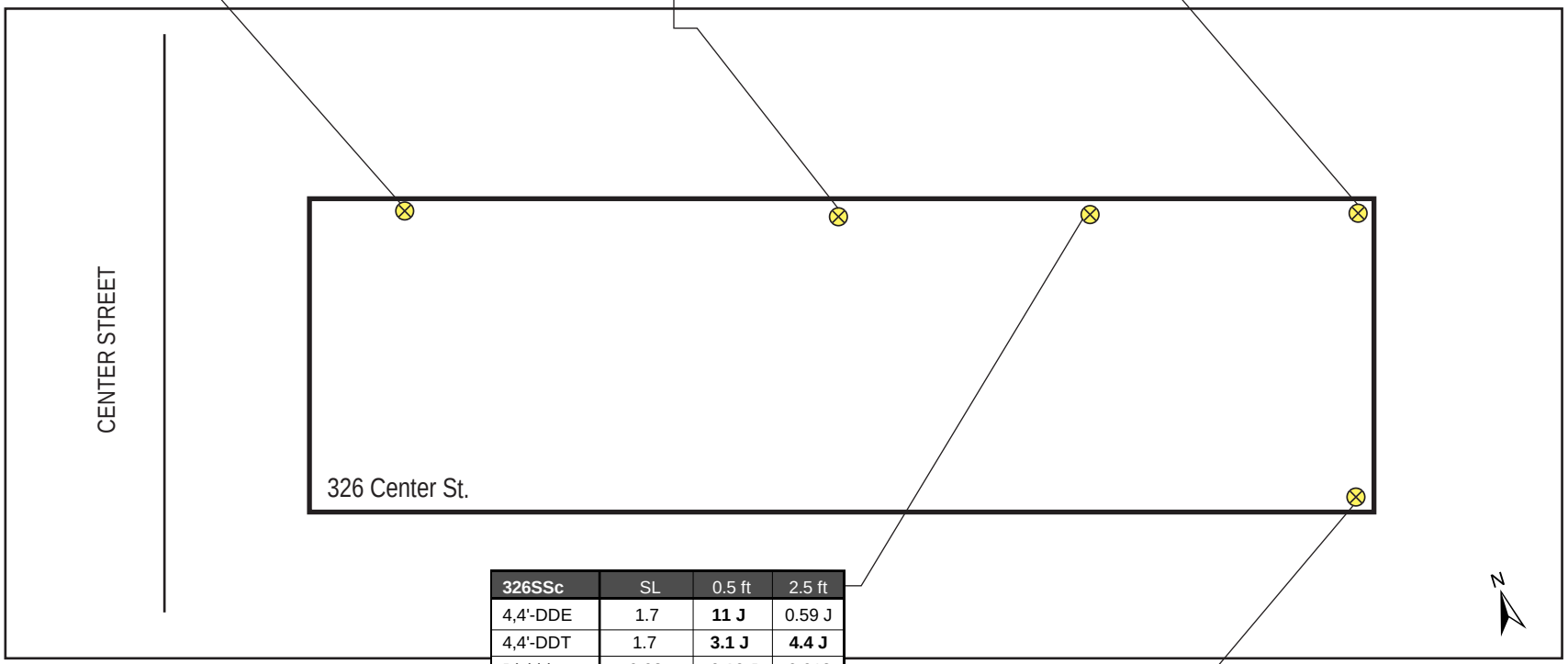
326SSa	SL	0.5 ft	2.5 ft
Lead	194 / 340	**274**	35.9

326SSb	SL	0.5 ft	2.5 ft
Lead	194 / 340	**261 J+**	179

326SSd	SL	0.5 ft	2.5 ft
4,4'-DDT	1.7	**2.2**	**3**
Arsenic	22 / 0.062	**451**	**125**
Iron	23000	**25400**	5530
Lead	194 / 340	**28600**	**631 J+**



326SSc	SL	0.5 ft	2.5 ft
4,4'-DDE	1.7	**11 J**	0.59 J
4,4'-DDT	1.7	**3.1 J**	**4.4 J**
Dieldrin	0.03	**0.16 J**	0.013
Lead	194 / 340	**389 J+**	**284**

326SSe	SL	0.5 ft	2.5 ft
Lead	194 / 340	**1270 J+**	**53000 J**

⊗ SOIL SAMPLING LOCATION

All results and screening levels in mg/kg
ft - feet below ground surface
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UJ - not detected at estimated reporting limit
NA - not analyzed
Maximum value between field duplicate (FD) & primary sample is shown
SL - Screening Level

Notes:
1. Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations).
2. Concentrations are only shown for locations that had result(s) exceeding the screening levels during at least one sampling event.
3. For arsenic, 22 mg/kg was used for screening because the cancer endpoint of 0.062 mg/kg is below background levels.
4. Lead screening level in soil was evaluated using Department Toxic Substance Control's Lead Risk Assessment Spreadsheet Version 7 (Lead Spread 7, Cal/EPA 1999). Lead screening level of 194 mg/kg includes homegrown produce pathway.

FIGURE 16
326 CENTER STREET SOIL/PRODUCE SAMPLING LOCATIONS

HUMAN HEALTH RISK ASSESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

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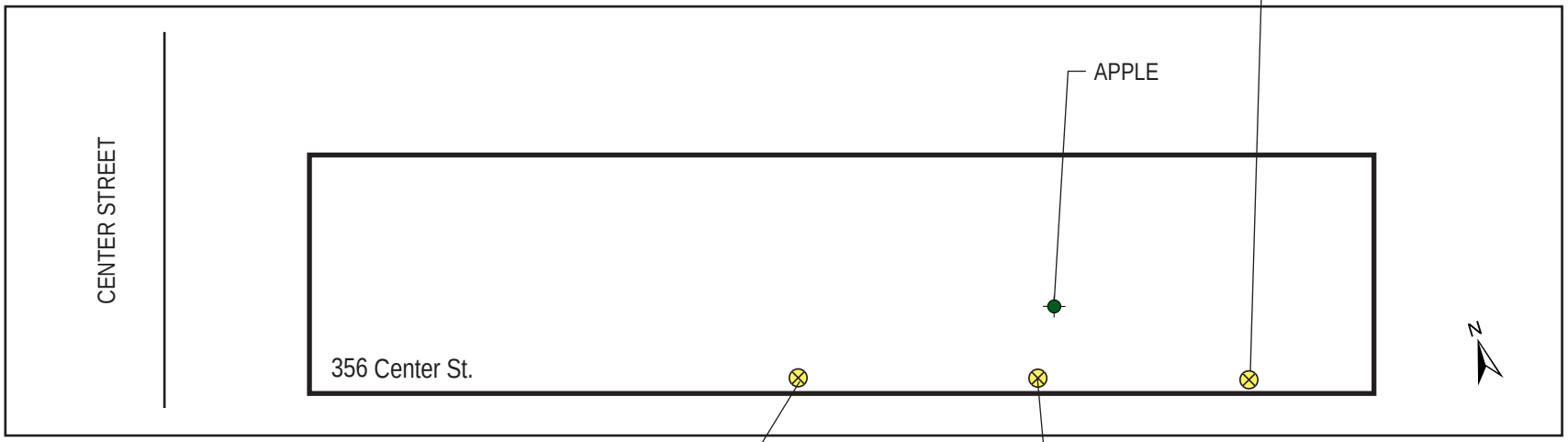

356SSc	SL	0.5 ft	2.5 ft
Lead	194 / 340	**354 J+**	26.2 J+

356SSa	SL	0.5 ft	2.5 ft
Lead	194 / 340	**822 J+**	**223**

356SSb	SL	0.5 ft	2.5 ft
Lead	194 / 340	**563 J+**	**432**

PRODUCE SAMPLING LOCATION

SOIL SAMPLING LOCATION

All results and screening levels in mg/kg
ft - feet below ground surface
Bold - detected above screening levels
J - estimated
U - not detected at listed reporting limit
UJ - not detected at estimated reporting limit
NA - not analyzed
Maximum value between field duplicate (FD) & primary sample is shown
SL - Screening Level

Notes:
1. Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations).
2. Concentrations are only shown for locations that had result(s) exceeding the screening levels during at least one sampling event.
3. For arsenic, 22 mg/kg was used for screening because the cancer endpoint of 0.062 mg/kg is below background levels.
4. Lead screening level in soil was evaluated using Department Toxic Substance Control's Lead Risk Assessment Spreadsheet Version 7 (Lead Spread 7, Cal/EPA 1999). Lead screening level of 194 mg/kg includes homegrown produce pathway.

FIGURE 17
356 CENTER STREET SOIL/PRODUCE SAMPLING LOCATIONS

HUMAN HEALTH RISK ASSESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

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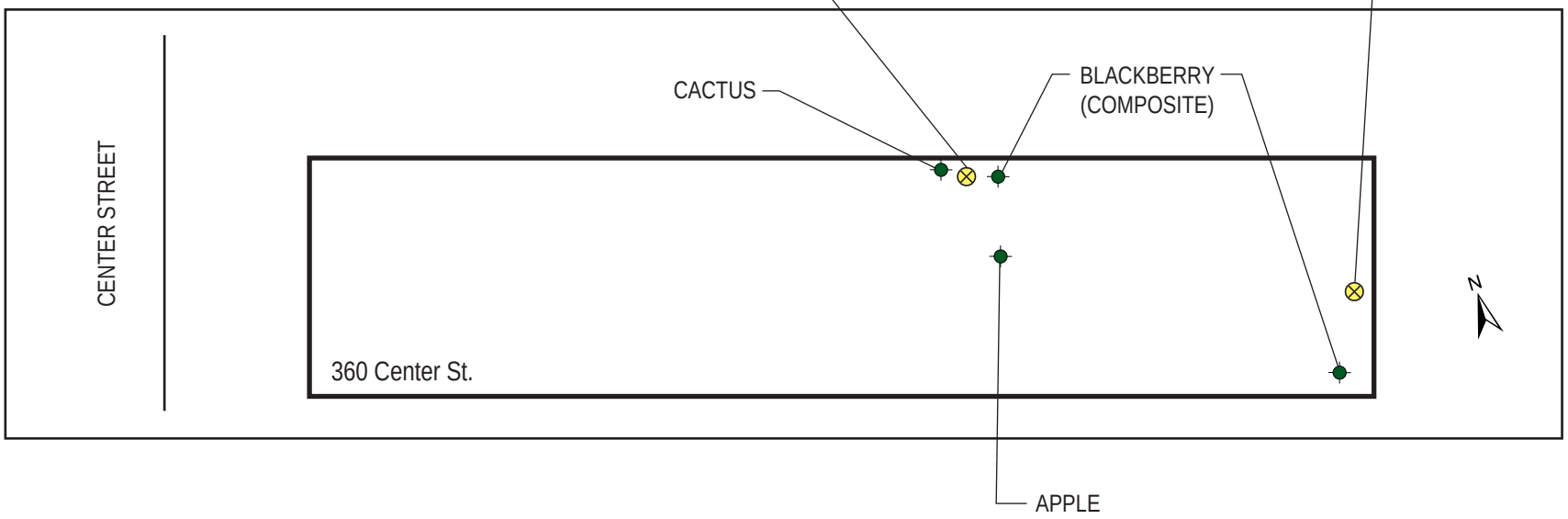
360SSa	SL	0.5 ft	2.5 ft
Aroclor-1254	0.22	**11**	**2.4 J**
Heptachlor epoxide	0.053	**0.31 J**	0.0099J
Lead	194 / 340	**2230 J+**	193

360SSb	SL	0.5 ft	2.5 ft
Lead	194 / 340	**600**	**478 J**



PRODUCE SAMPLING LOCATION

SOIL SAMPLING LOCATION

All results and screening levels in mg/kg
ft - feet below ground surface
Bold - detected above screening levels
J - estimated
U - not detected at listed reporting limit
UJ - not detected at estimated reporting limit
NA - not analyzed
Maximum value between field duplicate (FD) & primary sample is shown
SL - Screening Level

Notes:
1. Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations).
2. Concentrations are only shown for locations that had result(s) exceeding the screening levels during at least one sampling event.
3. For arsenic, 22 mg/kg was used for screening because the cancer endpoint of 0.062 mg/kg is below background levels.
4. Lead screening level in soil was evaluated using Department Toxic Substance Control's Lead Risk Assessment Spreadsheet Version 7 (Lead Spread 7, Cal/EPA 1999). Lead screening level of 194 mg/kg includes homegrown produce pathway.

FIGURE 18
360 CENTER STREET SOIL/PRODUCE SAMPLING LOCATIONS
HUMAN HEALTH RISK ASSESSMENT
AMCO CHEMICAL SUPERFUND SITE
OAKLAND, CALIFORNIA

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Attachment 1
Detailed Risk and Hazard Results for Exposure to Soil

Attachment 1 - Table of Contents - Soil Risk Calculations
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

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AMCO Chemical Superfund Site, Oakland, California

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Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

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Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Table 1-1
AMCO Summary Statistics and Exposure Point Concentrations for 4 Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Number of Detects	Number of Analyses	Percent Detects	Units	Minimum Detected Value	Maximum Detected Value	Minimum Non-detected Value	Maximum Non-detected Value	Location of Maximum Detected Value	Upper Depth of Maximum Detected Value	Lower Depth of Maximum Detected Value	Arithmetic Mean Value	Standard Deviation	Exposure Point Concentration	EPC Basis	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
Former AMCO Chemical Facility - Shallow																	
Metals																	
Aluminum	21	21	100	mg/kg	5400	20700	NA	NA	RSB-22	2	3	11000	4160	12600	95% Student's-t UCL	12600	95% Student's-t UCL
Antimony	14	21	67	mg/kg	0.3	49	12	12	RSB-04	2.5	3.5	6.41	10.5	13.6	95% Chebyshev (MVUE) UCL	13.6	95% Chebyshev (MVUE) UCL
Arsenic	21	21	100	mg/kg	1.8	15	NA	NA	RSB-24	1.8	3	6.12	3.86	7.71	95% Approximate Gamma UCL	7.71	95% Approximate Gamma UCL
Barium	21	21	100	mg/kg	68	1460	NA	NA	RSB-20	1.5	2.5	360	355	513	95% Approximate Gamma UCL	513	95% Approximate Gamma UCL
Beryllium	21	21	100	mg/kg	0.19	1.7	NA	NA	RSB-22	2	3	0.485	0.348	0.614	95% Approximate Gamma UCL	0.614	95% Approximate Gamma UCL
Cadmium	16	21	76	mg/kg	0.17	6.4	1	1	RSB-07	3.5	4.5	1.05	1.36	1.58	95% H-UCL	1.58	95% H-UCL
Chromium	21	21	100	mg/kg	22.1	2650	NA	NA	RSB-24	1.8	3	174	568	1410	99% Chebyshev (Mean, Sd) UCL	1410	99% Chebyshev (Mean, Sd) UCL
Cobalt	21	21	100	mg/kg	3.8	16.5	NA	NA	RSB-24	1.8	3	7.6	2.88	8.75	95% Approximate Gamma UCL	8.75	95% Approximate Gamma UCL
Copper	21	21	100	mg/kg	8.8	672	NA	NA	RSB-18	3	4	109	147	229	95% Chebyshev (MVUE) UCL	229	95% Chebyshev (MVUE) UCL
Iron	21	21	100	mg/kg	8130	66200	NA	NA	RSB-24	1.8	3	21300	12900	26100	95% Approximate Gamma UCL	26100	95% Approximate Gamma UCL
Lead	21	21	100	mg/kg	8.2	1710	NA	NA	RSB-20	1.5	2.5	382	439	640	95% Approximate Gamma UCL	640	95% Approximate Gamma UCL
Manganese	21	21	100	mg/kg	79.7	2450	NA	NA	RSB-24	1.8	3	508	664	1140	95% Chebyshev (Mean, Sd) UCL	1140	95% Chebyshev (Mean, Sd) UCL
Nickel	21	21	100	mg/kg	15.3	126	NA	NA	RSB-24	1.8	3	33.6	23	42.2	95% Student's-t UCL	42.2	95% Student's-t UCL
Selenium	12	21	57	mg/kg	0.31	2.5	7	7	RSB-20	1.5	2.5	2.4	1.08	3.43	95% Chebyshev (Mean, Sd) UCL	2.5	Maximum Result
Silver	18	21	86	mg/kg	0.18	2.2	2	2	RSB-20	1.5	2.5	0.643	0.467	0.843	95% Approximate Gamma UCL	0.843	95% Approximate Gamma UCL
Thallium	12	21	57	mg/kg	0.25	5.7	5	5	RSB-24	1.8	3	1.99	1.23	3.16	95% Chebyshev (Mean, Sd) UCL	3.16	95% Chebyshev (Mean, Sd) UCL
Vanadium	21	21	100	mg/kg	19.6	68.6	NA	NA	RSB-20	1.5	2.5	36.3	13.5	41.6	95% Approximate Gamma UCL	41.6	95% Approximate Gamma UCL
Zinc	21	21	100	mg/kg	23.1	2510	NA	NA	RSB-07	3.5	4.5	392	533	591	95% Approximate Gamma UCL	591	95% Approximate Gamma UCL
Pesticides/PCBs																	
4,4'-DDD	20	21	95	ug/kg	1	20000	1.1	1.1	RSB-21	1	1.5	3550	5420	9160	95% Adjusted Gamma UCL	9160	95% Adjusted Gamma UCL
4,4'-DDE	20	21	95	ug/kg	1.6	10000	3.5	3.5	RSB-18	3	4	1490	2460	3560	95% Adjusted Gamma UCL	3560	95% Adjusted Gamma UCL
4,4'-DDT	10	21	48	ug/kg	1.5	560	3.6	360	RSB-14	1	2	52.9	126	325	99% Chebyshev (Mean, Sd) UCL	325	99% Chebyshev (Mean, Sd) UCL
Aldrin	12	21	57	ug/kg	0.83	2400	1.8	18	RSB-17	4	5	151	523	1290	99% Chebyshev (Mean, Sd) UCL	1290	99% Chebyshev (Mean, Sd) UCL
alpha-BHC	4	21	19	ug/kg	2.4	26	1.8	180	RSB-20	1.5	2.5	7.88	19.7	50.6	99% Chebyshev (Mean, Sd) UCL	26	Maximum Result
alpha-Chlordane	11	21	52	ug/kg	0.4	170	0.54	18	RSB-21	1	1.5	15.9	37.4	40.4	95% Chebyshev (MVUE) UCL	40.4	95% Chebyshev (MVUE) UCL
beta-BHC	6	21	29	ug/kg	2.1	35	1.8	180	RSB-24	1.8	3	9.84	20.2	53.7	99% Chebyshev (Mean, Sd) UCL	35	Maximum Result
delta-BHC	1	21	5	ug/kg	4.1	4.1	1.8	180	RSB-03	1	2	7.76	19.4	49.9	99% Chebyshev (Mean, Sd) UCL	4.1	Maximum Result
Dieldrin	20	21	95	ug/kg	0.87	2400	3.5	3.5	RSB-18	3	4	541	839	1340	95% Adjusted Gamma UCL	1340	95% Adjusted Gamma UCL
Endosulfan sulfate	1	21	5	ug/kg	1.6	1.6	3.5	360	RSB-19	1	2	15.1	38.9	99.5	99% Chebyshev (Mean, Sd) UCL	1.6	Maximum Result
Endrin	3	21	14	ug/kg	1.2	4.6	3.5	360	RSB-23	1.3	2	14.8	39	99.4	99% Chebyshev (Mean, Sd) UCL	4.6	Maximum Result
Endrin aldehyde	1	21	5	ug/kg	1.1	1.1	3.5	360	RSB-04	2.5	3.5	15	38.9	99.5	99% Chebyshev (Mean, Sd) UCL	1.1	Maximum Result
Endrin ketone	4	21	19	ug/kg	1.1	12	3.5	360	RSB-24	1.8	3	14.7	38.9	99.1	99% Chebyshev (Mean, Sd) UCL	12	Maximum Result
gamma-Chlordane	12	21	57	ug/kg	0.83	190	1.8	40	RSB-21	1	1.5	18.6	41.6	109	99% Chebyshev (Mean, Sd) UCL	109	99% Chebyshev (Mean, Sd) UCL
Heptachlor	1	21	5	ug/kg	8.8	8.8	1.8	180	RSB-24	1.8	3	7.56	19.4	49.8	99% Chebyshev (Mean, Sd) UCL	8.8	Maximum Result
Methoxychlor	1	21	5	ug/kg	3.9	3.9	18	1800	RSB-08	4	5	75.9	195	498	99% Chebyshev (Mean, Sd) UCL	3.9	Maximum Result
Aroclor-1260	1	21	5	ug/kg	640	640	35	3600	RSB-22	2	3	176	403	1050	99% Chebyshev (Mean, Sd) UCL	640	Maximum Result
SVOCs/VOCs																	
1,2,4-Trichlorobenzene	6	21	29	ug/kg	2	2100	10	13	RSB-42	4	5	204	614	1540	99% Chebyshev (Mean, Sd) UCL	1540	99% Chebyshev (Mean, Sd) UCL
1,2-Dichlorobenzene	10	21	48	ug/kg	12	110000	10	13	RSB-18	3	4	13000	27100	54700	95% Hall's Bootstrap UCL	54700	95% Hall's Bootstrap UCL
1,3-Dichlorobenzene	8	21	38	ug/kg	10	3800	10	13	RSB-42	4	5	233	825	2020	99% Chebyshev (Mean, Sd) UCL	2020	99% Chebyshev (Mean, Sd) UCL
1,4-Dichlorobenzene	9	21	43	ug/kg	4	44000	10	13	RSB-42	4	5	3260	10200	25500	99% Chebyshev (Mean, Sd) UCL	25500	99% Chebyshev (Mean, Sd) UCL
2-Methylnaphthalene	12	21	57	ug/kg	130	380000	350	1400	RSB-17	4	5	74500	129000	114000	95% Hall's Bootstrap UCL	114000	95% Hall's Bootstrap UCL
2-Methylphenol	1	21	5	ug/kg	990	990	350	14000	RSB-24	1.8	3	2390	2800	8480	99% Chebyshev (Mean, Sd) UCL	990	Maximum Result
4-Chloro-3-methylphenol	2	21	10	ug/kg	2000	7200	350	13000	RSB-18	3	4	2450	2800	8540	99% Chebyshev (Mean, Sd) UCL	7200	Maximum Result
4-Methylphenol	2	21	10	ug/kg	1500	3600	350	13000	RSB-18	3	4	2250	2610	7910	99% Chebyshev (Mean, Sd) UCL	3600	Maximum Result
Acenaphthene	3	21	14	ug/kg	2500	10000	350	14000	RSB-20	1.5	2.5	2530	3060	9180	99% Chebyshev (Mean, Sd) UCL	9180	99% Chebyshev (Mean, Sd) UCL
Anthracene	3	21	14	ug/kg	77	1100	350	14000	RSB-24	1.8	3	2390	2810	8480	99% Chebyshev (Mean, Sd) UCL	1100	Maximum Result
Benzo(a)anthracene	3	21	14	ug/kg	150	550	350	14000	RSB-24	1.8	3	2380	2810	8480	99% Chebyshev (Mean, Sd) UCL	550	Maximum Result
Benzo(a)pyrene	2	21	10	ug/kg	130	500	350	14000	RSB-08	4	5	2400	2790	8470	99% Chebyshev (Mean, Sd) UCL	500	Maximum Result
Benzo(b)fluoranthene	2	21	10	ug/kg	110	420	350	14000	RSB-08	4	5	2400	2800	8470	99% Chebyshev (Mean, Sd) UCL	420	Maximum Result
Benzo(g,h,i)perylene	1	21	5	ug/kg	430	430	350	14000	RSB-08	4	5	2400	2790	8470	99% Chebyshev (Mean, Sd) UCL	430	Maximum Result
Benzo(k)fluoranthene	2	21	10	ug/kg	130	430	350	14000	RSB-08	4	5	2400	2800	8470	99% Chebyshev (Mean, Sd) UCL	430	Maximum Result
Benzyl butyl phthalate	1	21	5	ug/kg	7600	7600	350	14000	RSB-24	1.8	3	2710	3000	9230	99% Chebyshev (Mean, Sd) UCL	7600	Maximum Result

Table 1-1
AMCO Summary Statistics and Exposure Point Concentrations for 4 Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Number of Detects	Number of Analyses	Percent Detects	Units	Minimum Detected Value	Maximum Detected Value	Minimum Non-detected Value	Maximum Non-detected Value	Location of Maximum Detected Value	Upper Depth of Maximum Detected Value	Lower Depth of Maximum Detected Value	Arithmetic Mean Value	Standard Deviation	Exposure Point Concentration	EPC Basis	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
Biphenyl (diphenyl)	4	21	19	ug/kg	1600	4400	350	14000	RSB-20	1.5	2.5	2020	2430	7300	99% Chebyshev (Mean, Sd) UCL	4400	Maximum Result
bis(2-Ethylhexyl)phthalate	4	21	19	ug/kg	3300	13000	350	13000	RSB-20	1.5	2.5	2570	3350	9850	99% Chebyshev (Mean, Sd) UCL	9850	99% Chebyshev (Mean, Sd) UCL
Caprolactam	1	21	5	ug/kg	95	95	350	14000	RSB-10	1	2	2390	2810	8480	99% Chebyshev (Mean, Sd) UCL	95	Maximum Result
Carbazole	1	21	5	ug/kg	1100	1100	350	14000	RSB-24	1.8	3	2400	2800	8480	99% Chebyshev (Mean, Sd) UCL	1100	Maximum Result
Chrysene	3	21	14	ug/kg	190	910	350	14000	RSB-24	1.8	3	2400	2790	8470	99% Chebyshev (Mean, Sd) UCL	910	Maximum Result
Dibenz(a,h)anthracene	1	21	5	ug/kg	120	120	350	14000	RSB-08	4	5	2390	2810	8480	99% Chebyshev (Mean, Sd) UCL	120	Maximum Result
Dibenzofuran	2	21	10	ug/kg	2000	4100	350	14000	RSB-20	1.5	2.5	2350	2700	8200	99% Chebyshev (Mean, Sd) UCL	4100	Maximum Result
Di-n-butyl phthalate	2	21	10	ug/kg	530	2900	350	14000	RSB-20	1.5	2.5	2220	2700	8070	99% Chebyshev (Mean, Sd) UCL	2900	Maximum Result
Fluoranthene	5	21	24	ug/kg	77	4200	380	14000	RSB-24	1.8	3	2490	2690	4220	95% Approximate Gamma UCL	4200	Maximum Result
Fluorene	4	21	19	ug/kg	2400	8900	350	13000	RSB-20	1.5	2.5	2310	2760	8310	99% Chebyshev (Mean, Sd) UCL	8310	99% Chebyshev (Mean, Sd) UCL
Indeno(1,2,3-c,d)pyrene	1	21	5	ug/kg	440	440	350	14000	RSB-08	4	5	2400	2790	8470	99% Chebyshev (Mean, Sd) UCL	440	Maximum Result
Naphthalene	7	21	33	ug/kg	13000	80000	350	13000	RSB-20	1.5	2.5	10700	19400	52800	99% Chebyshev (Mean, Sd) UCL	52800	99% Chebyshev (Mean, Sd) UCL
Phenanthrene	7	21	33	ug/kg	190	16000	350	13000	RSB-20	1.5	2.5	3140	4130	12100	99% Chebyshev (Mean, Sd) UCL	12100	99% Chebyshev (Mean, Sd) UCL
Pyrene	6	21	29	ug/kg	95	4900	350	14000	RSB-20	1.5	2.5	2370	2590	3970	95% Approximate Gamma UCL	3970	95% Approximate Gamma UCL
1,1,1-Trichloroethane	2	21	10	ug/kg	7	81	10	14	RSB-24	1.8	3	9.48	16.4	25.1	95% Chebyshev (Mean, Sd) UCL	25.1	95% Chebyshev (Mean, Sd) UCL
1,1-Dichloroethane	9	21	43	ug/kg	5	14000	10	13	RSB-18	3	4	1330	4050	10100	99% Chebyshev (Mean, Sd) UCL	10100	99% Chebyshev (Mean, Sd) UCL
1,1-Dichloroethene	3	21	14	ug/kg	6	240	10	13	RSB-24	1.8	3	19	51.5	68	95% Chebyshev (Mean, Sd) UCL	68	95% Chebyshev (Mean, Sd) UCL
1,2-Dichloroethane	1	21	5	ug/kg	220	220	10	14	RSB-24	1.8	3	16	46.7	60.5	95% Chebyshev (Mean, Sd) UCL	60.5	95% Chebyshev (Mean, Sd) UCL
Acetone	16	21	76	ug/kg	30	860	10	13	RSB-24	1.8	3	134	191	226	95% Approximate Gamma UCL	226	95% Approximate Gamma UCL
Benzene	7	21	33	ug/kg	25	3500	10	1300	RSB-24	1.8	3	265	768	1930	99% Chebyshev (Mean, Sd) UCL	1930	99% Chebyshev (Mean, Sd) UCL
Carbon disulfide	7	21	33	ug/kg	3	9	10	14	RSB-23	1.3	2	5.76	1.41	6.29	95% Student's-t UCL	6.29	95% Student's-t UCL
Chlorobenzene	7	21	33	ug/kg	44	19000	10	13	RSB-42	4	5	1100	4140	10100	99% Chebyshev (Mean, Sd) UCL	10100	99% Chebyshev (Mean, Sd) UCL
Chloroethane	4	21	19	ug/kg	7	75	10	13	RSB-21	1	1.5	9.6	15.1	24	95% Chebyshev (Mean, Sd) UCL	24	95% Chebyshev (Mean, Sd) UCL
Chloromethane	1	21	5	ug/kg	480	480	10	14	RSB-19	1	2	28.4	103	127	95% Chebyshev (Mean, Sd) UCL	127	95% Chebyshev (Mean, Sd) UCL
cis-1,2-Dichloroethene	10	21	48	ug/kg	3	240000	10	13	RSB-24	1.8	3	13900	52200	149000	95% Hall's Bootstrap UCL	149000	95% Hall's Bootstrap UCL
Cyclohexane	8	21	38	ug/kg	7	3300	10	1300	RSB-21	1	1.5	420	980	2550	99% Chebyshev (Mean, Sd) UCL	2550	99% Chebyshev (Mean, Sd) UCL
Ethylbenzene	9	21	43	ug/kg	3	89000	10	13	RSB-24	1.8	3	12600	24200	22400	95% Hall's Bootstrap UCL	22400	95% Hall's Bootstrap UCL
Isopropylbenzene (cumene)	9	21	43	ug/kg	31	17000	10	13	RSB-21	1	1.5	3340	5510	5350	95% Hall's Bootstrap UCL	5350	95% Hall's Bootstrap UCL
Methyl ethyl ketone	6	21	29	ug/kg	14	570	10	36	RSB-24	1.8	3	44.7	124	314	99% Chebyshev (Mean, Sd) UCL	314	99% Chebyshev (Mean, Sd) UCL
Methyl isobutyl ketone	1	21	5	ug/kg	11000	11000	10	13	RSB-18	3	4	529	2400	5740	99% Chebyshev (Mean, Sd) UCL	5740	99% Chebyshev (Mean, Sd) UCL
Methyl tert-butyl ether	1	21	5	ug/kg	4	4	10	14	RSB-22	2	3	5.76	0.625	6	95% Student's-t UCL	4	Maximum Result
Methylcyclohexane	9	21	43	ug/kg	43	35000	10	13	RSB-21	1	1.5	5320	10300	10200	95% Hall's Bootstrap UCL	10200	95% Hall's Bootstrap UCL
Methylene chloride	6	21	29	ug/kg	4	14	10	13	RSB-18	3	4	7.24	3.04	8.38	95% Student's-t UCL	8.38	95% Student's-t UCL
Styrene	1	21	5	ug/kg	980	980	10	14	RSB-20	1.5	2.5	52.2	213	514	99% Chebyshev (Mean, Sd) UCL	514	99% Chebyshev (Mean, Sd) UCL
Tetrachloroethene	9	21	43	ug/kg	4	110	10	13	RSB-24	1.8	3	19.5	31.4	87.6	99% Chebyshev (Mean, Sd) UCL	87.6	99% Chebyshev (Mean, Sd) UCL
Toluene	9	21	43	ug/kg	3	530000	10	13	RSB-24	1.8	3	70900	168000	116000	95% Hall's Bootstrap UCL	116000	95% Hall's Bootstrap UCL
trans-1,2-Dichloroethene	7	21	33	ug/kg	3	1200	10	13	RSB-24	1.8	3	74.5	260	638	99% Chebyshev (Mean, Sd) UCL	638	99% Chebyshev (Mean, Sd) UCL
Trichloroethene	9	21	43	ug/kg	5	920	10	13	RSB-24	1.8	3	76	205	521	99% Chebyshev (Mean, Sd) UCL	521	99% Chebyshev (Mean, Sd) UCL
Vinyl chloride	5	21	24	ug/kg	51	2200	10	13	RSB-22	2	3	177	509	1280	99% Chebyshev (Mean, Sd) UCL	1280	99% Chebyshev (Mean, Sd) UCL
Xylenes, total	8	21	38	ug/kg	50	640000	10	13	RSB-24	1.8	3	77600	167000	157000	95% Hall's Bootstrap UCL	157000	95% Hall's Bootstrap UCL
Dioxins/Furans																	
1,2,3,4,6,7,8-HpCDD	4	4	100	ng/kg	0.706	1100	NA	NA	RSB-18	3	4	409	479	972	95% Student's-t UCL	972	95% Student's-t UCL
1,2,3,4,6,7,8-HpCDF	3	4	75	ng/kg	42.1	178	0.379	0.379	RSB-18	3	4	70.1	76.2	160	95% Student's-t UCL	160	95% Student's-t UCL
1,2,3,4,7,8,9-HpCDF	2	4	50	ng/kg	4.25	8.51	0.417	2.49	RSB-18	3	4	3.55	3.72	7.93	95% Student's-t UCL	7.93	95% Student's-t UCL
1,2,3,4,7,8-HxCDD	3	4	75	ng/kg	1.75	16.4	0.383	0.383	RSB-18	3	4	5.03	7.62	51.7	95% Approximate Gamma UCL	16.4	Maximum Result
1,2,3,4,7,8-HxCDF	1	4	25	ng/kg	2.46	2.46	0.319	2.28	RSB-12	1	2	1.09	0.998	2.26	95% Student's-t UCL	2.26	95% Student's-t UCL
1,2,3,6,7,8-HxCDD	3	4	75	ng/kg	6.63	73.5	0.371	0.371	RSB-18	3	4	22.8	34.1	270	95% Approximate Gamma UCL	73.5	Maximum Result
1,2,3,6,7,8-HxCDF	3	4	75	ng/kg	2.18	16.8	0.511	0.511	RSB-18	3	4	6.34	7.39	15	95% Student's-t UCL	15	95% Student's-t UCL
1,2,3,7,8,9-HxCDD	3	4	75	ng/kg	2.59	41.4	0.318	0.318	RSB-18	3	4	11.9	19.7	143	95% Approximate Gamma UCL	41.4	Maximum Result
1,2,3,7,8,9-HxCDF	2	4	50	ng/kg	1.17	8.75	0.496	1.1	RSB-18	3	4	2.68	4.07	25.3	95% Approximate Gamma UCL	8.75	Maximum Result
1,2,3,7,8-PeCDD	2	4	50	ng/kg	1.03	15.3	0.625	1.38	RSB-18	3	4	4.33	7.32	47	95% Approximate Gamma UCL	15.3	Maximum Result
2,3,4,6,7,8-HxCDF	3	4	75	ng/kg	1.57	16.9	0.282	0.282	RSB-18	3	4	6.15	7.59	15.1	95% Student's-t UCL	15.1	95% Student's-t UCL
2,3,4,7,8-PeCDF	3	4	75	ng/kg	5.55	42.4	0.349	0.349	RSB-18	3	4	13.9	19.2	36.6	95% Student's-t UCL	36.6	95% Student's-t UCL
2,3,7,8-TCDF	1	4	25	ng/kg	5.36	5.36	0.316	2.22	RSB-18	3	4	1.77	2.42	4.63	95% Student's-t UCL	4.63	95% Student's-t UCL
OCDD	3	4	75	ng/kg	2130	8420	3.47	3.47	RSB-18	3	4	3900	3650	8200	95% Student's-t UCL	8200	95% Student's-t UCL
OCDF	3	4	75	ng/kg	31.1	354	0.519	0.519	RSB-18	3	4	136	161	325	95% Student's-t UCL	325	95% Student's-t UCL

Table 1-1
AMCO Summary Statistics and Exposure Point Concentrations for 4 Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Number of Detects	Number of Analyses	Percent Detects	Units	Minimum Detected Value	Maximum Detected Value	Minimum Non-detected Value	Maximum Non-detected Value	Location of Maximum Detected Value	Upper Depth of Maximum Detected Value	Lower Depth of Maximum Detected Value	Arithmetic Mean Value	Standard Deviation	Exposure Point Concentration	EPC Basis	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
Former AMCO Chemical Facility - Deep																	
Metals																	
Aluminum	32	32	100	mg/kg	5400	20700	NA	NA	RSB-22	2	3	11200	4260	12500	95% Student's-t UCL	12500	95% Student's-t UCL
Antimony	22	32	69	mg/kg	0.27	49	12	12	RSB-04	2.5	3.5	5.45	8.63	20.6	99% Chebyshev (Mean, Sd) UCL	20.6	99% Chebyshev (Mean, Sd) UCL
Arsenic	32	32	100	mg/kg	1.3	21	NA	NA	RSB-10	4	5	6.47	5.07	8.1	95% Approximate Gamma UCL	8.1	95% Approximate Gamma UCL
Barium	32	32	100	mg/kg	46.8	1460	NA	NA	RSB-20	1.5	2.5	355	372	555	95% H-UCL	555	95% H-UCL
Beryllium	32	32	100	mg/kg	0.17	1.7	NA	NA	RSB-22	2	3	0.498	0.348	0.604	95% Approximate Gamma UCL	0.604	95% Approximate Gamma UCL
Cadmium	22	32	69	mg/kg	0.15	6.4	1	1	RSB-07	3.5	4.5	0.87	1.13	1.74	95% Chebyshev (Mean, Sd) UCL	1.74	95% Chebyshev (Mean, Sd) UCL
Chromium	32	32	100	mg/kg	22.1	2650	NA	NA	RSB-24	1.8	3	138	463	495	95% Chebyshev (Mean, Sd) UCL	495	95% Chebyshev (Mean, Sd) UCL
Cobalt	32	32	100	mg/kg	3.8	16.5	NA	NA	RSB-24	1.8	3	7.12	2.55	7.9	95% Approximate Gamma UCL	7.9	95% Approximate Gamma UCL
Copper	32	32	100	mg/kg	7.6	672	NA	NA	RSB-18	3	4	102	130	145	95% Approximate Gamma UCL	145	95% Approximate Gamma UCL
Iron	32	32	100	mg/kg	8130	66200	NA	NA	RSB-24	1.8	3	20100	11600	23400	95% Approximate Gamma UCL	23400	95% Approximate Gamma UCL
Lead	32	32	100	mg/kg	3	1710	NA	NA	RSB-20	1.5	2.5	378	480	605	95% Approximate Gamma UCL	605	95% Approximate Gamma UCL
Manganese	32	32	100	mg/kg	79.7	2450	NA	NA	RSB-24	1.8	3	418	551	843	95% Chebyshev (Mean, Sd) UCL	843	95% Chebyshev (Mean, Sd) UCL
Nickel	32	32	100	mg/kg	15.3	126	NA	NA	RSB-24	1.8	3	31.2	19.4	37	95% Student's-t UCL	37	95% Student's-t UCL
Selenium	18	32	56	mg/kg	0.31	3.9	7	7	RSB-10	4	5	2.43	1.13	3.3	95% Chebyshev (Mean, Sd) UCL	3.3	95% Chebyshev (Mean, Sd) UCL
Silver	28	32	88	mg/kg	0.1	2.2	2	2	RSB-20	1.5	2.5	0.613	0.461	0.775	95% Approximate Gamma UCL	0.775	95% Approximate Gamma UCL
Thallium	15	32	47	mg/kg	0.25	5.7	5	5.4	RSB-24	1.8	3	2.08	1.04	2.88	95% Chebyshev (Mean, Sd) UCL	2.88	95% Chebyshev (Mean, Sd) UCL
Vanadium	32	32	100	mg/kg	19.6	68.6	NA	NA	RSB-20	1.5	2.5	36.4	13	40.5	95% Approximate Gamma UCL	40.5	95% Approximate Gamma UCL
Zinc	32	32	100	mg/kg	17.1	2510	NA	NA	RSB-07	3.5	4.5	310	452	441	95% Approximate Gamma UCL	441	95% Approximate Gamma UCL
Pesticides/PCBs																	
4,4'-DDD	28	31	90	ug/kg	0.97	34000	1.1	4	RSB-23	4.75	6	4480	7640	8400	95% Hall's Bootstrap UCL	8400	95% Hall's Bootstrap UCL
4,4'-DDE	27	31	87	ug/kg	1.6	10000	3.5	5.5	RSB-18	3	4	1460	2340	5640	99% Chebyshev (Mean, Sd) UCL	5640	99% Chebyshev (Mean, Sd) UCL
4,4'-DDT	14	31	45	ug/kg	1.5	560	3.6	390	RSB-14	1	2	51.4	110	247	99% Chebyshev (Mean, Sd) UCL	247	99% Chebyshev (Mean, Sd) UCL
Aldrin	14	31	45	ug/kg	0.83	2400	1.8	200	RSB-17	4	5	129	445	924	99% Chebyshev (Mean, Sd) UCL	924	99% Chebyshev (Mean, Sd) UCL
alpha-BHC	5	31	16	ug/kg	2.4	26	1.2	200	RSB-20	1.5	2.5	9.43	23.4	51.3	99% Chebyshev (Mean, Sd) UCL	26	Maximum Result
alpha-Chlordane	15	31	48	ug/kg	0.4	170	0.54	18	RSB-21	1	1.5	13.8	31.7	70.4	99% Chebyshev (Mean, Sd) UCL	70.4	99% Chebyshev (Mean, Sd) UCL
beta-BHC	7	31	23	ug/kg	2.1	35	1.8	200	RSB-24	1.8	3	11.2	23.6	53.4	99% Chebyshev (Mean, Sd) UCL	35	Maximum Result
delta-BHC	1	31	3	ug/kg	4.1	4.1	1.8	200	RSB-03	1	2	9.36	23.3	50.9	99% Chebyshev (Mean, Sd) UCL	4.1	Maximum Result
Dieldrin	25	31	81	ug/kg	0.87	2400	3.5	5.5	RSB-18	3	4	564	850	2080	99% Chebyshev (Mean, Sd) UCL	2080	99% Chebyshev (Mean, Sd) UCL
Endosulfan sulfate	1	31	3	ug/kg	1.6	1.6	3.5	390	RSB-19	1	2	18.2	46	100	99% Chebyshev (Mean, Sd) UCL	1.6	Maximum Result
Endrin	4	31	13	ug/kg	1.2	4.6	3.5	390	RSB-23	1.3	2	18	46	100	99% Chebyshev (Mean, Sd) UCL	4.6	Maximum Result
Endrin aldehyde	1	31	3	ug/kg	1.1	1.1	3.5	390	RSB-04	2.5	3.5	18.2	46	100	99% Chebyshev (Mean, Sd) UCL	1.1	Maximum Result
Endrin ketone	5	31	16	ug/kg	1.1	12	3.5	390	RSB-24	1.8	3	18.1	45.9	100	99% Chebyshev (Mean, Sd) UCL	12	Maximum Result
gamma-BHC	2	31	6	ug/kg	0.65	2.5	1.8	200	RSB-13	4	5	9.28	23.3	50.9	99% Chebyshev (Mean, Sd) UCL	2.5	Maximum Result
gamma-Chlordane	15	31	48	ug/kg	0.83	190	1.8	200	RSB-21	1	1.5	18.8	38.4	87.5	99% Chebyshev (Mean, Sd) UCL	87.5	99% Chebyshev (Mean, Sd) UCL
Heptachlor	3	31	10	ug/kg	2.5	8.8	1.8	200	RSB-24	1.8	3	9.49	23.2	51	99% Chebyshev (Mean, Sd) UCL	8.8	Maximum Result
Methoxychlor	1	31	3	ug/kg	3.9	3.9	18	2000	RSB-08	4	5	92.4	233	509	99% Chebyshev (Mean, Sd) UCL	3.9	Maximum Result
Aroclor-1260	2	31	6	ug/kg	640	980	35	3900	RSB-22	5	6	228	487	1100	99% Chebyshev (Mean, Sd) UCL	980	Maximum Result
SVOCs/VOCs																	
1,2,4-Trichlorobenzene	7	31	23	ug/kg	2	2100	10	17	RSB-42	4	5	142	510	1050	99% Chebyshev (Mean, Sd) UCL	1050	99% Chebyshev (Mean, Sd) UCL
1,2-Dichlorobenzene	13	31	42	ug/kg	12	110000	10	17	RSB-18	3	4	10900	23600	40200	95% Hall's Bootstrap UCL	40200	95% Hall's Bootstrap UCL
1,3-Dichlorobenzene	11	31	35	ug/kg	6	3800	10	17	RSB-42	4	5	162	682	1380	99% Chebyshev (Mean, Sd) UCL	1380	99% Chebyshev (Mean, Sd) UCL
1,4-Dichlorobenzene	12	31	39	ug/kg	4	44000	10	17	RSB-42	4	5	2380	8490	17600	99% Chebyshev (Mean, Sd) UCL	17600	99% Chebyshev (Mean, Sd) UCL
1,4-Dioxane (p-dioxane)	1	10	10	ug/kg	1500	1500	250	390	RSB-12	4	5	NA	429	872	95% Chebyshev (Mean, Sd) UCL	872	95% Chebyshev (Mean, Sd) UCL
2-Methylnaphthalene	18	32	56	ug/kg	130	550000	350	1400	RSB-22	5	6	102000	171000	402000	99% Chebyshev (Mean, Sd) UCL	402000	99% Chebyshev (Mean, Sd) UCL
2-Methylphenol	1	32	3	ug/kg	990	990	350	23000	RSB-24	1.8	3	2570	3210	8220	99% Chebyshev (Mean, Sd) UCL	990	Maximum Result
4-Chloro-3-methylphenol	2	32	6	ug/kg	2000	7200	350	23000	RSB-18	3	4	2610	3210	8250	99% Chebyshev (Mean, Sd) UCL	7200	Maximum Result
4-Methylphenol	3	32	9	ug/kg	1500	3600	350	23000	RSB-18	3	4	2360	3000	7630	99% Chebyshev (Mean, Sd) UCL	3600	Maximum Result
Acenaphthene	6	32	19	ug/kg	2500	10000	350	23000	RSB-20	1.5	2.5	2540	3290	8320	99% Chebyshev (Mean, Sd) UCL	8320	99% Chebyshev (Mean, Sd) UCL
Acetophenone	1	32	3	ug/kg	14000	14000	350	14000	RSB-21	4	5	2650	3450	8730	99% Chebyshev (Mean, Sd) UCL	8730	99% Chebyshev (Mean, Sd) UCL
Anthracene	3	32	9	ug/kg	77	1100	350	23000	RSB-24	1.8	3	2570	3210	8220	99% Chebyshev (Mean, Sd) UCL	1100	Maximum Result
Benzo(a)anthracene	3	32	9	ug/kg	150	550	350	23000	RSB-24	1.8	3	2560	3210	8210	99% Chebyshev (Mean, Sd) UCL	550	Maximum Result
Benzo(a)pyrene	2	32	6	ug/kg	130	500	350	23000	RSB-08	4	5	2580	3200	8210	99% Chebyshev (Mean, Sd) UCL	500	Maximum Result
Benzo(b)fluoranthene	2	32	6	ug/kg	110	420	350	23000	RSB-08	4	5	2580	3210	8220	99% Chebyshev (Mean, Sd) UCL	420	Maximum Result
Benzo(g,h,i)perylene	1	32	3	ug/kg	430	430	350	23000	RSB-08	4	5	2580	3200	8210	99% Chebyshev (Mean, Sd) UCL	430	Maximum Result

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AMCO Summary Statistics and Exposure Point Concentrations for 4 Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Number of Detects	Number of Analyses	Percent Detects	Units	Minimum Detected Value	Maximum Detected Value	Minimum Non-detected Value	Maximum Non-detected Value	Location of Maximum Detected Value	Upper Depth of Maximum Detected Value	Lower Depth of Maximum Detected Value	Arithmetic Mean Value	Standard Deviation	Exposure Point Concentration	EPC Basis	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
Benzo(k)fluoranthene	2	32	6	ug/kg	130	430	350	23000	RSB-08	4	5	2580	3210	8210	99% Chebyshev (Mean, Sd) UCL	430	Maximum Result
Benzyl butyl phthalate	1	32	3	ug/kg	7600	7600	350	23000	RSB-24	1.8	3	2780	3320	8610	99% Chebyshev (Mean, Sd) UCL	7600	Maximum Result
Biphenyl (diphenyl)	7	32	22	ug/kg	1600	7100	350	23000	RSB-18	6	7	2230	2960	7430	99% Chebyshev (Mean, Sd) UCL	7100	Maximum Result
bis(2-Ethylhexyl)phthalate	6	32	19	ug/kg	2800	13000	350	23000	RSB-20	1.5	2.5	2630	3540	8860	99% Chebyshev (Mean, Sd) UCL	8860	99% Chebyshev (Mean, Sd) UCL
Caprolactam	1	32	3	ug/kg	95	95	350	23000	RSB-10	1	2	2570	3210	8220	99% Chebyshev (Mean, Sd) UCL	95	Maximum Result
Carbazole	1	32	3	ug/kg	1100	1100	350	23000	RSB-24	1.8	3	2570	3210	8220	99% Chebyshev (Mean, Sd) UCL	1100	Maximum Result
Chrysene	5	32	16	ug/kg	120	3500	350	23000	RSB-18	6	7	2460	3110	7930	99% Chebyshev (Mean, Sd) UCL	3500	Maximum Result
Dibenz(a,h)anthracene	1	32	3	ug/kg	120	120	350	23000	RSB-08	4	5	2570	3210	8220	99% Chebyshev (Mean, Sd) UCL	120	Maximum Result
Dibenzofuran	3	32	9	ug/kg	2000	4100	350	23000	RSB-20	1.5	2.5	2420	3050	7780	99% Chebyshev (Mean, Sd) UCL	4100	Maximum Result
Di-n-butyl phthalate	2	32	6	ug/kg	530	2900	350	23000	RSB-20	1.5	2.5	2460	3160	8010	99% Chebyshev (Mean, Sd) UCL	2900	Maximum Result
Fluoranthene	10	32	31	ug/kg	77	5900	380	14000	RSB-21	4	5	2360	2670	7050	99% Chebyshev (Mean, Sd) UCL	5900	Maximum Result
Fluorene	7	32	22	ug/kg	2400	9700	350	23000	RSB-18	6	7	2420	3230	8100	99% Chebyshev (Mean, Sd) UCL	8100	99% Chebyshev (Mean, Sd) UCL
Indeno(1,2,3-c,d)pyrene	1	32	3	ug/kg	440	440	350	23000	RSB-08	4	5	2580	3200	8210	99% Chebyshev (Mean, Sd) UCL	440	Maximum Result
Naphthalene	11	32	34	ug/kg	13000	80000	350	13000	RSB-20	1.5	2.5	13000	21600	51000	99% Chebyshev (Mean, Sd) UCL	51000	99% Chebyshev (Mean, Sd) UCL
Pentachlorophenol	1	32	3	ug/kg	6700	6700	870	58000	RSB-23	4.75	6	6170	7900	20100	99% Chebyshev (Mean, Sd) UCL	6700	Maximum Result
Phenanthrene	13	32	41	ug/kg	88	33000	350	13000	RSB-18	6	7	3670	6500	15100	99% Chebyshev (Mean, Sd) UCL	15100	99% Chebyshev (Mean, Sd) UCL
Pyrene	10	32	31	ug/kg	95	9600	350	14000	RSB-18	6	7	2360	2810	7300	99% Chebyshev (Mean, Sd) UCL	7300	99% Chebyshev (Mean, Sd) UCL
1,1,1-Trichloroethane	3	31	10	ug/kg	7	81	10	17	RSB-24	1.8	3	10.3	16.3	23.1	95% Chebyshev (Mean, Sd) UCL	23.1	95% Chebyshev (Mean, Sd) UCL
1,1-Dichloroethane	12	31	39	ug/kg	5	14000	10	17	RSB-18	3	4	1150	3440	7300	99% Chebyshev (Mean, Sd) UCL	7300	99% Chebyshev (Mean, Sd) UCL
1,1-Dichloroethene	5	31	16	ug/kg	6	240	10	17	RSB-24	1.8	3	17.9	44.3	52.6	95% Chebyshev (Mean, Sd) UCL	52.6	95% Chebyshev (Mean, Sd) UCL
1,2-Dichloroethane	2	31	6	ug/kg	13	220	10	17	RSB-24	1.8	3	13.2	38.4	43.3	95% Chebyshev (Mean, Sd) UCL	43.3	95% Chebyshev (Mean, Sd) UCL
Acetone	22	31	71	ug/kg	30	860	10	130	RSB-24	1.8	3	138	183	209	95% Approximate Gamma UCL	209	95% Approximate Gamma UCL
Benzene	10	31	32	ug/kg	25	3500	10	1300	RSB-24	1.8	3	244	660	1420	99% Chebyshev (Mean, Sd) UCL	1420	99% Chebyshev (Mean, Sd) UCL
Carbon disulfide	10	31	32	ug/kg	3	14	10	16	RSB-12	4	5	5.98	2.07	6.61	95% Student's-t UCL	6.61	95% Student's-t UCL
Chlorobenzene	10	31	32	ug/kg	44	19000	10	17	RSB-42	4	5	788	3420	6890	99% Chebyshev (Mean, Sd) UCL	6890	99% Chebyshev (Mean, Sd) UCL
Chloroethane	7	31	23	ug/kg	7	75	10	16	RSB-21	1	1.5	9.06	12.5	18.8	95% Chebyshev (Mean, Sd) UCL	18.8	95% Chebyshev (Mean, Sd) UCL
Chloromethane	1	31	3	ug/kg	480	480	10	17	RSB-19	1	2	21.4	85.1	88	95% Chebyshev (Mean, Sd) UCL	88	95% Chebyshev (Mean, Sd) UCL
cis-1,2-Dichloroethene	13	31	42	ug/kg	3	240000	10	17	RSB-24	1.8	3	16200	53800	134000	95% Hall's Bootstrap UCL	134000	95% Hall's Bootstrap UCL
Cyclohexane	11	31	35	ug/kg	7	3300	10	1300	RSB-21	1	1.5	481	1060	2380	99% Chebyshev (Mean, Sd) UCL	2380	99% Chebyshev (Mean, Sd) UCL
Ethylbenzene	12	31	39	ug/kg	3	110000	10	17	RSB-22	5	6	14100	28100	25200	95% Hall's Bootstrap UCL	25200	95% Hall's Bootstrap UCL
Isopropylbenzene (cumene)	12	31	39	ug/kg	31	20000	10	17	RSB-23	4.75	6	3600	6180	14700	99% Chebyshev (Mean, Sd) UCL	14700	99% Chebyshev (Mean, Sd) UCL
Methyl ethyl ketone	10	31	32	ug/kg	14	570	10	36	RSB-24	1.8	3	55.6	126	281	99% Chebyshev (Mean, Sd) UCL	281	99% Chebyshev (Mean, Sd) UCL
Methyl isobutyl ketone	2	31	6	ug/kg	3900	11000	10	17	RSB-18	3	4	486	2070	4190	99% Chebyshev (Mean, Sd) UCL	4190	99% Chebyshev (Mean, Sd) UCL
Methyl tert-butyl ether	1	31	3	ug/kg	4	4	10	17	RSB-22	2	3	6.06	0.901	6.34	95% Student's-t UCL	4	Maximum Result
Methylcyclohexane	12	31	39	ug/kg	43	78000	10	17	RSB-22	5	6	7110	16500	16200	95% Hall's Bootstrap UCL	16200	95% Hall's Bootstrap UCL
Methylene chloride	10	31	32	ug/kg	4	15	10	16	RSB-23	4.75	6	7.66	3.27	8.66	95% Student's-t UCL	8.66	95% Student's-t UCL
Styrene	1	31	3	ug/kg	980	980	10	17	RSB-20	1.5	2.5	37.5	175	174	95% Chebyshev (Mean, Sd) UCL	174	95% Chebyshev (Mean, Sd) UCL
Tetrachloroethene	12	31	39	ug/kg	4	1400	10	17	RSB-23	4.75	6	62.9	250	509	99% Chebyshev (Mean, Sd) UCL	509	99% Chebyshev (Mean, Sd) UCL
Toluene	13	31	42	ug/kg	3	1600000	10	16	RSB-23	4.75	6	2.08	320000	494000	95% Hall's Bootstrap UCL	494000	95% Hall's Bootstrap UCL
trans-1,2-Dichloroethene	10	31	32	ug/kg	3	1200	10	17	RSB-24	1.8	3	80.3	251	529	99% Chebyshev (Mean, Sd) UCL	529	99% Chebyshev (Mean, Sd) UCL
Trichloroethene	12	31	39	ug/kg	4	7300	10	17	RSB-23	4.75	6	290	1310	2630	99% Chebyshev (Mean, Sd) UCL	2630	99% Chebyshev (Mean, Sd) UCL
Vinyl chloride	8	31	26	ug/kg	43	2200	10	17	RSB-22	2	3	138	423	895	99% Chebyshev (Mean, Sd) UCL	895	99% Chebyshev (Mean, Sd) UCL
Xylenes, total	11	31	35	ug/kg	50	640000	10	17	RSB-24	1.8	3	83600	172000	140000	95% Hall's Bootstrap UCL	140000	95% Hall's Bootstrap UCL
Dioxins/Furans																	
1,2,3,4,6,7,8-HpCDD	4	4	100	ng/kg	0.706	1100	NA	NA	RSB-18	3	4	409	479	972	95% Student's-t UCL	972	95% Student's-t UCL
1,2,3,4,6,7,8-HpCDF	3	4	75	ng/kg	42.1	178	0.379	0.379	RSB-18	3	4	70.1	76.2	160	95% Student's-t UCL	160	95% Student's-t UCL
1,2,3,4,7,8,9-HpCDF	2	4	50	ng/kg	4.25	8.51	0.417	2.49	RSB-18	3	4	3.55	3.72	7.93	95% Student's-t UCL	7.93	95% Student's-t UCL
1,2,3,4,7,8-HxCDD	3	4	75	ng/kg	1.75	16.4	0.383	0.383	RSB-18	3	4	5.03	7.62	51.7	95% Approximate Gamma UCL	16.4	Maximum Result
1,2,3,4,7,8-HxCDF	1	4	25	ng/kg	2.46	2.46	0.319	2.28	RSB-12	1	2	1.09	0.998	2.26	95% Student's-t UCL	2.26	95% Student's-t UCL
1,2,3,6,7,8-HxCDD	3	4	75	ng/kg	6.63	73.5	0.371	0.371	RSB-18	3	4	22.8	34.1	270	95% Approximate Gamma UCL	73.5	Maximum Result
1,2,3,6,7,8-HxCDF	3	4	75	ng/kg	2.18	16.8	0.511	0.511	RSB-18	3	4	6.34	7.39	15	95% Student's-t UCL	15	95% Student's-t UCL
1,2,3,7,8,9-HxCDD	3	4	75	ng/kg	2.59	41.4	0.318	0.318	RSB-18	3	4	11.9	19.7	143	95% Approximate Gamma UCL	41.4	Maximum Result
1,2,3,7,8,9-HxCDF	2	4	50	ng/kg	1.17	8.75	0.496	1.1	RSB-18	3	4	2.68	4.07	25.3	95% Approximate Gamma UCL	8.75	Maximum Result
1,2,3,7,8-PeCDD	2	4	50	ng/kg	1.03	15.3	0.625	1.38	RSB-18	3	4	4.33	7.32	47	95% Approximate Gamma UCL	15.3	Maximum Result
2,3,4,6,7,8-HxCDF	3	4	75	ng/kg	1.57	16.9	0.282	0.282	RSB-18	3	4	6.15	7.59	15.1	95% Student's-t UCL	15.1	95% Student's-t UCL
2,3,4,7,8-PeCDF	3	4	75	ng/kg	5.55	42.4	0.349	0.349	RSB-18	3	4	13.9	19.2	36.6	95% Student's-t UCL	36.6	95% Student's-t UCL
2,3,7,8-TCDF	1	4	25	ng/kg	5.36	5.36	0.316	2.22	RSB-18	3	4	1.77	2.42	4.63	95% Student's-t UCL	4.63	95% Student's-t UCL

Table 1-1
AMCO Summary Statistics and Exposure Point Concentrations for 4 Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Number of Detects	Number of Analyses	Percent Detects	Units	Minimum Detected Value	Maximum Detected Value	Minimum Non-detected Value	Maximum Non-detected Value	Location of Maximum Detected Value	Upper Depth of Maximum Detected Value	Lower Depth of Maximum Detected Value	Arithmetic Mean Value	Standard Deviation	Exposure Point Concentration	EPC Basis	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
OCDD	3	4	75	ng/kg	2130	8420	3.47	3.47	RSB-18	3	4	3900	3650	8200	95% Student's-t UCL	8200	95% Student's-t UCL
OCDF	3	4	75	ng/kg	31.1	354	0.519	0.519	RSB-18	3	4	136	161	325	95% Student's-t UCL	325	95% Student's-t UCL
Parking Lot - Shallow																	
Metals																	
Aluminum	3	3	100	mg/kg	7980	13500	NA	NA	RSB-33	1.5	2.5	NA	2760	NA		13500	Maximum Result
Antimony	3	3	100	mg/kg	3.4	216	NA	NA	RSB-33	1.5	2.5	NA	123	NA		216	Maximum Result
Arsenic	3	3	100	mg/kg	6.4	20	NA	NA	RSB-33	1.5	2.5	NA	7.22	NA		20	Maximum Result
Barium	3	3	100	mg/kg	313	3800	NA	NA	RSB-33	1.5	2.5	NA	1980	NA		3800	Maximum Result
Beryllium	3	3	100	mg/kg	0.29	0.92	NA	NA	RSB-33	1.5	2.5	NA	0.353	NA		0.92	Maximum Result
Cadmium	3	3	100	mg/kg	0.81	11.1	NA	NA	RSB-32	2	3	NA	5.22	NA		11.1	Maximum Result
Chromium	3	3	100	mg/kg	51.3	102	NA	NA	RSB-32	2	3	NA	25.4	NA		102	Maximum Result
Cobalt	3	3	100	mg/kg	5.8	15.1	NA	NA	RSB-32	2	3	NA	4.7	NA		15.1	Maximum Result
Copper	3	3	100	mg/kg	108	418	NA	NA	RSB-33	1.5	2.5	NA	163	NA		418	Maximum Result
Iron	3	3	100	mg/kg	26600	74500	NA	NA	RSB-33	1.5	2.5	NA	26100	NA		74500	Maximum Result
Lead	3	3	100	mg/kg	1000	2170	NA	NA	RSB-31	1.8	3	NA	639	NA		2170	Maximum Result
Manganese	3	3	100	mg/kg	269	1110	NA	NA	RSB-33	1.5	2.5	NA	443	NA		1110	Maximum Result
Nickel	3	3	100	mg/kg	25.8	72.1	NA	NA	RSB-32	2	3	NA	24	NA		72.1	Maximum Result
Selenium	3	3	100	mg/kg	1.7	4.6	NA	NA	RSB-33	1.5	2.5	NA	1.55	NA		4.6	Maximum Result
Silver	3	3	100	mg/kg	0.7	1.1	NA	NA	RSB-33	1.5	2.5	NA	0.225	NA		1.1	Maximum Result
Thallium	3	3	100	mg/kg	1.1	4.9	NA	NA	RSB-33	1.5	2.5	NA	2.11	NA		4.9	Maximum Result
Vanadium	3	3	100	mg/kg	31.2	64.2	NA	NA	RSB-33	1.5	2.5	NA	17.9	NA		64.2	Maximum Result
Zinc	3	3	100	mg/kg	557	8030	NA	NA	RSB-33	1.5	2.5	NA	4270	NA		8030	Maximum Result
Pesticides/PCBs																	
4,4'-DDD	2	3	67	ug/kg	3.7	9.9	4.5	4.5	RSB-32	2	3	NA	4.06	NA		9.9	Maximum Result
4,4'-DDE	2	3	67	ug/kg	3.1	3.5	4.5	4.5	RSB-32	2	3	NA	0.638	NA		3.5	Maximum Result
4,4'-DDT	2	3	67	ug/kg	3	9.5	4.5	4.5	RSB-32	2	3	NA	3.99	NA		9.5	Maximum Result
Endrin	1	3	33	ug/kg	5.5	5.5	4	4.5	RSB-33	1.5	2.5	NA	1.95	NA		5.5	Maximum Result
Endrin ketone	2	3	67	ug/kg	2.4	14	4.5	4.5	RSB-33	1.5	2.5	NA	6.74	NA		14	Maximum Result
gamma-Chlordane	1	3	33	ug/kg	1.7	1.7	1.9	2.3	RSB-32	2	3	NA	0.388	NA		1.7	Maximum Result
Methoxychlor	1	3	33	ug/kg	9.9	9.9	20	23	RSB-33	1.5	2.5	NA	0.896	NA		9.9	Maximum Result
SVOCs/VOCs																	
2-Methylnaphthalene	1	3	33	ug/kg	170	170	450	800	RSB-33	1.5	2.5	NA	120	NA		170	Maximum Result
Acenaphthylene	2	3	67	ug/kg	260	690	450	450	RSB-32	2	3	NA	259	NA		690	Maximum Result
Anthracene	2	3	67	ug/kg	240	860	450	450	RSB-32	2	3	NA	362	NA		860	Maximum Result
Benzo(a)anthracene	2	3	67	ug/kg	1000	1300	450	450	RSB-33	1.5	2.5	NA	555	NA		1300	Maximum Result
Benzo(a)pyrene	2	3	67	ug/kg	1000	2600	450	450	RSB-33	1.5	2.5	NA	1210	NA		2600	Maximum Result
Benzo(b)fluoranthene	1	3	33	ug/kg	1700	1700	450	720	RSB-33	1.5	2.5	NA	815	NA		1700	Maximum Result
Benzo(g,h,i)perylene	1	3	33	ug/kg	2300	2300	450	510	RSB-33	1.5	2.5	NA	1190	NA		2300	Maximum Result
Benzo(k)fluoranthene	1	3	33	ug/kg	1500	1500	450	850	RSB-33	1.5	2.5	NA	686	NA		1500	Maximum Result
Biphenyl (diphenyl)	1	3	33	ug/kg	160	160	380	450	RSB-32	2	3	NA	32.5	NA		160	Maximum Result
Chrysene	2	3	67	ug/kg	1300	1800	450	450	RSB-33	1.5	2.5	NA	805	NA		1800	Maximum Result
Fluoranthene	2	3	67	ug/kg	2700	3000	450	450	RSB-32	2	3	NA	1520	NA		3000	Maximum Result
Fluorene	1	3	33	ug/kg	500	500	380	450	RSB-32	2	3	NA	170	NA		500	Maximum Result
Indeno(1,2,3-c,d)pyrene	1	3	33	ug/kg	2300	2300	450	630	RSB-33	1.5	2.5	NA	1170	NA		2300	Maximum Result
Naphthalene	2	3	67	ug/kg	160	160	450	450	RSB-32	2	3	NA	37.5	NA		160	Maximum Result
Phenanthrene	2	3	67	ug/kg	1000	4400	450	450	RSB-32	2	3	NA	2220	NA		4400	Maximum Result
Pyrene	2	3	67	ug/kg	3600	4400	450	450	RSB-33	1.5	2.5	NA	2220	NA		4400	Maximum Result
Acetone	2	3	67	ug/kg	25	50	14	14	RSB-33	1.5	2.5	NA	21.6	NA		50	Maximum Result
cis-1,2-Dichloroethene	1	3	33	ug/kg	2	2	12	14	RSB-33	1.5	2.5	NA	2.65	NA		2	Maximum Result
Methyl ethyl ketone	1	3	33	ug/kg	21	21	12	14	RSB-33	1.5	2.5	NA	8.39	NA		21	Maximum Result
Methylene chloride	2	3	67	ug/kg	2	4	12	12	RSB-31	1.8	3	NA	2	NA		4	Maximum Result
Toluene	1	3	33	ug/kg	9	9	12	14	RSB-33	1.5	2.5	NA	1.53	NA		9	Maximum Result
Xylenes, total	1	3	33	ug/kg	5	5	12	14	RSB-33	1.5	2.5	NA	1	NA		5	Maximum Result
Dioxins/Furans																	
1,2,3,4,6,7,8-HpCDD	3	3	100	ng/kg	4.49	35.1	NA	NA	RSB-33	1.5	2.5	NA	15.9	NA		35.1	Maximum Result

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1,2,3,4,6,7,8-HpCDF	3	3	100	ng/kg	2.89	30.8	NA	NA	RSB-33	1.5	2.5	NA	15.4	NA		30.8	Maximum Result
1,2,3,4,7,8,9-HpCDF	2	3	67	ng/kg	0.892	2.83	0.984	0.984	RSB-33	1.5	2.5	NA	1.25	NA		2.83	Maximum Result
1,2,3,4,7,8-HxCDD	1	3	33	ng/kg	2.83	2.83	0.423	0.545	RSB-33	1.5	2.5	NA	1.49	NA		2.83	Maximum Result
1,2,3,4,7,8-HxCDF	2	3	67	ng/kg	3.23	17.4	0.502	0.502	RSB-33	1.5	2.5	NA	9.16	NA		17.4	Maximum Result
1,2,3,6,7,8-HxCDD	3	3	100	ng/kg	0.943	5.59	NA	NA	RSB-33	1.5	2.5	NA	2.66	NA		5.59	Maximum Result
1,2,3,6,7,8-HxCDF	2	3	67	ng/kg	3.18	11.3	0.412	0.412	RSB-33	1.5	2.5	NA	5.74	NA		11.3	Maximum Result
1,2,3,7,8,9-HxCDD	1	3	33	ng/kg	3.75	3.75	0.423	0.473	RSB-33	1.5	2.5	NA	2.04	NA		3.75	Maximum Result
1,2,3,7,8,9-HxCDF	2	3	67	ng/kg	1.01	3.79	0.416	0.416	RSB-33	1.5	2.5	NA	1.88	NA		3.79	Maximum Result
1,2,3,7,8-PeCDD	2	3	67	ng/kg	1.76	3.37	0.603	0.603	RSB-33	1.5	2.5	NA	1.53	NA		3.37	Maximum Result
1,2,3,7,8-PeCDF	2	3	67	ng/kg	3.71	3.91	0.397	0.397	RSB-33	1.5	2.5	NA	2.09	NA		3.91	Maximum Result
2,3,4,6,7,8-HxCDF	3	3	100	ng/kg	0.724	15.5	NA	NA	RSB-33	1.5	2.5	NA	7.86	NA		15.5	Maximum Result
2,3,4,7,8-PeCDF	2	3	67	ng/kg	4.86	33.2	0.444	0.444	RSB-33	1.5	2.5	NA	17.9	NA		33.2	Maximum Result
2,3,7,8-TCDD	1	3	33	ng/kg	0.898	0.898	0.833	0.872	RSB-33	1.5	2.5	NA	0.273	NA		0.898	Maximum Result
2,3,7,8-TCDF	2	3	67	ng/kg	6.68	8.22	0.901	0.901	RSB-33	1.5	2.5	NA	4.11	NA		8.22	Maximum Result
OCDD	3	3	100	ng/kg	6.57	357	NA	NA	RSB-32	2	3	NA	176	NA		357	Maximum Result
OCDF	2	3	67	ng/kg	4.95	18.8	1.65	1.65	RSB-33	1.5	2.5	NA	9.42	NA		18.8	Maximum Result
Parking Lot - Deep																	
Metals																	
Aluminum	6	6	100	mg/kg	7130	14900	NA	NA	RSB-32	5	6	10300	3270	13000	95% Student's-t UCL	13000	95% Student's-t UCL
Antimony	4	6	67	mg/kg	3.4	216	12	12	RSB-33	1.5	2.5	39.8	86.3	391	99% Chebyshev (Mean, Sd) UCL	216	Maximum Result
Arsenic	6	6	100	mg/kg	2.3	20	NA	NA	RSB-33	1.5	2.5	7.33	6.7	12.8	95% Student's-t UCL	12.8	95% Student's-t UCL
Barium	6	6	100	mg/kg	80.2	3800	NA	NA	RSB-33	1.5	2.5	816	1470	3500	95% Approximate Gamma UCL	3500	95% Approximate Gamma UCL
Beryllium	6	6	100	mg/kg	0.22	0.92	NA	NA	RSB-33	1.5	2.5	0.398	0.261	0.674	95% Approximate Gamma UCL	0.674	95% Approximate Gamma UCL
Cadmium	6	6	100	mg/kg	0.2	11.1	NA	NA	RSB-32	2	3	2.91	4.31	12.6	95% Approximate Gamma UCL	11.1	Maximum Result
Chromium	6	6	100	mg/kg	32.5	102	NA	NA	RSB-32	2	3	58.4	26.3	80.1	95% Student's-t UCL	80.1	95% Student's-t UCL
Cobalt	6	6	100	mg/kg	5.3	15.1	NA	NA	RSB-32	2	3	7.9	3.82	11.9	95% Approximate Gamma UCL	11.9	95% Approximate Gamma UCL
Copper	6	6	100	mg/kg	11.5	418	NA	NA	RSB-33	1.5	2.5	163	175	307	95% Student's-t UCL	307	95% Student's-t UCL
Iron	6	6	100	mg/kg	12200	74500	NA	NA	RSB-33	1.5	2.5	30900	22500	57400	95% Approximate Gamma UCL	57400	95% Approximate Gamma UCL
Lead	6	6	100	mg/kg	3.6	2170	NA	NA	RSB-31	1.8	3	751	854	1450	95% Student's-t UCL	1450	95% Student's-t UCL
Manganese	6	6	100	mg/kg	156	1110	NA	NA	RSB-33	1.5	2.5	423	352	857	95% Approximate Gamma UCL	857	95% Approximate Gamma UCL
Nickel	6	6	100	mg/kg	25	72.1	NA	NA	RSB-32	2	3	42	20.3	58.7	95% Student's-t UCL	58.7	95% Student's-t UCL
Selenium	6	6	100	mg/kg	0.94	4.6	NA	NA	RSB-33	1.5	2.5	2.06	1.31	3.53	95% Approximate Gamma UCL	3.53	95% Approximate Gamma UCL
Silver	6	6	100	mg/kg	0.13	1.1	NA	NA	RSB-33	1.5	2.5	0.515	0.385	0.832	95% Student's-t UCL	0.832	95% Student's-t UCL
Thallium	6	6	100	mg/kg	0.41	4.9	NA	NA	RSB-33	1.5	2.5	1.57	1.67	3.81	95% Approximate Gamma UCL	3.81	95% Approximate Gamma UCL
Vanadium	6	6	100	mg/kg	25.7	64.2	NA	NA	RSB-33	1.5	2.5	37.6	14.4	49.5	95% Student's-t UCL	49.5	95% Student's-t UCL
Zinc	6	6	100	mg/kg	28.2	8030	NA	NA	RSB-33	1.5	2.5	1600	3160	19400	95% Adjusted Gamma UCL	8030	Maximum Result
Pesticides/PCBs																	
4,4'-DDD	3	6	50	ug/kg	3.7	65	3.9	4.5	RSB-33	4.5	5.5	14.1	25.1	60.8	95% Approximate Gamma UCL	60.8	95% Approximate Gamma UCL
4,4'-DDE	3	6	50	ug/kg	3.1	26	3.9	4.5	RSB-33	4.5	5.5	6.46	9.59	23.5	95% Chebyshev (Mean, Sd) UCL	23.5	95% Chebyshev (Mean, Sd) UCL
4,4'-DDT	3	6	50	ug/kg	2.6	9.5	3.9	4.5	RSB-32	2	3	3.54	2.95	8.79	95% Chebyshev (Mean, Sd) UCL	8.79	95% Chebyshev (Mean, Sd) UCL
Dieldrin	1	6	17	ug/kg	10	10	3.8	4.5	RSB-33	4.5	5.5	3.34	3.26	9.15	95% Chebyshev (Mean, Sd) UCL	9.15	95% Chebyshev (Mean, Sd) UCL
Endrin	1	6	17	ug/kg	5.5	5.5	1.8	4.5	RSB-33	1.5	2.5	2.43	1.58	4.27	95% Approximate Gamma UCL	4.27	95% Approximate Gamma UCL
Endrin ketone	3	6	50	ug/kg	2.4	14	3.9	4.5	RSB-33	1.5	2.5	4.73	4.78	13.2	95% Chebyshev (Mean, Sd) UCL	13.2	95% Chebyshev (Mean, Sd) UCL
gamma-Chlordane	2	6	33	ug/kg	1.1	1.7	1.9	2.3	RSB-32	2	3	1.15	0.279	1.41	95% Approximate Gamma UCL	1.41	95% Approximate Gamma UCL
Methoxychlor	1	6	17	ug/kg	9.9	9.9	20	23	RSB-33	1.5	2.5	10.2	0.622	10.7	95% Student's-t UCL	9.9	Maximum Result
SVOCs/VOCs																	
2-Methylnaphthalene	2	6	33	ug/kg	170	2100	390	800	RSB-33	4.5	5.5	548	765	1910	95% Chebyshev (Mean, Sd) UCL	1910	95% Chebyshev (Mean, Sd) UCL
Acenaphthylene	3	6	50	ug/kg	260	1200	390	450	RSB-33	4.5	5.5	461	409	NA	95% H-UCL	1200	Maximum Result
Anthracene	3	6	50	ug/kg	240	940	390	450	RSB-33	4.5	5.5	443	356	1080	95% Chebyshev (Mean, Sd) UCL	940	Maximum Result
Benzo(a)anthracene	3	6	50	ug/kg	1000	4300	390	450	RSB-33	4.5	5.5	1200	1590	4140	95% Approximate Gamma UCL	4140	95% Approximate Gamma UCL
Benzo(a)pyrene	3	6	50	ug/kg	1000	8900	390	450	RSB-33	4.5	5.5	2190	3420	9750	95% Approximate Gamma UCL	8900	Maximum Result
Benzo(b)fluoranthene	2	6	33	ug/kg	1700	5600	390	720	RSB-33	4.5	5.5	1380	2150	5610	95% Approximate Gamma UCL	5600	Maximum Result
Benzo(g,h,i)perylene	2	6	33	ug/kg	2300	9000	390	510	RSB-33	4.5	5.5	2030	3520	16300	99% Chebyshev (Mean, Sd) UCL	9000	Maximum Result
Benzo(k)fluoranthene	2	6	33	ug/kg	1500	3500	390	850	RSB-33	4.5	5.5	1010	1320	3400	95% Approximate Gamma UCL	3400	95% Approximate Gamma UCL
Biphenyl (diphenyl)	1	6	17	ug/kg	160	160	380	770	RSB-32	2	3	225	81.1	303	95% Approximate Gamma UCL	160	Maximum Result

Table 1-1
AMCO Summary Statistics and Exposure Point Concentrations for 4 Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Number of Detects	Number of Analyses	Percent Detects	Units	Minimum Detected Value	Maximum Detected Value	Minimum Non-detected Value	Maximum Non-detected Value	Location of Maximum Detected Value	Upper Depth of Maximum Detected Value	Lower Depth of Maximum Detected Value	Arithmetic Mean Value	Standard Deviation	Exposure Point Concentration	EPC Basis	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
Chrysene	3	6	50	ug/kg	1300	6500	390	450	RSB-33	4.5	5.5	1700	2450	6740	95% Approximate Gamma UCL	6500	Maximum Result
Dibenz(a,h)anthracene	1	6	17	ug/kg	1100	1100	380	800	RSB-33	4.5	5.5	384	360	1020	95% Chebyshev (Mean, Sd) UCL	1020	95% Chebyshev (Mean, Sd) UCL
Fluoranthene	4	6	67	ug/kg	81	12000	390	450	RSB-33	4.5	5.5	3030	4590	30800	95% Adjusted Gamma UCL	12000	Maximum Result
Fluorene	1	6	17	ug/kg	500	500	380	770	RSB-32	2	3	282	130	423	95% Approximate Gamma UCL	423	95% Approximate Gamma UCL
Indeno(1,2,3-c,d)pyrene	2	6	33	ug/kg	2300	8300	390	630	RSB-33	4.5	5.5	1920	3230	15100	99% Chebyshev (Mean, Sd) UCL	8300	Maximum Result
Naphthalene	3	6	50	ug/kg	160	870	390	450	RSB-33	4.5	5.5	301	280	799	95% Chebyshev (Mean, Sd) UCL	799	95% Chebyshev (Mean, Sd) UCL
Phenanthrene	3	6	50	ug/kg	1000	4400	390	450	RSB-32	2	3	1740	2090	6770	95% Approximate Gamma UCL	4400	Maximum Result
Pyrene	3	6	50	ug/kg	3600	16000	390	450	RSB-33	4.5	5.5	4100	6120	41500	95% Adjusted Gamma UCL	16000	Maximum Result
Acetone	4	6	67	ug/kg	11	50	12	14	RSB-33	1.5	2.5	20.3	16.6	34	95% Student's-t UCL	34	95% Student's-t UCL
cis-1,2-Dichloroethene	1	6	17	ug/kg	2	2	12	14	RSB-33	1.5	2.5	5.5	1.76	6.95	95% Student's-t UCL	2	Maximum Result
Methyl ethyl ketone	1	6	17	ug/kg	21	21	12	14	RSB-33	1.5	2.5	8.67	6.06	19.4	95% Chebyshev (Mean, Sd) UCL	19.4	95% Chebyshev (Mean, Sd) UCL
Methylene chloride	2	6	33	ug/kg	2	4	12	12	RSB-31	1.8	3	5	1.67	6.38	95% Student's-t UCL	4	Maximum Result
Toluene	2	6	33	ug/kg	3	9	12	14	RSB-33	1.5	2.5	6.17	1.94	7.76	95% Student's-t UCL	7.76	95% Student's-t UCL
Xylenes, total	1	6	17	ug/kg	5	5	12	14	RSB-33	1.5	2.5	6	0.632	6.52	95% Student's-t UCL	5	Maximum Result
Dioxins/Furans																	
1,2,3,4,6,7,8-HpCDD	3	3	100	ng/kg	4.49	35.1	NA	NA	RSB-33	1.5	2.5	NA	15.9	NA		35.1	Maximum Result
1,2,3,4,6,7,8-HpCDF	3	3	100	ng/kg	2.89	30.8	NA	NA	RSB-33	1.5	2.5	NA	15.4	NA		30.8	Maximum Result
1,2,3,4,7,8,9-HpCDF	2	3	67	ng/kg	0.892	2.83	0.984	0.984	RSB-33	1.5	2.5	NA	1.25	NA		2.83	Maximum Result
1,2,3,4,7,8-HxCDD	1	3	33	ng/kg	2.83	2.83	0.423	0.545	RSB-33	1.5	2.5	NA	1.49	NA		2.83	Maximum Result
1,2,3,4,7,8-HxCDF	2	3	67	ng/kg	3.23	17.4	0.502	0.502	RSB-33	1.5	2.5	NA	9.16	NA		17.4	Maximum Result
1,2,3,6,7,8-HxCDD	3	3	100	ng/kg	0.943	5.59	NA	NA	RSB-33	1.5	2.5	NA	2.66	NA		5.59	Maximum Result
1,2,3,6,7,8-HxCDF	2	3	67	ng/kg	3.18	11.3	0.412	0.412	RSB-33	1.5	2.5	NA	5.74	NA		11.3	Maximum Result
1,2,3,7,8,9-HxCDD	1	3	33	ng/kg	3.75	3.75	0.423	0.473	RSB-33	1.5	2.5	NA	2.04	NA		3.75	Maximum Result
1,2,3,7,8,9-HxCDF	2	3	67	ng/kg	1.01	3.79	0.416	0.416	RSB-33	1.5	2.5	NA	1.88	NA		3.79	Maximum Result
1,2,3,7,8-PeCDD	2	3	67	ng/kg	1.76	3.37	0.603	0.603	RSB-33	1.5	2.5	NA	1.53	NA		3.37	Maximum Result
1,2,3,7,8-PeCDF	2	3	67	ng/kg	3.71	3.91	0.397	0.397	RSB-33	1.5	2.5	NA	2.09	NA		3.91	Maximum Result
2,3,4,6,7,8-HxCDF	3	3	100	ng/kg	0.724	15.5	NA	NA	RSB-33	1.5	2.5	NA	7.86	NA		15.5	Maximum Result
2,3,4,7,8-PeCDF	2	3	67	ng/kg	4.86	33.2	0.444	0.444	RSB-33	1.5	2.5	NA	17.9	NA		33.2	Maximum Result
2,3,7,8-TCDD	1	3	33	ng/kg	0.898	0.898	0.833	0.872	RSB-33	1.5	2.5	NA	0.273	NA		0.898	Maximum Result
2,3,7,8-TCDF	2	3	67	ng/kg	6.68	8.22	0.901	0.901	RSB-33	1.5	2.5	NA	4.11	NA		8.22	Maximum Result
OCDD	3	3	100	ng/kg	6.57	357	NA	NA	RSB-32	2	3	NA	176	NA		357	Maximum Result
OCDF	2	3	67	ng/kg	4.95	18.8	1.65	1.65	RSB-33	1.5	2.5	NA	9.42	NA		18.8	Maximum Result
Large Vacant Lot - Shallow																	
Metals																	
Aluminum	14	14	100	mg/kg	5400	14000	NA	NA	RSB-27	1.8	3	8030	2420	9210	95% Approximate Gamma UCL	9210	95% Approximate Gamma UCL
Antimony	14	14	100	mg/kg	0.26	10.9	NA	NA	RSB-25	1.8	3	2.06	2.77	3.5	95% Approximate Gamma UCL	3.5	95% Approximate Gamma UCL
Arsenic	14	14	100	mg/kg	2.5	53.7	NA	NA	RSB-28	1.8	3	16.4	15.3	26.9	95% Approximate Gamma UCL	26.9	95% Approximate Gamma UCL
Barium	14	14	100	mg/kg	102	1990	NA	NA	RSB-36	2	3	354	500	937	95% Chebyshev (Mean, Sd) UCL	937	95% Chebyshev (Mean, Sd) UCL
Beryllium	14	14	100	mg/kg	0.23	0.44	NA	NA	RSB-36	2	3	0.276	0.0567	0.303	95% Student's-t UCL	0.303	95% Student's-t UCL
Cadmium	13	14	93	mg/kg	0.13	5.7	1	1	RSB-26	1.8	3	0.789	1.43	2.45	95% Chebyshev (Mean, Sd) UCL	2.45	95% Chebyshev (Mean, Sd) UCL
Chromium	14	14	100	mg/kg	22.9	348	NA	NA	RSB-01	2	3	98.1	89.7	154	95% Approximate Gamma UCL	154	95% Approximate Gamma UCL
Cobalt	14	14	100	mg/kg	3.4	11.3	NA	NA	RSB-27	1.8	3	6.01	2.21	7.06	95% Student's-t UCL	7.06	95% Student's-t UCL
Copper	14	14	100	mg/kg	13.6	409	NA	NA	RSB-25	1.8	3	91.9	105	149	95% Approximate Gamma UCL	149	95% Approximate Gamma UCL
Iron	14	14	100	mg/kg	10100	40200	NA	NA	RSB-01	2	3	19700	9590	24900	95% Approximate Gamma UCL	24900	95% Approximate Gamma UCL
Lead	14	14	100	mg/kg	73.1	5130	NA	NA	RSB-25	1.8	3	685	1380	4360	99% Chebyshev (Mean, Sd) UCL	4360	99% Chebyshev (Mean, Sd) UCL
Manganese	14	14	100	mg/kg	178	528	NA	NA	RSB-27	1.8	3	316	91.6	360	95% Student's-t UCL	360	95% Student's-t UCL
Nickel	14	14	100	mg/kg	17.9	36.3	NA	NA	RSB-26	1.8	3	23.1	5.87	25.8	95% Student's-t UCL	25.8	95% Student's-t UCL
Selenium	6	14	43	mg/kg	1.1	3	7	7	RSB-26	1.8	3	3.03	0.733	3.38	95% Student's-t UCL	3	Maximum Result
Silver	14	14	100	mg/kg	0.095	0.97	NA	NA	RSB-26	1.8	3	0.365	0.259	0.512	95% Approximate Gamma UCL	0.512	95% Approximate Gamma UCL
Thallium	7	14	50	mg/kg	0.36	2.6	5	5	RSB-28	1.8	3	1.76	0.962	2.88	95% Chebyshev (Mean, Sd) UCL	2.6	Maximum Result
Vanadium	14	14	100	mg/kg	17.5	58.3	NA	NA	RSB-27	1.8	3	28.2	9.66	32.6	95% Approximate Gamma UCL	32.6	95% Approximate Gamma UCL
Zinc	14	14	100	mg/kg	43.8	1390	NA	NA	RSB-26	1.8	3	292	334	453	95% Approximate Gamma UCL	453	95% Approximate Gamma UCL
Pesticides/PCBs																	
4,4'-DDD	11	14	79	ug/kg	2.4	11000	3.8	3.8	RSB-27	1.8	3	2190	3530	9090	95% Adjusted Gamma UCL	9090	95% Adjusted Gamma UCL
4,4'-DDE	13	14	93	ug/kg	1.3	8600	3.8	3.8	RSB-27	1.8	3	1330	2640	5260	95% Adjusted Gamma UCL	5260	95% Adjusted Gamma UCL

Table 1-1
AMCO Summary Statistics and Exposure Point Concentrations for 4 Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Number of Detects	Number of Analyses	Percent Detects	Units	Minimum Detected Value	Maximum Detected Value	Minimum Non-detected Value	Maximum Non-detected Value	Location of Maximum Detected Value	Upper Depth of Maximum Detected Value	Lower Depth of Maximum Detected Value	Arithmetic Mean Value	Standard Deviation	Exposure Point Concentration	EPC Basis	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
4,4'-DDT	12	14	86	ug/kg	5.4	140000	3.6	3.8	RSB-27	1.8	3	13000	37300	NA	95% Hall's Bootstrap UCL	140000	Maximum Result
alpha-BHC	1	14	7	ug/kg	6	6	1.8	960	RSB-01	2	3	40.9	127	379	99% Chebyshev (Mean, Sd) UCL	6	Maximum Result
alpha-Chlordane	5	14	36	ug/kg	1.3	81	1.9	960	RSB-26	1.8	3	47.3	127	384	99% Chebyshev (Mean, Sd) UCL	81	Maximum Result
beta-BHC	5	14	36	ug/kg	1.8	24	1.8	960	RSB-25	1.8	3	43.4	126	159	99% Chebyshev (MVUE) UCL	24	Maximum Result
Dieldrin	10	14	71	ug/kg	1.2	86	3.8	1900	RSB-36	2	3	81	251	246	99% Chebyshev (MVUE) UCL	86	Maximum Result
Endosulfan sulfate	1	14	7	ug/kg	4.4	4.4	3.5	1900	RSB-25	1.8	3	81.3	251	750	99% Chebyshev (Mean, Sd) UCL	4.4	Maximum Result
Endrin	3	14	21	ug/kg	0.8	14	3.6	1900	RSB-28	1.8	3	80.7	252	749	99% Chebyshev (Mean, Sd) UCL	14	Maximum Result
Endrin aldehyde	2	14	14	ug/kg	3	4.9	3.5	1900	RSB-40	1.5	2.5	81.4	251	750	99% Chebyshev (Mean, Sd) UCL	4.9	Maximum Result
Endrin ketone	2	14	14	ug/kg	2.3	6.9	3.5	1900	RSB-40	1.5	2.5	81.5	251	750	99% Chebyshev (Mean, Sd) UCL	6.9	Maximum Result
gamma-BHC	3	14	21	ug/kg	13	420	1.8	98	RSB-27	1.8	3	45.7	113	347	99% Chebyshev (Mean, Sd) UCL	347	99% Chebyshev (Mean, Sd) UCL
gamma-Chlordane	6	14	43	ug/kg	1	83	1.9	960	RSB-26	1.8	3	48.2	126	225	99% Chebyshev (MVUE) UCL	83	Maximum Result
Heptachlor	1	14	7	ug/kg	0.65	0.65	1.8	960	RSB-40	1.5	2.5	41.1	127	379	99% Chebyshev (Mean, Sd) UCL	0.65	Maximum Result
Heptachlor epoxide	1	14	7	ug/kg	2.8	2.8	1.8	960	RSB-26	1.8	3	41.2	127	379	99% Chebyshev (Mean, Sd) UCL	2.8	Maximum Result
Methoxychlor	1	14	7	ug/kg	7	7	18	9600	RSB-26	1.8	3	411	1270	3790	99% Chebyshev (Mean, Sd) UCL	7	Maximum Result
Aroclor-1260	2	14	14	ug/kg	20	33	35	19000	RSB-34	2	3	812	2510	7500	99% Chebyshev (Mean, Sd) UCL	33	Maximum Result
SVOCs/VOCs																	
1,2-Dichlorobenzene	2	14	14	ug/kg	13	15	11	12	RSB-38	2	3	6.79	3.09	8.25	95% Student's-t UCL	8.25	95% Student's-t UCL
1,4-Dichlorobenzene	1	14	7	ug/kg	2	2	11	12	RSB-38	2	3	5.32	0.973	5.78	95% Student's-t UCL	2	Maximum Result
2-Methylnaphthalene	6	14	43	ug/kg	77	4600	370	750	RSB-35	2	3	655	1210	3870	99% Chebyshev (Mean, Sd) UCL	3870	99% Chebyshev (Mean, Sd) UCL
Acetophenone	2	14	14	ug/kg	280	420	350	750	RSB-34	2	3	223	78.6	260	95% Student's-t UCL	260	95% Student's-t UCL
Benzo(a)anthracene	5	14	36	ug/kg	80	1200	350	1100	RSB-40	1.5	2.5	319	291	488	95% H-UCL	488	95% H-UCL
Benzo(a)pyrene	5	14	36	ug/kg	81	1400	350	1100	RSB-40	1.5	2.5	382	363	651	95% H-UCL	651	95% H-UCL
Benzo(b)fluoranthene	4	14	29	ug/kg	130	860	350	1100	RSB-40	1.5	2.5	341	256	640	95% Chebyshev (Mean, Sd) UCL	640	95% Chebyshev (Mean, Sd) UCL
Benzo(g,h,i)perylene	6	14	43	ug/kg	82	1200	350	1100	RSB-40	1.5	2.5	373	332	660	95% H-UCL	660	95% H-UCL
Benzo(k)fluoranthene	4	14	29	ug/kg	150	890	350	1100	RSB-40	1.5	2.5	340	243	623	95% Chebyshev (Mean, Sd) UCL	623	95% Chebyshev (Mean, Sd) UCL
bis(2-Ethylhexyl)phthalate	2	14	14	ug/kg	360	2300	350	1100	RSB-27	1.8	3	415	559	1070	95% Chebyshev (Mean, Sd) UCL	1070	95% Chebyshev (Mean, Sd) UCL
Caprolactam	1	14	7	ug/kg	230	230	350	1100	RSB-35	2	3	229	105	279	95% Student's-t UCL	230	Maximum Result
Chrysene	5	14	36	ug/kg	110	1500	350	1100	RSB-40	1.5	2.5	371	366	797	95% Chebyshev (Mean, Sd) UCL	797	95% Chebyshev (Mean, Sd) UCL
Dibenz(a,h)anthracene	3	14	21	ug/kg	100	370	350	1100	RSB-38	2	3	246	140	313	95% Student's-t UCL	313	95% Student's-t UCL
Fluoranthene	6	14	43	ug/kg	89	1800	350	1100	RSB-40	1.5	2.5	393	446	668	95% H-UCL	668	95% H-UCL
Indeno(1,2,3-c,d)pyrene	6	14	43	ug/kg	82	1100	350	1100	RSB-38	2	3	376	348	694	95% H-UCL	694	95% H-UCL
Naphthalene	4	14	29	ug/kg	81	600	350	750	RSB-35	2	3	224	125	283	95% Student's-t UCL	283	95% Student's-t UCL
Phenanthrene	5	14	36	ug/kg	78	440	350	1100	RSB-40	1.5	2.5	273	147	378	95% H-UCL	378	95% H-UCL
Pyrene	7	14	50	ug/kg	120	2900	350	1100	RSB-40	1.5	2.5	500	728	1350	95% Chebyshev (Mean, Sd) UCL	1350	95% Chebyshev (Mean, Sd) UCL
Acetone	4	14	29	ug/kg	53	150	11	78	RSB-41	2.1	3	37.8	45.1	158	99% Chebyshev (Mean, Sd) UCL	150	Maximum Result
Chlorobenzene	1	14	7	ug/kg	49	49	11	12	RSB-01	2	3	8.68	11.6	22.2	95% Chebyshev (Mean, Sd) UCL	22.2	95% Chebyshev (Mean, Sd) UCL
cis-1,2-Dichloroethene	4	14	29	ug/kg	3	44	11	12	RSB-38	2	3	8.5	10.3	20.5	95% Chebyshev (Mean, Sd) UCL	20.5	95% Chebyshev (Mean, Sd) UCL
Ethylbenzene	3	14	21	ug/kg	3	45	11	12	RSB-38	2	3	8.11	10.6	20.5	95% Chebyshev (Mean, Sd) UCL	20.5	95% Chebyshev (Mean, Sd) UCL
Isopropylbenzene (cumene)	1	14	7	ug/kg	430	430	11	12	RSB-38	2	3	35.9	113	338	99% Chebyshev (Mean, Sd) UCL	338	99% Chebyshev (Mean, Sd) UCL
Methyl ethyl ketone	5	14	36	ug/kg	6	41	11	12	RSB-41	2.1	3	11.3	10.8	23.8	95% Chebyshev (Mean, Sd) UCL	23.8	95% Chebyshev (Mean, Sd) UCL
Methyl isobutyl ketone	1	14	7	ug/kg	12	12	11	12	RSB-38	2	3	6.04	1.73	6.85	95% Student's-t UCL	6.85	95% Student's-t UCL
Methylcyclohexane	2	14	14	ug/kg	15	440	11	12	RSB-34	2	3	37.3	116	346	99% Chebyshev (Mean, Sd) UCL	346	99% Chebyshev (Mean, Sd) UCL
Methylene chloride	1	14	7	ug/kg	11	11	11	12	RSB-38	2	3	5.96	1.46	6.66	95% Student's-t UCL	6.66	95% Student's-t UCL
Tetrachloroethene	1	14	7	ug/kg	11	11	11	12	RSB-27	1.8	3	5.96	1.46	6.66	95% Student's-t UCL	6.66	95% Student's-t UCL
Toluene	1	14	7	ug/kg	170	170	11	12	RSB-38	2	3	17.3	43.9	68.5	95% Chebyshev (Mean, Sd) UCL	68.5	95% Chebyshev (Mean, Sd) UCL
Trichloroethene	3	14	21	ug/kg	3	4	11	12	RSB-26	1.8	3	5.14	0.842	5.54	95% Student's-t UCL	4	Maximum Result
Xylenes, total	2	14	14	ug/kg	14	370	11	12	RSB-38	2	3	32.2	97.2	291	99% Chebyshev (Mean, Sd) UCL	291	99% Chebyshev (Mean, Sd) UCL
Large Vacant Lot - Deep																	
Metals																	
Aluminum	23	23	100	mg/kg	5400	14000	NA	NA	RSB-27	1.8	3	7530	1990	8240	95% Student's-t UCL	8240	95% Student's-t UCL
Antimony	21	23	91	mg/kg	0.26	10.9	12	12	RSB-25	1.8	3	2.12	2.52	3.48	95% H-UCL	3.48	95% H-UCL
Arsenic	23	23	100	mg/kg	2.5	53.7	NA	NA	RSB-28	1.8	3	12.8	13	18.1	95% Approximate Gamma UCL	18.1	95% Approximate Gamma UCL
Barium	23	23	100	mg/kg	78.5	1990	NA	NA	RSB-36	2	3	291	397	652	95% Chebyshev (Mean, Sd) UCL	652	95% Chebyshev (Mean, Sd) UCL
Beryllium	23	23	100	mg/kg	0.18	0.44	NA	NA	RSB-36	2	3	0.262	0.052	0.281	95% Approximate Gamma UCL	0.281	95% Approximate Gamma UCL
Cadmium	19	23	83	mg/kg	0.13	5.7	1	1	RSB-26	1.8	3	0.683	1.12	1.71	95% Chebyshev (Mean, Sd) UCL	1.71	95% Chebyshev (Mean, Sd) UCL

Table 1-1
AMCO Summary Statistics and Exposure Point Concentrations for 4 Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Number of Detects	Number of Analyses	Percent Detects	Units	Minimum Detected Value	Maximum Detected Value	Minimum Non-detected Value	Maximum Non-detected Value	Location of Maximum Detected Value	Upper Depth of Maximum Detected Value	Lower Depth of Maximum Detected Value	Arithmetic Mean Value	Standard Deviation	Exposure Point Concentration	EPC Basis	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
Chromium	23	23	100	mg/kg	22.9	348	NA	NA	RSB-01	2	3	92.2	81.2	166	95% Chebyshev (Mean, Sd) UCL	166	95% Chebyshev (Mean, Sd) UCL
Cobalt	23	23	100	mg/kg	3.4	11.3	NA	NA	RSB-27	1.8	3	5.76	1.98	6.47	95% Student's-t UCL	6.47	95% Student's-t UCL
Copper	23	23	100	mg/kg	7.3	409	NA	NA	RSB-25	1.8	3	79.9	91.1	114	95% Approximate Gamma UCL	114	95% Approximate Gamma UCL
Iron	23	23	100	mg/kg	8610	40200	NA	NA	RSB-01	2	3	18000	9330	21400	95% Approximate Gamma UCL	21400	95% Approximate Gamma UCL
Lead	23	23	100	mg/kg	3.1	5130	NA	NA	RSB-25	1.8	3	465	1100	2750	99% Chebyshev (Mean, Sd) UCL	2750	99% Chebyshev (Mean, Sd) UCL
Manganese	23	23	100	mg/kg	139	528	NA	NA	RSB-27	1.8	3	288	101	324	95% Student's-t UCL	324	95% Student's-t UCL
Nickel	23	23	100	mg/kg	17.3	36.3	NA	NA	RSB-26	1.8	3	22.7	4.99	24.5	95% Student's-t UCL	24.5	95% Student's-t UCL
Selenium	13	23	57	mg/kg	0.31	3.5	7	7	RSB-25	4.8	6	2.59	1.09	3.59	95% Chebyshev (Mean, Sd) UCL	3.5	Maximum Result
Silver	22	23	96	mg/kg	0.095	0.97	2	2	RSB-26	1.8	3	0.365	0.267	0.495	95% H-UCL	0.495	95% H-UCL
Thallium	8	23	35	mg/kg	0.36	2.6	5	5	RSB-28	1.8	3	1.96	0.886	2.77	95% Chebyshev (Mean, Sd) UCL	2.6	Maximum Result
Vanadium	23	23	100	mg/kg	17.5	58.3	NA	NA	RSB-27	1.8	3	26.4	7.85	28.9	95% Approximate Gamma UCL	28.9	95% Approximate Gamma UCL
Zinc	23	23	100	mg/kg	17.5	1390	NA	NA	RSB-26	1.8	3	229	274	321	95% Approximate Gamma UCL	321	95% Approximate Gamma UCL
Pesticides/PCBs																	
4,4'-DDD	20	23	87	ug/kg	2.4	11000	3.8	3.8	RSB-27	1.8	3	1490	2880	3790	95% Adjusted Gamma UCL	3790	95% Adjusted Gamma UCL
4,4'-DDE	22	23	96	ug/kg	1.3	8600	3.8	3.8	RSB-27	1.8	3	850	2120	2100	95% Adjusted Gamma UCL	2100	95% Adjusted Gamma UCL
4,4'-DDT	20	23	87	ug/kg	5.4	140000	3.6	4	RSB-27	1.8	3	8270	29300	80500	99% Chebyshev (MVUE) UCL	80500	99% Chebyshev (MVUE) UCL
alpha-BHC	1	23	4	ug/kg	6	6	1.8	960	RSB-01	2	3	25.8	99.6	232	99% Chebyshev (Mean, Sd) UCL	6	Maximum Result
alpha-Chlordane	8	23	35	ug/kg	0.48	81	1.9	960	RSB-26	1.8	3	29.8	99.9	237	99% Chebyshev (Mean, Sd) UCL	81	Maximum Result
beta-BHC	10	23	43	ug/kg	1.2	24	1.8	960	RSB-25	1.8	3	27.6	99.2	233	99% Chebyshev (Mean, Sd) UCL	24	Maximum Result
Dieldrin	14	23	61	ug/kg	1.2	86	3.7	1900	RSB-36	2	3	51.3	197	459	99% Chebyshev (Mean, Sd) UCL	86	Maximum Result
Endosulfan I	1	23	4	ug/kg	0.74	0.74	1.8	960	RSB-28	4.8	6	25.9	99.6	232	99% Chebyshev (Mean, Sd) UCL	0.74	Maximum Result
Endosulfan sulfate	1	23	4	ug/kg	4.4	4.4	3.5	1900	RSB-25	1.8	3	51.2	197	460	99% Chebyshev (Mean, Sd) UCL	4.4	Maximum Result
Endrin	6	23	26	ug/kg	0.8	14	3.6	1900	RSB-28	1.8	3	50.8	197	460	99% Chebyshev (Mean, Sd) UCL	14	Maximum Result
Endrin aldehyde	2	23	9	ug/kg	3	4.9	3.5	1900	RSB-40	1.5	2.5	51.2	197	460	99% Chebyshev (Mean, Sd) UCL	4.9	Maximum Result
Endrin ketone	2	23	9	ug/kg	2.3	6.9	3.5	1900	RSB-40	1.5	2.5	51.3	197	460	99% Chebyshev (Mean, Sd) UCL	6.9	Maximum Result
gamma-BHC	6	23	26	ug/kg	1.2	420	1.8	98	RSB-27	1.8	3	29.5	89.7	216	99% Chebyshev (Mean, Sd) UCL	216	99% Chebyshev (Mean, Sd) UCL
gamma-Chlordane	11	23	48	ug/kg	0.77	83	1.9	960	RSB-26	1.8	3	30.6	99.8	238	99% Chebyshev (Mean, Sd) UCL	83	Maximum Result
Heptachlor	1	23	4	ug/kg	0.65	0.65	1.8	960	RSB-40	1.5	2.5	25.9	99.6	232	99% Chebyshev (Mean, Sd) UCL	0.65	Maximum Result
Heptachlor epoxide	1	23	4	ug/kg	2.8	2.8	1.8	960	RSB-26	1.8	3	26	99.5	232	99% Chebyshev (Mean, Sd) UCL	2.8	Maximum Result
Methoxychlor	1	23	4	ug/kg	7	7	18	9600	RSB-26	1.8	3	259	996	2320	99% Chebyshev (Mean, Sd) UCL	7	Maximum Result
Aroclor-1260	2	23	9	ug/kg	20	33	35	19000	RSB-34	2	3	511	1970	4600	99% Chebyshev (Mean, Sd) UCL	33	Maximum Result
SVOCs/VOCs																	
1,1-Dichloroethane	1	23	4	ug/kg	15	15	11	13	RSB-27	4.8	6	6.13	1.96	6.83	95% Student's-t UCL	6.83	95% Student's-t UCL
1,2-Dichlorobenzene	3	23	13	ug/kg	13	2200	11	13	RSB-01	5	6	102	457	1050	99% Chebyshev (Mean, Sd) UCL	1050	99% Chebyshev (Mean, Sd) UCL
1,3-Dichlorobenzene	1	23	4	ug/kg	2	2	11	13	RSB-01	5	6	5.57	0.83	5.86	95% Student's-t UCL	2	Maximum Result
1,4-Dichlorobenzene	2	23	9	ug/kg	2	300	11	13	RSB-01	5	6	18.4	61.4	74.2	95% Chebyshev (Mean, Sd) UCL	74.2	95% Chebyshev (Mean, Sd) UCL
2-Methylnaphthalene	7	23	30	ug/kg	77	4600	370	750	RSB-35	2	3	488	954	1360	95% Chebyshev (Mean, Sd) UCL	1360	95% Chebyshev (Mean, Sd) UCL
Acetophenone	2	23	9	ug/kg	280	420	350	750	RSB-34	2	3	214	61.8	236	95% Student's-t UCL	236	95% Student's-t UCL
Anthracene	1	23	4	ug/kg	81	81	350	1100	RSB-25	4.8	6	227	112	267	95% Student's-t UCL	81	Maximum Result
Benzo(a)anthracene	7	23	30	ug/kg	80	1200	350	1100	RSB-40	1.5	2.5	280	236	495	95% Chebyshev (Mean, Sd) UCL	495	95% Chebyshev (Mean, Sd) UCL
Benzo(a)pyrene	7	23	30	ug/kg	81	1400	350	1100	RSB-40	1.5	2.5	337	309	617	95% Chebyshev (Mean, Sd) UCL	617	95% Chebyshev (Mean, Sd) UCL
Benzo(b)fluoranthene	6	23	26	ug/kg	130	860	350	1100	RSB-40	1.5	2.5	303	218	501	95% Chebyshev (Mean, Sd) UCL	501	95% Chebyshev (Mean, Sd) UCL
Benzo(g,h,i)perylene	8	23	35	ug/kg	82	1200	350	1100	RSB-40	1.5	2.5	327	279	581	95% Chebyshev (Mean, Sd) UCL	581	95% Chebyshev (Mean, Sd) UCL
Benzo(k)fluoranthene	6	23	26	ug/kg	150	890	350	1100	RSB-40	1.5	2.5	303	211	495	95% Chebyshev (Mean, Sd) UCL	495	95% Chebyshev (Mean, Sd) UCL
Benzyl butyl phthalate	1	23	4	ug/kg	270	270	350	1100	RSB-37	5	6	234	108	273	95% Student's-t UCL	270	Maximum Result
bis(2-Ethylhexyl)phthalate	3	23	13	ug/kg	360	2300	350	1100	RSB-27	1.8	3	405	549	904	95% Chebyshev (Mean, Sd) UCL	904	95% Chebyshev (Mean, Sd) UCL
Caprolactam	1	23	4	ug/kg	230	230	350	1100	RSB-35	2	3	217	82.6	247	95% Student's-t UCL	230	Maximum Result
Chrysene	7	23	30	ug/kg	110	1500	350	1100	RSB-40	1.5	2.5	323	302	597	95% Chebyshev (Mean, Sd) UCL	597	95% Chebyshev (Mean, Sd) UCL
Dibenz(a,h)anthracene	4	23	17	ug/kg	100	370	350	1100	RSB-38	2	3	227	111	267	95% Student's-t UCL	267	95% Student's-t UCL
Fluoranthene	8	23	35	ug/kg	89	1800	350	1100	RSB-40	1.5	2.5	361	412	735	95% Chebyshev (Mean, Sd) UCL	735	95% Chebyshev (Mean, Sd) UCL
Indeno(1,2,3-c,d)pyrene	8	23	35	ug/kg	82	1100	350	1100	RSB-38	2	3	333	294	600	95% Chebyshev (Mean, Sd) UCL	600	95% Chebyshev (Mean, Sd) UCL
Naphthalene	4	23	17	ug/kg	81	600	350	750	RSB-35	2	3	214	97.2	249	95% Student's-t UCL	249	95% Student's-t UCL
Phenanthrene	7	23	30	ug/kg	78	550	350	1100	RSB-25	4.8	6	260	134	308	95% Student's-t UCL	308	95% Student's-t UCL
Pyrene	9	23	39	ug/kg	120	2900	350	1100	RSB-40	1.5	2.5	442	631	1020	95% Chebyshev (Mean, Sd) UCL	1020	95% Chebyshev (Mean, Sd) UCL
Acetone	11	23	48	ug/kg	24	150	11	78	RSB-41	2.1	3	41	39.3	60.5	95% Approximate Gamma UCL	60.5	95% Approximate Gamma UCL
Chlorobenzene	2	23	9	ug/kg	49	4700	11	13	RSB-01	5	6	212	978	2240	99% Chebyshev (Mean, Sd) UCL	2240	99% Chebyshev (Mean, Sd) UCL
cis-1,2-Dichloroethene	7	23	30	ug/kg	3	44	11	12	RSB-38	2	3	8.76	10.1	18	95% Chebyshev (Mean, Sd) UCL	18	95% Chebyshev (Mean, Sd) UCL

Table 1-1
AMCO Summary Statistics and Exposure Point Concentrations for 4 Soil Exposure Areas
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Number of Detects	Number of Analyses	Percent Detects	Units	Minimum Detected Value	Maximum Detected Value	Minimum Non-detected Value	Maximum Non-detected Value	Location of Maximum Detected Value	Upper Depth of Maximum Detected Value	Lower Depth of Maximum Detected Value	Arithmetic Mean Value	Standard Deviation	Exposure Point Concentration	EPC Basis	Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
Ethylbenzene	4	23	17	ug/kg	3	45	11	13	RSB-38	2	3	7.15	8.3	10.1	95% Student's-t UCL	10.1	95% Student's-t UCL
Isopropylbenzene (cumene)	1	23	4	ug/kg	430	430	11	13	RSB-38	2	3	24.2	88.5	105	95% Chebyshev (Mean, Sd) UCL	105	95% Chebyshev (Mean, Sd) UCL
Methyl ethyl ketone	6	23	26	ug/kg	6	41	11	13	RSB-41	2.1	3	9.83	8.93	17.9	95% Chebyshev (Mean, Sd) UCL	17.9	95% Chebyshev (Mean, Sd) UCL
Methyl isobutyl ketone	1	23	4	ug/kg	12	12	11	13	RSB-38	2	3	6.02	1.34	6.5	95% Student's-t UCL	6.5	95% Student's-t UCL
Methylcyclohexane	2	23	9	ug/kg	15	440	11	13	RSB-34	2	3	25	90.5	107	95% Chebyshev (Mean, Sd) UCL	107	95% Chebyshev (Mean, Sd) UCL
Methylene chloride	2	23	9	ug/kg	2	11	11	13	RSB-38	2	3	5.8	1.4	6.31	95% Student's-t UCL	6.31	95% Student's-t UCL
Tetrachloroethene	1	23	4	ug/kg	11	11	11	13	RSB-27	1.8	3	5.98	1.13	6.38	95% Student's-t UCL	6.38	95% Student's-t UCL
Toluene	1	23	4	ug/kg	170	170	11	13	RSB-38	2	3	12.9	34.2	44	95% Chebyshev (Mean, Sd) UCL	44	95% Chebyshev (Mean, Sd) UCL
Trichloroethene	3	23	13	ug/kg	3	4	11	13	RSB-26	1.8	3	5.48	0.79	5.76	95% Student's-t UCL	4	Maximum Result
Vinyl chloride	1	23	4	ug/kg	1	1	11	13	RSB-36	5	6	5.52	1.03	5.89	95% Student's-t UCL	1	Maximum Result
Xylenes, total	2	23	9	ug/kg	14	370	11	13	RSB-38	2	3	22	75.9	90.9	95% Chebyshev (Mean, Sd) UCL	90.9	95% Chebyshev (Mean, Sd) UCL
Small Vacant Lot - Shallow																	
Metals																	
Aluminum	2	2	100	mg/kg	7300	8020	NA	NA	RSB-30	2	3	NA	509	NA		8020	Maximum Result
Arsenic	2	2	100	mg/kg	6.6	14.2	NA	NA	RSB-30	2	3	NA	5.37	NA		14.2	Maximum Result
Barium	2	2	100	mg/kg	264	278	NA	NA	RSB-02	2	3	NA	9.9	NA		278	Maximum Result
Beryllium	2	2	100	mg/kg	0.23	0.29	NA	NA	RSB-02	2	3	NA	0.0424	NA		0.29	Maximum Result
Cadmium	2	2	100	mg/kg	1.5	2.1	NA	NA	RSB-30	2	3	NA	0.424	NA		2.1	Maximum Result
Chromium	2	2	100	mg/kg	33.5	33.5	NA	NA	RSB-02	2	3	NA	0	NA		33.5	Maximum Result
Cobalt	2	2	100	mg/kg	5.9	6.7	NA	NA	RSB-02	2	3	NA	0.566	NA		6.7	Maximum Result
Copper	2	2	100	mg/kg	65.3	95.8	NA	NA	RSB-02	2	3	NA	21.6	NA		95.8	Maximum Result
Iron	2	2	100	mg/kg	13900	16300	NA	NA	RSB-30	2	3	NA	1700	NA		16300	Maximum Result
Lead	2	2	100	mg/kg	300	386	NA	NA	RSB-02	2	3	NA	60.8	NA		386	Maximum Result
Manganese	2	2	100	mg/kg	240	312	NA	NA	RSB-30	2	3	NA	50.9	NA		312	Maximum Result
Nickel	2	2	100	mg/kg	22.7	23.8	NA	NA	RSB-30	2	3	NA	0.778	NA		23.8	Maximum Result
Selenium	2	2	100	mg/kg	1	1.2	NA	NA	RSB-30	2	3	NA	0.141	NA		1.2	Maximum Result
Silver	2	2	100	mg/kg	0.43	0.65	NA	NA	RSB-02	2	3	NA	0.156	NA		0.65	Maximum Result
Thallium	2	2	100	mg/kg	0.45	0.96	NA	NA	RSB-30	2	3	NA	0.361	NA		0.96	Maximum Result
Vanadium	2	2	100	mg/kg	24.1	26.5	NA	NA	RSB-30	2	3	NA	1.7	NA		26.5	Maximum Result
Zinc	2	2	100	mg/kg	565	736	NA	NA	RSB-30	2	3	NA	121	NA		736	Maximum Result
Pesticides/PCBs																	
4,4'-DDD	2	2	100	ug/kg	4.1	5.9	NA	NA	RSB-30	2	3	NA	1.27	NA		5.9	Maximum Result
4,4'-DDE	2	2	100	ug/kg	11	18	NA	NA	RSB-02	2	3	NA	4.95	NA		18	Maximum Result
4,4'-DDT	2	2	100	ug/kg	29	45	NA	NA	RSB-30	2	3	NA	11.3	NA		45	Maximum Result
alpha-Chlordane	1	2	50	ug/kg	8.2	8.2	2	2	RSB-02	2	3	NA	5.09	NA		8.2	Maximum Result
Dieldrin	1	2	50	ug/kg	1.3	1.3	1.5	1.5	RSB-02	2	3	NA	0.389	NA		1.3	Maximum Result
gamma-Chlordane	2	2	100	ug/kg	0.65	5.9	NA	NA	RSB-02	2	3	NA	3.71	NA		5.9	Maximum Result

Table 1-2
Soil Exposure Assumptions
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Parameter		Units	Reasonable Maximum Exposure (RME) Scenario: Occupational Worker		Construction Worker		Residential Adult		Residential Child		Intake Equation
Incidental Ingestion of Soil											
Concentration in Soil	C_s	mg/kg	Chemical specific		Chemical specific		Chemical specific		Chemical specific		
Ingestion Rate	IngR	mg/day	100	EPA, 1989	330	EPA, 1989	100	EPA, 1989	200	EPA, 1989	
Exposure Frequency	EF	days/yr	250	EPA, 1989	250	EPA, 1989	350	EPA, 1989	350	EPA, 1989	$\frac{Cs \times IngR \times EF \times ED \times CF}{BW \times AT}$
Exposure Duration	ED	years	25	EPA, 1989	1	EPA, 1989	24	EPA, 1989	6	EPA, 1989	
Conversion Factor	CF	kg/mg	1.00E-06		1.00E-06		1.00E-06		1.00E-06		
Body Weight	BW	kg	70	EPA, 1989	70	EPA, 1989	70	EPA, 1989	15	EPA, 1989	
Averaging Time for carcinogens	AT_C	days	25,550	EPA, 1989	25,550	EPA, 1989	25,550	EPA, 1989	25,550	EPA, 1989	
Averaging Time for noncarcinogens	AT_{NC}	days	9,125	EPA, 1989	365	EPA, 1989	8,760	EPA, 1989	2,190	EPA, 1989	
Inhalation of Particulates											
Concentration in Soil	C_s	mg/kg	Chemical specific		Chemical specific		Chemical specific		Chemical specific		
Inhalation Rate	InhR	m^3/day	20	EPA, 1989	20	EPA, 1989	20	EPA, 1989	10	EPA, 1989	
Exposure Frequency	EF	days/yr	250	EPA, 1989	250	EPA, 1989	350	EPA, 1989	350	EPA, 1989	$\frac{Cs \times InhR \times EF \times ED \times \left[\left(1/PEF\right)+\left(1/VF\right)\right]}{BW \times AT}$
Exposure Duration	ED	years	25	EPA, 1989	1	EPA, 1989	24	EPA, 1989	6	EPA, 1989	
1/Particulate Emission Factor	1/PEF	kg/m^3	7.60E-10	EPA, 1996	7.60E-10	EPA, 1996	7.60E-10	EPA, 1996	7.60E-10	EPA, 1996	
1/Volatilization Factor	1/VF	kg/m^3	Chemical specific	EPA, 2004	Chemical specific	EPA, 2004	Chemical specific	EPA, 2004	Chemical specific	EPA, 2004	
Body Weight	BW	kg	70	EPA, 1989	70	EPA, 1989	70	EPA, 1989	15	EPA, 1989	
Averaging Time for carcinogens	AT_C	days	25,550	EPA, 1989	25,550	EPA, 1989	25,550	EPA, 1989	25,550	EPA, 1989	
Averaging Time for noncarcinogens	AT_{NC}	days	9,125	EPA, 1989	365	EPA, 1989	8,760	EPA, 1989	2,190	EPA, 1989	
Dermal Contact with Soil											
Concentration in Soil	C_s	mg/kg	Chemical specific		Chemical specific		Chemical specific		Chemical specific		
Exposure Frequency	EF	days/yr	250	EPA, 1989	250	EPA, 1989	350	EPA, 1989	350	EPA, 1989	
Exposure Duration	ED	years	25	EPA, 1989	1	EPA, 1989	24	EPA, 1989	6	EPA, 1989	$\frac{Cs \times SA \times EF \times ED \times AF \times ABS \times CF}{BW \times AT}$
Skin Surface Area	SA	cm^2	5700	CalEPA, 2005	5700	CALEPA, 2005	5700	CalEPA, 2005	2900	CalEPA, 2005	
Soil-Skin Adherence Factor	AF	mg/cm^2/day	0.2	CalEPA, 2005	0.8	CALEPA, 2005	0.07	CalEPA, 2005	0.2	CalEPA, 2005	
Absorption Factor	ABS	unitless	Chemical specific	CalEPA, 2005	Chemical specific	CalEPA, 2005	Chemical specific	CalEPA, 2005	Chemical specific	CalEPA, 2005	
Conversion Factor	CF	kg/mg	1.00E-06		1.00E-06		1.00E-06		1.00E-06		
Body Weight	BW	kg	70	EPA, 1989	70	EPA, 1989	70	EPA, 1989	15	EPA, 1989	
Averaging Time for carcinogens	AT_C	days	25,550	EPA, 1989	25,550	EPA, 1989	25,550	EPA, 1989	25,550	EPA, 1989	
Averaging Time for noncarcinogens	ATnc	days	9,125	EPA, 1989	365	EPA, 1989	8,760	EPA, 1989	2,190	EPA, 1989	

Notes:
AT_C = 70 years x 365 days/year
AT_{NC} = ED (years) x 365 days/year
PEF = 1.32E-09 m^3/kg
RME = reasonable maximum exposure.
EPA, 1989: Risk Assessment Guidance for Superfund (RAGS) Volume I Human Health Evaluation Manual Part A.
EPA, 1996: Soil Screening Guidance.
EPA, 2004: User's Guide and Background Technical Document for Preliminary Remediation Goals (PRG). Region 9. October.
CalEPA, DTSC, HERD, 2005: Recommended DTSC Default Exposure Factors for Use in Risk Assessment at California Military Facilities.

Table 1-3
Cancer and Noncancer Toxicity Values for COPCs
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Oral RfD (mg/kg-day)	References	REL or Reference Conc (mg/m^3)	Inhalation RFD (mg/kg-day)	References	Primary Target Organ/Efftect	Uncertainty/ Modifying Factors	Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References	Inhalation Unit Risk $(mg/m^3)^{-1}$	Inhalation Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References
Aluminum	1	PPRTV	--	0.0014	PPRTV	NA	--	--	--	--	--	--
Antimony	0.0004	IRIS	--	--	--	Blood (glucose), Mortality	--	--	--	--	--	--
Arsenic	0.0003	IRIS	--	--	--	Skin, Circulatory System	--	1.5	IRIS	0.0043	15.1	IRIS
Arsenic	--	--	0.03	0.000009	OEHHA	--	--	9.5	OEHHA	0.0033	11.6	OEHHA
Barium	0.07	IRIS	--	0.00014	HEAST	Kidney	--	--	--	--	--	--
Beryllium	0.002	IRIS	--	0.000006	IRIS	GI (Small intestinal lesions)	--	--	--	--	8.4	IRIS
Beryllium	--	--	0.07	0.00002	OEHHA	--	--	--	--	0.0024	8.4	OEHHA
Boron	0.2	IRIS	--	0.0057	HEAST	Testes	--	--	--	--	--	--
Cadmium	0.0005	IRIS	--	--	--	Kidney	--	--	--	--	6.3	IRIS
Cadmium	0.000011	OEHHA*	0.02	0.000006	OEHHA	--	--	0.38	OEHHA	0.0042	14.7	OEHHA
Chromium	--	--	--	--	--	--	--	--	--	--	42	IRIS
Hexavalent Chromium	0.003	IRIS	--	0.0000022	IRIS	NOAEL	--	--	--	--	290	IRIS
Cobalt	0.02	PPRTV	--	0.0000057	PPRTV	Circulatory	--	--	--	--	9.8	PPRTV
Copper	0.04	HEAST	--	--	--	GI	--	--	--	--	--	--
Iron	0.3	NCEA	--	--	--	NA	--	--	--	--	--	--
Lead	--	--	--	--	--	--	--	--	--	--	--	--
Manganese	0.024	IRIS	--	0.000014	IRIS	CNS	--	--	--	--	--	--
Manganese	0.03	OEHHA*	0.2	0.000057	OEHHA	--	--	--	--	--	--	--
Mercury	0.0003	IRIS	--	--	--	CNS	--	--	--	--	--	--
Molybdenum	0.005	IRIS	--	--	--	Kidney	--	--	--	--	--	--
Nickel	0.02	IRIS	--	--	--	Whole body	--	--	--	--	--	--
Nickel	0.011	OEHHA*	0.05	0.000014	OEHHA	--	--	--	--	0.00026	0.91	OEHHA
Selenium	0.005	IRIS	20	0.0057	OEHHA	Respiratory system - selenosis	--	--	--	--	--	--
Silver	0.005	IRIS	--	--	--	Skin	--	--	--	--	--	--
Thallium	0.000066	IRIS	--	--	--	NA	3000/1	--	--	--	--	--
Vanadium	0.001	NCEA	--	--	--	NA	--	--	--	--	--	--
Zinc	0.3	IRIS	--	--	--	Red blood cells	--	--	--	--	--	--
Cyanide	0.02	IRIS	--	--	--	Weight loss, thyroid effects and myelin degeneration	100/5	--	--	--	--	--
4,4'-DDD	--	--	--	--	--	--	--	0.24	IRIS	0.000069	0.24	OEHHA/ Route Extrapolation
4,4'-DDE	--	--	--	--	--	--	--	0.34	IRIS	0.000097	0.34	OEHHA/ Route Extrapolation
4,4'-DDT	0.0005	IRIS	--	0.0005	Route Extrapolation	Liver	--	0.34	IRIS	0.000097	0.34	IRIS
Aldrin	0.00003	IRIS	--	0.00003	Route Extrapolation	Liver	1000/1	17	IRIS	0.0049	17.2	IRIS/OEHHA
alpha-BHC	0.0005	NCEA	--	0.0005	Route Extrapolation	NA	NA	6.3	IRIS	--	6.3	IRIS
alpha-BHC	--	--	--	--	--	--	NA	2.7	OEHHA	0.00077	2.7	OEHHA
alpha-Chlordane	0.0005	IRIS	--	0.0002	IRIS	Liver	300/1	0.35	IRIS	--	0.35	IRIS
alpha-Chlordane	0.000033	OEHHA*	--	--	--	--	300/1	1.2	OEHHA	0.00034	1.2	OEHHA
beta-BHC	--	--	--	--	--	--	NA	1.8	OEHHA	--	1.8	OEHHA
beta-BHC	--	--	--	--	--	--	NA	1.5	OEHHA	0.00043	1.5	OEHHA
delta-BHC	--	--	--	--	--	--	NA	--	--	--	--	--
Diazinon	0.0009	HEAST	--	0.0009	Route Extrapolation	Liver	--	--	--	--	--	--

Table 1-3
Cancer and Noncancer Toxicity Values for COPCs
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Oral RfD (mg/kg-day)	References	REL or Reference Conc (mg/m^3)	Inhalation RFD (mg/kg-day)	References	Primary Target Organ/Efftect	Uncertainty/ Modifying Factors	Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References	Inhalation Unit Risk $(mg/m^3)^{-1}$	Inhalation Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References
Dieldrin	0.00005	IRIS	--	0.00005	Route Extrapolation	Liver	100/1	16	IRIS	0.0046	16.1	IRIS
Endosulfan I	0.006	IRIS	--	0.006	Route Extrapolation	Reduced body weight	100/1	--	--	--	--	--
Endosulfan II	0.006	IRIS	--	0.006	Route Extrapolation	Reduced body weight	100/1	--	--	--	--	--
Endosulfan sulfate	0.006	IRIS	--	0.006	Route Extrapolation	Reduced body weight	100/1	--	--	--	--	--
Endrin	0.0003	IRIS	--	0.0003	Route Extrapolation	Liver	100/1	--	--	--	--	--
Endrin aldehyde	0.0003	IRIS	--	0.0003	Route Extrapolation	Liver	100/1	--	--	--	--	--
Endrin ketone	0.0003	IRIS	--	0.0003	Route Extrapolation	Liver	100/1	--	--	--	--	--
gamma-BHC	0.0003	IRIS	--	0.0003	Route Extrapolation	Liver	1000/1	1.3	HEAST	--	1.3	Route Extrapolation
gamma-BHC	--	--	--	--	--	--	1000/1	1.1	OEHHA	0.00031	1.1	OEHHA
gamma-Chlordane	0.0005	IRIS	--	0.0002	IRIS	Liver	300/1	0.35	IRIS	--	0.35	IRIS
gamma-Chlordane	0.000033	OEHHA*	--	--	--	--	300/1	1.2	OEHHA	0.00034	1.2	OEHHA
Heptachlor	0.0005	IRIS	--	0.0005	Route Extrapolation	Liver	300/1	4.5	IRIS	--	4.55	IRIS
Heptachlor	0.00003	OEHHA*	--	--	--	--	300/1	4.1	OEHHA	--	4.1	OEHHA
Heptachlor epoxide	0.000013	IRIS	--	0.000013	Route Extrapolation	Liver	1000/1	9.1	IRIS	--	9.1	IRIS
Heptachlor epoxide	0.000013	OEHHA*	--	--	--	--	1000/1	5.5	OEHHA	--	5.5	OEHHA
Methoxychlor	0.005	IRIS	--	0.005	Route Extrapolation	Reproductive	1000/1	--	--	--	--	--
Methoxychlor	0.00002	OEHHA*		0.00002	Route Extrapolation							
Toxaphene	--	--	--	--	--	--	NA	1.1	IRIS	--	1.1	IRIS
Toxaphene	--	--	--	--	--	--	NA	1.2	OEHHA	0.00034	1.2	OEHHA
Aroclor-1016	0.00007	IRIS	--	0.00007	Route Extrapolation	Reduced birth weight	100/1	0.07	IRIS	--	0.07	IRIS
Aroclor-1221	0.00002	Surrogate	--	0.00002	Surrogate	--	--	2	IRIS	--	2	IRIS
Aroclor-1232	0.00002	Surrogate	--	0.00002	Surrogate	--	--	2	IRIS	--	2	IRIS
Aroclor-1242	0.00002	Surrogate	--	0.00002	Surrogate	--	--	2	IRIS	--	2	IRIS
Aroclor-1248	0.00002	Surrogate	--	0.00002	Surrogate	--	--	2	IRIS	--	2	IRIS
Aroclor-1254	0.00002	IRIS	--	0.00002	Route Extrapolation	Eyes	300/1	2	IRIS	--	2	IRIS
Aroclor-1260	0.00002	Surrogate	--	0.00002	Surrogate	Eyes	300/1	2	IRIS	--	2	IRIS
1,2,4,5-Tetrachlorobenzene	0.0003	IRIS	--	0.0003	Route Extrapolation	--	--	--	--	--	--	--
2,4,5-Trichlorophenol	0.1	IRIS	--	0.1	Route Extrapolation	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	0.0001	NCEA	--	0.0001	Route Extrapolation	--	--	0.011	IRIS	--	0.011	IRIS
2,4,6-Trichlorophenol	--	--	--	--	--	--	--	0.07	OEHHA	0.00002	0.07	OEHHA
2,2-Dichloropropane	--	--	--	--	--	--	--	--	--	--	--	--
2,4-Dichlorophenol	0.003	IRIS	--	0.003	Route Extrapolation	Decreased delayed hypersensitivity response	100/1	--	--	--	--	--
2,4-Dimethylphenol	0.02	IRIS	--	0.02	Route Extrapolation	Clinical signs (lethargy, prostration, ataxia) and hematological changes	3000/1	--	--	--	--	--
2,4-Dinitrophenol	0.002	IRIS	--	0.002	Route Extrapolation	Cataract formation	1000/1	--	--	--	--	--
2,4-Dinitrotoluene	0.002	IRIS	--	0.002	Route Extrapolation	Neurotoxicity, Heinz bodies and biliary tract hyperplasia	100/1	0.68	IRIS	--	0.68	Route Extrapolation

Table 1-3
Cancer and Noncancer Toxicity Values for COPCs
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Chemical of Potential Concern	Oral RfD (mg/kg-day)	References	REL or Reference Conc (mg/m^3)	Inhalation RFD (mg/kg-day)	References	Primary Target Organ/Efftect	Uncertainty/ Modifying Factors	Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References	Inhalation Unit Risk $(mg/m^3)^{-1}$	Inhalation Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References
2,4-Dinitrotoluene	--	--	--	--	--	--	100/1	0.31	OEHHA	0.000089	0.31	OEHHA
2,6-Dinitrotoluene	0.001	HEAST	--	0.001	Route Extrapolation	--	--	0.68	IRIS	--	0.68	Route Extrapolation
2-Chloronaphthalene	0.08	IRIS	--	0.08	Route Extrapolation	Dyspnea, abnormal appearance, liver enlargement	3000/1	--	--	--	--	--
2-Chlorophenol	0.005	IRIS	--	0.005	Route Extrapolation	Reproductive effects	1000/1	--	--	--	--	--
2-Chlorotoluene	0.02	IRIS	--	2.0E-02	Route Extrapolation	Decrease in body weight gain	1000/1	--	--	--	--	--
2-Methylnaphthalene	0.004	IRIS	--	--	--	Pulmonary alveolar proteinosis	1000/1	--	--	--	--	--
2-Methylphenol	0.05	IRIS	--	0.05	Route Extrapolation	Decreased body weight & Neurotoxicity	1000/1	--	--	--	--	--
2-Nitroaniline	0.003	PPRTV	--	0.00003	PPRTV	NA	--	--	--	--	--	--
2-Nitrophenol	--	--	--	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	--	--	--	--	--	--	--	0.45	IRIS	--	0.45	Route Extrapolation
3,3'-Dichlorobenzidine	--	--	--	--	--	--	--	1.2	OEHHA	0.00034	1.2	OEHHA
3,4-Methylphenol	0.05	IRIS	--	0.05	Route Extrapolation	Decreased body weights and neurotoxicity	1000/1	--	--	--	--	--
3-Nitroaniline	0.0003	PPRTV	--	0.0003	PPRTV	--	--	0.021	PPRTV	--	0.021	Route Extrapolation
4,6-Dinitro-2-methylphenol	0.0001	PPRTV	--	0.0001	Route Extrapolation	--	--	--	--	--	--	--
4-Bromophenylphenyl ether	--	--	--	--	--	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	--	--	--	--	--	--	--	--	--	--	--	--
4-Chloroaniline	0.004	IRIS	--	0.004	Route Extrapolation	Nonneoplastic lesions of splenic capsule	3000/1	--	--	--	--	--
4-Chlorophenylphenyl ether	--	--	--	--	--	--	--	--	--	--	--	--
4-Methylphenol	0.005	HEAST	--	0.005	Route Extrapolation	--	--	--	--	--	--	--
4-Nitroaniline	0.003	PPRTV	--	0.001	PPRTV	--	--	0.021	PPRTV	--	0.021	Route Extrapolation
4-Nitrophenol	0.008	R9	--	--	--	--	--	--	--	--	--	--
Acenaphthene	0.06	IRIS	--	0.06	Route Extrapolation	Hepatotoxicity	3000/1	--	--	--	--	--
Acenaphthylene	--	--	--	--	--	--	--	--	--	--	--	--
Acetophenone	0.1	IRIS	--	--	--	General toxicity	3000/1	--	--	--	--	--
Anthracene	0.3	IRIS	--	0.3	Route Extrapolation	No observed effects	3000/1	--	--	--	--	--
Atrazine	0.035	IRIS	--	0.035	Route Extrapolation	Decreased body weight gain	100/1	0.222	HEAST	--	0.222	Route Extrapolation
Atrazine	--	--	--	--	--	--	100/1	0.23	OEHHA	--	--	--
Benzaldehyde	0.1	IRIS	--	0.1	Route Extrapolation	Forestomach lesions, kidney toxicity	1000/1	--	--	--	--	--
Benzo(a)anthracene	--	--	--	--	--	--	--	0.73	NCEA	--	0.73	Route Extrapolation
Benzo(a)anthracene	--	--	--	--	--	--	--	1.2	OEHHA	0.00011	0.39	OEHHA
Benzo(a)pyrene	--	--	--	--	--	--	--	7.3	IRIS	--	7.3	Route Extrapolation
Benzo(a)pyrene	--	--	--	--	--	--	--	12	OEHHA	0.0011	3.85	OEHHA

Table 1-3
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Chemical of Potential Concern	Oral RfD (mg/kg-day)	References	REL or Reference Conc (mg/m^3)	Inhalation RFD (mg/kg-day)	References	Primary Target Organ/Efftect	Uncertainty/ Modifying Factors	Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References	Inhalation Unit Risk $(mg/m^3)^{-1}$	Inhalation Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References
Benzo(b)fluoranthene	--	--	--	--	--	--	--	0.73	NCEA	--	0.73	Route Extrapolation
Benzo(b)fluoranthene	--	--	--	--	--	--	--	1.2	OEHHA	0.00011	0.39	OEHHA
Benzo(g,h,i)perylene	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	--	--	--	--	--	--	--	0.073	NCEA	--	0.073	Route Extrapolation
Benzo(k)fluoranthene	--	--	--	--	--	--	--	1.2	OEHHA	0.00011	0.39	OEHHA
Benzyl butyl phthalate	0.2	IRIS	--	0.2	Route Extrapolation	Significantly increased liver-to-body weight and liver-to-brain weight ratios	1000/1	--	--	--	--	--
Biphenyl (diphenyl)	0.05	IRIS	--	0.05	Route Extrapolation	Kidney damage	100/10	--	--	--	--	--
bis(2-Chloroethoxy)methane	--	--	--	--	--	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	--	--	--	--	--	--	--	1.1	IRIS	--	1.1	IRIS
bis(2-Chloroethyl)ether	--	--	--	--	--	--	--	2.5	OEHHA	0.00071	2.5	OEHHA
bis(2-Ethylhexyl)phthalate	0.02	IRIS	--	0.02	Route Extrapolation	Increased relative liver weight	1000/1	0.014	IRIS	--	0.014	Route Extrapolation
bis(2-Ethylhexyl)phthalate	--	--	--	--	--	--	1000/1	0.003	OEHHA	0.0000024	0.0084	OEHHA
Caprolactam	0.5	IRIS	--	0.5	Route Extrapolation	Reduced offspring body weight	100/1	--	--	--	--	--
Carbazole	--	--	--	--	--	--	--	0.02	HEAST	--	0.02	Route Extrapolation
Chrysene	--	--	--	--	--	--	--	0.0073	NCEA	--	0.0073	Route Extrapolation
Chrysene	--	--	--	--	--	--	--	0.12	OEHHA	0.000011	0.039	OEHHA
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	7.3	NCEA	--	7.3	Route Extrapolation
Dibenz(a,h)anthracene	--	--	--	--	--	--	--	4.1	OEHHA	0.0012	4.2	OEHHA
Dibenzofuran	0.002	NCEA	--	0.002	Route Extrapolation	--	--	--	--	--	--	--
Diethylphthalate	0.8	IRIS	--	0.8	Route Extrapolation	Decreased growth rate, food consumption and altered organ weights	1000/1	--	--	--	--	--
Dimethylphthalate	10	HEAST	--	10	Route Extrapolation	--	--	--	--	--	--	--
Di-n-butyl phthalate	0.1	IRIS	--	0.1	Route Extrapolation	Increased mortality	1000/1	--	--	--	--	--
Di-n-octyl phthalate	0.04	PPRTV	--	0.04	Route Extrapolation	--	--	--	--	--	--	--
Fluoranthene	0.04	IRIS	--	0.04	Route Extrapolation	Kidney, Liver, Circulatory	3000/1	--	--	--	--	--
Fluorene	0.04	IRIS	--	0.04	Route Extrapolation	Kidney, Liver, Circulatory	3000/1	--	--	--	--	--
Hexachlorobenzene	0.0008	IRIS	--	0.0008	Route Extrapolation	Liver effects	100/1	1.6	IRIS	--	1.6	IRIS
Hexachlorobenzene	--	--	--	--	--	--	100/1	1.8	OEHHA	0.00051	1.8	OEHHA
Hexachlorobutadiene	0.0003	NCEA	--	0.0003	Route Extrapolation	--	--	0.078	IRIS	--	0.078	IRIS
Hexachlorocyclopentadiene	0.006	IRIS	--	0.000057	IRIS	Chronic irritation	1000/1	--	--	--	--	--
Hexachloroethane	0.001	IRIS	--	0.001	Route Extrapolation	Atrophy and degeneration of the renal tubules	1000/1	0.014	IRIS	--	0.014	IRIS
Hexachloroethane	--	--	--	--	--	--	1000/1	0.039	OEHHA	0.00011	0.39	OEHHA
Indeno(1,2,3-c,d)pyrene	--	--	--	--	--	--	--	0.73	NCEA	--	0.73	Route Extrapolation
Indeno(1,2,3-c,d)pyrene	--	--	--	--	--	--	--	0.039	OEHHA	0.00011	0.39	OEHHA

Table 1-3
Cancer and Noncancer Toxicity Values for COPCs
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Oral RfD (mg/kg-day)	References	REL or Reference Conc (mg/m^3)	Inhalation RFD (mg/kg-day)	References	Primary Target Organ/Efftect	Uncertainty/ Modifying Factors	Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References	Inhalation Unit Risk $(mg/m^3)^{-1}$	Inhalation Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References
Isophorone	0.2	IRIS	--	0.2	Route Extrapolation	No observed effects	1000/1	0.00095	IRIS	--	0.00095	Route Extrapolation
p-Cymene (p-Isopropyltoluene)	--	--	--	--	--	--	--	--	--	--	--	--
Naphthalene	0.02	IRIS	--	0.00086	IRIS	Decreased body weight	3000/1	--	--	--	--	--
Naphthalene	--	--	9	0.0026	OEHHA	--	3000/1	0.12	OEHHA	0.000034	0.12	OEHHA
Nitrobenzene	0.0005	IRIS	--	0.00057	HEAST	Hematologic, adrenal, renal and hepatic lesions	10000/1	--	--	--	--	--
N-Nitrosodi-n-propylamine	--	--	--	--	--	--	--	7	IRIS	0.002	7	OEHHA
N-Nitrosodiphenylamine	0.02	PPRTV	--	0.02	PPRTV	--	--	0.0049	IRIS	--	0.0049	Route Extrapolation
N-Nitrosodiphenylamine	--	--	--	--	--	--	--	0.009	OEHHA	0.0000026	0.009	OEHHA
Pentachlorophenol	0.03	IRIS	--	0.03	Route Extrapolation	Liver and kidney pathology	100/1	0.12	IRIS	--	0.12	Route Extrapolation
Pentachlorophenol	0.003	OEHHA*	--	--	--	--	--	0.081	OEHHA	0.0000046	0.016	OEHHA
Phenanthrene	--	--	--	--	--	--	--	--	--	--	--	--
Phenol	0.3	IRIS	--	0.3	Route Extrapolation	Decreased maternal weight gain	300/1	--	--	--	--	--
Phenol	--	--	200	0.057	OEHHA	--	300/1	--	--	--	--	--
n-Propylbenzene	0.04	NCEA	--	0.04	Route Extrapolation	--	--	--	--	--	--	--
Pyrene	0.03	IRIS	--	0.03	Route Extrapolation	tubular pathology,	3000/1	--	--	--	--	--
1,1,1-Trichloroethane	0.28	NCEA	--	0.63	PPRTV	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	0.06	PPRTV	--	0.06	Route Extrapolation	--	--	0.2	IRIS	--	0.2	IRIS
1,1,2,2-Tetrachloroethane	--	--	--	--	--	--	--	0.27	OEHHA	0.000058	0.2	OEHHA
1,1,2-Trichloroethane	0.004	IRIS	--	0.004	Route Extrapolation	chemistry	1000/1	0.057	IRIS	--	0.056	IRIS
1,1,2-Trichloroethane	--	--	--	--	--	--	1000/1	0.072	OEHHA	0.000016	0.056	OEHHA
1,1-Dichloroethane	0.1	HEAST	--	0.14	HEAST	--	--	0.0057	OEHHA	0.0000016	0.0056	OEHHA
1,1-Dichloroethene	0.02	IRIS	--	0.057	IRIS	--	--	0.091	IRIS	--	0.091	IRIS
1,1-Dichloroethene	--	--	70	0.02	OEHHA	--	--	--	--	--	--	--
1,2,3-Trichlorobenzene	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	0.01	IRIS	--	0.001	PPRTV	Increased adrenal weights; vacuolization of zona fasciculata in the cortex	1000/1	0.0036	OEHHA	--	--	--
1,2,4-Trimethylbenzene	0.05	PPRTV	--	0.0017	PPRTV	NA	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane	0.000057	Route Extrapolation	--	0.000057	IRIS	--	--	1.4	HEAST	--	0.0024	withdrawn
1,2-Dibromo-3-chloropropane	--	--	--	--	--	--	--	7	OEHHA	0.0019	6.7	OEHHA
1,2-Dibromoethane	0.009	IRIS	--	0.0026	IRIS	liver peliosis, and	3000/1	2	IRIS	--	2	IRIS
1,2-Dibromoethane	--	--	--	--	--	--	3000/1	3.6	OEHHA	0.000071	0.25	OEHHA
1,2-Dichlorobenzene	0.09	IRIS	--	0.057	HEAST	observed	1000/1	--	--	--	--	--
1,2-Dichloroethane	0.02	NCEA	--	0.0014	NCEA	--	--	0.091	IRIS	--	0.091	IRIS
1,2-Dichloroethane	--	--	--	--	--	--	--	0.047	OEHHA	0.000021	0.074	OEHHA
1,2-Dichloropropane	0.0011	Route Extrapolation	--	0.0011	IRIS	--	--	0.068	HEAST	--	0.068	Route Extrapolation
1,2-Dichloropropane	--	--	--	--	--	--	--	0.036	OEHHA	0.00001	0.035	OEHHA
1,3-Butadiene	0.00057	Route Extrapolation	--	0.00057	IRIS	--	--	0.11	Route Extrapolation	--	0.11	IRIS

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Chemical of Potential Concern	Oral RfD (mg/kg-day)	References	REL or Reference Conc (mg/m^3)	Inhalation RFD (mg/kg-day)	References	Primary Target Organ/Efftect	Uncertainty/ Modifying Factors	Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References	Inhalation Unit Risk $(mg/m^3)^{-1}$	Inhalation Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	References
1,3-Butadiene			20	0.0057	OEHHA	--	--	3.4	OEHHA	0.00017	0.6	OEHHA
1,3-Dichlorobenzene	0.03	NCEA	--	0.03	Route Extrapolation	--	--	--	--	--	--	--
1,3,5-Trimethylbenzene	0.05	PPRTV	--	0.0017	PPRTV	NA	--	--	--	--	--	--
1,4-Dichlorobenzene	0.03	NCEA	--	0.23	IRIS	--	--	0.024	HEAST	--	0.022	NCEA
1,4-Dichlorobenzene	--	--	800	0.23	OEHHA	--	--	0.0054	OEHHA	0.000011	0.04	OEHHA
1,4-Dioxane (p-dioxane)	--	--	--	--	--	--	--	0.011	IRIS	--	0.011	Route Extrapolation
1,4-Dioxane (p-dioxane)	--	--	3000	0.86	OEHHA	--	--	0.027	OEHHA	0.0000077	0.027	OEHHA
2-Hexanone	--	--	--	--	--	--	--	--	--	--	--	--
Acetone	0.9	IRIS	--	0.9	Route Extrapolation	Nephropathy	1000/1	--	--	--	--	--
Benzene	0.004	IRIS	30	0.0086	IRIS	Immune system (decreased lymphocyte count)	300/1	0.055	IRIS	0.0000078	0.0273	IRIS
Benzene	--	--	60	0.017	OEHHA	--	300/1	0.1	OEHHA	0.000029	0.1	OEHHA
Bromodichloromethane	0.02	IRIS	--	0.02	Route Extrapolation	Renal cytomegaly	1000/1	0.062	IRIS	--	0.062	Route Extrapolation
Bromodichloromethane	--	--	--	--	--	--	1000/1	0.13	OEHHA	0.000037	0.1	OEHHA
Bromoform	0.02	IRIS	--	0.02	Route Extrapolation	Hepatic lesions	1000/1	0.0079	IRIS	--	0.00385	IRIS
Bromomethane	0.0014	IRIS	--	0.0014	IRIS	Epithelial hyperplasia of the forestomach	1000/1	--	--	--	--	--
Carbon disulfide	0.1	IRIS	--	0.2	IRIS	Fetal toxicity/ malformations	100/1	--	--	--	--	--
Carbon disulfide	--	--	800	0.23	OEHHA	--	100/1	--	--	--	--	--
Carbon tetrachloride	0.0007	IRIS	--	0.0007	Route Extrapolation	Liver lesions	1000/1	0.13	IRIS	--	0.0525	IRIS
Carbon tetrachloride	--	--	40	0.011	OEHHA	--	1000/1	0.15	OEHHA	0.000042	0.15	OEHHA
Chlorobenzene	0.02	IRIS	--	0.017	NCEA	Histopathologic changes in liver	1000/1	--	--	--	--	--
Chlorobenzene	--	--	1000	0.29	OEHHA	--	1000/1	--	--	--	--	--
Chloroethane	0.4	NCEA	--	2.86	IRIS	--	--	0.0029	NCEA	--	0.0029	Route Extrapolation
Chloroform	0.01	IRIS	--	0.014	NCEA	Moderate/marked fatty cyst formation in the liver and elevated SGPT	100/1	--	--	--	0.081	IRIS
Chloroform	--	--	300	0.086	OEHHA	--	100/1	0.031	OEHHA	0.0000053	0.019	OEHHA
Chloromethane	0.026	Route Extrapolation	--	0.026	IRIS	Brain (cerebellar lesions)	1000/1	--	--	--	--	--
cis-1,2-Dichloroethene	0.01	PPRTV	--	0.01	Route Extrapolation	Decreased hematocrit and hemoglobin (Blood)	--	--	--	--	--	--
cis-1,3-Dichloropropene	0.03	IRIS	--	0.0057	IRIS	Chronic irritation	100/1	0.1	IRIS	--	0.014	IRIS
cis-1,3-Dichloropropene	--	--	--	--	--	--	100/1	0.091	OEHHA	0.000016	0.056	OEHHA
Cyclohexane	1.7	Route Extrapolation	--	1.7	IRIS	--	--	--	--	--	--	--
Dibromochloromethane	0.02	IRIS	--	0.02	Route Extrapolation	Hepatic lesions	1000/1	0.084	IRIS	--	0.084	Route Extrapolation
Dibromochloromethane	--	--	--	--	--	--	1000/1	0.094	OEHHA	0.000027	0.095	OEHHA
Ethyl tertiary butyl ether	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	0.1	IRIS	--	0.29	IRIS	Liver and kidney toxicity	1000/1	--	--	--	--	--
Ethylbenzene	--	--	2000	0.57	OEHHA	--	1000/1	--	--	--	--	--

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Freon 11	0.3	IRIS	--	0.2	HEAST	Survival and histopathology	1000/1	--	--	--	--	--
Freon 113	30	IRIS	--	8.57	HEAST	Psychomotor impairment	10/1	--	--	--	--	--
Freon 12	0.2	IRIS	--	0.057	HEAST	Reduced body weight	100/1	--	--	--	--	--
Isopropylbenzene (cumene)	0.1	IRIS	--	0.11	IRIS	Increased kidney weights in female rats and adrenal weights in male and female rats	1000/1	--	--	--	--	--
Isopropyl ether	--	--	--	--	--	--	--	--	--	--	--	--
Methyl acetate	1	HEAST	--	1	Route Extrapolation	--	--	--	--	--	--	--
Methyl ethyl ketone	0.6	IRIS	--	1.4	IRIS	Decreased pup body weight	1000/1	--	--	--	--	--
Methyl isobutyl ketone	0.08	HEAST	--	0.86	IRIS	--	--	--	--	--	--	--
Methyl tert-butyl ether	0.857	Route Extrapolation	--	0.86	IRIS	--	--	--	--	--	--	--
Methyl tert-butyl ether	--	--	8000	2.3	OEHHA	--	--	0.0018	OEHHA	0.00000026	0.00091	OEHHA
Methylcyclohexane	0.86	Route Extrapolation	--	0.86	HEAST	--	--	--	--	--	--	--
Methylene chloride	0.06	IRIS	--	0.86	HEAST	Liver toxicity	100/1	0.0075	IRIS	--	0.0016	IRIS
Methylene chloride	--	--	400	0.11	OEHHA	--	100/1	0.014	OEHHA	0.000001	0.0035	OEHHA
n-Butylbenzene	0.04	NCEA	--	0.04	Reg 9 (RE)	--	--	--	--	--	--	--
Styrene	0.2	IRIS	--	0.29	IRIS	Red blood cell and liver effects	1000/1	--	--	--	--	--
Styrene	--	--	900	0.26	OEHHA	--	1000/1	--	--	--	--	--
sec-Butylbenzene	0.04	NCEA	--	0.04	Route Extrapolation	--	--	--	--	--	--	--
tert-Butyl alcohol	0.1	IRIS	--	0.0026	NCEA	--	--	--	--	--	--	--
tert-Butylbenzene	0.04	NCEA		0.04	Reg 9 (RE)	--	--	--	--	--	--	--
Tetrachloroethene	0.01	IRIS	35	0.01	OEHHA	Hepatotoxicity in mice, weight gain in rats	1000/1	0.54	OEHHA	0.0000059	0.021	OEHHA
Toluene	0.2	IRIS	--	0.11	IRIS	Kidney	3000/1	--	--	--	--	--
Toluene	--	--	300	0.086	OEHHA	--	3000/1	--	--	--	--	--
trans-1,2-Dichloroethene	0.02	IRIS	--	0.02	Route Extrapolation	Increased serum alkaline phosphatase in male mice	1000/1	--	--	--	--	--
trans-1,3-Dichloropropene	0.03	IRIS	--	0.0057	IRIS	--	--	0.1	IRIS	--	0.014	IRIS
trans-1,3-Dichloropropene	--	--	--	--	--	--	--	0.091	OEHHA	0.000016	0.056	OEHHA
Trichloroethene	0.0003	NCEA	--	0.01	NCEA	NA	--	0.4	NCEA	--	0.4	NCEA
Trichloroethene	--	--	600	0.17	OEHHA	--	--	0.013	OEHHA	0.000002	0.007	OEHHA
Vinyl chloride	0.003	IRIS	100	0.029	IRIS	Liver	30/1	1.5	IRIS	--	0.031	IRIS
Vinyl chloride	--	--	--	--	--	--	30/1	0.27	OEHHA	0.000078	0.27	OEHHA
o-Xylene	0.2	IRIS	--	0.029	IRIS	Decreased body weight, increased mortality	1000/1	--	--	--	--	--
o-Xylenes	--	--	700	0.2	OEHHA	--	1000/1	--	--	--	--	--

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m,p-Xylenes	0.2	IRIS	--	0.029	IRIS	Decreased body weight, increased mortality	1000/1	--	--	--	--	--
m,p-Xylenes	--	--	700	0.2	OEHHA	--	1000/1	--	--	--	--	--
Xylenes, total	0.2	IRIS	--	0.029	IRIS	Decreased body weight, increased mortality	1000/1	--	--	--	--	--
Xylenes, total	--	--	700	0.2	OEHHA	--	1000/1	--	--	--	--	--
1,2,3,4,6,7,8-HpCDD	--	--	--	--	--	--	--	1500	calc using TEF	--	1500	calc using TEF
1,2,3,4,6,7,8-HpCDD	--	--	0.00004	0.00000001	OEHHA	--	--	1300	OEHHA	0.38	1300	OEHHA
1,2,3,4,6,7,8-HpCDF	--	--	--	--	--	--	--	1500	calc using TEF	--	1500	calc using TEF
1,2,3,4,6,7,8-HpCDF	--	--	0.00004	0.00000001	OEHHA	--	--	1300	OEHHA	0.38	1300	OEHHA
1,2,3,4,7,8,9-HpCDF	--	--	--	--	--	--	--	1500	calc using TEF	--	1500	calc using TEF
1,2,3,4,7,8,9-HpCDF	--	--	0.00004	0.00000001	OEHHA	--	--	1300	OEHHA	0.38	1300	OEHHA
1,2,3,4,7,8-HxCDD	--	--	--	--	--	--	--	15000	calc using TEF	--	15000	calc using TEF
1,2,3,4,7,8-HxCDD	--	--	0.00004	0.00000001	OEHHA	--	--	13000	OEHHA	3.8	13000	OEHHA
1,2,3,4,7,8-HxCDF	--	--	--	--	--	--	--	15000	calc using TEF	--	15000	calc using TEF
1,2,3,4,7,8-HxCDF	--	--	0.00004	0.00000001	OEHHA	--	--	13000	OEHHA	3.8	13000	OEHHA
1,2,3,6,7,8-HxCDD	--	--	--	--	--	--	--	15000	calc using TEF	--	15000	calc using TEF
1,2,3,6,7,8-HxCDD	--	--	0.00004	0.00000001	OEHHA	--	--	13000	OEHHA	3.8	13000	OEHHA
1,2,3,6,7,8-HxCDF	--	--	--	--	--	--	--	15000	calc using TEF	--	15000	calc using TEF
1,2,3,6,7,8-HxCDF	--	--	0.00004	0.00000001	OEHHA	--	--	13000	OEHHA	3.8	13000	OEHHA
1,2,3,7,8,9-HxCDD	--	--	--	--	--	--	--	15000	calc using TEF	--	15000	calc using TEF
1,2,3,7,8,9-HxCDD	--	--	0.00004	0.00000001	OEHHA	--	--	13000	OEHHA	3.8	13000	OEHHA
1,2,3,7,8,9-HxCDF	--	--	--	--	--	--	--	15000	calc using TEF	--	15000	calc using TEF
1,2,3,7,8,9-HxCDF	--	--	0.00004	0.00000001	OEHHA	--	--	13000	OEHHA	3.8	13000	OEHHA
1,2,3,7,8-PeCDD	--	--	--	--	--	--	--	150000	calc using TEF	--	150000	calc using TEF
1,2,3,7,8-PeCDD	--	--	0.00004	0.00000001	OEHHA	--	--	6500	OEHHA	38	130000	OEHHA
1,2,3,7,8-PeCDF	--	--	--	--	--	--	--	7500	calc using TEF	--	7500	calc using TEF
1,2,3,7,8-PeCDF	--	--	0.00004	0.00000001	OEHHA	--	--	6500	OEHHA	1.9	6500	OEHHA
2,3,4,6,7,8-HxCDF	--	--	--	--	--	--	--	15000	calc using TEF	--	15000	calc using TEF
2,3,4,6,7,8-HxCDF	--	--	0.00004	0.00000001	OEHHA	--	--	13000	OEHHA	3.8	13000	OEHHA
2,3,4,7,8-PeCDF	--	--	--	--	--	--	--	75000	calc using TEF	--	75000	calc using TEF
2,3,4,7,8-PeCDF	--	--	0.00004	0.00000001	OEHHA	--	--	65000	OEHHA	19	65000	OEHHA
2,3,7,8-TCDD	--	--	--	--	--	--	--	150000	HEAST	--	150000	HEAST
2,3,7,8-TCDD	--	--	0.00004	0.00000001	OEHHA	--	--	130000	OEHHA	38	130000	OEHHA
2,3,7,8-TCDF	--	--	--	--	--	--	--	15000	calc using TEF	--	15000	calc using TEF
2,3,7,8-TCDF	--	--	0.00004	0.00000001	OEHHA	--	--	13000	OEHHA	3.8	13000	OEHHA
OCDD	--	--	--	--	--	--	--	15	calc using TEF	--	15	calc using TEF
OCDD	--	--	0.00004	0.00000001	OEHHA	--	--	13	OEHHA	0.0038	13	OEHHA
OCDF	--	--	--	--	--	--	--	15	calc using TEF	--	15	calc using TEF
OCDF	--	--	0.00004	0.00000001	OEHHA	--	--	13	OEHHA	0.0038	13	OEHHA

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References

HEAST: Health Effects Assessment Summary Tables (1997)

IRIS: Integrated Risk Information System (EPA 2006)

NCEA: National Center for Environmental Assessment (as cited on the Region 9 PRG Table, 2004)

OEHHA: California Office of Environmental Health Hazard Assessment. Toxicity Criteria Database (2005)

OEHHA*: California Office of Environmental Health Hazard Assessment. Child Reference Dose (2007)

PPRTV : Provisional Peer Reviewed Toxicity Value (as cited on the Region 9 PRG Table, 2004)

Region 9 Preliminary Remediation Goals (PRG) Table (October 2004)

Route Extrapolation: Route to route extrapolation

Shaded values are State of California toxicity values

Table 1-4
Volatilization Factors and Absorption Factors
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical	Absorption Factor[a]	Volatilization Factor[b] (m^3/kg)
Metals		
Aluminum	0.01	NV
Antimony	0.01	NV
Arsenic	0.03	NV
Barium	0.01	NV
Beryllium	0.01	NV
Cadmium	0.001	NV
Chromium	0.01	NV
Cobalt	0.01	NV
Copper	0.01	NV
Iron	0.01	NV
Lead	0.01	NV
Manganese	0.01	NV
Nickel	0.01	NV
Selenium	0.01	NV
Silver	0.01	NV
Thallium	0.01	NV
Vanadium	0.01	NV
Zinc	0.01	NV
Pesticides/PCBs		
4,4'-DDD	0.05	NV
4,4'-DDE	0.05	NV
4,4'-DDT	0.05	NV
Aldrin	0.05	NV
alpha-BHC	0.05	NV
alpha-Chlordane	0.05	NV
beta-BHC	0.05	NV
delta-BHC	0.05	NV
Dieldrin	0.05	NV
Endosulfan sulfate	0.05	NV
Endrin	0.05	NV
Endrin aldehyde	0.05	NV
Endrin ketone	0.05	NV
gamma-BHC	0.05	NV
gamma-Chlordane	0.05	NV
Heptachlor	0.05	NV
Methoxychlor	0.05	NV
Aroclor-1260	0.15	NV
SVOCs/VOCs		
1,2,4-Trichlorobenzene	0.1	4.76E+04
1,2-Dichlorobenzene	0.1	1.60E+04
1,3-Dichlorobenzene	0.1	1.60E+04
1,4-Dichlorobenzene	0.1	1.41E+04
1,4-Dioxane (p-dioxane)	0.1	NV

Table 1-4
Volatilization Factors and Absorption Factors
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical	Absorption Factor[a]	Volatilization Factor[b] (m^3/kg)
2-Methylnaphthalene	0.15	6.15E+04
2-Methylphenol	0.1	NV
4-Chloro-3-methylphenol	0.1	NV
4-Methylphenol	0.1	NV
Acenaphthene	0.15	2.42E+05
Acetophenone	0.1	NV
Anthracene	0.15	8.64E+05
Benzo(a)anthracene	0.15	NV
Benzo(a)pyrene	0.15	NV
Benzo(b)fluoranthene	0.15	NV
Benzo(g,h,i)perylene	0.15	NV
Benzo(k)fluoranthene	0.15	NV
Benzyl butyl phthalate	0.1	NV
Biphenyl (diphenyl)	0.1	NV
bis(2-Ethylhexyl)phthalate	0.1	NV
Caprolactam	0.1	NV
Carbazole	0.1	NV
Chrysene	0.15	NV
Dibenz(a,h)anthracene	0.15	NV
Dibenzofuran	0.1	5.55E+05
Di-n-butyl phthalate	0.1	NV
Fluoranthene	0.15	NV
Fluorene	0.15	5.62E+05
Indeno(1,2,3-c,d)pyrene	0.15	NV
Naphthalene	0.15	6.15E+04
Pentachlorophenol	0.25	NV
Phenanthrene	0.15	NV
Pyrene	0.15	NV
1,1,1-Trichloroethane	0.1	2.31E+03
1,1-Dichloroethane	0.1	2.42E+03
1,1-Dichloroethene	0.1	1.42E+03
1,2-Dichloroethane	0.1	3.85E+03
Acetone	0.1	1.08E+04
Benzene	0.1	2.82E+03
Carbon disulfide	0.1	1.16E+03
Chlorobenzene	0.1	6.79E+03
Chloroethane	0.1	1.13E+03
Chloromethane	0.1	5.36E+03
cis-1,2-Dichloroethene	0.1	2.95E+03
Cyclohexane	0.1	1.05E+03
Ethylbenzene	0.1	5.89E+03
Isopropylbenzene (cumene)	0.1	3.06E+03
Methyl ethyl ketone	0.1	1.66E+04
Methyl isobutyl ketone	0.1	2.14E+04

Table 1-4
Volatilization Factors and Absorption Factors
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical	Absorption Factor[a]	Volatilization Factor[b] (m^3/kg)
Methyl tert-butyl ether	0.1	4.00E+03
Methylcyclohexane	0.1	1.73E+03
Methylene chloride	0.1	2.13E+03
Styrene	0.1	1.14E+04
Tetrachloroethene	0.1	2.18E+03
Toluene	0.1	3.39E+03
trans-1,2-Dichloroethene	0.1	2.00E+03
Trichloroethene	0.1	2.78E+03
Vinyl chloride	0.1	8.90E+02
Xylenes, total	0.1	5.20E+03
Dioxans/Furans		
1,2,3,4,6,7,8-HpCDD	0.03	NV
1,2,3,4,6,7,8-HpCDF	0.03	NV
1,2,3,4,7,8,9-HpCDF	0.03	NV
1,2,3,4,7,8-HxCDD	0.03	NV
1,2,3,4,7,8-HxCDF	0.03	NV
1,2,3,6,7,8-HxCDD	0.03	NV
1,2,3,6,7,8-HxCDF	0.03	NV
1,2,3,7,8,9-HxCDD	0.03	NV
1,2,3,7,8,9-HxCDF	0.03	NV
1,2,3,7,8-PeCDD	0.03	NV
2,3,4,6,7,8-HxCDF	0.03	NV
2,3,4,7,8-PeCDF	0.03	NV
2,3,7,8-TCDF	0.03	NV
OCDD	0.03	NV
OCDF	0.03	NV

Notes:
[a]Source: DTSC Preliminary Endangerment Assessment Guidance Manual, January 1994.
[b]Calculated from equation in Soil Screening Guidance Manual, May 1996
NV = not volatile

Table 1-5
Exposure Point Concentrations - Shallow Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (EPC)	EPC Basis
Metals			
Aluminum	mg/kg	1.26E+04	95% Student's-t UCL
Antimony	mg/kg	1.36E+01	95% Chebyshev (MVUE) UCL
Arsenic	mg/kg	7.71E+00	95% Approximate Gamma UCL
Barium	mg/kg	5.13E+02	95% Approximate Gamma UCL
Beryllium	mg/kg	6.14E-01	95% Approximate Gamma UCL
Cadmium	mg/kg	1.58E+00	95% H-UCL
Chromium	mg/kg	1.41E+03	99% Chebyshev (Mean, Sd) UCL
Cobalt	mg/kg	8.75E+00	95% Approximate Gamma UCL
Copper	mg/kg	2.29E+02	95% Chebyshev (MVUE) UCL
Iron	mg/kg	2.61E+04	95% Approximate Gamma UCL
Lead	mg/kg	6.40E+02	95% Approximate Gamma UCL
Manganese	mg/kg	1.14E+03	95% Chebyshev (Mean, Sd) UCL
Nickel	mg/kg	4.22E+01	95% Student's-t UCL
Selenium	mg/kg	2.50E+00	Maximum Result
Silver	mg/kg	8.43E-01	95% Approximate Gamma UCL
Thallium	mg/kg	3.16E+00	95% Chebyshev (Mean, Sd) UCL
Vanadium	mg/kg	4.16E+01	95% Approximate Gamma UCL
Zinc	mg/kg	5.91E+02	95% Approximate Gamma UCL
Pesticides/PCBs			
Aldrin	mg/kg	1.29E+00	99% Chebyshev (Mean, Sd) UCL
alpha-BHC	mg/kg	2.60E-02	Maximum Result
alpha-Chlordane	mg/kg	4.04E-02	95% Chebyshev (MVUE) UCL
4,4'-DDD	mg/kg	9.16E+00	95% Adjusted Gamma UCL
4,4'-DDE	mg/kg	3.56E+00	95% Adjusted Gamma UCL
4,4'-DDT	mg/kg	3.25E-01	99% Chebyshev (Mean, Sd) UCL
beta-BHC	mg/kg	3.50E-02	Maximum Result
delta-BHC	mg/kg	4.10E-03	Maximum Result
Dieldrin	mg/kg	1.34E+00	95% Adjusted Gamma UCL
Endosulfan sulfate	mg/kg	1.60E-03	Maximum Result
Endrin	mg/kg	4.60E-03	Maximum Result
Endrin aldehyde	mg/kg	1.10E-03	Maximum Result
Endrin ketone	mg/kg	1.20E-02	Maximum Result
gamma-Chlordane	mg/kg	1.09E-01	99% Chebyshev (Mean, Sd) UCL
Heptachlor	mg/kg	8.80E-03	Maximum Result
Methoxychlor	mg/kg	3.90E-03	Maximum Result
Aroclor-1260	mg/kg	6.40E-01	Maximum Result
SVOCs/VOCs			
1,2,4-Trichlorobenzene	mg/kg	1.54E+00	99% Chebyshev (Mean, Sd) UCL
1,2-Dichlorobenzene	mg/kg	5.47E+01	95% Hall's Bootstrap UCL
1,3-Dichlorobenzene	mg/kg	2.02E+00	99% Chebyshev (Mean, Sd) UCL
1,4-Dichlorobenzene	mg/kg	2.55E+01	99% Chebyshev (Mean, Sd) UCL

Table 1-5
Exposure Point Concentrations - Shallow Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (EPC)	EPC Basis
2-Methylnaphthalene	mg/kg	1.14E+02	95% Hall's Bootstrap UCL
2-Methylphenol	mg/kg	9.90E-01	Maximum Result
4-Chloro-3-methylphenol	mg/kg	7.20E+00	Maximum Result
4-Methylphenol	mg/kg	3.60E+00	Maximum Result
Acenaphthene	mg/kg	9.18E+00	99% Chebyshev (Mean, Sd) UCL
Anthracene	mg/kg	1.10E+00	Maximum Result
Benzo(a)anthracene	mg/kg	5.50E-01	Maximum Result
Benzo(a)pyrene	mg/kg	5.00E-01	Maximum Result
Benzo(b)fluoranthene	mg/kg	4.20E-01	Maximum Result
Benzo(g,h,i)perylene	mg/kg	4.30E-01	Maximum Result
Benzo(k)fluoranthene	mg/kg	4.30E-01	Maximum Result
Benzyl butyl phthalate	mg/kg	7.60E+00	Maximum Result
Biphenyl (diphenyl)	mg/kg	4.40E+00	Maximum Result
bis(2-Ethylhexyl)phthalate	mg/kg	9.85E+00	99% Chebyshev (Mean, Sd) UCL
Caprolactam	mg/kg	9.50E-02	Maximum Result
Carbazole	mg/kg	1.10E+00	Maximum Result
Chrysene	mg/kg	9.10E-01	Maximum Result
Dibenz(a,h)anthracene	mg/kg	1.20E-01	Maximum Result
Dibenzofuran	mg/kg	4.10E+00	Maximum Result
Di-n-butyl phthalate	mg/kg	2.90E+00	Maximum Result
Fluoranthene	mg/kg	4.20E+00	Maximum Result
Fluorene	mg/kg	8.31E+00	99% Chebyshev (Mean, Sd) UCL
Indeno(1,2,3-c,d)pyrene	mg/kg	4.40E-01	Maximum Result
Naphthalene	mg/kg	5.28E+01	99% Chebyshev (Mean, Sd) UCL
Phenanthrene	mg/kg	1.21E+01	99% Chebyshev (Mean, Sd) UCL
Pyrene	mg/kg	3.97E+00	95% Approximate Gamma UCL
1,1,1-Trichloroethane	mg/kg	2.51E-02	95% Chebyshev (Mean, Sd) UCL
1,1-Dichloroethane	mg/kg	1.01E+01	99% Chebyshev (Mean, Sd) UCL
1,1-Dichloroethene	mg/kg	6.80E-02	95% Chebyshev (Mean, Sd) UCL
1,2-Dichloroethane	mg/kg	6.05E-02	95% Chebyshev (Mean, Sd) UCL
Acetone	mg/kg	2.26E-01	95% Approximate Gamma UCL
Benzene	mg/kg	1.93E+00	99% Chebyshev (Mean, Sd) UCL
Carbon disulfide	mg/kg	6.29E-03	95% Student's-t UCL
Chlorobenzene	mg/kg	1.01E+01	99% Chebyshev (Mean, Sd) UCL
Chloroethane	mg/kg	2.40E-02	95% Chebyshev (Mean, Sd) UCL
Chloromethane	mg/kg	1.27E-01	95% Chebyshev (Mean, Sd) UCL
cis-1,2-Dichloroethene	mg/kg	1.49E+02	95% Hall's Bootstrap UCL
Cyclohexane	mg/kg	2.55E+00	99% Chebyshev (Mean, Sd) UCL
Ethylbenzene	mg/kg	2.24E+01	95% Hall's Bootstrap UCL
Isopropylbenzene (cumene)	mg/kg	5.35E+00	95% Hall's Bootstrap UCL
Methyl ethyl ketone	mg/kg	3.14E-01	99% Chebyshev (Mean, Sd) UCL
Methyl isobutyl ketone	mg/kg	5.74E+00	99% Chebyshev (Mean, Sd) UCL

Table 1-5
Exposure Point Concentrations - Shallow Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (EPC)	EPC Basis
Methyl tert-butyl ether	mg/kg	4.00E-03	Maximum Result
Methylcyclohexane	mg/kg	1.02E+01	95% Hall's Bootstrap UCL
Methylene chloride	mg/kg	8.38E-03	95% Student's-t UCL
Styrene	mg/kg	5.14E-01	99% Chebyshev (Mean, Sd) UCL
Tetrachloroethene	mg/kg	8.76E-02	99% Chebyshev (Mean, Sd) UCL
Toluene	mg/kg	1.16E+02	95% Hall's Bootstrap UCL
trans-1,2-Dichloroethene	mg/kg	6.38E-01	99% Chebyshev (Mean, Sd) UCL
Trichloroethene	mg/kg	5.21E-01	99% Chebyshev (Mean, Sd) UCL
Vinyl chloride	mg/kg	1.28E+00	99% Chebyshev (Mean, Sd) UCL
Xylenes, total	mg/kg	1.57E+02	95% Hall's Bootstrap UCL
Dioxans/Furans			
1,2,3,4,6,7,8-HpCDD	mg/kg	9.72E-04	95% Student's-t UCL
1,2,3,4,6,7,8-HpCDF	mg/kg	1.60E-04	95% Student's-t UCL
1,2,3,4,7,8,9-HpCDF	mg/kg	7.93E-06	95% Student's-t UCL
1,2,3,4,7,8-HxCDD	mg/kg	1.64E-05	Maximum Result
1,2,3,4,7,8-HxCDF	mg/kg	2.26E-06	95% Student's-t UCL
1,2,3,6,7,8-HxCDD	mg/kg	7.35E-05	Maximum Result
1,2,3,6,7,8-HxCDF	mg/kg	1.50E-05	95% Student's-t UCL
1,2,3,7,8,9-HxCDD	mg/kg	4.14E-05	Maximum Result
1,2,3,7,8,9-HxCDF	mg/kg	8.75E-06	Maximum Result
1,2,3,7,8-PeCDD	mg/kg	1.53E-05	Maximum Result
2,3,4,6,7,8-HxCDF	mg/kg	1.51E-05	95% Student's-t UCL
2,3,4,7,8-PeCDF	mg/kg	3.66E-05	95% Student's-t UCL
2,3,7,8-TCDF	mg/kg	4.63E-06	95% Student's-t UCL
OCDD	mg/kg	8.20E-03	95% Student's-t UCL
OCDF	mg/kg	3.25E-04	95% Student's-t UCL

Notes:
EPC summary statistics are presented in Table 1-1.

Table 1-6
Exposure Point Concentrations - Deep Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (EPC)	EPC Basis
Metals			
Aluminum	mg/kg	1.25E+04	95% Student's-t UCL
Antimony	mg/kg	2.06E+01	99% Chebyshev (Mean, Sd) UCL
Arsenic	mg/kg	8.10E+00	95% Approximate Gamma UCL
Barium	mg/kg	5.55E+02	95% H-UCL
Beryllium	mg/kg	6.04E-01	95% Approximate Gamma UCL
Cadmium	mg/kg	1.74E+00	95% Chebyshev (Mean, Sd) UCL
Chromium	mg/kg	4.95E+02	95% Chebyshev (Mean, Sd) UCL
Cobalt	mg/kg	7.90E+00	95% Approximate Gamma UCL
Copper	mg/kg	1.45E+02	95% Approximate Gamma UCL
Iron	mg/kg	2.34E+04	95% Approximate Gamma UCL
Lead	mg/kg	6.05E+02	95% Approximate Gamma UCL
Manganese	mg/kg	8.43E+02	95% Chebyshev (Mean, Sd) UCL
Nickel	mg/kg	3.70E+01	95% Student's-t UCL
Selenium	mg/kg	3.30E+00	95% Chebyshev (Mean, Sd) UCL
Silver	mg/kg	7.75E-01	95% Approximate Gamma UCL
Thallium	mg/kg	2.88E+00	95% Chebyshev (Mean, Sd) UCL
Vanadium	mg/kg	4.05E+01	95% Approximate Gamma UCL
Zinc	mg/kg	4.41E+02	95% Approximate Gamma UCL
Pesticides/PCBs			
4,4'-DDD	mg/kg	8.40E+00	95% Hall's Bootstrap UCL
4,4'-DDE	mg/kg	5.64E+00	99% Chebyshev (Mean, Sd) UCL
4,4'-DDT	mg/kg	2.47E-01	99% Chebyshev (Mean, Sd) UCL
Aldrin	mg/kg	9.24E-01	99% Chebyshev (Mean, Sd) UCL
alpha-BHC	mg/kg	2.60E-02	Maximum Result
alpha-Chlordane	mg/kg	7.04E-02	99% Chebyshev (Mean, Sd) UCL
beta-BHC	mg/kg	3.50E-02	Maximum Result
delta-BHC	mg/kg	4.10E-03	Maximum Result
Dieldrin	mg/kg	2.08E+00	99% Chebyshev (Mean, Sd) UCL
Endosulfan sulfate	mg/kg	1.60E-03	Maximum Result
Endrin	mg/kg	4.60E-03	Maximum Result
Endrin aldehyde	mg/kg	1.10E-03	Maximum Result
Endrin ketone	mg/kg	1.20E-02	Maximum Result
gamma-BHC	mg/kg	2.50E-03	Maximum Result
gamma-Chlordane	mg/kg	8.75E-02	99% Chebyshev (Mean, Sd) UCL
Heptachlor	mg/kg	8.80E-03	Maximum Result
Methoxychlor	mg/kg	3.90E-03	Maximum Result
Aroclor-1260	mg/kg	9.80E-01	Maximum Result
SVOCs/VOCs			
1,2,4-Trichlorobenzene	mg/kg	1.05E+00	99% Chebyshev (Mean, Sd) UCL
1,2-Dichlorobenzene	mg/kg	4.02E+01	95% Hall's Bootstrap UCL
1,3-Dichlorobenzene	mg/kg	1.38E+00	99% Chebyshev (Mean, Sd) UCL

Table 1-6
Exposure Point Concentrations - Deep Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (EPC)	EPC Basis
1,4-Dichlorobenzene	mg/kg	1.76E+01	99% Chebyshev (Mean, Sd) UCL
1,4-Dioxane (p-dioxane)	mg/kg	8.72E-01	95% Chebyshev (Mean, Sd) UCL
2-Methylnaphthalene	mg/kg	4.02E+02	99% Chebyshev (Mean, Sd) UCL
2-Methylphenol	mg/kg	9.90E-01	Maximum Result
4-Chloro-3-methylphenol	mg/kg	7.20E+00	Maximum Result
4-Methylphenol	mg/kg	3.60E+00	Maximum Result
Acenaphthene	mg/kg	8.32E+00	99% Chebyshev (Mean, Sd) UCL
Acetophenone	mg/kg	8.73E+00	99% Chebyshev (Mean, Sd) UCL
Anthracene	mg/kg	1.10E+00	Maximum Result
Benzo(a)anthracene	mg/kg	5.50E-01	Maximum Result
Benzo(a)pyrene	mg/kg	5.00E-01	Maximum Result
Benzo(b)fluoranthene	mg/kg	4.20E-01	Maximum Result
Benzo(g,h,i)perylene	mg/kg	4.30E-01	Maximum Result
Benzo(k)fluoranthene	mg/kg	4.30E-01	Maximum Result
Benzyl butyl phthalate	mg/kg	7.60E+00	Maximum Result
Biphenyl (diphenyl)	mg/kg	7.10E+00	Maximum Result
bis(2-Ethylhexyl)phthalate	mg/kg	8.86E+00	99% Chebyshev (Mean, Sd) UCL
Caprolactam	mg/kg	9.50E-02	Maximum Result
Carbazole	mg/kg	1.10E+00	Maximum Result
Chrysene	mg/kg	3.50E+00	Maximum Result
Dibenz(a,h)anthracene	mg/kg	1.20E-01	Maximum Result
Dibenzofuran	mg/kg	4.10E+00	Maximum Result
Di-n-butyl phthalate	mg/kg	2.90E+00	Maximum Result
Fluoranthene	mg/kg	5.90E+00	Maximum Result
Fluorene	mg/kg	8.10E+00	99% Chebyshev (Mean, Sd) UCL
Indeno(1,2,3-c,d)pyrene	mg/kg	4.40E-01	Maximum Result
Naphthalene	mg/kg	5.10E+01	99% Chebyshev (Mean, Sd) UCL
Pentachlorophenol	mg/kg	6.70E+00	Maximum Result
Phenanthrene	mg/kg	1.51E+01	99% Chebyshev (Mean, Sd) UCL
Pyrene	mg/kg	7.30E+00	99% Chebyshev (Mean, Sd) UCL
1,1,1-Trichloroethane	mg/kg	2.31E-02	95% Chebyshev (Mean, Sd) UCL
1,1-Dichloroethane	mg/kg	7.30E+00	99% Chebyshev (Mean, Sd) UCL
1,1-Dichloroethene	mg/kg	5.26E-02	95% Chebyshev (Mean, Sd) UCL
1,2-Dichloroethane	mg/kg	4.33E-02	95% Chebyshev (Mean, Sd) UCL
Acetone	mg/kg	2.09E-01	95% Approximate Gamma UCL
Benzene	mg/kg	1.42E+00	99% Chebyshev (Mean, Sd) UCL
Carbon disulfide	mg/kg	6.61E-03	95% Student's-t UCL
Chlorobenzene	mg/kg	6.89E+00	99% Chebyshev (Mean, Sd) UCL
Chloroethane	mg/kg	1.88E-02	95% Chebyshev (Mean, Sd) UCL
Chloromethane	mg/kg	8.80E-02	95% Chebyshev (Mean, Sd) UCL
cis-1,2-Dichloroethene	mg/kg	1.34E+02	95% Hall's Bootstrap UCL
Cyclohexane	mg/kg	2.38E+00	99% Chebyshev (Mean, Sd) UCL

Table 1-6
Exposure Point Concentrations - Deep Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (EPC)	EPC Basis
Ethylbenzene	mg/kg	2.52E+01	95% Hall's Bootstrap UCL
Isopropylbenzene (cumene)	mg/kg	1.47E+01	99% Chebyshev (Mean, Sd) UCL
Methyl ethyl ketone	mg/kg	2.81E-01	99% Chebyshev (Mean, Sd) UCL
Methyl isobutyl ketone	mg/kg	4.19E+00	99% Chebyshev (Mean, Sd) UCL
Methyl tert-butyl ether	mg/kg	4.00E-03	Maximum Result
Methylcyclohexane	mg/kg	1.62E+01	95% Hall's Bootstrap UCL
Methylene chloride	mg/kg	8.66E-03	95% Student's-t UCL
Styrene	mg/kg	1.74E-01	95% Chebyshev (Mean, Sd) UCL
Tetrachloroethene	mg/kg	5.09E-01	99% Chebyshev (Mean, Sd) UCL
Toluene	mg/kg	2.88E-03	95% Chebyshev (Mean, Sd) UCL
trans-1,2-Dichloroethene	mg/kg	5.29E-01	99% Chebyshev (Mean, Sd) UCL
Trichloroethene	mg/kg	2.63E+00	99% Chebyshev (Mean, Sd) UCL
Vinyl chloride	mg/kg	8.95E-01	99% Chebyshev (Mean, Sd) UCL
Xylenes, total	mg/kg	1.40E+02	95% Hall's Bootstrap UCL
Dioxans/Furans			
1,2,3,4,6,7,8-HpCDD	mg/kg	9.72E-04	95% Student's-t UCL
1,2,3,4,6,7,8-HpCDF	mg/kg	1.60E-04	95% Student's-t UCL
1,2,3,4,7,8,9-HpCDF	mg/kg	7.93E-06	95% Student's-t UCL
1,2,3,4,7,8-HxCDD	mg/kg	1.64E-05	Maximum Result
1,2,3,4,7,8-HxCDF	mg/kg	2.26E-06	95% Student's-t UCL
1,2,3,6,7,8-HxCDD	mg/kg	7.35E-05	Maximum Result
1,2,3,6,7,8-HxCDF	mg/kg	1.50E-05	95% Student's-t UCL
1,2,3,7,8,9-HxCDD	mg/kg	4.14E-05	Maximum Result
1,2,3,7,8,9-HxCDF	mg/kg	8.75E-06	Maximum Result
1,2,3,7,8-PeCDD	mg/kg	1.53E-05	Maximum Result
2,3,4,6,7,8-HxCDF	mg/kg	1.51E-05	95% Student's-t UCL
2,3,4,7,8-PeCDF	mg/kg	3.66E-05	95% Student's-t UCL
2,3,7,8-TCDF	mg/kg	4.63E-06	95% Student's-t UCL
OCDD	mg/kg	8.20E-03	95% Student's-t UCL
OCDF	mg/kg	3.25E-04	95% Student's-t UCL

Notes:
EPC summary statistics are presented in Table 1-1.

Table 1-7
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Residential Exposure Scenario - Future Adult Resident Receptor - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	24	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5700	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		0.00E+00
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.07	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Metals											
Aluminum	1.26E+04	5.92E-03	NA		2.36E-04	NA		8.99E-07	NA		
Antimony	1.36E+01	6.39E-06	NA		2.55E-07	NA		9.71E-10	NA		
Arsenic	7.71E+00	3.62E-06	9.50E+00	3.44E-05	4.33E-07	9.50E+00	4.12E-06	5.50E-10	1.51E+01	8.28E-09	**3.85E-05**
Barium	5.13E+02	2.41E-04	NA		9.61E-06	NA		3.66E-08	NA		
Beryllium	6.14E-01	2.88E-07	NA		1.15E-08	NA		4.38E-11	8.40E+00	3.68E-10	3.68E-10
Cadmium	1.58E+00	7.42E-07	3.80E-01	2.82E-07	2.96E-09	3.80E-01	1.13E-09	1.13E-10	1.47E+01	1.66E-09	2.85E-07
Chromium	1.41E+03	6.62E-04	NA		2.64E-05	NA		1.01E-07	4.20E+01	4.23E-06	**4.23E-06**
Cobalt	8.75E+00	4.11E-06	NA		1.64E-07	NA		6.25E-10	9.80E+00	6.12E-09	6.12E-09
Copper	2.29E+02	1.08E-04	NA		4.29E-06	NA		1.63E-08	NA		
Iron	2.61E+04	1.23E-02	NA		4.89E-04	NA		1.86E-06	NA		
Lead	6.40E+02	3.01E-04	NA		1.20E-05	NA		4.57E-08	NA		
Manganese	1.14E+03	5.35E-04	NA		2.14E-05	NA		8.14E-08	NA		
Nickel	4.22E+01	1.98E-05	NA		7.91E-07	NA		3.01E-09	9.10E-01	2.74E-09	2.74E-09
Selenium	2.50E+00	1.17E-06	NA		4.68E-08	NA		1.78E-10	NA		
Silver	8.43E-01	3.96E-07	NA		1.58E-08	NA		6.02E-11	NA		
Thallium	3.16E+00	1.48E-06	NA		5.92E-08	NA		2.26E-10	NA		
Vanadium	4.16E+01	1.95E-05	NA		7.80E-07	NA		2.97E-09	NA		
Zinc	5.91E+02	2.78E-04	NA		1.11E-05	NA		4.22E-08	NA		
Pesticides/PCBs											
Aldrin	1.29E+00	6.06E-07	1.70E+01	1.03E-05	1.21E-07	1.70E+01	2.05E-06	9.21E-11	1.72E+01	1.58E-09	**1.24E-05**
alpha-BHC	2.60E-02	1.22E-08	6.30E+00	7.69E-08	2.44E-09	6.30E+00	1.53E-08	1.86E-12	6.30E+00	1.17E-11	9.23E-08

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs	Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			Total Cancer Risk
	[mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	[-]
alpha-Chlordane	4.04E-02	1.90E-08	1.20E+00	2.28E-08	3.79E-09	1.20E+00	4.54E-09	2.88E-12	1.19E+00	3.43E-12	2.73E-08
4,4'-DDD	9.16E+00	4.30E-06	2.40E-01	1.03E-06	8.58E-07	2.40E-01	2.06E-07	6.54E-10	2.42E-01	1.58E-10	**1.24E-06**
4,4'-DDE	3.56E+00	1.67E-06	3.40E-01	5.68E-07	3.34E-07	3.40E-01	1.13E-07	2.54E-10	3.40E-01	8.63E-11	6.82E-07
4,4'-DDT	3.25E-01	1.53E-07	3.40E-01	5.19E-08	3.05E-08	3.40E-01	1.04E-08	2.32E-11	3.40E-01	7.88E-12	6.23E-08
beta-BHC	3.50E-02	1.64E-08	1.80E+00	2.96E-08	3.28E-09	1.80E+00	5.90E-09	2.50E-12	1.80E+00	4.50E-12	3.55E-08
delta-BHC	4.10E-03	1.93E-09	NA		3.84E-10	NA		2.93E-13	NA		
Dieldrin	1.34E+00	6.29E-07	1.60E+01	1.01E-05	1.26E-07	1.60E+01	2.01E-06	9.56E-11	1.61E+01	1.54E-09	**1.21E-05**
Endosulfan sulfate	1.60E-03	7.51E-10	NA		1.50E-10	NA		1.14E-13	NA		
Endrin	4.60E-03	2.16E-09	NA		4.31E-10	NA		3.28E-13	NA		
Endrin aldehyde	1.10E-03	5.17E-10	NA		1.03E-10	NA		7.85E-14	NA		
Endrin ketone	1.20E-02	5.64E-09	NA		1.12E-09	NA		8.57E-13	NA		
gamma-Chlordane	1.09E-01	5.12E-08	1.20E+00	6.14E-08	1.02E-08	1.20E+00	1.23E-08	7.78E-12	1.19E+00	9.26E-12	7.37E-08
Heptachlor	8.80E-03	4.13E-09	4.50E+00	1.86E-08	8.25E-10	4.50E+00	3.71E-09	6.28E-13	4.55E+00	2.86E-12	2.23E-08
Methoxychlor	3.90E-03	1.83E-09	NA		3.65E-10	NA		2.78E-13	NA		
Aroclor-1260	6.40E-01	3.01E-07	2.00E+00	6.01E-07	1.80E-07	2.00E+00	3.60E-07	4.57E-11	2.00E+00	9.14E-11	9.61E-07
SVOCs/VOCs											
1,2,4-Trichlorobenzene	1.54E+00	7.23E-07	3.60E-03	2.60E-09	2.89E-07	3.60E-03	1.04E-09	3.04E-06	NA		3.64E-09
1,2-Dichlorobenzene	5.47E+01	2.57E-05	NA		1.03E-05	NA		3.21E-04	NA		
1,3-Dichlorobenzene	2.02E+00	9.49E-07	NA		3.79E-07	NA		1.19E-05	NA		
1,4-Dichlorobenzene	2.55E+01	1.20E-05	2.40E-02	2.87E-07	4.78E-06	2.40E-02	1.15E-07	1.70E-04	3.85E-02	6.54E-06	**6.94E-06**
2-Methylnaphthalene	1.14E+02	5.35E-05	NA		3.20E-05	NA		1.74E-04	NA		
2-Methylphenol	9.90E-01	4.65E-07	NA		1.86E-07	NA		7.07E-11	NA		
4-Chloro-3-methylphenol	7.20E+00	3.38E-06	NA		1.35E-06	NA		5.14E-10	NA		
4-Methylphenol	3.60E+00	1.69E-06	NA		6.75E-07	NA		2.57E-10	NA		
Acenaphthene	9.18E+00	4.31E-06	NA		2.58E-06	NA		3.57E-06	NA		
Anthracene	1.10E+00	5.17E-07	NA		3.09E-07	NA		1.20E-07	NA		
Benzo(a)anthracene	5.50E-01	2.58E-07	1.20E+00	3.10E-07	1.55E-07	1.20E+00	1.86E-07	3.93E-11	7.30E-01	2.87E-11	4.96E-07
Benzo(a)pyrene	5.00E-01	2.35E-07	1.20E+01	2.82E-06	1.41E-07	1.20E+01	1.69E-06	3.57E-11	7.30E+00	2.61E-10	**4.50E-06**
Benzo(b)fluoranthene	4.20E-01	1.97E-07	1.20E+00	2.37E-07	1.18E-07	1.20E+00	1.42E-07	3.00E-11	7.30E-01	2.19E-11	3.78E-07
Benzo(g,h,i)perylene	4.30E-01	2.02E-07	NA		1.21E-07	NA		3.07E-11	NA		
Benzo(k)fluoranthene	4.30E-01	2.02E-07	1.20E+00	2.42E-07	1.21E-07	1.20E+00	1.45E-07	3.07E-11	3.85E-01	1.18E-11	3.87E-07
Benzyl butyl phthalate	7.60E+00	3.57E-06	NA		1.42E-06	NA		5.42E-10	NA		
Biphenyl (diphenyl)	4.40E+00	2.07E-06	NA		8.25E-07	NA		3.14E-10	NA		
bis(2-Ethylhexyl)phthalate	9.85E+00	4.63E-06	1.40E-02	6.48E-08	1.85E-06	1.40E-02	2.58E-08	7.03E-10	1.40E-02	9.84E-12	9.06E-08
Caprolactam	9.50E-02	4.46E-08	NA		1.78E-08	NA		6.78E-12	NA		
Carbazole	1.10E+00	5.17E-07	2.00E-02	1.03E-08	2.06E-07	2.00E-02	4.12E-09	7.85E-11	2.00E-02	1.57E-12	1.45E-08
Chrysene	9.10E-01	4.27E-07	1.20E-01	5.13E-08	2.56E-07	1.20E-01	3.07E-08	6.50E-11	3.85E-02	2.50E-12	8.20E-08
Dibenz(a,h)anthracene	1.20E-01	5.64E-08	7.30E+00	4.11E-07	3.37E-08	7.30E+00	2.46E-07	8.57E-12	7.30E+00	6.25E-11	6.58E-07
Dibenzofuran	4.10E+00	1.93E-06	NA		7.68E-07	NA		6.95E-07	NA		
Di-n-butyl phthalate	2.90E+00	1.36E-06	NA		5.43E-07	NA		2.07E-10	NA		
Fluoranthene	4.20E+00	1.97E-06	NA		1.18E-06	NA		3.00E-10	NA		
Fluorene	8.31E+00	3.90E-06	NA		2.34E-06	NA		1.39E-06	NA		
Indeno(1,2,3-c,d)pyrene	4.40E-01	2.07E-07	7.30E-01	1.51E-07	1.24E-07	7.30E-01	9.03E-08	3.14E-11	7.30E-01	2.29E-11	2.41E-07
Naphthalene	5.28E+01	2.48E-05	1.20E-01	2.98E-06	1.48E-05	1.20E-01	1.78E-06	8.06E-05	1.19E-01	9.60E-06	**1.44E-05**
Phenanthrene	1.21E+01	5.68E-06	NA		3.40E-06	NA		8.64E-10	NA		
Pyrene	3.97E+00	1.86E-06	NA		1.12E-06	NA		8.91E-08	NA		
1,1,1-Trichloroethane	2.51E-02	1.18E-08	NA		4.70E-09	NA		1.02E-06	NA		
1,1-Dichloroethane	1.01E+01	4.74E-06	5.70E-03	2.70E-08	1.89E-06	5.70E-03	1.08E-08	3.92E-04	5.60E-03	2.19E-06	**2.23E-06**
1,1-Dichloroethene	6.80E-02	3.19E-08	9.10E-02	2.91E-09	1.27E-08	9.10E-02	1.16E-09	4.50E-06	9.10E-02	4.09E-07	4.13E-07

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Oral: Cancer Slope Factor, SF [mg/kg/day]-1	Oral: Cancer Risk [-]	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Dermal: Cancer Slope Factor, SF [mg/kg/day]-1	Dermal: Cancer Risk [-]	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Inhalation: Cancer Slope Factor, SF [mg/kg/day]-1	Inhalation: Cancer Risk [-]	Total Cancer Risk [-]
1,2-Dichloroethane	6.05E-02	2.84E-08	9.10E-02	2.59E-09	1.13E-08	9.10E-02	1.03E-09	1.48E-06	9.10E-02	1.34E-07	1.38E-07
Acetone	2.26E-01	1.06E-07	NA		4.24E-08	NA		1.96E-06	NA		
Benzene	1.93E+00	9.06E-07	1.00E-01	9.06E-08	3.62E-07	1.00E-01	3.62E-08	6.43E-05	1.02E-01	6.53E-06	**6.66E-06**
Carbon disulfide	6.29E-03	2.95E-09	NA		1.18E-09	NA		5.08E-07	NA		
Chlorobenzene	1.01E+01	4.74E-06	NA		1.89E-06	NA		1.40E-04	NA		
Chloroethane	2.40E-02	1.13E-08	2.90E-03	3.27E-11	4.50E-09	2.90E-03	1.30E-11	1.99E-06	2.90E-03	5.77E-09	5.82E-09
Chloromethane	1.27E-01	5.96E-08	NA		2.38E-08	NA		2.22E-06	NA		
cis-1,2-Dichloroethene	1.49E+02	7.00E-05	NA		2.79E-05	NA		4.75E-03	NA		
Cyclohexane	2.55E+00	1.20E-06	NA		4.78E-07	NA		2.29E-04	NA		
Ethylbenzene	2.24E+01	1.05E-05	NA		4.20E-06	NA		3.57E-04	NA		
Isopropylbenzene (cumene)	5.35E+00	2.51E-06	NA		1.00E-06	NA		1.64E-04	NA		
Methyl ethyl ketone	3.14E-01	1.47E-07	NA		5.88E-08	NA		1.78E-06	NA		
Methyl isobutyl ketone	5.74E+00	2.70E-06	NA		1.08E-06	NA		2.52E-05	NA		
Methyl tert-butyl ether	4.00E-03	1.88E-09	1.80E-03	3.38E-12	7.50E-10	1.80E-03	1.35E-12	9.40E-08	9.10E-04	8.55E-11	9.02E-11
Methylcyclohexane	1.02E+01	4.79E-06	NA		1.91E-06	NA		5.55E-04	NA		
Methylene chloride	8.38E-03	3.94E-09	1.40E-02	5.51E-11	1.57E-09	1.40E-02	2.20E-11	3.70E-07	3.50E-03	1.30E-09	1.37E-09
Styrene	5.14E-01	2.41E-07	NA		9.63E-08	NA		4.22E-06	NA		
Tetrachloroethene	8.76E-02	4.11E-08	5.40E-01	2.22E-08	1.64E-08	5.40E-01	8.86E-09	3.78E-06	2.07E-02	7.81E-08	1.09E-07
Toluene	1.16E+02	5.45E-05	NA		2.17E-05	NA		3.21E-03	NA		
trans-1,2-Dichloroethene	6.38E-01	3.00E-07	NA		1.20E-07	NA		3.00E-05	NA		
Trichloroethene	5.21E-01	2.45E-07	4.00E-01	9.79E-08	9.76E-08	4.00E-01	3.91E-08	1.76E-05	4.00E-01	7.04E-06	**7.18E-06**
Vinyl chloride	1.28E+00	6.01E-07	1.50E+00	9.02E-07	2.40E-07	1.50E+00	3.60E-07	1.35E-04	2.73E-01	3.69E-05	**3.81E-05**
Xylenes, total	1.57E+02	7.37E-05	NA		2.94E-05	NA		2.84E-03	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	9.72E-04	4.57E-10	1.50E+03	6.85E-07	5.46E-11	1.50E+03	8.20E-08	6.94E-14	1.50E+03	1.04E-10	7.67E-07
1,2,3,4,6,7,8-HpCDF	1.60E-04	7.51E-11	1.50E+03	1.13E-07	9.00E-12	1.50E+03	1.35E-08	1.14E-14	1.50E+03	1.71E-11	1.26E-07
1,2,3,4,7,8,9-HpCDF	7.93E-06	3.72E-12	1.50E+03	5.59E-09	4.46E-13	1.50E+03	6.69E-10	5.66E-16	1.50E+03	8.49E-13	6.26E-09
1,2,3,4,7,8-HxCDD	1.64E-05	7.70E-12	1.50E+04	1.16E-07	9.22E-13	1.50E+04	1.38E-08	1.17E-15	1.50E+04	1.76E-11	1.29E-07
1,2,3,4,7,8-HxCDF	2.26E-06	1.06E-12	1.50E+04	1.59E-08	1.27E-13	1.50E+04	1.91E-09	1.61E-16	1.50E+04	2.42E-12	1.78E-08
1,2,3,6,7,8-HxCDD	7.35E-05	3.45E-11	1.50E+04	5.18E-07	4.13E-12	1.50E+04	6.20E-08	5.25E-15	1.50E+04	7.87E-11	5.80E-07
1,2,3,6,7,8-HxCDF	1.50E-05	7.05E-12	1.50E+04	1.06E-07	8.43E-13	1.50E+04	1.26E-08	1.07E-15	1.50E+04	1.61E-11	1.18E-07
1,2,3,7,8,9-HxCDD	4.14E-05	1.94E-11	1.50E+04	2.92E-07	2.33E-12	1.50E+04	3.49E-08	2.96E-15	1.50E+04	4.43E-11	3.27E-07
1,2,3,7,8,9-HxCDF	8.75E-06	4.11E-12	1.50E+04	6.16E-08	4.92E-13	1.50E+04	7.38E-09	6.25E-16	1.50E+04	9.37E-12	6.90E-08
1,2,3,7,8-PeCDD	1.53E-05	7.19E-12	1.50E+05	1.08E-06	8.60E-13	1.50E+05	1.29E-07	1.09E-15	1.50E+05	1.64E-10	**1.21E-06**
2,3,4,6,7,8-HxCDF	1.51E-05	7.09E-12	1.50E+04	1.06E-07	8.49E-13	1.50E+04	1.27E-08	1.08E-15	1.50E+04	1.62E-11	1.19E-07
2,3,4,7,8-PeCDF	3.66E-05	1.72E-11	7.50E+04	1.29E-06	2.06E-12	7.50E+04	1.54E-07	2.61E-15	7.50E+04	1.96E-10	**1.44E-06**
2,3,7,8-TCDF	4.63E-06	2.17E-12	1.50E+04	3.26E-08	2.60E-13	1.50E+04	3.90E-09	3.30E-16	1.50E+04	4.96E-12	3.65E-08
OCDD	8.20E-03	3.85E-09	1.50E+01	5.78E-08	4.61E-10	1.50E+01	6.91E-09	5.85E-13	1.50E+01	8.78E-12	6.47E-08
OCDF	3.25E-04	1.53E-10	1.50E+01	2.29E-09	1.83E-11	1.50E+01	2.74E-10	2.32E-14	1.50E+01	3.48E-13	2.56E-09
			Total Risk:	7.07E-05		**Total Risk:**	1.44E-05		**Total Risk:**	7.37E-05	**1.59E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **2E-04**

Table 1-8
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Residential Exposure Scenario - Future Adult Resident Receptor - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	24	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5700	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		0.00E+00
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.07	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cw [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Aluminum	1.26E+04	1.73E-02	1.00E+00	1.73E-02	6.89E-04	1.00E+00	6.89E-04	2.62E-06	1.40E-03	1.87E-03	1.98E-02
Antimony	1.36E+01	1.86E-05	4.00E-04	4.66E-02	7.43E-07	4.00E-04	1.86E-03	2.83E-09	NA		4.84E-02
Arsenic	7.71E+00	1.06E-05	3.00E-04	3.52E-02	1.26E-06	3.00E-04	4.21E-03	1.61E-09	8.57E-06	1.87E-04	3.96E-02
Barium	5.13E+02	7.03E-04	7.00E-02	1.00E-02	2.80E-05	7.00E-02	4.01E-04	1.07E-07	1.43E-04	7.48E-04	1.12E-02
Beryllium	6.14E-01	8.41E-07	2.00E-03	4.21E-04	3.36E-08	2.00E-03	1.68E-05	1.28E-10	5.71E-06	2.24E-05	4.60E-04
Cadmium	1.58E+00	2.16E-06	5.00E-04	4.33E-03	8.64E-09	5.00E-04	1.73E-05	3.29E-10	5.71E-06	5.76E-05	4.40E-03
Chromium	1.41E+03	1.93E-03	NA		7.71E-05	NA		2.94E-07	NA		
Cobalt	8.75E+00	1.20E-05	2.00E-02	5.99E-04	4.78E-07	2.00E-02	2.39E-05	1.82E-09	5.70E-06	3.20E-04	9.43E-04
Copper	2.29E+02	3.14E-04	4.00E-02	7.84E-03	1.25E-05	4.00E-02	3.13E-04	4.77E-08	NA		8.16E-03
Iron	2.61E+04	3.58E-02	3.00E-01	1.19E-01	1.43E-03	3.00E-01	4.76E-03	5.43E-06	NA		**1.24E-01**
Lead	6.40E+02	8.77E-04	NA		3.50E-05	NA		1.33E-07	NA		
Manganese	1.14E+03	1.56E-03	2.40E-02	6.51E-02	6.23E-05	2.40E-02	2.60E-03	2.37E-07	1.40E-05	1.70E-02	8.46E-02
Nickel	4.22E+01	5.78E-05	2.00E-02	2.89E-03	2.31E-06	2.00E-02	1.15E-04	8.79E-09	1.43E-05	6.15E-04	3.62E-03
Selenium	2.50E+00	3.42E-06	5.00E-03	6.85E-04	1.37E-07	5.00E-03	2.73E-05	5.20E-10	5.71E-03	9.11E-08	7.12E-04
Silver	8.43E-01	1.15E-06	5.00E-03	2.31E-04	4.61E-08	5.00E-03	9.22E-06	1.76E-10	NA		2.40E-04
Thallium	3.16E+00	4.33E-06	6.60E-05	6.56E-02	1.73E-07	6.60E-05	2.62E-03	6.58E-10	NA		6.82E-02
Vanadium	4.16E+01	5.70E-05	1.00E-03	5.70E-02	2.27E-06	1.00E-03	2.27E-03	8.66E-09	NA		5.93E-02
Zinc	5.91E+02	8.10E-04	3.00E-01	2.70E-03	3.23E-05	3.00E-01	1.08E-04	1.23E-07	NA		2.81E-03

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Pesticides/PCBs											
Aldrin	1.29E+00	1.77E-06	3.00E-05	5.89E-02	3.53E-07	3.00E-05	1.18E-02	2.69E-10	3.00E-05	8.95E-06	7.07E-02
alpha-BHC	2.60E-02	3.56E-08	5.00E-04	7.12E-05	7.11E-09	5.00E-04	1.42E-05	5.41E-12	5.00E-04	1.08E-08	8.55E-05
alpha-Chlordane	4.04E-02	5.53E-08	5.00E-04	1.11E-04	1.10E-08	5.00E-04	2.21E-05	8.41E-12	2.00E-04	4.21E-08	1.33E-04
4,4'-DDD	9.16E+00	1.25E-05	NA		2.50E-06	NA		1.91E-09	NA		
4,4'-DDE	3.56E+00	4.88E-06	NA		9.73E-07	NA		7.41E-10	NA		
4,4'-DDT	3.25E-01	4.45E-07	5.00E-04	8.90E-04	8.88E-08	5.00E-04	1.78E-04	6.77E-11	5.00E-04	1.35E-07	1.07E-03
beta-BHC	3.50E-02	4.79E-08	NA		9.57E-09	NA		7.29E-12	NA		
delta-BHC	4.10E-03	5.62E-09	NA		1.12E-09	NA		8.54E-13	NA		
Dieldrin	1.34E+00	1.84E-06	5.00E-05	3.67E-02	3.66E-07	5.00E-05	7.32E-03	2.79E-10	5.00E-05	5.58E-06	4.40E-02
Endosulfan sulfate	1.60E-03	2.19E-09	6.00E-03	3.65E-07	4.37E-10	6.00E-03	7.29E-08	3.33E-13	6.00E-03	5.55E-11	4.38E-07
Endrin	4.60E-03	6.30E-09	3.00E-04	2.10E-05	1.26E-09	3.00E-04	4.19E-06	9.58E-13	3.00E-04	3.19E-09	2.52E-05
Endrin aldehyde	1.10E-03	1.51E-09	3.00E-04	5.02E-06	3.01E-10	3.00E-04	1.00E-06	2.29E-13	3.00E-04	7.63E-10	6.03E-06
Endrin ketone	1.20E-02	1.64E-08	3.00E-04	5.48E-05	3.28E-09	3.00E-04	1.09E-05	2.50E-12	3.00E-04	8.33E-09	6.57E-05
gamma-Chlordane	1.09E-01	1.49E-07	5.00E-04	2.99E-04	2.98E-08	5.00E-04	5.96E-05	2.27E-11	2.00E-04	1.13E-07	3.58E-04
Heptachlor	8.80E-03	1.21E-08	5.00E-04	2.41E-05	2.40E-09	5.00E-04	4.81E-06	1.83E-12	5.00E-04	3.66E-09	2.89E-05
Methoxychlor	3.90E-03	5.34E-09	5.00E-03	1.07E-06	1.07E-09	5.00E-03	2.13E-07	8.12E-13	5.00E-03	1.62E-10	1.28E-06
Aroclor-1260	6.40E-01	8.77E-07	2.00E-05	4.38E-02	5.25E-07	2.00E-05	2.62E-02	1.33E-10	2.00E-05	6.66E-06	7.01E-02
SVOCs/VOCs											
1,2,4-Trichlorobenzene	1.54E+00	2.11E-06	1.00E-02	2.11E-04	8.42E-07	1.00E-02	8.42E-05	8.87E-06	1.00E-03	8.87E-03	9.17E-03
1,2-Dichlorobenzene	5.47E+01	7.49E-05	9.00E-02	8.33E-04	2.99E-05	9.00E-02	3.32E-04	9.37E-04	5.71E-02	1.64E-02	1.76E-02
1,3-Dichlorobenzene	2.02E+00	2.77E-06	3.00E-02	9.22E-05	1.10E-06	3.00E-02	3.68E-05	3.46E-05	3.00E-02	1.15E-03	1.28E-03
1,4-Dichlorobenzene	2.55E+01	3.49E-05	3.00E-02	1.16E-03	1.39E-05	3.00E-02	4.65E-04	4.96E-04	2.30E-01	2.15E-03	3.78E-03
2-Methylnaphthalene	1.14E+02	1.56E-04	4.00E-03	3.90E-02	9.35E-05	4.00E-03	2.34E-02	5.08E-04	NA		6.24E-02
2-Methylphenol	9.90E-01	1.36E-06	5.00E-02	2.71E-05	5.41E-07	5.00E-02	1.08E-05	2.06E-10	5.00E-02	4.12E-09	3.79E-05
4-Chloro-3-methylphenol	7.20E+00	9.86E-06	NA		3.94E-06	NA		1.50E-09	NA		
4-Methylphenol	3.60E+00	4.93E-06	5.00E-03	9.86E-04	1.97E-06	5.00E-03	3.94E-04	7.49E-10	5.00E-03	1.50E-07	1.38E-03
Acenaphthene	9.18E+00	1.26E-05	6.00E-02	2.10E-04	7.53E-06	6.00E-02	1.25E-04	1.04E-05	6.00E-02	1.74E-04	5.09E-04
Anthracene	1.10E+00	1.51E-06	3.00E-01	5.02E-06	9.02E-07	3.00E-01	3.01E-06	3.49E-07	3.00E-01	1.16E-06	9.19E-06
Benzo(a)anthracene	5.50E-01	7.53E-07	NA		4.51E-07	NA		1.15E-10	NA		
Benzo(a)pyrene	5.00E-01	6.85E-07	NA		4.10E-07	NA		1.04E-10	NA		
Benzo(b)fluoranthene	4.20E-01	5.75E-07	NA		3.44E-07	NA		8.74E-11	NA		
Benzo(g,h,i)perylene	4.30E-01	5.89E-07	NA		3.53E-07	NA		8.95E-11	NA		
Benzo(k)fluoranthene	4.30E-01	5.89E-07	NA		3.53E-07	NA		8.95E-11	NA		
Benzyl butyl phthalate	7.60E+00	1.04E-05	2.00E-01	5.21E-05	4.15E-06	2.00E-01	2.08E-05	1.58E-09	2.00E-01	7.91E-09	7.28E-05
Biphenyl (diphenyl)	4.40E+00	6.03E-06	5.00E-02	1.21E-04	2.40E-06	5.00E-02	4.81E-05	9.16E-10	5.00E-02	1.83E-08	1.69E-04
bis(2-Ethylhexyl)phthalate	9.85E+00	1.35E-05	2.00E-02	6.75E-04	5.38E-06	2.00E-02	2.69E-04	2.05E-09	2.00E-02	1.03E-07	9.44E-04
Caprolactam	9.50E-02	1.30E-07	5.00E-01	2.60E-07	5.19E-08	5.00E-01	1.04E-07	1.98E-11	5.00E-01	3.96E-11	3.64E-07
Carbazole	1.10E+00	1.51E-06	NA		6.01E-07	NA		2.29E-10	NA		
Chrysene	9.10E-01	1.25E-06	NA		7.46E-07	NA		1.89E-10	NA		
Dibenz(a,h)anthracene	1.20E-01	1.64E-07	NA		9.84E-08	NA		2.50E-11	NA		
Dibenzofuran	4.10E+00	5.62E-06	2.00E-03	2.81E-03	2.24E-06	2.00E-03	1.12E-03	2.03E-06	2.00E-03	1.01E-03	4.94E-03
Di-n-butyl phthalate	2.90E+00	3.97E-06	1.00E-01	3.97E-05	1.59E-06	1.00E-01	1.59E-05	6.04E-10	1.00E-01	6.04E-09	5.56E-05
Fluoranthene	4.20E+00	5.75E-06	4.00E-02	1.44E-04	3.44E-06	4.00E-02	8.61E-05	8.74E-10	4.00E-02	2.19E-08	2.30E-04
Fluorene	8.31E+00	1.14E-05	4.00E-02	2.85E-04	6.81E-06	4.00E-02	1.70E-04	4.05E-06	4.00E-02	1.01E-04	5.56E-04
Indeno(1,2,3-c,d)pyrene	4.40E-01	6.03E-07	NA		3.61E-07	NA		9.16E-11	NA		

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Naphthalene	5.28E+01	7.23E-05	2.00E-02	3.62E-03	4.33E-05	2.00E-02	2.16E-03	2.35E-04	8.57E-04	2.74E-01	**2.80E-01**
Phenanthrene	1.21E+01	1.66E-05	NA		9.92E-06	NA		2.52E-09	NA		
Pyrene	3.97E+00	5.44E-06	3.00E-02	1.81E-04	3.25E-06	3.00E-02	1.08E-04	2.60E-07	3.00E-02	8.66E-06	2.98E-04
1,1,1-Trichloroethane	2.51E-02	3.44E-08	2.80E-01	1.23E-07	1.37E-08	2.80E-01	4.90E-08	2.98E-06	6.30E-01	4.73E-06	4.90E-06
1,1-Dichloroethane	1.01E+01	1.38E-05	1.00E-01	1.38E-04	5.52E-06	1.00E-01	5.52E-05	1.14E-03	1.43E-01	8.00E-03	8.19E-03
1,1-Dichloroethene	6.80E-02	9.32E-08	2.00E-02	4.66E-06	3.72E-08	2.00E-02	1.86E-06	1.31E-05	2.00E-02	6.56E-04	6.62E-04
1,2-Dichloroethane	6.05E-02	8.29E-08	2.00E-02	4.14E-06	3.31E-08	2.00E-02	1.65E-06	4.31E-06	1.40E-03	3.08E-03	3.08E-03
Acetone	2.26E-01	3.10E-07	9.00E-01	3.44E-07	1.24E-07	9.00E-01	1.37E-07	5.72E-06	9.00E-01	6.36E-06	6.84E-06
Benzene	1.93E+00	2.64E-06	4.00E-03	6.61E-04	1.05E-06	4.00E-03	2.64E-04	1.88E-04	8.57E-03	2.19E-02	2.28E-02
Carbon disulfide	6.29E-03	8.62E-09	1.00E-01	8.62E-08	3.44E-09	1.00E-01	3.44E-08	1.48E-06	2.00E-01	7.41E-06	7.53E-06
Chlorobenzene	1.01E+01	1.38E-05	2.00E-02	6.92E-04	5.52E-06	2.00E-02	2.76E-04	4.07E-04	1.70E-02	2.40E-02	2.49E-02
Chloroethane	2.40E-02	3.29E-08	4.00E-01	8.22E-08	1.31E-08	4.00E-01	3.28E-08	5.81E-06	2.86E+00	2.03E-06	2.15E-06
Chloromethane	1.27E-01	1.74E-07	2.60E-02	6.69E-06	6.94E-08	2.60E-02	2.67E-06	6.49E-06	2.60E-02	2.50E-04	2.59E-04
cis-1,2-Dichloroethene	1.49E+02	2.04E-04	1.00E-02	2.04E-02	8.14E-05	1.00E-02	8.14E-03	1.39E-02	1.00E-02	1.39E+00	**1.41E+00**
Cyclohexane	2.55E+00	3.49E-06	1.70E+00	2.05E-06	1.39E-06	1.70E+00	8.20E-07	6.68E-04	1.70E+00	3.93E-04	3.96E-04
Ethylbenzene	2.24E+01	3.07E-05	1.00E-01	3.07E-04	1.22E-05	1.00E-01	1.22E-04	1.04E-03	2.90E-01	3.59E-03	4.02E-03
Isopropylbenzene (cumene)	5.35E+00	7.33E-06	1.00E-01	7.33E-05	2.92E-06	1.00E-01	2.92E-05	4.79E-04	1.10E-01	4.36E-03	4.46E-03
Methyl ethyl ketone	3.14E-01	4.30E-07	6.00E-01	7.17E-07	1.72E-07	6.00E-01	2.86E-07	5.20E-06	1.40E+00	3.71E-06	4.72E-06
Methyl isobutyl ketone	5.74E+00	7.86E-06	8.00E-02	9.83E-05	3.14E-06	8.00E-02	3.92E-05	7.34E-05	8.60E-01	8.53E-05	2.23E-04
Methyl tert-butyl ether	4.00E-03	5.48E-09	8.57E-01	6.39E-09	2.19E-09	8.57E-01	2.55E-09	2.74E-07	8.57E-01	3.20E-07	3.29E-07
Methylcyclohexane	1.02E+01	1.40E-05	8.60E-01	1.62E-05	5.58E-06	8.60E-01	6.48E-06	1.62E-03	8.60E-01	1.88E-03	1.90E-03
Methylene chloride	8.38E-03	1.15E-08	6.00E-02	1.91E-07	4.58E-09	6.00E-02	7.63E-08	1.08E-06	1.14E-01	9.45E-06	9.72E-06
Styrene	5.14E-01	7.04E-07	2.00E-01	3.52E-06	2.81E-07	2.00E-01	1.40E-06	1.23E-05	2.57E-01	4.79E-05	5.28E-05
Tetrachloroethene	8.76E-02	1.20E-07	1.00E-02	1.20E-05	4.79E-08	1.00E-02	4.79E-06	1.10E-05	1.00E-02	1.10E-03	1.12E-03
Toluene	1.16E+02	1.59E-04	2.00E-01	7.95E-04	6.34E-05	2.00E-01	3.17E-04	9.37E-03	8.57E-02	1.09E-01	**1.10E-01**
trans-1,2-Dichloroethene	6.38E-01	8.74E-07	2.00E-02	4.37E-05	3.49E-07	2.00E-02	1.74E-05	8.75E-05	2.00E-02	4.38E-03	4.44E-03
Trichloroethene	5.21E-01	7.14E-07	3.00E-04	2.38E-03	2.85E-07	3.00E-04	9.49E-04	5.13E-05	1.00E-02	5.13E-03	8.46E-03
Vinyl chloride	1.28E+00	1.75E-06	3.00E-03	5.84E-04	7.00E-07	3.00E-03	2.33E-04	3.94E-04	2.86E-02	1.38E-02	1.46E-02
Xylenes, total	1.57E+02	2.15E-04	2.00E-01	1.08E-03	8.58E-05	2.00E-01	4.29E-04	8.27E-03	2.90E-02	2.85E-01	**2.87E-01**
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	9.72E-04	1.33E-09	NA		1.59E-10	NA		2.02E-13	1.14E-08	1.77E-05	1.77E-05
1,2,3,4,6,7,8-HpCDF	1.60E-04	2.19E-10	NA		2.62E-11	NA		3.33E-14	1.14E-08	2.91E-06	2.91E-06
1,2,3,4,7,8,9-HpCDF	7.93E-06	1.09E-11	NA		1.30E-12	NA		1.65E-15	1.14E-08	1.44E-07	1.44E-07
1,2,3,4,7,8-HxCDD	1.64E-05	2.25E-11	NA		2.69E-12	NA		3.41E-15	1.14E-08	2.99E-07	2.99E-07
1,2,3,4,7,8-HxCDF	2.26E-06	3.10E-12	NA		3.71E-13	NA		4.71E-16	1.14E-08	4.12E-08	4.12E-08
1,2,3,6,7,8-HxCDD	7.35E-05	1.01E-10	NA		1.21E-11	NA		1.53E-14	1.14E-08	1.34E-06	1.34E-06
1,2,3,6,7,8-HxCDF	1.50E-05	2.05E-11	NA		2.46E-12	NA		3.12E-15	1.14E-08	2.73E-07	2.73E-07
1,2,3,7,8,9-HxCDD	4.14E-05	5.67E-11	NA		6.79E-12	NA		8.62E-15	1.14E-08	7.54E-07	7.54E-07
1,2,3,7,8,9-HxCDF	8.75E-06	1.20E-11	NA		1.43E-12	NA		1.82E-15	1.14E-08	1.59E-07	1.59E-07
1,2,3,7,8-PeCDD	1.53E-05	2.10E-11	NA		2.51E-12	NA		3.19E-15	1.14E-08	2.79E-07	2.79E-07
2,3,4,6,7,8-HxCDF	1.51E-05	2.07E-11	NA		2.48E-12	NA		3.14E-15	1.14E-08	2.75E-07	2.75E-07
2,3,4,7,8-PeCDF	3.66E-05	5.01E-11	NA		6.00E-12	NA		7.62E-15	1.14E-08	6.67E-07	6.67E-07

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
2,3,7,8-TCDF	4.63E-06	6.34E-12	NA		7.59E-13	NA		9.64E-16	1.14E-08	8.43E-08	8.43E-08
OCDD	8.20E-03	1.12E-08	NA		1.34E-09	NA		1.71E-12	1.14E-08	1.49E-04	1.49E-04
OCDF	3.25E-04	4.45E-10	NA		5.33E-11	NA		6.77E-14	1.14E-08	5.92E-06	5.92E-06
		Total Risk (Hazard Index):		0.65	**Total Risk (Hazard Index):**		0.11	**Total Risk (Hazard Index):**		2.20	**2.96**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-Carcinogenic Risk (Hazard Index) Across All Exposure Routes : **3**

Table 1-9
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Residential Exposure Scenario - Future Child Resident Receptor - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Child Resident
	Receptor Age:	Child (6 years)

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	6	yr
Soil Ingestion Rate	IR	200	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	10	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	2900	cm2/day [soil]
Body Weight	BW	15	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		0.00E+00
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
Metals											
Aluminum	1.26E+04	1.38E-02	NA		4.00E-04	NA		5.25E-07	NA		
Antimony	1.36E+01	1.49E-05	NA		4.32E-07	NA		5.66E-10	NA		
Arsenic	7.71E+00	8.45E-06	9.50E+00	8.03E-05	7.35E-07	9.50E+00	6.98E-06	3.21E-10	1.51E+01	4.83E-09	**8.73E-05**
Barium	5.13E+02	5.62E-04	NA		1.63E-05	NA		2.14E-08	NA		
Beryllium	6.14E-01	6.73E-07	NA		1.95E-08	NA		2.56E-11	8.40E+00	2.15E-10	2.15E-10
Cadmium	1.58E+00	1.73E-06	3.80E-01	6.58E-07	5.02E-09	3.80E-01	1.91E-09	6.58E-11	1.47E+01	9.67E-10	6.61E-07
Chromium	1.41E+03	1.55E-03	NA		4.48E-05	NA		5.87E-08	4.20E+01	2.47E-06	**2.47E-06**
Cobalt	8.75E+00	9.59E-06	NA		2.78E-07	NA		3.64E-10	9.80E+00	3.57E-09	3.57E-09
Copper	2.29E+02	2.51E-04	NA		7.28E-06	NA		9.53E-09	NA		
Iron	2.61E+04	2.86E-02	NA		8.29E-04	NA		1.09E-06	NA		
Lead	6.40E+02	7.01E-04	NA		2.03E-05	NA		2.66E-08	NA		
Manganese	1.14E+03	1.25E-03	NA		3.62E-05	NA		4.75E-08	NA		
Nickel	4.22E+01	4.62E-05	NA		1.34E-06	NA		1.76E-09	9.10E-01	1.60E-09	1.60E-09
Selenium	2.50E+00	2.74E-06	NA		7.95E-08	NA		1.04E-10	NA		
Silver	8.43E-01	9.24E-07	NA		2.68E-08	NA		3.51E-11	NA		
Thallium	3.16E+00	3.46E-06	NA		1.00E-07	NA		1.32E-10	NA		
Vanadium	4.16E+01	4.56E-05	NA		1.32E-06	NA		1.73E-09	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Zinc	5.91E+02	6.48E-04	NA		1.88E-05	NA		2.46E-08	NA		
Pesticides/PCBs											
Aldrin	1.29E+00	1.41E-06	1.70E+01	2.40E-05	2.05E-07	1.70E+01	3.48E-06	5.37E-11	1.72E+01	9.21E-10	**2.75E-05**
alpha-BHC	2.60E-02	2.85E-08	6.30E+00	1.80E-07	4.13E-09	6.30E+00	2.60E-08	1.08E-12	6.30E+00	6.82E-12	2.06E-07
alpha-Chlordane	4.04E-02	4.43E-08	1.20E+00	5.31E-08	6.42E-09	1.20E+00	7.70E-09	1.68E-12	1.19E+00	2.00E-12	6.08E-08
4,4'-DDD	9.16E+00	1.00E-05	2.40E-01	2.41E-06	1.46E-06	2.40E-01	3.49E-07	3.81E-10	2.42E-01	9.21E-11	**2.76E-06**
4,4'-DDE	3.56E+00	3.90E-06	3.40E-01	1.33E-06	5.66E-07	3.40E-01	1.92E-07	1.48E-10	3.40E-01	5.03E-11	**1.52E-06**
4,4'-DDT	3.25E-01	3.56E-07	3.40E-01	1.21E-07	5.16E-08	3.40E-01	1.76E-08	1.35E-11	3.40E-01	4.59E-12	1.39E-07
beta-BHC	3.50E-02	3.84E-08	1.80E+00	6.90E-08	5.56E-09	1.80E+00	1.00E-08	1.46E-12	1.80E+00	2.62E-12	7.91E-08
delta-BHC	4.10E-03	4.49E-09	NA		6.52E-10	NA		1.71E-13	NA		
Dieldrin	1.34E+00	1.47E-06	1.60E+01	2.35E-05	2.13E-07	1.60E+01	3.41E-06	5.58E-11	1.61E+01	8.98E-10	**2.69E-05**
Endosulfan sulfate	1.60E-03	1.75E-09	NA		2.54E-10	NA		6.66E-14	NA		
Endrin	4.60E-03	5.04E-09	NA		7.31E-10	NA		1.92E-13	NA		
Endrin aldehyde	1.10E-03	1.21E-09	NA		1.75E-10	NA		4.58E-14	NA		
Endrin ketone	1.20E-02	1.32E-08	NA		1.91E-09	NA		5.00E-13	NA		
gamma-Chlordane	1.09E-01	1.19E-07	1.20E+00	1.43E-07	1.73E-08	1.20E+00	2.08E-08	4.54E-12	1.19E+00	5.40E-12	1.64E-07
Heptachlor	8.80E-03	9.64E-09	4.50E+00	4.34E-08	1.40E-09	4.50E+00	6.29E-09	3.66E-13	4.55E+00	1.67E-12	4.97E-08
Methoxychlor	3.90E-03	4.27E-09	NA		6.20E-10	NA		1.62E-13	NA		
Aroclor-1260	6.40E-01	7.01E-07	2.00E+00	1.40E-06	3.05E-07	2.00E+00	6.10E-07	2.66E-11	2.00E+00	5.33E-11	**2.01E-06**
SVOCs/VOCs											
1,2,4-Trichlorobenzene	1.54E+00	1.69E-06	3.60E-03	6.08E-09	4.89E-07	3.60E-03	1.76E-09	1.77E-06	NA		7.84E-09
1,2-Dichlorobenzene	5.47E+01	5.99E-05	NA		1.74E-05	NA		1.87E-04	NA		
1,3-Dichlorobenzene	2.02E+00	2.21E-06	NA		6.42E-07	NA		6.92E-06	NA		
1,4-Dichlorobenzene	2.55E+01	2.79E-05	2.40E-02	6.71E-07	8.10E-06	2.40E-02	1.94E-07	9.91E-05	3.85E-02	3.82E-06	**4.68E-06**
2-Methylnaphthalene	1.14E+02	1.25E-04	NA		5.43E-05	NA		1.02E-04	NA		
2-Methylphenol	9.90E-01	1.08E-06	NA		3.15E-07	NA		4.12E-11	NA		
4-Chloro-3-methylphenol	7.20E+00	7.89E-06	NA		2.29E-06	NA		3.00E-10	NA		
4-Methylphenol	3.60E+00	3.95E-06	NA		1.14E-06	NA		1.50E-10	NA		
Acenaphthene	9.18E+00	1.01E-05	NA		4.38E-06	NA		2.08E-06	NA		
Anthracene	1.10E+00	1.21E-06	NA		5.24E-07	NA		6.98E-08	NA		
Benzo(a)anthracene	5.50E-01	6.03E-07	1.20E+00	7.23E-07	2.62E-07	1.20E+00	3.15E-07	2.29E-11	7.30E-01	1.67E-11	**1.04E-06**
Benzo(a)pyrene	5.00E-01	5.48E-07	1.20E+01	6.58E-06	2.38E-07	1.20E+01	2.86E-06	2.08E-11	7.30E+00	1.52E-10	**9.44E-06**
Benzo(b)fluoranthene	4.20E-01	4.60E-07	1.20E+00	5.52E-07	2.00E-07	1.20E+00	2.40E-07	1.75E-11	7.30E-01	1.28E-11	7.93E-07
Benzo(g,h,i)perylene	4.30E-01	4.71E-07	NA		2.05E-07	NA		1.79E-11	NA		
Benzo(k)fluoranthene	4.30E-01	4.71E-07	1.20E+00	5.65E-07	2.05E-07	1.20E+00	2.46E-07	1.79E-11	3.85E-01	6.89E-12	8.11E-07
Benzyl butyl phthalate	7.60E+00	8.33E-06	NA		2.42E-06	NA		3.16E-10	NA		
Biphenyl (diphenyl)	4.40E+00	4.82E-06	NA		1.40E-06	NA		1.83E-10	NA		
bis(2-Ethylhexyl)phthalate	9.85E+00	1.08E-05	1.40E-02	1.51E-07	3.13E-06	1.40E-02	4.38E-08	4.10E-10	1.40E-02	5.74E-12	1.95E-07
Caprolactam	9.50E-02	1.04E-07	NA		3.02E-08	NA		3.96E-12	NA		
Carbazole	1.10E+00	1.21E-06	2.00E-02	2.41E-08	3.50E-07	2.00E-02	6.99E-09	4.58E-11	2.00E-02	9.16E-13	3.11E-08
Chrysene	9.10E-01	9.97E-07	1.20E-01	1.20E-07	4.34E-07	1.20E-01	5.21E-08	3.79E-11	3.85E-02	1.46E-12	1.72E-07
Dibenz(a,h)anthracene	1.20E-01	1.32E-07	7.30E+00	9.60E-07	5.72E-08	7.30E+00	4.18E-07	5.00E-12	7.30E+00	3.65E-11	**1.38E-06**
Dibenzofuran	4.10E+00	4.49E-06	NA		1.30E-06	NA		4.05E-07	NA		
Di-n-butyl phthalate	2.90E+00	3.18E-06	NA		9.22E-07	NA		1.21E-10	NA		
Fluoranthene	4.20E+00	4.60E-06	NA		2.00E-06	NA		1.75E-10	NA		
Fluorene	8.31E+00	9.11E-06	NA		3.96E-06	NA		8.11E-07	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Indeno(1,2,3-c,d)pyrene	4.40E-01	4.82E-07	7.30E-01	3.52E-07	2.10E-07	7.30E-01	1.53E-07	1.83E-11	7.30E-01	1.34E-11	5.05E-07
Naphthalene	5.28E+01	5.79E-05	1.20E-01	6.94E-06	2.52E-05	1.20E-01	3.02E-06	4.70E-05	1.19E-01	5.60E-06	**1.56E-05**
Phenanthrene	1.21E+01	1.33E-05	NA		5.77E-06	NA		5.04E-10	NA		
Pyrene	3.97E+00	4.35E-06	NA		1.89E-06	NA		5.20E-08	NA		
1,1,1-Trichloroethane	2.51E-02	2.75E-08	NA		7.98E-09	NA		5.96E-07	NA		
1,1-Dichloroethane	1.01E+01	1.11E-05	5.70E-03	6.31E-08	3.21E-06	5.70E-03	1.83E-08	2.29E-04	5.60E-03	1.28E-06	**1.36E-06**
1,1-Dichloroethene	6.80E-02	7.45E-08	9.10E-02	6.78E-09	2.16E-08	9.10E-02	1.97E-09	2.62E-06	9.10E-02	2.39E-07	2.47E-07
1,2-Dichloroethane	6.05E-02	6.63E-08	9.10E-02	6.03E-09	1.92E-08	9.10E-02	1.75E-09	8.61E-07	9.10E-02	7.84E-08	8.62E-08
Acetone	2.26E-01	2.48E-07	NA		7.18E-08	NA		1.14E-06	NA		
Benzene	1.93E+00	2.12E-06	1.00E-01	2.12E-07	6.13E-07	1.00E-01	6.13E-08	3.75E-05	1.02E-01	3.81E-06	**4.08E-06**
Carbon disulfide	6.29E-03	6.89E-09	NA		2.00E-09	NA		2.96E-07	NA		
Chlorobenzene	1.01E+01	1.11E-05	NA		3.21E-06	NA		8.15E-05	NA		
Chloroethane	2.40E-02	2.63E-08	2.90E-03	7.63E-11	7.63E-09	2.90E-03	2.21E-11	1.16E-06	2.90E-03	3.37E-09	3.47E-09
Chloromethane	1.27E-01	1.39E-07	NA		4.04E-08	NA		1.30E-06	NA		
cis-1,2-Dichloroethene	1.49E+02	1.63E-04	NA		4.74E-05	NA		2.77E-03	NA		
Cyclohexane	2.55E+00	2.79E-06	NA		8.10E-07	NA		1.34E-04	NA		
Ethylbenzene	2.24E+01	2.45E-05	NA		7.12E-06	NA		2.08E-04	NA		
Isopropylbenzene (cumene)	5.35E+00	5.86E-06	NA		1.70E-06	NA		9.58E-05	NA		
Methyl ethyl ketone	3.14E-01	3.44E-07	NA		9.98E-08	NA		1.04E-06	NA		
Methyl isobutyl ketone	5.74E+00	6.29E-06	NA		1.82E-06	NA		1.47E-05	NA		
Methyl tert-butyl ether	4.00E-03	4.38E-09	1.80E-03	7.89E-12	1.27E-09	1.80E-03	2.29E-12	5.48E-08	9.10E-04	4.99E-11	6.01E-11
Methylcyclohexane	1.02E+01	1.12E-05	NA		3.24E-06	NA		3.24E-04	NA		
Methylene chloride	8.38E-03	9.18E-09	1.40E-02	1.29E-10	2.66E-09	1.40E-02	3.73E-11	2.16E-07	3.50E-03	7.56E-10	9.22E-10
Styrene	5.14E-01	5.63E-07	NA		1.63E-07	NA		2.46E-06	NA		
Tetrachloroethene	8.76E-02	9.60E-08	5.40E-01	5.18E-08	2.78E-08	5.40E-01	1.50E-08	2.21E-06	2.07E-02	4.55E-08	1.12E-07
Toluene	1.16E+02	1.27E-04	NA		3.69E-05	NA		1.87E-03	NA		
trans-1,2-Dichloroethene	6.38E-01	6.99E-07	NA		2.03E-07	NA		1.75E-05	NA		
Trichloroethene	5.21E-01	5.71E-07	4.00E-01	2.28E-07	1.66E-07	4.00E-01	6.62E-08	1.03E-05	4.00E-01	4.11E-06	**4.40E-06**
Vinyl chloride	1.28E+00	1.40E-06	1.50E+00	2.10E-06	4.07E-07	1.50E+00	6.10E-07	7.88E-05	2.73E-01	2.15E-05	**2.42E-05**
Xylenes, total	1.57E+02	1.72E-04	NA		4.99E-05	NA		1.65E-03	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	9.72E-04	1.07E-09	1.50E+03	1.60E-06	9.27E-11	1.50E+03	1.39E-07	4.05E-14	1.50E+03	6.07E-11	**1.74E-06**
1,2,3,4,6,7,8-HpCDF	1.60E-04	1.75E-10	1.50E+03	2.63E-07	1.53E-11	1.50E+03	2.29E-08	6.66E-15	1.50E+03	9.99E-12	2.86E-07
1,2,3,4,7,8,9-HpCDF	7.93E-06	8.69E-12	1.50E+03	1.30E-08	7.56E-13	1.50E+03	1.13E-09	3.30E-16	1.50E+03	4.95E-13	1.42E-08
1,2,3,4,7,8-HxCDD	1.64E-05	1.80E-11	1.50E+04	2.70E-07	1.56E-12	1.50E+04	2.35E-08	6.83E-16	1.50E+04	1.02E-11	2.93E-07
1,2,3,4,7,8-HxCDF	2.26E-06	2.48E-12	1.50E+04	3.72E-08	2.15E-13	1.50E+04	3.23E-09	9.41E-17	1.50E+04	1.41E-12	4.04E-08
1,2,3,6,7,8-HxCDD	7.35E-05	8.05E-11	1.50E+04	1.21E-06	7.01E-12	1.50E+04	1.05E-07	3.06E-15	1.50E+04	4.59E-11	**1.31E-06**
1,2,3,6,7,8-HxCDF	1.50E-05	1.64E-11	1.50E+04	2.47E-07	1.43E-12	1.50E+04	2.15E-08	6.25E-16	1.50E+04	9.37E-12	2.68E-07
1,2,3,7,8,9-HxCDD	4.14E-05	4.54E-11	1.50E+04	6.81E-07	3.95E-12	1.50E+04	5.92E-08	1.72E-15	1.50E+04	2.59E-11	7.40E-07
1,2,3,7,8,9-HxCDF	8.75E-06	9.59E-12	1.50E+04	1.44E-07	8.34E-13	1.50E+04	1.25E-08	3.64E-16	1.50E+04	5.46E-12	1.56E-07
1,2,3,7,8-PeCDD	1.53E-05	1.68E-11	1.50E+05	2.52E-06	1.46E-12	1.50E+05	2.19E-07	6.37E-16	1.50E+05	9.56E-11	**2.73E-06**
2,3,4,6,7,8-HxCDF	1.51E-05	1.65E-11	1.50E+04	2.48E-07	1.44E-12	1.50E+04	2.16E-08	6.29E-16	1.50E+04	9.43E-12	2.70E-07
2,3,4,7,8-PeCDF	3.66E-05	4.01E-11	7.50E+04	3.01E-06	3.49E-12	7.50E+04	2.62E-07	1.52E-15	7.50E+04	1.14E-10	**3.27E-06**

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
2,3,7,8-TCDF	4.63E-06	5.07E-12	1.50E+04	7.61E-08	4.41E-13	1.50E+04	6.62E-09	1.93E-16	1.50E+04	2.89E-12	8.27E-08
OCDD	8.20E-03	8.99E-09	1.50E+01	1.35E-07	7.82E-10	1.50E+01	1.17E-08	3.41E-13	1.50E+01	5.12E-12	1.47E-07
OCDF	3.25E-04	3.56E-10	1.50E+01	5.34E-09	3.10E-11	1.50E+01	4.65E-10	1.35E-14	1.50E+01	2.03E-13	5.81E-09
			Total Risk:	1.65E-04		**Total Risk:**	2.44E-05		**Total Risk:**	4.30E-05	**2.32E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **2E-04**

Table 1-10
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Residential Exposure Scenario - Future Child Resident Receptor - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Child Resident
	Receptor Age:	Child (6 years)

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	6	yr
Soil Ingestion Rate	IR	200	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	10	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	2900	cm2/day [soil]
Body Weight	BW	15	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		0.00E+00
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cw [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Aluminum	1.26E+04	1.61E-01	1.00E+00	1.61E-01	4.67E-03	1.00E+00	4.67E-03	6.12E-06	1.40E-03	4.37E-03	1.70E-01
Antimony	1.36E+01	1.74E-04	4.00E-04	4.35E-01	5.04E-06	4.00E-04	1.26E-02	6.61E-09	NA		4.47E-01
Arsenic	7.71E+00	9.86E-05	3.00E-04	3.29E-01	8.58E-06	3.00E-04	2.86E-02	3.75E-09	8.57E-06	4.37E-04	3.58E-01
Barium	5.13E+02	6.56E-03	7.00E-02	9.37E-02	1.90E-04	7.00E-02	2.72E-03	2.49E-07	1.43E-04	1.74E-03	9.82E-02
Beryllium	6.14E-01	7.85E-06	2.00E-03	3.93E-03	2.28E-07	2.00E-03	1.14E-04	2.98E-10	5.71E-06	5.22E-05	4.09E-03
Cadmium	1.58E+00	2.02E-05	1.10E-05	1.84E+00	5.86E-08	1.10E-05	5.33E-03	7.68E-10	5.71E-06	1.34E-04	**1.84E+00**
Chromium	1.41E+03	1.80E-02	NA		5.23E-04	NA		6.85E-07	NA		
Cobalt	8.75E+00	1.12E-04	2.00E-02	5.59E-03	3.24E-06	2.00E-02	1.62E-04	4.25E-09	5.70E-06	7.46E-04	6.50E-03
Copper	2.29E+02	2.93E-03	4.00E-02	7.32E-02	8.49E-05	4.00E-02	2.12E-03	1.11E-07	NA		7.53E-02
Iron	2.61E+04	3.34E-01	3.00E-01	1.11E+00	9.68E-03	3.00E-01	3.23E-02	1.27E-05	NA		**1.14E+00**
Lead	6.40E+02	8.18E-03	NA		2.37E-04	NA		3.11E-07	NA		
Manganese	1.14E+03	1.46E-02	2.40E-02	6.07E-01	4.23E-04	2.40E-02	1.76E-02	5.54E-07	1.40E-05	3.96E-02	6.64E-01
Nickel	4.22E+01	5.40E-04	1.10E-02	4.90E-02	1.56E-05	1.10E-02	1.42E-03	2.05E-08	1.43E-05	1.43E-03	5.19E-02
Selenium	2.50E+00	3.20E-05	5.00E-03	6.39E-03	9.27E-07	5.00E-03	1.85E-04	1.21E-09	5.71E-03	2.13E-07	6.58E-03
Silver	8.43E-01	1.08E-05	5.00E-03	2.16E-03	3.13E-07	5.00E-03	6.25E-05	4.10E-10	NA		2.22E-03
Thallium	3.16E+00	4.04E-05	6.60E-05	6.12E-01	1.17E-06	6.60E-05	1.78E-02	1.54E-09	NA		6.30E-01
Vanadium	4.16E+01	5.32E-04	1.00E-03	5.32E-01	1.54E-05	1.00E-03	1.54E-02	2.02E-08	NA		5.47E-01

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Zinc	5.91E+02	7.56E-03	3.00E-01	2.52E-02	2.19E-04	3.00E-01	7.30E-04	2.87E-07	NA		2.59E-02
Pesticides/PCBs											
Aldrin	1.29E+00	1.65E-05	3.00E-05	5.50E-01	2.39E-06	3.00E-05	7.97E-02	6.27E-10	3.00E-05	2.09E-05	6.30E-01
alpha-BHC	2.60E-02	3.32E-07	5.00E-04	6.65E-04	4.82E-08	5.00E-04	9.64E-05	1.26E-11	5.00E-04	2.53E-08	7.61E-04
alpha-Chlordane	4.04E-02	5.17E-07	3.30E-05	1.57E-02	7.49E-08	3.30E-05	2.27E-03	1.96E-11	2.00E-04	9.81E-08	1.79E-02
4,4'-DDD	9.16E+00	1.17E-04	NA		1.70E-05	NA		4.45E-09	NA		
4,4'-DDE	3.56E+00	4.55E-05	NA		6.60E-06	NA		1.73E-09	NA		
4,4'-DDT	3.25E-01	4.16E-06	5.00E-04	8.31E-03	6.03E-07	5.00E-04	1.21E-03	1.58E-10	5.00E-04	3.16E-07	9.52E-03
beta-BHC	3.50E-02	4.47E-07	NA		6.49E-08	NA		1.70E-11	NA		
delta-BHC	4.10E-03	5.24E-08	NA		7.60E-09	NA		1.99E-12	NA		
Dieldrin	1.34E+00	1.71E-05	5.00E-05	3.43E-01	2.48E-06	5.00E-05	4.97E-02	6.51E-10	5.00E-05	1.30E-05	3.92E-01
Endosulfan sulfate	1.60E-03	2.05E-08	6.00E-03	3.41E-06	2.97E-09	6.00E-03	4.94E-07	7.77E-13	6.00E-03	1.30E-10	3.90E-06
Endrin	4.60E-03	5.88E-08	3.00E-04	1.96E-04	8.53E-09	3.00E-04	2.84E-05	2.23E-12	3.00E-04	7.45E-09	2.24E-04
Endrin aldehyde	1.10E-03	1.41E-08	3.00E-04	4.69E-05	2.04E-09	3.00E-04	6.80E-06	5.34E-13	3.00E-04	1.78E-09	5.37E-05
Endrin ketone	1.20E-02	1.53E-07	3.00E-04	5.11E-04	2.22E-08	3.00E-04	7.42E-05	5.83E-12	3.00E-04	1.94E-08	5.86E-04
gamma-Chlordane	1.09E-01	1.39E-06	3.30E-05	4.22E-02	2.02E-07	3.30E-05	6.12E-03	5.29E-11	2.00E-04	2.65E-07	4.84E-02
Heptachlor	8.80E-03	1.13E-07	3.00E-05	3.75E-03	1.63E-08	3.00E-05	5.44E-04	4.27E-12	3.00E-05	1.42E-07	4.29E-03
Methoxychlor	3.90E-03	4.99E-08	2.00E-05	2.49E-03	7.23E-09	2.00E-05	3.62E-04	1.89E-12	2.00E-05	9.47E-08	2.85E-03
Aroclor-1260	6.40E-01	8.18E-06	2.00E-05	4.09E-01	3.56E-06	2.00E-05	1.78E-01	3.11E-10	2.00E-05	1.55E-05	5.87E-01
SVOCs/VOCs											
1,2,4-Trichlorobenzene	1.54E+00	1.97E-05	1.00E-02	1.97E-03	5.71E-06	1.00E-02	5.71E-04	2.07E-05	1.00E-03	2.07E-02	2.32E-02
1,2-Dichlorobenzene	5.47E+01	6.99E-04	9.00E-02	7.77E-03	2.03E-04	9.00E-02	2.25E-03	2.19E-03	5.71E-02	3.82E-02	4.83E-02
1,3-Dichlorobenzene	2.02E+00	2.58E-05	3.00E-02	8.61E-04	7.49E-06	3.00E-02	2.50E-04	8.07E-05	3.00E-02	2.69E-03	3.80E-03
1,4-Dichlorobenzene	2.55E+01	3.26E-04	3.00E-02	1.09E-02	9.45E-05	3.00E-02	3.15E-03	1.16E-03	2.30E-01	5.03E-03	1.90E-02
2-Methylnaphthalene	1.14E+02	1.46E-03	4.00E-03	3.64E-01	6.34E-04	4.00E-03	1.59E-01	1.18E-03	NA		5.23E-01
2-Methylphenol	9.90E-01	1.27E-05	5.00E-02	2.53E-04	3.67E-06	5.00E-02	7.34E-05	4.81E-10	5.00E-02	9.62E-09	3.27E-04
4-Chloro-3-methylphenol	7.20E+00	9.21E-05	NA		2.67E-05	NA		3.50E-09	NA		
4-Methylphenol	3.60E+00	4.60E-05	5.00E-03	9.21E-03	1.33E-05	5.00E-03	2.67E-03	1.75E-09	5.00E-03	3.50E-07	1.19E-02
Acenaphthene	9.18E+00	1.17E-04	6.00E-02	1.96E-03	5.11E-05	6.00E-02	8.51E-04	2.43E-05	6.00E-02	4.05E-04	3.21E-03
Anthracene	1.10E+00	1.41E-05	3.00E-01	4.69E-05	6.12E-06	3.00E-01	2.04E-05	8.15E-07	3.00E-01	2.72E-06	7.00E-05
Benzo(a)anthracene	5.50E-01	7.03E-06	NA		3.06E-06	NA		2.67E-10	NA		
Benzo(a)pyrene	5.00E-01	6.39E-06	NA		2.78E-06	NA		2.43E-10	NA		
Benzo(b)fluoranthene	4.20E-01	5.37E-06	NA		2.34E-06	NA		2.04E-10	NA		
Benzo(g,h,i)perylene	4.30E-01	5.50E-06	NA		2.39E-06	NA		2.09E-10	NA		
Benzo(k)fluoranthene	4.30E-01	5.50E-06	NA		2.39E-06	NA		2.09E-10	NA		
Benzyl butyl phthalate	7.60E+00	9.72E-05	2.00E-01	4.86E-04	2.82E-05	2.00E-01	1.41E-04	3.69E-09	2.00E-01	1.85E-08	6.27E-04
Biphenyl (diphenyl)	4.40E+00	5.63E-05	5.00E-02	1.13E-03	1.63E-05	5.00E-02	3.26E-04	2.14E-09	5.00E-02	4.27E-08	1.45E-03
bis(2-Ethylhexyl)phthalate	9.85E+00	1.26E-04	2.00E-02	6.30E-03	3.65E-05	2.00E-02	1.83E-03	4.78E-09	2.00E-02	2.39E-07	8.12E-03
Caprolactam	9.50E-02	1.21E-06	5.00E-01	2.43E-06	3.52E-07	5.00E-01	7.04E-07	4.61E-11	5.00E-01	9.23E-11	3.13E-06
Carbazole	1.10E+00	1.41E-05	NA		4.08E-06	NA		5.34E-10	NA		
Chrysene	9.10E-01	1.16E-05	NA		5.06E-06	NA		4.42E-10	NA		
Dibenz(a,h)anthracene	1.20E-01	1.53E-06	NA		6.67E-07	NA		5.83E-11	NA		
Dibenzofuran	4.10E+00	5.24E-05	2.00E-03	2.62E-02	1.52E-05	2.00E-03	7.60E-03	4.73E-06	2.00E-03	2.36E-03	3.62E-02
Di-n-butyl phthalate	2.90E+00	3.71E-05	1.00E-01	3.71E-04	1.08E-05	1.00E-01	1.08E-04	1.41E-09	1.00E-01	1.41E-08	4.78E-04
Fluoranthene	4.20E+00	5.37E-05	4.00E-02	1.34E-03	2.34E-05	4.00E-02	5.84E-04	2.04E-09	4.00E-02	5.10E-08	1.93E-03

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Fluorene	8.31E+00	1.06E-04	4.00E-02	2.66E-03	4.62E-05	4.00E-02	1.16E-03	9.46E-06	4.00E-02	2.37E-04	4.05E-03
Indeno(1,2,3-c,d)pyrene	4.40E-01	5.63E-06	NA		2.45E-06	NA		2.14E-10	NA		
Naphthalene	5.28E+01	6.75E-04	2.00E-02	3.38E-02	2.94E-04	2.00E-02	1.47E-02	5.49E-04	8.57E-04	6.40E-01	6.89E-01
Phenanthrene	1.21E+01	1.55E-04	NA		6.73E-05	NA		5.88E-09	NA		
Pyrene	3.97E+00	5.08E-05	3.00E-02	1.69E-03	2.21E-05	3.00E-02	7.36E-04	6.07E-07	3.00E-02	2.02E-05	2.45E-03
1,1,1-Trichloroethane	2.51E-02	3.21E-07	2.80E-01	1.15E-06	9.31E-08	2.80E-01	3.32E-07	6.95E-06	6.30E-01	1.10E-05	1.25E-05
1,1-Dichloroethane	1.01E+01	1.29E-04	1.00E-01	1.29E-03	3.74E-05	1.00E-01	3.74E-04	2.67E-03	1.43E-01	1.87E-02	2.03E-02
1,1-Dichloroethene	6.80E-02	8.69E-07	2.00E-02	4.35E-05	2.52E-07	2.00E-02	1.26E-05	3.06E-05	2.00E-02	1.53E-03	1.59E-03
1,2-Dichloroethane	6.05E-02	7.74E-07	2.00E-02	3.87E-05	2.24E-07	2.00E-02	1.12E-05	1.00E-05	1.40E-03	7.18E-03	7.23E-03
Acetone	2.26E-01	2.89E-06	9.00E-01	3.21E-06	8.38E-07	9.00E-01	9.31E-07	1.34E-05	9.00E-01	1.48E-05	1.90E-05
Benzene	1.93E+00	2.47E-05	4.00E-03	6.17E-03	7.16E-06	4.00E-03	1.79E-03	4.38E-04	8.57E-03	5.11E-02	5.90E-02
Carbon disulfide	6.29E-03	8.04E-08	1.00E-01	8.04E-07	2.33E-08	1.00E-01	2.33E-07	3.46E-06	2.00E-01	1.73E-05	1.83E-05
Chlorobenzene	1.01E+01	1.29E-04	2.00E-02	6.46E-03	3.74E-05	2.00E-02	1.87E-03	9.51E-04	1.70E-02	5.59E-02	6.42E-02
Chloroethane	2.40E-02	3.07E-07	4.00E-01	7.67E-07	8.90E-08	4.00E-01	2.22E-07	1.35E-05	2.86E+00	4.74E-06	5.73E-06
Chloromethane	1.27E-01	1.62E-06	2.60E-02	6.25E-05	4.71E-07	2.60E-02	1.81E-05	1.51E-05	2.60E-02	5.82E-04	6.63E-04
cis-1,2-Dichloroethene	1.49E+02	1.91E-03	1.00E-02	1.91E-01	5.52E-04	1.00E-02	5.52E-02	3.23E-02	1.00E-02	3.23E+00	**3.48E+00**
Cyclohexane	2.55E+00	3.26E-05	1.70E+00	1.92E-05	9.45E-06	1.70E+00	5.56E-06	1.56E-03	1.70E+00	9.17E-04	9.42E-04
Ethylbenzene	2.24E+01	2.86E-04	1.00E-01	2.86E-03	8.31E-05	1.00E-01	8.31E-04	2.43E-03	2.90E-01	8.39E-03	1.21E-02
Isopropylbenzene (cumene)	5.35E+00	6.84E-05	1.00E-01	6.84E-04	1.98E-05	1.00E-01	1.98E-04	1.12E-03	1.10E-01	1.02E-02	1.10E-02
Methyl ethyl ketone	3.14E-01	4.01E-06	6.00E-01	6.69E-06	1.16E-06	6.00E-01	1.94E-06	1.21E-05	1.40E+00	8.66E-06	1.73E-05
Methyl isobutyl ketone	5.74E+00	7.34E-05	8.00E-02	9.17E-04	2.13E-05	8.00E-02	2.66E-04	1.71E-04	8.60E-01	1.99E-04	1.38E-03
Methyl tert-butyl ether	4.00E-03	5.11E-08	8.57E-01	5.97E-08	1.48E-08	8.57E-01	1.73E-08	6.40E-07	8.57E-01	7.46E-07	8.23E-07
Methylcyclohexane	1.02E+01	1.30E-04	8.60E-01	1.52E-04	3.78E-05	8.60E-01	4.40E-05	3.77E-03	8.60E-01	4.39E-03	4.58E-03
Methylene chloride	8.38E-03	1.07E-07	6.00E-02	1.79E-06	3.11E-08	6.00E-02	5.18E-07	2.52E-06	1.14E-01	2.20E-05	2.43E-05
Styrene	5.14E-01	6.57E-06	2.00E-01	3.29E-05	1.91E-06	2.00E-01	9.53E-06	2.87E-05	2.57E-01	1.12E-04	1.54E-04
Tetrachloroethene	8.76E-02	1.12E-06	1.00E-02	1.12E-04	3.25E-07	1.00E-02	3.25E-05	2.57E-05	1.00E-02	2.57E-03	2.72E-03
Toluene	1.16E+02	1.48E-03	2.00E-01	7.42E-03	4.30E-04	2.00E-01	2.15E-03	2.19E-02	8.57E-02	2.55E-01	2.65E-01
trans-1,2-Dichloroethene	6.38E-01	8.16E-06	2.00E-02	4.08E-04	2.37E-06	2.00E-02	1.18E-04	2.04E-04	2.00E-02	1.02E-02	1.07E-02
Trichloroethene	5.21E-01	6.66E-06	3.00E-04	2.22E-02	1.93E-06	3.00E-04	6.44E-03	1.20E-04	1.00E-02	1.20E-02	4.06E-02
Vinyl chloride	1.28E+00	1.64E-05	3.00E-03	5.46E-03	4.75E-06	3.00E-03	1.58E-03	9.19E-04	2.86E-02	3.22E-02	3.92E-02
Xylenes, total	1.57E+02	2.01E-03	2.00E-01	1.00E-02	5.82E-04	2.00E-01	2.91E-03	1.93E-02	2.90E-02	6.66E-01	6.79E-01
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	9.72E-04	1.24E-08	NA		1.08E-09	NA		4.72E-13	1.14E-08	4.13E-05	4.13E-05
1,2,3,4,6,7,8-HpCDF	1.60E-04	2.05E-09	NA		1.78E-10	NA		7.77E-14	1.14E-08	6.80E-06	6.80E-06
1,2,3,4,7,8,9-HpCDF	7.93E-06	1.01E-10	NA		8.82E-12	NA		3.85E-15	1.14E-08	3.37E-07	3.37E-07
1,2,3,4,7,8-HxCDD	1.64E-05	2.10E-10	NA		1.82E-11	NA		7.97E-15	1.14E-08	6.97E-07	6.97E-07
1,2,3,4,7,8-HxCDF	2.26E-06	2.89E-11	NA		2.51E-12	NA		1.10E-15	1.14E-08	9.61E-08	9.61E-08
1,2,3,6,7,8-HxCDD	7.35E-05	9.40E-10	NA		8.18E-11	NA		3.57E-14	1.14E-08	3.12E-06	3.12E-06
1,2,3,6,7,8-HxCDF	1.50E-05	1.92E-10	NA		1.67E-11	NA		7.29E-15	1.14E-08	6.38E-07	6.38E-07
1,2,3,7,8,9-HxCDD	4.14E-05	5.29E-10	NA		4.61E-11	NA		2.01E-14	1.14E-08	1.76E-06	1.76E-06
1,2,3,7,8,9-HxCDF	8.75E-06	1.12E-10	NA		9.73E-12	NA		4.25E-15	1.14E-08	3.72E-07	3.72E-07
1,2,3,7,8-PeCDD	1.53E-05	1.96E-10	NA		1.70E-11	NA		7.43E-15	1.14E-08	6.50E-07	6.50E-07
2,3,4,6,7,8-HxCDF	1.51E-05	1.93E-10	NA		1.68E-11	NA		7.34E-15	1.14E-08	6.42E-07	6.42E-07
2,3,4,7,8-PeCDF	3.66E-05	4.68E-10	NA		4.07E-11	NA		1.78E-14	1.14E-08	1.56E-06	1.56E-06
2,3,7,8-TCDF	4.63E-06	5.92E-11	NA		5.15E-12	NA		2.25E-15	1.14E-08	1.97E-07	1.97E-07

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
OCDD	8.20E-03	1.05E-07	NA		9.12E-09	NA		3.98E-12	1.14E-08	3.49E-04	3.49E-04
OCDF	3.25E-04	4.16E-09	NA		3.62E-10	NA		1.58E-13	1.14E-08	1.38E-05	1.38E-05
		Total Risk (Hazard Index):		7.99	**Total Risk (Hazard Index):**		0.73	**Total Risk (Hazard Index):**		5.13	**13.84**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-Carcinogenic Risk (Hazard Index) Across All Exposure Routes : **14**

Table 1-11
Cancer Risk Results - Detailed Summary of Risk Drivers - Future Adult/Child Resident - Shallow Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	**3.4E-05**	**4.1E-06**	8.3E-09	**3.9E-05**	24%	**8.0E-05**	**7.0E-06**	4.8E-09	**8.7E-05**	38%
Chromium			**4.2E-06**	**4.2E-06**	3%			**2.5E-06**	**2.5E-06**	1%
Subtotal Metals	**3.5E-05**	**4.1E-06**	**4.2E-06**	**4.3E-05**	27%	**8.1E-05**	**7.0E-06**	**2.5E-06**	**9.0E-05**	39%
Pesticides/PCBs										
Aldrin	**1.0E-05**	**2.1E-06**	1.6E-09	**1.2E-05**	8%	**2.4E-05**	**3.5E-06**	9.2E-10	**2.8E-05**	12%
4,4'-DDD	**1.0E-06**	2.1E-07	1.6E-10	**1.2E-06**	0.8%	**2.4E-06**	3.5E-07	9.2E-11	**2.8E-06**	1%
4,4'-DDE	5.7E-07	1.1E-07	8.6E-11	6.8E-07	0.4%	**1.3E-06**	1.9E-07	5.0E-11	**1.5E-06**	0.7%
Dieldrin	**1.0E-05**	**2.0E-06**	1.5E-09	**1.2E-05**	8%	**2.3E-05**	**3.4E-06**	9.0E-10	**2.7E-05**	12%
Aroclor-1260	6.0E-07	3.6E-07	9.1E-11	9.6E-07	0.6%	**1.4E-06**	6.1E-07	5.3E-11	**2.0E-06**	0.9%
Subtotal Pesticides/PCBs	**2.3E-05**	**4.8E-06**	3.5E-09	**2.8E-05**	17%	**5.3E-05**	**8.1E-06**	2.0E-09	**6.1E-05**	26%
SVOCs/VOCs										
1,4-Dichlorobenzene	2.9E-07	1.1E-07	**6.5E-06**	**6.9E-06**	4%	6.7E-07	1.9E-07	**3.8E-06**	**4.7E-06**	2%
Benzo(a)anthracene	3.1E-07	1.9E-07	2.9E-11	5.0E-07	0.3%	7.2E-07	3.1E-07	1.7E-11	**1.0E-06**	0.4%
Benzo(a)pyrene	**2.8E-06**	**1.7E-06**	2.6E-10	**4.5E-06**	3%	**6.6E-06**	**2.9E-06**	1.5E-10	**9.4E-06**	4%
Dibenz(a,h)anthracene	4.1E-07	2.5E-07	6.3E-11	6.6E-07	0.4%	9.6E-07	4.2E-07	3.6E-11	**1.4E-06**	0.6%
Naphthalene	**3.0E-06**	**1.8E-06**	**9.6E-06**	**1.4E-05**	9%	**6.9E-06**	**3.0E-06**	**5.6E-06**	**1.6E-05**	7%
1,1-Dichloroethane	2.7E-08	1.1E-08	**2.2E-06**	**2.2E-06**	1%	6.3E-08	1.8E-08	**1.3E-06**	**1.4E-06**	0.6%
Benzene	9.1E-08	3.6E-08	**6.5E-06**	**6.7E-06**	4%	2.1E-07	6.1E-08	**3.8E-06**	**4.1E-06**	2%
Trichloroethene	9.8E-08	3.9E-08	**7.0E-06**	**7.2E-06**	5%	2.3E-07	6.6E-08	**4.1E-06**	**4.4E-06**	2%
Vinyl chloride	9.0E-07	3.6E-07	**3.7E-05**	**3.8E-05**	24%	**2.1E-06**	6.1E-07	**2.2E-05**	**2.4E-05**	10%
Subtotal SVOCs/VOCs	**8.7E-06**	**4.9E-06**	**6.9E-05**	**8.3E-05**	52%	**2.0E-05**	**8.3E-06**	**4.0E-05**	**6.9E-05**	30%
Dioxans/Furans										
1,2,3,4,6,7,8-HpCDD	6.8E-07	8.2E-08	1.0E-10	7.7E-07	0.5%	**1.6E-06**	1.4E-07	6.1E-11	**1.7E-06**	0.7%
1,2,3,6,7,8-HxCDD	5.2E-07	6.2E-08	7.9E-11	5.8E-07	0.4%	**1.2E-06**	1.1E-07	4.6E-11	**1.3E-06**	0.6%

Table 1-11
Cancer Risk Results - Detailed Summary of Risk Drivers - Future Adult/Child Resident - Shallow Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
1,2,3,7,8-PeCDD	**1.1E-06**	1.3E-07	1.6E-10	**1.2E-06**	0.8%	**2.5E-06**	2.2E-07	9.6E-11	**2.7E-06**	1%
2,3,4,7,8-PeCDF	**1.3E-06**	1.5E-07	2.0E-10	**1.4E-06**	0.9%	**3.0E-06**	2.6E-07	1.1E-10	**3.3E-06**	1%
Subtotal Dioxans/Furans	**4.5E-06**	5.4E-07	6.8E-10	**5.0E-06**	3%	**1.0E-05**	9.1E-07	4.0E-10	**1.1E-05**	5%
Total:	**7.1E-05**	**1.4E-05**	**7.4E-05**	**1.6E-04**		**1.6E-04**	**2.4E-05**	**4.3E-05**	**2.3E-04**	

Total Estimated Cancer Risk Across All Exposure Routes:	**2E-04**	**2E-04**

Sum of Adult and Child Excess Lifetime Cancer Risk (30 year exposure):	**2.4E-04**	**3.9E-05**	**1.2E-04**	**3.91E-04**

Total Estimated Adult plus Child Cancer Risk Across All Exposure Routes:	**4E-04**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total cancer risk for all chemicals evaluated.

Table 1-12
Noncancer Risk Results - Detailed Summary of Risk Drivers - Future Adult/Child Resident - Shallow Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Non-Carcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Aluminum	1.7E-02	6.9E-04	1.9E-03	2.0E-02	0.7%	**1.6E-01**	4.7E-03	4.4E-03	**1.7E-01**	1%
Antimony	4.7E-02	1.9E-03		4.8E-02	2%	**4.3E-01**	1.3E-02		**4.5E-01**	3%
Arsenic	3.5E-02	4.2E-03	1.9E-04	4.0E-02	1%	**3.3E-01**	2.9E-02	4.4E-04	**3.6E-01**	3%
Iron	**1.2E-01**	4.8E-03		**1.2E-01**	4%	**1.1E+00**	3.2E-02		**1.1E+00**	8%
Manganese	6.5E-02	2.6E-03	1.7E-02	8.5E-02	3%	**6.1E-01**	1.8E-02	4.0E-02	**6.6E-01**	5%
Thallium	6.6E-02	2.6E-03		6.8E-02	2%	**6.1E-01**	1.8E-02		**6.3E-01**	5%
Vanadium	5.7E-02	2.3E-03		5.9E-02	2%	**5.3E-01**	1.5E-02		**5.5E-01**	4%
Subtotal Metals	**4.4E-01**	2.0E-02	2.1E-02	**4.8E-01**	16%	**5.9E+00**	**1.4E-01**	4.8E-02	**6.1E+00**	44%
Pesticides/PCBs										
Aldrin	5.9E-02	1.2E-02	9.0E-06	7.1E-02	2%	**5.5E-01**	8.0E-02	2.1E-05	**6.3E-01**	5%
Dieldrin	3.7E-02	7.3E-03	5.6E-06	4.4E-02	1%	**3.4E-01**	5.0E-02	1.3E-05	**3.9E-01**	3%
Aroclor-1260	4.4E-02	2.6E-02	6.7E-06	7.0E-02	2%	**4.1E-01**	**1.8E-01**	1.6E-05	**5.9E-01**	4%
Subtotal Pesticides/PCBs	**1.4E-01**	4.6E-02	2.2E-05	**1.9E-01**	6%	**1.4E+00**	**3.2E-01**	5.0E-05	**1.7E+00**	12%
SVOCs/VOCs										
2-Methylnaphthalene	3.9E-02	2.3E-02		6.2E-02	2%	**3.6E-01**	**1.6E-01**		**5.2E-01**	4%
Naphthalene	3.6E-03	2.2E-03	**2.7E-01**	**2.8E-01**	9%	3.4E-02	1.5E-02	**6.4E-01**	**6.9E-01**	5%
cis-1,2-Dichloroethene	2.0E-02	8.1E-03	**1.4E+00**	**1.4E+00**	48%	**1.9E-01**	5.5E-02	**3.2E+00**	**3.5E+00**	25%
Toluene	7.9E-04	3.2E-04	**1.1E-01**	**1.1E-01**	4%	7.4E-03	2.2E-03	**2.6E-01**	**2.6E-01**	2%
Xylenes, total	1.1E-03	4.3E-04	**2.9E-01**	**2.9E-01**	10%	1.0E-02	2.9E-03	**6.7E-01**	**6.8E-01**	5%
Subtotal SVOCs/VOCs	7.8E-02	4.0E-02	**2.2E+00**	**2.3E+00**	78%	**7.3E-01**	**2.7E-01**	**5.1E+00**	**6.1E+00**	44%
Total:	**0.7**	**0.1**	**2.2**	**3.0**		**8.0**	**0.7**	**5.1**	**13.8**	

Total Estimated Hazard Index Across All Exposure Routes: **3** **14**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total hazard quotient for all chemicals evaluated.

Table 1-13
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Occupational Exposure Scenario - Industrial Worker Receptor - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Occupational
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Industrial Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	25	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	25	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
Metals											
Aluminum	1.26E+04	4.40E-03	NA		5.02E-04	NA		6.69E-07	NA		
Antimony	1.36E+01	4.75E-06	NA		5.42E-07	NA		7.22E-10	NA		
Arsenic	7.71E+00	2.69E-06	9.50E+00	2.56E-05	9.21E-07	9.50E+00	8.75E-06	4.09E-10	1.51E+01	6.16E-09	**3.44E-05**
Barium	5.13E+02	1.79E-04	NA		2.04E-05	NA		2.72E-08	NA		
Beryllium	6.14E-01	2.15E-07	NA		2.45E-08	NA		3.26E-11	8.40E+00	2.74E-10	2.74E-10
Cadmium	1.58E+00	5.52E-07	3.80E-01	2.10E-07	6.29E-09	3.80E-01	2.39E-09	8.39E-11	1.47E+01	1.23E-09	2.13E-07
Chromium	1.41E+03	4.93E-04	NA		5.62E-05	NA		7.49E-08	4.20E+01	3.15E-06	**3.15E-06**
Cobalt	8.75E+00	3.06E-06	NA		3.49E-07	NA		4.65E-10	9.80E+00	4.55E-09	4.55E-09
Copper	2.29E+02	8.00E-05	NA		9.12E-06	NA		1.22E-08	NA		
Iron	2.61E+04	9.12E-03	NA		1.04E-03	NA		1.39E-06	NA		
Lead	6.40E+02	2.24E-04	NA		2.55E-05	NA		3.40E-08	NA		
Manganese	1.14E+03	3.98E-04	NA		4.54E-05	NA		6.05E-08	NA		
Nickel	4.22E+01	1.47E-05	NA		1.68E-06	NA		2.24E-09	9.10E-01	2.04E-09	2.04E-09
Selenium	2.50E+00	8.74E-07	NA		9.96E-08	NA		1.33E-10	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Silver	8.43E-01	2.95E-07	NA		3.36E-08	NA		4.48E-11	NA		
Thallium	3.16E+00	1.10E-06	NA		1.26E-07	NA		1.68E-10	NA		
Vanadium	4.16E+01	1.45E-05	NA		1.66E-06	NA		2.21E-09	NA		
Zinc	5.91E+02	2.07E-04	NA		2.35E-05	NA		3.14E-08	NA		
Pesticides/PCBs											
Aldrin	1.29E+00	4.51E-07	1.70E+01	7.66E-06	2.57E-07	1.70E+01	4.37E-06	6.85E-11	1.72E+01	1.17E-09	**1.20E-05**
alpha-BHC	2.60E-02	9.09E-09	6.30E+00	5.72E-08	5.18E-09	6.30E+00	3.26E-08	1.38E-12	6.30E+00	8.70E-12	8.99E-08
alpha-Chlordane	4.04E-02	1.41E-08	1.20E+00	1.69E-08	8.05E-09	1.20E+00	9.66E-09	2.15E-12	1.19E+00	2.55E-12	2.66E-08
4,4'-DDD	9.16E+00	3.20E-06	2.40E-01	7.68E-07	1.82E-06	2.40E-01	4.38E-07	4.86E-10	2.42E-01	1.17E-10	**1.21E-06**
4,4'-DDE	3.56E+00	1.24E-06	3.40E-01	4.23E-07	7.09E-07	3.40E-01	2.41E-07	1.89E-10	3.40E-01	6.42E-11	6.64E-07
4,4'-DDT	3.25E-01	1.14E-07	3.40E-01	3.86E-08	6.47E-08	3.40E-01	2.20E-08	1.73E-11	3.40E-01	5.86E-12	6.06E-08
beta-BHC	3.50E-02	1.22E-08	1.80E+00	2.20E-08	6.97E-09	1.80E+00	1.25E-08	1.86E-12	1.80E+00	3.35E-12	3.46E-08
delta-BHC	4.10E-03	1.43E-09	NA		8.17E-10	NA		2.18E-13	NA		
Dieldrin	1.34E+00	4.68E-07	1.60E+01	7.49E-06	2.67E-07	1.60E+01	4.27E-06	7.12E-11	1.61E+01	1.15E-09	**1.18E-05**
Endosulfan sulfate	1.60E-03	5.59E-10	NA		3.19E-10	NA		8.50E-14	NA		
Endrin	4.60E-03	1.61E-09	NA		9.16E-10	NA		2.44E-13	NA		
Endrin aldehyde	1.10E-03	3.84E-10	NA		2.19E-10	NA		5.84E-14	NA		
Endrin ketone	1.20E-02	4.19E-09	NA		2.39E-09	NA		6.37E-13	NA		
gamma-Chlordane	1.09E-01	3.81E-08	1.20E+00	4.57E-08	2.17E-08	1.20E+00	2.61E-08	5.79E-12	1.19E+00	6.89E-12	7.18E-08
Heptachlor	8.80E-03	3.08E-09	4.50E+00	1.38E-08	1.75E-09	4.50E+00	7.89E-09	4.67E-13	4.55E+00	2.13E-12	2.17E-08
Methoxychlor	3.90E-03	1.36E-09	NA		7.77E-10	NA		2.07E-13	NA		
Aroclor-1260	6.40E-01	2.24E-07	2.00E+00	4.47E-07	3.82E-07	2.00E+00	7.65E-07	3.40E-11	2.00E+00	6.80E-11	**1.21E-06**
SVOCs/VOCs											
1,2,4-Trichlorobenzene	1.54E+00	5.38E-07	3.60E-03	1.94E-09	6.14E-07	3.60E-03	2.21E-09	2.26E-06	NA		4.15E-09
1,2-Dichlorobenzene	5.47E+01	1.91E-05	NA		2.18E-05	NA		2.39E-04	NA		
1,3-Dichlorobenzene	2.02E+00	7.06E-07	NA		8.05E-07	NA		8.82E-06	NA		
1,4-Dichlorobenzene	2.55E+01	8.91E-06	2.40E-02	2.14E-07	1.02E-05	2.40E-02	2.44E-07	1.26E-04	3.85E-02	4.87E-06	**5.33E-06**
2-Methylnaphthalene	1.14E+02	3.98E-05	NA		6.81E-05	NA		1.30E-04	NA		
2-Methylphenol	9.90E-01	3.46E-07	NA		3.94E-07	NA		5.26E-11	NA		
4-Chloro-3-methylphenol	7.20E+00	2.52E-06	NA		2.87E-06	NA		3.82E-10	NA		
4-Methylphenol	3.60E+00	1.26E-06	NA		1.43E-06	NA		1.91E-10	NA		
Acenaphthene	9.18E+00	3.21E-06	NA		5.49E-06	NA		2.66E-06	NA		
Anthracene	1.10E+00	3.84E-07	NA		6.57E-07	NA		8.91E-08	NA		
Benzo(a)anthracene	5.50E-01	1.92E-07	1.20E+00	2.31E-07	3.29E-07	1.20E+00	3.94E-07	2.92E-11	7.30E-01	2.13E-11	6.25E-07
Benzo(a)pyrene	5.00E-01	1.75E-07	1.20E+01	2.10E-06	2.99E-07	1.20E+01	3.59E-06	2.66E-11	7.30E+00	1.94E-10	**5.68E-06**
Benzo(b)fluoranthene	4.20E-01	1.47E-07	1.20E+00	1.76E-07	2.51E-07	1.20E+00	3.01E-07	2.23E-11	7.30E-01	1.63E-11	4.77E-07
Benzo(g,h,i)perylene	4.30E-01	1.50E-07	NA		2.57E-07	NA		2.28E-11	NA		
Benzo(k)fluoranthene	4.30E-01	1.50E-07	1.20E+00	1.80E-07	2.57E-07	1.20E+00	3.08E-07	2.28E-11	3.85E-01	8.79E-12	4.89E-07
Benzyl butyl phthalate	7.60E+00	2.66E-06	NA		3.03E-06	NA		4.04E-10	NA		
Biphenyl (diphenyl)	4.40E+00	1.54E-06	NA		1.75E-06	NA		2.34E-10	NA		
bis(2-Ethylhexyl)phthalate	9.85E+00	3.44E-06	1.40E-02	4.82E-08	3.92E-06	1.40E-02	5.49E-08	5.23E-10	1.40E-02	7.32E-12	1.03E-07
Caprolactam	9.50E-02	3.32E-08	NA		3.78E-08	NA		5.05E-12	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Carbazole	1.10E+00	3.84E-07	2.00E-02	7.69E-09	4.38E-07	2.00E-02	8.76E-09	5.84E-11	2.00E-02	1.17E-12	1.65E-08
Chrysene	9.10E-01	3.18E-07	1.20E-01	3.82E-08	5.44E-07	1.20E-01	6.53E-08	4.83E-11	3.85E-02	1.86E-12	1.03E-07
Dibenz(a,h)anthracene	1.20E-01	4.19E-08	7.30E+00	3.06E-07	7.17E-08	7.30E+00	5.23E-07	6.37E-12	7.30E+00	4.65E-11	8.30E-07
Dibenzofuran	4.10E+00	1.43E-06	NA		1.63E-06	NA		5.17E-07	NA		
Di-n-butyl phthalate	2.90E+00	1.01E-06	NA		1.16E-06	NA		1.54E-10	NA		
Fluoranthene	4.20E+00	1.47E-06	NA		2.51E-06	NA		2.23E-10	NA		
Fluorene	8.31E+00	2.90E-06	NA		4.97E-06	NA		1.03E-06	NA		
Indeno(1,2,3-c,d)pyrene	4.40E-01	1.54E-07	7.30E-01	1.12E-07	2.63E-07	7.30E-01	1.92E-07	2.34E-11	7.30E-01	1.71E-11	3.04E-07
Naphthalene	5.28E+01	1.85E-05	1.20E-01	2.21E-06	3.16E-05	1.20E-01	3.79E-06	6.00E-05	1.19E-01	7.14E-06	**1.31E-05**
Phenanthrene	1.21E+01	4.23E-06	NA		7.23E-06	NA		6.43E-10	NA		
Pyrene	3.97E+00	1.39E-06	NA		2.37E-06	NA		6.63E-08	NA		
1,1,1-Trichloroethane	2.51E-02	8.77E-09	NA		1.00E-08	NA		7.60E-07	NA		
1,1-Dichloroethane	1.01E+01	3.53E-06	5.70E-03	2.01E-08	4.02E-06	5.70E-03	2.29E-08	2.92E-04	5.60E-03	1.63E-06	**1.68E-06**
1,1-Dichloroethene	6.80E-02	2.38E-08	9.10E-02	2.16E-09	2.71E-08	9.10E-02	2.47E-09	3.34E-06	9.10E-02	3.04E-07	3.09E-07
1,2-Dichloroethane	6.05E-02	2.11E-08	9.10E-02	1.92E-09	2.41E-08	9.10E-02	2.19E-09	1.10E-06	9.10E-02	1.00E-07	1.04E-07
Acetone	2.26E-01	7.90E-08	NA		9.00E-08	NA		1.46E-06	NA		
Benzene	1.93E+00	6.74E-07	1.00E-01	6.74E-08	7.69E-07	1.00E-01	7.69E-08	4.79E-05	1.02E-01	4.86E-06	**5.00E-06**
Carbon disulfide	6.29E-03	2.20E-09	NA		2.51E-09	NA		3.78E-07	NA		
Chlorobenzene	1.01E+01	3.53E-06	NA		4.02E-06	NA		1.04E-04	NA		
Chloroethane	2.40E-02	8.39E-09	2.90E-03	2.43E-11	9.56E-09	2.90E-03	2.77E-11	1.48E-06	2.90E-03	4.30E-09	4.35E-09
Chloromethane	1.27E-01	4.44E-08	NA		5.06E-08	NA		1.66E-06	NA		
cis-1,2-Dichloroethene	1.49E+02	5.21E-05	NA		5.94E-05	NA		3.53E-03	NA		
Cyclohexane	2.55E+00	8.91E-07	NA		1.02E-06	NA		1.70E-04	NA		
Ethylbenzene	2.24E+01	7.83E-06	NA		8.92E-06	NA		2.66E-04	NA		
Isopropylbenzene (cumene)	5.35E+00	1.87E-06	NA		2.13E-06	NA		1.22E-04	NA		
Methyl ethyl ketone	3.14E-01	1.10E-07	NA		1.25E-07	NA		1.33E-06	NA		
Methyl isobutyl ketone	5.74E+00	2.01E-06	NA		2.29E-06	NA		1.87E-05	NA		
Methyl tert-butyl ether	4.00E-03	1.40E-09	1.80E-03	2.52E-12	1.59E-09	1.80E-03	2.87E-12	6.99E-08	9.10E-04	6.36E-11	6.90E-11
Methylcyclohexane	1.02E+01	3.56E-06	NA		4.06E-06	NA		4.13E-04	NA		
Methylene chloride	8.38E-03	2.93E-09	1.40E-02	4.10E-11	3.34E-09	1.40E-02	4.67E-11	2.75E-07	3.50E-03	9.64E-10	1.05E-09
Styrene	5.14E-01	1.80E-07	NA		2.05E-07	NA		3.14E-06	NA		
Tetrachloroethene	8.76E-02	3.06E-08	5.40E-01	1.65E-08	3.49E-08	5.40E-01	1.88E-08	2.81E-06	2.07E-02	5.81E-08	9.35E-08
Toluene	1.16E+02	4.05E-05	NA		4.62E-05	NA		2.39E-03	NA		
trans-1,2-Dichloroethene	6.38E-01	2.23E-07	NA		2.54E-07	NA		2.23E-05	NA		
Trichloroethene	5.21E-01	1.82E-07	4.00E-01	7.28E-08	2.08E-07	4.00E-01	8.30E-08	1.31E-05	4.00E-01	5.24E-06	**5.40E-06**
Vinyl chloride	1.28E+00	4.47E-07	1.50E+00	6.71E-07	5.10E-07	1.50E+00	7.65E-07	1.01E-04	2.73E-01	2.74E-05	**2.89E-05**
Xylenes, total	1.57E+02	5.49E-05	NA		6.25E-05	NA		2.11E-03	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	9.72E-04	3.40E-10	1.50E+03	5.10E-07	1.16E-10	1.50E+03	1.74E-07	5.16E-14	1.50E+03	7.74E-11	6.84E-07
1,2,3,4,6,7,8-HpCDF	1.60E-04	5.59E-11	1.50E+03	8.39E-08	1.91E-11	1.50E+03	2.87E-08	8.50E-15	1.50E+03	1.27E-11	1.13E-07
1,2,3,4,7,8,9-HpCDF	7.93E-06	2.77E-12	1.50E+03	4.16E-09	9.48E-13	1.50E+03	1.42E-09	4.21E-16	1.50E+03	6.32E-13	5.58E-09
1,2,3,4,7,8-HxCDD	1.64E-05	5.73E-12	1.50E+04	8.60E-08	1.96E-12	1.50E+04	2.94E-08	8.71E-16	1.50E+04	1.31E-11	1.15E-07

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
1,2,3,4,7,8-HxCDF	2.26E-06	7.90E-13	1.50E+04	1.18E-08	2.70E-13	1.50E+04	4.05E-09	1.20E-16	1.50E+04	1.80E-12	1.59E-08
1,2,3,6,7,8-HxCDD	7.35E-05	2.57E-11	1.50E+04	3.85E-07	8.78E-12	1.50E+04	1.32E-07	3.90E-15	1.50E+04	5.86E-11	5.17E-07
1,2,3,6,7,8-HxCDF	1.50E-05	5.24E-12	1.50E+04	7.86E-08	1.79E-12	1.50E+04	2.69E-08	7.97E-16	1.50E+04	1.19E-11	1.06E-07
1,2,3,7,8,9-HxCDD	4.14E-05	1.45E-11	1.50E+04	2.17E-07	4.95E-12	1.50E+04	7.42E-08	2.20E-15	1.50E+04	3.30E-11	2.91E-07
1,2,3,7,8,9-HxCDF	8.75E-06	3.06E-12	1.50E+04	4.59E-08	1.05E-12	1.50E+04	1.57E-08	4.65E-16	1.50E+04	6.97E-12	6.16E-08
1,2,3,7,8-PeCDD	1.53E-05	5.35E-12	1.50E+05	8.02E-07	1.83E-12	1.50E+05	2.74E-07	8.13E-16	1.50E+05	1.22E-10	**1.08E-06**
2,3,4,6,7,8-HxCDF	1.51E-05	5.28E-12	1.50E+04	7.92E-08	1.80E-12	1.50E+04	2.71E-08	8.02E-16	1.50E+04	1.20E-11	1.06E-07
2,3,4,7,8-PeCDF	3.66E-05	1.28E-11	7.50E+04	9.59E-07	4.37E-12	7.50E+04	3.28E-07	1.94E-15	7.50E+04	1.46E-10	**1.29E-06**
2,3,7,8-TCDF	4.63E-06	1.62E-12	1.50E+04	2.43E-08	5.53E-13	1.50E+04	8.30E-09	2.46E-16	1.50E+04	3.69E-12	3.26E-08
OCDD	8.20E-03	2.87E-09	1.50E+01	4.30E-08	9.80E-10	1.50E+01	1.47E-08	4.35E-13	1.50E+01	6.53E-12	5.77E-08
OCDF	3.25E-04	1.14E-10	1.50E+01	1.70E-09	3.88E-11	1.50E+01	5.83E-10	1.73E-14	1.50E+01	2.59E-13	2.29E-09
			Total Risk:	5.26E-05		**Total Risk:**	3.05E-05		**Total Risk:**	5.48E-05	**1.38E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **1E-04**

Table 1-14
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Occupational Exposure Scenario - Industrial Worker Receptor - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Occupational
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Industrial Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	25	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	25	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Metals											
Aluminum	1.26E+04	1.23E-02	1.00E+00	1.23E-02	1.41E-03	1.00E+00	1.41E-03	1.87E-06	1.40E-03	1.34E-03	1.51E-02
Antimony	1.36E+01	1.33E-05	4.00E-04	3.33E-02	1.52E-06	4.00E-04	3.79E-03	2.02E-09	NA		3.71E-02
Arsenic	7.71E+00	7.54E-06	3.00E-04	2.51E-02	2.58E-06	3.00E-04	8.60E-03	1.15E-09	8.57E-06	1.34E-04	3.39E-02
Barium	5.13E+02	5.02E-04	7.00E-02	7.17E-03	5.72E-05	7.00E-02	8.17E-04	7.63E-08	1.43E-04	5.34E-04	8.52E-03
Beryllium	6.14E-01	6.01E-07	2.00E-03	3.00E-04	6.85E-08	2.00E-03	3.42E-05	9.13E-11	5.71E-06	1.60E-05	3.51E-04
Cadmium	1.58E+00	1.55E-06	5.00E-04	3.09E-03	1.76E-08	5.00E-04	3.52E-05	2.35E-10	5.71E-06	4.11E-05	3.17E-03
Chromium	1.41E+03	1.38E-03	NA		1.57E-04	NA		2.10E-07	NA		
Cobalt	8.75E+00	8.56E-06	2.00E-02	4.28E-04	9.76E-07	2.00E-02	4.88E-05	1.30E-09	5.70E-06	2.28E-04	7.05E-04
Copper	2.29E+02	2.24E-04	4.00E-02	5.60E-03	2.55E-05	4.00E-02	6.39E-04	3.41E-08	NA		6.24E-03
Iron	2.61E+04	2.55E-02	3.00E-01	8.51E-02	2.91E-03	3.00E-01	9.70E-03	3.88E-06	NA		9.48E-02
Lead	6.40E+02	6.26E-04	NA		7.14E-05	NA		9.52E-08	NA		
Manganese	1.14E+03	1.12E-03	2.40E-02	4.65E-02	1.27E-04	2.40E-02	5.30E-03	1.70E-07	1.40E-05	1.21E-02	6.39E-02
Nickel	4.22E+01	4.13E-05	2.00E-02	2.06E-03	4.71E-06	2.00E-02	2.35E-04	6.28E-09	1.43E-05	4.39E-04	2.74E-03
Selenium	2.50E+00	2.45E-06	5.00E-03	4.89E-04	2.79E-07	5.00E-03	5.58E-05	3.72E-10	5.71E-03	6.51E-08	5.45E-04

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Silver	8.43E-01	8.25E-07	5.00E-03	1.65E-04	9.40E-08	5.00E-03	1.88E-05	1.25E-10	NA		1.84E-04
Thallium	3.16E+00	3.09E-06	6.60E-05	4.68E-02	3.52E-07	6.60E-05	5.34E-03	4.70E-10	NA		5.22E-02
Vanadium	4.16E+01	4.07E-05	1.00E-03	4.07E-02	4.64E-06	1.00E-03	4.64E-03	6.19E-09	NA		4.53E-02
Zinc	5.91E+02	5.78E-04	3.00E-01	1.93E-03	6.59E-05	3.00E-01	2.20E-04	8.79E-08	NA		2.15E-03
Pesticides/PCBs											
Aldrin	1.29E+00	1.26E-06	3.00E-05	4.21E-02	7.19E-07	3.00E-05	2.40E-02	1.92E-10	3.00E-05	6.39E-06	6.61E-02
alpha-BHC	2.60E-02	2.54E-08	5.00E-04	5.09E-05	1.45E-08	5.00E-04	2.90E-05	3.87E-12	5.00E-04	7.73E-09	7.99E-05
alpha-Chlordane	4.04E-02	3.95E-08	5.00E-04	7.91E-05	2.25E-08	5.00E-04	4.51E-05	6.01E-12	2.00E-04	3.00E-08	1.24E-04
4,4'-DDD	9.16E+00	8.96E-06	NA		5.11E-06	NA		1.36E-09	NA		
4,4'-DDE	3.56E+00	3.48E-06	NA		1.99E-06	NA		5.29E-10	NA		
4,4'-DDT	3.25E-01	3.18E-07	5.00E-04	6.36E-04	1.81E-07	5.00E-04	3.63E-04	4.83E-11	5.00E-04	9.67E-08	9.99E-04
beta-BHC	3.50E-02	3.42E-08	NA		1.95E-08	NA		5.20E-12	NA		
delta-BHC	4.10E-03	4.01E-09	NA		2.29E-09	NA		6.10E-13	NA		
Dieldrin	1.34E+00	1.31E-06	5.00E-05	2.62E-02	7.47E-07	5.00E-05	1.49E-02	1.99E-10	5.00E-05	3.99E-06	4.12E-02
Endosulfan sulfate	1.60E-03	1.57E-09	6.00E-03	2.61E-07	8.92E-10	6.00E-03	1.49E-07	2.38E-13	6.00E-03	3.97E-11	4.10E-07
Endrin	4.60E-03	4.50E-09	3.00E-04	1.50E-05	2.57E-09	3.00E-04	8.55E-06	6.84E-13	3.00E-04	2.28E-09	2.36E-05
Endrin aldehyde	1.10E-03	1.08E-09	3.00E-04	3.59E-06	6.14E-10	3.00E-04	2.05E-06	1.64E-13	3.00E-04	5.45E-10	5.63E-06
Endrin ketone	1.20E-02	1.17E-08	3.00E-04	3.91E-05	6.69E-09	3.00E-04	2.23E-05	1.78E-12	3.00E-04	5.95E-09	6.15E-05
gamma-Chlordane	1.09E-01	1.07E-07	5.00E-04	2.13E-04	6.08E-08	5.00E-04	1.22E-04	1.62E-11	2.00E-04	8.10E-08	3.35E-04
Heptachlor	8.80E-03	8.61E-09	5.00E-04	1.72E-05	4.91E-09	5.00E-04	9.82E-06	1.31E-12	5.00E-04	2.62E-09	2.70E-05
Methoxychlor	3.90E-03	3.82E-09	5.00E-03	7.63E-07	2.18E-09	5.00E-03	4.35E-07	5.80E-13	5.00E-03	1.16E-10	1.20E-06
Aroclor-1260	6.40E-01	6.26E-07	2.00E-05	3.13E-02	1.07E-06	2.00E-05	5.35E-02	9.52E-11	2.00E-05	4.76E-06	8.49E-02
SVOCs/VOCs											
1,2,4-Trichlorobenzene	1.54E+00	1.51E-06	1.00E-02	1.51E-04	1.72E-06	1.00E-02	1.72E-04	6.34E-06	1.00E-03	6.34E-03	6.66E-03
1,2-Dichlorobenzene	5.47E+01	5.35E-05	9.00E-02	5.95E-04	6.10E-05	9.00E-02	6.78E-04	6.69E-04	5.71E-02	1.17E-02	1.30E-02
1,3-Dichlorobenzene	2.02E+00	1.98E-06	3.00E-02	6.59E-05	2.25E-06	3.00E-02	7.51E-05	2.47E-05	3.00E-02	8.24E-04	9.64E-04
1,4-Dichlorobenzene	2.55E+01	2.50E-05	3.00E-02	8.32E-04	2.84E-05	3.00E-02	9.48E-04	3.54E-04	2.30E-01	1.54E-03	3.32E-03
2-Methylnaphthalene	1.14E+02	1.12E-04	4.00E-03	2.79E-02	1.91E-04	4.00E-03	4.77E-02	3.63E-04	NA		7.56E-02
2-Methylphenol	9.90E-01	9.69E-07	5.00E-02	1.94E-05	1.10E-06	5.00E-02	2.21E-05	1.47E-10	5.00E-02	2.94E-09	4.15E-05
4-Chloro-3-methylphenol	7.20E+00	7.05E-06	NA		8.03E-06	NA		1.07E-09	NA		
4-Methylphenol	3.60E+00	3.52E-06	5.00E-03	7.05E-04	4.02E-06	5.00E-03	8.03E-04	5.35E-10	5.00E-03	1.07E-07	1.51E-03
Acenaphthene	9.18E+00	8.98E-06	6.00E-02	1.50E-04	1.54E-05	6.00E-02	2.56E-04	7.44E-06	6.00E-02	1.24E-04	5.30E-04
Anthracene	1.10E+00	1.08E-06	3.00E-01	3.59E-06	1.84E-06	3.00E-01	6.14E-06	2.49E-07	3.00E-01	8.31E-07	1.06E-05
Benzo(a)anthracene	5.50E-01	5.38E-07	NA		9.20E-07	NA		8.18E-11	NA		
Benzo(a)pyrene	5.00E-01	4.89E-07	NA		8.37E-07	NA		7.44E-11	NA		
Benzo(b)fluoranthene	4.20E-01	4.11E-07	NA		7.03E-07	NA		6.25E-11	NA		
Benzo(g,h,i)perylene	4.30E-01	4.21E-07	NA		7.19E-07	NA		6.39E-11	NA		
Benzo(k)fluoranthene	4.30E-01	4.21E-07	NA		7.19E-07	NA		6.39E-11	NA		
Benzyl butyl phthalate	7.60E+00	7.44E-06	2.00E-01	3.72E-05	8.48E-06	2.00E-01	4.24E-05	1.13E-09	2.00E-01	5.65E-09	7.96E-05
Biphenyl (diphenyl)	4.40E+00	4.31E-06	5.00E-02	8.61E-05	4.91E-06	5.00E-02	9.82E-05	6.54E-10	5.00E-02	1.31E-08	1.84E-04
bis(2-Ethylhexyl)phthalate	9.85E+00	9.64E-06	2.00E-02	4.82E-04	1.10E-05	2.00E-02	5.49E-04	1.46E-09	2.00E-02	7.32E-08	1.03E-03
Caprolactam	9.50E-02	9.30E-08	5.00E-01	1.86E-07	1.06E-07	5.00E-01	2.12E-07	1.41E-11	5.00E-01	2.83E-11	3.98E-07

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Carbazole	1.10E+00	1.08E-06	NA		1.23E-06	NA		1.64E-10	NA		
Chrysene	9.10E-01	8.90E-07	NA		1.52E-06	NA		1.35E-10	NA		
Dibenz(a,h)anthracene	1.20E-01	1.17E-07	NA		2.01E-07	NA		1.78E-11	NA		
Dibenzofuran	4.10E+00	4.01E-06	2.00E-03	2.01E-03	4.57E-06	2.00E-03	2.29E-03	1.45E-06	2.00E-03	7.24E-04	5.02E-03
Di-n-butyl phthalate	2.90E+00	2.84E-06	1.00E-01	2.84E-05	3.23E-06	1.00E-01	3.23E-05	4.31E-10	1.00E-01	4.31E-09	6.07E-05
Fluoranthene	4.20E+00	4.11E-06	4.00E-02	1.03E-04	7.03E-06	4.00E-02	1.76E-04	6.25E-10	4.00E-02	1.56E-08	2.78E-04
Fluorene	8.31E+00	8.13E-06	4.00E-02	2.03E-04	1.39E-05	4.00E-02	3.48E-04	2.90E-06	4.00E-02	7.24E-05	6.23E-04
Indeno(1,2,3-c,d)pyrene	4.40E-01	4.31E-07	NA		7.36E-07	NA		6.54E-11	NA		
Naphthalene	5.28E+01	5.17E-05	2.00E-02	2.58E-03	8.83E-05	2.00E-02	4.42E-03	1.68E-04	8.57E-04	1.96E-01	2.03E-01
Phenanthrene	1.21E+01	1.18E-05	NA		2.02E-05	NA		1.80E-09	NA		
Pyrene	3.97E+00	3.88E-06	3.00E-02	1.29E-04	6.64E-06	3.00E-02	2.21E-04	1.86E-07	3.00E-02	6.19E-06	3.57E-04
1,1,1-Trichloroethane	2.51E-02	2.46E-08	2.80E-01	8.77E-08	2.80E-08	2.80E-01	1.00E-07	2.13E-06	6.30E-01	3.38E-06	3.57E-06
1,1-Dichloroethane	1.01E+01	9.88E-06	1.00E-01	9.88E-05	1.13E-05	1.00E-01	1.13E-04	8.16E-04	1.43E-01	5.72E-03	5.93E-03
1,1-Dichloroethene	6.80E-02	6.65E-08	2.00E-02	3.33E-06	7.59E-08	2.00E-02	3.79E-06	9.36E-06	2.00E-02	4.68E-04	4.75E-04
1,2-Dichloroethane	6.05E-02	5.92E-08	2.00E-02	2.96E-06	6.75E-08	2.00E-02	3.37E-06	3.08E-06	1.40E-03	2.20E-03	2.20E-03
Acetone	2.26E-01	2.21E-07	9.00E-01	2.46E-07	2.52E-07	9.00E-01	2.80E-07	4.09E-06	9.00E-01	4.54E-06	5.07E-06
Benzene	1.93E+00	1.89E-06	4.00E-03	4.72E-04	2.15E-06	4.00E-03	5.38E-04	1.34E-04	8.57E-03	1.56E-02	1.66E-02
Carbon disulfide	6.29E-03	6.15E-09	1.00E-01	6.15E-08	7.02E-09	1.00E-01	7.02E-08	1.06E-06	2.00E-01	5.29E-06	5.42E-06
Chlorobenzene	1.01E+01	9.88E-06	2.00E-02	4.94E-04	1.13E-05	2.00E-02	5.63E-04	2.91E-04	1.70E-02	1.71E-02	1.82E-02
Chloroethane	2.40E-02	2.35E-08	4.00E-01	5.87E-08	2.68E-08	4.00E-01	6.69E-08	4.15E-06	2.86E+00	1.45E-06	1.58E-06
Chloromethane	1.27E-01	1.24E-07	2.60E-02	4.78E-06	1.42E-07	2.60E-02	5.45E-06	4.64E-06	2.60E-02	1.78E-04	1.89E-04
cis-1,2-Dichloroethene	1.49E+02	1.46E-04	1.00E-02	1.46E-02	1.66E-04	1.00E-02	1.66E-02	9.90E-03	1.00E-02	9.90E-01	**1.02E+00**
Cyclohexane	2.55E+00	2.50E-06	1.70E+00	1.47E-06	2.84E-06	1.70E+00	1.67E-06	4.77E-04	1.70E+00	2.81E-04	2.84E-04
Ethylbenzene	2.24E+01	2.19E-05	1.00E-01	2.19E-04	2.50E-05	1.00E-01	2.50E-04	7.45E-04	2.90E-01	2.57E-03	3.04E-03
Isopropylbenzene (cumene)	5.35E+00	5.23E-06	1.00E-01	5.23E-05	5.97E-06	1.00E-01	5.97E-05	3.42E-04	1.10E-01	3.11E-03	3.22E-03
Methyl ethyl ketone	3.14E-01	3.07E-07	6.00E-01	5.12E-07	3.50E-07	6.00E-01	5.84E-07	3.71E-06	1.40E+00	2.65E-06	3.75E-06
Methyl isobutyl ketone	5.74E+00	5.62E-06	8.00E-02	7.02E-05	6.40E-06	8.00E-02	8.00E-05	5.24E-05	8.60E-01	6.09E-05	2.11E-04
Methyl tert-butyl ether	4.00E-03	3.91E-09	8.57E-01	4.57E-09	4.46E-09	8.57E-01	5.21E-09	1.96E-07	8.57E-01	2.28E-07	2.38E-07
Methylcyclohexane	1.02E+01	9.98E-06	8.60E-01	1.16E-05	1.14E-05	8.60E-01	1.32E-05	1.16E-03	8.60E-01	1.34E-03	1.37E-03
Methylene chloride	8.38E-03	8.20E-09	6.00E-02	1.37E-07	9.35E-09	6.00E-02	1.56E-07	7.71E-07	1.14E-01	6.75E-06	7.04E-06
Styrene	5.14E-01	5.03E-07	2.00E-01	2.51E-06	5.73E-07	2.00E-01	2.87E-06	8.80E-06	2.57E-01	3.42E-05	3.96E-05
Tetrachloroethene	8.76E-02	8.57E-08	1.00E-02	8.57E-06	9.77E-08	1.00E-02	9.77E-06	7.88E-06	1.00E-02	7.88E-04	8.06E-04
Toluene	1.16E+02	1.14E-04	2.00E-01	5.68E-04	1.29E-04	2.00E-01	6.47E-04	6.69E-03	8.57E-02	7.81E-02	7.93E-02
trans-1,2-Dichloroethene	6.38E-01	6.24E-07	2.00E-02	3.12E-05	7.12E-07	2.00E-02	3.56E-05	6.25E-05	2.00E-02	3.13E-03	3.19E-03
Trichloroethene	5.21E-01	5.10E-07	3.00E-04	1.70E-03	5.81E-07	3.00E-04	1.94E-03	3.67E-05	1.00E-02	3.67E-03	7.30E-03
Vinyl chloride	1.28E+00	1.25E-06	3.00E-03	4.17E-04	1.43E-06	3.00E-03	4.76E-04	2.81E-04	2.86E-02	9.85E-03	1.07E-02
Xylenes, total	1.57E+02	1.54E-04	2.00E-01	7.68E-04	1.75E-04	2.00E-01	8.76E-04	5.91E-03	2.90E-02	2.04E-01	2.05E-01
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	9.72E-04	9.51E-10	NA		3.25E-10	NA		1.45E-13	1.14E-08	1.26E-05	1.26E-05
1,2,3,4,6,7,8-HpCDF	1.60E-04	1.57E-10	NA		5.35E-11	NA		2.38E-14	1.14E-08	2.08E-06	2.08E-06
1,2,3,4,7,8,9-HpCDF	7.93E-06	7.76E-12	NA		2.65E-12	NA		1.18E-15	1.14E-08	1.03E-07	1.03E-07
1,2,3,4,7,8-HxCDD	1.64E-05	1.60E-11	NA		5.49E-12	NA		2.44E-15	1.14E-08	2.13E-07	2.13E-07

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
1,2,3,4,7,8-HxCDF	2.26E-06	2.21E-12	NA		7.56E-13	NA		3.36E-16	1.14E-08	2.94E-08	2.94E-08
1,2,3,6,7,8-HxCDD	7.35E-05	7.19E-11	NA		2.46E-11	NA		1.09E-14	1.14E-08	9.56E-07	9.56E-07
1,2,3,6,7,8-HxCDF	1.50E-05	1.47E-11	NA		5.02E-12	NA		2.23E-15	1.14E-08	1.95E-07	1.95E-07
1,2,3,7,8,9-HxCDD	4.14E-05	4.05E-11	NA		1.39E-11	NA		6.16E-15	1.14E-08	5.39E-07	5.39E-07
1,2,3,7,8,9-HxCDF	8.75E-06	8.56E-12	NA		2.93E-12	NA		1.30E-15	1.14E-08	1.14E-07	1.14E-07
1,2,3,7,8-PeCDD	1.53E-05	1.50E-11	NA		5.12E-12	NA		2.28E-15	1.14E-08	1.99E-07	1.99E-07
2,3,4,6,7,8-HxCDF	1.51E-05	1.48E-11	NA		5.05E-12	NA		2.25E-15	1.14E-08	1.96E-07	1.96E-07
2,3,4,7,8-PeCDF	3.66E-05	3.58E-11	NA		1.22E-11	NA		5.44E-15	1.14E-08	4.76E-07	4.76E-07
2,3,7,8-TCDF	4.63E-06	4.53E-12	NA		1.55E-12	NA		6.89E-16	1.14E-08	6.02E-08	6.02E-08
OCDD	8.20E-03	8.02E-09	NA		2.74E-09	NA		1.22E-12	1.14E-08	1.07E-04	1.07E-04
OCDF	3.25E-04	3.18E-10	NA		1.09E-10	NA		4.83E-14	1.14E-08	4.23E-06	4.23E-06
		Total Risk (Hazard Index):		4.67E-01	**Total Risk (Hazard Index):**		2.15E-01	**Total Risk (Hazard Index):**		1.57E+00	**2.25E+00**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **2**

Table 1-15
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Construction Exposure Scenario - Future Construction Worker Receptor - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Construction Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	1	yr
Soil Ingestion Rate	IR	330	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.8	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
Metals											
Aluminum	1.26E+04	5.81E-04	NA		8.03E-05	NA		2.68E-08	NA		
Antimony	1.36E+01	6.27E-07	NA		8.67E-08	NA		2.89E-11	NA		
Arsenic	7.71E+00	3.56E-07	9.50E+00	3.38E-06	1.47E-07	9.50E+00	1.40E-06	1.64E-11	1.51E+01	2.46E-10	**4.78E-06**
Barium	5.13E+02	2.37E-05	NA		3.27E-06	NA		1.09E-09	NA		
Beryllium	6.14E-01	2.83E-08	NA		3.91E-09	NA		1.30E-12	8.40E+00	1.10E-11	1.10E-11
Cadmium	1.58E+00	7.29E-08	3.80E-01	2.77E-08	1.01E-09	3.80E-01	3.83E-10	3.36E-12	1.47E+01	4.93E-11	2.81E-08
Chromium	1.41E+03	6.50E-05	NA		8.99E-06	NA		3.00E-09	4.20E+01	1.26E-07	1.26E-07
Cobalt	8.75E+00	4.04E-07	NA		5.58E-08	NA		1.86E-11	9.80E+00	1.82E-10	1.82E-10
Copper	2.29E+02	1.06E-05	NA		1.46E-06	NA		4.86E-10	NA		
Iron	2.61E+04	1.20E-03	NA		1.66E-04	NA		5.54E-08	NA		
Lead	6.40E+02	2.95E-05	NA		4.08E-06	NA		1.36E-09	NA		
Manganese	1.14E+03	5.26E-05	NA		7.27E-06	NA		2.42E-09	NA		
Nickel	4.22E+01	1.95E-06	NA		2.69E-07	NA		8.96E-11	9.10E-01	8.16E-11	8.16E-11
Selenium	2.50E+00	1.15E-07	NA		1.59E-08	NA		5.31E-12	NA		
Silver	8.43E-01	3.89E-08	NA		5.37E-09	NA		1.79E-12	NA		
Thallium	3.16E+00	1.46E-07	NA		2.01E-08	NA		6.71E-12	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Vanadium	4.16E+01	1.92E-06	NA		2.65E-07	NA		8.84E-11	NA		
Zinc	5.91E+02	2.73E-05	NA		3.77E-06	NA		1.26E-09	NA		
Pesticides/PCBs											
Aldrin	1.29E+00	5.95E-08	1.70E+01	1.01E-06	4.11E-08	1.70E+01	6.99E-07	2.74E-12	1.72E+01	4.70E-11	**1.71E-06**
alpha-BHC	2.60E-02	1.20E-09	6.30E+00	7.56E-09	8.29E-10	6.30E+00	5.22E-09	5.52E-14	6.30E+00	3.48E-13	1.28E-08
alpha-Chlordane	4.04E-02	1.86E-09	1.20E+00	2.24E-09	1.29E-09	1.20E+00	1.55E-09	8.58E-14	1.19E+00	1.02E-13	3.78E-09
4,4'-DDD	9.16E+00	4.23E-07	2.40E-01	1.01E-07	2.92E-07	2.40E-01	7.01E-08	1.95E-11	2.42E-01	4.70E-12	1.71E-07
4,4'-DDE	3.56E+00	1.64E-07	3.40E-01	5.58E-08	1.13E-07	3.40E-01	3.86E-08	7.56E-12	3.40E-01	2.57E-12	9.44E-08
4,4'-DDT	3.25E-01	1.50E-08	3.40E-01	5.10E-09	1.04E-08	3.40E-01	3.52E-09	6.90E-13	3.40E-01	2.34E-13	8.62E-09
beta-BHC	3.50E-02	1.61E-09	1.80E+00	2.91E-09	1.12E-09	1.80E+00	2.01E-09	7.44E-14	1.80E+00	1.34E-13	4.91E-09
delta-BHC	4.10E-03	1.89E-10	NA		1.31E-10	NA		8.71E-15	NA		
Dieldrin	1.34E+00	6.18E-08	1.60E+01	9.89E-07	4.27E-08	1.60E+01	6.83E-07	2.85E-12	1.61E+01	4.58E-11	**1.67E-06**
Endosulfan sulfate	1.60E-03	7.38E-11	NA		5.10E-11	NA		3.40E-15	NA		
Endrin	4.60E-03	2.12E-10	NA		1.47E-10	NA		9.77E-15	NA		
Endrin aldehyde	1.10E-03	5.07E-11	NA		3.51E-11	NA		2.34E-15	NA		
Endrin ketone	1.20E-02	5.54E-10	NA		3.82E-10	NA		2.55E-14	NA		
gamma-Chlordane	1.09E-01	5.03E-09	1.20E+00	6.03E-09	3.47E-09	1.20E+00	4.17E-09	2.32E-13	1.19E+00	2.76E-13	1.02E-08
Heptachlor	8.80E-03	4.06E-10	4.50E+00	1.83E-09	2.80E-10	4.50E+00	1.26E-09	1.87E-14	4.55E+00	8.51E-14	3.09E-09
Methoxychlor	3.90E-03	1.80E-10	NA		1.24E-10	NA		8.28E-15	NA		
Aroclor-1260	6.40E-01	2.95E-08	2.00E+00	5.90E-08	6.12E-08	2.00E+00	1.22E-07	1.36E-12	2.00E+00	2.72E-12	1.81E-07
SVOCs/VOCs											
1,2,4-Trichlorobenzene	1.54E+00	7.10E-08	3.60E-03	2.56E-10	9.82E-08	3.60E-03	3.53E-10	3.27E-12	NA		6.09E-10
1,2-Dichlorobenzene	5.47E+01	2.52E-06	NA		3.49E-06	NA		9.56E-06	NA		
1,3-Dichlorobenzene	2.02E+00	9.32E-08	NA		1.29E-07	NA		3.53E-07	NA		
1,4-Dichlorobenzene	2.55E+01	1.18E-06	2.40E-02	2.82E-08	1.63E-06	2.40E-02	3.90E-08	5.06E-06	3.85E-02	1.95E-07	2.62E-07
2-Methylnaphthalene	1.14E+02	5.26E-06	NA		1.09E-05	NA		5.18E-06	NA		
2-Methylphenol	9.90E-01	4.57E-08	NA		6.31E-08	NA		2.10E-12	NA		
4-Chloro-3-methylphenol	7.20E+00	3.32E-07	NA		4.59E-07	NA		1.53E-11	NA		
4-Methylphenol	3.60E+00	1.66E-07	NA		2.29E-07	NA		7.65E-12	NA		
Acenaphthene	9.18E+00	4.23E-07	NA		8.78E-07	NA		1.06E-07	NA		
Anthracene	1.10E+00	5.07E-08	NA		1.05E-07	NA		3.56E-09	NA		
Benzo(a)anthracene	5.50E-01	2.54E-08	1.20E+00	3.04E-08	5.26E-08	1.20E+00	6.31E-08	1.17E-12	7.30E-01	8.53E-13	9.35E-08
Benzo(a)pyrene	5.00E-01	2.31E-08	1.20E+01	2.77E-07	4.78E-08	1.20E+01	5.74E-07	1.06E-12	7.30E+00	7.75E-12	8.50E-07
Benzo(b)fluoranthene	4.20E-01	1.94E-08	1.20E+00	2.32E-08	4.02E-08	1.20E+00	4.82E-08	8.92E-13	7.30E-01	6.51E-13	7.14E-08
Benzo(g,h,i)perylene	4.30E-01	1.98E-08	NA		4.11E-08	NA		9.13E-13	NA		
Benzo(k)fluoranthene	4.30E-01	1.98E-08	1.20E+00	2.38E-08	4.11E-08	1.20E+00	4.93E-08	9.13E-13	3.85E-01	3.52E-13	7.31E-08
Benzyl butyl phthalate	7.60E+00	3.51E-07	NA		4.84E-07	NA		1.61E-11	NA		
Biphenyl (diphenyl)	4.40E+00	2.03E-07	NA		2.80E-07	NA		9.35E-12	NA		
bis(2-Ethylhexyl)phthalate	9.85E+00	4.54E-07	1.40E-02	6.36E-09	6.28E-07	1.40E-02	8.79E-09	2.09E-11	1.40E-02	2.93E-13	1.52E-08
Caprolactam	9.50E-02	4.38E-09	NA		6.06E-09	NA		2.02E-13	NA		
Carbazole	1.10E+00	5.07E-08	2.00E-02	1.01E-09	7.01E-08	2.00E-02	1.40E-09	2.34E-12	2.00E-02	4.67E-14	2.42E-09
Chrysene	9.10E-01	4.20E-08	1.20E-01	5.04E-09	8.70E-08	1.20E-01	1.04E-08	1.93E-12	3.85E-02	7.44E-14	1.55E-08
Dibenz(a,h)anthracene	1.20E-01	5.54E-09	7.30E+00	4.04E-08	1.15E-08	7.30E+00	8.38E-08	2.55E-13	7.30E+00	1.86E-12	1.24E-07
Dibenzofuran	4.10E+00	1.89E-07	NA		2.61E-07	NA		2.07E-08	NA		
Di-n-butyl phthalate	2.90E+00	1.34E-07	NA		1.85E-07	NA		6.16E-12	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Fluoranthene	4.20E+00	1.94E-07	NA		4.02E-07	NA		8.92E-12	NA		
Fluorene	8.31E+00	3.83E-07	NA		7.95E-07	NA		4.14E-08	NA		
Indeno(1,2,3-c,d)pyrene	4.40E-01	2.03E-08	7.30E-01	1.48E-08	4.21E-08	7.30E-01	3.07E-08	9.35E-13	7.30E-01	6.82E-13	4.55E-08
Naphthalene	5.28E+01	2.44E-06	1.20E-01	2.92E-07	5.05E-06	1.20E-01	6.06E-07	2.40E-06	1.19E-01	2.86E-07	**1.18E-06**
Phenanthrene	1.21E+01	5.58E-07	NA		1.16E-06	NA		2.57E-11	NA		
Pyrene	3.97E+00	1.83E-07	NA		3.80E-07	NA		2.65E-09	NA		
1,1,1-Trichloroethane	2.51E-02	1.16E-09	NA		1.60E-09	NA		3.04E-08	NA		
1,1-Dichloroethane	1.01E+01	4.66E-07	5.70E-03	2.66E-09	6.44E-07	5.70E-03	3.67E-09	1.17E-05	5.60E-03	6.53E-08	7.16E-08
1,1-Dichloroethene	6.80E-02	3.14E-09	9.10E-02	2.85E-10	4.33E-09	9.10E-02	3.94E-10	1.34E-07	9.10E-02	1.22E-08	1.29E-08
1,2-Dichloroethane	6.05E-02	2.79E-09	9.10E-02	2.54E-10	3.86E-09	9.10E-02	3.51E-10	4.39E-08	9.10E-02	4.00E-09	4.60E-09
Acetone	2.26E-01	1.04E-08	NA		1.44E-08	NA		5.84E-08	NA		
Benzene	1.93E+00	8.90E-08	1.00E-01	8.90E-09	1.23E-07	1.00E-01	1.23E-08	1.91E-06	1.02E-01	1.94E-07	2.16E-07
Carbon disulfide	6.29E-03	2.90E-10	NA		4.01E-10	NA		1.51E-08	NA		
Chlorobenzene	1.01E+01	4.66E-07	NA		6.44E-07	NA		4.16E-06	NA		
Chloroethane	2.40E-02	1.11E-09	2.90E-03	3.21E-12	1.53E-09	2.90E-03	4.44E-12	5.93E-08	2.90E-03	1.72E-10	1.79E-10
Chloromethane	1.27E-01	5.86E-09	NA		8.10E-09	NA		6.62E-08	NA		
cis-1,2-Dichloroethene	1.49E+02	6.87E-06	NA		9.50E-06	NA		1.41E-04	NA		
Cyclohexane	2.55E+00	1.18E-07	NA		1.63E-07	NA		6.82E-06	NA		
Ethylbenzene	2.24E+01	1.03E-06	NA		1.43E-06	NA		1.06E-05	NA		
Isopropylbenzene (cumene)	5.35E+00	2.47E-07	NA		3.41E-07	NA		4.89E-06	NA		
Methyl ethyl ketone	3.14E-01	1.45E-08	NA		2.00E-08	NA		5.30E-08	NA		
Methyl isobutyl ketone	5.74E+00	2.65E-07	NA		3.66E-07	NA		7.49E-07	NA		
Methyl tert-butyl ether	4.00E-03	1.85E-10	1.80E-03	3.32E-13	2.55E-10	1.80E-03	4.59E-13	2.80E-09	9.10E-04	2.55E-12	3.34E-12
Methylcyclohexane	1.02E+01	4.71E-07	NA		6.50E-07	NA		1.65E-05	NA		
Methylene chloride	8.38E-03	3.87E-10	1.40E-02	5.41E-12	5.34E-10	1.40E-02	7.48E-12	1.10E-08	3.50E-03	3.86E-11	5.15E-11
Styrene	5.14E-01	2.37E-08	NA		3.28E-08	NA		1.26E-07	NA		
Tetrachloroethene	8.76E-02	4.04E-09	5.40E-01	2.18E-09	5.58E-09	5.40E-01	3.02E-09	1.13E-07	2.07E-02	2.32E-09	7.52E-09
Toluene	1.16E+02	5.35E-06	NA		7.39E-06	NA		9.56E-05	NA		
trans-1,2-Dichloroethene	6.38E-01	2.94E-08	NA		4.07E-08	NA		8.93E-07	NA		
Trichloroethene	5.21E-01	2.40E-08	4.00E-01	9.61E-09	3.32E-08	4.00E-01	1.33E-08	5.24E-07	4.00E-01	2.10E-07	2.32E-07
Vinyl chloride	1.28E+00	5.90E-08	1.50E+00	8.86E-08	8.16E-08	1.50E+00	1.22E-07	4.02E-06	2.73E-01	1.10E-06	**1.31E-06**
Xylenes, total	1.57E+02	7.24E-06	NA		1.00E-05	NA		8.44E-05	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	9.72E-04	4.48E-11	1.50E+03	6.73E-08	1.86E-11	1.50E+03	2.79E-08	2.06E-15	1.50E+03	3.10E-12	9.51E-08
1,2,3,4,6,7,8-HpCDF	1.60E-04	7.38E-12	1.50E+03	1.11E-08	3.06E-12	1.50E+03	4.59E-09	3.40E-16	1.50E+03	5.10E-13	1.57E-08
1,2,3,4,7,8,9-HpCDF	7.93E-06	3.66E-13	1.50E+03	5.49E-10	1.52E-13	1.50E+03	2.27E-10	1.68E-17	1.50E+03	2.53E-14	7.76E-10
1,2,3,4,7,8-HxCDD	1.64E-05	7.56E-13	1.50E+04	1.13E-08	3.14E-13	1.50E+04	4.70E-09	3.48E-17	1.50E+04	5.23E-13	1.61E-08
1,2,3,4,7,8-HxCDF	2.26E-06	1.04E-13	1.50E+04	1.56E-09	4.32E-14	1.50E+04	6.48E-10	4.80E-18	1.50E+04	7.20E-14	2.21E-09
1,2,3,6,7,8-HxCDD	7.35E-05	3.39E-12	1.50E+04	5.09E-08	1.41E-12	1.50E+04	2.11E-08	1.56E-16	1.50E+04	2.34E-12	7.19E-08
1,2,3,6,7,8-HxCDF	1.50E-05	6.92E-13	1.50E+04	1.04E-08	2.87E-13	1.50E+04	4.30E-09	3.19E-17	1.50E+04	4.78E-13	1.47E-08
1,2,3,7,8,9-HxCDD	4.14E-05	1.91E-12	1.50E+04	2.86E-08	7.92E-13	1.50E+04	1.19E-08	8.79E-17	1.50E+04	1.32E-12	4.05E-08
1,2,3,7,8,9-HxCDF	8.75E-06	4.04E-13	1.50E+04	6.05E-09	1.67E-13	1.50E+04	2.51E-09	1.86E-17	1.50E+04	2.79E-13	8.56E-09
1,2,3,7,8-PeCDD	1.53E-05	7.06E-13	1.50E+05	1.06E-07	2.93E-13	1.50E+05	4.39E-08	3.25E-17	1.50E+05	4.88E-12	1.50E-07
2,3,4,6,7,8-HxCDF	1.51E-05	6.97E-13	1.50E+04	1.04E-08	2.89E-13	1.50E+04	4.33E-09	3.21E-17	1.50E+04	4.81E-13	1.48E-08
2,3,4,7,8-PeCDF	3.66E-05	1.69E-12	7.50E+04	1.27E-07	7.00E-13	7.50E+04	5.25E-08	7.78E-17	7.50E+04	5.83E-12	1.79E-07

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
2,3,7,8-TCDF	4.63E-06	2.14E-13	1.50E+04	3.20E-09	8.85E-14	1.50E+04	1.33E-09	9.84E-18	1.50E+04	1.48E-13	4.53E-09
OCDD	8.20E-03	3.78E-10	1.50E+01	5.67E-09	1.57E-10	1.50E+01	2.35E-09	1.74E-14	1.50E+01	2.61E-13	8.03E-09
OCDF	3.25E-04	1.50E-11	1.50E+01	2.25E-10	6.21E-12	1.50E+01	9.32E-11	6.90E-16	1.50E+01	1.04E-14	3.18E-10
			Total Risk:	6.94E-06		**Total Risk:**	4.88E-06		**Total Risk:**	2.19E-06	**1.40E-05**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **1E-05**

Table 1-16
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Construction Exposure Scenario - Future Construction Worker Receptor - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Construction Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter (units)	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	1	yr
Soil Ingestion Rate	IR	330	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.8	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Aluminum	1.26E+04	4.07E-02	1.00E+00	4.07E-02	5.62E-03	1.00E+00	5.62E-03	1.87E-06	1.40E-03	1.34E-03	4.76E-02
Antimony	1.36E+01	4.39E-05	4.00E-04	1.10E-01	6.07E-06	4.00E-04	1.52E-02	2.02E-09	NA		1.25E-01
Arsenic	7.71E+00	2.49E-05	3.00E-04	8.30E-02	1.03E-05	3.00E-04	3.44E-02	1.15E-09	8.57E-06	1.34E-04	1.18E-01
Barium	5.13E+02	1.66E-03	7.00E-02	2.37E-02	2.29E-04	7.00E-02	3.27E-03	7.63E-08	1.43E-04	5.34E-04	2.75E-02
Beryllium	6.14E-01	1.98E-06	2.00E-03	9.91E-04	2.74E-07	2.00E-03	1.37E-04	9.13E-11	5.71E-06	1.60E-05	1.14E-03
Cadmium	1.58E+00	5.10E-06	5.00E-04	1.02E-02	7.05E-08	5.00E-04	1.41E-04	2.35E-10	5.71E-06	4.11E-05	1.04E-02
Chromium	1.41E+03	4.55E-03	NA		6.29E-04	NA		2.10E-07	NA		
Cobalt	8.75E+00	2.83E-05	2.00E-02	1.41E-03	3.90E-06	2.00E-02	1.95E-04	1.30E-09	5.70E-06	2.28E-04	1.84E-03
Copper	2.29E+02	7.39E-04	4.00E-02	1.85E-02	1.02E-04	4.00E-02	2.55E-03	3.41E-08	NA		2.10E-02
Iron	2.61E+04	8.43E-02	3.00E-01	2.81E-01	1.16E-02	3.00E-01	3.88E-02	3.88E-06	NA		3.20E-01
Lead	6.40E+02	2.07E-03	NA		2.86E-04	NA		9.52E-08	NA		
Manganese	1.14E+03	3.68E-03	2.40E-02	1.53E-01	5.09E-04	2.40E-02	2.12E-02	1.70E-07	1.40E-05	1.21E-02	1.87E-01
Nickel	4.22E+01	1.36E-04	2.00E-02	6.81E-03	1.88E-05	2.00E-02	9.41E-04	6.28E-09	1.43E-05	4.39E-04	8.19E-03
Selenium	2.50E+00	8.07E-06	5.00E-03	1.61E-03	1.12E-06	5.00E-03	2.23E-04	3.72E-10	5.71E-03	6.51E-08	1.84E-03
Silver	8.43E-01	2.72E-06	5.00E-03	5.44E-04	3.76E-07	5.00E-03	7.52E-05	1.25E-10	NA		6.20E-04
Thallium	3.16E+00	1.02E-05	6.60E-05	1.55E-01	1.41E-06	6.60E-05	2.14E-02	4.70E-10	NA		1.76E-01

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Vanadium	4.16E+01	1.34E-04	1.00E-03	1.34E-01	1.86E-05	1.00E-03	1.86E-02	6.19E-09	NA		1.53E-01
Zinc	5.91E+02	1.91E-03	3.00E-01	6.36E-03	2.64E-04	3.00E-01	8.79E-04	8.79E-08	NA		7.24E-03
Pesticides/PCBs											
Aldrin	1.29E+00	4.17E-06	3.00E-05	1.39E-01	2.88E-06	3.00E-05	9.59E-02	1.92E-10	3.00E-05	6.39E-06	2.35E-01
alpha-BHC	2.60E-02	8.40E-08	5.00E-04	1.68E-04	5.80E-08	5.00E-04	1.16E-04	3.87E-12	5.00E-04	7.73E-09	2.84E-04
alpha-Chlordane	4.04E-02	1.30E-07	5.00E-04	2.61E-04	9.01E-08	5.00E-04	1.80E-04	6.01E-12	2.00E-04	3.00E-08	4.41E-04
4,4'-DDD	9.16E+00	2.96E-05	NA		2.04E-05	NA		1.36E-09	NA		
4,4'-DDE	3.56E+00	1.15E-05	NA		7.94E-06	NA		5.29E-10	NA		
4,4'-DDT	3.25E-01	1.05E-06	5.00E-04	2.10E-03	7.25E-07	5.00E-04	1.45E-03	4.83E-11	5.00E-04	9.67E-08	3.55E-03
beta-BHC	3.50E-02	1.13E-07	NA		7.81E-08	NA		5.20E-12	NA		
delta-BHC	4.10E-03	1.32E-08	NA		9.15E-09	NA		6.10E-13	NA		
Dieldrin	1.34E+00	4.33E-06	5.00E-05	8.65E-02	2.99E-06	5.00E-05	5.98E-02	1.99E-10	5.00E-05	3.99E-06	1.46E-01
Endosulfan sulfate	1.60E-03	5.17E-09	6.00E-03	8.61E-07	3.57E-09	6.00E-03	5.95E-07	2.38E-13	6.00E-03	3.97E-11	1.46E-06
Endrin	4.60E-03	1.49E-08	3.00E-04	4.95E-05	1.03E-08	3.00E-04	3.42E-05	6.84E-13	3.00E-04	2.28E-09	8.37E-05
Endrin aldehyde	1.10E-03	3.55E-09	3.00E-04	1.18E-05	2.45E-09	3.00E-04	8.18E-06	1.64E-13	3.00E-04	5.45E-10	2.00E-05
Endrin ketone	1.20E-02	3.87E-08	3.00E-04	1.29E-04	2.68E-08	3.00E-04	8.92E-05	1.78E-12	3.00E-04	5.95E-09	2.18E-04
gamma-Chlordane	1.09E-01	3.52E-07	5.00E-04	7.04E-04	2.43E-07	5.00E-04	4.86E-04	1.62E-11	2.00E-04	8.10E-08	1.19E-03
Heptachlor	8.80E-03	2.84E-08	5.00E-04	5.68E-05	1.96E-08	5.00E-04	3.93E-05	1.31E-12	5.00E-04	2.62E-09	9.61E-05
Methoxychlor	3.90E-03	1.26E-08	5.00E-03	2.52E-06	8.70E-09	5.00E-03	1.74E-06	5.80E-13	5.00E-03	1.16E-10	4.26E-06
Aroclor-1260	6.40E-01	2.07E-06	2.00E-05	1.03E-01	4.28E-06	2.00E-05	2.14E-01	9.52E-11	2.00E-05	4.76E-06	3.17E-01
SVOCs/VOCs											
1,2,4-Trichlorobenzene	1.54E+00	4.97E-06	1.00E-02	4.97E-04	6.87E-06	1.00E-02	6.87E-04	6.34E-06	1.00E-03	6.34E-03	7.52E-03
1,2-Dichlorobenzene	5.47E+01	1.77E-04	9.00E-02	1.96E-03	2.44E-04	9.00E-02	2.71E-03	6.69E-04	5.71E-02	1.17E-02	1.64E-02
1,3-Dichlorobenzene	2.02E+00	6.52E-06	3.00E-02	2.17E-04	9.01E-06	3.00E-02	3.00E-04	2.47E-05	3.00E-02	8.24E-04	1.34E-03
1,4-Dichlorobenzene	2.55E+01	8.23E-05	3.00E-02	2.74E-03	1.14E-04	3.00E-02	3.79E-03	3.54E-04	2.30E-01	1.54E-03	8.08E-03
2-Methylnaphthalene	1.14E+02	3.68E-04	4.00E-03	9.20E-02	7.63E-04	4.00E-03	1.91E-01	3.63E-04	NA		2.83E-01
2-Methylphenol	9.90E-01	3.20E-06	5.00E-02	6.39E-05	4.42E-06	5.00E-02	8.83E-05	1.47E-10	5.00E-02	2.94E-09	1.52E-04
4-Chloro-3-methylphenol	7.20E+00	2.32E-05	NA		3.21E-05	NA		1.07E-09	NA		
4-Methylphenol	3.60E+00	1.16E-05	5.00E-03	2.32E-03	1.61E-05	5.00E-03	3.21E-03	5.35E-10	5.00E-03	1.07E-07	5.54E-03
Acenaphthene	9.18E+00	2.96E-05	6.00E-02	4.94E-04	6.14E-05	6.00E-02	1.02E-03	7.44E-06	6.00E-02	1.24E-04	1.64E-03
Anthracene	1.10E+00	3.55E-06	3.00E-01	1.18E-05	7.36E-06	3.00E-01	2.45E-05	2.49E-07	3.00E-01	8.31E-07	3.72E-05
Benzo(a)anthracene	5.50E-01	1.78E-06	NA		3.68E-06	NA		8.18E-11	NA		
Benzo(a)pyrene	5.00E-01	1.61E-06	NA		3.35E-06	NA		7.44E-11	NA		
Benzo(b)fluoranthene	4.20E-01	1.36E-06	NA		2.81E-06	NA		6.25E-11	NA		
Benzo(g,h,i)perylene	4.30E-01	1.39E-06	NA		2.88E-06	NA		6.39E-11	NA		
Benzo(k)fluoranthene	4.30E-01	1.39E-06	NA		2.88E-06	NA		6.39E-11	NA		
Benzyl butyl phthalate	7.60E+00	2.45E-05	2.00E-01	1.23E-04	3.39E-05	2.00E-01	1.70E-04	1.13E-09	2.00E-01	5.65E-09	2.92E-04
Biphenyl (diphenyl)	4.40E+00	1.42E-05	5.00E-02	2.84E-04	1.96E-05	5.00E-02	3.93E-04	6.54E-10	5.00E-02	1.31E-08	6.77E-04
bis(2-Ethylhexyl)phthalate	9.85E+00	3.18E-05	2.00E-02	1.59E-03	4.39E-05	2.00E-02	2.20E-03	1.46E-09	2.00E-02	7.32E-08	3.79E-03
Caprolactam	9.50E-02	3.07E-07	5.00E-01	6.14E-07	4.24E-07	5.00E-01	8.48E-07	1.41E-11	5.00E-01	2.83E-11	1.46E-06
Carbazole	1.10E+00	3.55E-06	NA		4.91E-06	NA		1.64E-10	NA		
Chrysene	9.10E-01	2.94E-06	NA		6.09E-06	NA		1.35E-10	NA		
Dibenz(a,h)anthracene	1.20E-01	3.87E-07	NA		8.03E-07	NA		1.78E-11	NA		
Dibenzofuran	4.10E+00	1.32E-05	2.00E-03	6.62E-03	1.83E-05	2.00E-03	9.15E-03	1.45E-06	2.00E-03	7.24E-04	1.65E-02

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Di-n-butyl phthalate	2.90E+00	9.36E-06	1.00E-01	9.36E-05	1.29E-05	1.00E-01	1.29E-04	4.31E-10	1.00E-01	4.31E-09	2.23E-04
Fluoranthene	4.20E+00	1.36E-05	4.00E-02	3.39E-04	2.81E-05	4.00E-02	7.03E-04	6.25E-10	4.00E-02	1.56E-08	1.04E-03
Fluorene	8.31E+00	2.68E-05	4.00E-02	6.71E-04	5.56E-05	4.00E-02	1.39E-03	2.90E-06	4.00E-02	7.24E-05	2.13E-03
Indeno(1,2,3-c,d)pyrene	4.40E-01	1.42E-06	NA		2.94E-06	NA		6.54E-11	NA		
Naphthalene	5.28E+01	1.70E-04	2.00E-02	8.52E-03	3.53E-04	2.00E-02	1.77E-02	1.68E-04	8.57E-04	1.96E-01	2.22E-01
Phenanthrene	1.21E+01	3.91E-05	NA		8.10E-05	NA		1.80E-09	NA		
Pyrene	3.97E+00	1.28E-05	3.00E-02	4.27E-04	2.66E-05	3.00E-02	8.86E-04	1.86E-07	3.00E-02	6.19E-06	1.32E-03
1,1,1-Trichloroethane	2.51E-02	8.10E-08	2.80E-01	2.89E-07	1.12E-07	2.80E-01	4.00E-07	2.13E-06	6.30E-01	3.38E-06	4.07E-06
1,1-Dichloroethane	1.01E+01	3.26E-05	1.00E-01	3.26E-04	4.51E-05	1.00E-01	4.51E-04	8.16E-04	1.43E-01	5.72E-03	6.49E-03
1,1-Dichloroethene	6.80E-02	2.20E-07	2.00E-02	1.10E-05	3.03E-07	2.00E-02	1.52E-05	9.36E-06	2.00E-02	4.68E-04	4.94E-04
1,2-Dichloroethane	6.05E-02	1.95E-07	2.00E-02	9.77E-06	2.70E-07	2.00E-02	1.35E-05	3.08E-06	1.40E-03	2.20E-03	2.22E-03
Acetone	2.26E-01	7.30E-07	9.00E-01	8.11E-07	1.01E-06	9.00E-01	1.12E-06	4.09E-06	9.00E-01	4.54E-06	6.47E-06
Benzene	1.93E+00	6.23E-06	4.00E-03	1.56E-03	8.61E-06	4.00E-03	2.15E-03	1.34E-04	8.57E-03	1.56E-02	1.93E-02
Carbon disulfide	6.29E-03	2.03E-08	1.00E-01	2.03E-07	2.81E-08	1.00E-01	2.81E-07	1.06E-06	2.00E-01	5.29E-06	5.78E-06
Chlorobenzene	1.01E+01	3.26E-05	2.00E-02	1.63E-03	4.51E-05	2.00E-02	2.25E-03	2.91E-04	1.70E-02	1.71E-02	2.10E-02
Chloroethane	2.40E-02	7.75E-08	4.00E-01	1.94E-07	1.07E-07	4.00E-01	2.68E-07	4.15E-06	2.86E+00	1.45E-06	1.91E-06
Chloromethane	1.27E-01	4.10E-07	2.60E-02	1.58E-05	5.67E-07	2.60E-02	2.18E-05	4.64E-06	2.60E-02	1.78E-04	2.16E-04
cis-1,2-Dichloroethene	1.49E+02	4.81E-04	1.00E-02	4.81E-02	6.65E-04	1.00E-02	6.65E-02	9.90E-03	1.00E-02	9.90E-01	**1.10E+00**
Cyclohexane	2.55E+00	8.23E-06	1.70E+00	4.84E-06	1.14E-05	1.70E+00	6.69E-06	4.77E-04	1.70E+00	2.81E-04	2.92E-04
Ethylbenzene	2.24E+01	7.23E-05	1.00E-01	7.23E-04	9.99E-05	1.00E-01	9.99E-04	7.45E-04	2.90E-01	2.57E-03	4.29E-03
Isopropylbenzene (cumene)	5.35E+00	1.73E-05	1.00E-01	1.73E-04	2.39E-05	1.00E-01	2.39E-04	3.42E-04	1.10E-01	3.11E-03	3.52E-03
Methyl ethyl ketone	3.14E-01	1.01E-06	6.00E-01	1.69E-06	1.40E-06	6.00E-01	2.34E-06	3.71E-06	1.40E+00	2.65E-06	6.68E-06
Methyl isobutyl ketone	5.74E+00	1.85E-05	8.00E-02	2.32E-04	2.56E-05	8.00E-02	3.20E-04	5.24E-05	8.60E-01	6.09E-05	6.13E-04
Methyl tert-butyl ether	4.00E-03	1.29E-08	8.57E-01	1.51E-08	1.78E-08	8.57E-01	2.08E-08	1.96E-07	8.57E-01	2.28E-07	2.64E-07
Methylcyclohexane	1.02E+01	3.29E-05	8.60E-01	3.83E-05	4.55E-05	8.60E-01	5.29E-05	1.16E-03	8.60E-01	1.34E-03	1.43E-03
Methylene chloride	8.38E-03	2.71E-08	6.00E-02	4.51E-07	3.74E-08	6.00E-02	6.23E-07	7.71E-07	1.14E-01	6.75E-06	7.82E-06
Styrene	5.14E-01	1.66E-06	2.00E-01	8.30E-06	2.29E-06	2.00E-01	1.15E-05	8.80E-06	2.57E-01	3.42E-05	5.40E-05
Tetrachloroethene	8.76E-02	2.83E-07	1.00E-02	2.83E-05	3.91E-07	1.00E-02	3.91E-05	7.88E-06	1.00E-02	7.88E-04	8.55E-04
Toluene	1.16E+02	3.75E-04	2.00E-01	1.87E-03	5.18E-04	2.00E-01	2.59E-03	6.69E-03	8.57E-02	7.81E-02	8.25E-02
trans-1,2-Dichloroethene	6.38E-01	2.06E-06	2.00E-02	1.03E-04	2.85E-06	2.00E-02	1.42E-04	6.25E-05	2.00E-02	3.13E-03	3.37E-03
Trichloroethene	5.21E-01	1.68E-06	3.00E-04	5.61E-03	2.32E-06	3.00E-04	7.75E-03	3.67E-05	1.00E-02	3.67E-03	1.70E-02
Vinyl chloride	1.28E+00	4.13E-06	3.00E-03	1.38E-03	5.71E-06	3.00E-03	1.90E-03	2.81E-04	2.86E-02	9.85E-03	1.31E-02
Xylenes, total	1.57E+02	5.07E-04	2.00E-01	2.53E-03	7.01E-04	2.00E-01	3.50E-03	5.91E-03	2.90E-02	2.04E-01	2.10E-01
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	9.72E-04	3.14E-09	NA		1.30E-09	NA		1.45E-13	1.14E-08	1.26E-05	1.26E-05
1,2,3,4,6,7,8-HpCDF	1.60E-04	5.17E-10	NA		2.14E-10	NA		2.38E-14	1.14E-08	2.08E-06	2.08E-06
1,2,3,4,7,8,9-HpCDF	7.93E-06	2.56E-11	NA		1.06E-11	NA		1.18E-15	1.14E-08	1.03E-07	1.03E-07
1,2,3,4,7,8-HxCDD	1.64E-05	5.30E-11	NA		2.20E-11	NA		2.44E-15	1.14E-08	2.13E-07	2.13E-07
1,2,3,4,7,8-HxCDF	2.26E-06	7.30E-12	NA		3.03E-12	NA		3.36E-16	1.14E-08	2.94E-08	2.94E-08
1,2,3,6,7,8-HxCDD	7.35E-05	2.37E-10	NA		9.84E-11	NA		1.09E-14	1.14E-08	9.56E-07	9.56E-07
1,2,3,6,7,8-HxCDF	1.50E-05	4.84E-11	NA		2.01E-11	NA		2.23E-15	1.14E-08	1.95E-07	1.95E-07
1,2,3,7,8,9-HxCDD	4.14E-05	1.34E-10	NA		5.54E-11	NA		6.16E-15	1.14E-08	5.39E-07	5.39E-07
1,2,3,7,8,9-HxCDF	8.75E-06	2.83E-11	NA		1.17E-11	NA		1.30E-15	1.14E-08	1.14E-07	1.14E-07
1,2,3,7,8-PeCDD	1.53E-05	4.94E-11	NA		2.05E-11	NA		2.28E-15	1.14E-08	1.99E-07	1.99E-07

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
2,3,4,6,7,8-HxCDF	1.51E-05	4.88E-11	NA		2.02E-11	NA		2.25E-15	1.14E-08	1.96E-07	1.96E-07
2,3,4,7,8-PeCDF	3.66E-05	1.18E-10	NA		4.90E-11	NA		5.44E-15	1.14E-08	4.76E-07	4.76E-07
2,3,7,8-TCDF	4.63E-06	1.50E-11	NA		6.20E-12	NA		6.89E-16	1.14E-08	6.02E-08	6.02E-08
OCDD	8.20E-03	2.65E-08	NA		1.10E-08	NA		1.22E-12	1.14E-08	1.07E-04	1.07E-04
OCDF	3.25E-04	1.05E-09	NA		4.35E-10	NA		4.83E-14	1.14E-08	4.23E-06	4.23E-06
		Total Risk (Hazard Index):		1.54E+00	**Total Risk (Hazard Index):**		8.60E-01	**Total Risk (Hazard Index):**		1.570E+00	**3.97E+00**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **4**

Table 1-17
Cancer Risk Results - Detailed Summary of Risk Drivers - Future Industrial/Construction Worker - Shallow Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Industrial Worker					Future Construction Worker				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	**2.6E-05**	**8.8E-06**	6.2E-09	**3.4E-05**	25%	**3.4E-06**	**1.4E-06**	2.5E-10	**4.8E-06**	34%
Chromium			**3.1E-06**	**3.1E-06**	2%			1.3E-07	1.3E-07	0.9%
Subtotal Metals	**2.6E-05**	**8.8E-06**	**3.2E-06**	**3.8E-05**	27%	**3.4E-06**	**1.4E-06**	1.3E-07	**4.9E-06**	35%
Pesticides/PCBs										
Aldrin	**7.7E-06**	**4.4E-06**	1.2E-09	**1.2E-05**	9%	**1.0E-06**	7.0E-07	4.7E-11	**1.7E-06**	12%
4,4'-DDD	7.7E-07	4.4E-07	1.2E-10	**1.2E-06**	0.9%	1.0E-07	7.0E-08	4.7E-12	1.7E-07	1%
Dieldrin	**7.5E-06**	**4.3E-06**	1.1E-09	**1.2E-05**	9%	9.9E-07	6.8E-07	4.6E-11	**1.7E-06**	12%
Aroclor-1260	4.5E-07	7.6E-07	6.8E-11	**1.2E-06**	0.9%	5.9E-08	1.2E-07	2.7E-12	1.8E-07	1%
Subtotal Pesticides/PCBs	**1.7E-05**	**1.0E-05**	2.6E-09	**2.7E-05**	20%	**2.2E-06**	**1.6E-06**	1.0E-10	**3.9E-06**	28%
SVOCs/VOCs										
1,4-Dichlorobenzene	2.1E-07	2.4E-07	**4.9E-06**	**5.3E-06**	4%	2.8E-08	3.9E-08	1.9E-07	2.6E-07	2%
Benzo(a)pyrene	**2.1E-06**	**3.6E-06**	1.9E-10	**5.7E-06**	4%	2.8E-07	5.7E-07	7.8E-12	8.5E-07	6%
Naphthalene	**2.2E-06**	**3.8E-06**	**7.1E-06**	**1.3E-05**	10%	2.9E-07	6.1E-07	2.9E-07	**1.2E-06**	8%
1,1-Dichloroethane	2.0E-08	2.3E-08	**1.6E-06**	**1.7E-06**	1%	2.7E-09	3.7E-09	6.5E-08	7.2E-08	0.5%
Benzene	6.7E-08	7.7E-08	**4.9E-06**	**5.0E-06**	4%	8.9E-09	1.2E-08	1.9E-07	2.2E-07	2%
Trichloroethene	7.3E-08	8.3E-08	**5.2E-06**	**5.4E-06**	4%	9.6E-09	1.3E-08	2.1E-07	2.3E-07	2%
Vinyl chloride	6.7E-07	7.6E-07	**2.7E-05**	**2.9E-05**	21%	8.9E-08	1.2E-07	**1.1E-06**	**1.3E-06**	9%
Subtotal SVOCs/VOCs	**6.5E-06**	**1.0E-05**	**5.2E-05**	**6.9E-05**	50%	8.6E-07	**1.7E-06**	**2.1E-06**	**4.6E-06**	33%
Dioxans/Furans										
1,2,3,7,8-PeCDD	8.0E-07	2.7E-07	1.2E-10	**1.1E-06**	0.8%	1.1E-07	4.4E-08	4.9E-12	1.5E-07	1.1%
2,3,4,7,8-PeCDF	9.6E-07	3.3E-07	1.5E-10	**1.3E-06**	1%	1.3E-07	5.2E-08	5.8E-12	1.8E-07	1%
Subtotal Dioxans/Furans	**3.3E-06**	**1.1E-06**	5.1E-10	**4.5E-06**	3%	4.4E-07	1.8E-07	2.0E-11	6.2E-07	4%

Table 1-17
Cancer Risk Results - Detailed Summary of Risk Drivers - Future Industrial/Construction Worker - Shallow Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Industrial Worker					Future Construction Worker				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Total:	5.3E-05	3.1E-05	5.5E-05	1.38E-04		6.9E-06	4.9E-06	2.2E-06	1.40E-05	

Total Estimated Cancer Risk Across All Exposure Routes: **1E-04** **1E-05**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total cancer risk for all chemicals evaluated.

Table 1-18
Noncancer Risk Results - Detailed Summary of Risk Drivers - Future Industrial/Construction Worker - Shallow Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Non-Carcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Industrial Worker					Future Construction Worker				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Antimony	3.3E-02	3.8E-03		3.7E-02	2%	**1.1E-01**	1.5E-02		**1.2E-01**	3%
Arsenic	2.5E-02	8.6E-03	1.3E-04	3.4E-02	2%	8.3E-02	3.4E-02	1.3E-04	**1.2E-01**	3%
Iron	8.5E-02	9.7E-03		9.5E-02	4%	**2.8E-01**	3.9E-02		**3.2E-01**	8%
Manganese	4.6E-02	5.3E-03	1.2E-02	6.4E-02	3%	**1.5E-01**	2.1E-02	1.2E-02	**1.9E-01**	5%
Thallium	4.7E-02	5.3E-03		5.2E-02	2%	**1.5E-01**	2.1E-02		**1.8E-01**	4%
Vanadium	4.1E-02	4.6E-03		4.5E-02	2%	**1.3E-01**	1.9E-02		**1.5E-01**	4%
Subtotal Metals	**3.1E-01**	4.1E-02	1.5E-02	**3.7E-01**	16%	**1.0E+00**	**1.6E-01**	1.5E-02	**1.2E+00**	30%
Pesticides/PCBs										
Aldrin	4.2E-02	2.4E-02	6.4E-06	6.6E-02	3%	**1.4E-01**	9.6E-02	6.4E-06	**2.3E-01**	6%
Dieldrin	2.6E-02	1.5E-02	4.0E-06	4.1E-02	2%	8.7E-02	6.0E-02	4.0E-06	**1.5E-01**	4%
Aroclor-1260	3.1E-02	5.4E-02	4.8E-06	8.5E-02	3.8%	**1.0E-01**	**2.1E-01**	4.8E-06	**3.2E-01**	8.0%
Subtotal Pesticides/PCBs	**1.0E-01**	9.3E-02	1.5E-05	**1.9E-01**	9%	**3.3E-01**	**3.7E-01**	1.5E-05	**7.0E-01**	18%
SVOCs/VOCs										
2-Methylnaphthalene	2.8E-02	4.8E-02		7.6E-02	3%	9.2E-02	**1.9E-01**		**2.8E-01**	7%
Naphthalene	2.6E-03	4.4E-03	**2.0E-01**	**2.0E-01**	9%	8.5E-03	1.8E-02	**2.0E-01**	**2.2E-01**	6%
cis-1,2-Dichloroethene	1.5E-02	1.7E-02	**9.9E-01**	**1.0E+00**	45%	4.8E-02	6.6E-02	**9.9E-01**	**1.1E+00**	28%
Xylenes, total	7.7E-04	8.8E-04	**2.0E-01**	**2.1E-01**	9%	2.5E-03	3.5E-03	**2.0E-01**	**2.1E-01**	5%
Subtotal SVOCs/VOCs	5.6E-02	8.1E-02	**1.6E+00**	**1.7E+00**	75%	**1.8E-01**	**3.2E-01**	**1.6E+00**	**2.1E+00**	52%
Total:	**0.5**	**0.2**	**1.6**	**2.3**		**1.5**	**0.9**	**1.6**	**4.0**	

Total Estimated Hazard Index Across All Exposure Routes: **2** **4**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total hazard quotient for all chemicals evaluated.

Table 1-19
Risk Calculation Worksheet for Deep Soil - Carcinogenic Effects - Residential Exposure Scenario - Future Adult Resident Receptor - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	24	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5700	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		0.00E+00
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.07	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs** [mg/kg]	**Chronic Daily Intake** [mg/kg/day]	**Cancer Slope Factor, SF** [mg/kg/day]-1	**Cancer Risk** [-]	**Chronic Daily Intake** [mg/kg/day]	**Cancer Slope Factor, SF** [mg/kg/day]-1	**Cancer Risk** [-]	**Chronic Daily Intake** [mg/kg/day]	**Cancer Slope Factor, SF** [mg/kg/day]-1	**Cancer Risk** [-]	**Total Cancer Risk** [-]
Metals											
Aluminum	1.25E+04	5.87E-03	NA		2.34E-04	NA		8.92E-07	NA		
Antimony	2.06E+01	9.68E-06	NA		3.86E-07	NA		1.47E-09	NA		
Arsenic	8.10E+00	3.80E-06	9.50E+00	3.61E-05	4.55E-07	9.50E+00	4.33E-06	5.78E-10	1.51E+01	8.70E-09	4.05E-05
Barium	5.55E+02	2.61E-04	NA		1.04E-05	NA		3.96E-08	NA		
Beryllium	6.04E-01	2.84E-07	NA		1.13E-08	NA		4.31E-11	8.40E+00	3.62E-10	3.62E-10
Cadmium	1.74E+00	8.17E-07	3.80E-01	3.11E-07	3.26E-09	3.80E-01	1.24E-09	1.24E-10	1.47E+01	1.83E-09	3.14E-07
Chromium	4.95E+02	2.32E-04	NA		9.28E-06	NA		3.53E-08	4.20E+01	1.48E-06	1.48E-06
Cobalt	7.90E+00	3.71E-06	NA		1.48E-07	NA		5.64E-10	9.80E+00	5.53E-09	5.53E-09
Copper	1.45E+02	6.81E-05	NA		2.72E-06	NA		1.03E-08	NA		
Iron	2.34E+04	1.10E-02	NA		4.39E-04	NA		1.67E-06	NA		
Lead	6.05E+02	2.84E-04	NA		1.13E-05	NA		4.32E-08	NA		
Manganese	8.43E+02	3.96E-04	NA		1.58E-05	NA		6.02E-08	NA		
Nickel	3.70E+01	1.74E-05	NA		6.93E-07	NA		2.64E-09	9.10E-01	2.40E-09	2.40E-09
Selenium	3.30E+00	1.55E-06	NA		6.18E-08	NA		2.36E-10	NA		
Silver	7.75E-01	3.64E-07	NA		1.45E-08	NA		5.53E-11	NA		
Thallium	2.88E+00	1.35E-06	NA		5.40E-08	NA		2.06E-10	NA		
Vanadium	4.05E+01	1.90E-05	NA		7.59E-07	NA		2.89E-09	NA		
Zinc	4.41E+02	2.07E-04	NA		8.26E-06	NA		3.15E-08	NA		
Pesticides/PCBs											
4,4'-DDD	8.40E+00	3.95E-06	2.40E-01	9.47E-07	7.87E-07	2.40E-01	1.89E-07	6.00E-10	2.42E-01	1.45E-10	1.14E-06
4,4'-DDE	5.64E+00	2.65E-06	3.40E-01	9.01E-07	5.28E-07	3.40E-01	1.80E-07	4.03E-10	3.40E-01	1.37E-10	1.08E-06
4,4'-DDT	2.47E-01	1.16E-07	3.40E-01	3.94E-08	2.31E-08	3.40E-01	7.87E-09	1.76E-11	3.40E-01	5.99E-12	4.73E-08

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Oral: Cancer Risk [-]	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Dermal: Cancer Risk [-]	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Inhalation: Cancer Risk [-]	Total Cancer Risk [-]
Aldrin	9.24E-01	4.34E-07	1.70E+01	7.38E-06	8.66E-08	1.70E+01	1.47E-06	6.60E-11	1.72E+01	1.13E-09	8.85E-06
alpha-BHC	2.60E-02	1.22E-08	6.30E+00	7.69E-08	2.44E-09	6.30E+00	1.53E-08	1.86E-12	6.30E+00	1.17E-11	9.23E-08
alpha-Chlordane	7.04E-02	3.31E-08	1.20E+00	3.97E-08	6.60E-09	1.20E+00	7.92E-09	5.03E-12	1.19E+00	5.98E-12	4.76E-08
beta-BHC	3.50E-02	1.64E-08	1.80E+00	2.96E-08	3.28E-09	1.80E+00	5.90E-09	2.50E-12	1.80E+00	4.50E-12	3.55E-08
delta-BHC	4.10E-03	1.93E-09	NA		3.84E-10	NA		2.93E-13	NA		
Dieldrin	2.08E+00	9.77E-07	1.60E+01	1.56E-05	1.95E-07	1.60E+01	3.12E-06	1.48E-10	1.61E+01	2.39E-09	1.88E-05
Endosulfan sulfate	1.60E-03	7.51E-10	NA		1.50E-10	NA		1.14E-13	NA		
Endrin	4.60E-03	2.16E-09	NA		4.31E-10	NA		3.28E-13	NA		
Endrin aldehyde	1.10E-03	5.17E-10	NA		1.03E-10	NA		7.85E-14	NA		
Endrin ketone	1.20E-02	5.64E-09	NA		1.12E-09	NA		8.57E-13	NA		
gamma-BHC	2.50E-03	1.17E-09	1.30E+00	1.53E-09	2.34E-10	1.30E+00	3.05E-10	1.78E-13	1.30E+00	2.32E-13	1.83E-09
gamma-Chlordane	8.75E-02	4.11E-08	1.20E+00	4.93E-08	8.20E-09	1.20E+00	9.84E-09	6.25E-12	1.19E+00	7.43E-12	5.92E-08
Heptachlor	8.80E-03	4.13E-09	4.50E+00	1.86E-08	8.25E-10	4.50E+00	3.71E-09	6.28E-13	4.55E+00	2.86E-12	2.23E-08
Methoxychlor	3.90E-03	1.83E-09	NA		3.65E-10	NA		2.78E-13	NA		
Aroclor-1260	9.80E-01	4.60E-07	2.00E+00	9.21E-07	2.75E-07	2.00E+00	5.51E-07	7.00E-11	2.00E+00	1.40E-10	1.47E-06
SVOCs/VOCs											
1,2,4-Trichlorobenzene	1.05E+00	4.93E-07	3.60E-03	1.78E-09	1.97E-07	3.60E-03	7.08E-10	2.07E-06	NA		2.48E-09
1,2-Dichlorobenzene	4.02E+01	1.89E-05	NA		7.53E-06	NA		2.36E-04	NA		
1,3-Dichlorobenzene	1.38E+00	6.48E-07	NA		2.59E-07	NA		8.10E-06	NA		
1,4-Dichlorobenzene	1.76E+01	8.27E-06	2.40E-02	1.98E-07	3.30E-06	2.40E-02	7.92E-08	1.17E-04	3.85E-02	4.52E-06	4.79E-06
1,4-Dioxane (p-dioxane)	8.72E-01	4.10E-07	2.70E-02	1.11E-08	1.63E-07	2.70E-02	4.41E-09	6.22E-11	2.70E-02	1.68E-12	1.55E-08
2-Methylnaphthalene	4.02E+02	1.89E-04	NA		1.13E-04	NA		6.14E-04	NA		
2-Methylphenol	9.90E-01	4.65E-07	NA		1.86E-07	NA		7.07E-11	NA		
4-Chloro-3-methylphenol	7.20E+00	3.38E-06	NA		1.35E-06	NA		5.14E-10	NA		
4-Methylphenol	3.60E+00	1.69E-06	NA		6.75E-07	NA		2.57E-10	NA		
Acenaphthene	8.32E+00	3.91E-06	NA		2.34E-06	NA		3.24E-06	NA		
Acetophenone	8.73E+00	4.10E-06	NA		1.64E-06	NA		6.23E-10	NA		
Anthracene	1.10E+00	5.17E-07	NA		3.09E-07	NA		1.20E-07	NA		
Benzo(a)anthracene	5.50E-01	2.58E-07	1.20E+00	3.10E-07	1.55E-07	1.20E+00	1.86E-07	3.93E-11	7.30E-01	2.87E-11	4.96E-07
Benzo(a)pyrene	5.00E-01	2.35E-07	1.20E+01	2.82E-06	1.41E-07	1.20E+01	1.69E-06	3.57E-11	7.30E+00	2.61E-10	4.50E-06
Benzo(b)fluoranthene	4.20E-01	1.97E-07	1.20E+00	2.37E-07	1.18E-07	1.20E+00	1.42E-07	3.00E-11	7.30E-01	2.19E-11	3.78E-07
Benzo(g,h,i)perylene	4.30E-01	2.02E-07	NA		1.21E-07	NA		3.07E-11	NA		
Benzo(k)fluoranthene	4.30E-01	2.02E-07	1.20E+00	2.42E-07	1.21E-07	1.20E+00	1.45E-07	3.07E-11	3.85E-01	1.18E-11	3.87E-07
Benzyl butyl phthalate	7.60E+00	3.57E-06	NA		1.42E-06	NA		5.42E-10	NA		
Biphenyl (diphenyl)	7.10E+00	3.33E-06	NA		1.33E-06	NA		5.07E-10	NA		
bis(2-Ethylhexyl)phthalate	8.86E+00	4.16E-06	1.40E-02	5.83E-08	1.66E-06	1.40E-02	2.32E-08	6.32E-10	1.40E-02	8.85E-12	8.15E-08
Caprolactam	9.50E-02	4.46E-08	NA		1.78E-08	NA		6.78E-12	NA		
Carbazole	1.10E+00	5.17E-07	2.00E-02	1.03E-08	2.06E-07	2.00E-02	4.12E-09	7.85E-11	2.00E-02	1.57E-12	1.45E-08
Chrysene	3.50E+00	1.64E-06	1.20E-01	1.97E-07	9.84E-07	1.20E-01	1.18E-07	2.50E-10	3.85E-02	9.62E-12	3.15E-07
Dibenz(a,h)anthracene	1.20E-01	5.64E-08	7.30E+00	4.11E-07	3.37E-08	7.30E+00	2.46E-07	8.57E-12	7.30E+00	6.25E-11	6.58E-07
Dibenzofuran	4.10E+00	1.93E-06	NA		7.68E-07	NA		6.95E-07	NA		
Di-n-butyl phthalate	2.90E+00	1.36E-06	NA		5.43E-07	NA		2.07E-10	NA		
Fluoranthene	5.90E+00	2.77E-06	NA		1.66E-06	NA		4.21E-10	NA		
Fluorene	8.10E+00	3.80E-06	NA		2.28E-06	NA		1.36E-06	NA		
Indeno(1,2,3-c,d)pyrene	4.40E-01	2.07E-07	7.30E-01	1.51E-07	1.24E-07	7.30E-01	9.03E-08	3.14E-11	7.30E-01	2.29E-11	2.41E-07
Naphthalene	5.10E+01	2.40E-05	1.20E-01	2.87E-06	1.43E-05	1.20E-01	1.72E-06	7.79E-05	1.19E-01	9.27E-06	1.39E-05
Pentachlorophenol	6.70E+00	3.15E-06	1.20E-01	3.78E-07	3.14E-06	1.20E-01	3.77E-07	4.78E-10	1.20E-01	5.74E-11	7.54E-07
Phenanthrene	1.51E+01	7.09E-06	NA		4.24E-06	NA		1.08E-09	NA		
Pyrene	7.30E+00	3.43E-06	NA		2.05E-06	NA		1.64E-07	NA		
1,1,1-Trichloroethane	2.31E-02	1.08E-08	NA		4.33E-09	NA		9.40E-07	NA		

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Oral: Cancer Risk [-]	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Dermal: Cancer Risk [-]	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Inhalation: Cancer Risk [-]	Total Cancer Risk [-]
1,1-Dichloroethane	7.30E+00	3.43E-06	5.70E-03	1.95E-08	1.37E-06	5.70E-03	7.80E-09	2.83E-04	5.60E-03	1.59E-06	1.61E-06
1,1-Dichloroethene	5.26E-02	2.47E-08	9.10E-02	2.25E-09	9.86E-09	9.10E-02	8.97E-10	3.48E-06	9.10E-02	3.16E-07	3.20E-07
1,2-Dichloroethane	4.33E-02	2.03E-08	9.10E-02	1.85E-09	8.11E-09	9.10E-02	7.38E-10	1.06E-06	9.10E-02	9.62E-08	9.87E-08
Acetone	2.09E-01	9.82E-08	NA		3.92E-08	NA		1.81E-06	NA		
Benzene	1.42E+00	6.67E-07	1.00E-01	6.67E-08	2.66E-07	1.00E-01	2.66E-08	4.73E-05	1.02E-01	4.80E-06	4.90E-06
Carbon disulfide	6.61E-03	3.10E-09	NA		1.24E-09	NA		5.34E-07	NA		
Chlorobenzene	6.89E+00	3.24E-06	NA		1.29E-06	NA		9.53E-05	NA		
Chloroethane	1.88E-02	8.83E-09	2.90E-03	2.56E-11	3.52E-09	2.90E-03	1.02E-11	1.56E-06	2.90E-03	4.52E-09	4.56E-09
Chloromethane	8.80E-02	4.13E-08	NA		1.65E-08	NA		1.54E-06	NA		
cis-1,2-Dichloroethene	1.34E+02	6.29E-05	NA		2.51E-05	NA		4.27E-03	NA		
Cyclohexane	2.38E+00	1.12E-06	NA		4.46E-07	NA		2.14E-04	NA		
Ethylbenzene	2.52E+01	1.18E-05	NA		4.72E-06	NA		4.02E-04	NA		
Isopropylbenzene (cumene)	1.47E+01	6.90E-06	NA		2.75E-06	NA		4.51E-04	NA		
Methyl ethyl ketone	2.81E-01	1.32E-07	NA		5.27E-08	NA		1.59E-06	NA		
Methyl isobutyl ketone	4.19E+00	1.97E-06	NA		7.85E-07	NA		1.84E-05	NA		
Methyl tert-butyl ether	4.00E-03	1.88E-09	1.80E-03	3.38E-12	7.50E-10	1.80E-03	1.35E-12	9.40E-08	9.10E-04	8.55E-11	9.02E-11
Methylcyclohexane	1.62E+01	7.61E-06	NA		3.04E-06	NA		8.81E-04	NA		
Methylene chloride	8.66E-03	4.07E-09	1.40E-02	5.69E-11	1.62E-09	1.40E-02	2.27E-11	3.83E-07	3.50E-03	1.34E-09	1.42E-09
Styrene	1.74E-01	8.17E-08	NA		3.26E-08	NA		1.43E-06	NA		
Tetrachloroethene	5.09E-01	2.39E-07	5.40E-01	1.29E-07	9.54E-08	5.40E-01	5.15E-08	2.20E-05	2.07E-02	4.54E-07	6.34E-07
Toluene	2.88E-03	1.35E-09	NA		5.40E-10	NA		7.98E-08	NA		
trans-1,2-Dichloroethene	5.29E-01	2.48E-07	NA		9.91E-08	NA		2.49E-05	NA		
Trichloroethene	2.63E+00	1.24E-06	4.00E-01	4.94E-07	4.93E-07	4.00E-01	1.97E-07	8.89E-05	4.00E-01	3.55E-05	3.62E-05
Vinyl chloride	8.95E-01	4.20E-07	1.50E+00	6.31E-07	1.68E-07	1.50E+00	2.52E-07	9.45E-05	2.73E-01	2.58E-05	2.67E-05
Xylenes, total	1.40E+02	6.58E-05	NA		2.62E-05	NA		2.53E-03	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	9.72E-04	4.57E-10	1.50E+03	6.85E-07	5.46E-11	1.50E+03	8.20E-08	6.94E-14	1.50E+03	1.04E-10	7.67E-07
1,2,3,4,6,7,8-HpCDF	1.60E-04	7.51E-11	1.50E+03	1.13E-07	9.00E-12	1.50E+03	1.35E-08	1.14E-14	1.50E+03	1.71E-11	1.26E-07
1,2,3,4,7,8,9-HpCDF	7.93E-06	3.72E-12	1.50E+03	5.59E-09	4.46E-13	1.50E+03	6.69E-10	5.66E-16	1.50E+03	8.49E-13	6.26E-09
1,2,3,4,7,8-HxCDD	1.64E-05	7.70E-12	1.50E+04	1.16E-07	9.22E-13	1.50E+04	1.38E-08	1.17E-15	1.50E+04	1.76E-11	1.29E-07
1,2,3,4,7,8-HxCDF	2.26E-06	1.06E-12	1.50E+04	1.59E-08	1.27E-13	1.50E+04	1.91E-09	1.61E-16	1.50E+04	2.42E-12	1.78E-08
1,2,3,6,7,8-HxCDD	7.35E-05	3.45E-11	1.50E+04	5.18E-07	4.13E-12	1.50E+04	6.20E-08	5.25E-15	1.50E+04	7.87E-11	5.80E-07
1,2,3,6,7,8-HxCDF	1.50E-05	7.05E-12	1.50E+04	1.06E-07	8.43E-13	1.50E+04	1.26E-08	1.07E-15	1.50E+04	1.61E-11	1.18E-07
1,2,3,7,8,9-HxCDD	4.14E-05	1.94E-11	1.50E+04	2.92E-07	2.33E-12	1.50E+04	3.49E-08	2.96E-15	1.50E+04	4.43E-11	3.27E-07
1,2,3,7,8,9-HxCDF	8.75E-06	4.11E-12	1.50E+04	6.16E-08	4.92E-13	1.50E+04	7.38E-09	6.25E-16	1.50E+04	9.37E-12	6.90E-08
1,2,3,7,8-PeCDD	1.53E-05	7.19E-12	1.50E+05	1.08E-06	8.60E-13	1.50E+05	1.29E-07	1.09E-15	1.50E+05	1.64E-10	1.21E-06
2,3,4,6,7,8-HxCDF	1.51E-05	7.09E-12	1.50E+04	1.06E-07	8.49E-13	1.50E+04	1.27E-08	1.08E-15	1.50E+04	1.62E-11	1.19E-07
2,3,4,7,8-PeCDF	3.66E-05	1.72E-11	7.50E+04	1.29E-06	2.06E-12	7.50E+04	1.54E-07	2.61E-15	7.50E+04	1.96E-10	1.44E-06
2,3,7,8-TCDF	4.63E-06	2.17E-12	1.50E+04	3.26E-08	2.60E-13	1.50E+04	3.90E-09	3.30E-16	1.50E+04	4.96E-12	3.65E-08
OCDD	8.20E-03	3.85E-09	1.50E+01	5.78E-08	4.61E-10	1.50E+01	6.91E-09	5.85E-13	1.50E+01	8.78E-12	6.47E-08
OCDF	3.25E-04	1.53E-10	1.50E+01	2.29E-09	1.83E-11	1.50E+01	2.74E-10	2.32E-14	1.50E+01	3.48E-13	2.56E-09
			Total Risk:	7.62E-05		**Total Risk:**	1.58E-05		**Total Risk:**	8.39E-05	1.76E-04

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **2E-04**

Table 1-20
Risk Calculation Worksheet for Deep Soil - Noncarcinogenic Effects - Residential Exposure Scenario - Future Adult Resident Receptor - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter (units)	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	24	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5700	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		0.00E+00
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.07	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Aluminum	1.25E+04	1.71E-02	1.00E+00	1.71E-02	6.83E-04	1.00E+00	6.83E-04	2.60E-06	1.40E-03	1.86E-03	1.97E-02
Antimony	2.06E+01	2.82E-05	4.00E-04	7.05E-02	1.13E-06	4.00E-04	2.81E-03	4.29E-09	NA		7.34E-02
Arsenic	8.10E+00	1.11E-05	3.00E-04	3.70E-02	1.33E-06	3.00E-04	4.43E-03	1.69E-09	8.57E-06	1.97E-04	4.16E-02
Barium	5.55E+02	7.60E-04	7.00E-02	1.09E-02	3.03E-05	7.00E-02	4.33E-04	1.16E-07	1.43E-04	8.09E-04	1.21E-02
Beryllium	6.04E-01	8.27E-07	2.00E-03	4.14E-04	3.30E-08	2.00E-03	1.65E-05	1.26E-10	5.71E-06	2.20E-05	4.52E-04
Cadmium	1.74E+00	2.38E-06	5.00E-04	4.77E-03	9.51E-09	5.00E-04	1.90E-05	3.62E-10	5.71E-06	6.34E-05	4.85E-03
Chromium	4.95E+02	6.78E-04	NA		2.71E-05	NA		1.03E-07	NA		
Cobalt	7.90E+00	1.08E-05	2.00E-02	5.41E-04	4.32E-07	2.00E-02	2.16E-05	1.64E-09	5.70E-06	2.89E-04	8.51E-04
Copper	1.45E+02	1.99E-04	4.00E-02	4.97E-03	7.93E-06	4.00E-02	1.98E-04	3.02E-08	NA		5.16E-03
Iron	2.34E+04	3.21E-02	3.00E-01	1.07E-01	1.28E-03	3.00E-01	4.26E-03	4.87E-06	NA		**1.11E-01**
Lead	6.05E+02	8.29E-04	NA		3.31E-05	NA		1.26E-07	NA		
Manganese	8.43E+02	1.15E-03	2.40E-02	4.81E-02	4.61E-05	2.40E-02	1.92E-03	1.76E-07	1.40E-05	1.25E-02	6.26E-02
Nickel	3.70E+01	5.07E-05	2.00E-02	2.53E-03	2.02E-06	2.00E-02	1.01E-04	7.70E-09	1.43E-05	5.39E-04	3.17E-03
Selenium	3.30E+00	4.52E-06	5.00E-03	9.04E-04	1.80E-07	5.00E-03	3.61E-05	6.87E-10	5.71E-03	1.20E-07	9.40E-04
Silver	7.75E-01	1.06E-06	5.00E-03	2.12E-04	4.24E-08	5.00E-03	8.47E-06	1.61E-10	NA		2.21E-04

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Thallium	2.88E+00	3.95E-06	6.60E-05	5.98E-02	1.57E-07	6.60E-05	2.39E-03	6.00E-10	NA		6.22E-02
Vanadium	4.05E+01	5.55E-05	1.00E-03	5.55E-02	2.21E-06	1.00E-03	2.21E-03	8.43E-09	NA		5.77E-02
Zinc	4.41E+02	6.04E-04	3.00E-01	2.01E-03	2.41E-05	3.00E-01	8.03E-05	9.18E-08	NA		2.09E-03
Pesticides/PCBs											
4,4'-DDD	8.40E+00	1.15E-05	NA		2.30E-06	NA		1.75E-09	NA		
4,4'-DDE	5.64E+00	7.73E-06	NA		1.54E-06	NA		1.17E-09	NA		
4,4'-DDT	2.47E-01	3.38E-07	5.00E-04	6.77E-04	6.75E-08	5.00E-04	1.35E-04	5.14E-11	5.00E-04	1.03E-07	8.12E-04
Aldrin	9.24E-01	1.27E-06	3.00E-05	4.22E-02	2.53E-07	3.00E-05	8.42E-03	1.92E-10	3.00E-05	6.41E-06	5.06E-02
alpha-BHC	2.60E-02	3.56E-08	5.00E-04	7.12E-05	7.11E-09	5.00E-04	1.42E-05	5.41E-12	5.00E-04	1.08E-08	8.55E-05
alpha-Chlordane	7.04E-02	9.64E-08	5.00E-04	1.93E-04	1.92E-08	5.00E-04	3.85E-05	1.47E-11	2.00E-04	7.33E-08	2.31E-04
beta-BHC	3.50E-02	4.79E-08	NA		9.57E-09	NA		7.29E-12	NA		
delta-BHC	4.10E-03	5.62E-09	NA		1.12E-09	NA		8.54E-13	NA		
Dieldrin	2.08E+00	2.85E-06	5.00E-05	5.70E-02	5.68E-07	5.00E-05	1.14E-02	4.33E-10	5.00E-05	8.66E-06	6.84E-02
Endosulfan sulfate	1.60E-03	2.19E-09	6.00E-03	3.65E-07	4.37E-10	6.00E-03	7.29E-08	3.33E-13	6.00E-03	5.55E-11	4.38E-07
Endrin	4.60E-03	6.30E-09	3.00E-04	2.10E-05	1.26E-09	3.00E-04	4.19E-06	9.58E-13	3.00E-04	3.19E-09	2.52E-05
Endrin aldehyde	1.10E-03	1.51E-09	3.00E-04	5.02E-06	3.01E-10	3.00E-04	1.00E-06	2.29E-13	3.00E-04	7.63E-10	6.03E-06
Endrin ketone	1.20E-02	1.64E-08	3.00E-04	5.48E-05	3.28E-09	3.00E-04	1.09E-05	2.50E-12	3.00E-04	8.33E-09	6.57E-05
gamma-BHC	2.50E-03	3.42E-09	3.00E-04	1.14E-05	6.83E-10	3.00E-04	2.28E-06	5.20E-13	3.00E-04	1.73E-09	1.37E-05
gamma-Chlordane	8.75E-02	1.20E-07	5.00E-04	2.40E-04	2.39E-08	5.00E-04	4.78E-05	1.82E-11	2.00E-04	9.11E-08	2.88E-04
Heptachlor	8.80E-03	1.21E-08	5.00E-04	2.41E-05	2.40E-09	5.00E-04	4.81E-06	1.83E-12	5.00E-04	3.66E-09	2.89E-05
Methoxychlor	3.90E-03	5.34E-09	5.00E-03	1.07E-06	1.07E-09	5.00E-03	2.13E-07	8.12E-13	5.00E-03	1.62E-10	1.28E-06
Aroclor-1260	9.80E-01	1.34E-06	2.00E-05	6.71E-02	8.03E-07	2.00E-05	4.02E-02	2.04E-10	2.00E-05	1.02E-05	**1.07E-01**
SVOCs/VOCs											
1,2,4-Trichlorobenzene	1.05E+00	1.44E-06	1.00E-02	1.44E-04	5.74E-07	1.00E-02	5.74E-05	6.05E-06	1.00E-03	6.05E-03	6.25E-03
1,2-Dichlorobenzene	4.02E+01	5.51E-05	9.00E-02	6.12E-04	2.20E-05	9.00E-02	2.44E-04	6.88E-04	5.71E-02	1.20E-02	1.29E-02
1,3-Dichlorobenzene	1.38E+00	1.89E-06	3.00E-02	6.30E-05	7.54E-07	3.00E-02	2.51E-05	2.36E-05	3.00E-02	7.88E-04	8.76E-04
1,4-Dichlorobenzene	1.76E+01	2.41E-05	3.00E-02	8.04E-04	9.62E-06	3.00E-02	3.21E-04	3.42E-04	2.30E-01	1.49E-03	2.61E-03
1,4-Dioxane (p-dioxane)	8.72E-01	1.19E-06	NA		4.77E-07	NA		1.82E-10	8.57E-01	2.12E-10	2.12E-10
2-Methylnaphthalene	4.02E+02	5.51E-04	4.00E-03	1.38E-01	3.30E-04	4.00E-03	8.24E-02	1.79E-03	NA		**2.20E-01**
2-Methylphenol	9.90E-01	1.36E-06	5.00E-02	2.71E-05	5.41E-07	5.00E-02	1.08E-05	2.06E-10	5.00E-02	4.12E-09	3.79E-05
4-Chloro-3-methylphenol	7.20E+00	9.86E-06	NA		3.94E-06	NA		1.50E-09	NA		
4-Methylphenol	3.60E+00	4.93E-06	5.00E-03	9.86E-04	1.97E-06	5.00E-03	3.94E-04	7.49E-10	5.00E-03	1.50E-07	1.38E-03
Acenaphthene	8.32E+00	1.14E-05	6.00E-02	1.90E-04	6.82E-06	6.00E-02	1.14E-04	9.44E-06	6.00E-02	1.57E-04	4.61E-04
Acetophenone	8.73E+00	1.20E-05	1.00E-01	1.20E-04	4.77E-06	1.00E-01	4.77E-05	1.82E-09	NA		1.67E-04
Anthracene	1.10E+00	1.51E-06	3.00E-01	5.02E-06	9.02E-07	3.00E-01	3.01E-06	3.49E-07	3.00E-01	1.16E-06	9.19E-06
Benzo(a)anthracene	5.50E-01	7.53E-07	NA		4.51E-07	NA		1.15E-10	NA		
Benzo(a)pyrene	5.00E-01	6.85E-07	NA		4.10E-07	NA		1.04E-10	NA		
Benzo(b)fluoranthene	4.20E-01	5.75E-07	NA		3.44E-07	NA		8.74E-11	NA		
Benzo(g,h,i)perylene	4.30E-01	5.89E-07	NA		3.53E-07	NA		8.95E-11	NA		
Benzo(k)fluoranthene	4.30E-01	5.89E-07	NA		3.53E-07	NA		8.95E-11	NA		
Benzyl butyl phthalate	7.60E+00	1.04E-05	2.00E-01	5.21E-05	4.15E-06	2.00E-01	2.08E-05	1.58E-09	2.00E-01	7.91E-09	7.28E-05
Biphenyl (diphenyl)	7.10E+00	9.73E-06	5.00E-02	1.95E-04	3.88E-06	5.00E-02	7.76E-05	1.48E-09	5.00E-02	2.96E-08	2.72E-04

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
bis(2-Ethylhexyl)phthalate	8.86E+00	1.21E-05	2.00E-02	6.07E-04	4.84E-06	2.00E-02	2.42E-04	1.84E-09	2.00E-02	9.22E-08	8.49E-04
Caprolactam	9.50E-02	1.30E-07	5.00E-01	2.60E-07	5.19E-08	5.00E-01	1.04E-07	1.98E-11	5.00E-01	3.96E-11	3.64E-07
Carbazole	1.10E+00	1.51E-06	NA		6.01E-07	NA		2.29E-10	NA		
Chrysene	3.50E+00	4.79E-06	NA		2.87E-06	NA		7.29E-10	NA		
Dibenz(a,h)anthracene	1.20E-01	1.64E-07	NA		9.84E-08	NA		2.50E-11	NA		
Dibenzofuran	4.10E+00	5.62E-06	2.00E-03	2.81E-03	2.24E-06	2.00E-03	1.12E-03	2.03E-06	2.00E-03	1.01E-03	4.94E-03
Di-n-butyl phthalate	2.90E+00	3.97E-06	1.00E-01	3.97E-05	1.59E-06	1.00E-01	1.59E-05	6.04E-10	1.00E-01	6.04E-09	5.56E-05
Fluoranthene	5.90E+00	8.08E-06	4.00E-02	2.02E-04	4.84E-06	4.00E-02	1.21E-04	1.23E-09	4.00E-02	3.07E-08	3.23E-04
Fluorene	8.10E+00	1.11E-05	4.00E-02	2.77E-04	6.64E-06	4.00E-02	1.66E-04	3.95E-06	4.00E-02	9.88E-05	5.42E-04
Indeno(1,2,3-c,d)pyrene	4.40E-01	6.03E-07	NA		3.61E-07	NA		9.16E-11	NA		
Naphthalene	5.10E+01	6.99E-05	2.00E-02	3.49E-03	4.18E-05	2.00E-02	2.09E-03	2.27E-04	8.57E-04	2.65E-01	**2.71E-01**
Pentachlorophenol	6.70E+00	9.18E-06	3.00E-02	3.06E-04	9.16E-06	3.00E-02	3.05E-04	1.39E-09	3.00E-02	4.65E-08	6.11E-04
Phenanthrene	1.51E+01	2.07E-05	NA		1.24E-05	NA		3.14E-09	NA		
Pyrene	7.30E+00	1.00E-05	3.00E-02	3.33E-04	5.99E-06	3.00E-02	2.00E-04	4.78E-07	3.00E-02	1.59E-05	5.49E-04
1,1,1-Trichloroethane	2.31E-02	3.16E-08	2.80E-01	1.13E-07	1.26E-08	2.80E-01	4.51E-08	2.74E-06	6.30E-01	4.35E-06	4.51E-06
1,1-Dichloroethane	7.30E+00	1.00E-05	1.00E-01	1.00E-04	3.99E-06	1.00E-01	3.99E-05	8.26E-04	1.43E-01	5.78E-03	5.92E-03
1,1-Dichloroethene	5.26E-02	7.21E-08	2.00E-02	3.60E-06	2.87E-08	2.00E-02	1.44E-06	1.01E-05	2.00E-02	5.07E-04	5.12E-04
1,2-Dichloroethane	4.33E-02	5.93E-08	2.00E-02	2.97E-06	2.37E-08	2.00E-02	1.18E-06	3.08E-06	1.40E-03	2.20E-03	2.21E-03
Acetone	2.09E-01	2.86E-07	9.00E-01	3.18E-07	1.14E-07	9.00E-01	1.27E-07	5.29E-06	9.00E-01	5.88E-06	6.33E-06
Benzene	1.42E+00	1.95E-06	4.00E-03	4.86E-04	7.76E-07	4.00E-03	1.94E-04	1.38E-04	8.57E-03	1.61E-02	1.68E-02
Carbon disulfide	6.61E-03	9.05E-09	1.00E-01	9.05E-08	3.61E-09	1.00E-01	3.61E-08	1.56E-06	2.00E-01	7.78E-06	7.91E-06
Chlorobenzene	6.89E+00	9.44E-06	2.00E-02	4.72E-04	3.77E-06	2.00E-02	1.88E-04	2.78E-04	1.70E-02	1.63E-02	1.70E-02
Chloroethane	1.88E-02	2.58E-08	4.00E-01	6.44E-08	1.03E-08	4.00E-01	2.57E-08	4.55E-06	2.86E+00	1.59E-06	1.68E-06
Chloromethane	8.80E-02	1.21E-07	2.60E-02	4.64E-06	4.81E-08	2.60E-02	1.85E-06	4.50E-06	2.60E-02	1.73E-04	1.79E-04
cis-1,2-Dichloroethene	1.34E+02	1.84E-04	1.00E-02	1.84E-02	7.32E-05	1.00E-02	7.32E-03	1.25E-02	1.00E-02	1.25E+00	**1.27E+00**
Cyclohexane	2.38E+00	3.26E-06	1.70E+00	1.92E-06	1.30E-06	1.70E+00	7.65E-07	6.24E-04	1.70E+00	3.67E-04	3.69E-04
Ethylbenzene	2.52E+01	3.45E-05	1.00E-01	3.45E-04	1.38E-05	1.00E-01	1.38E-04	1.17E-03	2.90E-01	4.04E-03	4.53E-03
Isopropylbenzene (cumene)	1.47E+01	2.01E-05	1.00E-01	2.01E-04	8.03E-06	1.00E-01	8.03E-05	1.32E-03	1.10E-01	1.20E-02	1.23E-02
Methyl ethyl ketone	2.81E-01	3.85E-07	6.00E-01	6.42E-07	1.54E-07	6.00E-01	2.56E-07	4.65E-06	1.40E+00	3.32E-06	4.22E-06
Methyl isobutyl ketone	4.19E+00	5.74E-06	8.00E-02	7.17E-05	2.29E-06	8.00E-02	2.86E-05	5.36E-05	8.60E-01	6.23E-05	1.63E-04
Methyl tert-butyl ether	4.00E-03	5.48E-09	8.57E-01	6.39E-09	2.19E-09	8.57E-01	2.55E-09	2.74E-07	8.57E-01	3.20E-07	3.29E-07
Methylcyclohexane	1.62E+01	2.22E-05	8.60E-01	2.58E-05	8.85E-06	8.60E-01	1.03E-05	2.57E-03	8.60E-01	2.99E-03	3.02E-03
Methylene chloride	8.66E-03	1.19E-08	6.00E-02	1.98E-07	4.73E-09	6.00E-02	7.89E-08	1.12E-06	1.14E-01	9.76E-06	1.00E-05
Styrene	1.74E-01	2.38E-07	2.00E-01	1.19E-06	9.51E-08	2.00E-01	4.76E-07	4.17E-06	2.57E-01	1.62E-05	1.79E-05
Tetrachloroethene	5.09E-01	6.97E-07	1.00E-02	6.97E-05	2.78E-07	1.00E-02	2.78E-05	6.41E-05	1.00E-02	6.41E-03	6.50E-03
Toluene	2.88E-03	3.95E-09	2.00E-01	1.97E-08	1.57E-09	2.00E-01	7.87E-09	2.33E-07	8.57E-02	2.71E-06	2.74E-06
trans-1,2-Dichloroethene	5.29E-01	7.25E-07	2.00E-02	3.62E-05	2.89E-07	2.00E-02	1.45E-05	7.26E-05	2.00E-02	3.63E-03	3.68E-03
Trichloroethene	2.63E+00	3.60E-06	3.00E-04	1.20E-02	1.44E-06	3.00E-04	4.79E-03	2.59E-04	1.00E-02	2.59E-02	4.27E-02
Vinyl chloride	8.95E-01	1.23E-06	3.00E-03	4.09E-04	4.89E-07	3.00E-03	1.63E-04	2.76E-04	2.86E-02	9.64E-03	1.02E-02
Xylenes, total	1.40E+02	1.92E-04	2.00E-01	9.59E-04	7.65E-05	2.00E-01	3.83E-04	7.38E-03	2.90E-02	2.54E-01	**2.56E-01**

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	9.72E-04	1.33E-09	NA		1.59E-10	NA		2.02E-13	1.14E-08	1.77E-05	1.77E-05
1,2,3,4,6,7,8-HpCDF	1.60E-04	2.19E-10	NA		2.62E-11	NA		3.33E-14	1.14E-08	2.91E-06	2.91E-06
1,2,3,4,7,8,9-HpCDF	7.93E-06	1.09E-11	NA		1.30E-12	NA		1.65E-15	1.14E-08	1.44E-07	1.44E-07
1,2,3,4,7,8-HxCDD	1.64E-05	2.25E-11	NA		2.69E-12	NA		3.41E-15	1.14E-08	2.99E-07	2.99E-07
1,2,3,4,7,8-HxCDF	2.26E-06	3.10E-12	NA		3.71E-13	NA		4.71E-16	1.14E-08	4.12E-08	4.12E-08
1,2,3,6,7,8-HxCDD	7.35E-05	1.01E-10	NA		1.21E-11	NA		1.53E-14	1.14E-08	1.34E-06	1.34E-06
1,2,3,6,7,8-HxCDF	1.50E-05	2.05E-11	NA		2.46E-12	NA		3.12E-15	1.14E-08	2.73E-07	2.73E-07
1,2,3,7,8,9-HxCDD	4.14E-05	5.67E-11	NA		6.79E-12	NA		8.62E-15	1.14E-08	7.54E-07	7.54E-07
1,2,3,7,8,9-HxCDF	8.75E-06	1.20E-11	NA		1.43E-12	NA		1.82E-15	1.14E-08	1.59E-07	1.59E-07
1,2,3,7,8-PeCDD	1.53E-05	2.10E-11	NA		2.51E-12	NA		3.19E-15	1.14E-08	2.79E-07	2.79E-07
2,3,4,6,7,8-HxCDF	1.51E-05	2.07E-11	NA		2.48E-12	NA		3.14E-15	1.14E-08	2.75E-07	2.75E-07
2,3,4,7,8-PeCDF	3.66E-05	5.01E-11	NA		6.00E-12	NA		7.62E-15	1.14E-08	6.67E-07	6.67E-07
2,3,7,8-TCDF	4.63E-06	6.34E-12	NA		7.59E-13	NA		9.64E-16	1.14E-08	8.43E-08	8.43E-08
OCDD	8.20E-03	1.12E-08	NA		1.34E-09	NA		1.71E-12	1.14E-08	1.49E-04	1.49E-04
OCDF	3.25E-04	4.45E-10	NA		5.33E-11	NA		6.77E-14	1.14E-08	5.92E-06	5.92E-06
		Total Risk (Hazard Index):		0.77	**Total Risk (Hazard Index):**		0.18	**Total Risk (Hazard Index):**		1.91E+00	**2.86**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **3**

Table 1-21
Risk Calculation Worksheet for Deep Soil - Carcinogenic Effects - Residential Exposure Scenario - Future Child Resident Receptor - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Child Resident
	Receptor Age:	Child (6 years)

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	6	yr
Soil Ingestion Rate	IR	200	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	10	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	2900	cm2/day [soil]
Body Weight	BW	15	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		0.00E+00
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
Metals											
Aluminum	1.25E+04	1.37E-02	NA		3.97E-04	NA		5.20E-07	NA		
Antimony	2.06E+01	2.26E-05	NA		6.55E-07	NA		8.58E-10	NA		
Arsenic	8.10E+00	8.88E-06	9.50E+00	8.43E-05	7.72E-07	9.50E+00	7.34E-06	3.37E-10	1.51E+01	5.08E-09	9.17E-05
Barium	5.55E+02	6.08E-04	NA		1.76E-05	NA		2.31E-08	NA		
Beryllium	6.04E-01	6.62E-07	NA		1.92E-08	NA		2.51E-11	8.40E+00	2.11E-10	2.11E-10
Cadmium	1.74E+00	1.91E-06	3.80E-01	7.25E-07	5.53E-09	3.80E-01	2.10E-09	7.24E-11	1.47E+01	1.06E-09	7.28E-07
Chromium	4.95E+02	5.42E-04	NA		1.57E-05	NA		2.06E-08	4.20E+01	8.66E-07	8.66E-07
Cobalt	7.90E+00	8.66E-06	NA		2.51E-07	NA		3.29E-10	9.80E+00	3.22E-09	3.22E-09
Copper	1.45E+02	1.59E-04	NA		4.61E-06	NA		6.04E-09	NA		
Iron	2.34E+04	2.56E-02	NA		7.44E-04	NA		9.74E-07	NA		
Lead	6.05E+02	6.63E-04	NA		1.92E-05	NA		2.52E-08	NA		
Manganese	8.43E+02	9.24E-04	NA		2.68E-05	NA		3.51E-08	NA		
Nickel	3.70E+01	4.05E-05	NA		1.18E-06	NA		1.54E-09	9.10E-01	1.40E-09	1.40E-09
Selenium	3.30E+00	3.62E-06	NA		1.05E-07	NA		1.37E-10	NA		
Silver	7.75E-01	8.49E-07	NA		2.46E-08	NA		3.23E-11	NA		
Thallium	2.88E+00	3.16E-06	NA		9.15E-08	NA		1.20E-10	NA		
Vanadium	4.05E+01	4.44E-05	NA		1.29E-06	NA		1.69E-09	NA		
Zinc	4.41E+02	4.83E-04	NA		1.40E-05	NA		1.84E-08	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Pesticides/PCBs											
4,4'-DDD	8.40E+00	9.21E-06	2.40E-01	2.21E-06	1.33E-06	2.40E-01	3.20E-07	3.50E-10	2.42E-01	8.45E-11	2.53E-06
4,4'-DDE	5.64E+00	6.18E-06	3.40E-01	2.10E-06	8.96E-07	3.40E-01	3.05E-07	2.35E-10	3.40E-01	7.97E-11	2.41E-06
4,4'-DDT	2.47E-01	2.71E-07	3.40E-01	9.20E-08	3.92E-08	3.40E-01	1.33E-08	1.03E-11	3.40E-01	3.49E-12	1.05E-07
Aldrin	9.24E-01	1.01E-06	1.70E+01	1.72E-05	1.47E-07	1.70E+01	2.50E-06	3.85E-11	1.72E+01	6.60E-10	1.97E-05
alpha-BHC	2.60E-02	2.85E-08	6.30E+00	1.80E-07	4.13E-09	6.30E+00	2.60E-08	1.08E-12	6.30E+00	6.82E-12	2.06E-07
alpha-Chlordane	7.04E-02	7.72E-08	1.20E+00	9.26E-08	1.12E-08	1.20E+00	1.34E-08	2.93E-12	1.19E+00	3.49E-12	1.06E-07
beta-BHC	3.50E-02	3.84E-08	1.80E+00	6.90E-08	5.56E-09	1.80E+00	1.00E-08	1.46E-12	1.80E+00	2.62E-12	7.91E-08
delta-BHC	4.10E-03	4.49E-09	NA		6.52E-10	NA		1.71E-13	NA		
Dieldrin	2.08E+00	2.28E-06	1.60E+01	3.65E-05	3.31E-07	1.60E+01	5.29E-06	8.66E-11	1.61E+01	1.39E-09	4.18E-05
Endosulfan sulfate	1.60E-03	1.75E-09	NA		2.54E-10	NA		6.66E-14	NA		
Endrin	4.60E-03	5.04E-09	NA		7.31E-10	NA		1.92E-13	NA		
Endrin aldehyde	1.10E-03	1.21E-09	NA		1.75E-10	NA		4.58E-14	NA		
Endrin ketone	1.20E-02	1.32E-08	NA		1.91E-09	NA		5.00E-13	NA		
gamma-BHC	2.50E-03	2.74E-09	1.30E+00	3.56E-09	3.97E-10	1.30E+00	5.16E-10	1.04E-13	1.30E+00	1.35E-13	4.08E-09
gamma-Chlordane	8.75E-02	9.59E-08	1.20E+00	1.15E-07	1.39E-08	1.20E+00	1.67E-08	3.64E-12	1.19E+00	4.34E-12	1.32E-07
Heptachlor	8.80E-03	9.64E-09	4.50E+00	4.34E-08	1.40E-09	4.50E+00	6.29E-09	3.66E-13	4.55E+00	1.67E-12	4.97E-08
Methoxychlor	3.90E-03	4.27E-09	NA		6.20E-10	NA		1.62E-13	NA		
Aroclor-1260	9.80E-01	1.07E-06	2.00E+00	2.15E-06	4.67E-07	2.00E+00	9.34E-07	4.08E-11	2.00E+00	8.16E-11	3.08E-06
SVOCs/VOCs											
1,2,4-Trichlorobenzene	1.05E+00	1.15E-06	3.60E-03	4.14E-09	3.34E-07	3.60E-03	1.20E-09	1.21E-06	NA		5.34E-09
1,2-Dichlorobenzene	4.02E+01	4.41E-05	NA		1.28E-05	NA		1.38E-04	NA		
1,3-Dichlorobenzene	1.38E+00	1.51E-06	NA		4.39E-07	NA		4.73E-06	NA		
1,4-Dichlorobenzene	1.76E+01	1.93E-05	2.40E-02	4.63E-07	5.59E-06	2.40E-02	1.34E-07	6.84E-05	3.85E-02	2.63E-06	3.23E-06
1,4-Dioxane (p-dioxane)	8.72E-01	9.56E-07	2.70E-02	2.58E-08	2.77E-07	2.70E-02	7.48E-09	3.63E-11	2.70E-02	9.78E-13	3.33E-08
2-Methylnaphthalene	4.02E+02	4.41E-04	NA		1.92E-04	NA		3.58E-04	NA		
2-Methylphenol	9.90E-01	1.08E-06	NA		3.15E-07	NA		4.12E-11	NA		
4-Chloro-3-methylphenol	7.20E+00	7.89E-06	NA		2.29E-06	NA		3.00E-10	NA		
4-Methylphenol	3.60E+00	3.95E-06	NA		1.14E-06	NA		1.50E-10	NA		
Acenaphthene	8.32E+00	9.12E-06	NA		3.97E-06	NA		1.89E-06	NA		
Acetophenone	8.73E+00	9.57E-06	NA		2.77E-06	NA		3.63E-10	NA		
Anthracene	1.10E+00	1.21E-06	NA		5.24E-07	NA		6.98E-08	NA		
Benzo(a)anthracene	5.50E-01	6.03E-07	1.20E+00	7.23E-07	2.62E-07	1.20E+00	3.15E-07	2.29E-11	7.30E-01	1.67E-11	1.04E-06
Benzo(a)pyrene	5.00E-01	5.48E-07	1.20E+01	6.58E-06	2.38E-07	1.20E+01	2.86E-06	2.08E-11	7.30E+00	1.52E-10	9.44E-06
Benzo(b)fluoranthene	4.20E-01	4.60E-07	1.20E+00	5.52E-07	2.00E-07	1.20E+00	2.40E-07	1.75E-11	7.30E-01	1.28E-11	7.93E-07
Benzo(g,h,i)perylene	4.30E-01	4.71E-07	NA		2.05E-07	NA		1.79E-11	NA		
Benzo(k)fluoranthene	4.30E-01	4.71E-07	1.20E+00	5.65E-07	2.05E-07	1.20E+00	2.46E-07	1.79E-11	3.85E-01	6.89E-12	8.11E-07
Benzyl butyl phthalate	7.60E+00	8.33E-06	NA		2.42E-06	NA		3.16E-10	NA		
Biphenyl (diphenyl)	7.10E+00	7.78E-06	NA		2.26E-06	NA		2.96E-10	NA		
bis(2-Ethylhexyl)phthalate	8.86E+00	9.71E-06	1.40E-02	1.36E-07	2.82E-06	1.40E-02	3.94E-08	3.69E-10	1.40E-02	5.16E-12	1.75E-07
Caprolactam	9.50E-02	1.04E-07	NA		3.02E-08	NA		3.96E-12	NA		
Carbazole	1.10E+00	1.21E-06	2.00E-02	2.41E-08	3.50E-07	2.00E-02	6.99E-09	4.58E-11	2.00E-02	9.16E-13	3.11E-08
Chrysene	3.50E+00	3.84E-06	1.20E-01	4.60E-07	1.67E-06	1.20E-01	2.00E-07	1.46E-10	3.85E-02	5.61E-12	6.60E-07
Dibenz(a,h)anthracene	1.20E-01	1.32E-07	7.30E+00	9.60E-07	5.72E-08	7.30E+00	4.18E-07	5.00E-12	7.30E+00	3.65E-11	1.38E-06
Dibenzofuran	4.10E+00	4.49E-06	NA		1.30E-06	NA		4.05E-07	NA		
Di-n-butyl phthalate	2.90E+00	3.18E-06	NA		9.22E-07	NA		1.21E-10	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Fluoranthene	5.90E+00	6.47E-06	NA		2.81E-06	NA		2.46E-10	NA		
Fluorene	8.10E+00	8.88E-06	NA		3.86E-06	NA		7.90E-07	NA		
Indeno(1,2,3-c,d)pyrene	4.40E-01	4.82E-07	7.30E-01	3.52E-07	2.10E-07	7.30E-01	1.53E-07	1.83E-11	7.30E-01	1.34E-11	5.05E-07
Naphthalene	5.10E+01	5.59E-05	1.20E-01	6.71E-06	2.43E-05	1.20E-01	2.92E-06	4.54E-05	1.19E-01	5.41E-06	1.50E-05
Pentachlorophenol	6.70E+00	7.34E-06	1.20E-01	8.81E-07	5.32E-06	1.20E-01	6.39E-07	2.79E-10	1.20E-01	3.35E-11	1.52E-06
Phenanthrene	1.51E+01	1.65E-05	NA		7.20E-06	NA		6.29E-10	NA		
Pyrene	7.30E+00	8.00E-06	NA		3.48E-06	NA		9.56E-08	NA		
1,1,1-Trichloroethane	2.31E-02	2.53E-08	NA		7.34E-09	NA		5.48E-07	NA		
1,1-Dichloroethane	7.30E+00	8.00E-06	5.70E-03	4.56E-08	2.32E-06	5.70E-03	1.32E-08	1.65E-04	5.60E-03	9.25E-07	9.84E-07
1,1-Dichloroethene	5.26E-02	5.76E-08	9.10E-02	5.25E-09	1.67E-08	9.10E-02	1.52E-09	2.03E-06	9.10E-02	1.85E-07	1.91E-07
1,2-Dichloroethane	4.33E-02	4.75E-08	9.10E-02	4.32E-09	1.38E-08	9.10E-02	1.25E-09	6.16E-07	9.10E-02	5.61E-08	6.17E-08
Acetone	2.09E-01	2.29E-07	NA		6.64E-08	NA		1.06E-06	NA		
Benzene	1.42E+00	1.56E-06	1.00E-01	1.56E-07	4.51E-07	1.00E-01	4.51E-08	2.76E-05	1.02E-01	2.80E-06	3.00E-06
Carbon disulfide	6.61E-03	7.24E-09	NA		2.10E-09	NA		3.11E-07	NA		
Chlorobenzene	6.89E+00	7.55E-06	NA		2.19E-06	NA		5.56E-05	NA		
Chloroethane	1.88E-02	2.06E-08	2.90E-03	5.97E-11	5.97E-09	2.90E-03	1.73E-11	9.10E-07	2.90E-03	2.64E-09	2.72E-09
Chloromethane	8.80E-02	9.64E-08	NA		2.80E-08	NA		8.99E-07	NA		
cis-1,2-Dichloroethene	1.34E+02	1.47E-04	NA		4.26E-05	NA		2.49E-03	NA		
Cyclohexane	2.38E+00	2.61E-06	NA		7.56E-07	NA		1.25E-04	NA		
Ethylbenzene	2.52E+01	2.76E-05	NA		8.01E-06	NA		2.35E-04	NA		
Isopropylbenzene (cumene)	1.47E+01	1.61E-05	NA		4.67E-06	NA		2.63E-04	NA		
Methyl ethyl ketone	2.81E-01	3.08E-07	NA		8.93E-08	NA		9.30E-07	NA		
Methyl isobutyl ketone	4.19E+00	4.59E-06	NA		1.33E-06	NA		1.07E-05	NA		
Methyl tert-butyl ether	4.00E-03	4.38E-09	1.80E-03	7.89E-12	1.27E-09	1.80E-03	2.29E-12	5.48E-08	9.10E-04	4.99E-11	6.01E-11
Methylcyclohexane	1.62E+01	1.78E-05	NA		5.15E-06	NA		5.14E-04	NA		
Methylene chloride	8.66E-03	9.49E-09	1.40E-02	1.33E-10	2.75E-09	1.40E-02	3.85E-11	2.23E-07	3.50E-03	7.81E-10	9.52E-10
Styrene	1.74E-01	1.91E-07	NA		5.53E-08	NA		8.34E-07	NA		
Tetrachloroethene	5.09E-01	5.58E-07	5.40E-01	3.01E-07	1.62E-07	5.40E-01	8.74E-08	1.28E-05	2.07E-02	2.65E-07	6.53E-07
Toluene	2.88E-03	3.16E-09	NA		9.15E-10	NA		4.65E-08	NA		
trans-1,2-Dichloroethene	5.29E-01	5.80E-07	NA		1.68E-07	NA		1.45E-05	NA		
Trichloroethene	2.63E+00	2.88E-06	4.00E-01	1.15E-06	8.36E-07	4.00E-01	3.34E-07	5.18E-05	4.00E-01	2.07E-05	2.22E-05
Vinyl chloride	8.95E-01	9.81E-07	1.50E+00	1.47E-06	2.84E-07	1.50E+00	4.27E-07	5.51E-05	2.73E-01	1.50E-05	1.69E-05
Xylenes, total	1.40E+02	1.53E-04	NA		4.45E-05	NA		1.48E-03	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	9.72E-04	1.07E-09	1.50E+03	1.60E-06	9.27E-11	1.50E+03	1.39E-07	4.05E-14	1.50E+03	6.07E-11	1.74E-06
1,2,3,4,6,7,8-HpCDF	1.60E-04	1.75E-10	1.50E+03	2.63E-07	1.53E-11	1.50E+03	2.29E-08	6.66E-15	1.50E+03	9.99E-12	2.86E-07
1,2,3,4,7,8,9-HpCDF	7.93E-06	8.69E-12	1.50E+03	1.30E-08	7.56E-13	1.50E+03	1.13E-09	3.30E-16	1.50E+03	4.95E-13	1.42E-08
1,2,3,4,7,8-HxCDD	1.64E-05	1.80E-11	1.50E+04	2.70E-07	1.56E-12	1.50E+04	2.35E-08	6.83E-16	1.50E+04	1.02E-11	2.93E-07
1,2,3,4,7,8-HxCDF	2.26E-06	2.48E-12	1.50E+04	3.72E-08	2.15E-13	1.50E+04	3.23E-09	9.41E-17	1.50E+04	1.41E-12	4.04E-08
1,2,3,6,7,8-HxCDD	7.35E-05	8.05E-11	1.50E+04	1.21E-06	7.01E-12	1.50E+04	1.05E-07	3.06E-15	1.50E+04	4.59E-11	1.31E-06
1,2,3,6,7,8-HxCDF	1.50E-05	1.64E-11	1.50E+04	2.47E-07	1.43E-12	1.50E+04	2.15E-08	6.25E-16	1.50E+04	9.37E-12	2.68E-07
1,2,3,7,8,9-HxCDD	4.14E-05	4.54E-11	1.50E+04	6.81E-07	3.95E-12	1.50E+04	5.92E-08	1.72E-15	1.50E+04	2.59E-11	7.40E-07
1,2,3,7,8,9-HxCDF	8.75E-06	9.59E-12	1.50E+04	1.44E-07	8.34E-13	1.50E+04	1.25E-08	3.64E-16	1.50E+04	5.46E-12	1.56E-07
1,2,3,7,8-PeCDD	1.53E-05	1.68E-11	1.50E+05	2.52E-06	1.46E-12	1.50E+05	2.19E-07	6.37E-16	1.50E+05	9.56E-11	2.73E-06
2,3,4,6,7,8-HxCDF	1.51E-05	1.65E-11	1.50E+04	2.48E-07	1.44E-12	1.50E+04	2.16E-08	6.29E-16	1.50E+04	9.43E-12	2.70E-07
2,3,4,7,8-PeCDF	3.66E-05	4.01E-11	7.50E+04	3.01E-06	3.49E-12	7.50E+04	2.62E-07	1.52E-15	7.50E+04	1.14E-10	3.27E-06

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
2,3,7,8-TCDF	4.63E-06	5.07E-12	1.50E+04	7.61E-08	4.41E-13	1.50E+04	6.62E-09	1.93E-16	1.50E+04	2.89E-12	8.27E-08
OCDD	8.20E-03	8.99E-09	1.50E+01	1.35E-07	7.82E-10	1.50E+01	1.17E-08	3.41E-13	1.50E+01	5.12E-12	1.47E-07
OCDF	3.25E-04	3.56E-10	1.50E+01	5.34E-09	3.10E-11	1.50E+01	4.65E-10	1.35E-14	1.50E+01	2.03E-13	5.81E-09
			Total Risk:	1.78E-04		**Total Risk:**	2.68E-05		**Total Risk:**	4.89E-05	2.54E-04

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **3E-04**

Table 1-22
Risk Calculation Worksheet for Deep Soil - Noncarcinogenic Effects - Residential Exposure Scenario - Future Child Resident Receptor - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Child Resident
	Receptor Age:	Child (6 years)

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter (units)	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	6	yr
Soil Ingestion Rate	IR	200	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	10	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	2900	cm2/day [soil]
Body Weight	BW	15	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		0.00E+00
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Metals											
Aluminum	1.25E+04	1.60E-01	1.00E+00	1.60E-01	4.63E-03	1.00E+00	4.63E-03	6.07E-06	1.40E-03	4.34E-03	**1.69E-01**
Antimony	2.06E+01	2.63E-04	4.00E-04	6.58E-01	7.64E-06	4.00E-04	1.91E-02	1.00E-08	NA		**6.78E-01**
Arsenic	8.10E+00	1.04E-04	3.00E-04	3.45E-01	9.01E-06	3.00E-04	3.00E-02	3.93E-09	8.57E-06	4.59E-04	**3.76E-01**
Barium	5.55E+02	7.10E-03	7.00E-02	1.01E-01	2.06E-04	7.00E-02	2.94E-03	2.70E-07	1.43E-04	1.89E-03	**1.06E-01**
Beryllium	6.04E-01	7.72E-06	2.00E-03	3.86E-03	2.24E-07	2.00E-03	1.12E-04	2.93E-10	5.71E-06	5.14E-05	4.02E-03
Cadmium	1.74E+00	2.22E-05	1.10E-05	2.02E+00	6.45E-08	1.10E-05	5.87E-03	8.45E-10	5.71E-06	1.48E-04	**2.03E+00**
Chromium	4.95E+02	6.33E-03	NA		1.84E-04	NA		2.40E-07	NA		
Cobalt	7.90E+00	1.01E-04	2.00E-02	5.05E-03	2.93E-06	2.00E-02	1.46E-04	3.84E-09	5.70E-06	6.73E-04	5.87E-03
Copper	1.45E+02	1.85E-03	4.00E-02	4.63E-02	5.38E-05	4.00E-02	1.34E-03	7.04E-08	NA		4.77E-02
Iron	2.34E+04	2.99E-01	3.00E-01	9.97E-01	8.68E-03	3.00E-01	2.89E-02	1.14E-05	NA		**1.03E+00**
Lead	6.05E+02	7.74E-03	NA		2.24E-04	NA		2.94E-07	NA		
Manganese	8.43E+02	1.08E-02	2.40E-02	4.49E-01	3.13E-04	2.40E-02	1.30E-02	4.10E-07	1.40E-05	2.93E-02	**4.91E-01**
Nickel	3.70E+01	4.73E-04	1.10E-02	4.30E-02	1.37E-05	1.10E-02	1.25E-03	1.80E-08	1.43E-05	1.26E-03	4.55E-02
Selenium	3.30E+00	4.22E-05	5.00E-03	8.44E-03	1.22E-06	5.00E-03	2.45E-04	1.60E-09	5.71E-03	2.81E-07	8.68E-03
Silver	7.75E-01	9.91E-06	5.00E-03	1.98E-03	2.87E-07	5.00E-03	5.75E-05	3.76E-10	NA		2.04E-03
Thallium	2.88E+00	3.68E-05	6.60E-05	5.58E-01	1.07E-06	6.60E-05	1.62E-02	1.40E-09	NA		**5.74E-01**

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Vanadium	4.05E+01	5.18E-04	1.00E-03	5.18E-01	1.50E-05	1.00E-03	1.50E-02	1.97E-08	NA		**5.33E-01**
Zinc	4.41E+02	5.64E-03	3.00E-01	1.88E-02	1.64E-04	3.00E-01	5.45E-04	2.14E-07	NA		1.93E-02
Pesticides/PCBs											
4,4'-DDD	8.40E+00	1.07E-04	NA		1.56E-05	NA		4.08E-09	NA		
4,4'-DDE	5.64E+00	7.21E-05	NA		1.05E-05	NA		2.74E-09	NA		
4,4'-DDT	2.47E-01	3.16E-06	5.00E-04	6.32E-03	4.58E-07	5.00E-04	9.16E-04	1.20E-10	5.00E-04	2.40E-07	7.23E-03
Aldrin	9.24E-01	1.18E-05	3.00E-05	3.94E-01	1.71E-06	3.00E-05	5.71E-02	4.49E-10	3.00E-05	1.50E-05	**4.51E-01**
alpha-BHC	2.60E-02	3.32E-07	5.00E-04	6.65E-04	4.82E-08	5.00E-04	9.64E-05	1.26E-11	5.00E-04	2.53E-08	7.61E-04
alpha-Chlordane	7.04E-02	9.00E-07	3.30E-05	2.73E-02	1.31E-07	3.30E-05	3.95E-03	3.42E-11	2.00E-04	1.71E-07	3.12E-02
beta-BHC	3.50E-02	4.47E-07	NA		6.49E-08	NA		1.70E-11	NA		
delta-BHC	4.10E-03	5.24E-08	NA		7.60E-09	NA		1.99E-12	NA		
Dieldrin	2.08E+00	2.66E-05	5.00E-05	5.32E-01	3.86E-06	5.00E-05	7.71E-02	1.01E-09	5.00E-05	2.02E-05	**6.09E-01**
Endosulfan sulfate	1.60E-03	2.05E-08	6.00E-03	3.41E-06	2.97E-09	6.00E-03	4.94E-07	7.77E-13	6.00E-03	1.30E-10	3.90E-06
Endrin	4.60E-03	5.88E-08	3.00E-04	1.96E-04	8.53E-09	3.00E-04	2.84E-05	2.23E-12	3.00E-04	7.45E-09	2.24E-04
Endrin aldehyde	1.10E-03	1.41E-08	3.00E-04	4.69E-05	2.04E-09	3.00E-04	6.80E-06	5.34E-13	3.00E-04	1.78E-09	5.37E-05
Endrin ketone	1.20E-02	1.53E-07	3.00E-04	5.11E-04	2.22E-08	3.00E-04	7.42E-05	5.83E-12	3.00E-04	1.94E-08	5.86E-04
gamma-BHC	2.50E-03	3.20E-08	3.00E-04	1.07E-04	4.63E-09	3.00E-04	1.54E-05	1.21E-12	3.00E-04	4.05E-09	1.22E-04
gamma-Chlordane	8.75E-02	1.12E-06	3.30E-05	3.39E-02	1.62E-07	3.30E-05	4.92E-03	4.25E-11	2.00E-04	2.13E-07	3.88E-02
Heptachlor	8.80E-03	1.13E-07	3.00E-05	3.75E-03	1.63E-08	3.00E-05	5.44E-04	4.27E-12	3.00E-05	1.42E-07	4.29E-03
Methoxychlor	3.90E-03	4.99E-08	2.00E-05	2.49E-03	7.23E-09	2.00E-05	3.62E-04	1.89E-12	2.00E-05	9.47E-08	2.85E-03
Aroclor-1260	9.80E-01	1.25E-05	2.00E-05	6.26E-01	5.45E-06	2.00E-05	2.73E-01	4.76E-10	2.00E-05	2.38E-05	**9.0E-01**
SVOCs/VOCs											
1,2,4-Trichlorobenzene	1.05E+00	1.34E-05	1.00E-02	1.34E-03	3.89E-06	1.00E-02	3.89E-04	1.41E-05	1.00E-03	1.41E-02	1.58E-02
1,2-Dichlorobenzene	4.02E+01	5.14E-04	9.00E-02	5.71E-03	1.49E-04	9.00E-02	1.66E-03	1.61E-03	5.71E-02	2.81E-02	3.55E-02
1,3-Dichlorobenzene	1.38E+00	1.76E-05	3.00E-02	5.88E-04	5.12E-06	3.00E-02	1.71E-04	5.51E-05	3.00E-02	1.84E-03	2.60E-03
1,4-Dichlorobenzene	1.76E+01	2.25E-04	3.00E-02	7.50E-03	6.53E-05	3.00E-02	2.18E-03	7.98E-04	2.30E-01	3.47E-03	1.31E-02
1,4-Dioxane (p-dioxane)	9.12E-01	1.17E-05	NA		3.38E-06	NA		4.43E-10	8.57E-01	5.17E-10	5.17E-10
2-Methylnaphthalene	4.02E+02	5.14E-03	4.00E-03	1.28E+00	2.24E-03	4.00E-03	5.59E-01	4.18E-03	NA		**1.84E+00**
2-Methylphenol	9.90E-01	1.27E-05	5.00E-02	2.53E-04	3.67E-06	5.00E-02	7.34E-05	4.81E-10	5.00E-02	9.62E-09	3.27E-04
4-Chloro-3-methylphenol	7.20E+00	9.21E-05	NA		2.67E-05	NA		3.50E-09	NA		
4-Methylphenol	3.60E+00	4.60E-05	5.00E-03	9.21E-03	1.33E-05	5.00E-03	2.67E-03	1.75E-09	5.00E-03	3.50E-07	1.19E-02
Acenaphthene	8.32E+00	1.06E-04	6.00E-02	1.77E-03	4.63E-05	6.00E-02	7.71E-04	2.20E-05	6.00E-02	3.67E-04	2.91E-03
Acetophenone	8.73E+00	1.12E-04	1.00E-01	1.12E-03	3.24E-05	1.00E-01	3.24E-04	4.24E-09	NA		1.44E-03
Anthracene	1.10E+00	1.41E-05	3.00E-01	4.69E-05	6.12E-06	3.00E-01	2.04E-05	8.15E-07	3.00E-01	2.72E-06	7.00E-05
Benzo(a)anthracene	5.50E-01	7.03E-06	NA		3.06E-06	NA		2.67E-10	NA		
Benzo(a)pyrene	5.00E-01	6.39E-06	NA		2.78E-06	NA		2.43E-10	NA		
Benzo(b)fluoranthene	4.20E-01	5.37E-06	NA		2.34E-06	NA		2.04E-10	NA		
Benzo(g,h,i)perylene	4.30E-01	5.50E-06	NA		2.39E-06	NA		2.09E-10	NA		
Benzo(k)fluoranthene	4.30E-01	5.50E-06	NA		2.39E-06	NA		2.09E-10	NA		
Benzyl butyl phthalate	7.60E+00	9.72E-05	2.00E-01	4.86E-04	2.82E-05	2.00E-01	1.41E-04	3.69E-09	2.00E-01	1.85E-08	6.27E-04
Biphenyl (diphenyl)	7.10E+00	9.08E-05	5.00E-02	1.82E-03	2.63E-05	5.00E-02	5.27E-04	3.45E-09	5.00E-02	6.90E-08	2.34E-03
bis(2-Ethylhexyl)phthalate	8.86E+00	1.13E-04	2.00E-02	5.66E-03	3.29E-05	2.00E-02	1.64E-03	4.30E-09	2.00E-02	2.15E-07	7.31E-03
Caprolactam	9.50E-02	1.21E-06	5.00E-01	2.43E-06	3.52E-07	5.00E-01	7.04E-07	4.61E-11	5.00E-01	9.23E-11	3.13E-06
Carbazole	1.10E+00	1.41E-05	NA		4.08E-06	NA		5.34E-10	NA		

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Chrysene	3.50E+00	4.47E-05	NA		1.95E-05	NA		1.70E-09	NA		
Dibenz(a,h)anthracene	1.20E-01	1.53E-06	NA		6.67E-07	NA		5.83E-11	NA		
Dibenzofuran	4.10E+00	5.24E-05	2.00E-03	2.62E-02	1.52E-05	2.00E-03	7.60E-03	4.73E-06	2.00E-03	2.36E-03	3.62E-02
Di-n-butyl phthalate	2.90E+00	3.71E-05	1.00E-01	3.71E-04	1.08E-05	1.00E-01	1.08E-04	1.41E-09	1.00E-01	1.41E-08	4.78E-04
Fluoranthene	5.90E+00	7.54E-05	4.00E-02	1.89E-03	3.28E-05	4.00E-02	8.20E-04	2.87E-09	4.00E-02	7.17E-08	2.71E-03
Fluorene	8.10E+00	1.04E-04	4.00E-02	2.59E-03	4.50E-05	4.00E-02	1.13E-03	9.22E-06	4.00E-02	2.31E-04	3.95E-03
Indeno(1,2,3-c,d)pyrene	4.40E-01	5.63E-06	NA		2.45E-06	NA		2.14E-10	NA		
Naphthalene	5.10E+01	6.52E-04	2.00E-02	3.26E-02	2.84E-04	2.00E-02	1.42E-02	5.30E-04	8.57E-04	6.18E-01	**6.65E-01**
Pentachlorophenol	6.70E+00	8.57E-05	3.00E-02	2.86E-03	6.21E-05	3.00E-02	2.07E-03	3.25E-09	3.00E-02	1.08E-07	4.93E-03
Phenanthrene	1.51E+01	1.93E-04	NA		8.40E-05	NA		7.34E-09	NA		
Pyrene	7.30E+00	9.33E-05	3.00E-02	3.11E-03	4.06E-05	3.00E-02	1.35E-03	1.12E-06	3.00E-02	3.72E-05	4.50E-03
1,1,1-Trichloroethane	2.31E-02	2.95E-07	2.80E-01	1.05E-06	8.56E-08	2.80E-01	3.06E-07	6.40E-06	6.30E-01	1.02E-05	1.15E-05
1,1-Dichloroethane	7.30E+00	9.33E-05	1.00E-01	9.33E-04	2.71E-05	1.00E-01	2.71E-04	1.93E-03	1.43E-01	1.35E-02	1.47E-02
1,1-Dichloroethene	5.26E-02	6.73E-07	2.00E-02	3.36E-05	1.95E-07	2.00E-02	9.75E-06	2.37E-05	2.00E-02	1.18E-03	1.23E-03
1,2-Dichloroethane	4.33E-02	5.54E-07	2.00E-02	2.77E-05	1.61E-07	2.00E-02	8.03E-06	7.19E-06	1.40E-03	5.14E-03	5.17E-03
Acetone	2.09E-01	2.67E-06	9.00E-01	2.97E-06	7.75E-07	9.00E-01	8.61E-07	1.24E-05	9.00E-01	1.37E-05	1.76E-05
Benzene	1.42E+00	1.82E-05	4.00E-03	4.54E-03	5.27E-06	4.00E-03	1.32E-03	3.22E-04	8.57E-03	3.76E-02	4.34E-02
Carbon disulfide	6.61E-03	8.45E-08	1.00E-01	8.45E-07	2.45E-08	1.00E-01	2.45E-07	3.63E-06	2.00E-01	1.82E-05	1.93E-05
Chlorobenzene	6.89E+00	8.81E-05	2.00E-02	4.40E-03	2.55E-05	2.00E-02	1.28E-03	6.48E-04	1.70E-02	3.81E-02	4.38E-02
Chloroethane	1.88E-02	2.40E-07	4.00E-01	6.01E-07	6.97E-08	4.00E-01	1.74E-07	1.06E-05	2.86E+00	3.71E-06	4.49E-06
Chloromethane	8.80E-02	1.13E-06	2.60E-02	4.33E-05	3.26E-07	2.60E-02	1.25E-05	1.05E-05	2.60E-02	4.04E-04	4.59E-04
cis-1,2-Dichloroethene	1.34E+02	1.71E-03	1.00E-02	1.71E-01	4.97E-04	1.00E-02	4.97E-02	2.91E-02	1.00E-02	2.91E+00	**3.13E+00**
Cyclohexane	2.38E+00	3.04E-05	1.70E+00	1.79E-05	8.82E-06	1.70E+00	5.19E-06	1.45E-03	1.70E+00	8.56E-04	8.79E-04
Ethylbenzene	2.52E+01	3.22E-04	1.00E-01	3.22E-03	9.34E-05	1.00E-01	9.34E-04	2.74E-03	2.90E-01	9.44E-03	1.36E-02
Isopropylbenzene (cumene)	1.47E+01	1.88E-04	1.00E-01	1.88E-03	5.45E-05	1.00E-01	5.45E-04	3.07E-03	1.10E-01	2.79E-02	3.04E-02
Methyl ethyl ketone	2.81E-01	3.59E-06	6.00E-01	5.99E-06	1.04E-06	6.00E-01	1.74E-06	1.09E-05	1.40E+00	7.75E-06	1.55E-05
Methyl isobutyl ketone	4.19E+00	5.36E-05	8.00E-02	6.70E-04	1.55E-05	8.00E-02	1.94E-04	1.25E-04	8.60E-01	1.45E-04	1.01E-03
Methyl tert-butyl ether	4.00E-03	5.11E-08	8.57E-01	5.97E-08	1.48E-08	8.57E-01	1.73E-08	6.40E-07	8.57E-01	7.46E-07	8.23E-07
Methylcyclohexane	1.62E+01	2.07E-04	8.60E-01	2.41E-04	6.01E-05	8.60E-01	6.98E-05	5.99E-03	8.60E-01	6.97E-03	7.28E-03
Methylene chloride	8.66E-03	1.11E-07	6.00E-02	1.85E-06	3.21E-08	6.00E-02	5.35E-07	2.60E-06	1.14E-01	2.28E-05	2.52E-05
Styrene	1.74E-01	2.22E-06	2.00E-01	1.11E-05	6.45E-07	2.00E-01	3.23E-06	9.73E-06	2.57E-01	3.78E-05	5.22E-05
Tetrachloroethene	5.09E-01	6.51E-06	1.00E-02	6.51E-04	1.89E-06	1.00E-02	1.89E-04	1.49E-04	1.00E-02	1.49E-02	1.58E-02
Toluene	2.88E-03	3.68E-08	2.00E-01	1.84E-07	1.07E-08	2.00E-01	5.34E-08	5.43E-07	8.57E-02	6.33E-06	6.57E-06
trans-1,2-Dichloroethene	5.29E-01	6.76E-06	2.00E-02	3.38E-04	1.96E-06	2.00E-02	9.81E-05	1.69E-04	2.00E-02	8.47E-03	8.90E-03
Trichloroethene	2.63E+00	3.36E-05	3.00E-04	1.12E-01	9.75E-06	3.00E-04	3.25E-02	6.05E-04	1.00E-02	6.05E-02	**2.05E-01**
Vinyl chloride	8.95E-01	1.14E-05	3.00E-03	3.81E-03	3.32E-06	3.00E-03	1.11E-03	6.43E-04	2.86E-02	2.25E-02	2.74E-02
Xylenes, total	1.40E+02	1.79E-03	2.00E-01	8.95E-03	5.19E-04	2.00E-01	2.60E-03	1.72E-02	2.90E-02	5.94E-01	**6.05E-01**
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	9.72E-04	1.24E-08	NA		1.08E-09	NA		4.72E-13	1.14E-08	4.13E-05	4.13E-05
1,2,3,4,6,7,8-HpCDF	1.60E-04	2.05E-09	NA		1.78E-10	NA		7.77E-14	1.14E-08	6.80E-06	6.80E-06
1,2,3,4,7,8,9-HpCDF	7.93E-06	1.01E-10	NA		8.82E-12	NA		3.85E-15	1.14E-08	3.37E-07	3.37E-07
1,2,3,4,7,8-HxCDD	1.64E-05	2.10E-10	NA		1.82E-11	NA		7.97E-15	1.14E-08	6.97E-07	6.97E-07
1,2,3,4,7,8-HxCDF	2.26E-06	2.89E-11	NA		2.51E-12	NA		1.10E-15	1.14E-08	9.61E-08	9.61E-08
1,2,3,6,7,8-HxCDD	7.35E-05	9.40E-10	NA		8.18E-11	NA		3.57E-14	1.14E-08	3.12E-06	3.12E-06

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
1,2,3,6,7,8-HxCDF	1.50E-05	1.92E-10	NA		1.67E-11	NA		7.29E-15	1.14E-08	6.38E-07	6.38E-07
1,2,3,7,8,9-HxCDD	4.14E-05	5.29E-10	NA		4.61E-11	NA		2.01E-14	1.14E-08	1.76E-06	1.76E-06
1,2,3,7,8,9-HxCDF	8.75E-06	1.12E-10	NA		9.73E-12	NA		4.25E-15	1.14E-08	3.72E-07	3.72E-07
1,2,3,7,8-PeCDD	1.53E-05	1.96E-10	NA		1.70E-11	NA		7.43E-15	1.14E-08	6.50E-07	6.50E-07
2,3,4,6,7,8-HxCDF	1.51E-05	1.93E-10	NA		1.68E-11	NA		7.34E-15	1.14E-08	6.42E-07	6.42E-07
2,3,4,7,8-PeCDF	3.66E-05	4.68E-10	NA		4.07E-11	NA		1.78E-14	1.14E-08	1.56E-06	1.56E-06
2,3,7,8-TCDF	4.63E-06	5.92E-11	NA		5.15E-12	NA		2.25E-15	1.14E-08	1.97E-07	1.97E-07
OCDD	8.20E-03	1.05E-07	NA		9.12E-09	NA		3.98E-12	1.14E-08	3.49E-04	3.49E-04
OCDF	3.25E-04	4.16E-09	NA		3.62E-10	NA		1.58E-13	1.14E-08	1.38E-05	1.38E-05
		Total Risk (Hazard Index):		9.3E+00	**Total Risk (Hazard Index):**		1.2E+00	**Total Risk (Hazard Index):**		4.46	**14.97**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **15**

Table 1-23
Cancer Risk Results - Detailed Summary of Risk Drivers - Future Adult/Child Resident - Deep Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	**3.6E-05**	**4.3E-06**	8.7E-09	**4.0E-05**	23%	**8.4E-05**	**7.3E-06**	5.1E-09	**9.2E-05**	36%
Chromium			**1.5E-06**	**1.5E-06**	0.8%			8.7E-07	8.7E-07	0.3%
Subtotal Metals	**3.6E-05**	**4.3E-06**	**1.5E-06**	**4.2E-05**	24%	**8.5E-05**	**7.3E-06**	8.8E-07	**9.3E-05**	37%
Pesticides/PCBs										
4,4'-DDD	9.5E-07	1.9E-07	1.4E-10	**1.1E-06**	0.6%	**2.2E-06**	3.2E-07	8.4E-11	**2.5E-06**	1%
4,4'-DDE	9.0E-07	1.8E-07	1.4E-10	**1.1E-06**	0.6%	**2.1E-06**	3.0E-07	8.0E-11	**2.4E-06**	0.9%
Aldrin	**7.4E-06**	**1.5E-06**	1.1E-09	**8.9E-06**	5%	**1.7E-05**	**2.5E-06**	6.6E-10	**2.0E-05**	8%
Dieldrin	**1.6E-05**	**3.1E-06**	2.4E-09	**1.9E-05**	11%	**3.6E-05**	**5.3E-06**	1.4E-09	**4.2E-05**	16%
Aroclor-1260	9.2E-07	5.5E-07	1.4E-10	**1.5E-06**	0.8%	**2.1E-06**	9.3E-07	8.2E-11	**3.1E-06**	1%
Subtotal Pesticides/PCBs	**2.6E-05**	**5.6E-06**	4.0E-09	**3.2E-05**	18%	**6.1E-05**	**9.4E-06**	2.3E-09	**7.0E-05**	28%
SVOCs/VOCs										
1,4-Dichlorobenzene	2.0E-07	7.9E-08	**4.5E-06**	**4.8E-06**	3%	4.6E-07	1.3E-07	**2.6E-06**	**3.2E-06**	1%
Benzo(a)anthracene	3.1E-07	1.9E-07	2.9E-11	5.0E-07	0.3%	7.2E-07	3.1E-07	1.7E-11	**1.0E-06**	0.4%
Benzo(a)pyrene	**2.8E-06**	**1.7E-06**	2.6E-10	**4.5E-06**	3%	**6.6E-06**	**2.9E-06**	1.5E-10	**9.4E-06**	4%
Dibenz(a,h)anthracene	4.1E-07	2.5E-07	6.3E-11	6.6E-07	0.4%	9.6E-07	4.2E-07	3.6E-11	**1.4E-06**	0.5%
Naphthalene	**2.9E-06**	**1.7E-06**	**9.3E-06**	**1.4E-05**	8%	**6.7E-06**	**2.9E-06**	**5.4E-06**	**1.5E-05**	6%
Pentachlorophenol	3.8E-07	3.8E-07	5.7E-11	7.5E-07	0.4%	8.8E-07	6.4E-07	3.3E-11	**1.5E-06**	0.6%
1,1-Dichloroethane	2.0E-08	7.8E-09	**1.6E-06**	**1.6E-06**	0.9%	4.6E-08	1.3E-08	9.3E-07	9.8E-07	0.4%
Benzene	6.7E-08	2.7E-08	**4.8E-06**	**4.9E-06**	3%	1.6E-07	4.5E-08	**2.8E-06**	**3.0E-06**	1%
Trichloroethene	4.9E-07	2.0E-07	**3.6E-05**	**3.6E-05**	21%	**1.2E-06**	3.3E-07	**2.1E-05**	**2.2E-05**	9%
Vinyl chloride	6.3E-07	2.5E-07	**2.6E-05**	**2.7E-05**	15%	**1.5E-06**	4.3E-07	**1.5E-05**	**1.7E-05**	7%
Subtotal SVOCs/VOCs	**9.2E-06**	**5.4E-06**	**8.2E-05**	**9.7E-05**	55%	**2.2E-05**	**9.1E-06**	**4.8E-05**	**7.9E-05**	31%
Dioxans/Furans										
1,2,3,4,6,7,8-HpCDD	6.8E-07	8.2E-08	1.0E-10	7.7E-07	0.4%	**1.6E-06**	1.4E-07	6.1E-11	**1.7E-06**	0.7%
1,2,3,6,7,8-HxCDD	5.2E-07	6.2E-08	7.9E-11	5.8E-07	0.3%	**1.2E-06**	1.1E-07	4.6E-11	**1.3E-06**	0.5%

Table 1-23
Cancer Risk Results - Detailed Summary of Risk Drivers - Future Adult/Child Resident - Deep Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
1,2,3,7,8-PeCDD	**1.1E-06**	1.3E-07	1.6E-10	**1.2E-06**	0.7%	**2.5E-06**	2.2E-07	9.6E-11	**2.7E-06**	1%
2,3,4,7,8-PeCDF	**1.3E-06**	1.5E-07	2.0E-10	**1.4E-06**	0.8%	**3.0E-06**	2.6E-07	1.1E-10	**3.3E-06**	1%
Subtotal Dioxans/Furans	**4.5E-06**	5.4E-07	6.8E-10	**5.0E-06**	3%	**1.0E-05**	9.1E-07	4.0E-10	**1.1E-05**	4%
Total:	**7.6E-05**	**1.6E-05**	**8.4E-05**	**1.8E-04**		**1.8E-04**	**2.7E-05**	**4.9E-05**	**2.5E-04**	

Total Estimated Cancer Risk Across All Exposure Routes:	**2E-04**	**3E-04**

Sum of Adult and Child Excess Lifetime Cancer Risk (30 year exposure):	**2.5E-04**	**4.3E-05**	**1.3E-04**	**4.29E-04**

Total Estimated Adult plus Child Cancer Risk Across All Exposure Routes:	**4E-04**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total cancer risk for all chemicals evaluated.

Table 1-24
Noncancer Risk Results - Detailed Summary of Risk Drivers - Future Adult/Child Resident - Deep Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Non-Carcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Aluminum	1.7E-02	6.8E-04	1.9E-03	2.0E-02	0.7%	**1.6E-01**	4.6E-03	4.3E-03	**1.7E-01**	1%
Antimony	7.1E-02	2.8E-03		7.3E-02	3%	**6.6E-01**	1.9E-02		**6.8E-01**	5%
Arsenic	3.7E-02	4.4E-03	2.0E-04	4.2E-02	1%	**3.5E-01**	3.0E-02	4.6E-04	**3.8E-01**	3%
Barium	1.1E-02	4.3E-04	8.1E-04	1.2E-02	0.4%	**1.0E-01**	2.9E-03	1.9E-03	**1.1E-01**	0.7%
Iron	**1.1E-01**	4.3E-03		**1.1E-01**	4%	**1.0E+00**	2.9E-02		**1.0E+00**	7%
Manganese	4.8E-02	1.9E-03	1.3E-02	6.3E-02	2%	**4.5E-01**	1.3E-02	2.9E-02	**4.9E-01**	3%
Thallium	6.0E-02	2.4E-03		6.2E-02	2%	**5.6E-01**	1.6E-02		**5.7E-01**	4%
Vanadium	5.5E-02	2.2E-03		5.8E-02	2%	**5.2E-01**	1.5E-02		**5.3E-01**	4%
Subtotal Metals	**4.2E-01**	2.0E-02	1.6E-02	**4.6E-01**	16%	**5.9E+00**	**1.4E-01**	3.8E-02	**6.1E+00**	41%
Pesticides/PCBs										
Aldrin	4.2E-02	8.4E-03	6.4E-06	5.1E-02	2%	**3.9E-01**	5.7E-02	1.5E-05	**4.5E-01**	3%
Dieldrin	5.7E-02	1.1E-02	8.7E-06	6.8E-02	2%	**5.3E-01**	7.7E-02	2.0E-05	**6.1E-01**	4%
Aroclor-1260	6.7E-02	4.0E-02	1.0E-05	**1.1E-01**	4%	**6.3E-01**	**2.7E-01**	2.4E-05	**9.0E-01**	6%
Subtotal Pesticides/PCBs	**1.7E-01**	6.0E-02	2.6E-05	**2.3E-01**	8%	**1.6E+00**	**4.2E-01**	6.0E-05	**2.0E+00**	14%
SVOCs/VOCs										
2-Methylnaphthalene	**1.4E-01**	8.2E-02		**2.2E-01**	8%	**1.3E+00**	**5.6E-01**		**1.8E+00**	12%
Naphthalene	3.5E-03	2.1E-03	**2.7E-01**	**2.7E-01**	9%	3.3E-02	1.4E-02	**6.2E-01**	**6.7E-01**	4%
cis-1,2-Dichloroethene	1.8E-02	7.3E-03	**1.2E+00**	**1.3E+00**	44%	**1.7E-01**	5.0E-02	**2.9E+00**	**3.1E+00**	21%
Trichloroethene	1.2E-02	4.8E-03	2.6E-02	4.3E-02	1%	**1.1E-01**	3.3E-02	6.0E-02	**2.1E-01**	1%
Xylenes, total	9.6E-04	3.8E-04	**2.5E-01**	**2.6E-01**	9%	8.9E-03	2.6E-03	**5.9E-01**	**6.1E-01**	4%
Subtotal SVOCs/VOCs	**1.8E-01**	**1.0E-01**	**1.9E+00**	**2.2E+00**	76%	**1.7E+00**	**6.9E-01**	**4.4E+00**	**6.8E+00**	45%
Total:	**0.8**	**0.2**	**1.9**	**2.9**		**9.3**	**1.2**	**4.5**	**15.0**	

Total Estimated Hazard Index Across All Exposure Routes: **3** **15**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.

Table 1-25
Risk Calculation Worksheet for Deep Soil - Carcinogenic Effects - Occupational Exposure Scenario - Industrial Worker Receptor - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Occupational
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Industrial Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	25	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	25	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
Metals											
Aluminum	1.25E+04	4.37E-03	NA		4.98E-04	NA		6.64E-07	NA		
Antimony	2.06E+01	7.20E-06	NA		8.21E-07	NA		1.09E-09	NA		
Arsenic	8.10E+00	2.83E-06	9.50E+00	2.69E-05	9.68E-07	9.50E+00	9.20E-06	4.30E-10	1.51E+01	6.47E-09	**3.61E-05**
Barium	5.55E+02	1.94E-04	NA		2.21E-05	NA		2.95E-08	NA		
Beryllium	6.04E-01	2.11E-07	NA		2.41E-08	NA		3.21E-11	8.40E+00	2.69E-10	2.69E-10
Cadmium	1.74E+00	6.08E-07	3.80E-01	2.31E-07	6.93E-09	3.80E-01	2.63E-09	9.24E-11	1.47E+01	1.36E-09	2.35E-07
Chromium	4.95E+02	1.73E-04	NA		1.97E-05	NA		2.63E-08	4.20E+01	1.10E-06	**1.10E-06**
Cobalt	7.90E+00	2.76E-06	NA		3.15E-07	NA		4.20E-10	9.80E+00	4.11E-09	4.11E-09
Copper	1.45E+02	5.07E-05	NA		5.78E-06	NA		7.70E-09	NA		
Iron	2.34E+04	8.18E-03	NA		9.32E-04	NA		1.24E-06	NA		
Lead	6.05E+02	2.11E-04	NA		2.41E-05	NA		3.21E-08	NA		
Manganese	8.43E+02	2.95E-04	NA		3.36E-05	NA		4.48E-08	NA		
Nickel	3.70E+01	1.29E-05	NA		1.47E-06	NA		1.97E-09	9.10E-01	1.79E-09	1.79E-09
Selenium	3.30E+00	1.15E-06	NA		1.31E-07	NA		1.75E-10	NA		
Silver	7.75E-01	2.71E-07	NA		3.09E-08	NA		4.12E-11	NA		
Thallium	2.88E+00	1.01E-06	NA		1.15E-07	NA		1.53E-10	NA		
Vanadium	4.05E+01	1.42E-05	NA		1.61E-06	NA		2.15E-09	NA		
Zinc	4.41E+02	1.54E-04	NA		1.76E-05	NA		2.34E-08	NA		

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Oral: Cancer Risk [-]	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Dermal: Cancer Risk [-]	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Inhalation: Cancer Risk [-]	Total Cancer Risk [-]
Pesticides/PCBs											
4,4'-DDD	8.40E+00	2.94E-06	2.40E-01	7.05E-07	1.67E-06	2.40E-01	4.02E-07	4.46E-10	2.42E-01	1.08E-10	**1.11E-06**
4,4'-DDE	5.64E+00	1.97E-06	3.40E-01	6.70E-07	1.12E-06	3.40E-01	3.82E-07	3.00E-10	3.40E-01	1.02E-10	**1.05E-06**
4,4'-DDT	2.47E-01	8.63E-08	3.40E-01	2.93E-08	4.92E-08	3.40E-01	1.67E-08	1.31E-11	3.40E-01	4.45E-12	4.61E-08
Aldrin	9.24E-01	3.23E-07	1.70E+01	5.49E-06	1.84E-07	1.70E+01	3.13E-06	4.91E-11	1.72E+01	8.42E-10	**8.62E-06**
alpha-BHC	2.60E-02	9.09E-09	6.30E+00	5.72E-08	5.18E-09	6.30E+00	3.26E-08	1.38E-12	6.30E+00	8.70E-12	8.99E-08
alpha-Chlordane	7.04E-02	2.46E-08	1.20E+00	2.95E-08	1.40E-08	1.20E+00	1.68E-08	3.74E-12	1.19E+00	4.45E-12	4.64E-08
beta-BHC	3.50E-02	1.22E-08	1.80E+00	2.20E-08	6.97E-09	1.80E+00	1.25E-08	1.86E-12	1.80E+00	3.35E-12	3.46E-08
delta-BHC	4.10E-03	1.43E-09	NA		8.17E-10	NA		2.18E-13	NA		
Dieldrin	2.08E+00	7.27E-07	1.60E+01	1.16E-05	4.14E-07	1.60E+01	6.63E-06	1.10E-10	1.61E+01	1.78E-09	**1.83E-05**
Endosulfan sulfate	1.60E-03	5.59E-10	NA		3.19E-10	NA		8.50E-14	NA		
Endrin	4.60E-03	1.61E-09	NA		9.16E-10	NA		2.44E-13	NA		
Endrin aldehyde	1.10E-03	3.84E-10	NA		2.19E-10	NA		5.84E-14	NA		
Endrin ketone	1.20E-02	4.19E-09	NA		2.39E-09	NA		6.37E-13	NA		
gamma-BHC	2.50E-03	8.74E-10	1.30E+00	1.14E-09	4.98E-10	1.30E+00	6.47E-10	1.33E-13	1.30E+00	1.73E-13	1.78E-09
gamma-Chlordane	8.75E-02	3.06E-08	1.20E+00	3.67E-08	1.74E-08	1.20E+00	2.09E-08	4.65E-12	1.19E+00	5.53E-12	5.76E-08
Heptachlor	8.80E-03	3.08E-09	4.50E+00	1.38E-08	1.75E-09	4.50E+00	7.89E-09	4.67E-13	4.55E+00	2.13E-12	2.17E-08
Methoxychlor	3.90E-03	1.36E-09	NA		7.77E-10	NA		2.07E-13	NA		
Aroclor-1260	9.80E-01	3.42E-07	2.00E+00	6.85E-07	5.86E-07	2.00E+00	1.17E-06	5.20E-11	2.00E+00	1.04E-10	**1.86E-06**
SVOCs/VOCs											
1,2,4-Trichlorobenzene	1.05E+00	3.67E-07	3.60E-03	1.32E-09	4.18E-07	3.60E-03	1.51E-09	1.54E-06	NA		2.83E-09
1,2-Dichlorobenzene	4.02E+01	1.40E-05	NA		1.60E-05	NA		1.76E-04	NA		
1,3-Dichlorobenzene	1.38E+00	4.82E-07	NA		5.50E-07	NA		6.03E-06	NA		
1,4-Dichlorobenzene	1.76E+01	6.15E-06	2.40E-02	1.48E-07	7.01E-06	2.40E-02	1.68E-07	8.73E-05	3.85E-02	3.36E-06	**3.68E-06**
1,4-Dioxane (p-dioxane)	8.72E-01	3.05E-07	2.70E-02	8.23E-09	3.47E-07	2.70E-02	9.38E-09	4.63E-11	2.70E-02	1.25E-12	1.76E-08
2-Methylnaphthalene	4.02E+02	1.40E-04	NA		2.40E-04	NA		4.57E-04	NA		
2-Methylphenol	9.90E-01	3.46E-07	NA		3.94E-07	NA		5.26E-11	NA		
4-Chloro-3-methylphenol	7.20E+00	2.52E-06	NA		2.87E-06	NA		3.82E-10	NA		
4-Methylphenol	3.60E+00	1.26E-06	NA		1.43E-06	NA		1.91E-10	NA		
Acenaphthene	8.32E+00	2.91E-06	NA		4.97E-06	NA		2.41E-06	NA		
Acetophenone	8.73E+00	3.05E-06	NA		3.48E-06	NA		4.64E-10	NA		
Anthracene	1.10E+00	3.84E-07	NA		6.57E-07	NA		8.91E-08	NA		
Benzo(a)anthracene	5.50E-01	1.92E-07	1.20E+00	2.31E-07	3.29E-07	1.20E+00	3.94E-07	2.92E-11	7.30E-01	2.13E-11	6.25E-07
Benzo(a)pyrene	5.00E-01	1.75E-07	1.20E+01	2.10E-06	2.99E-07	1.20E+01	3.59E-06	2.66E-11	7.30E+00	1.94E-10	**5.68E-06**
Benzo(b)fluoranthene	4.20E-01	1.47E-07	1.20E+00	1.76E-07	2.51E-07	1.20E+00	3.01E-07	2.23E-11	7.30E-01	1.63E-11	4.77E-07
Benzo(g,h,i)perylene	4.30E-01	1.50E-07	NA		2.57E-07	NA		2.28E-11	NA		
Benzo(k)fluoranthene	4.30E-01	1.50E-07	1.20E+00	1.80E-07	2.57E-07	1.20E+00	3.08E-07	2.28E-11	3.85E-01	8.79E-12	4.89E-07
Benzyl butyl phthalate	7.60E+00	2.66E-06	NA		3.03E-06	NA		4.04E-10	NA		
Biphenyl (diphenyl)	7.10E+00	2.48E-06	NA		2.83E-06	NA		3.77E-10	NA		
bis(2-Ethylhexyl)phthalate	8.86E+00	3.10E-06	1.40E-02	4.33E-08	3.53E-06	1.40E-02	4.94E-08	4.71E-10	1.40E-02	6.59E-12	9.28E-08
Caprolactam	9.50E-02	3.32E-08	NA		3.78E-08	NA		5.05E-12	NA		
Carbazole	1.10E+00	3.84E-07	2.00E-02	7.69E-09	4.38E-07	2.00E-02	8.76E-09	5.84E-11	2.00E-02	1.17E-12	1.65E-08
Chrysene	3.50E+00	1.22E-06	1.20E-01	1.47E-07	2.09E-06	1.20E-01	2.51E-07	1.86E-10	3.85E-02	7.16E-12	3.98E-07
Dibenz(a,h)anthracene	1.20E-01	4.19E-08	7.30E+00	3.06E-07	7.17E-08	7.30E+00	5.23E-07	6.37E-12	7.30E+00	4.65E-11	8.30E-07
Dibenzofuran	4.10E+00	1.43E-06	NA		1.63E-06	NA		5.17E-07	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Di-n-butyl phthalate	2.90E+00	1.01E-06	NA		1.16E-06	NA		1.54E-10	NA		
Fluoranthene	5.90E+00	2.06E-06	NA		3.53E-06	NA		3.13E-10	NA		
Fluorene	8.10E+00	2.83E-06	NA		4.84E-06	NA		1.01E-06	NA		
Indeno(1,2,3-c,d)pyrene	4.40E-01	1.54E-07	7.30E-01	1.12E-07	2.63E-07	7.30E-01	1.92E-07	2.34E-11	7.30E-01	1.71E-11	3.04E-07
Naphthalene	5.10E+01	1.78E-05	1.20E-01	2.14E-06	3.05E-05	1.20E-01	3.66E-06	5.79E-05	1.19E-01	6.90E-06	**1.27E-05**
Pentachlorophenol	6.70E+00	2.34E-06	1.20E-01	2.81E-07	6.67E-06	1.20E-01	8.01E-07	3.56E-10	1.20E-01	4.27E-11	**1.08E-06**
Phenanthrene	1.51E+01	5.28E-06	NA		9.02E-06	NA		8.02E-10	NA		
Pyrene	7.30E+00	2.55E-06	NA		4.36E-06	NA		1.22E-07	NA		
1,1,1-Trichloroethane	2.31E-02	8.07E-09	NA		9.20E-09	NA		7.00E-07	NA		
1,1-Dichloroethane	7.30E+00	2.55E-06	5.70E-03	1.45E-08	2.91E-06	5.70E-03	1.66E-08	2.11E-04	5.60E-03	1.18E-06	**1.21E-06**
1,1-Dichloroethene	5.26E-02	1.84E-08	9.10E-02	1.67E-09	2.10E-08	9.10E-02	1.91E-09	2.59E-06	9.10E-02	2.35E-07	2.39E-07
1,2-Dichloroethane	4.33E-02	1.51E-08	9.10E-02	1.38E-09	1.72E-08	9.10E-02	1.57E-09	7.86E-07	9.10E-02	7.15E-08	7.45E-08
Acetone	2.09E-01	7.30E-08	NA		8.33E-08	NA		1.35E-06	NA		
Benzene	1.42E+00	4.96E-07	1.00E-01	4.96E-08	5.66E-07	1.00E-01	5.66E-08	3.52E-05	1.02E-01	3.57E-06	**3.68E-06**
Carbon disulfide	6.61E-03	2.31E-09	NA		2.63E-09	NA		3.97E-07	NA		
Chlorobenzene	6.89E+00	2.41E-06	NA		2.74E-06	NA		7.09E-05	NA		
Chloroethane	1.88E-02	6.57E-09	2.90E-03	1.91E-11	7.49E-09	2.90E-03	2.17E-11	1.16E-06	2.90E-03	3.37E-09	3.41E-09
Chloromethane	8.80E-02	3.08E-08	NA		3.51E-08	NA		1.15E-06	NA		
cis-1,2-Dichloroethene	1.34E+02	4.68E-05	NA		5.34E-05	NA		3.18E-03	NA		
Cyclohexane	2.38E+00	8.32E-07	NA		9.48E-07	NA		1.59E-04	NA		
Ethylbenzene	2.52E+01	8.81E-06	NA		1.00E-05	NA		2.99E-04	NA		
Isopropylbenzene (cumene)	1.47E+01	5.14E-06	NA		5.86E-06	NA		3.36E-04	NA		
Methyl ethyl ketone	2.81E-01	9.82E-08	NA		1.12E-07	NA		1.19E-06	NA		
Methyl isobutyl ketone	4.19E+00	1.46E-06	NA		1.67E-06	NA		1.37E-05	NA		
Methyl tert-butyl ether	4.00E-03	1.40E-09	1.80E-03	2.52E-12	1.59E-09	1.80E-03	2.87E-12	6.99E-08	9.10E-04	6.36E-11	6.90E-11
Methylcyclohexane	1.62E+01	5.66E-06	NA		6.45E-06	NA		6.55E-04	NA		
Methylene chloride	8.66E-03	3.03E-09	1.40E-02	4.24E-11	3.45E-09	1.40E-02	4.83E-11	2.85E-07	3.50E-03	9.96E-10	1.09E-09
Styrene	1.74E-01	6.08E-08	NA		6.93E-08	NA		1.06E-06	NA		
Tetrachloroethene	5.09E-01	1.78E-07	5.40E-01	9.61E-08	2.03E-07	5.40E-01	1.09E-07	1.63E-05	2.07E-02	3.38E-07	5.43E-07
Toluene	2.88E-03	1.01E-09	NA		1.15E-09	NA		5.93E-08	NA		
trans-1,2-Dichloroethene	5.29E-01	1.85E-07	NA		2.11E-07	NA		1.85E-05	NA		
Trichloroethene	2.63E+00	9.19E-07	4.00E-01	3.68E-07	1.05E-06	4.00E-01	4.19E-07	6.61E-05	4.00E-01	2.64E-05	**2.72E-05**
Vinyl chloride	8.95E-01	3.13E-07	1.50E+00	4.69E-07	3.57E-07	1.50E+00	5.35E-07	7.03E-05	2.73E-01	1.92E-05	**2.02E-05**
Xylenes, total	1.40E+02	4.89E-05	NA		5.58E-05	NA		1.88E-03	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	9.72E-04	3.40E-10	1.50E+03	5.10E-07	1.16E-10	1.50E+03	1.74E-07	5.16E-14	1.50E+03	7.74E-11	6.84E-07
1,2,3,4,6,7,8-HpCDF	1.60E-04	5.59E-11	1.50E+03	8.39E-08	1.91E-11	1.50E+03	2.87E-08	8.50E-15	1.50E+03	1.27E-11	1.13E-07
1,2,3,4,7,8,9-HpCDF	7.93E-06	2.77E-12	1.50E+03	4.16E-09	9.48E-13	1.50E+03	1.42E-09	4.21E-16	1.50E+03	6.32E-13	5.58E-09
1,2,3,4,7,8-HxCDD	1.64E-05	5.73E-12	1.50E+04	8.60E-08	1.96E-12	1.50E+04	2.94E-08	8.71E-16	1.50E+04	1.31E-11	1.15E-07
1,2,3,4,7,8-HxCDF	2.26E-06	7.90E-13	1.50E+04	1.18E-08	2.70E-13	1.50E+04	4.05E-09	1.20E-16	1.50E+04	1.80E-12	1.59E-08
1,2,3,6,7,8-HxCDD	7.35E-05	2.57E-11	1.50E+04	3.85E-07	8.78E-12	1.50E+04	1.32E-07	3.90E-15	1.50E+04	5.86E-11	5.17E-07
1,2,3,6,7,8-HxCDF	1.50E-05	5.24E-12	1.50E+04	7.86E-08	1.79E-12	1.50E+04	2.69E-08	7.97E-16	1.50E+04	1.19E-11	1.06E-07
1,2,3,7,8,9-HxCDD	4.14E-05	1.45E-11	1.50E+04	2.17E-07	4.95E-12	1.50E+04	7.42E-08	2.20E-15	1.50E+04	3.30E-11	2.91E-07
1,2,3,7,8,9-HxCDF	8.75E-06	3.06E-12	1.50E+04	4.59E-08	1.05E-12	1.50E+04	1.57E-08	4.65E-16	1.50E+04	6.97E-12	6.16E-08
1,2,3,7,8-PeCDD	1.53E-05	5.35E-12	1.50E+05	8.02E-07	1.83E-12	1.50E+05	2.74E-07	8.13E-16	1.50E+05	1.22E-10	**1.08E-06**

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
2,3,4,6,7,8-HxCDF	1.51E-05	5.28E-12	1.50E+04	7.92E-08	1.80E-12	1.50E+04	2.71E-08	8.02E-16	1.50E+04	1.20E-11	1.06E-07
2,3,4,7,8-PeCDF	3.66E-05	1.28E-11	7.50E+04	9.59E-07	4.37E-12	7.50E+04	3.28E-07	1.94E-15	7.50E+04	1.46E-10	**1.29E-06**
2,3,7,8-TCDF	4.63E-06	1.62E-12	1.50E+04	2.43E-08	5.53E-13	1.50E+04	8.30E-09	2.46E-16	1.50E+04	3.69E-12	3.26E-08
OCDD	8.20E-03	2.87E-09	1.50E+01	4.30E-08	9.80E-10	1.50E+01	1.47E-08	4.35E-13	1.50E+01	6.53E-12	5.77E-08
OCDF	3.25E-04	1.14E-10	1.50E+01	1.70E-09	3.88E-11	1.50E+01	5.83E-10	1.73E-14	1.50E+01	2.59E-13	2.29E-09
			Total Risk:	5.67E-05		**Total Risk:**	3.36E-05		**Total Risk:**	6.24E-05	**1.53E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **2E-04**

Table 1-26
Risk Calculation Worksheet for Deep Soil - Noncarcinogenic Effects - Occupational Exposure Scenario - Industrial Worker Receptor - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Occupational
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Industrial Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	25	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	25	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Aluminum	1.25E+04	1.22E-02	1.00E+00	1.22E-02	1.39E-03	1.00E+00	1.39E-03	1.86E-06	1.40E-03	1.33E-03	1.50E-02
Antimony	2.06E+01	2.02E-05	4.00E-04	5.04E-02	2.30E-06	4.00E-04	5.74E-03	3.06E-09	NA		5.61E-02
Arsenic	8.10E+00	7.93E-06	3.00E-04	2.64E-02	2.71E-06	3.00E-04	9.04E-03	1.20E-09	8.57E-06	1.41E-04	3.56E-02
Barium	5.55E+02	5.43E-04	7.00E-02	7.76E-03	6.19E-05	7.00E-02	8.84E-04	8.25E-08	1.43E-04	5.78E-04	9.22E-03
Beryllium	6.04E-01	5.91E-07	2.00E-03	2.95E-04	6.74E-08	2.00E-03	3.37E-05	8.98E-11	5.71E-06	1.57E-05	3.45E-04
Cadmium	1.74E+00	1.70E-06	5.00E-04	3.41E-03	1.94E-08	5.00E-04	3.88E-05	2.59E-10	5.71E-06	4.53E-05	3.49E-03
Chromium	4.95E+02	4.84E-04	NA		5.52E-05	NA		7.36E-08	NA		
Cobalt	7.90E+00	7.73E-06	2.00E-02	3.86E-04	8.81E-07	2.00E-02	4.41E-05	1.17E-09	5.70E-06	2.06E-04	6.37E-04
Copper	1.45E+02	1.42E-04	4.00E-02	3.55E-03	1.62E-05	4.00E-02	4.04E-04	2.16E-08	NA		3.95E-03
Iron	2.34E+04	2.29E-02	3.00E-01	7.63E-02	2.61E-03	3.00E-01	8.70E-03	3.48E-06	NA		8.50E-02
Lead	6.05E+02	5.92E-04	NA		6.75E-05	NA		9.00E-08	NA		
Manganese	8.43E+02	8.25E-04	2.40E-02	3.44E-02	9.40E-05	2.40E-02	3.92E-03	1.25E-07	1.40E-05	8.95E-03	4.72E-02
Nickel	3.70E+01	3.62E-05	2.00E-02	1.81E-03	4.13E-06	2.00E-02	2.06E-04	5.50E-09	1.43E-05	3.85E-04	2.40E-03
Selenium	3.30E+00	3.23E-06	5.00E-03	6.46E-04	3.68E-07	5.00E-03	7.36E-05	4.91E-10	5.71E-03	8.59E-08	7.19E-04

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Silver	7.75E-01	7.58E-07	5.00E-03	1.52E-04	8.64E-08	5.00E-03	1.73E-05	1.15E-10	NA		1.69E-04
Thallium	2.88E+00	2.82E-06	6.60E-05	4.27E-02	3.21E-07	6.60E-05	4.87E-03	4.28E-10	NA		4.76E-02
Vanadium	4.05E+01	3.96E-05	1.00E-03	3.96E-02	4.52E-06	1.00E-03	4.52E-03	6.02E-09	NA		4.41E-02
Zinc	4.41E+02	4.32E-04	3.00E-01	1.44E-03	4.92E-05	3.00E-01	1.64E-04	6.56E-08	NA		1.60E-03
Pesticides/PCBs											
4,4'-DDD	8.40E+00	8.22E-06	NA		4.68E-06	NA		1.25E-09	NA		
4,4'-DDE	5.64E+00	5.52E-06	NA		3.15E-06	NA		8.39E-10	NA		
4,4'-DDT	2.47E-01	2.42E-07	5.00E-04	4.83E-04	1.38E-07	5.00E-04	2.76E-04	3.67E-11	5.00E-04	7.35E-08	7.59E-04
Aldrin	9.24E-01	9.04E-07	3.00E-05	3.01E-02	5.15E-07	3.00E-05	1.72E-02	1.37E-10	3.00E-05	4.58E-06	4.73E-02
alpha-BHC	2.60E-02	2.54E-08	5.00E-04	5.09E-05	1.45E-08	5.00E-04	2.90E-05	3.87E-12	5.00E-04	7.73E-09	7.99E-05
alpha-Chlordane	7.04E-02	6.89E-08	5.00E-04	1.38E-04	3.93E-08	5.00E-04	7.85E-05	1.05E-11	2.00E-04	5.23E-08	2.16E-04
beta-BHC	3.50E-02	3.42E-08	NA		1.95E-08	NA		5.20E-12	NA		
delta-BHC	4.10E-03	4.01E-09	NA		2.29E-09	NA		6.10E-13	NA		
Dieldrin	2.08E+00	2.04E-06	5.00E-05	4.07E-02	1.16E-06	5.00E-05	2.32E-02	3.09E-10	5.00E-05	6.19E-06	6.39E-02
Endosulfan sulfate	1.60E-03	1.57E-09	6.00E-03	2.61E-07	8.92E-10	6.00E-03	1.49E-07	2.38E-13	6.00E-03	3.97E-11	4.10E-07
Endrin	4.60E-03	4.50E-09	3.00E-04	1.50E-05	2.57E-09	3.00E-04	8.55E-06	6.84E-13	3.00E-04	2.28E-09	2.36E-05
Endrin aldehyde	1.10E-03	1.08E-09	3.00E-04	3.59E-06	6.14E-10	3.00E-04	2.05E-06	1.64E-13	3.00E-04	5.45E-10	5.63E-06
Endrin ketone	1.20E-02	1.17E-08	3.00E-04	3.91E-05	6.69E-09	3.00E-04	2.23E-05	1.78E-12	3.00E-04	5.95E-09	6.15E-05
gamma-BHC	2.50E-03	2.45E-09	3.00E-04	8.15E-06	1.39E-09	3.00E-04	4.65E-06	3.72E-13	3.00E-04	1.24E-09	1.28E-05
gamma-Chlordane	8.75E-02	8.56E-08	5.00E-04	1.71E-04	4.88E-08	5.00E-04	9.76E-05	1.30E-11	2.00E-04	6.51E-08	2.69E-04
Heptachlor	8.80E-03	8.61E-09	5.00E-04	1.72E-05	4.91E-09	5.00E-04	9.82E-06	1.31E-12	5.00E-04	2.62E-09	2.70E-05
Methoxychlor	3.90E-03	3.82E-09	5.00E-03	7.63E-07	2.18E-09	5.00E-03	4.35E-07	5.80E-13	5.00E-03	1.16E-10	1.20E-06
Aroclor-1260	9.80E-01	9.59E-07	2.00E-05	4.79E-02	1.64E-06	2.00E-05	8.20E-02	1.46E-10	2.00E-05	7.29E-06	1.30E-01
SVOCs/VOCs											
1,2,4-Trichlorobenzene	1.05E+00	1.03E-06	1.00E-02	1.03E-04	1.17E-06	1.00E-02	1.17E-04	4.32E-06	1.00E-03	4.32E-03	4.54E-03
1,2-Dichlorobenzene	4.02E+01	3.93E-05	9.00E-02	4.37E-04	4.48E-05	9.00E-02	4.98E-04	4.92E-04	5.71E-02	8.60E-03	9.54E-03
1,3-Dichlorobenzene	1.38E+00	1.35E-06	3.00E-02	4.50E-05	1.54E-06	3.00E-02	5.13E-05	1.69E-05	3.00E-02	5.63E-04	6.59E-04
1,4-Dichlorobenzene	1.76E+01	1.72E-05	3.00E-02	5.74E-04	1.96E-05	3.00E-02	6.54E-04	2.44E-04	2.30E-01	1.06E-03	2.29E-03
1,4-Dioxane (p-dioxane)	8.72E-01	8.53E-07	NA		9.73E-07	NA		1.30E-10	8.57E-01	1.51E-10	1.51E-10
2-Methylnaphthalene	4.02E+02	3.93E-04	4.00E-03	9.83E-02	6.73E-04	4.00E-03	1.68E-01	1.28E-03	NA		2.66E-01
2-Methylphenol	9.90E-01	9.69E-07	5.00E-02	1.94E-05	1.10E-06	5.00E-02	2.21E-05	1.47E-10	5.00E-02	2.94E-09	4.15E-05
4-Chloro-3-methylphenol	7.20E+00	7.05E-06	NA		8.03E-06	NA		1.07E-09	NA		
4-Methylphenol	3.60E+00	3.52E-06	5.00E-03	7.05E-04	4.02E-06	5.00E-03	8.03E-04	5.35E-10	5.00E-03	1.07E-07	1.51E-03
Acenaphthene	8.32E+00	8.14E-06	6.00E-02	1.36E-04	1.39E-05	6.00E-02	2.32E-04	6.74E-06	6.00E-02	1.12E-04	4.80E-04
Acetophenone	8.73E+00	8.54E-06	1.00E-01	8.54E-05	9.74E-06	1.00E-01	9.74E-05	1.30E-09	NA		1.83E-04
Anthracene	1.10E+00	1.08E-06	3.00E-01	3.59E-06	1.84E-06	3.00E-01	6.14E-06	2.49E-07	3.00E-01	8.31E-07	1.06E-05
Benzo(a)anthracene	5.50E-01	5.38E-07	NA		9.20E-07	NA		8.18E-11	NA		
Benzo(a)pyrene	5.00E-01	4.89E-07	NA		8.37E-07	NA		7.44E-11	NA		
Benzo(b)fluoranthene	4.20E-01	4.11E-07	NA		7.03E-07	NA		6.25E-11	NA		
Benzo(g,h,i)perylene	4.30E-01	4.21E-07	NA		7.19E-07	NA		6.39E-11	NA		
Benzo(k)fluoranthene	4.30E-01	4.21E-07	NA		7.19E-07	NA		6.39E-11	NA		
Benzyl butyl phthalate	7.60E+00	7.44E-06	2.00E-01	3.72E-05	8.48E-06	2.00E-01	4.24E-05	1.13E-09	2.00E-01	5.65E-09	7.96E-05

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Biphenyl (diphenyl)	7.10E+00	6.95E-06	5.00E-02	1.39E-04	7.92E-06	5.00E-02	1.58E-04	1.06E-09	5.00E-02	2.11E-08	2.97E-04
bis(2-Ethylhexyl)phthalate	8.86E+00	8.67E-06	2.00E-02	4.33E-04	9.88E-06	2.00E-02	4.94E-04	1.32E-09	2.00E-02	6.59E-08	9.28E-04
Caprolactam	9.50E-02	9.30E-08	5.00E-01	1.86E-07	1.06E-07	5.00E-01	2.12E-07	1.41E-11	5.00E-01	2.83E-11	3.98E-07
Carbazole	1.10E+00	1.08E-06	NA		1.23E-06	NA		1.64E-10	NA		
Chrysene	3.50E+00	3.42E-06	NA		5.86E-06	NA		5.20E-10	NA		
Dibenz(a,h)anthracene	1.20E-01	1.17E-07	NA		2.01E-07	NA		1.78E-11	NA		
Dibenzofuran	4.10E+00	4.01E-06	2.00E-03	2.01E-03	4.57E-06	2.00E-03	2.29E-03	1.45E-06	2.00E-03	7.24E-04	5.02E-03
Di-n-butyl phthalate	2.90E+00	2.84E-06	1.00E-01	2.84E-05	3.23E-06	1.00E-01	3.23E-05	4.31E-10	1.00E-01	4.31E-09	6.07E-05
Fluoranthene	5.90E+00	5.77E-06	4.00E-02	1.44E-04	9.87E-06	4.00E-02	2.47E-04	8.77E-10	4.00E-02	2.19E-08	3.91E-04
Fluorene	8.10E+00	7.93E-06	4.00E-02	1.98E-04	1.36E-05	4.00E-02	3.39E-04	2.82E-06	4.00E-02	7.06E-05	6.08E-04
Indeno(1,2,3-c,d)pyrene	4.40E-01	4.31E-07	NA		7.36E-07	NA		6.54E-11	NA		
Naphthalene	5.10E+01	4.99E-05	2.00E-02	2.50E-03	8.53E-05	2.00E-02	4.27E-03	1.62E-04	8.57E-04	1.89E-01	1.96E-01
Pentachlorophenol	6.70E+00	6.56E-06	3.00E-02	2.19E-04	1.87E-05	3.00E-02	6.23E-04	9.96E-10	3.00E-02	3.32E-08	8.41E-04
Phenanthrene	1.51E+01	1.48E-05	NA		2.53E-05	NA		2.25E-09	NA		
Pyrene	7.30E+00	7.14E-06	3.00E-02	2.38E-04	1.22E-05	3.00E-02	4.07E-04	3.41E-07	3.00E-02	1.14E-05	6.57E-04
1,1,1-Trichloroethane	2.31E-02	2.26E-08	2.80E-01	8.07E-08	2.58E-08	2.80E-01	9.20E-08	1.96E-06	6.30E-01	3.11E-06	3.28E-06
1,1-Dichloroethane	7.30E+00	7.14E-06	1.00E-01	7.14E-05	8.14E-06	1.00E-01	8.14E-05	5.90E-04	1.43E-01	4.13E-03	4.28E-03
1,1-Dichloroethene	5.26E-02	5.15E-08	2.00E-02	2.57E-06	5.87E-08	2.00E-02	2.93E-06	7.24E-06	2.00E-02	3.62E-04	3.68E-04
1,2-Dichloroethane	4.33E-02	4.24E-08	2.00E-02	2.12E-06	4.83E-08	2.00E-02	2.41E-06	2.20E-06	1.40E-03	1.57E-03	1.58E-03
Acetone	2.09E-01	2.05E-07	9.00E-01	2.27E-07	2.33E-07	9.00E-01	2.59E-07	3.78E-06	9.00E-01	4.20E-06	4.69E-06
Benzene	1.42E+00	1.39E-06	4.00E-03	3.47E-04	1.58E-06	4.00E-03	3.96E-04	9.86E-05	8.57E-03	1.15E-02	1.22E-02
Carbon disulfide	6.61E-03	6.47E-09	1.00E-01	6.47E-08	7.37E-09	1.00E-01	7.37E-08	1.11E-06	2.00E-01	5.56E-06	5.70E-06
Chlorobenzene	6.89E+00	6.74E-06	2.00E-02	3.37E-04	7.69E-06	2.00E-02	3.84E-04	1.99E-04	1.70E-02	1.17E-02	1.24E-02
Chloroethane	1.88E-02	1.84E-08	4.00E-01	4.60E-08	2.10E-08	4.00E-01	5.24E-08	3.25E-06	2.86E+00	1.14E-06	1.24E-06
Chloromethane	8.80E-02	8.61E-08	2.60E-02	3.31E-06	9.82E-08	2.60E-02	3.78E-06	3.21E-06	2.60E-02	1.24E-04	1.31E-04
cis-1,2-Dichloroethene	1.34E+02	1.31E-04	1.00E-02	1.31E-02	1.49E-04	1.00E-02	1.49E-02	8.90E-03	1.00E-02	8.90E-01	9.18E-01
Cyclohexane	2.38E+00	2.33E-06	1.70E+00	1.37E-06	2.65E-06	1.70E+00	1.56E-06	4.45E-04	1.70E+00	2.62E-04	2.65E-04
Ethylbenzene	2.52E+01	2.47E-05	1.00E-01	2.47E-04	2.81E-05	1.00E-01	2.81E-04	8.38E-04	2.90E-01	2.89E-03	3.42E-03
Isopropylbenzene (cumene)	1.47E+01	1.44E-05	1.00E-01	1.44E-04	1.64E-05	1.00E-01	1.64E-04	9.41E-04	1.10E-01	8.55E-03	8.86E-03
Methyl ethyl ketone	2.81E-01	2.75E-07	6.00E-01	4.58E-07	3.13E-07	6.00E-01	5.22E-07	3.32E-06	1.40E+00	2.37E-06	3.35E-06
Methyl isobutyl ketone	4.19E+00	4.10E-06	8.00E-02	5.12E-05	4.67E-06	8.00E-02	5.84E-05	3.83E-05	8.60E-01	4.45E-05	1.54E-04
Methyl tert-butyl ether	4.00E-03	3.91E-09	8.57E-01	4.57E-09	4.46E-09	8.57E-01	5.21E-09	1.96E-07	8.57E-01	2.28E-07	2.38E-07
Methylcyclohexane	1.62E+01	1.59E-05	8.60E-01	1.84E-05	1.81E-05	8.60E-01	2.10E-05	1.84E-03	8.60E-01	2.13E-03	2.17E-03
Methylene chloride	8.66E-03	8.47E-09	6.00E-02	1.41E-07	9.66E-09	6.00E-02	1.61E-07	7.97E-07	1.14E-01	6.97E-06	7.28E-06
Styrene	1.74E-01	1.70E-07	2.00E-01	8.51E-07	1.94E-07	2.00E-01	9.70E-07	2.98E-06	2.57E-01	1.16E-05	1.34E-05
Tetrachloroethene	5.09E-01	4.98E-07	1.00E-02	4.98E-05	5.68E-07	1.00E-02	5.68E-05	4.58E-05	1.00E-02	4.58E-03	4.68E-03
Toluene	2.88E-03	2.82E-09	2.00E-01	1.41E-08	3.21E-09	2.00E-01	1.61E-08	1.66E-07	8.57E-02	1.94E-06	1.97E-06
trans-1,2-Dichloroethene	5.29E-01	5.18E-07	2.00E-02	2.59E-05	5.90E-07	2.00E-02	2.95E-05	5.18E-05	2.00E-02	2.59E-03	2.65E-03
Trichloroethene	2.63E+00	2.57E-06	3.00E-04	8.58E-03	2.93E-06	3.00E-04	9.78E-03	1.85E-04	1.00E-02	1.85E-02	3.69E-02
Vinyl chloride	8.95E-01	8.76E-07	3.00E-03	2.92E-04	9.98E-07	3.00E-03	3.33E-04	1.97E-04	2.86E-02	6.89E-03	7.51E-03
Xylenes, total	1.40E+02	1.37E-04	2.00E-01	6.85E-04	1.56E-04	2.00E-01	7.81E-04	5.27E-03	2.90E-02	1.82E-01	1.83E-01
Dioxans/Furans											

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
1,2,3,4,6,7,8-HpCDD	9.72E-04	9.51E-10	NA		3.25E-10	NA		1.45E-13	1.14E-08	1.26E-05	1.26E-05
1,2,3,4,6,7,8-HpCDF	1.60E-04	1.57E-10	NA		5.35E-11	NA		2.38E-14	1.14E-08	2.08E-06	2.08E-06
1,2,3,4,7,8,9-HpCDF	7.93E-06	7.76E-12	NA		2.65E-12	NA		1.18E-15	1.14E-08	1.03E-07	1.03E-07
1,2,3,4,7,8-HxCDD	1.64E-05	1.60E-11	NA		5.49E-12	NA		2.44E-15	1.14E-08	2.13E-07	2.13E-07
1,2,3,4,7,8-HxCDF	2.26E-06	2.21E-12	NA		7.56E-13	NA		3.36E-16	1.14E-08	2.94E-08	2.94E-08
1,2,3,6,7,8-HxCDD	7.35E-05	7.19E-11	NA		2.46E-11	NA		1.09E-14	1.14E-08	9.56E-07	9.56E-07
1,2,3,6,7,8-HxCDF	1.50E-05	1.47E-11	NA		5.02E-12	NA		2.23E-15	1.14E-08	1.95E-07	1.95E-07
1,2,3,7,8,9-HxCDD	4.14E-05	4.05E-11	NA		1.39E-11	NA		6.16E-15	1.14E-08	5.39E-07	5.39E-07
1,2,3,7,8,9-HxCDF	8.75E-06	8.56E-12	NA		2.93E-12	NA		1.30E-15	1.14E-08	1.14E-07	1.14E-07
1,2,3,7,8-PeCDD	1.53E-05	1.50E-11	NA		5.12E-12	NA		2.28E-15	1.14E-08	1.99E-07	1.99E-07
2,3,4,6,7,8-HxCDF	1.51E-05	1.48E-11	NA		5.05E-12	NA		2.25E-15	1.14E-08	1.96E-07	1.96E-07
2,3,4,7,8-PeCDF	3.66E-05	3.58E-11	NA		1.22E-11	NA		5.44E-15	1.14E-08	4.76E-07	4.76E-07
2,3,7,8-TCDF	4.63E-06	4.53E-12	NA		1.55E-12	NA		6.89E-16	1.14E-08	6.02E-08	6.02E-08
OCDD	8.20E-03	8.02E-09	NA		2.74E-09	NA		1.22E-12	1.14E-08	1.07E-04	1.07E-04
OCDF	3.25E-04	3.18E-10	NA		1.09E-10	NA		4.83E-14	1.14E-08	4.23E-06	4.23E-06
		Total Risk (Hazard Index):		5.52E-01	**Total Risk (Hazard Index):**		3.70E-01	**Total Risk (Hazard Index):**		1.36E+00	**2.29E+00**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **2**

Table 1-27
Risk Calculation Worksheet for Deep Soil - Carcinogenic Effects - Construction Exposure Scenario - Future Construction Worker Receptor - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Construction Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	1	yr
Soil Ingestion Rate	IR	330	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	7.00E+01	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.8	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Metals											
Aluminum	1.25E+04	5.77E-04	NA		7.97E-05	NA		2.66E-08	NA		
Antimony	2.06E+01	9.50E-07	NA		1.31E-07	NA		4.38E-11	NA		
Arsenic	8.10E+00	3.74E-07	9.50E+00	3.55E-06	1.55E-07	9.50E+00	1.47E-06	1.72E-11	1.51E+01	2.59E-10	**5.02E-06**
Barium	5.55E+02	2.56E-05	NA		3.54E-06	NA		1.18E-09	NA		
Beryllium	6.04E-01	2.79E-08	NA		3.85E-09	NA		1.28E-12	8.40E+00	1.08E-11	1.08E-11
Cadmium	1.74E+00	8.03E-08	3.80E-01	3.05E-08	1.11E-09	3.80E-01	4.21E-10	3.70E-12	1.47E+01	5.43E-11	3.10E-08
Chromium	4.95E+02	2.28E-05	NA		3.16E-06	NA		1.05E-09	4.20E+01	4.42E-08	4.42E-08
Cobalt	7.90E+00	3.64E-07	NA		5.04E-08	NA		1.68E-11	9.80E+00	1.64E-10	1.64E-10
Copper	1.45E+02	6.69E-06	NA		9.24E-07	NA		3.08E-10	NA		
Iron	2.34E+04	1.08E-03	NA		1.49E-04	NA		4.97E-08	NA		
Lead	6.05E+02	2.79E-05	NA		3.86E-06	NA		1.29E-09	NA		
Manganese	8.43E+02	3.89E-05	NA		5.37E-06	NA		1.79E-09	NA		
Nickel	3.70E+01	1.71E-06	NA		2.36E-07	NA		7.86E-11	9.10E-01	7.15E-11	7.15E-11
Selenium	3.30E+00	1.52E-07	NA		2.10E-08	NA		7.01E-12	NA		
Silver	7.75E-01	3.57E-08	NA		4.94E-09	NA		1.65E-12	NA		
Thallium	2.88E+00	1.33E-07	NA		1.84E-08	NA		6.12E-12	NA		
Vanadium	4.05E+01	1.87E-06	NA		2.58E-07	NA		8.60E-11	NA		
Zinc	4.41E+02	2.03E-05	NA		2.81E-06	NA		9.37E-10	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Pesticides/PCBs											
4,4'-DDD	8.40E+00	3.87E-07	2.40E-01	9.30E-08	2.68E-07	2.40E-01	6.43E-08	1.78E-11	2.42E-01	4.31E-12	1.57E-07
4,4'-DDE	5.64E+00	2.60E-07	3.40E-01	8.85E-08	1.80E-07	3.40E-01	6.11E-08	1.20E-11	3.40E-01	4.07E-12	1.50E-07
4,4'-DDT	2.47E-01	1.14E-08	3.40E-01	3.87E-09	7.87E-09	3.40E-01	2.68E-09	5.25E-13	3.40E-01	1.78E-13	6.55E-09
Aldrin	9.24E-01	4.26E-08	1.70E+01	7.25E-07	2.94E-08	1.70E+01	5.01E-07	1.96E-12	1.72E+01	3.37E-11	**1.23E-06**
alpha-BHC	2.60E-02	1.20E-09	6.30E+00	7.56E-09	8.29E-10	6.30E+00	5.22E-09	5.52E-14	6.30E+00	3.48E-13	1.28E-08
alpha-Chlordane	7.04E-02	3.25E-09	1.20E+00	3.90E-09	2.24E-09	1.20E+00	2.69E-09	1.50E-13	1.19E+00	1.78E-13	6.59E-09
beta-BHC	3.50E-02	1.61E-09	1.80E+00	2.91E-09	1.12E-09	1.80E+00	2.01E-09	7.44E-14	1.80E+00	1.34E-13	4.91E-09
delta-BHC	4.10E-03	1.89E-10	NA		1.31E-10	NA		8.71E-15	NA		
Dieldrin	2.08E+00	9.59E-08	1.60E+01	1.54E-06	6.63E-08	1.60E+01	1.06E-06	4.42E-12	1.61E+01	7.11E-11	**2.60E-06**
Endosulfan sulfate	1.60E-03	7.38E-11	NA		5.10E-11	NA		3.40E-15	NA		
Endrin	4.60E-03	2.12E-10	NA		1.47E-10	NA		9.77E-15	NA		
Endrin aldehyde	1.10E-03	5.07E-11	NA		3.51E-11	NA		2.34E-15	NA		
Endrin ketone	1.20E-02	5.54E-10	NA		3.82E-10	NA		2.55E-14	NA		
gamma-BHC	2.50E-03	1.15E-10	1.30E+00	1.50E-10	7.97E-11	1.30E+00	1.04E-10	5.31E-15	1.30E+00	6.90E-15	2.54E-10
gamma-Chlordane	8.75E-02	4.04E-09	1.20E+00	4.84E-09	2.79E-09	1.20E+00	3.35E-09	1.86E-13	1.19E+00	2.21E-13	8.19E-09
Heptachlor	8.80E-03	4.06E-10	4.50E+00	1.83E-09	2.80E-10	4.50E+00	1.26E-09	1.87E-14	4.55E+00	8.51E-14	3.09E-09
Methoxychlor	3.90E-03	1.80E-10	NA		1.24E-10	NA		8.28E-15	NA		
Aroclor-1260	9.80E-01	4.52E-08	2.00E+00	9.04E-08	9.37E-08	2.00E+00	1.87E-07	2.08E-12	2.00E+00	4.16E-12	2.78E-07
SVOCs/VOCs											
1,2,4-Trichlorobenzene	1.05E+00	4.84E-08	3.60E-03	1.74E-10	6.69E-08	3.60E-03	2.41E-10	6.17E-08	NA		4.15E-10
1,2-Dichlorobenzene	4.02E+01	1.85E-06	NA		2.56E-06	NA		7.02E-06	NA		
1,3-Dichlorobenzene	1.38E+00	6.37E-08	NA		8.80E-08	NA		2.41E-07	NA		
1,4-Dichlorobenzene	1.76E+01	8.12E-07	2.40E-02	1.95E-08	1.12E-06	2.40E-02	2.69E-08	3.49E-06	3.85E-02	1.34E-07	1.81E-07
1,4-Dioxane (p-dioxane)	8.72E-01	4.02E-08	2.70E-02	1.09E-09	5.56E-08	2.70E-02	1.50E-09	1.85E-12	2.70E-02	4.99E-14	2.59E-09
2-Methylnaphthalene	4.02E+02	1.85E-05	NA		3.84E-05	NA		1.83E-05	NA		
2-Methylphenol	9.90E-01	4.57E-08	NA		6.31E-08	NA		2.10E-12	NA		
4-Chloro-3-methylphenol	7.20E+00	3.32E-07	NA		4.59E-07	NA		1.53E-11	NA		
4-Methylphenol	3.60E+00	1.66E-07	NA		2.29E-07	NA		7.65E-12	NA		
Acenaphthene	8.32E+00	3.84E-07	NA		7.95E-07	NA		9.63E-08	NA		
Acetophenone	8.73E+00	4.03E-07	NA		5.56E-07	NA		1.85E-11	NA		
Anthracene	1.10E+00	5.07E-08	NA		1.05E-07	NA		3.56E-09	NA		
Benzo(a)anthracene	5.50E-01	2.54E-08	1.20E+00	3.04E-08	5.26E-08	1.20E+00	6.31E-08	1.17E-12	7.30E-01	8.53E-13	9.35E-08
Benzo(a)pyrene	5.00E-01	2.31E-08	1.20E+01	2.77E-07	4.78E-08	1.20E+01	5.74E-07	1.06E-12	7.30E+00	7.75E-12	8.50E-07
Benzo(b)fluoranthene	4.20E-01	1.94E-08	1.20E+00	2.32E-08	4.02E-08	1.20E+00	4.82E-08	8.92E-13	7.30E-01	6.51E-13	7.14E-08
Benzo(g,h,i)perylene	4.30E-01	1.98E-08	NA		4.11E-08	NA		9.13E-13	NA		
Benzo(k)fluoranthene	4.30E-01	1.98E-08	1.20E+00	2.38E-08	4.11E-08	1.20E+00	4.93E-08	9.13E-13	3.85E-01	3.52E-13	7.31E-08
Benzyl butyl phthalate	7.60E+00	3.51E-07	NA		4.84E-07	NA		1.61E-11	NA		
Biphenyl (diphenyl)	7.10E+00	3.28E-07	NA		4.53E-07	NA		1.51E-11	NA		
bis(2-Ethylhexyl)phthalate	8.86E+00	4.09E-07	1.40E-02	5.72E-09	5.65E-07	1.40E-02	7.91E-09	1.88E-11	1.40E-02	2.64E-13	1.36E-08
Caprolactam	9.50E-02	4.38E-09	NA		6.06E-09	NA		2.02E-13	NA		
Carbazole	1.10E+00	5.07E-08	2.00E-02	1.01E-09	7.01E-08	2.00E-02	1.40E-09	2.34E-12	2.00E-02	4.67E-14	2.42E-09
Chrysene	3.50E+00	1.61E-07	1.20E-01	1.94E-08	3.35E-07	1.20E-01	4.02E-08	7.44E-12	3.85E-02	2.86E-13	5.95E-08
Dibenz(a,h)anthracene	1.20E-01	5.54E-09	7.30E+00	4.04E-08	1.15E-08	7.30E+00	8.38E-08	2.55E-13	7.30E+00	1.86E-12	1.24E-07
Dibenzofuran	4.10E+00	1.89E-07	NA		2.61E-07	NA		2.07E-08	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Di-n-butyl phthalate	2.90E+00	1.34E-07	NA		1.85E-07	NA		6.16E-12	NA		
Fluoranthene	5.90E+00	2.72E-07	NA		5.64E-07	NA		1.25E-11	NA		
Fluorene	8.10E+00	3.74E-07	NA		7.74E-07	NA		4.03E-08	NA		
Indeno(1,2,3-c,d)pyrene	4.40E-01	2.03E-08	7.30E-01	1.48E-08	4.21E-08	7.30E-01	3.07E-08	9.35E-13	7.30E-01	6.82E-13	4.55E-08
Naphthalene	5.10E+01	2.35E-06	1.20E-01	2.82E-07	4.88E-06	1.20E-01	5.85E-07	2.32E-06	1.19E-01	2.76E-07	**1.14E-06**
Pentachlorophenol	6.70E+00	3.09E-07	1.20E-01	3.71E-08	1.07E-06	1.20E-01	1.28E-07	1.42E-11	1.20E-01	1.71E-12	1.65E-07
Phenanthrene	1.51E+01	6.97E-07	NA		1.44E-06	NA		3.21E-11	NA		
Pyrene	7.30E+00	3.37E-07	NA		6.98E-07	NA		4.88E-09	NA		
1,1,1-Trichloroethane	2.31E-02	1.07E-09	NA		1.47E-09	NA		2.80E-08	NA		
1,1-Dichloroethane	7.30E+00	3.37E-07	5.70E-03	1.92E-09	4.65E-07	5.70E-03	2.65E-09	8.43E-06	5.60E-03	4.72E-08	5.18E-08
1,1-Dichloroethene	5.26E-02	2.43E-09	9.10E-02	2.21E-10	3.35E-09	9.10E-02	3.05E-10	1.03E-07	9.10E-02	9.42E-09	9.94E-09
1,2-Dichloroethane	4.33E-02	2.00E-09	9.10E-02	1.82E-10	2.76E-09	9.10E-02	2.51E-10	3.14E-08	9.10E-02	2.86E-09	3.29E-09
Acetone	2.09E-01	9.64E-09	NA		1.33E-08	NA		5.40E-08	NA		
Benzene	1.42E+00	6.55E-08	1.00E-01	6.55E-09	9.05E-08	1.00E-01	9.05E-09	1.41E-06	1.02E-01	1.43E-07	1.59E-07
Carbon disulfide	6.61E-03	3.05E-10	NA		4.21E-10	NA		1.59E-08	NA		
Chlorobenzene	6.89E+00	3.18E-07	NA		4.39E-07	NA		2.84E-06	NA		
Chloroethane	1.88E-02	8.67E-10	2.90E-03	2.51E-12	1.20E-09	2.90E-03	3.48E-12	4.64E-08	2.90E-03	1.35E-10	1.41E-10
Chloromethane	8.80E-02	4.06E-09	NA		5.61E-09	NA		4.59E-08	NA		
cis-1,2-Dichloroethene	1.34E+02	6.18E-06	NA		8.54E-06	NA		1.27E-04	NA		
Cyclohexane	2.38E+00	1.10E-07	NA		1.52E-07	NA		6.36E-06	NA		
Ethylbenzene	2.52E+01	1.16E-06	NA		1.61E-06	NA		1.20E-05	NA		
Isopropylbenzene (cumene)	1.47E+01	6.78E-07	NA		9.37E-07	NA		1.34E-05	NA		
Methyl ethyl ketone	2.81E-01	1.30E-08	NA		1.79E-08	NA		4.75E-08	NA		
Methyl isobutyl ketone	4.19E+00	1.93E-07	NA		2.67E-07	NA		5.46E-07	NA		
Methyl tert-butyl ether	4.00E-03	1.85E-10	1.80E-03	3.32E-13	2.55E-10	1.80E-03	4.59E-13	2.80E-09	9.10E-04	2.55E-12	3.34E-12
Methylcyclohexane	1.62E+01	7.47E-07	NA		1.03E-06	NA		2.62E-05	NA		
Methylene chloride	8.66E-03	3.99E-10	1.40E-02	5.59E-12	5.52E-10	1.40E-02	7.73E-12	1.14E-08	3.50E-03	3.99E-11	5.32E-11
Styrene	1.74E-01	8.03E-09	NA		1.11E-08	NA		4.26E-08	NA		
Tetrachloroethene	5.09E-01	2.35E-08	5.40E-01	1.27E-08	3.24E-08	5.40E-01	1.75E-08	6.54E-07	2.07E-02	1.35E-08	4.37E-08
Toluene	2.88E-03	1.33E-10	NA		1.84E-10	NA		2.37E-09	NA		
trans-1,2-Dichloroethene	5.29E-01	2.44E-08	NA		3.37E-08	NA		7.41E-07	NA		
Trichloroethene	2.63E+00	1.21E-07	4.00E-01	4.85E-08	1.68E-07	4.00E-01	6.71E-08	2.64E-06	4.00E-01	1.06E-06	**1.17E-06**
Vinyl chloride	8.95E-01	4.13E-08	1.50E+00	6.19E-08	5.70E-08	1.50E+00	8.56E-08	2.81E-06	2.73E-01	7.68E-07	9.15E-07
Xylenes, total	1.40E+02	6.46E-06	NA		8.92E-06	NA		7.53E-05	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	9.72E-04	4.48E-11	1.50E+03	6.73E-08	1.86E-11	1.50E+03	2.79E-08	2.06E-15	1.50E+03	3.10E-12	9.51E-08
1,2,3,4,6,7,8-HpCDF	1.60E-04	7.38E-12	1.50E+03	1.11E-08	3.06E-12	1.50E+03	4.59E-09	3.40E-16	1.50E+03	5.10E-13	1.57E-08
1,2,3,4,7,8,9-HpCDF	7.93E-06	3.66E-13	1.50E+03	5.49E-10	1.52E-13	1.50E+03	2.27E-10	1.68E-17	1.50E+03	2.53E-14	7.76E-10
1,2,3,4,7,8-HxCDD	1.64E-05	7.56E-13	1.50E+04	1.13E-08	3.14E-13	1.50E+04	4.70E-09	3.48E-17	1.50E+04	5.23E-13	1.61E-08
1,2,3,4,7,8-HxCDF	2.26E-06	1.04E-13	1.50E+04	1.56E-09	4.32E-14	1.50E+04	6.48E-10	4.80E-18	1.50E+04	7.20E-14	2.21E-09
1,2,3,6,7,8-HxCDD	7.35E-05	3.39E-12	1.50E+04	5.09E-08	1.41E-12	1.50E+04	2.11E-08	1.56E-16	1.50E+04	2.34E-12	7.19E-08
1,2,3,6,7,8-HxCDF	1.50E-05	6.92E-13	1.50E+04	1.04E-08	2.87E-13	1.50E+04	4.30E-09	3.19E-17	1.50E+04	4.78E-13	1.47E-08
1,2,3,7,8,9-HxCDD	4.14E-05	1.91E-12	1.50E+04	2.86E-08	7.92E-13	1.50E+04	1.19E-08	8.79E-17	1.50E+04	1.32E-12	4.05E-08
1,2,3,7,8,9-HxCDF	8.75E-06	4.04E-13	1.50E+04	6.05E-09	1.67E-13	1.50E+04	2.51E-09	1.86E-17	1.50E+04	2.79E-13	8.56E-09
1,2,3,7,8-PeCDD	1.53E-05	7.06E-13	1.50E+05	1.06E-07	2.93E-13	1.50E+05	4.39E-08	3.25E-17	1.50E+05	4.88E-12	1.50E-07

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
2,3,4,6,7,8-HxCDF	1.51E-05	6.97E-13	1.50E+04	1.04E-08	2.89E-13	1.50E+04	4.33E-09	3.21E-17	1.50E+04	4.81E-13	1.48E-08
2,3,4,7,8-PeCDF	3.66E-05	1.69E-12	7.50E+04	1.27E-07	7.00E-13	7.50E+04	5.25E-08	7.78E-17	7.50E+04	5.83E-12	1.79E-07
2,3,7,8-TCDF	4.63E-06	2.14E-13	1.50E+04	3.20E-09	8.85E-14	1.50E+04	1.33E-09	9.84E-18	1.50E+04	1.48E-13	4.53E-09
OCDD	8.20E-03	3.78E-10	1.50E+01	5.67E-09	1.57E-10	1.50E+01	2.35E-09	1.74E-14	1.50E+01	2.61E-13	8.03E-09
OCDF	3.25E-04	1.50E-11	1.50E+01	2.25E-10	6.21E-12	1.50E+01	9.32E-11	6.90E-16	1.50E+01	1.04E-14	3.18E-10
			Total Risk:	7.48E-06		**Total Risk:**	5.37E-06		**Total Risk:**	2.50E-06	**1.53E-05**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **2E-05**

Table 1-28
Risk Calculation Worksheet for Deep Soil - Noncarcinogenic Effects - Construction Exposure Scenario - Future Construction Worker Receptor - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Construction Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter (units)	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	1	yr
Soil Ingestion Rate	IR	330	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	7.00E+01	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.8	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Aluminum	1.25E+04	4.04E-02	1.00E+00	4.04E-02	5.58E-03	1.00E+00	5.58E-03	1.86E-06	1.40E-03	1.33E-03	4.73E-02
Antimony	2.06E+01	6.65E-05	4.00E-04	1.66E-01	9.19E-06	4.00E-04	2.30E-02	3.06E-09	NA		**1.89E-01**
Arsenic	8.10E+00	2.62E-05	3.00E-04	8.72E-02	1.08E-05	3.00E-04	3.61E-02	1.20E-09	8.57E-06	1.41E-04	**1.23E-01**
Barium	5.55E+02	1.79E-03	7.00E-02	2.56E-02	2.48E-04	7.00E-02	3.54E-03	8.25E-08	1.43E-04	5.78E-04	2.97E-02
Beryllium	6.04E-01	1.95E-06	2.00E-03	9.75E-04	2.69E-07	2.00E-03	1.35E-04	8.98E-11	5.71E-06	1.57E-05	1.13E-03
Cadmium	1.74E+00	5.62E-06	5.00E-04	1.12E-02	7.76E-08	5.00E-04	1.55E-04	2.59E-10	5.71E-06	4.53E-05	1.14E-02
Chromium	4.95E+02	1.60E-03	NA		2.21E-04	NA		7.36E-08	NA		
Cobalt	7.90E+00	2.55E-05	2.00E-02	1.28E-03	3.52E-06	2.00E-02	1.76E-04	1.17E-09	5.70E-06	2.06E-04	1.66E-03
Copper	1.45E+02	4.68E-04	4.00E-02	1.17E-02	6.47E-05	4.00E-02	1.62E-03	2.16E-08	NA		1.33E-02
Iron	2.34E+04	7.56E-02	3.00E-01	2.52E-01	1.04E-02	3.00E-01	3.48E-02	3.48E-06	NA		**2.87E-01**
Lead	6.05E+02	1.95E-03	NA		2.70E-04	NA		9.00E-08	NA		
Manganese	8.43E+02	2.72E-03	2.40E-02	1.13E-01	3.76E-04	2.40E-02	1.57E-02	1.25E-07	1.40E-05	8.95E-03	**1.38E-01**
Nickel	3.70E+01	1.19E-04	2.00E-02	5.97E-03	1.65E-05	2.00E-02	8.25E-04	5.50E-09	1.43E-05	3.85E-04	7.18E-03
Selenium	3.30E+00	1.07E-05	5.00E-03	2.13E-03	1.47E-06	5.00E-03	2.94E-04	4.91E-10	5.71E-03	8.59E-08	2.43E-03
Silver	7.75E-01	2.50E-06	5.00E-03	5.00E-04	3.46E-07	5.00E-03	6.92E-05	1.15E-10	NA		5.70E-04
Thallium	2.88E+00	9.30E-06	6.60E-05	1.41E-01	1.29E-06	6.60E-05	1.95E-02	4.28E-10	NA		**1.60E-01**
Vanadium	4.05E+01	1.31E-04	1.00E-03	1.31E-01	1.81E-05	1.00E-03	1.81E-02	6.02E-09	NA		**1.49E-01**
Zinc	4.41E+02	1.42E-03	3.00E-01	4.75E-03	1.97E-04	3.00E-01	6.56E-04	6.56E-08	NA		5.40E-03

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Pesticides/PCBs											
4,4'-DDD	8.40E+00	2.71E-05	NA		1.87E-05	NA		1.25E-09	NA		
4,4'-DDE	5.64E+00	1.82E-05	NA		1.26E-05	NA		8.39E-10	NA		
4,4'-DDT	2.47E-01	7.98E-07	5.00E-04	1.60E-03	5.51E-07	5.00E-04	1.10E-03	3.67E-11	5.00E-04	7.35E-08	2.70E-03
Aldrin	9.24E-01	2.98E-06	3.00E-05	9.95E-02	2.06E-06	3.00E-05	6.87E-02	1.37E-10	3.00E-05	4.58E-06	**1.68E-01**
alpha-BHC	2.60E-02	8.40E-08	5.00E-04	1.68E-04	5.80E-08	5.00E-04	1.16E-04	3.87E-12	5.00E-04	7.73E-09	2.84E-04
alpha-Chlordane	7.04E-02	2.27E-07	5.00E-04	4.55E-04	1.57E-07	5.00E-04	3.14E-04	1.05E-11	2.00E-04	5.23E-08	7.69E-04
beta-BHC	3.50E-02	1.13E-07	NA		7.81E-08	NA		5.20E-12	NA		
delta-BHC	4.10E-03	1.32E-08	NA		9.15E-09	NA		6.10E-13	NA		
Dieldrin	2.08E+00	6.72E-06	5.00E-05	1.34E-01	4.64E-06	5.00E-05	9.28E-02	3.09E-10	5.00E-05	6.19E-06	**2.27E-01**
Endosulfan sulfate	1.60E-03	5.17E-09	6.00E-03	8.61E-07	3.57E-09	6.00E-03	5.95E-07	2.38E-13	6.00E-03	3.97E-11	1.46E-06
Endrin	4.60E-03	1.49E-08	3.00E-04	4.95E-05	1.03E-08	3.00E-04	3.42E-05	6.84E-13	3.00E-04	2.28E-09	8.37E-05
Endrin aldehyde	1.10E-03	3.55E-09	3.00E-04	1.18E-05	2.45E-09	3.00E-04	8.18E-06	1.64E-13	3.00E-04	5.45E-10	2.00E-05
Endrin ketone	1.20E-02	3.87E-08	3.00E-04	1.29E-04	2.68E-08	3.00E-04	8.92E-05	1.78E-12	3.00E-04	5.95E-09	2.18E-04
gamma-BHC	2.50E-03	8.07E-09	3.00E-04	2.69E-05	5.58E-09	3.00E-04	1.86E-05	3.72E-13	3.00E-04	1.24E-09	4.55E-05
gamma-Chlordane	8.75E-02	2.83E-07	5.00E-04	5.65E-04	1.95E-07	5.00E-04	3.90E-04	1.30E-11	2.00E-04	6.51E-08	9.56E-04
Heptachlor	8.80E-03	2.84E-08	5.00E-04	5.68E-05	1.96E-08	5.00E-04	3.93E-05	1.31E-12	5.00E-04	2.62E-09	9.61E-05
Methoxychlor	3.90E-03	1.26E-08	5.00E-03	2.52E-06	8.70E-09	5.00E-03	1.74E-06	5.80E-13	5.00E-03	1.16E-10	4.26E-06
Aroclor-1260	9.80E-01	3.16E-06	2.00E-05	1.58E-01	6.56E-06	2.00E-05	3.28E-01	1.46E-10	2.00E-05	7.29E-06	**4.86E-01**
SVOCs/VOCs											
1,2,4-Trichlorobenzene	1.05E+00	3.39E-06	1.00E-02	3.39E-04	4.68E-06	1.00E-02	4.68E-04	4.32E-06	1.00E-03	4.32E-03	5.13E-03
1,2-Dichlorobenzene	4.02E+01	1.30E-04	9.00E-02	1.44E-03	1.79E-04	9.00E-02	1.99E-03	4.92E-04	5.71E-02	8.60E-03	1.20E-02
1,3-Dichlorobenzene	1.38E+00	4.46E-06	3.00E-02	1.49E-04	6.16E-06	3.00E-02	2.05E-04	1.69E-05	3.00E-02	5.63E-04	9.16E-04
1,4-Dichlorobenzene	1.76E+01	5.68E-05	3.00E-02	1.89E-03	7.85E-05	3.00E-02	2.62E-03	2.44E-04	2.30E-01	1.06E-03	5.57E-03
1,4-Dioxane (p-dioxane)	8.72E-01	2.82E-06	NA		3.89E-06	NA		1.30E-10	8.57E-01	1.51E-10	1.51E-10
2-Methylnaphthalene	4.02E+02	1.30E-03	4.00E-03	3.25E-01	2.69E-03	4.00E-03	6.73E-01	1.28E-03	NA		**9.97E-01**
2-Methylphenol	9.90E-01	3.20E-06	5.00E-02	6.39E-05	4.42E-06	5.00E-02	8.83E-05	1.47E-10	5.00E-02	2.94E-09	1.52E-04
4-Chloro-3-methylphenol	7.20E+00	2.32E-05	NA		3.21E-05	NA		1.07E-09	NA		
4-Methylphenol	3.60E+00	1.16E-05	5.00E-03	2.32E-03	1.61E-05	5.00E-03	3.21E-03	5.35E-10	5.00E-03	1.07E-07	5.54E-03
Acenaphthene	8.32E+00	2.69E-05	6.00E-02	4.48E-04	5.57E-05	6.00E-02	9.28E-04	6.74E-06	6.00E-02	1.12E-04	1.49E-03
Acetophenone	8.73E+00	2.82E-05	1.00E-01	2.82E-04	3.90E-05	1.00E-01	3.90E-04	1.30E-09	NA		6.71E-04
Anthracene	1.10E+00	3.55E-06	3.00E-01	1.18E-05	7.36E-06	3.00E-01	2.45E-05	2.49E-07	3.00E-01	8.31E-07	3.72E-05
Benzo(a)anthracene	5.50E-01	1.78E-06	NA		3.68E-06	NA		8.18E-11	NA		
Benzo(a)pyrene	5.00E-01	1.61E-06	NA		3.35E-06	NA		7.44E-11	NA		
Benzo(b)fluoranthene	4.20E-01	1.36E-06	NA		2.81E-06	NA		6.25E-11	NA		
Benzo(g,h,i)perylene	4.30E-01	1.39E-06	NA		2.88E-06	NA		6.39E-11	NA		
Benzo(k)fluoranthene	4.30E-01	1.39E-06	NA		2.88E-06	NA		6.39E-11	NA		
Benzyl butyl phthalate	7.60E+00	2.45E-05	2.00E-01	1.23E-04	3.39E-05	2.00E-01	1.70E-04	1.13E-09	2.00E-01	5.65E-09	2.92E-04
Biphenyl (diphenyl)	7.10E+00	2.29E-05	5.00E-02	4.59E-04	3.17E-05	5.00E-02	6.34E-04	1.06E-09	5.00E-02	2.11E-08	1.09E-03
bis(2-Ethylhexyl)phthalate	8.86E+00	2.86E-05	2.00E-02	1.43E-03	3.95E-05	2.00E-02	1.98E-03	1.32E-09	2.00E-02	6.59E-08	3.41E-03
Caprolactam	9.50E-02	3.07E-07	5.00E-01	6.14E-07	4.24E-07	5.00E-01	8.48E-07	1.41E-11	5.00E-01	2.83E-11	1.46E-06
Carbazole	1.10E+00	3.55E-06	NA		4.91E-06	NA		1.64E-10	NA		
Chrysene	3.50E+00	1.13E-05	NA		2.34E-05	NA		5.20E-10	NA		
Dibenz(a,h)anthracene	1.20E-01	3.87E-07	NA		8.03E-07	NA		1.78E-11	NA		
Dibenzofuran	4.10E+00	1.32E-05	2.00E-03	6.62E-03	1.83E-05	2.00E-03	9.15E-03	1.45E-06	2.00E-03	7.24E-04	1.65E-02
Di-n-butyl phthalate	2.90E+00	9.36E-06	1.00E-01	9.36E-05	1.29E-05	1.00E-01	1.29E-04	4.31E-10	1.00E-01	4.31E-09	2.23E-04

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Fluoranthene	5.90E+00	1.91E-05	4.00E-02	4.76E-04	3.95E-05	4.00E-02	9.87E-04	8.77E-10	4.00E-02	2.19E-08	1.46E-03
Fluorene	8.10E+00	2.62E-05	4.00E-02	6.54E-04	5.42E-05	4.00E-02	1.36E-03	2.82E-06	4.00E-02	7.06E-05	2.08E-03
Indeno(1,2,3-c,d)pyrene	4.40E-01	1.42E-06	NA		2.94E-06	NA		6.54E-11	NA		
Naphthalene	5.10E+01	1.65E-04	2.00E-02	8.23E-03	3.41E-04	2.00E-02	1.71E-02	1.62E-04	8.57E-04	1.89E-01	**2.15E-01**
Pentachlorophenol	6.70E+00	2.16E-05	3.00E-02	7.21E-04	7.47E-05	3.00E-02	2.49E-03	9.96E-10	3.00E-02	3.32E-08	3.21E-03
Phenanthrene	1.51E+01	4.88E-05	NA		1.01E-04	NA		2.25E-09	NA		
Pyrene	7.30E+00	2.36E-05	3.00E-02	7.86E-04	4.89E-05	3.00E-02	1.63E-03	3.41E-07	3.00E-02	1.14E-05	2.43E-03
1,1,1-Trichloroethane	2.31E-02	7.46E-08	2.80E-01	2.66E-07	1.03E-07	2.80E-01	3.68E-07	1.96E-06	6.30E-01	3.11E-06	3.74E-06
1,1-Dichloroethane	7.30E+00	2.36E-05	1.00E-01	2.36E-04	3.26E-05	1.00E-01	3.26E-04	5.90E-04	1.43E-01	4.13E-03	4.69E-03
1,1-Dichloroethene	5.26E-02	1.70E-07	2.00E-02	8.49E-06	2.35E-07	2.00E-02	1.17E-05	7.24E-06	2.00E-02	3.62E-04	3.82E-04
1,2-Dichloroethane	4.33E-02	1.40E-07	2.00E-02	6.99E-06	1.93E-07	2.00E-02	9.66E-06	2.20E-06	1.40E-03	1.57E-03	1.59E-03
Acetone	2.09E-01	6.75E-07	9.00E-01	7.50E-07	9.33E-07	9.00E-01	1.04E-06	3.78E-06	9.00E-01	4.20E-06	5.99E-06
Benzene	1.42E+00	4.59E-06	4.00E-03	1.15E-03	6.34E-06	4.00E-03	1.58E-03	9.86E-05	8.57E-03	1.15E-02	1.42E-02
Carbon disulfide	6.61E-03	2.13E-08	1.00E-01	2.13E-07	2.95E-08	1.00E-01	2.95E-07	1.11E-06	2.00E-01	5.56E-06	6.07E-06
Chlorobenzene	6.89E+00	2.22E-05	2.00E-02	1.11E-03	3.07E-05	2.00E-02	1.54E-03	1.99E-04	1.70E-02	1.17E-02	1.43E-02
Chloroethane	1.88E-02	6.07E-08	4.00E-01	1.52E-07	8.39E-08	4.00E-01	2.10E-07	3.25E-06	2.86E+00	1.14E-06	1.50E-06
Chloromethane	8.80E-02	2.84E-07	2.60E-02	1.09E-05	3.93E-07	2.60E-02	1.51E-05	3.21E-06	2.60E-02	1.24E-04	1.50E-04
cis-1,2-Dichloroethene	1.34E+02	4.33E-04	1.00E-02	4.33E-02	5.98E-04	1.00E-02	5.98E-02	8.90E-03	1.00E-02	8.90E-01	**9.93E-01**
Cyclohexane	2.38E+00	7.68E-06	1.70E+00	4.52E-06	1.06E-05	1.70E+00	6.25E-06	4.45E-04	1.70E+00	2.62E-04	2.73E-04
Ethylbenzene	2.52E+01	8.14E-05	1.00E-01	8.14E-04	1.12E-04	1.00E-01	1.12E-03	8.38E-04	2.90E-01	2.89E-03	4.83E-03
Isopropylbenzene (cumene)	1.47E+01	4.75E-05	1.00E-01	4.75E-04	6.56E-05	1.00E-01	6.56E-04	9.41E-04	1.10E-01	8.55E-03	9.68E-03
Methyl ethyl ketone	2.81E-01	9.07E-07	6.00E-01	1.51E-06	1.25E-06	6.00E-01	2.09E-06	3.32E-06	1.40E+00	2.37E-06	5.98E-06
Methyl isobutyl ketone	4.19E+00	1.35E-05	8.00E-02	1.69E-04	1.87E-05	8.00E-02	2.34E-04	3.83E-05	8.60E-01	4.45E-05	4.47E-04
Methyl tert-butyl ether	4.00E-03	1.29E-08	8.57E-01	1.51E-08	1.78E-08	8.57E-01	2.08E-08	1.96E-07	8.57E-01	2.28E-07	2.64E-07
Methylcyclohexane	1.62E+01	5.23E-05	8.60E-01	6.08E-05	7.23E-05	8.60E-01	8.40E-05	1.84E-03	8.60E-01	2.13E-03	2.28E-03
Methylene chloride	8.66E-03	2.80E-08	6.00E-02	4.66E-07	3.86E-08	6.00E-02	6.44E-07	7.97E-07	1.14E-01	6.97E-06	8.08E-06
Styrene	1.74E-01	5.62E-07	2.00E-01	2.81E-06	7.76E-07	2.00E-01	3.88E-06	2.98E-06	2.57E-01	1.16E-05	1.83E-05
Tetrachloroethene	5.09E-01	1.64E-06	1.00E-02	1.64E-04	2.27E-06	1.00E-02	2.27E-04	4.58E-05	1.00E-02	4.58E-03	4.97E-03
Toluene	2.88E-03	9.30E-09	2.00E-01	4.65E-08	1.29E-08	2.00E-01	6.43E-08	1.66E-07	8.57E-02	1.94E-06	2.05E-06
trans-1,2-Dichloroethene	5.29E-01	1.71E-06	2.00E-02	8.54E-05	2.36E-06	2.00E-02	1.18E-04	5.18E-05	2.00E-02	2.59E-03	2.80E-03
Trichloroethene	2.63E+00	8.49E-06	3.00E-04	2.83E-02	1.17E-05	3.00E-04	3.91E-02	1.85E-04	1.00E-02	1.85E-02	8.59E-02
Vinyl chloride	8.95E-01	2.89E-06	3.00E-03	9.63E-04	3.99E-06	3.00E-03	1.33E-03	1.97E-04	2.86E-02	6.89E-03	9.18E-03
Xylenes, total	1.40E+02	4.52E-04	2.00E-01	2.26E-03	6.25E-04	2.00E-01	3.12E-03	5.27E-03	2.90E-02	1.82E-01	**1.87E-01**
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	9.72E-04	3.14E-09	NA		1.30E-09	NA		1.45E-13	1.14E-08	1.26E-05	1.26E-05
1,2,3,4,6,7,8-HpCDF	1.60E-04	5.17E-10	NA		2.14E-10	NA		2.38E-14	1.14E-08	2.08E-06	2.08E-06
1,2,3,4,7,8,9-HpCDF	7.93E-06	2.56E-11	NA		1.06E-11	NA		1.18E-15	1.14E-08	1.03E-07	1.03E-07
1,2,3,4,7,8-HxCDD	1.64E-05	5.30E-11	NA		2.20E-11	NA		2.44E-15	1.14E-08	2.13E-07	2.13E-07
1,2,3,4,7,8-HxCDF	2.26E-06	7.30E-12	NA		3.03E-12	NA		3.36E-16	1.14E-08	2.94E-08	2.94E-08
1,2,3,6,7,8-HxCDD	7.35E-05	2.37E-10	NA		9.84E-11	NA		1.09E-14	1.14E-08	9.56E-07	9.56E-07
1,2,3,6,7,8-HxCDF	1.50E-05	4.84E-11	NA		2.01E-11	NA		2.23E-15	1.14E-08	1.95E-07	1.95E-07
1,2,3,7,8,9-HxCDD	4.14E-05	1.34E-10	NA		5.54E-11	NA		6.16E-15	1.14E-08	5.39E-07	5.39E-07
1,2,3,7,8,9-HxCDF	8.75E-06	2.83E-11	NA		1.17E-11	NA		1.30E-15	1.14E-08	1.14E-07	1.14E-07
1,2,3,7,8-PeCDD	1.53E-05	4.94E-11	NA		2.05E-11	NA		2.28E-15	1.14E-08	1.99E-07	1.99E-07
2,3,4,6,7,8-HxCDF	1.51E-05	4.88E-11	NA		2.02E-11	NA		2.25E-15	1.14E-08	1.96E-07	1.96E-07
2,3,4,7,8-PeCDF	3.66E-05	1.18E-10	NA		4.90E-11	NA		5.44E-15	1.14E-08	4.76E-07	4.76E-07
2,3,7,8-TCDF	4.63E-06	1.50E-11	NA		6.20E-12	NA		6.89E-16	1.14E-08	6.02E-08	6.02E-08

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
OCDD	8.20E-03	2.65E-08	NA		1.10E-08	NA		1.22E-12	1.14E-08	1.07E-04	1.07E-04
OCDF	3.25E-04	1.05E-09	NA		4.35E-10	NA		4.83E-14	1.14E-08	4.23E-06	4.23E-06
		Total Risk (Hazard Index):		1.82E+00	**Total Risk (Hazard Index):**		1.48E+00	**Total Risk (Hazard Index):**		1.36E+00	**4.7E+00**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **5**

Table 1-29
Cancer Risk Results - Detailed Summary of Risk Drivers - Future Industrial/Construction Worker - Deep Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Industrial Worker					Future Construction Worker				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	**2.7E-05**	**9.2E-06**	6.5E-09	**3.6E-05**	24%	**3.5E-06**	**1.5E-06**	2.6E-10	**5.0E-06**	33%
Chromium			**1.1E-06**	**1.1E-06**	0.7%			4.4E-08	4.4E-08	0.3%
Subtotal Metals	**2.7E-05**	**9.2E-06**	**1.1E-06**	**3.7E-05**	25%	**3.6E-06**	**1.5E-06**	4.5E-08	**5.1E-06**	33%
Pesticides/PCBs										
4,4'-DDD	7.0E-07	4.0E-07	1.1E-10	**1.1E-06**	0.7%	9.3E-08	6.4E-08	4.3E-12	1.6E-07	1%
4,4'-DDE	6.7E-07	3.8E-07	1.0E-10	**1.1E-06**	0.7%	8.8E-08	6.1E-08	4.1E-12	1.5E-07	1%
Aldrin	**5.5E-06**	**3.1E-06**	8.4E-10	**8.6E-06**	6%	7.2E-07	5.0E-07	3.4E-11	**1.2E-06**	8%
Dieldrin	**1.2E-05**	**6.6E-06**	1.8E-09	**1.8E-05**	12%	**1.5E-06**	**1.1E-06**	7.1E-11	**2.6E-06**	17%
Aroclor-1260	6.8E-07	**1.2E-06**	1.0E-10	**1.9E-06**	1%	9.0E-08	1.9E-07	4.2E-12	2.8E-07	2%
Subtotal Pesticides/PCBs	**1.9E-05**	**1.2E-05**	3.0E-09	**3.1E-05**	20%	**2.6E-06**	**1.9E-06**	1.2E-10	**4.4E-06**	29%
SVOCs/VOCs										
1,4-Dichlorobenzene	1.5E-07	1.7E-07	**3.4E-06**	**3.7E-06**	2%	1.9E-08	2.7E-08	1.3E-07	1.8E-07	1%
Benzo(a)pyrene	**2.1E-06**	**3.6E-06**	1.9E-10	**5.7E-06**	4%	2.8E-07	5.7E-07	7.8E-12	8.5E-07	6%
Naphthalene	**2.1E-06**	**3.7E-06**	**6.9E-06**	**1.3E-05**	8%	2.8E-07	5.9E-07	2.8E-07	**1.1E-06**	7%
Pentachlorophenol	2.8E-07	8.0E-07	4.3E-11	**1.1E-06**	0.7%	3.7E-08	1.3E-07	1.7E-12	1.7E-07	1%
1,1-Dichloroethane	1.5E-08	1.7E-08	**1.2E-06**	**1.2E-06**	0.8%	1.9E-09	2.7E-09	4.7E-08	5.2E-08	0.3%
Benzene	5.0E-08	5.7E-08	**3.6E-06**	**3.7E-06**	2%	6.6E-09	9.1E-09	1.4E-07	1.6E-07	1%
Trichloroethene	3.7E-07	4.2E-07	**2.6E-05**	**2.7E-05**	18%	4.9E-08	6.7E-08	**1.1E-06**	**1.2E-06**	8%
Vinyl chloride	4.7E-07	5.3E-07	**1.9E-05**	**2.0E-05**	13%	6.2E-08	8.6E-08	7.7E-07	9.2E-07	6%
Subtotal SVOCs/VOCs	**6.9E-06**	**1.1E-05**	**6.1E-05**	**8.0E-05**	52%	9.1E-07	**1.8E-06**	**2.5E-06**	**5.2E-06**	34%
Dioxans/Furans										
1,2,3,7,8-PeCDD	8.0E-07	2.7E-07	1.2E-10	**1.1E-06**	0.7%	1.1E-07	4.4E-08	4.9E-12	1.5E-07	1%
2,3,4,7,8-PeCDF	9.6E-07	3.3E-07	1.5E-10	**1.3E-06**	0.8%	1.3E-07	5.2E-08	5.8E-12	1.8E-07	1%
Subtotal Dioxans/Furans	**3.3E-06**	**1.1E-06**	5.1E-10	**4.5E-06**	3%	4.4E-07	1.8E-07	2.0E-11	6.2E-07	4%
Total:	**5.7E-05**	**3.4E-05**	**6.2E-05**	**1.53E-04**		**7.5E-06**	**5.4E-06**	**2.5E-06**	**1.53E-05**	

Total Estimated Cancer Risk Across All Exposure Routes: **2E-04** **2E-05**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total cancer risk for all chemicals evaluated.

Table 1-30
Noncancer Risk Results - Detailed Summary of Risk Drivers - Future Industrial/Construction Worker - Deep Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Non-Carcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Industrial Worker					Future Construction Worker				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Antimony	5.0E-02	5.7E-03		5.6E-02	2%	**1.7E-01**	2.3E-02		**1.9E-01**	4%
Arsenic	2.6E-02	9.0E-03	1.4E-04	3.6E-02	2%	8.7E-02	3.6E-02	1.4E-04	**1.2E-01**	3%
Iron	7.6E-02	8.7E-03		8.5E-02	4%	**2.5E-01**	3.5E-02		**2.9E-01**	6%
Manganese	3.4E-02	3.9E-03	9.0E-03	4.7E-02	2%	**1.1E-01**	1.6E-02	9.0E-03	**1.4E-01**	3%
Thallium	4.3E-02	4.9E-03		4.8E-02	2%	**1.4E-01**	1.9E-02		**1.6E-01**	3%
Vanadium	4.0E-02	4.5E-03		4.4E-02	2%	**1.3E-01**	1.8E-02		**1.5E-01**	3%
Subtotal Metals	**3.0E-01**	4.0E-02	1.2E-02	**3.5E-01**	15%	**9.9E-01**	**1.6E-01**	**1.2E-02**	**1.2E+00**	25%
Pesticides/PCBs										
Aldrin	3.0E-02	1.7E-02	4.6E-06	4.7E-02	2%	9.9E-02	6.9E-02	4.6E-06	**1.7E-01**	4%
Dieldrin	4.1E-02	2.3E-02	6.2E-06	6.4E-02	3%	**1.3E-01**	9.3E-02	6.2E-06	**2.3E-01**	5%
Subtotal Pesticides/PCBs	**1.2E-01**	**1.2E-01**	1.8E-05	**2.4E-01**	11%	**4.0E-01**	**4.9E-01**	1.8E-05	**8.9E-01**	19%
SVOCs/VOCs										
2-Methylnaphthalene	9.8E-02	**1.7E-01**		**2.7E-01**	12%	**3.2E-01**	**6.7E-01**		**1.0E+00**	21%
Naphthalene	2.5E-03	4.3E-03	**1.9E-01**	**2.0E-01**	9%	8.2E-03	1.7E-02	**1.9E-01**	**2.1E-01**	5%
cis-1,2-Dichloroethene	1.3E-02	1.5E-02	**8.9E-01**	**9.2E-01**	40%	4.3E-02	6.0E-02	**8.9E-01**	**9.9E-01**	21%
Xylenes, total	6.8E-04	7.8E-04	**1.8E-01**	**1.8E-01**	8%	2.3E-03	3.1E-03	**1.8E-01**	**1.9E-01**	4%
Subtotal SVOCs/VOCs	**1.3E-01**	**2.1E-01**	**1.4E+00**	**1.7E+00**	74%	**4.3E-01**	**8.3E-01**	**1.4E+00**	**2.6E+00**	56%
Total:	**0.6**	**0.4**	**1.4**	**2.3**		**1.8**	**1.5**	**1.4**	**4.7**	

Total Estimated Hazard Index Across All Exposure Routes: **2** **5**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total hazard quotient for all chemicals evaluated.

Table 1-31
Exposure Point Concentrations for Site Risks - Shallow Soil - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (EPC)	EPC Basis
Metals			
Aluminum	mg/kg	1.35E+04	Maximum Result
Antimony	mg/kg	2.16E+02	Maximum Result
Arsenic	mg/kg	2.00E+01	Maximum Result
Barium	mg/kg	3.80E+03	Maximum Result
Beryllium	mg/kg	9.20E-01	Maximum Result
Cadmium	mg/kg	1.11E+01	Maximum Result
Chromium	mg/kg	1.02E+02	Maximum Result
Cobalt	mg/kg	1.51E+01	Maximum Result
Copper	mg/kg	4.18E+02	Maximum Result
Iron	mg/kg	7.45E+04	Maximum Result
Lead	mg/kg	2.17E+03	Maximum Result
Manganese	mg/kg	1.11E+03	Maximum Result
Nickel	mg/kg	7.21E+01	Maximum Result
Selenium	mg/kg	4.60E+00	Maximum Result
Silver	mg/kg	1.10E+00	Maximum Result
Thallium	mg/kg	4.90E+00	Maximum Result
Vanadium	mg/kg	6.42E+01	Maximum Result
Zinc	mg/kg	8.03E+03	Maximum Result
Pesticides/PCBs			
4,4'-DDD	mg/kg	9.90E-03	Maximum Result
4,4'-DDE	mg/kg	3.50E-03	Maximum Result
4,4'-DDT	mg/kg	9.50E-03	Maximum Result
Endrin	mg/kg	5.50E-03	Maximum Result
Endrin ketone	mg/kg	1.40E-02	Maximum Result
gamma-Chlordane	mg/kg	1.70E-03	Maximum Result
Methoxychlor	mg/kg	9.90E-03	Maximum Result
SVOCs/VOCs			
2-Methylnaphthalene	mg/kg	1.70E-01	Maximum Result
Acenaphthylene	mg/kg	6.90E-01	Maximum Result
Anthracene	mg/kg	8.60E-01	Maximum Result
Benzo(a)anthracene	mg/kg	1.30E+00	Maximum Result
Benzo(a)pyrene	mg/kg	2.60E+00	Maximum Result
Benzo(b)fluoranthene	mg/kg	1.70E+00	Maximum Result
Benzo(g,h,i)perylene	mg/kg	2.30E+00	Maximum Result
Benzo(k)fluoranthene	mg/kg	1.50E+00	Maximum Result
Biphenyl (diphenyl)	mg/kg	1.60E-01	Maximum Result
Chrysene	mg/kg	1.80E+00	Maximum Result
Fluoranthene	mg/kg	3.00E+00	Maximum Result
Fluorene	mg/kg	5.00E-01	Maximum Result
Indeno(1,2,3-c,d)pyrene	mg/kg	2.30E+00	Maximum Result
Naphthalene	mg/kg	1.60E-01	Maximum Result
Phenanthrene	mg/kg	4.40E+00	Maximum Result
Pyrene	mg/kg	4.40E+00	Maximum Result
Acetone	mg/kg	5.00E-02	Maximum Result
cis-1,2-Dichloroethene	mg/kg	2.00E-03	Maximum Result
Methyl ethyl ketone	mg/kg	2.10E-02	Maximum Result

Table 1-31
Exposure Point Concentrations for Site Risks - Shallow Soil - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (EPC)	EPC Basis
Methylene chloride	mg/kg	4.00E-03	Maximum Result
Toluene	mg/kg	9.00E-03	Maximum Result
Xylenes, total	mg/kg	5.00E-03	Maximum Result
Dioxans/Furans			
1,2,3,4,6,7,8-HpCDD	mg/kg	3.51E-05	Maximum Result
1,2,3,4,6,7,8-HpCDF	mg/kg	3.08E-05	Maximum Result
1,2,3,4,7,8,9-HpCDF	mg/kg	2.83E-06	Maximum Result
1,2,3,4,7,8-HxCDD	mg/kg	2.83E-06	Maximum Result
1,2,3,4,7,8-HxCDF	mg/kg	1.74E-05	Maximum Result
1,2,3,6,7,8-HxCDD	mg/kg	5.59E-06	Maximum Result
1,2,3,6,7,8-HxCDF	mg/kg	1.13E-05	Maximum Result
1,2,3,7,8,9-HxCDD	mg/kg	3.75E-06	Maximum Result
1,2,3,7,8,9-HxCDF	mg/kg	3.79E-06	Maximum Result
1,2,3,7,8-PeCDD	mg/kg	3.37E-06	Maximum Result
1,2,3,7,8-PeCDF	mg/kg	3.91E-06	Maximum Result
2,3,4,6,7,8-HxCDF	mg/kg	1.55E-05	Maximum Result
2,3,4,7,8-PeCDF	mg/kg	3.32E-05	Maximum Result
2,3,7,8-TCDD	mg/kg	8.98E-07	Maximum Result
2,3,7,8-TCDF	mg/kg	8.22E-06	Maximum Result
OCDD	mg/kg	3.57E-04	Maximum Result
OCDF	mg/kg	1.88E-05	Maximum Result

Notes:
EPC summary statistics are presented in Table 1-1.

Table 1-32
Exposure Point Concentrations for Site Risks - Deep Soil - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (EPC)	EPC Basis
Metals			
Aluminum	mg/kg	1.30E+04	95% Student's-t UCL
Antimony	mg/kg	2.16E+02	Maximum Result
Arsenic	mg/kg	1.28E+01	95% Student's-t UCL
Barium	mg/kg	3.50E+03	95% Approximate Gamma UCL
Beryllium	mg/kg	6.74E-01	95% Approximate Gamma UCL
Cadmium	mg/kg	1.11E+01	Maximum Result
Chromium	mg/kg	8.01E+01	95% Student's-t UCL
Cobalt	mg/kg	1.19E+01	95% Approximate Gamma UCL
Copper	mg/kg	3.07E+02	95% Student's-t UCL
Iron	mg/kg	5.74E+04	95% Approximate Gamma UCL
Lead	mg/kg	1.45E+03	95% Student's-t UCL
Manganese	mg/kg	8.57E+02	95% Approximate Gamma UCL
Nickel	mg/kg	5.87E+01	95% Student's-t UCL
Selenium	mg/kg	3.53E+00	95% Approximate Gamma UCL
Silver	mg/kg	8.32E-01	95% Student's-t UCL
Thallium	mg/kg	3.81E+00	95% Approximate Gamma UCL
Vanadium	mg/kg	4.95E+01	95% Student's-t UCL
Zinc	mg/kg	8.03E+03	Maximum Result
Pesticides/PCBs			
4,4'-DDD	mg/kg	6.08E-02	95% Approximate Gamma UCL
4,4'-DDE	mg/kg	2.35E-02	95% Chebyshev (Mean, Sd) UCL
4,4'-DDT	mg/kg	8.79E-03	95% Chebyshev (Mean, Sd) UCL
Dieldrin	mg/kg	9.15E-03	95% Chebyshev (Mean, Sd) UCL
Endrin	mg/kg	4.27E-03	95% Approximate Gamma UCL
Endrin ketone	mg/kg	1.32E-02	95% Chebyshev (Mean, Sd) UCL
gamma-Chlordane	mg/kg	1.41E-03	95% Approximate Gamma UCL
Methoxychlor	mg/kg	9.90E-03	Maximum Result
SVOCs/VOCs			
2-Methylnaphthalene	mg/kg	1.91E+00	95% Chebyshev (Mean, Sd) UCL
Acenaphthylene	mg/kg	1.20E+00	Maximum Result
Anthracene	mg/kg	9.40E-01	Maximum Result
Benzo(a)anthracene	mg/kg	4.14E+00	95% Approximate Gamma UCL
Benzo(a)pyrene	mg/kg	8.90E+00	Maximum Result
Benzo(b)fluoranthene	mg/kg	5.60E+00	Maximum Result
Benzo(g,h,i)perylene	mg/kg	9.00E+00	Maximum Result
Benzo(k)fluoranthene	mg/kg	3.40E+00	95% Approximate Gamma UCL
Biphenyl (diphenyl)	mg/kg	1.60E-01	Maximum Result
Chrysene	mg/kg	6.50E+00	Maximum Result
Dibenz(a,h)anthracene	mg/kg	1.02E+00	95% Chebyshev (Mean, Sd) UCL
Fluoranthene	mg/kg	1.20E+01	Maximum Result
Fluorene	mg/kg	4.23E-01	95% Approximate Gamma UCL
Indeno(1,2,3-c,d)pyrene	mg/kg	8.30E+00	Maximum Result
Naphthalene	mg/kg	7.99E-01	95% Chebyshev (Mean, Sd) UCL
Phenanthrene	mg/kg	4.40E+00	Maximum Result
Pyrene	mg/kg	1.60E+01	Maximum Result
Acetone	mg/kg	3.40E-02	95% Student's-t UCL

Table 1-32
Exposure Point Concentrations for Site Risks - Deep Soil - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (EPC)	EPC Basis
cis-1,2-Dichloroethene	mg/kg	2.00E-03	Maximum Result
Methyl ethyl ketone	mg/kg	1.94E-02	95% Chebyshev (Mean, Sd) UCL
Methylene chloride	mg/kg	4.00E-03	Maximum Result
Toluene	mg/kg	7.76E-03	95% Student's-t UCL
Xylenes, total	mg/kg	5.00E-03	Maximum Result
Dioxans/Furans			
1,2,3,4,6,7,8-HpCDD	mg/kg	3.51E-05	Maximum Result
1,2,3,4,6,7,8-HpCDF	mg/kg	3.08E-05	Maximum Result
1,2,3,4,7,8,9-HpCDF	mg/kg	2.83E-06	Maximum Result
1,2,3,4,7,8-HxCDD	mg/kg	2.83E-06	Maximum Result
1,2,3,4,7,8-HxCDF	mg/kg	1.74E-05	Maximum Result
1,2,3,6,7,8-HxCDD	mg/kg	5.59E-06	Maximum Result
1,2,3,6,7,8-HxCDF	mg/kg	1.13E-05	Maximum Result
1,2,3,7,8,9-HxCDD	mg/kg	3.75E-06	Maximum Result
1,2,3,7,8,9-HxCDF	mg/kg	3.79E-06	Maximum Result
1,2,3,7,8-PeCDD	mg/kg	3.37E-06	Maximum Result
1,2,3,7,8-PeCDF	mg/kg	3.91E-06	Maximum Result
2,3,4,6,7,8-HxCDF	mg/kg	1.55E-05	Maximum Result
2,3,4,7,8-PeCDF	mg/kg	3.32E-05	Maximum Result
2,3,7,8-TCDD	mg/kg	8.98E-07	Maximum Result
2,3,7,8-TCDF	mg/kg	8.22E-06	Maximum Result
OCDD	mg/kg	3.57E-04	Maximum Result
OCDF	mg/kg	1.88E-05	Maximum Result

Notes:
EPC summary statistics are presented in Table 1-1.

Table 1-33
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Residential Exposure Scenario - Future Adult Resident Receptor - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	24	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5700	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.07	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Metals											
Aluminum	1.35E+04	6.34E-03	NA		2.53E-04	NA		9.64E-07	NA		
Antimony	2.16E+02	1.01E-04	NA		4.05E-06	NA		1.54E-08	NA		
Arsenic	2.00E+01	9.39E-06	9.50E+00	8.92E-05	1.12E-06	9.50E+00	1.07E-05	1.43E-09	1.51E+01	2.15E-08	**9.99E-05**
Barium	3.80E+03	1.78E-03	NA		7.12E-05	NA		2.71E-07	NA		
Beryllium	9.20E-01	4.32E-07	NA		1.72E-08	NA		6.57E-11	8.40E+00	5.52E-10	5.52E-10
Cadmium	1.11E+01	5.21E-06	3.80E-01	1.98E-06	2.08E-08	3.80E-01	7.90E-09	7.92E-10	1.47E+01	1.16E-08	**2.00E-06**
Chromium	1.02E+02	4.79E-05	NA		1.91E-06	NA		7.28E-09	4.20E+01	3.06E-07	3.06E-07
Cobalt	1.51E+01	7.09E-06	NA		2.83E-07	NA		1.08E-09	9.80E+00	1.06E-08	1.06E-08
Copper	4.18E+02	1.96E-04	NA		7.83E-06	NA		2.98E-08	NA		
Iron	7.45E+04	3.50E-02	NA		1.40E-03	NA		5.32E-06	NA		
Lead	2.17E+03	1.02E-03	NA		4.07E-05	NA		1.55E-07	NA		
Manganese	1.11E+03	5.21E-04	NA		2.08E-05	NA		7.92E-08	NA		
Nickel	7.21E+01	3.39E-05	NA		1.35E-06	NA		5.15E-09	9.10E-01	4.68E-09	4.68E-09
Selenium	4.60E+00	2.16E-06	NA		8.62E-08	NA		3.28E-10	NA		
Silver	1.10E+00	5.17E-07	NA		2.06E-08	NA		7.85E-11	NA		
Thallium	4.90E+00	2.30E-06	NA		9.18E-08	NA		3.50E-10	NA		
Vanadium	6.42E+01	3.02E-05	NA		1.20E-06	NA		4.58E-09	NA		
Zinc	8.03E+03	3.77E-03	NA		1.50E-04	NA		5.73E-07	NA		

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs	Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			Total Cancer Risk
	[mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	[-]
Pesticides/PCBs											
4,4'-DDD	9.90E-03	4.65E-09	2.40E-01	1.12E-09	9.28E-10	2.40E-01	2.23E-10	7.07E-13	2.42E-01	1.71E-13	1.34E-09
4,4'-DDE	3.50E-03	1.64E-09	3.40E-01	5.59E-10	3.28E-10	3.40E-01	1.12E-10	2.50E-13	3.40E-01	8.48E-14	6.70E-10
4,4'-DDT	9.50E-03	4.46E-09	3.40E-01	1.52E-09	8.90E-10	3.40E-01	3.03E-10	6.78E-13	3.40E-01	2.30E-13	1.82E-09
Endrin	5.50E-03	2.58E-09	NA		5.15E-10	NA		3.93E-13	NA		
Endrin ketone	1.40E-02	6.58E-09	NA		1.31E-09	NA		9.99E-13	NA		
gamma-Chlordane	1.70E-03	7.98E-10	1.20E+00	9.58E-10	1.59E-10	1.20E+00	1.91E-10	1.21E-13	1.19E+00	1.44E-13	1.15E-09
Methoxychlor	9.90E-03	4.65E-09	NA		9.28E-10	NA		7.07E-13	NA		
SVOCs/VOCs											
2-Methylnaphthalene	1.70E-01	7.98E-08	NA		4.78E-08	NA		2.60E-07	NA		
Acenaphthylene	6.90E-01	3.24E-07	NA		1.94E-07	NA		4.93E-11	NA		
Anthracene	8.60E-01	4.04E-07	NA		2.42E-07	NA		9.36E-08	NA		
Benzo(a)anthracene	1.30E+00	6.11E-07	1.20E+00	7.33E-07	3.65E-07	1.20E+00	4.39E-07	9.28E-11	7.30E-01	6.77E-11	**1.17E-06**
Benzo(a)pyrene	2.60E+00	1.22E-06	1.20E+01	1.47E-05	7.31E-07	1.20E+01	8.77E-06	1.86E-10	7.30E+00	1.35E-09	**2.34E-05**
Benzo(b)fluoranthene	1.70E+00	7.98E-07	1.20E+00	9.58E-07	4.78E-07	1.20E+00	5.73E-07	1.21E-10	7.30E-01	8.86E-11	**1.53E-06**
Benzo(g,h,i)perylene	2.30E+00	1.08E-06	NA		6.47E-07	NA		1.64E-10	NA		
Benzo(k)fluoranthene	1.50E+00	7.05E-07	1.20E+00	8.45E-07	4.22E-07	1.20E+00	5.06E-07	1.07E-10	3.85E-01	4.12E-11	**1.35E-06**
Biphenyl (diphenyl)	1.60E-01	7.51E-08	NA		3.00E-08	NA		1.14E-11	NA		
Chrysene	1.80E+00	8.45E-07	1.20E-01	1.01E-07	5.06E-07	1.20E-01	6.07E-08	1.28E-10	3.85E-02	4.95E-12	1.62E-07
Fluoranthene	3.00E+00	1.41E-06	NA		8.43E-07	NA		2.14E-10	NA		
Fluorene	5.00E-01	2.35E-07	NA		1.41E-07	NA		8.36E-08	NA		
Indeno(1,2,3-c,d)pyrene	2.30E+00	1.08E-06	7.30E-01	7.89E-07	6.47E-07	7.30E-01	4.72E-07	1.64E-10	7.30E-01	1.20E-10	**1.26E-06**
Naphthalene	1.60E-01	7.51E-08	1.20E-01	9.02E-09	4.50E-08	1.20E-01	5.40E-09	2.44E-07	1.19E-01	2.91E-08	4.35E-08
Phenanthrene	4.40E+00	2.07E-06	NA		1.24E-06	NA		3.14E-10	NA		
Pyrene	4.40E+00	2.07E-06	NA		1.24E-06	NA		3.14E-10	NA		
Acetone	5.00E-02	2.35E-08	NA		9.37E-09	NA		4.34E-07	NA		
cis-1,2-Dichloroethene	2.00E-03	9.39E-10	NA		3.75E-10	NA		6.38E-08	NA		
Methyl ethyl ketone	2.10E-02	9.86E-09	NA		3.94E-09	NA		1.19E-07	NA		
Methylene chloride	4.00E-03	1.88E-09	1.40E-02	2.63E-11	7.50E-10	1.40E-02	1.05E-11	1.77E-07	3.50E-03	6.18E-10	6.55E-10
Toluene	9.00E-03	4.23E-09	NA		1.69E-09	NA		2.49E-07	NA		
Xylenes, total	5.00E-03	2.35E-09	NA		9.37E-10	NA		9.03E-08	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	3.51E-05	1.65E-11	1.50E+03	2.47E-08	1.97E-12	1.50E+03	2.96E-09	2.51E-15	1.50E+03	3.76E-12	2.77E-08
1,2,3,4,6,7,8-HpCDF	3.08E-05	1.45E-11	1.50E+03	2.17E-08	1.73E-12	1.50E+03	2.60E-09	2.20E-15	1.50E+03	3.30E-12	2.43E-08
1,2,3,4,7,8,9-HpCDF	2.83E-06	1.33E-12	1.50E+03	1.99E-09	1.59E-13	1.50E+03	2.39E-10	2.02E-16	1.50E+03	3.03E-13	2.23E-09
1,2,3,4,7,8-HxCDD	2.83E-06	1.33E-12	1.50E+04	1.99E-08	1.59E-13	1.50E+04	2.39E-09	2.02E-16	1.50E+04	3.03E-12	2.23E-08
1,2,3,4,7,8-HxCDF	1.74E-05	8.17E-12	1.50E+04	1.23E-07	9.78E-13	1.50E+04	1.47E-08	1.24E-15	1.50E+04	1.86E-11	1.37E-07
1,2,3,6,7,8-HxCDD	5.59E-06	2.63E-12	1.50E+04	3.94E-08	3.14E-13	1.50E+04	4.71E-09	3.99E-16	1.50E+04	5.99E-12	4.41E-08
1,2,3,6,7,8-HxCDF	1.13E-05	5.31E-12	1.50E+04	7.96E-08	6.35E-13	1.50E+04	9.53E-09	8.07E-16	1.50E+04	1.21E-11	8.91E-08
1,2,3,7,8,9-HxCDD	3.75E-06	1.76E-12	1.50E+04	2.64E-08	2.11E-13	1.50E+04	3.16E-09	2.68E-16	1.50E+04	4.02E-12	2.96E-08
1,2,3,7,8,9-HxCDF	3.79E-06	1.78E-12	1.50E+04	2.67E-08	2.13E-13	1.50E+04	3.20E-09	2.71E-16	1.50E+04	4.06E-12	2.99E-08
1,2,3,7,8-PeCDD	3.37E-06	1.58E-12	1.50E+05	2.37E-07	1.89E-13	1.50E+05	2.84E-08	2.41E-16	1.50E+05	3.61E-11	2.66E-07
1,2,3,7,8-PeCDF	3.91E-06	1.84E-12	7.50E+03	1.38E-08	2.20E-13	7.50E+03	1.65E-09	2.79E-16	7.50E+03	2.09E-12	1.54E-08
2,3,4,6,7,8-HxCDF	1.55E-05	7.28E-12	1.50E+04	1.09E-07	8.71E-13	1.50E+04	1.31E-08	1.11E-15	1.50E+04	1.66E-11	1.22E-07
2,3,4,7,8-PeCDF	3.32E-05	1.56E-11	7.50E+04	1.17E-06	1.87E-12	7.50E+04	1.40E-07	2.37E-15	7.50E+04	1.78E-10	**1.31E-06**
2,3,7,8-TCDD	8.98E-07	4.22E-13	1.50E+05	6.33E-08	5.05E-14	1.50E+05	7.57E-09	6.41E-17	1.50E+05	9.61E-12	7.08E-08

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
2,3,7,8-TCDF	8.22E-06	3.86E-12	1.50E+04	5.79E-08	4.62E-13	1.50E+04	6.93E-09	5.87E-16	1.50E+04	8.80E-12	6.49E-08
OCDD	3.57E-04	1.68E-10	1.50E+01	2.52E-09	2.01E-11	1.50E+01	3.01E-10	2.55E-14	1.50E+01	3.82E-13	2.82E-09
OCDF	1.88E-05	8.83E-12	1.50E+01	1.32E-10	1.06E-12	1.50E+01	1.59E-11	1.34E-15	1.50E+01	2.01E-14	1.48E-10
			Total Risk:	1.11E-04		**Total Risk:**	2.18E-05		**Total Risk:**	3.86E-07	**1.33E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **1E-04**

Table 1-34
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Residential Exposure Scenario - Future Adult Resident Receptor - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	24	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5700	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.1	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Metals											
Aluminum	1.35E+04	1.85E-02	1.00E+00	1.85E-02	7.38E-04	1.00E+00	7.38E-04	2.81E-06	1.40E-03	2.01E-03	2.12E-02
Antimony	2.16E+02	2.96E-04	4.00E-04	7.40E-01	1.18E-05	4.00E-04	2.95E-02	4.50E-08	NA		**7.69E-01**
Arsenic	2.00E+01	2.74E-05	3.00E-04	9.13E-02	3.28E-06	3.00E-04	1.09E-02	4.16E-09	8.57E-06	4.86E-04	**1.03E-01**
Barium	3.80E+03	5.21E-03	7.00E-02	7.44E-02	2.08E-04	7.00E-02	2.97E-03	7.91E-07	1.43E-04	5.54E-03	8.29E-02
Beryllium	9.20E-01	1.26E-06	2.00E-03	6.30E-04	5.03E-08	2.00E-03	2.51E-05	1.92E-10	5.71E-06	3.35E-05	6.89E-04
Cadmium	1.11E+01	1.52E-05	5.00E-04	3.04E-02	6.07E-08	5.00E-04	1.21E-04	2.31E-09	5.71E-06	4.04E-04	3.09E-02
Chromium	1.02E+02	1.40E-04	NA		5.58E-06	NA		2.12E-08	NA		
Cobalt	1.51E+01	2.07E-05	2.00E-02	1.03E-03	8.25E-07	2.00E-02	4.13E-05	3.14E-09	5.70E-06	5.52E-04	1.63E-03
Copper	4.18E+02	5.73E-04	4.00E-02	1.43E-02	2.28E-05	4.00E-02	5.71E-04	8.70E-08	NA		1.49E-02
Iron	7.45E+04	1.02E-01	3.00E-01	3.40E-01	4.07E-03	3.00E-01	1.36E-02	1.55E-05	NA		**3.54E-01**
Lead	2.17E+03	2.97E-03	NA		1.19E-04	NA		4.52E-07	NA		
Manganese	1.11E+03	1.52E-03	2.40E-02	6.34E-02	6.07E-05	2.40E-02	2.53E-03	2.31E-07	1.40E-05	1.65E-02	8.24E-02
Nickel	7.21E+01	9.88E-05	2.00E-02	4.94E-03	3.94E-06	2.00E-02	1.97E-04	1.50E-08	1.43E-05	1.05E-03	6.19E-03
Selenium	4.60E+00	6.30E-06	5.00E-03	1.26E-03	2.51E-07	5.00E-03	5.03E-05	9.58E-10	5.71E-03	1.68E-07	1.31E-03
Silver	1.10E+00	1.51E-06	5.00E-03	3.01E-04	6.01E-08	5.00E-03	1.20E-05	2.29E-10	NA		3.13E-04
Thallium	4.90E+00	6.71E-06	6.60E-05	1.02E-01	2.68E-07	6.60E-05	4.06E-03	1.02E-09	NA		**1.06E-01**

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Vanadium	6.42E+01	8.79E-05	1.00E-03	8.79E-02	3.51E-06	1.00E-03	3.51E-03	1.34E-08	NA		9.15E-02
Zinc	8.03E+03	1.10E-02	3.00E-01	3.67E-02	4.39E-04	3.00E-01	1.46E-03	1.67E-06	NA		3.81E-02
Pesticides/PCBs											
4,4'-DDD	9.90E-03	1.36E-08	NA		2.71E-09	NA		2.06E-12	NA		
4,4'-DDE	3.50E-03	4.79E-09	NA		9.57E-10	NA		7.29E-13	NA		
4,4'-DDT	9.50E-03	1.30E-08	5.00E-04	2.60E-05	2.60E-09	5.00E-04	5.19E-06	1.98E-12	5.00E-04	3.96E-09	3.12E-05
Endrin	5.50E-03	7.53E-09	3.00E-04	2.51E-05	1.50E-09	3.00E-04	5.01E-06	1.15E-12	3.00E-04	3.82E-09	3.01E-05
Endrin ketone	1.40E-02	1.92E-08	3.00E-04	6.39E-05	3.83E-09	3.00E-04	1.28E-05	2.91E-12	3.00E-04	9.72E-09	7.67E-05
gamma-Chlordane	1.70E-03	2.33E-09	5.00E-04	4.66E-06	4.65E-10	5.00E-04	9.29E-07	3.54E-13	2.00E-04	1.77E-09	5.59E-06
Methoxychlor	9.90E-03	1.36E-08	5.00E-03	2.71E-06	2.71E-09	5.00E-03	5.41E-07	2.06E-12	5.00E-03	4.12E-10	3.25E-06
SVOCs/VOCs											
2-Methylnaphthalene	1.70E-01	2.33E-07	4.00E-03	5.82E-05	1.39E-07	4.00E-03	3.48E-05	7.57E-07	NA		9.31E-05
Acenaphthylene	6.90E-01	9.45E-07	NA		5.66E-07	NA		1.44E-10	NA		
Anthracene	8.60E-01	1.18E-06	3.00E-01	3.93E-06	7.05E-07	3.00E-01	2.35E-06	2.73E-07	3.00E-01	9.10E-07	7.19E-06
Benzo(a)anthracene	1.30E+00	1.78E-06	NA		1.07E-06	NA		2.71E-10	NA		
Benzo(a)pyrene	2.60E+00	3.56E-06	NA		2.13E-06	NA		5.41E-10	NA		
Benzo(b)fluoranthene	1.70E+00	2.33E-06	NA		1.39E-06	NA		3.54E-10	NA		
Benzo(g,h,i)perylene	2.30E+00	3.15E-06	NA		1.89E-06	NA		4.79E-10	NA		
Benzo(k)fluoranthene	1.50E+00	2.05E-06	NA		1.23E-06	NA		3.12E-10	NA		
Biphenyl (diphenyl)	1.60E-01	2.19E-07	5.00E-02	4.38E-06	8.75E-08	5.00E-02	1.75E-06	3.33E-11	5.00E-02	6.66E-10	6.13E-06
Chrysene	1.80E+00	2.47E-06	NA		1.48E-06	NA		3.75E-10	NA		
Fluoranthene	3.00E+00	4.11E-06	4.00E-02	1.03E-04	2.46E-06	4.00E-02	6.15E-05	6.25E-10	4.00E-02	1.56E-08	1.64E-04
Fluorene	5.00E-01	6.85E-07	4.00E-02	1.71E-05	4.10E-07	4.00E-02	1.02E-05	2.44E-07	4.00E-02	6.10E-06	3.35E-05
Indeno(1,2,3-c,d)pyrene	2.30E+00	3.15E-06	NA		1.89E-06	NA		4.79E-10	NA		
Naphthalene	1.60E-01	2.19E-07	2.00E-02	1.10E-05	1.31E-07	2.00E-02	6.56E-06	7.13E-07	8.57E-04	8.32E-04	8.49E-04
Phenanthrene	4.40E+00	6.03E-06	NA		3.61E-06	NA		9.16E-10	NA		
Pyrene	4.40E+00	6.03E-06	3.00E-02	2.01E-04	3.61E-06	3.00E-02	1.20E-04	9.16E-10	3.00E-02	3.05E-08	3.21E-04
Acetone	5.00E-02	6.85E-08	9.00E-01	7.61E-08	2.73E-08	9.00E-01	3.04E-08	1.27E-06	9.00E-01	1.41E-06	1.51E-06
cis-1,2-Dichloroethene	2.00E-03	2.74E-09	1.00E-02	2.74E-07	1.09E-09	1.00E-02	1.09E-07	1.86E-07	1.00E-02	1.86E-05	1.90E-05
Methyl ethyl ketone	2.10E-02	2.88E-08	6.00E-01	4.79E-08	1.15E-08	6.00E-01	1.91E-08	3.48E-07	1.40E+00	2.48E-07	3.15E-07
Methylene chloride	4.00E-03	5.48E-09	6.00E-02	9.13E-08	2.19E-09	6.00E-02	3.64E-08	5.15E-07	1.14E-01	4.51E-06	4.64E-06
Toluene	9.00E-03	1.23E-08	2.00E-01	6.16E-08	4.92E-09	2.00E-01	2.46E-08	7.27E-07	8.57E-02	8.48E-06	8.57E-06
Xylenes, total	5.00E-03	6.85E-09	2.00E-01	3.42E-08	2.73E-09	2.00E-01	1.37E-08	2.63E-07	2.90E-02	9.09E-06	9.13E-06
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	3.51E-05	4.81E-11	NA		5.76E-12	NA		7.31E-15	1.14E-08	6.39E-07	6.39E-07
1,2,3,4,6,7,8-HpCDF	3.08E-05	4.22E-11	NA		5.05E-12	NA		6.41E-15	1.14E-08	5.61E-07	5.61E-07
1,2,3,4,7,8,9-HpCDF	2.83E-06	3.88E-12	NA		4.64E-13	NA		5.89E-16	1.14E-08	5.16E-08	5.16E-08
1,2,3,4,7,8-HxCDD	2.83E-06	3.88E-12	NA		4.64E-13	NA		5.89E-16	1.14E-08	5.16E-08	5.16E-08
1,2,3,4,7,8-HxCDF	1.74E-05	2.38E-11	NA		2.85E-12	NA		3.62E-15	1.14E-08	3.17E-07	3.17E-07
1,2,3,6,7,8-HxCDD	5.59E-06	7.66E-12	NA		9.17E-13	NA		1.16E-15	1.14E-08	1.02E-07	1.02E-07
1,2,3,6,7,8-HxCDF	1.13E-05	1.55E-11	NA		1.85E-12	NA		2.35E-15	1.14E-08	2.06E-07	2.06E-07
1,2,3,7,8,9-HxCDD	3.75E-06	5.14E-12	NA		6.15E-13	NA		7.81E-16	1.14E-08	6.83E-08	6.83E-08
1,2,3,7,8,9-HxCDF	3.79E-06	5.19E-12	NA		6.21E-13	NA		7.89E-16	1.14E-08	6.90E-08	6.90E-08
1,2,3,7,8-PeCDD	3.37E-06	4.62E-12	NA		5.53E-13	NA		7.02E-16	1.14E-08	6.14E-08	6.14E-08
1,2,3,7,8-PeCDF	3.91E-06	5.36E-12	NA		6.41E-13	NA		8.14E-16	1.14E-08	7.12E-08	7.12E-08

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
2,3,4,6,7,8-HxCDF	1.55E-05	2.12E-11	NA		2.54E-12	NA		3.23E-15	1.14E-08	2.82E-07	2.82E-07
2,3,4,7,8-PeCDF	3.32E-05	4.55E-11	NA		5.44E-12	NA		6.91E-15	1.14E-08	6.05E-07	6.05E-07
2,3,7,8-TCDD	8.98E-07	1.23E-12	NA		1.47E-13	NA		1.87E-16	1.14E-08	1.64E-08	1.64E-08
2,3,7,8-TCDF	8.22E-06	1.13E-11	NA		1.35E-12	NA		1.71E-15	1.14E-08	1.50E-07	1.50E-07
OCDD	3.57E-04	4.89E-10	NA		5.85E-11	NA		7.43E-14	1.14E-08	6.50E-06	6.50E-06
OCDF	1.88E-05	2.58E-11	NA		3.08E-12	NA		3.91E-15	1.14E-08	3.42E-07	3.42E-07
		Total Risk (Hazard Index):		1.61	**Total Risk (Hazard Index):**		0.07	**Total Risk (Hazard Index):**		0.03	**1.71**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-Carcinogenic Risk (Hazard Index) Across All Exposure Routes : **2**

Table 1-35
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Residential Exposure Scenario - Future Child Resident Receptor - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Child Resident
	Receptor Age:	Child (0 to 6 yrs)

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	**Variable**	**Value**	**Units**
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	6	yr
Soil Ingestion Rate	IR	200	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	10	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	2900	cm2/day [soil]
Body Weight	BW	15	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			**Exposure Route = Dermal**			**Exposure Route = Inhalation**			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
Metals											
Aluminum	1.35E+04	1.48E-02	NA		4.29E-04	NA		5.62E-07	NA		
Antimony	2.16E+02	2.37E-04	NA		6.86E-06	NA		8.99E-09	NA		
Arsenic	2.00E+01	2.19E-05	9.50E+00	2.08E-04	1.91E-06	9.50E+00	1.81E-05	8.33E-10	1.51E+01	1.25E-08	**2.26E-04**
Barium	3.80E+03	4.16E-03	NA		1.21E-04	NA		1.58E-07	NA		
Beryllium	9.20E-01	1.01E-06	NA		2.92E-08	NA		3.83E-11	8.40E+00	3.22E-10	3.22E-10
Cadmium	1.11E+01	1.22E-05	3.80E-01	4.62E-06	3.53E-08	3.80E-01	1.34E-08	4.62E-10	1.47E+01	6.79E-09	**4.64E-06**
Chromium	1.02E+02	1.12E-04	NA		3.24E-06	NA		4.25E-09	4.20E+01	1.78E-07	1.78E-07
Cobalt	1.51E+01	1.65E-05	NA		4.80E-07	NA		6.29E-10	9.80E+00	6.16E-09	6.16E-09
Copper	4.18E+02	4.58E-04	NA		1.33E-05	NA		1.74E-08	NA		
Iron	7.45E+04	8.16E-02	NA		2.37E-03	NA		3.10E-06	NA		
Lead	2.17E+03	2.38E-03	NA		6.90E-05	NA		9.04E-08	NA		
Manganese	1.11E+03	1.22E-03	NA		3.53E-05	NA		4.62E-08	NA		
Nickel	7.21E+01	7.90E-05	NA		2.29E-06	NA		3.00E-09	9.10E-01	2.73E-09	2.73E-09
Selenium	4.60E+00	5.04E-06	NA		1.46E-07	NA		1.92E-10	NA		
Silver	1.10E+00	1.21E-06	NA		3.50E-08	NA		4.58E-11	NA		
Thallium	4.90E+00	5.37E-06	NA		1.56E-07	NA		2.04E-10	NA		
Vanadium	6.42E+01	7.04E-05	NA		2.04E-06	NA		2.67E-09	NA		
Zinc	8.03E+03	8.80E-03	NA		2.55E-04	NA		3.34E-07	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Pesticides/PCBs											
4,4'-DDD	9.90E-03	1.08E-08	2.40E-01	2.60E-09	1.57E-09	2.40E-01	3.78E-10	4.12E-13	2.42E-01	9.95E-14	2.98E-09
4,4'-DDE	3.50E-03	3.84E-09	3.40E-01	1.30E-09	5.56E-10	3.40E-01	1.89E-10	1.46E-13	3.40E-01	4.95E-14	1.49E-09
4,4'-DDT	9.50E-03	1.04E-08	3.40E-01	3.54E-09	1.51E-09	3.40E-01	5.13E-10	3.96E-13	3.40E-01	1.34E-13	4.05E-09
Endrin	5.50E-03	6.03E-09	NA		8.74E-10	NA		2.29E-13	NA		
Endrin ketone	1.40E-02	1.53E-08	NA		2.22E-09	NA		5.83E-13	NA		
gamma-Chlordane	1.70E-03	1.86E-09	1.20E+00	2.24E-09	2.70E-10	1.20E+00	3.24E-10	7.08E-14	1.19E+00	8.42E-14	2.56E-09
Methoxychlor	9.90E-03	1.08E-08	NA		1.57E-09	NA		4.12E-13	NA		
SVOCs/VOCs											
2-Methylnaphthalene	1.70E-01	1.86E-07	NA		8.10E-08	NA		1.51E-07	NA		
Acenaphthylene	6.90E-01	7.56E-07	NA		3.29E-07	NA		2.87E-11	NA		
Anthracene	8.60E-01	9.42E-07	NA		4.10E-07	NA		5.46E-08	NA		
Benzo(a)anthracene	1.30E+00	1.42E-06	1.20E+00	1.71E-06	6.20E-07	1.20E+00	7.44E-07	5.41E-11	7.30E-01	3.95E-11	**2.45E-06**
Benzo(a)pyrene	2.60E+00	2.85E-06	1.20E+01	3.42E-05	1.24E-06	1.20E+01	1.49E-05	1.08E-10	7.30E+00	7.90E-10	**4.91E-05**
Benzo(b)fluoranthene	1.70E+00	1.86E-06	1.20E+00	2.24E-06	8.10E-07	1.20E+00	9.72E-07	7.08E-11	7.30E-01	5.17E-11	**3.21E-06**
Benzo(g,h,i)perylene	2.30E+00	2.52E-06	NA		1.10E-06	NA		9.58E-11	NA		
Benzo(k)fluoranthene	1.50E+00	1.64E-06	1.20E+00	1.97E-06	7.15E-07	1.20E+00	8.58E-07	6.25E-11	3.85E-01	2.40E-11	**2.83E-06**
Biphenyl (diphenyl)	1.60E-01	1.75E-07	NA		5.08E-08	NA		6.66E-12	NA		
Chrysene	1.80E+00	1.97E-06	1.20E-01	2.37E-07	8.58E-07	1.20E-01	1.03E-07	7.49E-11	3.85E-02	2.89E-12	3.40E-07
Fluoranthene	3.00E+00	3.29E-06	NA		1.43E-06	NA		1.25E-10	NA		
Fluorene	5.00E-01	5.48E-07	NA		2.38E-07	NA		4.88E-08	NA		
Indeno(1,2,3-c,d)pyrene	2.30E+00	2.52E-06	7.30E-01	1.84E-06	1.10E-06	7.30E-01	8.00E-07	9.58E-11	7.30E-01	6.99E-11	**2.64E-06**
Naphthalene	1.60E-01	1.75E-07	1.20E-01	2.10E-08	7.63E-08	1.20E-01	9.15E-09	1.43E-07	1.19E-01	1.70E-08	4.72E-08
Phenanthrene	4.40E+00	4.82E-06	NA		2.10E-06	NA		1.83E-10	NA		
Pyrene	4.40E+00	4.82E-06	NA		2.10E-06	NA		1.83E-10	NA		
Acetone	5.00E-02	5.48E-08	NA		1.59E-08	NA		2.53E-07	NA		
cis-1,2-Dichloroethene	2.00E-03	2.19E-09	NA		6.36E-10	NA		3.72E-08	NA		
Methyl ethyl ketone	2.10E-02	2.30E-08	NA		6.67E-09	NA		6.95E-08	NA		
Methylene chloride	4.00E-03	4.38E-09	1.40E-02	6.14E-11	1.27E-09	1.40E-02	1.78E-11	1.03E-07	3.50E-03	3.61E-10	4.40E-10
Toluene	9.00E-03	9.86E-09	NA		2.86E-09	NA		1.45E-07	NA		
Xylenes, total	5.00E-03	5.48E-09	NA		1.59E-09	NA		5.27E-08	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	3.51E-05	3.85E-11	1.50E+03	5.77E-08	3.35E-12	1.50E+03	5.02E-09	1.46E-15	1.50E+03	2.19E-12	6.27E-08
1,2,3,4,6,7,8-HpCDF	3.08E-05	3.38E-11	1.50E+03	5.06E-08	2.94E-12	1.50E+03	4.40E-09	1.28E-15	1.50E+03	1.92E-12	5.50E-08
1,2,3,4,7,8,9-HpCDF	2.83E-06	3.10E-12	1.50E+03	4.65E-09	2.70E-13	1.50E+03	4.05E-10	1.18E-16	1.50E+03	1.77E-13	5.06E-09
1,2,3,4,7,8-HxCDD	2.83E-06	3.10E-12	1.50E+04	4.65E-08	2.70E-13	1.50E+04	4.05E-09	1.18E-16	1.50E+04	1.77E-12	5.06E-08
1,2,3,4,7,8-HxCDF	1.74E-05	1.91E-11	1.50E+04	2.86E-07	1.66E-12	1.50E+04	2.49E-08	7.24E-16	1.50E+04	1.09E-11	3.11E-07
1,2,3,6,7,8-HxCDD	5.59E-06	6.13E-12	1.50E+04	9.19E-08	5.33E-13	1.50E+04	7.99E-09	2.33E-16	1.50E+04	3.49E-12	9.99E-08
1,2,3,6,7,8-HxCDF	1.13E-05	1.24E-11	1.50E+04	1.86E-07	1.08E-12	1.50E+04	1.62E-08	4.71E-16	1.50E+04	7.06E-12	2.02E-07
1,2,3,7,8,9-HxCDD	3.75E-06	4.11E-12	1.50E+04	6.16E-08	3.58E-13	1.50E+04	5.36E-09	1.56E-16	1.50E+04	2.34E-12	6.70E-08
1,2,3,7,8,9-HxCDF	3.79E-06	4.15E-12	1.50E+04	6.23E-08	3.61E-13	1.50E+04	5.42E-09	1.58E-16	1.50E+04	2.37E-12	6.77E-08
1,2,3,7,8-PeCDD	3.37E-06	3.69E-12	1.50E+05	5.54E-07	3.21E-13	1.50E+05	4.82E-08	1.40E-16	1.50E+05	2.10E-11	6.02E-07
1,2,3,7,8-PeCDF	3.91E-06	4.28E-12	7.50E+03	3.21E-08	3.73E-13	7.50E+03	2.80E-09	1.63E-16	7.50E+03	1.22E-12	3.49E-08
2,3,4,6,7,8-HxCDF	1.55E-05	1.70E-11	1.50E+04	2.55E-07	1.48E-12	1.50E+04	2.22E-08	6.45E-16	1.50E+04	9.68E-12	2.77E-07
2,3,4,7,8-PeCDF	3.32E-05	3.64E-11	7.50E+04	2.73E-06	3.17E-12	7.50E+04	2.37E-07	1.38E-15	7.50E+04	1.04E-10	**2.97E-06**
2,3,7,8-TCDD	8.98E-07	9.84E-13	1.50E+05	1.48E-07	8.56E-14	1.50E+05	1.28E-08	3.74E-17	1.50E+05	5.61E-12	1.60E-07
2,3,7,8-TCDF	8.22E-06	9.01E-12	1.50E+04	1.35E-07	7.84E-13	1.50E+04	1.18E-08	3.42E-16	1.50E+04	5.13E-12	1.47E-07

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
OCDD	3.57E-04	3.91E-10	1.50E+01	5.87E-09	3.40E-11	1.50E+01	5.11E-10	1.49E-14	1.50E+01	2.23E-13	6.38E-09
OCDF	1.88E-05	2.06E-11	1.50E+01	3.09E-10	1.79E-12	1.50E+01	2.69E-11	7.83E-16	1.50E+01	1.17E-14	3.36E-10
			Total Risk:	2.60E-04		**Total Risk:**	3.69E-05		**Total Risk:**	2.25E-07	**2.97E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **3E-04**

Table 1-36
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Residential Exposure Scenario - Future Child Resident Receptor - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Child Resident
	Receptor Age:	Child (0 to 6 yrs)

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	6	yr
Soil Ingestion Rate	IR	200	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	10	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	2900	cm2/day [soil]
Body Weight	BW	15	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Aluminum	1.35E+04	1.73E-01	1.00E+00	1.73E-01	5.01E-03	1.00E+00	5.01E-03	6.56E-06	1.40E-03	4.68E-03	**1.82E-01**
Antimony	2.16E+02	2.76E-03	4.00E-04	6.90E+00	8.01E-05	4.00E-04	2.00E-01	1.05E-07	NA		**7.10E+00**
Arsenic	2.00E+01	2.56E-04	3.00E-04	8.52E-01	2.22E-05	3.00E-04	7.42E-02	9.72E-09	8.57E-06	1.13E-03	**9.28E-01**
Barium	3.80E+03	4.86E-02	7.00E-02	6.94E-01	1.41E-03	7.00E-02	2.01E-02	1.85E-06	1.43E-04	1.29E-02	**7.27E-01**
Beryllium	9.20E-01	1.18E-05	2.00E-03	5.88E-03	3.41E-07	2.00E-03	1.71E-04	4.47E-10	5.71E-06	7.83E-05	6.13E-03
Cadmium	1.11E+01	1.42E-04	1.10E-05	1.29E+01	4.12E-07	1.10E-05	3.74E-02	5.39E-09	5.71E-06	9.44E-04	**1.29E+01**
Chromium	1.02E+02	1.30E-03	NA		3.78E-05	NA		4.95E-08	NA		
Cobalt	1.51E+01	1.93E-04	2.00E-02	9.65E-03	5.60E-06	2.00E-02	2.80E-04	7.34E-09	5.70E-06	1.29E-03	1.12E-02
Copper	4.18E+02	5.34E-03	4.00E-02	1.34E-01	1.55E-04	4.00E-02	3.87E-03	2.03E-07	NA		**1.37E-01**
Iron	7.45E+04	9.53E-01	3.00E-01	3.18E+00	2.76E-02	3.00E-01	9.21E-02	3.62E-05	NA		**3.27E+00**
Lead	2.17E+03	2.77E-02	NA		8.05E-04	NA		1.05E-06	NA		
Manganese	1.11E+03	1.42E-02	2.40E-02	5.91E-01	4.12E-04	2.40E-02	1.71E-02	5.39E-07	1.40E-05	3.85E-02	**6.47E-01**
Nickel	7.21E+01	9.22E-04	1.10E-02	8.38E-02	2.67E-05	1.10E-02	2.43E-03	3.50E-08	1.43E-05	2.45E-03	8.87E-02
Selenium	4.60E+00	5.88E-05	5.00E-03	1.18E-02	1.71E-06	5.00E-03	3.41E-04	2.23E-09	5.71E-03	3.91E-07	1.21E-02
Silver	1.10E+00	1.41E-05	5.00E-03	2.81E-03	4.08E-07	5.00E-03	8.16E-05	5.34E-10	NA		2.89E-03

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Thallium	4.90E+00	6.26E-05	6.60E-05	9.49E-01	1.82E-06	6.60E-05	2.75E-02	2.38E-09	NA		**9.77E-01**
Vanadium	6.42E+01	8.21E-04	1.00E-03	8.21E-01	2.38E-05	1.00E-03	2.38E-02	3.12E-08	NA		**8.45E-01**
Zinc	8.03E+03	1.03E-01	3.00E-01	3.42E-01	2.98E-03	3.00E-01	9.92E-03	3.90E-06	NA		**3.52E-01**
Pesticides/PCBs											
4,4'-DDD	9.90E-03	1.27E-07	NA		1.84E-08	NA		4.81E-12	NA		
4,4'-DDE	3.50E-03	4.47E-08	NA		6.49E-09	NA		1.70E-12	NA		
4,4'-DDT	9.50E-03	1.21E-07	5.00E-04	2.43E-04	1.76E-08	5.00E-04	3.52E-05	4.61E-12	5.00E-04	9.23E-09	2.78E-04
Endrin	5.50E-03	7.03E-08	3.00E-04	2.34E-04	1.02E-08	3.00E-04	3.40E-05	2.67E-12	3.00E-04	8.91E-09	2.68E-04
Endrin ketone	1.40E-02	1.79E-07	3.00E-04	5.97E-04	2.60E-08	3.00E-04	8.65E-05	6.80E-12	3.00E-04	2.27E-08	6.83E-04
gamma-Chlordane	1.70E-03	2.17E-08	3.30E-05	6.59E-04	3.15E-09	3.30E-05	9.55E-05	8.26E-13	2.00E-04	4.13E-09	7.54E-04
Methoxychlor	9.90E-03	1.27E-07	2.00E-05	6.33E-03	1.84E-08	2.00E-05	9.18E-04	4.81E-12	2.00E-05	2.40E-07	7.25E-03
SVOCs/VOCs											
2-Methylnaphthalene	1.70E-01	2.17E-06	4.00E-03	5.43E-04	9.45E-07	4.00E-03	2.36E-04	1.77E-06	NA		7.80E-04
Acenaphthylene	6.90E-01	8.82E-06	NA		3.84E-06	NA		3.35E-10	NA		
Anthracene	8.60E-01	1.10E-05	3.00E-01	3.67E-05	4.78E-06	3.00E-01	1.59E-05	6.37E-07	3.00E-01	2.12E-06	5.47E-05
Benzo(a)anthracene	1.30E+00	1.66E-05	NA		7.23E-06	NA		6.31E-10	NA		
Benzo(a)pyrene	2.60E+00	3.32E-05	NA		1.45E-05	NA		1.26E-09	NA		
Benzo(b)fluoranthene	1.70E+00	2.17E-05	NA		9.45E-06	NA		8.26E-10	NA		
Benzo(g,h,i)perylene	2.30E+00	2.94E-05	NA		1.28E-05	NA		1.12E-09	NA		
Benzo(k)fluoranthene	1.50E+00	1.92E-05	NA		8.34E-06	NA		7.29E-10	NA		
Biphenyl (diphenyl)	1.60E-01	2.05E-06	5.00E-02	4.09E-05	5.93E-07	5.00E-02	1.19E-05	7.77E-11	5.00E-02	1.55E-09	5.28E-05
Chrysene	1.80E+00	2.30E-05	NA		1.00E-05	NA		8.74E-10	NA		
Fluoranthene	3.00E+00	3.84E-05	4.00E-02	9.59E-04	1.67E-05	4.00E-02	4.17E-04	1.46E-09	4.00E-02	3.64E-08	1.38E-03
Fluorene	5.00E-01	6.39E-06	4.00E-02	1.60E-04	2.78E-06	4.00E-02	6.95E-05	5.69E-07	4.00E-02	1.42E-05	2.44E-04
Indeno(1,2,3-c,d)pyrene	2.30E+00	2.94E-05	NA		1.28E-05	NA		1.12E-09	NA		
Naphthalene	1.60E-01	2.05E-06	2.00E-02	1.02E-04	8.90E-07	2.00E-02	4.45E-05	1.66E-06	8.57E-04	1.94E-03	2.09E-03
Phenanthrene	4.40E+00	5.63E-05	NA		2.45E-05	NA		2.14E-09	NA		
Pyrene	4.40E+00	5.63E-05	3.00E-02	1.88E-03	2.45E-05	3.00E-02	8.16E-04	2.14E-09	3.00E-02	7.12E-08	2.69E-03
Acetone	5.00E-02	6.39E-07	9.00E-01	7.10E-07	1.85E-07	9.00E-01	2.06E-07	2.95E-06	9.00E-01	3.28E-06	4.20E-06
cis-1,2-Dichloroethene	2.00E-03	2.56E-08	1.00E-02	2.56E-06	7.42E-09	1.00E-02	7.42E-07	4.34E-07	1.00E-02	4.34E-05	4.67E-05
Methyl ethyl ketone	2.10E-02	2.68E-07	6.00E-01	4.47E-07	7.79E-08	6.00E-01	1.30E-07	8.11E-07	1.40E+00	5.79E-07	1.16E-06
Methylene chloride	4.00E-03	5.11E-08	6.00E-02	8.52E-07	1.48E-08	6.00E-02	2.47E-07	1.20E-06	1.14E-01	1.05E-05	1.16E-05
Toluene	9.00E-03	1.15E-07	2.00E-01	5.75E-07	3.34E-08	2.00E-01	1.67E-07	1.70E-06	8.57E-02	1.98E-05	2.05E-05
Xylenes, total	5.00E-03	6.39E-08	2.00E-01	3.20E-07	1.85E-08	2.00E-01	9.27E-08	6.15E-07	2.90E-02	2.12E-05	2.16E-05
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	3.51E-05	4.49E-10	NA		3.90E-11	NA		1.71E-14	1.14E-08	1.49E-06	1.49E-06
1,2,3,4,6,7,8-HpCDF	3.08E-05	3.94E-10	NA		3.43E-11	NA		1.50E-14	1.14E-08	1.31E-06	1.31E-06
1,2,3,4,7,8,9-HpCDF	2.83E-06	3.62E-11	NA		3.15E-12	NA		1.37E-15	1.14E-08	1.20E-07	1.20E-07
1,2,3,4,7,8-HxCDD	2.83E-06	3.62E-11	NA		3.15E-12	NA		1.37E-15	1.14E-08	1.20E-07	1.20E-07
1,2,3,4,7,8-HxCDF	1.74E-05	2.22E-10	NA		1.94E-11	NA		8.45E-15	1.14E-08	7.40E-07	7.40E-07
1,2,3,6,7,8-HxCDD	5.59E-06	7.15E-11	NA		6.22E-12	NA		2.72E-15	1.14E-08	2.38E-07	2.38E-07
1,2,3,6,7,8-HxCDF	1.13E-05	1.44E-10	NA		1.26E-11	NA		5.49E-15	1.14E-08	4.80E-07	4.80E-07
1,2,3,7,8,9-HxCDD	3.75E-06	4.79E-11	NA		4.17E-12	NA		1.82E-15	1.14E-08	1.59E-07	1.59E-07
1,2,3,7,8,9-HxCDF	3.79E-06	4.85E-11	NA		4.22E-12	NA		1.84E-15	1.14E-08	1.61E-07	1.61E-07
1,2,3,7,8-PeCDD	3.37E-06	4.31E-11	NA		3.75E-12	NA		1.64E-15	1.14E-08	1.43E-07	1.43E-07

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
1,2,3,7,8-PeCDF	3.91E-06	5.00E-11	NA		4.35E-12	NA		1.90E-15	1.14E-08	1.66E-07	1.66E-07
2,3,4,6,7,8-HxCDF	1.55E-05	1.98E-10	NA		1.72E-11	NA		7.53E-15	1.14E-08	6.59E-07	6.59E-07
2,3,4,7,8-PeCDF	3.32E-05	4.24E-10	NA		3.69E-11	NA		1.61E-14	1.14E-08	1.41E-06	1.41E-06
2,3,7,8-TCDD	8.98E-07	1.15E-11	NA		9.99E-13	NA		4.36E-16	1.14E-08	3.82E-08	3.82E-08
2,3,7,8-TCDF	8.22E-06	1.05E-10	NA		9.14E-12	NA		3.99E-15	1.14E-08	3.49E-07	3.49E-07
OCDD	3.57E-04	4.56E-09	NA		3.97E-10	NA		1.73E-13	1.14E-08	1.52E-05	1.52E-05
OCDF	1.88E-05	2.40E-10	NA		2.09E-11	NA		9.13E-15	1.14E-08	7.99E-07	7.99E-07
		Total Risk (Hazard Index):		28	**Total Risk (Hazard Index):**		0.52	**Total Risk (Hazard Index):**		0.06	**28.2**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-Carcinogenic Risk (Hazard Index) Across All Exposure Routes : **28**

Table 1-37
Cancer Risk Results Detailed Summary of Risk Drivers - Shallow Soil - Future Adult/Child Resident - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	**8.9E-05**	**1.1E-05**	2.1E-08	**1.0E-04**	75%	**2.1E-04**	**1.8E-05**	1.3E-08	**2.3E-04**	76%
Cadmium	**2.0E-06**	7.9E-09	1.2E-08	**2.0E-06**	1%	**4.6E-06**	1.3E-08	6.8E-09	**4.6E-06**	2%
Subtotal Metals	**9.1E-05**	**1.1E-05**	3.5E-07	**1.0E-04**	77%	**2.1E-04**	**1.8E-05**	2.1E-07	**2.3E-04**	78%
SVOCs/VOCs										
Benzo(a)anthracene	7.3E-07	4.4E-07	6.8E-11	**1.2E-06**	0.9%	**1.7E-06**	7.4E-07	4.0E-11	**2.5E-06**	1%
Benzo(a)pyrene	**1.5E-05**	**8.8E-06**	1.4E-09	**2.3E-05**	18%	**3.4E-05**	**1.5E-05**	7.9E-10	**4.9E-05**	17%
Benzo(b)fluoranthene	9.6E-07	5.7E-07	8.9E-11	**1.5E-06**	1%	**2.2E-06**	9.7E-07	5.2E-11	**3.2E-06**	1%
Benzo(k)fluoranthene	8.5E-07	5.1E-07	4.1E-11	**1.4E-06**	1%	**2.0E-06**	8.6E-07	2.4E-11	**2.8E-06**	1%
Indeno(1,2,3-c,d)pyrene	7.9E-07	4.7E-07	1.2E-10	**1.3E-06**	0.9%	**1.8E-06**	8.0E-07	7.0E-11	**2.6E-06**	1%
Subtotal SVOCs/VOCs	**1.8E-05**	**1.1E-05**	3.1E-08	**2.9E-05**	22%	**4.2E-05**	**1.8E-05**	1.8E-08	**6.1E-05**	20%
Dioxans/Furans										
2,3,4,7,8-PeCDF	**1.2E-06**	1.4E-07	1.8E-10	**1.3E-06**	1%	**2.7E-06**	2.4E-07	1.0E-10	**3.0E-06**	1%
Subtotal Dioxans/Furans	**2.0E-06**	2.4E-07	3.1E-10	**2.3E-06**	2%	**4.7E-06**	4.1E-07	1.8E-10	**5.1E-06**	2%
Total:	**1.1E-04**	**2.2E-05**	3.9E-07	**1.3E-04**		**2.6E-04**	**3.7E-05**	2.3E-07	**3.0E-04**	

Total Estimated Cancer Risk Across All Exposure Routes:	**1E-04**				**3E-04**
Sum of Adult and Child Excess Lifetime Cancer Risk (30 year exposure):		**3.7E-04**	**5.9E-05**	**6.1E-07**	**4.30E-04**
Total Estimated Adult plus Child Cancer Risk Across All Exposure Routes:					**4E-04**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total cancer risk for all chemicals evaluated.

Table 1-38
Noncancer Risk Results Detailed Summary of Risk Drivers - Shallow Soil - Future Adult/Child Resident - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Non-Carcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Aluminum	1.8E-02	7.4E-04	2.0E-03	2.1E-02	1%	**1.7E-01**	5.0E-03	4.7E-03	**1.8E-01**	1%
Antimony	**7.4E-01**	3.0E-02		**7.7E-01**	45%	**6.9E+00**	**2.0E-01**		**7.1E+00**	25%
Arsenic	9.1E-02	1.1E-02	4.9E-04	**1.0E-01**	6%	**8.5E-01**	7.4E-02	1.1E-03	**9.3E-01**	3%
Barium	7.4E-02	3.0E-03	5.5E-03	8.3E-02	5%	**6.9E-01**	2.0E-02	1.3E-02	**7.3E-01**	3%
Cadmium	3.0E-02	1.2E-04	4.0E-04	3.1E-02	2%	**1.3E+01**	3.7E-02	9.4E-04	**1.3E+01**	46%
Copper	1.4E-02	5.7E-04		1.5E-02	0.9%	**1.3E-01**	3.9E-03		**1.4E-01**	0.5%
Iron	**3.4E-01**	1.4E-02		**3.5E-01**	21%	**3.2E+00**	9.2E-02		**3.3E+00**	12%
Manganese	6.3E-02	2.5E-03	1.7E-02	8.2E-02	5%	**5.9E-01**	1.7E-02	3.9E-02	**6.5E-01**	2%
Thallium	**1.0E-01**	4.1E-03		**1.1E-01**	6%	**9.5E-01**	2.8E-02		**9.8E-01**	3%
Vanadium	8.8E-02	3.5E-03		9.1E-02	5%	**8.2E-01**	2.4E-02		**8.4E-01**	3%
Zinc	3.7E-02	1.5E-03		3.8E-02	2%	**3.4E-01**	9.9E-03		**3.5E-01**	1%
Subtotal Metals	**1.6E+00**	7.0E-02	2.7E-02	**1.7E+00**	100%	**2.8E+01**	**5.1E-01**	6.2E-02	**2.8E+01**	100%
Total:	**1.6**	0.1	0.03	**1.7**		**28**	**0.5**	0.1	**28.2**	

Total Estimated Hazard Index Across All Exposure Routes: **2** **28**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total hazard quotient for all chemicals evaluated.

Table 1-39
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Occupational Exposure Scenario - Industrial Worker Receptor - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Occupational
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Industrial Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	25	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5700	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	25	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
Metals											
Aluminum	1.35E+04	4.72E-03	NA		5.38E-04	NA		7.17E-07	NA		
Antimony	2.16E+02	7.55E-05	NA		8.60E-06	NA		1.15E-08	NA		
Arsenic	2.00E+01	6.99E-06	9.50E+00	6.64E-05	2.39E-06	9.50E+00	2.27E-05	1.06E-09	1.51E+01	1.60E-08	**8.91E-05**
Barium	3.80E+03	1.33E-03	NA		1.51E-04	NA		2.02E-07	NA		
Beryllium	9.20E-01	3.21E-07	NA		3.67E-08	NA		4.89E-11	8.40E+00	4.10E-10	4.10E-10
Cadmium	1.11E+01	3.88E-06	3.80E-01	1.47E-06	4.42E-08	3.80E-01	1.68E-08	5.90E-10	1.47E+01	8.67E-09	**1.50E-06**
Chromium	1.02E+02	3.56E-05	NA		4.06E-06	NA		5.42E-09	4.20E+01	2.28E-07	2.28E-07
Cobalt	1.51E+01	5.28E-06	NA		6.02E-07	NA		8.02E-10	9.80E+00	7.86E-09	7.86E-09
Copper	4.18E+02	1.46E-04	NA		1.67E-05	NA		2.22E-08	NA		
Iron	7.45E+04	2.60E-02	NA		2.97E-03	NA		3.96E-06	NA		
Lead	2.17E+03	7.58E-04	NA		8.64E-05	NA		1.15E-07	NA		
Manganese	1.11E+03	3.88E-04	NA		4.42E-05	NA		5.90E-08	NA		
Nickel	7.21E+01	2.52E-05	NA		2.87E-06	NA		3.83E-09	9.10E-01	3.48E-09	3.48E-09
Selenium	4.60E+00	1.61E-06	NA		1.83E-07	NA		2.44E-10	NA		
Silver	1.10E+00	3.84E-07	NA		4.38E-08	NA		5.84E-11	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Thallium	4.90E+00	1.71E-06	NA		1.95E-07	NA		2.60E-10	NA		
Vanadium	6.42E+01	2.24E-05	NA		2.56E-06	NA		3.41E-09	NA		
Zinc	8.03E+03	2.81E-03	NA		3.20E-04	NA		4.26E-07	NA		
Pesticides/PCBs											
4,4'-DDD	9.90E-03	3.46E-09	2.40E-01	8.30E-10	1.97E-09	2.40E-01	4.73E-10	5.26E-13	2.42E-01	1.27E-13	1.30E-09
4,4'-DDE	3.50E-03	1.22E-09	3.40E-01	4.16E-10	6.97E-10	3.40E-01	2.37E-10	1.86E-13	3.40E-01	6.31E-14	6.53E-10
4,4'-DDT	9.50E-03	3.32E-09	3.40E-01	1.13E-09	1.89E-09	3.40E-01	6.43E-10	5.05E-13	3.40E-01	1.71E-13	1.77E-09
Endrin	5.50E-03	1.92E-09	NA		1.10E-09	NA		2.92E-13	NA		
Endrin ketone	1.40E-02	4.89E-09	NA		2.79E-09	NA		7.44E-13	NA		
gamma-Chlordane	1.70E-03	5.94E-10	1.20E+00	7.13E-10	3.39E-10	1.20E+00	4.06E-10	9.03E-14	1.19E+00	1.07E-13	1.12E-09
Methoxychlor	9.90E-03	3.46E-09	NA		1.97E-09	NA		5.26E-13	NA		
SVOCs/VOCs											
2-Methylnaphthalene	1.70E-01	5.94E-08	NA		1.02E-07	NA		1.93E-07	NA		
Acenaphthylene	6.90E-01	2.41E-07	NA		4.12E-07	NA		3.66E-11	NA		
Anthracene	8.60E-01	3.01E-07	NA		5.14E-07	NA		6.96E-08	NA		
Benzo(a)anthracene	1.30E+00	4.54E-07	1.20E+00	5.45E-07	7.77E-07	1.20E+00	9.32E-07	6.90E-11	7.30E-01	5.04E-11	**1.48E-06**
Benzo(a)pyrene	2.60E+00	9.09E-07	1.20E+01	1.09E-05	1.55E-06	1.20E+01	1.86E-05	1.38E-10	7.30E+00	1.01E-09	**2.95E-05**
Benzo(b)fluoranthene	1.70E+00	5.94E-07	1.20E+00	7.13E-07	1.02E-06	1.20E+00	1.22E-06	9.03E-11	7.30E-01	6.59E-11	**1.93E-06**
Benzo(g,h,i)perylene	2.30E+00	8.04E-07	NA		1.37E-06	NA		1.22E-10	NA		
Benzo(k)fluoranthene	1.50E+00	5.24E-07	1.20E+00	6.29E-07	8.96E-07	1.20E+00	1.08E-06	7.97E-11	3.85E-01	3.07E-11	**1.70E-06**
Biphenyl (diphenyl)	1.60E-01	5.59E-08	NA		6.37E-08	NA		8.50E-12	NA		
Chrysene	1.80E+00	6.29E-07	1.20E-01	7.55E-08	1.08E-06	1.20E-01	1.29E-07	9.56E-11	3.85E-02	3.68E-12	2.05E-07
Fluoranthene	3.00E+00	1.05E-06	NA		1.79E-06	NA		1.59E-10	NA		
Fluorene	5.00E-01	1.75E-07	NA		2.99E-07	NA		6.22E-08	NA		
Indeno(1,2,3-c,d)pyrene	2.30E+00	8.04E-07	7.30E-01	5.87E-07	1.37E-06	7.30E-01	1.00E-06	1.22E-10	7.30E-01	8.92E-11	**1.59E-06**
Naphthalene	1.60E-01	5.59E-08	1.20E-01	6.71E-09	9.56E-08	1.20E-01	1.15E-08	1.82E-07	1.19E-01	2.16E-08	3.98E-08
Phenanthrene	4.40E+00	1.54E-06	NA		2.63E-06	NA		2.34E-10	NA		
Pyrene	4.40E+00	1.54E-06	NA		2.63E-06	NA		2.34E-10	NA		
Acetone	5.00E-02	1.75E-08	NA		1.99E-08	NA		3.23E-07	NA		
cis-1,2-Dichloroethene	2.00E-03	6.99E-10	NA		7.97E-10	NA		4.74E-08	NA		
Methyl ethyl ketone	2.10E-02	7.34E-09	NA		8.37E-09	NA		8.87E-08	NA		
Methylene chloride	4.00E-03	1.40E-09	1.40E-02	1.96E-11	1.59E-09	1.40E-02	2.23E-11	1.31E-07	3.50E-03	4.60E-10	5.02E-10
Toluene	9.00E-03	3.15E-09	NA		3.59E-09	NA		1.85E-07	NA		
Xylenes, total	5.00E-03	1.75E-09	NA		1.99E-09	NA		6.72E-08	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	3.51E-05	1.23E-11	1.50E+03	1.84E-08	4.19E-12	1.50E+03	6.29E-09	1.86E-15	1.50E+03	2.80E-12	2.47E-08
1,2,3,4,6,7,8-HpCDF	3.08E-05	1.08E-11	1.50E+03	1.61E-08	3.68E-12	1.50E+03	5.52E-09	1.64E-15	1.50E+03	2.45E-12	2.17E-08
1,2,3,4,7,8,9-HpCDF	2.83E-06	9.89E-13	1.50E+03	1.48E-09	3.38E-13	1.50E+03	5.07E-10	1.50E-16	1.50E+03	2.25E-13	1.99E-09
1,2,3,4,7,8-HxCDD	2.83E-06	9.89E-13	1.50E+04	1.48E-08	3.38E-13	1.50E+04	5.07E-09	1.50E-16	1.50E+04	2.25E-12	1.99E-08
1,2,3,4,7,8-HxCDF	1.74E-05	6.08E-12	1.50E+04	9.12E-08	2.08E-12	1.50E+04	3.12E-08	9.24E-16	1.50E+04	1.39E-11	1.22E-07
1,2,3,6,7,8-HxCDD	5.59E-06	1.95E-12	1.50E+04	2.93E-08	6.68E-13	1.50E+04	1.00E-08	2.97E-16	1.50E+04	4.45E-12	3.93E-08
1,2,3,6,7,8-HxCDF	1.13E-05	3.95E-12	1.50E+04	5.92E-08	1.35E-12	1.50E+04	2.03E-08	6.00E-16	1.50E+04	9.00E-12	7.95E-08
1,2,3,7,8,9-HxCDD	3.75E-06	1.31E-12	1.50E+04	1.97E-08	4.48E-13	1.50E+04	6.72E-09	1.99E-16	1.50E+04	2.99E-12	2.64E-08
1,2,3,7,8,9-HxCDF	3.79E-06	1.32E-12	1.50E+04	1.99E-08	4.53E-13	1.50E+04	6.79E-09	2.01E-16	1.50E+04	3.02E-12	2.67E-08

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
1,2,3,7,8-PeCDD	3.37E-06	1.18E-12	1.50E+05	1.77E-07	4.03E-13	1.50E+05	6.04E-08	1.79E-16	1.50E+05	2.68E-11	2.37E-07
1,2,3,7,8-PeCDF	3.91E-06	1.37E-12	7.50E+03	1.02E-08	4.67E-13	7.50E+03	3.50E-09	2.08E-16	7.50E+03	1.56E-12	1.38E-08
2,3,4,6,7,8-HxCDF	1.55E-05	5.42E-12	1.50E+04	8.12E-08	1.85E-12	1.50E+04	2.78E-08	8.23E-16	1.50E+04	1.23E-11	1.09E-07
2,3,4,7,8-PeCDF	3.32E-05	1.16E-11	7.50E+04	8.70E-07	3.97E-12	7.50E+04	2.98E-07	1.76E-15	7.50E+04	1.32E-10	**1.17E-06**
2,3,7,8-TCDD	8.98E-07	3.14E-13	1.50E+05	4.71E-08	1.07E-13	1.50E+05	1.61E-08	4.77E-17	1.50E+05	7.15E-12	6.32E-08
2,3,7,8-TCDF	8.22E-06	2.87E-12	1.50E+04	4.31E-08	9.82E-13	1.50E+04	1.47E-08	4.37E-16	1.50E+04	6.55E-12	5.78E-08
OCDD	3.57E-04	1.25E-10	1.50E+01	1.87E-09	4.27E-11	1.50E+01	6.40E-10	1.90E-14	1.50E+01	2.84E-13	2.51E-09
OCDF	1.88E-05	6.57E-12	1.50E+01	9.85E-11	2.25E-12	1.50E+01	3.37E-11	9.98E-16	1.50E+01	1.50E-14	1.32E-10
			Total Risk:	8.28E-05		**Total Risk:**	4.63E-05		**Total Risk:**	2.87E-07	**1.29E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **1E-04**

Table 1-40
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Occupational Exposure Scenario - Industrial Worker Receptor - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Occupational
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Industrial Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	25	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5700	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	25	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Aluminum	1.35E+04	1.32E-02	1.00E+00	1.32E-02	1.51E-03	1.00E+00	1.51E-03	2.01E-06	1.40E-03	1.43E-03	1.61E-02
Antimony	2.16E+02	2.11E-04	4.00E-04	5.28E-01	2.41E-05	4.00E-04	6.02E-02	3.21E-08	NA		5.89E-01
Arsenic	2.00E+01	1.96E-05	3.00E-04	6.52E-02	6.69E-06	3.00E-04	2.23E-02	2.97E-09	8.57E-06	3.47E-04	8.79E-02
Barium	3.80E+03	3.72E-03	7.00E-02	5.31E-02	4.24E-04	7.00E-02	6.06E-03	5.65E-07	1.43E-04	3.96E-03	6.31E-02
Beryllium	9.20E-01	9.00E-07	2.00E-03	4.50E-04	1.03E-07	2.00E-03	5.13E-05	1.37E-10	5.71E-06	2.40E-05	5.25E-04
Cadmium	1.11E+01	1.09E-05	5.00E-04	2.17E-02	1.24E-07	5.00E-04	2.48E-04	1.65E-09	5.71E-06	2.89E-04	2.23E-02
Chromium	1.02E+02	9.98E-05	NA		1.14E-05	NA		1.52E-08	NA		
Cobalt	1.51E+01	1.48E-05	2.00E-02	7.39E-04	1.68E-06	2.00E-02	8.42E-05	2.25E-09	5.70E-06	3.94E-04	1.22E-03
Copper	4.18E+02	4.09E-04	4.00E-02	1.02E-02	4.66E-05	4.00E-02	1.17E-03	6.22E-08	NA		1.14E-02
Iron	7.45E+04	7.29E-02	3.00E-01	2.43E-01	8.31E-03	3.00E-01	2.77E-02	1.11E-05	NA		2.71E-01
Lead	2.17E+03	2.12E-03	NA		2.42E-04	NA		3.23E-07	NA		
Manganese	1.11E+03	1.09E-03	2.40E-02	4.53E-02	1.24E-04	2.40E-02	5.16E-03	1.65E-07	1.40E-05	1.18E-02	6.22E-02

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Nickel	7.21E+01	7.05E-05	2.00E-02	3.53E-03	8.04E-06	2.00E-02	4.02E-04	1.07E-08	1.43E-05	7.51E-04	4.68E-03
Selenium	4.60E+00	4.50E-06	5.00E-03	9.00E-04	5.13E-07	5.00E-03	1.03E-04	6.84E-10	5.71E-03	1.20E-07	1.00E-03
Silver	1.10E+00	1.08E-06	5.00E-03	2.15E-04	1.23E-07	5.00E-03	2.45E-05	1.64E-10	NA		2.40E-04
Thallium	4.90E+00	4.79E-06	6.60E-05	7.26E-02	5.47E-07	6.60E-05	8.28E-03	7.29E-10	NA		8.09E-02
Vanadium	6.42E+01	6.28E-05	1.00E-03	6.28E-02	7.16E-06	1.00E-03	7.16E-03	9.55E-09	NA		7.00E-02
Zinc	8.03E+03	7.86E-03	3.00E-01	2.62E-02	8.96E-04	3.00E-01	2.99E-03	1.19E-06	NA		2.92E-02
Pesticides/PCBs											
4,4'-DDD	9.90E-03	9.69E-09	NA		5.52E-09	NA		1.47E-12	NA		
4,4'-DDE	3.50E-03	3.42E-09	NA		1.95E-09	NA		5.20E-13	NA		
4,4'-DDT	9.50E-03	9.30E-09	5.00E-04	1.86E-05	5.30E-09	5.00E-04	1.06E-05	1.41E-12	5.00E-04	2.83E-09	2.92E-05
Endrin	5.50E-03	5.38E-09	3.00E-04	1.79E-05	3.07E-09	3.00E-04	1.02E-05	8.18E-13	3.00E-04	2.73E-09	2.82E-05
Endrin ketone	1.40E-02	1.37E-08	3.00E-04	4.57E-05	7.81E-09	3.00E-04	2.60E-05	2.08E-12	3.00E-04	6.94E-09	7.17E-05
gamma-Chlordane	1.70E-03	1.66E-09	5.00E-04	3.33E-06	9.48E-10	5.00E-04	1.90E-06	2.53E-13	2.00E-04	1.26E-09	5.22E-06
Methoxychlor	9.90E-03	9.69E-09	5.00E-03	1.94E-06	5.52E-09	5.00E-03	1.10E-06	1.47E-12	5.00E-03	2.94E-10	3.04E-06
SVOCs/VOCs											
2-Methylnaphthalene	1.70E-01	1.66E-07	4.00E-03	4.16E-05	2.84E-07	4.00E-03	7.11E-05	5.41E-07	NA		1.13E-04
Acenaphthylene	6.90E-01	6.75E-07	NA		1.15E-06	NA		1.03E-10	NA		
Anthracene	8.60E-01	8.41E-07	3.00E-01	2.80E-06	1.44E-06	3.00E-01	4.80E-06	1.95E-07	3.00E-01	6.50E-07	8.25E-06
Benzo(a)anthracene	1.30E+00	1.27E-06	NA		2.18E-06	NA		1.93E-10	NA		
Benzo(a)pyrene	2.60E+00	2.54E-06	NA		4.35E-06	NA		3.87E-10	NA		
Benzo(b)fluoranthene	1.70E+00	1.66E-06	NA		2.84E-06	NA		2.53E-10	NA		
Benzo(g,h,i)perylene	2.30E+00	2.25E-06	NA		3.85E-06	NA		3.42E-10	NA		
Benzo(k)fluoranthene	1.50E+00	1.47E-06	NA		2.51E-06	NA		2.23E-10	NA		
Biphenyl (diphenyl)	1.60E-01	1.57E-07	5.00E-02	3.13E-06	1.78E-07	5.00E-02	3.57E-06	2.38E-11	5.00E-02	4.76E-10	6.70E-06
Chrysene	1.80E+00	1.76E-06	NA		3.01E-06	NA		2.68E-10	NA		
Fluoranthene	3.00E+00	2.94E-06	4.00E-02	7.34E-05	5.02E-06	4.00E-02	1.25E-04	4.46E-10	4.00E-02	1.12E-08	1.99E-04
Fluorene	5.00E-01	4.89E-07	4.00E-02	1.22E-05	8.37E-07	4.00E-02	2.09E-05	1.74E-07	4.00E-02	4.36E-06	3.75E-05
Indeno(1,2,3-c,d)pyrene	2.30E+00	2.25E-06	NA		3.85E-06	NA		3.42E-10	NA		
Naphthalene	1.60E-01	1.57E-07	2.00E-02	7.83E-06	2.68E-07	2.00E-02	1.34E-05	5.09E-07	8.57E-04	5.94E-04	6.15E-04
Phenanthrene	4.40E+00	4.31E-06	NA		7.36E-06	NA		6.54E-10	NA		
Pyrene	4.40E+00	4.31E-06	3.00E-02	1.44E-04	7.36E-06	3.00E-02	2.45E-04	6.54E-10	3.00E-02	2.18E-08	3.89E-04
Acetone	5.00E-02	4.89E-08	9.00E-01	5.44E-08	5.58E-08	9.00E-01	6.20E-08	9.05E-07	9.00E-01	1.01E-06	1.12E-06
cis-1,2-Dichloroethene	2.00E-03	1.96E-09	1.00E-02	1.96E-07	2.23E-09	1.00E-02	2.23E-07	1.33E-07	1.00E-02	1.33E-05	1.37E-05
Methyl ethyl ketone	2.10E-02	2.05E-08	6.00E-01	3.42E-08	2.34E-08	6.00E-01	3.90E-08	2.48E-07	1.40E+00	1.77E-07	2.51E-07
Methylene chloride	4.00E-03	3.91E-09	6.00E-02	6.52E-08	4.46E-09	6.00E-02	7.44E-08	3.68E-07	1.14E-01	3.22E-06	3.36E-06
Toluene	9.00E-03	8.81E-09	2.00E-01	4.40E-08	1.00E-08	2.00E-01	5.02E-08	5.19E-07	8.57E-02	6.06E-06	6.15E-06
Xylenes, total	5.00E-03	4.89E-09	2.00E-01	2.45E-08	5.58E-09	2.00E-01	2.79E-08	1.88E-07	2.90E-02	6.49E-06	6.54E-06
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	3.51E-05	3.43E-11	NA		1.17E-11	NA		5.22E-15	1.14E-08	4.57E-07	4.57E-07
1,2,3,4,6,7,8-HpCDF	3.08E-05	3.01E-11	NA		1.03E-11	NA		4.58E-15	1.14E-08	4.01E-07	4.01E-07

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
1,2,3,4,7,8,9-HpCDF	2.83E-06	2.77E-12	NA		9.47E-13	NA		4.21E-16	1.14E-08	3.68E-08	3.68E-08
1,2,3,4,7,8-HxCDD	2.83E-06	2.77E-12	NA		9.47E-13	NA		4.21E-16	1.14E-08	3.68E-08	3.68E-08
1,2,3,4,7,8-HxCDF	1.74E-05	1.70E-11	NA		5.82E-12	NA		2.59E-15	1.14E-08	2.26E-07	2.26E-07
1,2,3,6,7,8-HxCDD	5.59E-06	5.47E-12	NA		1.87E-12	NA		8.31E-16	1.14E-08	7.27E-08	7.27E-08
1,2,3,6,7,8-HxCDF	1.13E-05	1.11E-11	NA		3.78E-12	NA		1.68E-15	1.14E-08	1.47E-07	1.47E-07
1,2,3,7,8,9-HxCDD	3.75E-06	3.67E-12	NA		1.25E-12	NA		5.58E-16	1.14E-08	4.88E-08	4.88E-08
1,2,3,7,8,9-HxCDF	3.79E-06	3.71E-12	NA		1.27E-12	NA		5.64E-16	1.14E-08	4.93E-08	4.93E-08
1,2,3,7,8-PeCDD	3.37E-06	3.30E-12	NA		1.13E-12	NA		5.01E-16	1.14E-08	4.38E-08	4.38E-08
1,2,3,7,8-PeCDF	3.91E-06	3.83E-12	NA		1.31E-12	NA		5.81E-16	1.14E-08	5.09E-08	5.09E-08
2,3,4,6,7,8-HxCDF	1.55E-05	1.52E-11	NA		5.19E-12	NA		2.30E-15	1.14E-08	2.02E-07	2.02E-07
2,3,4,7,8-PeCDF	3.32E-05	3.25E-11	NA		1.11E-11	NA		4.94E-15	1.14E-08	4.32E-07	4.32E-07
2,3,7,8-TCDD	8.98E-07	8.79E-13	NA		3.01E-13	NA		1.34E-16	1.14E-08	1.17E-08	1.17E-08
2,3,7,8-TCDF	8.22E-06	8.04E-12	NA		2.75E-12	NA		1.22E-15	1.14E-08	1.07E-07	1.07E-07
OCDD	3.57E-04	3.49E-10	NA		1.19E-10	NA		5.31E-14	1.14E-08	4.65E-06	4.65E-06
OCDF	1.88E-05	1.84E-11	NA		6.29E-12	NA		2.80E-15	1.14E-08	2.45E-07	2.45E-07
		Total Risk (Hazard Index):		1.15E+00	**Total Risk (Hazard Index):**		1.44E-01	**Total Risk (Hazard Index):**		1.96E-02	**1.31E+00**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **1**

Table 1-41
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Construction Exposure Scenario - Future Construction Worker Receptor - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Construction Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	1	yr
Soil Ingestion Rate	IR	330	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5700	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.8	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Metals											
Aluminum	1.35E+04	6.23E-04	NA		8.60E-05	NA		2.87E-08	NA		
Antimony	2.16E+02	9.96E-06	NA		1.38E-06	NA		4.59E-10	NA		
Arsenic	2.00E+01	9.23E-07	9.50E+00	8.76E-06	3.82E-07	9.50E+00	3.63E-06	4.25E-11	1.51E+01	6.39E-10	**1.24E-05**
Barium	3.80E+03	1.75E-04	NA		2.42E-05	NA		8.07E-09	NA		
Beryllium	9.20E-01	4.24E-08	NA		5.86E-09	NA		1.95E-12	8.40E+00	1.64E-11	1.64E-11
Cadmium	1.11E+01	5.12E-07	3.80E-01	1.95E-07	7.08E-09	3.80E-01	2.69E-09	2.36E-11	1.47E+01	3.47E-10	1.98E-07
Chromium	1.02E+02	4.71E-06	NA		6.50E-07	NA		2.17E-10	4.20E+01	9.10E-09	9.10E-09
Cobalt	1.51E+01	6.97E-07	NA		9.62E-08	NA		3.21E-11	9.80E+00	3.14E-10	3.14E-10
Copper	4.18E+02	1.93E-05	NA		2.66E-06	NA		8.88E-10	NA		
Iron	7.45E+04	3.44E-03	NA		4.75E-04	NA		1.58E-07	NA		
Lead	2.17E+03	1.00E-04	NA		1.38E-05	NA		4.61E-09	NA		
Manganese	1.11E+03	5.12E-05	NA		7.08E-06	NA		2.36E-09	NA		
Nickel	7.21E+01	3.33E-06	NA		4.60E-07	NA		1.53E-10	9.10E-01	1.39E-10	1.39E-10
Selenium	4.60E+00	2.12E-07	NA		2.93E-08	NA		9.77E-12	NA		
Silver	1.10E+00	5.07E-08	NA		7.01E-09	NA		2.34E-12	NA		
Thallium	4.90E+00	2.26E-07	NA		3.12E-08	NA		1.04E-11	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
Vanadium	6.42E+01	2.96E-06	NA		4.09E-07	NA		1.36E-10	NA		
Zinc	8.03E+03	3.70E-04	NA		5.12E-05	NA		1.71E-08	NA		
Pesticides/PCBs											
4,4'-DDD	9.90E-03	4.57E-10	2.40E-01	1.10E-10	3.16E-10	2.40E-01	7.57E-11	2.10E-14	2.42E-01	5.08E-15	1.85E-10
4,4'-DDE	3.50E-03	1.61E-10	3.40E-01	5.49E-11	1.12E-10	3.40E-01	3.79E-11	7.44E-15	3.40E-01	2.52E-15	9.28E-11
4,4'-DDT	9.50E-03	4.38E-10	3.40E-01	1.49E-10	3.03E-10	3.40E-01	1.03E-10	2.02E-14	3.40E-01	6.85E-15	2.52E-10
Endrin	5.50E-03	2.54E-10	NA		1.75E-10	NA		1.17E-14	NA		
Endrin ketone	1.40E-02	6.46E-10	NA		4.46E-10	NA		2.97E-14	NA		
gamma-Chlordane	1.70E-03	7.84E-11	1.20E+00	9.41E-11	5.42E-11	1.20E+00	6.50E-11	3.61E-15	1.19E+00	4.30E-15	1.59E-10
Methoxychlor	9.90E-03	4.57E-10	NA		3.16E-10	NA		2.10E-14	NA		
SVOCs/VOCs											
2-Methylnaphthalene	1.70E-01	7.84E-09	NA		1.63E-08	NA		7.73E-09	NA		
Acenaphthylene	6.90E-01	3.18E-08	NA		6.60E-08	NA		1.47E-12	NA		
Anthracene	8.60E-01	3.97E-08	NA		8.22E-08	NA		2.79E-09	NA		
Benzo(a)anthracene	1.30E+00	6.00E-08	1.20E+00	7.20E-08	1.24E-07	1.20E+00	1.49E-07	2.76E-12	7.30E-01	2.02E-12	2.21E-07
Benzo(a)pyrene	2.60E+00	1.20E-07	1.20E+01	1.44E-06	2.49E-07	1.20E+01	2.98E-06	5.52E-12	7.30E+00	4.03E-11	**4.42E-06**
Benzo(b)fluoranthene	1.70E+00	7.84E-08	1.20E+00	9.41E-08	1.63E-07	1.20E+00	1.95E-07	3.61E-12	7.30E-01	2.64E-12	2.89E-07
Benzo(g,h,i)perylene	2.30E+00	1.06E-07	NA		2.20E-07	NA		4.89E-12	NA		
Benzo(k)fluoranthene	1.50E+00	6.92E-08	1.20E+00	8.30E-08	1.43E-07	1.20E+00	1.72E-07	3.19E-12	3.85E-01	1.23E-12	2.55E-07
Biphenyl (diphenyl)	1.60E-01	7.38E-09	NA		1.02E-08	NA		3.40E-13	NA		
Chrysene	1.80E+00	8.30E-08	1.20E-01	9.96E-09	1.72E-07	1.20E-01	2.07E-08	3.82E-12	3.85E-02	1.47E-13	3.06E-08
Fluoranthene	3.00E+00	1.38E-07	NA		2.87E-07	NA		6.37E-12	NA		
Fluorene	5.00E-01	2.31E-08	NA		4.78E-08	NA		2.49E-09	NA		
Indeno(1,2,3-c,d)pyrene	2.30E+00	1.06E-07	7.30E-01	7.74E-08	2.20E-07	7.30E-01	1.61E-07	4.89E-12	7.30E-01	3.57E-12	2.38E-07
Naphthalene	1.60E-01	7.38E-09	1.20E-01	8.86E-10	1.53E-08	1.20E-01	1.84E-09	7.27E-09	1.19E-01	8.65E-10	3.59E-09
Phenanthrene	4.40E+00	2.03E-07	NA		4.21E-07	NA		9.35E-12	NA		
Pyrene	4.40E+00	2.03E-07	NA		4.21E-07	NA		9.35E-12	NA		
Acetone	5.00E-02	2.31E-09	NA		3.19E-09	NA		1.29E-08	NA		
cis-1,2-Dichloroethene	2.00E-03	9.23E-11	NA		1.27E-10	NA		1.90E-09	NA		
Methyl ethyl ketone	2.10E-02	9.69E-10	NA		1.34E-09	NA		3.55E-09	NA		
Methylene chloride	4.00E-03	1.85E-10	1.40E-02	2.58E-12	2.55E-10	1.40E-02	3.57E-12	5.26E-09	3.50E-03	1.84E-11	2.46E-11
Toluene	9.00E-03	4.15E-10	NA		5.74E-10	NA		7.42E-09	NA		
Xylenes, total	5.00E-03	2.31E-10	NA		3.19E-10	NA		2.69E-09	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	3.51E-05	1.62E-12	1.50E+03	2.43E-09	6.71E-13	1.50E+03	1.01E-09	7.46E-17	1.50E+03	1.12E-13	3.44E-09
1,2,3,4,6,7,8-HpCDF	3.08E-05	1.42E-12	1.50E+03	2.13E-09	5.89E-13	1.50E+03	8.83E-10	6.54E-17	1.50E+03	9.81E-14	3.01E-09
1,2,3,4,7,8,9-HpCDF	2.83E-06	1.31E-13	1.50E+03	1.96E-10	5.41E-14	1.50E+03	8.12E-11	6.01E-18	1.50E+03	9.02E-15	2.77E-10
1,2,3,4,7,8-HxCDD	2.83E-06	1.31E-13	1.50E+04	1.96E-09	5.41E-14	1.50E+04	8.12E-10	6.01E-18	1.50E+04	9.02E-14	2.77E-09
1,2,3,4,7,8-HxCDF	1.74E-05	8.03E-13	1.50E+04	1.20E-08	3.33E-13	1.50E+04	4.99E-09	3.70E-17	1.50E+04	5.54E-13	1.70E-08
1,2,3,6,7,8-HxCDD	5.59E-06	2.58E-13	1.50E+04	3.87E-09	1.07E-13	1.50E+04	1.60E-09	1.19E-17	1.50E+04	1.78E-13	5.47E-09
1,2,3,6,7,8-HxCDF	1.13E-05	5.21E-13	1.50E+04	7.82E-09	2.16E-13	1.50E+04	3.24E-09	2.40E-17	1.50E+04	3.60E-13	1.11E-08
1,2,3,7,8,9-HxCDD	3.75E-06	1.73E-13	1.50E+04	2.59E-09	7.17E-14	1.50E+04	1.08E-09	7.97E-18	1.50E+04	1.19E-13	3.67E-09
1,2,3,7,8,9-HxCDF	3.79E-06	1.75E-13	1.50E+04	2.62E-09	7.25E-14	1.50E+04	1.09E-09	8.05E-18	1.50E+04	1.21E-13	3.71E-09
1,2,3,7,8-PeCDD	3.37E-06	1.55E-13	1.50E+05	2.33E-08	6.44E-14	1.50E+05	9.67E-09	7.16E-18	1.50E+05	1.07E-12	3.30E-08
1,2,3,7,8-PeCDF	3.91E-06	1.80E-13	7.50E+03	1.35E-09	7.48E-14	7.50E+03	5.61E-10	8.31E-18	7.50E+03	6.23E-14	1.91E-09

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
2,3,4,6,7,8-HxCDF	1.55E-05	7.15E-13	1.50E+04	1.07E-08	2.96E-13	1.50E+04	4.45E-09	3.29E-17	1.50E+04	4.94E-13	1.52E-08
2,3,4,7,8-PeCDF	3.32E-05	1.53E-12	7.50E+04	1.15E-07	6.35E-13	7.50E+04	4.76E-08	7.05E-17	7.50E+04	5.29E-12	1.62E-07
2,3,7,8-TCDD	8.98E-07	4.14E-14	1.50E+05	6.21E-09	1.72E-14	1.50E+05	2.58E-09	1.91E-18	1.50E+05	2.86E-13	8.79E-09
2,3,7,8-TCDF	8.22E-06	3.79E-13	1.50E+04	5.69E-09	1.57E-13	1.50E+04	2.36E-09	1.75E-17	1.50E+04	2.62E-13	8.05E-09
OCDD	3.57E-04	1.65E-11	1.50E+01	2.47E-10	6.83E-12	1.50E+01	1.02E-10	7.58E-16	1.50E+01	1.14E-14	3.49E-10
OCDF	1.88E-05	8.67E-13	1.50E+01	1.30E-11	3.59E-13	1.50E+01	5.39E-12	3.99E-17	1.50E+01	5.99E-16	1.84E-11
			Total Risk:	1.09E-05		**Total Risk:**	7.40E-06		**Total Risk:**	1.15E-08	**1.83E-05**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **2E-05**

Table 1-42
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Construction Exposure Scenario - Future Construction Worker Receptor - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Construction Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter (units)	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	1	yr
Soil Ingestion Rate	IR	330	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5700	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.8	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Metals											
Aluminum	1.35E+04	4.36E-02	1.00E+00	4.36E-02	6.02E-03	1.00E+00	6.02E-03	2.01E-06	1.40E-03	1.43E-03	5.10E-02
Antimony	2.16E+02	6.97E-04	4.00E-04	1.74E+00	9.64E-05	4.00E-04	2.41E-01	3.21E-08	NA		**1.98E+00**
Arsenic	2.00E+01	6.46E-05	3.00E-04	2.15E-01	2.68E-05	3.00E-04	8.92E-02	2.97E-09	8.57E-06	3.47E-04	3.05E-01
Barium	3.80E+03	1.23E-02	7.00E-02	1.75E-01	1.70E-03	7.00E-02	2.42E-02	5.65E-07	1.43E-04	3.96E-03	2.03E-01
Beryllium	9.20E-01	2.97E-06	2.00E-03	1.49E-03	4.10E-07	2.00E-03	2.05E-04	1.37E-10	5.71E-06	2.40E-05	1.71E-03
Cadmium	1.11E+01	3.58E-05	5.00E-04	7.17E-02	4.95E-07	5.00E-04	9.91E-04	1.65E-09	5.71E-06	2.89E-04	7.30E-02
Chromium	1.02E+02	3.29E-04	NA		4.55E-05	NA		1.52E-08	NA		
Cobalt	1.51E+01	4.88E-05	2.00E-02	2.44E-03	6.74E-06	2.00E-02	3.37E-04	2.25E-09	5.70E-06	3.94E-04	3.17E-03
Copper	4.18E+02	1.35E-03	4.00E-02	3.37E-02	1.87E-04	4.00E-02	4.66E-03	6.22E-08	NA		3.84E-02
Iron	7.45E+04	2.41E-01	3.00E-01	8.02E-01	3.32E-02	3.00E-01	1.11E-01	1.11E-05	NA		9.13E-01
Lead	2.17E+03	7.01E-03	NA		9.68E-04	NA		3.23E-07	NA		
Manganese	1.11E+03	3.58E-03	2.40E-02	1.49E-01	4.95E-04	2.40E-02	2.06E-02	1.65E-07	1.40E-05	1.18E-02	1.82E-01
Nickel	7.21E+01	2.33E-04	2.00E-02	1.16E-02	3.22E-05	2.00E-02	1.61E-03	1.07E-08	1.43E-05	7.51E-04	1.40E-02
Selenium	4.60E+00	1.49E-05	5.00E-03	2.97E-03	2.05E-06	5.00E-03	4.10E-04	6.84E-10	5.71E-03	1.20E-07	3.38E-03
Silver	1.10E+00	3.55E-06	5.00E-03	7.10E-04	4.91E-07	5.00E-03	9.82E-05	1.64E-10	NA		8.09E-04
Thallium	4.90E+00	1.58E-05	6.60E-05	2.40E-01	2.19E-06	6.60E-05	3.31E-02	7.29E-10	NA		2.73E-01
Vanadium	6.42E+01	2.07E-04	1.00E-03	2.07E-01	2.86E-05	1.00E-03	2.86E-02	9.55E-09	NA		2.36E-01
Zinc	8.03E+03	2.59E-02	3.00E-01	8.64E-02	3.58E-03	3.00E-01	1.19E-02	1.19E-06	NA		9.84E-02

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Pesticides/PCBs											
4,4'-DDD	9.90E-03	3.20E-08	NA		2.21E-08	NA		1.47E-12	NA		
4,4'-DDE	3.50E-03	1.13E-08	NA		7.81E-09	NA		5.20E-13	NA		
4,4'-DDT	9.50E-03	3.07E-08	5.00E-04	6.14E-05	2.12E-08	5.00E-04	4.24E-05	1.41E-12	5.00E-04	2.83E-09	1.04E-04
Endrin	5.50E-03	1.78E-08	3.00E-04	5.92E-05	1.23E-08	3.00E-04	4.09E-05	8.18E-13	3.00E-04	2.73E-09	1.00E-04
Endrin ketone	1.40E-02	4.52E-08	3.00E-04	1.51E-04	3.12E-08	3.00E-04	1.04E-04	2.08E-12	3.00E-04	6.94E-09	2.55E-04
gamma-Chlordane	1.70E-03	5.49E-09	5.00E-04	1.10E-05	3.79E-09	5.00E-04	7.59E-06	2.53E-13	2.00E-04	1.26E-09	1.86E-05
Methoxychlor	9.90E-03	3.20E-08	5.00E-03	6.39E-06	2.21E-08	5.00E-03	4.42E-06	1.47E-12	5.00E-03	2.94E-10	1.08E-05
SVOCs/VOCs											
2-Methylnaphthalene	1.70E-01	5.49E-07	4.00E-03	1.37E-04	1.14E-06	4.00E-03	2.84E-04	5.41E-07	NA		4.22E-04
Acenaphthylene	6.90E-01	2.23E-06	NA		4.62E-06	NA		1.03E-10	NA		
Anthracene	8.60E-01	2.78E-06	3.00E-01	9.26E-06	5.76E-06	3.00E-01	1.92E-05	1.95E-07	3.00E-01	6.50E-07	2.91E-05
Benzo(a)anthracene	1.30E+00	4.20E-06	NA		8.70E-06	NA		1.93E-10	NA		
Benzo(a)pyrene	2.60E+00	8.40E-06	NA		1.74E-05	NA		3.87E-10	NA		
Benzo(b)fluoranthene	1.70E+00	5.49E-06	NA		1.14E-05	NA		2.53E-10	NA		
Benzo(g,h,i)perylene	2.30E+00	7.43E-06	NA		1.54E-05	NA		3.42E-10	NA		
Benzo(k)fluoranthene	1.50E+00	4.84E-06	NA		1.00E-05	NA		2.23E-10	NA		
Biphenyl (diphenyl)	1.60E-01	5.17E-07	5.00E-02	1.03E-05	7.14E-07	5.00E-02	1.43E-05	2.38E-11	5.00E-02	4.76E-10	2.46E-05
Chrysene	1.80E+00	5.81E-06	NA		1.20E-05	NA		2.68E-10	NA		
Fluoranthene	3.00E+00	9.69E-06	4.00E-02	2.42E-04	2.01E-05	4.00E-02	5.02E-04	4.46E-10	4.00E-02	1.12E-08	7.44E-04
Fluorene	5.00E-01	1.61E-06	4.00E-02	4.04E-05	3.35E-06	4.00E-02	8.37E-05	1.74E-07	4.00E-02	4.36E-06	1.28E-04
Indeno(1,2,3-c,d)pyrene	2.30E+00	7.43E-06	NA		1.54E-05	NA		3.42E-10	NA		
Naphthalene	1.60E-01	5.17E-07	2.00E-02	2.58E-05	1.07E-06	2.00E-02	5.35E-05	5.09E-07	8.57E-04	5.94E-04	6.73E-04
Phenanthrene	4.40E+00	1.42E-05	NA		2.94E-05	NA		6.54E-10	NA		
Pyrene	4.40E+00	1.42E-05	3.00E-02	4.74E-04	2.94E-05	3.00E-02	9.82E-04	6.54E-10	3.00E-02	2.18E-08	1.46E-03
Acetone	5.00E-02	1.61E-07	9.00E-01	1.79E-07	2.23E-07	9.00E-01	2.48E-07	9.05E-07	9.00E-01	1.01E-06	1.43E-06
cis-1,2-Dichloroethene	2.00E-03	6.46E-09	1.00E-02	6.46E-07	8.92E-09	1.00E-02	8.92E-07	1.33E-07	1.00E-02	1.33E-05	1.48E-05
Methyl ethyl ketone	2.10E-02	6.78E-08	6.00E-01	1.13E-07	9.37E-08	6.00E-01	1.56E-07	2.48E-07	1.40E+00	1.77E-07	4.47E-07
Methylene chloride	4.00E-03	1.29E-08	6.00E-02	2.15E-07	1.78E-08	6.00E-02	2.97E-07	3.68E-07	1.14E-01	3.22E-06	3.73E-06
Toluene	9.00E-03	2.91E-08	2.00E-01	1.45E-07	4.02E-08	2.00E-01	2.01E-07	5.19E-07	8.57E-02	6.06E-06	6.40E-06
Xylenes, total	5.00E-03	1.61E-08	2.00E-01	8.07E-08	2.23E-08	2.00E-01	1.12E-07	1.88E-07	2.90E-02	6.49E-06	6.68E-06
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	3.51E-05	1.13E-10	NA		4.70E-11	NA		5.22E-15	1.14E-08	4.57E-07	4.57E-07
1,2,3,4,6,7,8-HpCDF	3.08E-05	9.95E-11	NA		4.12E-11	NA		4.58E-15	1.14E-08	4.01E-07	4.01E-07
1,2,3,4,7,8,9-HpCDF	2.83E-06	9.14E-12	NA		3.79E-12	NA		4.21E-16	1.14E-08	3.68E-08	3.68E-08
1,2,3,4,7,8-HxCDD	2.83E-06	9.14E-12	NA		3.79E-12	NA		4.21E-16	1.14E-08	3.68E-08	3.68E-08
1,2,3,4,7,8-HxCDF	1.74E-05	5.62E-11	NA		2.33E-11	NA		2.59E-15	1.14E-08	2.26E-07	2.26E-07
1,2,3,6,7,8-HxCDD	5.59E-06	1.80E-11	NA		7.48E-12	NA		8.31E-16	1.14E-08	7.27E-08	7.27E-08
1,2,3,6,7,8-HxCDF	1.13E-05	3.65E-11	NA		1.51E-11	NA		1.68E-15	1.14E-08	1.47E-07	1.47E-07
1,2,3,7,8,9-HxCDD	3.75E-06	1.21E-11	NA		5.02E-12	NA		5.58E-16	1.14E-08	4.88E-08	4.88E-08
1,2,3,7,8,9-HxCDF	3.79E-06	1.22E-11	NA		5.07E-12	NA		5.64E-16	1.14E-08	4.93E-08	4.93E-08
1,2,3,7,8-PeCDD	3.37E-06	1.09E-11	NA		4.51E-12	NA		5.01E-16	1.14E-08	4.38E-08	4.38E-08
1,2,3,7,8-PeCDF	3.91E-06	1.26E-11	NA		5.23E-12	NA		5.81E-16	1.14E-08	5.09E-08	5.09E-08
2,3,4,6,7,8-HxCDF	1.55E-05	5.00E-11	NA		2.07E-11	NA		2.30E-15	1.14E-08	2.02E-07	2.02E-07
2,3,4,7,8-PeCDF	3.32E-05	1.07E-10	NA		4.44E-11	NA		4.94E-15	1.14E-08	4.32E-07	4.32E-07
2,3,7,8-TCDD	8.98E-07	2.90E-12	NA		1.20E-12	NA		1.34E-16	1.14E-08	1.17E-08	1.17E-08
2,3,7,8-TCDF	8.22E-06	2.65E-11	NA		1.10E-11	NA		1.22E-15	1.14E-08	1.07E-07	1.07E-07

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
OCDD	3.57E-04	1.15E-09	NA		4.78E-10	NA		5.31E-14	1.14E-08	4.65E-06	4.65E-06
OCDF	1.88E-05	6.07E-11	NA		2.52E-11	NA		2.80E-15	1.14E-08	2.45E-07	2.45E-07
		Total Risk (Hazard Index):		3.8	**Total Risk (Hazard Index):**		0.6	**Total Risk (Hazard Index):**		0.02	**4.38**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **4**

Table 1-43
Cancer Risk Results Detailed Summary of Risk Drivers - Future Industrial/Construction Worker - Shallow Soil - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Industrial Worker					Future Construction Worker				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	**6.6E-05**	**2.3E-05**	1.6E-08	**8.9E-05**	69%	**8.8E-06**	**3.6E-06**	6.4E-10	**1.2E-05**	68%
Cadmium	**1.5E-06**	1.7E-08	8.7E-09	**1.5E-06**	1%	1.9E-07	2.7E-09	3.5E-10	2.0E-07	1%
Subtotal Metals	**6.8E-05**	**2.3E-05**	2.6E-07	**9.1E-05**	70%	**9.0E-06**	**3.6E-06**	1.1E-08	**1.3E-05**	69%
SVOCs/VOCs										
Benzo(a)anthracene	5.5E-07	9.3E-07	5.0E-11	**1.5E-06**	1%	7.2E-08	1.5E-07	2.0E-12	2.2E-07	1%
Benzo(a)pyrene	**1.1E-05**	**1.9E-05**	1.0E-09	**3.0E-05**	23%	**1.4E-06**	**3.0E-06**	4.0E-11	**4.4E-06**	24%
Benzo(b)fluoranthene	7.1E-07	**1.2E-06**	6.6E-11	**1.9E-06**	1%	9.4E-08	2.0E-07	2.6E-12	2.9E-07	2%
Benzo(k)fluoranthene	6.3E-07	**1.1E-06**	3.1E-11	**1.7E-06**	1%	8.3E-08	1.7E-07	1.2E-12	2.6E-07	1%
Indeno(1,2,3-c,d)pyrene	5.9E-07	**1.0E-06**	8.9E-11	**1.6E-06**	1%	7.7E-08	1.6E-07	3.6E-12	2.4E-07	1%
Subtotal SVOCs/VOCs	**1.3E-05**	**2.3E-05**	2.3E-08	**3.6E-05**	28%	**1.8E-06**	**3.7E-06**	9.3E-10	**5.5E-06**	30%
Dioxans/Furans										
2,3,4,7,8-PeCDF	8.7E-07	3.0E-07	1.3E-10	**1.2E-06**	0.9%	1.1E-07	4.8E-08	5.3E-12	1.6E-07	0.9%
Subtotal Dioxans/Furans	**1.5E-06**	5.1E-07	2.3E-10	**2.0E-06**	2%	2.0E-07	8.2E-08	9.1E-12	2.8E-07	2%
Total:	**8.3E-05**	**4.6E-05**	2.9E-07	**1.29E-04**		**1.1E-05**	**7.4E-06**	1.1E-08	**1.83E-05**	

Total Estimated Cancer Risk Across All Exposure Routes: **1E-04** **2E-05**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total cancer risk for all chemicals evaluated.

Table 1-44
Noncancer Risk Results Detailed Summary of Risk Drivers - Future Industrial/Construction Worker - Shallow Soil - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Non-Carcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Industrial Worker					Future Construction Worker				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Antimony	**5.3E-01**	6.0E-02		**5.9E-01**	45%	**1.7E+00**	**2.4E-01**		**2.0E+00**	45%
Arsenic	6.5E-02	2.2E-02	3.5E-04	8.8E-02	7%	**2.2E-01**	8.9E-02	3.5E-04	**3.0E-01**	7%
Barium	5.3E-02	6.1E-03	4.0E-03	6.3E-02	5%	**1.8E-01**	2.4E-02	4.0E-03	**2.0E-01**	5%
Iron	**2.4E-01**	2.8E-02		**2.7E-01**	21%	**8.0E-01**	**1.1E-01**		**9.1E-01**	21%
Manganese	4.5E-02	5.2E-03	1.2E-02	6.2E-02	5%	**1.5E-01**	2.1E-02	1.2E-02	**1.8E-01**	4%
Thallium	7.3E-02	8.3E-03		8.1E-02	6%	**2.4E-01**	3.3E-02		**2.7E-01**	6%
Vanadium	6.3E-02	7.2E-03		7.0E-02	5%	**2.1E-01**	2.9E-02		**2.4E-01**	5%
Subtotal Metals	**1.1E+00**	**1.4E-01**	1.9E-02	**1.3E+00**	100%	**3.8E+00**	**5.7E-01**	1.9E-02	**4.4E+00**	100%
Total:	**1.1**	**0.1**	0.02	**1.3**		**3.8**	**0.6**	0.02	**4.4**	

Total Estimated Hazard Index Across All Exposure Routes: **1** **4**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total hazard quotient for all chemicals evaluated.

Table 1-45
Risk Calculation Worksheet for Deep Soil - Carcinogenic Effects - Residential Exposure Scenario - Future Adult Resident Receptor - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	24	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5700	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.07	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
Metals											
Aluminum	1.30E+04	6.11E-03	NA		2.44E-04	NA		9.28E-07	NA		
Antimony	2.16E+02	1.01E-04	NA		4.05E-06	NA		1.54E-08	NA		
Arsenic	1.28E+01	6.01E-06	9.50E+00	5.71E-05	7.20E-07	9.50E+00	6.84E-06	9.14E-10	1.51E+01	1.38E-08	**6.40E-05**
Barium	3.50E+03	1.64E-03	NA		6.56E-05	NA		2.50E-07	NA		
Beryllium	6.74E-01	3.17E-07	NA		1.26E-08	NA		4.81E-11	8.40E+00	4.04E-10	4.04E-10
Cadmium	1.11E+01	5.21E-06	3.80E-01	1.98E-06	2.08E-08	3.80E-01	7.90E-09	7.92E-10	1.47E+01	1.16E-08	**2.00E-06**
Chromium	8.01E+01	3.76E-05	NA		1.50E-06	NA		5.72E-09	4.20E+01	2.40E-07	2.40E-07
Cobalt	1.19E+01	5.59E-06	NA		2.23E-07	NA		8.49E-10	9.80E+00	8.32E-09	8.32E-09
Copper	3.07E+02	1.44E-04	NA		5.75E-06	NA		2.19E-08	NA		
Iron	5.74E+04	2.70E-02	NA		1.08E-03	NA		4.10E-06	NA		
Lead	1.45E+03	6.81E-04	NA		2.72E-05	NA		1.03E-07	NA		
Manganese	8.57E+02	4.03E-04	NA		1.61E-05	NA		6.12E-08	NA		
Nickel	5.87E+01	2.76E-05	NA		1.10E-06	NA		4.19E-09	9.10E-01	3.81E-09	3.81E-09
Selenium	3.53E+00	1.66E-06	NA		6.62E-08	NA		2.52E-10	NA		
Silver	8.32E-01	3.91E-07	NA		1.56E-08	NA		5.94E-11	NA		
Thallium	3.81E+00	1.79E-06	NA		7.14E-08	NA		2.72E-10	NA		
Vanadium	4.95E+01	2.32E-05	NA		9.28E-07	NA		3.53E-09	NA		
Zinc	8.03E+03	3.77E-03	NA		1.50E-04	NA		5.73E-07	NA		

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Oral: Cancer Risk [-]	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Dermal: Cancer Risk [-]	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Inhalation: Cancer Risk [-]	Total Cancer Risk [-]
Pesticides/PCBs											
4,4'-DDD	6.08E-02	2.86E-08	2.40E-01	6.85E-09	5.70E-09	2.40E-01	1.37E-09	4.34E-12	2.42E-01	1.05E-12	8.22E-09
4,4'-DDE	2.35E-02	1.10E-08	3.40E-01	3.75E-09	2.20E-09	3.40E-01	7.49E-10	1.68E-12	3.40E-01	5.69E-13	4.50E-09
4,4'-DDT	8.79E-03	4.13E-09	3.40E-01	1.40E-09	8.24E-10	3.40E-01	2.80E-10	6.27E-13	3.40E-01	2.13E-13	1.68E-09
Dieldrin	9.15E-03	4.30E-09	1.60E+01	6.88E-08	8.57E-10	1.60E+01	1.37E-08	6.53E-13	1.61E+01	1.05E-11	8.25E-08
Endrin	4.27E-03	2.01E-09	NA		4.00E-10	NA		3.05E-13	NA		
Endrin ketone	1.32E-02	6.20E-09	NA		1.24E-09	NA		9.42E-13	NA		
gamma-Chlordane	1.41E-03	6.62E-10	1.20E+00	7.95E-10	1.32E-10	1.20E+00	1.59E-10	1.01E-13	1.19E+00	1.20E-13	9.53E-10
Methoxychlor	9.90E-03	4.65E-09	NA		9.28E-10	NA		7.07E-13	NA		
SVOCs/VOCs											
2-Methylnaphthalene	1.91E+00	8.97E-07	NA		5.37E-07	NA		2.92E-06	NA		
Acenaphthylene	1.20E+00	5.64E-07	NA		3.37E-07	NA		8.57E-11	NA		
Anthracene	9.40E-01	4.41E-07	NA		2.64E-07	NA		1.02E-07	NA		
Benzo(a)anthracene	4.14E+00	1.94E-06	1.20E+00	2.33E-06	1.16E-06	1.20E+00	1.40E-06	2.96E-10	7.30E-01	2.16E-10	**3.73E-06**
Benzo(a)pyrene	8.90E+00	4.18E-06	1.20E+01	5.02E-05	2.50E-06	1.20E+01	3.00E-05	6.35E-10	7.30E+00	4.64E-09	**8.02E-05**
Benzo(b)fluoranthene	5.60E+00	2.63E-06	1.20E+00	3.16E-06	1.57E-06	1.20E+00	1.89E-06	4.00E-10	7.30E-01	2.92E-10	**5.05E-06**
Benzo(g,h,i)perylene	9.00E+00	4.23E-06	NA		2.53E-06	NA		6.42E-10	NA		
Benzo(k)fluoranthene	3.40E+00	1.60E-06	1.20E+00	1.92E-06	9.56E-07	1.20E+00	1.15E-06	2.43E-10	3.85E-01	9.34E-11	**3.06E-06**
Biphenyl (diphenyl)	1.60E-01	7.51E-08	NA		3.00E-08	NA		1.14E-11	NA		
Chrysene	6.50E+00	3.05E-06	1.20E-01	3.66E-07	1.83E-06	1.20E-01	2.19E-07	4.64E-10	3.85E-02	1.79E-11	5.86E-07
Dibenz(a,h)anthracene	1.02E+00	4.79E-07	7.30E+00	3.50E-06	2.87E-07	7.30E+00	2.09E-06	7.28E-11	7.30E+00	5.31E-10	**5.59E-06**
Fluoranthene	1.20E+01	5.64E-06	NA		3.37E-06	NA		8.57E-10	NA		
Fluorene	4.23E-01	1.99E-07	NA		1.19E-07	NA		7.08E-08	NA		
Indeno(1,2,3-c,d)pyrene	8.30E+00	3.90E-06	7.30E-01	2.85E-06	2.33E-06	7.30E-01	1.70E-06	5.92E-10	7.30E-01	4.32E-10	**4.55E-06**
Naphthalene	7.99E-01	3.75E-07	1.20E-01	4.50E-08	2.25E-07	1.20E-01	2.70E-08	1.22E-06	1.19E-01	1.45E-07	2.17E-07
Phenanthrene	4.40E+00	2.07E-06	NA		1.24E-06	NA		3.14E-10	NA		
Pyrene	1.60E+01	7.51E-06	NA		4.50E-06	NA		1.14E-09	NA		
Acetone	3.40E-02	1.60E-08	NA		6.37E-09	NA		2.95E-07	NA		
cis-1,2-Dichloroethene	2.00E-03	9.39E-10	NA		3.75E-10	NA		6.38E-08	NA		
Methyl ethyl ketone	1.94E-02	9.11E-09	NA		3.64E-09	NA		1.10E-07	NA		
Methylene chloride	4.00E-03	1.88E-09	1.40E-02	2.63E-11	7.50E-10	1.40E-02	1.05E-11	1.77E-07	3.50E-03	6.18E-10	6.55E-10
Toluene	7.76E-03	3.64E-09	NA		1.45E-09	NA		2.15E-07	NA		
Xylenes, total	5.00E-03	2.35E-09	NA		9.37E-10	NA		9.03E-08	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	3.51E-05	1.65E-11	1.50E+03	2.47E-08	1.97E-12	1.50E+03	2.96E-09	2.51E-15	1.50E+03	3.76E-12	2.77E-08
1,2,3,4,6,7,8-HpCDF	3.08E-05	1.45E-11	1.50E+03	2.17E-08	1.73E-12	1.50E+03	2.60E-09	2.20E-15	1.50E+03	3.30E-12	2.43E-08
1,2,3,4,7,8,9-HpCDF	2.83E-06	1.33E-12	1.50E+03	1.99E-09	1.59E-13	1.50E+03	2.39E-10	2.02E-16	1.50E+03	3.03E-13	2.23E-09
1,2,3,4,7,8-HxCDD	2.83E-06	1.33E-12	1.50E+04	1.99E-08	1.59E-13	1.50E+04	2.39E-09	2.02E-16	1.50E+04	3.03E-12	2.23E-08
1,2,3,4,7,8-HxCDF	1.74E-05	8.17E-12	1.50E+04	1.23E-07	9.78E-13	1.50E+04	1.47E-08	1.24E-15	1.50E+04	1.86E-11	1.37E-07
1,2,3,6,7,8-HxCDD	5.59E-06	2.63E-12	1.50E+04	3.94E-08	3.14E-13	1.50E+04	4.71E-09	3.99E-16	1.50E+04	5.99E-12	4.41E-08
1,2,3,6,7,8-HxCDF	1.13E-05	5.31E-12	1.50E+04	7.96E-08	6.35E-13	1.50E+04	9.53E-09	8.07E-16	1.50E+04	1.21E-11	8.91E-08
1,2,3,7,8,9-HxCDD	3.75E-06	1.76E-12	1.50E+04	2.64E-08	2.11E-13	1.50E+04	3.16E-09	2.68E-16	1.50E+04	4.02E-12	2.96E-08
1,2,3,7,8,9-HxCDF	3.79E-06	1.78E-12	1.50E+04	2.67E-08	2.13E-13	1.50E+04	3.20E-09	2.71E-16	1.50E+04	4.06E-12	2.99E-08
1,2,3,7,8-PeCDD	3.37E-06	1.58E-12	1.50E+05	2.37E-07	1.89E-13	1.50E+05	2.84E-08	2.41E-16	1.50E+05	3.61E-11	2.66E-07
1,2,3,7,8-PeCDF	3.91E-06	1.84E-12	7.50E+03	1.38E-08	2.20E-13	7.50E+03	1.65E-09	2.79E-16	7.50E+03	2.09E-12	1.54E-08
2,3,4,6,7,8-HxCDF	1.55E-05	7.28E-12	1.50E+04	1.09E-07	8.71E-13	1.50E+04	1.31E-08	1.11E-15	1.50E+04	1.66E-11	1.22E-07
2,3,4,7,8-PeCDF	3.32E-05	1.56E-11	7.50E+04	1.17E-06	1.87E-12	7.50E+04	1.40E-07	2.37E-15	7.50E+04	1.78E-10	**1.31E-06**
2,3,7,8-TCDD	8.98E-07	4.22E-13	1.50E+05	6.33E-08	5.05E-14	1.50E+05	7.57E-09	6.41E-17	1.50E+05	9.61E-12	7.08E-08
2,3,7,8-TCDF	8.22E-06	3.86E-12	1.50E+04	5.79E-08	4.62E-13	1.50E+04	6.93E-09	5.87E-16	1.50E+04	8.80E-12	6.49E-08
OCDD	3.57E-04	1.68E-10	1.50E+01	2.52E-09	6.69E-11	1.50E+01	1.00E-09	2.55E-14	1.50E+01	3.82E-13	3.52E-09

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
OCDF	1.88E-05	8.83E-12	1.50E+01	1.32E-10	3.52E-12	1.50E+01	5.28E-11	1.34E-15	1.50E+01	2.01E-14	1.85E-10
			Total Risk:	1.26E-04		**Total Risk:**	4.56E-05		**Total Risk:**	4.30E-07	**1.72E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **2E-04**

Table 1-46
Risk Calculation Worksheet for Deep Soil - Noncarcinogenic Effects - Residential Exposure Scenario - Future Adult Resident Receptor - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter (units)	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	24	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5700	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.07	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Metals											
Aluminum	1.30E+04	1.78E-02	1.00E+00	1.78E-02	7.11E-04	1.00E+00	7.11E-04	2.71E-06	1.40E-03	1.93E-03	2.05E-02
Antimony	2.16E+02	2.96E-04	4.00E-04	7.40E-01	1.18E-05	4.00E-04	2.95E-02	4.50E-08	NA		7.69E-01
Arsenic	1.28E+01	1.75E-05	3.00E-04	5.84E-02	2.10E-06	3.00E-04	7.00E-03	2.66E-09	8.57E-06	3.11E-04	6.58E-02
Barium	3.50E+03	4.79E-03	7.00E-02	6.85E-02	1.91E-04	7.00E-02	2.73E-03	7.29E-07	1.43E-04	5.10E-03	7.63E-02
Beryllium	6.74E-01	9.23E-07	2.00E-03	4.62E-04	3.68E-08	2.00E-03	1.84E-05	1.40E-10	5.71E-06	2.46E-05	5.05E-04
Cadmium	1.11E+01	1.52E-05	5.00E-04	3.04E-02	6.07E-08	5.00E-04	1.21E-04	2.31E-09	5.71E-06	4.04E-04	3.09E-02
Chromium	8.01E+01	1.10E-04	NA		4.38E-06	NA		1.67E-08	NA		
Cobalt	1.19E+01	1.63E-05	2.00E-02	8.15E-04	6.50E-07	2.00E-02	3.25E-05	2.48E-09	5.70E-06	4.35E-04	1.28E-03
Copper	3.07E+02	4.21E-04	4.00E-02	1.05E-02	1.68E-05	4.00E-02	4.19E-04	6.39E-08	NA		1.09E-02
Iron	5.74E+04	7.86E-02	3.00E-01	2.62E-01	3.14E-03	3.00E-01	1.05E-02	1.19E-05	NA		2.73E-01
Lead	1.45E+03	1.99E-03	NA		7.93E-05	NA		3.02E-07	NA		
Manganese	8.57E+02	1.17E-03	2.40E-02	4.89E-02	4.68E-05	2.40E-02	1.95E-03	1.78E-07	1.40E-05	1.27E-02	6.36E-02
Nickel	5.87E+01	8.04E-05	2.00E-02	4.02E-03	3.21E-06	2.00E-02	1.60E-04	1.22E-08	1.43E-05	8.55E-04	5.04E-03
Selenium	3.53E+00	4.84E-06	5.00E-03	9.67E-04	1.93E-07	5.00E-03	3.86E-05	7.35E-10	5.71E-03	1.29E-07	1.01E-03
Silver	8.32E-01	1.14E-06	5.00E-03	2.28E-04	4.55E-08	5.00E-03	9.10E-06	1.73E-10	NA		2.37E-04
Thallium	3.81E+00	5.22E-06	6.60E-05	7.91E-02	2.08E-07	6.60E-05	3.16E-03	7.93E-10	NA		8.22E-02
Vanadium	4.95E+01	6.78E-05	1.00E-03	6.78E-02	2.71E-06	1.00E-03	2.71E-03	1.03E-08	NA		7.05E-02
Zinc	8.03E+03	1.10E-02	3.00E-01	3.67E-02	4.39E-04	3.00E-01	1.46E-03	1.67E-06	NA		3.81E-02

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Pesticides/PCBs											
4,4'-DDD	6.08E-02	8.33E-08	NA		1.66E-08	NA		1.27E-11	NA		
4,4'-DDE	2.35E-02	3.22E-08	NA		6.42E-09	NA		4.89E-12	NA		
4,4'-DDT	8.79E-03	1.20E-08	5.00E-04	2.41E-05	2.40E-09	5.00E-04	4.80E-06	1.83E-12	5.00E-04	3.66E-09	2.89E-05
Dieldrin	9.15E-03	1.25E-08	5.00E-05	2.51E-04	2.50E-09	5.00E-05	5.00E-05	1.90E-12	5.00E-05	3.81E-08	3.01E-04
Endrin	4.27E-03	5.85E-09	3.00E-04	1.95E-05	1.17E-09	3.00E-04	3.89E-06	8.89E-13	3.00E-04	2.96E-09	2.34E-05
Endrin ketone	1.32E-02	1.81E-08	3.00E-04	6.03E-05	3.61E-09	3.00E-04	1.20E-05	2.75E-12	3.00E-04	9.16E-09	7.23E-05
gamma-Chlordane	1.41E-03	1.93E-09	5.00E-04	3.86E-06	3.85E-10	5.00E-04	7.71E-07	2.94E-13	2.00E-04	1.47E-09	4.64E-06
Methoxychlor	9.90E-03	1.36E-08	5.00E-03	2.71E-06	2.71E-09	5.00E-03	5.41E-07	2.06E-12	5.00E-03	4.12E-10	3.25E-06
SVOCs/VOCs											
2-Methylnaphthalene	1.91E+00	2.62E-06	4.00E-03	6.54E-04	1.57E-06	4.00E-03	3.91E-04	8.51E-06	NA		1.05E-03
Acenaphthylene	1.20E+00	1.64E-06	NA		9.84E-07	NA		2.50E-10	NA		
Anthracene	9.40E-01	1.29E-06	3.00E-01	4.29E-06	7.71E-07	3.00E-01	2.57E-06	2.98E-07	3.00E-01	9.95E-07	7.86E-06
Benzo(a)anthracene	4.14E+00	5.67E-06	NA		3.39E-06	NA		8.62E-10	NA		
Benzo(a)pyrene	8.90E+00	1.22E-05	NA		7.30E-06	NA		1.85E-09	NA		
Benzo(b)fluoranthene	5.60E+00	7.67E-06	NA		4.59E-06	NA		1.17E-09	NA		
Benzo(g,h,i)perylene	9.00E+00	1.23E-05	NA		7.38E-06	NA		1.87E-09	NA		
Benzo(k)fluoranthene	3.40E+00	4.66E-06	NA		2.79E-06	NA		7.08E-10	NA		
Biphenyl (diphenyl)	1.60E-01	2.19E-07	5.00E-02	4.38E-06	8.75E-08	5.00E-02	1.75E-06	3.33E-11	5.00E-02	6.66E-10	6.13E-06
Chrysene	6.50E+00	8.90E-06	NA		5.33E-06	NA		1.35E-09	NA		
Dibenz(a,h)anthracene	1.02E+00	1.40E-06	NA		8.36E-07	NA		2.12E-10	NA		
Fluoranthene	1.20E+01	1.64E-05	4.00E-02	4.11E-04	9.84E-06	4.00E-02	2.46E-04	2.50E-09	4.00E-02	6.25E-08	6.57E-04
Fluorene	4.23E-01	5.79E-07	4.00E-02	1.45E-05	3.47E-07	4.00E-02	8.67E-06	2.06E-07	4.00E-02	5.16E-06	2.83E-05
Indeno(1,2,3-c,d)pyrene	8.30E+00	1.14E-05	NA		6.80E-06	NA		1.73E-09	NA		
Naphthalene	7.99E-01	1.09E-06	2.00E-02	5.47E-05	6.55E-07	2.00E-02	3.28E-05	3.56E-06	8.57E-04	4.15E-03	4.24E-03
Phenanthrene	4.40E+00	6.03E-06	NA		3.61E-06	NA		9.16E-10	NA		
Pyrene	1.60E+01	2.19E-05	3.00E-02	7.31E-04	1.31E-05	3.00E-02	4.37E-04	3.33E-09	3.00E-02	1.11E-07	1.17E-03
Acetone	3.40E-02	4.66E-08	9.00E-01	5.18E-08	1.86E-08	9.00E-01	2.06E-08	8.61E-07	9.00E-01	9.57E-07	1.03E-06
cis-1,2-Dichloroethene	2.00E-03	2.74E-09	1.00E-02	2.74E-07	1.09E-09	1.00E-02	1.09E-07	1.86E-07	1.00E-02	1.86E-05	1.90E-05
Methyl ethyl ketone	1.94E-02	2.66E-08	6.00E-01	4.43E-08	1.06E-08	6.00E-01	1.77E-08	3.21E-07	1.40E+00	2.29E-07	2.91E-07
Methylene chloride	4.00E-03	5.48E-09	6.00E-02	9.13E-08	2.19E-09	6.00E-02	3.64E-08	5.15E-07	1.14E-01	4.51E-06	4.64E-06
Toluene	7.76E-03	1.06E-08	2.00E-01	5.32E-08	4.24E-09	2.00E-01	2.12E-08	6.27E-07	8.57E-02	7.31E-06	7.39E-06
Xylenes, total	5.00E-03	6.85E-09	2.00E-01	3.42E-08	2.73E-09	2.00E-01	1.37E-08	2.63E-07	2.90E-02	9.09E-06	9.13E-06
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	3.51E-05	4.81E-11	NA		5.76E-12	NA		7.31E-15	1.14E-08	6.39E-07	6.39E-07
1,2,3,4,6,7,8-HpCDF	3.08E-05	4.22E-11	NA		5.05E-12	NA		6.41E-15	1.14E-08	5.61E-07	5.61E-07
1,2,3,4,7,8,9-HpCDF	2.83E-06	3.88E-12	NA		4.64E-13	NA		5.89E-16	1.14E-08	5.16E-08	5.16E-08
1,2,3,4,7,8-HxCDD	2.83E-06	3.88E-12	NA		4.64E-13	NA		5.89E-16	1.14E-08	5.16E-08	5.16E-08
1,2,3,4,7,8-HxCDF	1.74E-05	2.38E-11	NA		2.85E-12	NA		3.62E-15	1.14E-08	3.17E-07	3.17E-07
1,2,3,6,7,8-HxCDD	5.59E-06	7.66E-12	NA		9.17E-13	NA		1.16E-15	1.14E-08	1.02E-07	1.02E-07
1,2,3,6,7,8-HxCDF	1.13E-05	1.55E-11	NA		1.85E-12	NA		2.35E-15	1.14E-08	2.06E-07	2.06E-07
1,2,3,7,8,9-HxCDD	3.75E-06	5.14E-12	NA		6.15E-13	NA		7.81E-16	1.14E-08	6.83E-08	6.83E-08
1,2,3,7,8,9-HxCDF	3.79E-06	5.19E-12	NA		6.21E-13	NA		7.89E-16	1.14E-08	6.90E-08	6.90E-08
1,2,3,7,8-PeCDD	3.37E-06	4.62E-12	NA		5.53E-13	NA		7.02E-16	1.14E-08	6.14E-08	6.14E-08
1,2,3,7,8-PeCDF	3.91E-06	5.36E-12	NA		6.41E-13	NA		8.14E-16	1.14E-08	7.12E-08	7.12E-08
2,3,4,6,7,8-HxCDF	1.55E-05	2.12E-11	NA		2.54E-12	NA		3.23E-15	1.14E-08	2.82E-07	2.82E-07
2,3,4,7,8-PeCDF	3.32E-05	4.55E-11	NA		5.44E-12	NA		6.91E-15	1.14E-08	6.05E-07	6.05E-07
2,3,7,8-TCDD	8.98E-07	1.23E-12	NA		1.47E-13	NA		1.87E-16	1.14E-08	1.64E-08	1.64E-08

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
2,3,7,8-TCDF	8.22E-06	1.13E-11	NA		1.35E-12	NA		1.71E-15	1.14E-08	1.50E-07	1.50E-07
OCDD	3.57E-04	4.89E-10	NA		5.85E-11	NA		7.43E-14	1.14E-08	6.50E-06	6.50E-06
OCDF	1.88E-05	2.58E-11	NA		3.08E-12	NA		3.91E-15	1.14E-08	3.42E-07	3.42E-07
		Total Risk (Hazard Index):		1.43	**Total Risk (Hazard Index):**		0.06	**Total Risk (Hazard Index):**		0.03	**1.52**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **2**

Table 1-47
Risk Calculation Worksheet for Deep Soil - Carcinogenic Effects - Residential Exposure Scenario - Future Child Resident Receptor - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Child Resident
	Receptor Age:	Child (0 to 6 yrs)

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	6	yr
Soil Ingestion Rate	IR	200	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	10	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	2900	cm2/day [soil]
Body Weight	BW	15	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.20	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Metals											
Aluminum	1.30E+04	1.42E-02	NA		4.13E-04	NA		5.41E-07	NA		
Antimony	2.16E+02	2.37E-04	NA		6.86E-06	NA		8.99E-09	NA		
Arsenic	1.28E+01	1.40E-05	9.50E+00	1.33E-04	1.22E-06	9.50E+00	1.16E-05	5.33E-10	1.51E+01	8.02E-09	**1.45E-04**
Barium	3.50E+03	3.84E-03	NA		1.11E-04	NA		1.46E-07	NA		
Beryllium	6.74E-01	7.39E-07	NA		2.14E-08	NA		2.81E-11	8.40E+00	2.36E-10	2.36E-10
Cadmium	1.11E+01	1.22E-05	3.80E-01	4.62E-06	3.53E-08	3.80E-01	1.34E-08	4.62E-10	1.47E+01	6.79E-09	**4.64E-06**
Chromium	8.01E+01	8.78E-05	NA		2.55E-06	NA		3.34E-09	4.20E+01	1.40E-07	1.40E-07
Cobalt	1.19E+01	1.30E-05	NA		3.78E-07	NA		4.95E-10	9.80E+00	4.86E-09	4.86E-09
Copper	3.07E+02	3.36E-04	NA		9.76E-06	NA		1.28E-08	NA		
Iron	5.74E+04	6.29E-02	NA		1.82E-03	NA		2.39E-06	NA		
Lead	1.45E+03	1.59E-03	NA		4.61E-05	NA		6.04E-08	NA		
Manganese	8.57E+02	9.39E-04	NA		2.72E-05	NA		3.57E-08	NA		
Nickel	5.87E+01	6.43E-05	NA		1.87E-06	NA		2.44E-09	9.10E-01	2.22E-09	2.22E-09
Selenium	3.53E+00	3.87E-06	NA		1.12E-07	NA		1.47E-10	NA		
Silver	8.32E-01	9.12E-07	NA		2.64E-08	NA		3.46E-11	NA		
Thallium	3.81E+00	4.18E-06	NA		1.21E-07	NA		1.59E-10	NA		

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Oral: Cancer Risk [-]	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Dermal: Cancer Risk [-]	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Inhalation: Cancer Risk [-]	Total Cancer Risk [-]
Vanadium	4.95E+01	5.42E-05	NA		1.57E-06	NA		2.06E-09	NA		
Zinc	8.03E+03	8.80E-03	NA		2.55E-04	NA		3.34E-07	NA		
Pesticides/PCBs											
4,4'-DDD	6.08E-02	6.66E-08	2.40E-01	1.60E-08	9.66E-09	2.40E-01	2.32E-09	2.53E-12	2.42E-01	6.11E-13	1.83E-08
4,4'-DDE	2.35E-02	2.58E-08	3.40E-01	8.76E-09	3.73E-09	3.40E-01	1.27E-09	9.78E-13	3.40E-01	3.32E-13	1.00E-08
4,4'-DDT	8.79E-03	9.63E-09	3.40E-01	3.28E-09	1.40E-09	3.40E-01	4.75E-10	3.66E-13	3.40E-01	1.24E-13	3.75E-09
Dieldrin	9.15E-03	1.00E-08	1.60E+01	1.60E-07	1.45E-09	1.60E+01	2.33E-08	3.81E-13	1.61E+01	6.13E-12	1.84E-07
Endrin	4.27E-03	4.68E-09	NA		6.79E-10	NA		1.78E-13	NA		
Endrin ketone	1.32E-02	1.45E-08	NA		2.10E-09	NA		5.50E-13	NA		
gamma-Chlordane	1.41E-03	1.55E-09	1.20E+00	1.85E-09	2.24E-10	1.20E+00	2.69E-10	5.87E-14	1.19E+00	6.99E-14	2.12E-09
Methoxychlor	9.90E-03	1.08E-08	NA		1.57E-09	NA		4.12E-13	NA		
SVOCs/VOCs											
2-Methylnaphthalene	1.91E+00	2.09E-06	NA		9.11E-07	NA		1.70E-06	NA		
Acenaphthylene	1.20E+00	1.32E-06	NA		5.72E-07	NA		5.00E-11	NA		
Anthracene	9.40E-01	1.03E-06	NA		4.48E-07	NA		5.97E-08	NA		
Benzo(a)anthracene	4.14E+00	4.54E-06	1.20E+00	5.44E-06	1.97E-06	1.20E+00	2.37E-06	1.72E-10	7.30E-01	1.26E-10	**7.81E-06**
Benzo(a)pyrene	8.90E+00	9.75E-06	1.20E+01	1.17E-04	4.24E-06	1.20E+01	5.09E-05	3.71E-10	7.30E+00	2.71E-09	**1.68E-04**
Benzo(b)fluoranthene	5.60E+00	6.14E-06	1.20E+00	7.36E-06	2.67E-06	1.20E+00	3.20E-06	2.33E-10	7.30E-01	1.70E-10	**1.06E-05**
Benzo(g,h,i)perylene	9.00E+00	9.86E-06	NA		4.29E-06	NA		3.75E-10	NA		
Benzo(k)fluoranthene	3.40E+00	3.73E-06	1.20E+00	4.47E-06	1.62E-06	1.20E+00	1.94E-06	1.42E-10	3.85E-01	5.45E-11	**6.42E-06**
Biphenyl (diphenyl)	1.60E-01	1.75E-07	NA		5.08E-08	NA		6.66E-12	NA		
Chrysene	6.50E+00	7.12E-06	1.20E-01	8.55E-07	3.10E-06	1.20E-01	3.72E-07	2.71E-10	3.85E-02	1.04E-11	**1.23E-06**
Dibenz(a,h)anthracene	1.02E+00	1.12E-06	7.30E+00	8.16E-06	4.86E-07	7.30E+00	3.55E-06	4.25E-11	7.30E+00	3.10E-10	**1.17E-05**
Fluoranthene	1.20E+01	1.32E-05	NA		5.72E-06	NA		5.00E-10	NA		
Fluorene	4.23E-01	4.64E-07	NA		2.02E-07	NA		4.13E-08	NA		
Indeno(1,2,3-c,d)pyrene	8.30E+00	9.10E-06	7.30E-01	6.64E-06	3.96E-06	7.30E-01	2.89E-06	3.46E-10	7.30E-01	2.52E-10	**9.53E-06**
Naphthalene	7.99E-01	8.76E-07	1.20E-01	1.05E-07	3.81E-07	1.20E-01	4.57E-08	7.12E-07	1.19E-01	8.47E-08	2.35E-07
Phenanthrene	4.40E+00	4.82E-06	NA		2.10E-06	NA		1.83E-10	NA		
Pyrene	1.60E+01	1.75E-05	NA		7.63E-06	NA		6.66E-10	NA		
Acetone	3.40E-02	3.73E-08	NA		1.08E-08	NA		1.72E-07	NA		
cis-1,2-Dichloroethene	2.00E-03	2.19E-09	NA		6.36E-10	NA		3.72E-08	NA		
Methyl ethyl ketone	1.94E-02	2.13E-08	NA		6.17E-09	NA		6.42E-08	NA		
Methylene chloride	4.00E-03	4.38E-09	1.40E-02	6.14E-11	1.27E-09	1.40E-02	1.78E-11	1.03E-07	3.50E-03	3.61E-10	4.40E-10
Toluene	7.76E-03	8.50E-09	NA		2.47E-09	NA		1.25E-07	NA		
Xylenes, total	5.00E-03	5.48E-09	NA		1.59E-09	NA		5.27E-08	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	3.51E-05	3.85E-11	1.50E+03	5.77E-08	3.35E-12	1.50E+03	5.02E-09	1.46E-15	1.50E+03	2.19E-12	6.27E-08
1,2,3,4,6,7,8-HpCDF	3.08E-05	3.38E-11	1.50E+03	5.06E-08	2.94E-12	1.50E+03	4.40E-09	1.28E-15	1.50E+03	1.92E-12	5.50E-08
1,2,3,4,7,8,9-HpCDF	2.83E-06	3.10E-12	1.50E+03	4.65E-09	2.70E-13	1.50E+03	4.05E-10	1.18E-16	1.50E+03	1.77E-13	5.06E-09
1,2,3,4,7,8-HxCDD	2.83E-06	3.10E-12	1.50E+04	4.65E-08	2.70E-13	1.50E+04	4.05E-09	1.18E-16	1.50E+04	1.77E-12	5.06E-08
1,2,3,4,7,8-HxCDF	1.74E-05	1.91E-11	1.50E+04	2.86E-07	1.66E-12	1.50E+04	2.49E-08	7.24E-16	1.50E+04	1.09E-11	3.11E-07
1,2,3,6,7,8-HxCDD	5.59E-06	6.13E-12	1.50E+04	9.19E-08	5.33E-13	1.50E+04	7.99E-09	2.33E-16	1.50E+04	3.49E-12	9.99E-08
1,2,3,6,7,8-HxCDF	1.13E-05	1.24E-11	1.50E+04	1.86E-07	1.08E-12	1.50E+04	1.62E-08	4.71E-16	1.50E+04	7.06E-12	2.02E-07
1,2,3,7,8,9-HxCDD	3.75E-06	4.11E-12	1.50E+04	6.16E-08	3.58E-13	1.50E+04	5.36E-09	1.56E-16	1.50E+04	2.34E-12	6.70E-08

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
1,2,3,7,8,9-HxCDF	3.79E-06	4.15E-12	1.50E+04	6.23E-08	3.61E-13	1.50E+04	5.42E-09	1.58E-16	1.50E+04	2.37E-12	6.77E-08
1,2,3,7,8-PeCDD	3.37E-06	3.69E-12	1.50E+05	5.54E-07	3.21E-13	1.50E+05	4.82E-08	1.40E-16	1.50E+05	2.10E-11	6.02E-07
1,2,3,7,8-PeCDF	3.91E-06	4.28E-12	7.50E+03	3.21E-08	3.73E-13	7.50E+03	2.80E-09	1.63E-16	7.50E+03	1.22E-12	3.49E-08
2,3,4,6,7,8-HxCDF	1.55E-05	1.70E-11	1.50E+04	2.55E-07	1.48E-12	1.50E+04	2.22E-08	6.45E-16	1.50E+04	9.68E-12	2.77E-07
2,3,4,7,8-PeCDF	3.32E-05	3.64E-11	7.50E+04	2.73E-06	3.17E-12	7.50E+04	2.37E-07	1.38E-15	7.50E+04	1.04E-10	**2.97E-06**
2,3,7,8-TCDD	8.98E-07	9.84E-13	1.50E+05	1.48E-07	8.56E-14	1.50E+05	1.28E-08	3.74E-17	1.50E+05	5.61E-12	1.60E-07
2,3,7,8-TCDF	8.22E-06	9.01E-12	1.50E+04	1.35E-07	7.84E-13	1.50E+04	1.18E-08	3.42E-16	1.50E+04	5.13E-12	1.47E-07
OCDD	3.57E-04	3.91E-10	1.50E+01	5.87E-09	3.40E-11	1.50E+01	5.11E-10	1.49E-14	1.50E+01	2.23E-13	6.38E-09
OCDF	1.88E-05	2.06E-11	1.50E+01	3.09E-10	1.79E-12	1.50E+01	2.69E-11	7.83E-16	1.50E+01	1.17E-14	3.36E-10
			Total Risk:	2.93E-04		**Total Risk:**	7.73E-05		**Total Risk:**	2.51E-07	**3.70E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **4E-04**

Table 1-48
Risk Calculation Worksheet for Deep Soil - Noncarcinogenic Effects - Residential Exposure Scenario - Future Child Resident Receptor - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Child Resident
	Receptor Age:	Child (0 to 6 yrs)

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter (units)	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	6	yr
Soil Ingestion Rate	IR	200	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	10	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	2900	cm2/day [soil]
Body Weight	BW	15	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.20	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Metals											
Aluminum	1.30E+04	1.66E-01	1.00E+00	1.66E-01	4.82E-03	1.00E+00	4.82E-03	6.31E-06	1.40E-03	4.51E-03	1.76E-01
Antimony	2.16E+02	2.76E-03	4.00E-04	6.90E+00	8.01E-05	4.00E-04	2.00E-01	1.05E-07	NA		**7.10E+00**
Arsenic	1.28E+01	1.64E-04	3.00E-04	5.46E-01	1.42E-05	3.00E-04	4.75E-02	6.22E-09	8.57E-06	7.25E-04	5.94E-01
Barium	3.50E+03	4.47E-02	7.00E-02	6.39E-01	1.30E-03	7.00E-02	1.85E-02	1.70E-06	1.43E-04	1.19E-02	6.70E-01
Beryllium	6.74E-01	8.62E-06	2.00E-03	4.31E-03	2.50E-07	2.00E-03	1.25E-04	3.27E-10	5.71E-06	5.73E-05	4.49E-03
Cadmium	1.11E+01	1.42E-04	1.10E-05	1.29E+01	4.12E-07	1.10E-05	3.74E-02	5.39E-09	5.71E-06	9.44E-04	**1.29E+01**
Chromium	8.01E+01	1.02E-03	NA		2.97E-05	NA		3.89E-08	NA		
Cobalt	1.19E+01	1.52E-04	2.00E-02	7.61E-03	4.41E-06	2.00E-02	2.21E-04	5.78E-09	5.70E-06	1.01E-03	8.84E-03
Copper	3.07E+02	3.93E-03	4.00E-02	9.81E-02	1.14E-04	4.00E-02	2.85E-03	1.49E-07	NA		1.01E-01
Iron	5.74E+04	7.34E-01	3.00E-01	2.45E+00	2.13E-02	3.00E-01	7.09E-02	2.79E-05	NA		**2.52E+00**
Lead	1.45E+03	1.85E-02	NA		5.38E-04	NA		7.04E-07	NA		
Manganese	8.57E+02	1.10E-02	2.40E-02	4.57E-01	3.18E-04	2.40E-02	1.32E-02	4.16E-07	1.40E-05	2.97E-02	5.00E-01
Nickel	5.87E+01	7.51E-04	1.10E-02	6.82E-02	2.18E-05	1.10E-02	1.98E-03	2.85E-08	1.43E-05	2.00E-03	7.22E-02
Selenium	3.53E+00	4.51E-05	5.00E-03	9.03E-03	1.31E-06	5.00E-03	2.62E-04	1.71E-09	5.71E-03	3.00E-07	9.29E-03
Silver	8.32E-01	1.06E-05	5.00E-03	2.13E-03	3.08E-07	5.00E-03	6.17E-05	4.04E-10	NA		2.19E-03
Thallium	3.81E+00	4.87E-05	6.60E-05	7.38E-01	1.41E-06	6.60E-05	2.14E-02	1.85E-09	NA		7.59E-01
Vanadium	4.95E+01	6.33E-04	1.00E-03	6.33E-01	1.84E-05	1.00E-03	1.84E-02	2.40E-08	NA		6.51E-01

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Zinc	8.03E+03	1.03E-01	3.00E-01	3.42E-01	2.98E-03	3.00E-01	9.92E-03	3.90E-06	NA		3.52E-01
Pesticides/PCBs											
4,4'-DDD	6.08E-02	7.77E-07	NA		1.13E-07	NA		2.95E-11	NA		
4,4'-DDE	2.35E-02	3.00E-07	NA		4.36E-08	NA		1.14E-11	NA		
4,4'-DDT	8.79E-03	1.12E-07	5.00E-04	2.25E-04	1.63E-08	5.00E-04	3.26E-05	4.27E-12	5.00E-04	8.54E-09	2.57E-04
Dieldrin	9.15E-03	1.17E-07	5.00E-05	2.34E-03	1.70E-08	5.00E-05	3.39E-04	4.44E-12	5.00E-05	8.89E-08	2.68E-03
Endrin	4.27E-03	5.46E-08	3.00E-04	1.82E-04	7.92E-09	3.00E-04	2.64E-05	2.07E-12	3.00E-04	6.91E-09	2.08E-04
Endrin ketone	1.32E-02	1.69E-07	3.00E-04	5.63E-04	2.45E-08	3.00E-04	8.16E-05	6.41E-12	3.00E-04	2.14E-08	6.44E-04
gamma-Chlordane	1.41E-03	1.80E-08	3.30E-05	5.46E-04	2.61E-09	3.30E-05	7.92E-05	6.85E-13	2.00E-04	3.42E-09	6.25E-04
Methoxychlor	9.90E-03	1.27E-07	2.00E-05	6.33E-03	1.84E-08	2.00E-05	9.18E-04	4.81E-12	2.00E-05	2.40E-07	7.25E-03
SVOCs/VOCs											
2-Methylnaphthalene	1.91E+00	2.44E-05	4.00E-03	6.11E-03	1.06E-05	4.00E-03	2.66E-03	1.99E-05	NA		8.76E-03
Acenaphthylene	1.20E+00	1.53E-05	NA		6.67E-06	NA		5.83E-10	NA		
Anthracene	9.40E-01	1.20E-05	3.00E-01	4.01E-05	5.23E-06	3.00E-01	1.74E-05	6.96E-07	3.00E-01	2.32E-06	5.98E-05
Benzo(a)anthracene	4.14E+00	5.29E-05	NA		2.30E-05	NA		2.01E-09	NA		
Benzo(a)pyrene	8.90E+00	1.14E-04	NA		4.95E-05	NA		4.32E-09	NA		
Benzo(b)fluoranthene	5.60E+00	7.16E-05	NA		3.11E-05	NA		2.72E-09	NA		
Benzo(g,h,i)perylene	9.00E+00	1.15E-04	NA		5.01E-05	NA		4.37E-09	NA		
Benzo(k)fluoranthene	3.40E+00	4.35E-05	NA		1.89E-05	NA		1.65E-09	NA		
Biphenyl (diphenyl)	1.60E-01	2.05E-06	5.00E-02	4.09E-05	5.93E-07	5.00E-02	1.19E-05	7.77E-11	5.00E-02	1.55E-09	5.28E-05
Chrysene	6.50E+00	8.31E-05	NA		3.62E-05	NA		3.16E-09	NA		
Dibenz(a,h)anthracene	1.02E+00	1.30E-05	NA		5.67E-06	NA		4.95E-10	NA		
Fluoranthene	1.20E+01	1.53E-04	4.00E-02	3.84E-03	6.67E-05	4.00E-02	1.67E-03	5.83E-09	4.00E-02	1.46E-07	5.50E-03
Fluorene	4.23E-01	5.41E-06	4.00E-02	1.35E-04	2.35E-06	4.00E-02	5.88E-05	4.82E-07	4.00E-02	1.20E-05	2.06E-04
Indeno(1,2,3-c,d)pyrene	8.30E+00	1.06E-04	NA		4.62E-05	NA		4.03E-09	NA		
Naphthalene	7.99E-01	1.02E-05	2.00E-02	5.11E-04	4.44E-06	2.00E-02	2.22E-04	8.30E-06	8.57E-04	9.69E-03	1.04E-02
Phenanthrene	4.40E+00	5.63E-05	NA		2.45E-05	NA		2.14E-09	NA		
Pyrene	1.60E+01	2.05E-04	3.00E-02	6.82E-03	8.90E-05	3.00E-02	2.97E-03	7.77E-09	3.00E-02	2.59E-07	9.79E-03
Acetone	3.40E-02	4.35E-07	9.00E-01	4.83E-07	1.26E-07	9.00E-01	1.40E-07	2.01E-06	9.00E-01	2.23E-06	2.86E-06
cis-1,2-Dichloroethene	2.00E-03	2.56E-08	1.00E-02	2.56E-06	7.42E-09	1.00E-02	7.42E-07	4.34E-07	1.00E-02	4.34E-05	4.67E-05
Methyl ethyl ketone	1.94E-02	2.48E-07	6.00E-01	4.13E-07	7.19E-08	6.00E-01	1.20E-07	7.49E-07	1.40E+00	5.35E-07	1.07E-06
Methylene chloride	4.00E-03	5.11E-08	6.00E-02	8.52E-07	1.48E-08	6.00E-02	2.47E-07	1.20E-06	1.14E-01	1.05E-05	1.16E-05
Toluene	7.76E-03	9.92E-08	2.00E-01	4.96E-07	2.88E-08	2.00E-01	1.44E-07	1.46E-06	8.57E-02	1.71E-05	1.77E-05
Xylenes, total	5.00E-03	6.39E-08	2.00E-01	3.20E-07	1.85E-08	2.00E-01	9.27E-08	6.15E-07	2.90E-02	2.12E-05	2.16E-05
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	3.51E-05	4.49E-10	NA		3.90E-11	NA		1.71E-14	1.14E-08	1.49E-06	1.49E-06
1,2,3,4,6,7,8-HpCDF	3.08E-05	3.94E-10	NA		3.43E-11	NA		1.50E-14	1.14E-08	1.31E-06	1.31E-06
1,2,3,4,7,8,9-HpCDF	2.83E-06	3.62E-11	NA		3.15E-12	NA		1.37E-15	1.14E-08	1.20E-07	1.20E-07
1,2,3,4,7,8-HxCDD	2.83E-06	3.62E-11	NA		3.15E-12	NA		1.37E-15	1.14E-08	1.20E-07	1.20E-07
1,2,3,4,7,8-HxCDF	1.74E-05	2.22E-10	NA		1.94E-11	NA		8.45E-15	1.14E-08	7.40E-07	7.40E-07
1,2,3,6,7,8-HxCDD	5.59E-06	7.15E-11	NA		6.22E-12	NA		2.72E-15	1.14E-08	2.38E-07	2.38E-07
1,2,3,6,7,8-HxCDF	1.13E-05	1.44E-10	NA		1.26E-11	NA		5.49E-15	1.14E-08	4.80E-07	4.80E-07
1,2,3,7,8,9-HxCDD	3.75E-06	4.79E-11	NA		4.17E-12	NA		1.82E-15	1.14E-08	1.59E-07	1.59E-07
1,2,3,7,8,9-HxCDF	3.79E-06	4.85E-11	NA		4.22E-12	NA		1.84E-15	1.14E-08	1.61E-07	1.61E-07
1,2,3,7,8-PeCDD	3.37E-06	4.31E-11	NA		3.75E-12	NA		1.64E-15	1.14E-08	1.43E-07	1.43E-07
1,2,3,7,8-PeCDF	3.91E-06	5.00E-11	NA		4.35E-12	NA		1.90E-15	1.14E-08	1.66E-07	1.66E-07
2,3,4,6,7,8-HxCDF	1.55E-05	1.98E-10	NA		1.72E-11	NA		7.53E-15	1.14E-08	6.59E-07	6.59E-07
2,3,4,7,8-PeCDF	3.32E-05	4.24E-10	NA		3.69E-11	NA		1.61E-14	1.14E-08	1.41E-06	1.41E-06
2,3,7,8-TCDD	8.98E-07	1.15E-11	NA		9.99E-13	NA		4.36E-16	1.14E-08	3.82E-08	3.82E-08

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
2,3,7,8-TCDF	8.22E-06	1.05E-10	NA		9.14E-12	NA		3.99E-15	1.14E-08	3.49E-07	3.49E-07
OCDD	3.57E-04	4.56E-09	NA		3.97E-10	NA		1.73E-13	1.14E-08	1.52E-05	1.52E-05
OCDF	1.88E-05	2.40E-10	NA		2.09E-11	NA		9.13E-15	1.14E-08	7.99E-07	7.99E-07
		Total Risk (Hazard Index):		26.0	**Total Risk (Hazard Index):**		0.5	**Total Risk (Hazard Index):**		0.1	**26.5**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **27**

Table 1-49
Cancer Risk Results Detailed Summary of Risk Drivers - Deep Soil - Future Adult/Child Resident - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	**5.7E-05**	**6.8E-06**	1.4E-08	**6.4E-05**	37%	**1.3E-04**	**1.2E-05**	8.0E-09	**1.4E-04**	39%
Cadmium	**2.0E-06**	7.9E-09	1.2E-08	**2.0E-06**	1%	**4.6E-06**	1.3E-08	6.8E-09	**4.6E-06**	1%
Subtotal Metals	**5.9E-05**	**6.8E-06**	2.8E-07	**6.6E-05**	39%	**1.4E-04**	**1.2E-05**	1.6E-07	**1.5E-04**	40%
SVOCs/VOCs										
Benzo(a)anthracene	**2.3E-06**	**1.4E-06**	2.2E-10	**3.7E-06**	2%	**5.4E-06**	**2.4E-06**	1.3E-10	**7.8E-06**	2%
Benzo(a)pyrene	**5.0E-05**	**3.0E-05**	4.6E-09	**8.0E-05**	47%	**1.2E-04**	**5.1E-05**	2.7E-09	**1.7E-04**	45%
Benzo(b)fluoranthene	**3.2E-06**	**1.9E-06**	2.9E-10	**5.0E-06**	3%	**7.4E-06**	**3.2E-06**	1.7E-10	**1.1E-05**	3%
Benzo(k)fluoranthene	**1.9E-06**	**1.1E-06**	9.3E-11	**3.1E-06**	2%	**4.5E-06**	**1.9E-06**	5.5E-11	**6.4E-06**	2%
Chrysene	3.7E-07	2.2E-07	1.8E-11	5.9E-07	0.3%	8.5E-07	3.7E-07	1.0E-11	**1.2E-06**	0.3%
Dibenz(a,h)anthracene	**3.5E-06**	**2.1E-06**	5.3E-10	**5.6E-06**	3%	**8.2E-06**	**3.5E-06**	3.1E-10	**1.2E-05**	3%
Indeno(1,2,3-c,d)pyrene	**2.8E-06**	**1.7E-06**	4.3E-10	**4.5E-06**	3%	**6.6E-06**	**2.9E-06**	2.5E-10	**9.5E-06**	3%
Subtotal SVOCs/VOCs	**6.4E-05**	**3.8E-05**	1.5E-07	**1.0E-04**	60%	**1.5E-04**	**6.5E-05**	8.9E-08	**2.2E-04**	58%
Dioxans/Furans										
2,3,4,7,8-PeCDF	**1.2E-06**	1.4E-07	1.8E-10	**1.3E-06**	0.8%	**2.7E-06**	2.4E-07	1.0E-10	**3.0E-06**	0.8%
Subtotal Dioxans/Furans	**2.0E-06**	2.4E-07	3.1E-10	**2.3E-06**	1%	**4.7E-06**	4.1E-07	1.8E-10	**5.1E-06**	1%
Total:	**1.3E-04**	**4.6E-05**	4.3E-07	**1.7E-04**		**2.9E-04**	**7.7E-05**	2.5E-07	**3.7E-04**	

Total Estimated Cancer Risk Across All Exposure Routes: **2E-04** **4E-04**

Sum of Adult and Child Excess Lifetime Cancer Risk (30 year exposure):	**4.2E-04**	**1.2E-04**	**6.8E-07**	**5.42E-04**

Total Estimated Adult plus Child Cancer Risk Across All Exposure Routes: **5E-04**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total cancer risk for all chemicals evaluated.

Table 1-50
Noncancer Risk Results Detailed Summary of Risk Drivers - Deep Soil - Future Adult/Child Resident - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Non-Carcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Aluminum	1.8E-02	7.1E-04	1.9E-03	2.0E-02	1%	**1.7E-01**	4.8E-03	4.5E-03	**1.8E-01**	1%
Antimony	**7.4E-01**	3.0E-02		**7.7E-01**	51%	**6.9E+00**	**2.0E-01**		**7.1E+00**	27%
Arsenic	5.8E-02	7.0E-03	3.1E-04	6.6E-02	4%	**5.5E-01**	4.7E-02	7.3E-04	**5.9E-01**	2%
Barium	6.8E-02	2.7E-03	5.1E-03	7.6E-02	5%	**6.4E-01**	1.9E-02	1.2E-02	**6.7E-01**	3%
Cadmium	3.0E-02	1.2E-04	4.0E-04	3.1E-02	2%	**1.3E+01**	3.7E-02	9.4E-04	**1.3E+01**	49%
Copper	1.1E-02	4.2E-04		1.1E-02	0.7%	9.8E-02	2.8E-03		**1.0E-01**	0.4%
Iron	**2.6E-01**	1.0E-02		**2.7E-01**	18%	**2.4E+00**	7.1E-02		**2.5E+00**	9%
Manganese	4.9E-02	2.0E-03	1.3E-02	6.4E-02	4%	**4.6E-01**	1.3E-02	3.0E-02	**5.0E-01**	2%
Thallium	7.9E-02	3.2E-03		8.2E-02	5%	**7.4E-01**	2.1E-02		**7.6E-01**	3%
Vanadium	6.8E-02	2.7E-03		7.1E-02	5%	**6.3E-01**	1.8E-02		**6.5E-01**	2%
Zinc	3.7E-02	1.5E-03		3.8E-02	3%	**3.4E-01**	9.9E-03		**3.5E-01**	1%
Subtotal Metals	**1.4E+00**	6.0E-02	2.2E-02	**1.5E+00**	100%	**2.6E+01**	**4.5E-01**	5.1E-02	**2.6E+01**	100%
Total:	**1.4**	0.1	0.03	**1.5**		**26**	**0.5**	0.1	**26.5**	

Total Estimated Hazard Index Across All Exposure Routes: **2** **27**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total hazard quotient for all chemicals evaluated.

Table 1-51
Risk Calculation Worksheet for Deep Soil - Carcinogenic Effects - Occupational Exposure Scenario - Industrial Worker Receptor - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Occupational
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Industrial Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	25	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5700	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	25	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Metals											
Aluminum	1.30E+04	4.54E-03	NA		5.18E-04	NA		6.90E-07	NA		
Antimony	2.16E+02	7.55E-05	NA		8.60E-06	NA		1.15E-08	NA		
Arsenic	1.28E+01	4.47E-06	9.50E+00	4.25E-05	1.53E-06	9.50E+00	1.45E-05	6.80E-10	1.51E+01	1.02E-08	**5.70E-05**
Barium	3.50E+03	1.22E-03	NA		1.39E-04	NA		1.86E-07	NA		
Beryllium	6.74E-01	2.36E-07	NA		2.69E-08	NA		3.58E-11	8.40E+00	3.01E-10	3.01E-10
Cadmium	1.11E+01	3.88E-06	3.80E-01	1.47E-06	4.42E-08	3.80E-01	1.68E-08	5.90E-10	1.47E+01	8.67E-09	**1.50E-06**
Chromium	8.01E+01	2.80E-05	NA		3.19E-06	NA		4.25E-09	4.20E+01	1.79E-07	1.79E-07
Cobalt	1.19E+01	4.16E-06	NA		4.74E-07	NA		6.32E-10	9.80E+00	6.19E-09	6.19E-09
Copper	3.07E+02	1.07E-04	NA		1.22E-05	NA		1.63E-08	NA		
Iron	5.74E+04	2.01E-02	NA		2.29E-03	NA		3.05E-06	NA		
Lead	1.45E+03	5.07E-04	NA		5.78E-05	NA		7.70E-08	NA		
Manganese	8.57E+02	2.99E-04	NA		3.41E-05	NA		4.55E-08	NA		
Nickel	5.87E+01	2.05E-05	NA		2.34E-06	NA		3.12E-09	9.10E-01	2.84E-09	2.84E-09
Selenium	3.53E+00	1.23E-06	NA		1.41E-07	NA		1.87E-10	NA		
Silver	8.32E-01	2.91E-07	NA		3.31E-08	NA		4.42E-11	NA		
Thallium	3.81E+00	1.33E-06	NA		1.52E-07	NA		2.02E-10	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Vanadium	4.95E+01	1.73E-05	NA		1.97E-06	NA		2.63E-09	NA		
Zinc	8.03E+03	2.81E-03	NA		3.20E-04	NA		4.26E-07	NA		
Pesticides/PCBs											
4,4'-DDD	6.08E-02	2.12E-08	2.40E-01	5.10E-09	1.21E-08	2.40E-01	2.91E-09	3.23E-12	2.42E-01	7.80E-13	8.01E-09
4,4'-DDE	2.35E-02	8.21E-09	3.40E-01	2.79E-09	4.68E-09	3.40E-01	1.59E-09	1.25E-12	3.40E-01	4.24E-13	4.38E-09
4,4'-DDT	8.79E-03	3.07E-09	3.40E-01	1.04E-09	1.75E-09	3.40E-01	5.95E-10	4.67E-13	3.40E-01	1.58E-13	1.64E-09
Dieldrin	9.15E-03	3.20E-09	1.60E+01	5.12E-08	1.82E-09	1.60E+01	2.92E-08	4.86E-13	1.61E+01	7.82E-12	8.03E-08
Endrin	4.27E-03	1.49E-09	NA		8.51E-10	NA		2.27E-13	NA		
Endrin ketone	1.32E-02	4.61E-09	NA		2.63E-09	NA		7.01E-13	NA		
gamma-Chlordane	1.41E-03	4.93E-10	1.20E+00	5.91E-10	2.81E-10	1.20E+00	3.37E-10	7.49E-14	1.19E+00	8.91E-14	9.28E-10
Methoxychlor	9.90E-03	3.46E-09	NA		1.97E-09	NA		5.26E-13	NA		
SVOCs/VOCs											
2-Methylnaphthalene	1.91E+00	6.67E-07	NA		1.14E-06	NA		2.17E-06	NA		
Acenaphthylene	1.20E+00	4.19E-07	NA		7.17E-07	NA		6.37E-11	NA		
Anthracene	9.40E-01	3.28E-07	NA		5.62E-07	NA		7.61E-08	NA		
Benzo(a)anthracene	4.14E+00	1.45E-06	1.20E+00	1.74E-06	2.47E-06	1.20E+00	2.97E-06	2.20E-10	7.30E-01	1.61E-10	**4.70E-06**
Benzo(a)pyrene	8.90E+00	3.11E-06	1.20E+01	3.73E-05	5.32E-06	1.20E+01	6.38E-05	4.73E-10	7.30E+00	3.45E-09	**1.01E-04**
Benzo(b)fluoranthene	5.60E+00	1.96E-06	1.20E+00	2.35E-06	3.35E-06	1.20E+00	4.02E-06	2.97E-10	7.30E-01	2.17E-10	**6.36E-06**
Benzo(g,h,i)perylene	9.00E+00	3.15E-06	NA		5.38E-06	NA		4.78E-10	NA		
Benzo(k)fluoranthene	3.40E+00	1.19E-06	1.20E+00	1.43E-06	2.03E-06	1.20E+00	2.44E-06	1.81E-10	3.85E-01	6.95E-11	**3.86E-06**
Biphenyl (diphenyl)	1.60E-01	5.59E-08	NA		6.37E-08	NA		8.50E-12	NA		
Chrysene	6.50E+00	2.27E-06	1.20E-01	2.73E-07	3.88E-06	1.20E-01	4.66E-07	3.45E-10	3.85E-02	1.33E-11	7.39E-07
Dibenz(a,h)anthracene	1.02E+00	3.56E-07	7.30E+00	2.60E-06	6.10E-07	7.30E+00	4.45E-06	5.42E-11	7.30E+00	3.95E-10	**7.05E-06**
Fluoranthene	1.20E+01	4.19E-06	NA		7.17E-06	NA		6.37E-10	NA		
Fluorene	4.23E-01	1.48E-07	NA		2.53E-07	NA		5.26E-08	NA		
Indeno(1,2,3-c,d)pyrene	8.30E+00	2.90E-06	7.30E-01	2.12E-06	4.96E-06	7.30E-01	3.62E-06	4.41E-10	7.30E-01	3.22E-10	**5.74E-06**
Naphthalene	7.99E-01	2.79E-07	1.20E-01	3.35E-08	4.77E-07	1.20E-01	5.73E-08	9.08E-07	1.19E-01	1.08E-07	1.99E-07
Phenanthrene	4.40E+00	1.54E-06	NA		2.63E-06	NA		2.34E-10	NA		
Pyrene	1.60E+01	5.59E-06	NA		9.56E-06	NA		8.50E-10	NA		
Acetone	3.40E-02	1.19E-08	NA		1.35E-08	NA		2.20E-07	NA		
cis-1,2-Dichloroethene	2.00E-03	6.99E-10	NA		7.97E-10	NA		4.74E-08	NA		
Methyl ethyl ketone	1.94E-02	6.78E-09	NA		7.73E-09	NA		8.19E-08	NA		
Methylene chloride	4.00E-03	1.40E-09	1.40E-02	1.96E-11	1.59E-09	1.40E-02	2.23E-11	1.31E-07	3.50E-03	4.60E-10	5.02E-10
Toluene	7.76E-03	2.71E-09	NA		3.09E-09	NA		1.60E-07	NA		
Xylenes, total	5.00E-03	1.75E-09	NA		1.99E-09	NA		6.72E-08	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	3.51E-05	1.23E-11	1.50E+03	1.84E-08	4.19E-12	1.50E+03	6.29E-09	1.86E-15	1.50E+03	2.80E-12	2.47E-08
1,2,3,4,6,7,8-HpCDF	3.08E-05	1.08E-11	1.50E+03	1.61E-08	3.68E-12	1.50E+03	5.52E-09	1.64E-15	1.50E+03	2.45E-12	2.17E-08
1,2,3,4,7,8,9-HpCDF	2.83E-06	9.89E-13	1.50E+03	1.48E-09	3.38E-13	1.50E+03	5.07E-10	1.50E-16	1.50E+03	2.25E-13	1.99E-09
1,2,3,4,7,8-HxCDD	2.83E-06	9.89E-13	1.50E+04	1.48E-08	3.38E-13	1.50E+04	5.07E-09	1.50E-16	1.50E+04	2.25E-12	1.99E-08
1,2,3,4,7,8-HxCDF	1.74E-05	6.08E-12	1.50E+04	9.12E-08	2.08E-12	1.50E+04	3.12E-08	9.24E-16	1.50E+04	1.39E-11	1.22E-07
1,2,3,6,7,8-HxCDD	5.59E-06	1.95E-12	1.50E+04	2.93E-08	6.68E-13	1.50E+04	1.00E-08	2.97E-16	1.50E+04	4.45E-12	3.93E-08

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
1,2,3,6,7,8-HxCDF	1.13E-05	3.95E-12	1.50E+04	5.92E-08	1.35E-12	1.50E+04	2.03E-08	6.00E-16	1.50E+04	9.00E-12	7.95E-08
1,2,3,7,8,9-HxCDD	3.75E-06	1.31E-12	1.50E+04	1.97E-08	4.48E-13	1.50E+04	6.72E-09	1.99E-16	1.50E+04	2.99E-12	2.64E-08
1,2,3,7,8,9-HxCDF	3.79E-06	1.32E-12	1.50E+04	1.99E-08	4.53E-13	1.50E+04	6.79E-09	2.01E-16	1.50E+04	3.02E-12	2.67E-08
1,2,3,7,8-PeCDD	3.37E-06	1.18E-12	1.50E+05	1.77E-07	4.03E-13	1.50E+05	6.04E-08	1.79E-16	1.50E+05	2.68E-11	2.37E-07
1,2,3,7,8-PeCDF	3.91E-06	1.37E-12	7.50E+03	1.02E-08	4.67E-13	7.50E+03	3.50E-09	2.08E-16	7.50E+03	1.56E-12	1.38E-08
2,3,4,6,7,8-HxCDF	1.55E-05	5.42E-12	1.50E+04	8.12E-08	1.85E-12	1.50E+04	2.78E-08	8.23E-16	1.50E+04	1.23E-11	1.09E-07
2,3,4,7,8-PeCDF	3.32E-05	1.16E-11	7.50E+04	8.70E-07	3.97E-12	7.50E+04	2.98E-07	1.76E-15	7.50E+04	1.32E-10	**1.17E-06**
2,3,7,8-TCDD	8.98E-07	3.14E-13	1.50E+05	4.71E-08	1.07E-13	1.50E+05	1.61E-08	4.77E-17	1.50E+05	7.15E-12	6.32E-08
2,3,7,8-TCDF	8.22E-06	2.87E-12	1.50E+04	4.31E-08	9.82E-13	1.50E+04	1.47E-08	4.37E-16	1.50E+04	6.55E-12	5.78E-08
OCDD	3.57E-04	1.25E-10	1.50E+01	1.87E-09	4.27E-11	1.50E+01	6.40E-10	1.90E-14	1.50E+01	2.84E-13	2.51E-09
OCDF	1.88E-05	6.57E-12	1.50E+01	9.85E-11	2.25E-12	1.50E+01	3.37E-11	9.98E-16	1.50E+01	1.50E-14	1.32E-10
			Total Risk:	**9.34E-05**		**Total Risk:**	**9.69E-05**		**Total Risk:**	3.20E-07	**1.91E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **2E-04**

Table 1-52
Risk Calculation Worksheet for Deep Soil - Noncarcinogenic Effects - Occupational Exposure Scenario - Industrial Worker Receptor - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information	Exposure Scenario:	Occupational
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Industrial Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	25	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5700	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	25	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Aluminum	1.30E+04	1.27E-02	1.00E+00	1.27E-02	1.45E-03	1.00E+00	1.45E-03	1.93E-06	1.40E-03	1.38E-03	1.56E-02
Antimony	2.16E+02	2.11E-04	4.00E-04	5.28E-01	2.41E-05	4.00E-04	6.02E-02	3.21E-08	NA		**5.89E-01**
Arsenic	1.28E+01	1.25E-05	3.00E-04	4.17E-02	4.28E-06	3.00E-04	1.43E-02	1.90E-09	8.57E-06	2.22E-04	5.62E-02
Barium	3.50E+03	3.42E-03	7.00E-02	4.89E-02	3.90E-04	7.00E-02	5.58E-03	5.20E-07	1.43E-04	3.64E-03	5.81E-02
Beryllium	6.74E-01	6.59E-07	2.00E-03	3.30E-04	7.52E-08	2.00E-03	3.76E-05	1.00E-10	5.71E-06	1.76E-05	3.85E-04
Cadmium	1.11E+01	1.09E-05	5.00E-04	2.17E-02	1.24E-07	5.00E-04	2.48E-04	1.65E-09	5.71E-06	2.89E-04	2.23E-02
Chromium	8.01E+01	7.84E-05	NA		8.93E-06	NA		1.19E-08	NA		
Cobalt	1.19E+01	1.16E-05	2.00E-02	5.82E-04	1.33E-06	2.00E-02	6.64E-05	1.77E-09	5.70E-06	3.10E-04	9.59E-04
Copper	3.07E+02	3.00E-04	4.00E-02	7.51E-03	3.42E-05	4.00E-02	8.56E-04	4.57E-08	NA		8.37E-03
Iron	5.74E+04	5.62E-02	3.00E-01	1.87E-01	6.40E-03	3.00E-01	2.13E-02	8.54E-06	NA		**2.09E-01**
Lead	1.45E+03	1.42E-03	NA		1.62E-04	NA		2.16E-07	NA		
Manganese	8.57E+02	8.39E-04	2.40E-02	3.49E-02	9.56E-05	2.40E-02	3.98E-03	1.27E-07	1.40E-05	9.10E-03	4.80E-02
Nickel	5.87E+01	5.74E-05	2.00E-02	2.87E-03	6.55E-06	2.00E-02	3.27E-04	8.73E-09	1.43E-05	6.11E-04	3.81E-03
Selenium	3.53E+00	3.45E-06	5.00E-03	6.91E-04	3.94E-07	5.00E-03	7.88E-05	5.25E-10	5.71E-03	9.19E-08	7.70E-04
Silver	8.32E-01	8.14E-07	5.00E-03	1.63E-04	9.28E-08	5.00E-03	1.86E-05	1.24E-10	NA		1.81E-04
Thallium	3.81E+00	3.73E-06	6.60E-05	5.65E-02	4.25E-07	6.60E-05	6.44E-03	5.67E-10	NA		6.29E-02
Vanadium	4.95E+01	4.84E-05	1.00E-03	4.84E-02	5.52E-06	1.00E-03	5.52E-03	7.36E-09	NA		5.40E-02
Zinc	8.03E+03	7.86E-03	3.00E-01	2.62E-02	8.96E-04	3.00E-01	2.99E-03	1.19E-06	NA		2.92E-02

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Pesticides/PCBs											
4,4'-DDD	6.08E-02	5.95E-08	NA		3.39E-08	NA		9.04E-12	NA		
4,4'-DDE	2.35E-02	2.30E-08	NA		1.31E-08	NA		3.49E-12	NA		
4,4'-DDT	8.79E-03	8.60E-09	5.00E-04	1.72E-05	4.90E-09	5.00E-04	9.80E-06	1.31E-12	5.00E-04	2.61E-09	2.70E-05
Dieldrin	9.15E-03	8.95E-09	5.00E-05	1.79E-04	5.10E-09	5.00E-05	1.02E-04	1.36E-12	5.00E-05	2.72E-08	2.81E-04
Endrin	4.27E-03	4.18E-09	3.00E-04	1.39E-05	2.38E-09	3.00E-04	7.94E-06	6.35E-13	3.00E-04	2.12E-09	2.19E-05
Endrin ketone	1.32E-02	1.29E-08	3.00E-04	4.31E-05	7.36E-09	3.00E-04	2.45E-05	1.96E-12	3.00E-04	6.54E-09	6.76E-05
gamma-Chlordane	1.41E-03	1.38E-09	5.00E-04	2.76E-06	7.86E-10	5.00E-04	1.57E-06	2.10E-13	2.00E-04	1.05E-09	4.33E-06
Methoxychlor	9.90E-03	9.69E-09	5.00E-03	1.94E-06	5.52E-09	5.00E-03	1.10E-06	1.47E-12	5.00E-03	2.94E-10	3.04E-06
SVOCs/VOCs											
2-Methylnaphthalene	1.91E+00	1.87E-06	4.00E-03	4.67E-04	3.20E-06	4.00E-03	7.99E-04	6.08E-06	NA		1.27E-03
Acenaphthylene	1.20E+00	1.17E-06	NA		2.01E-06	NA		1.78E-10	NA		
Anthracene	9.40E-01	9.20E-07	3.00E-01	3.07E-06	1.57E-06	3.00E-01	5.24E-06	2.13E-07	3.00E-01	7.10E-07	9.02E-06
Benzo(a)anthracene	4.14E+00	4.05E-06	NA		6.93E-06	NA		6.16E-10	NA		
Benzo(a)pyrene	8.90E+00	8.71E-06	NA		1.49E-05	NA		1.32E-09	NA		
Benzo(b)fluoranthene	5.60E+00	5.48E-06	NA		9.37E-06	NA		8.33E-10	NA		
Benzo(g,h,i)perylene	9.00E+00	8.81E-06	NA		1.51E-05	NA		1.34E-09	NA		
Benzo(k)fluoranthene	3.40E+00	3.33E-06	NA		5.69E-06	NA		5.06E-10	NA		
Biphenyl (diphenyl)	1.60E-01	1.57E-07	5.00E-02	3.13E-06	1.78E-07	5.00E-02	3.57E-06	2.38E-11	5.00E-02	4.76E-10	6.70E-06
Chrysene	6.50E+00	6.36E-06	NA		1.09E-05	NA		9.67E-10	NA		
Dibenz(a,h)anthracene	1.02E+00	9.98E-07	NA		1.71E-06	NA		1.52E-10	NA		
Fluoranthene	1.20E+01	1.17E-05	4.00E-02	2.94E-04	2.01E-05	4.00E-02	5.02E-04	1.78E-09	4.00E-02	4.46E-08	7.96E-04
Fluorene	4.23E-01	4.14E-07	4.00E-02	1.03E-05	7.08E-07	4.00E-02	1.77E-05	1.47E-07	4.00E-02	3.69E-06	3.17E-05
Indeno(1,2,3-c,d)pyrene	8.30E+00	8.12E-06	NA		1.39E-05	NA		1.23E-09	NA		
Naphthalene	7.99E-01	7.82E-07	2.00E-02	3.91E-05	1.34E-06	2.00E-02	6.68E-05	2.54E-06	8.57E-04	2.97E-03	3.07E-03
Phenanthrene	4.40E+00	4.31E-06	NA		7.36E-06	NA		6.54E-10	NA		
Pyrene	1.60E+01	1.57E-05	3.00E-02	5.22E-04	2.68E-05	3.00E-02	8.92E-04	2.38E-09	3.00E-02	7.93E-08	1.41E-03
Acetone	3.40E-02	3.33E-08	9.00E-01	3.70E-08	3.79E-08	9.00E-01	4.21E-08	6.15E-07	9.00E-01	6.83E-07	7.63E-07
cis-1,2-Dichloroethene	2.00E-03	1.96E-09	1.00E-02	1.96E-07	2.23E-09	1.00E-02	2.23E-07	1.33E-07	1.00E-02	1.33E-05	1.37E-05
Methyl ethyl ketone	1.94E-02	1.90E-08	6.00E-01	3.16E-08	2.16E-08	6.00E-01	3.61E-08	2.29E-07	1.40E+00	1.64E-07	2.32E-07
Methylene chloride	4.00E-03	3.91E-09	6.00E-02	6.52E-08	4.46E-09	6.00E-02	7.44E-08	3.68E-07	1.14E-01	3.22E-06	3.36E-06
Toluene	7.76E-03	7.59E-09	2.00E-01	3.80E-08	8.66E-09	2.00E-01	4.33E-08	4.48E-07	8.57E-02	5.22E-06	5.30E-06
Xylenes, total	5.00E-03	4.89E-09	2.00E-01	2.45E-08	5.58E-09	2.00E-01	2.79E-08	1.88E-07	2.90E-02	6.49E-06	6.54E-06
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	3.51E-05	3.43E-11	NA		1.17E-11	NA		5.22E-15	1.14E-08	4.57E-07	4.57E-07
1,2,3,4,6,7,8-HpCDF	3.08E-05	3.01E-11	NA		1.03E-11	NA		4.58E-15	1.14E-08	4.01E-07	4.01E-07
1,2,3,4,7,8,9-HpCDF	2.83E-06	2.77E-12	NA		9.47E-13	NA		4.21E-16	1.14E-08	3.68E-08	3.68E-08
1,2,3,4,7,8-HxCDD	2.83E-06	2.77E-12	NA		9.47E-13	NA		4.21E-16	1.14E-08	3.68E-08	3.68E-08
1,2,3,4,7,8-HxCDF	1.74E-05	1.70E-11	NA		5.82E-12	NA		2.59E-15	1.14E-08	2.26E-07	2.26E-07
1,2,3,6,7,8-HxCDD	5.59E-06	5.47E-12	NA		1.87E-12	NA		8.31E-16	1.14E-08	7.27E-08	7.27E-08
1,2,3,6,7,8-HxCDF	1.13E-05	1.11E-11	NA		3.78E-12	NA		1.68E-15	1.14E-08	1.47E-07	1.47E-07
1,2,3,7,8,9-HxCDD	3.75E-06	3.67E-12	NA		1.25E-12	NA		5.58E-16	1.14E-08	4.88E-08	4.88E-08
1,2,3,7,8,9-HxCDF	3.79E-06	3.71E-12	NA		1.27E-12	NA		5.64E-16	1.14E-08	4.93E-08	4.93E-08
1,2,3,7,8-PeCDD	3.37E-06	3.30E-12	NA		1.13E-12	NA		5.01E-16	1.14E-08	4.38E-08	4.38E-08
1,2,3,7,8-PeCDF	3.91E-06	3.83E-12	NA		1.31E-12	NA		5.81E-16	1.14E-08	5.09E-08	5.09E-08
2,3,4,6,7,8-HxCDF	1.55E-05	1.52E-11	NA		5.19E-12	NA		2.30E-15	1.14E-08	2.02E-07	2.02E-07
2,3,4,7,8-PeCDF	3.32E-05	3.25E-11	NA		1.11E-11	NA		4.94E-15	1.14E-08	4.32E-07	4.32E-07
2,3,7,8-TCDD	8.98E-07	8.79E-13	NA		3.01E-13	NA		1.34E-16	1.14E-08	1.17E-08	1.17E-08

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
2,3,7,8-TCDF	8.22E-06	8.04E-12	NA		2.75E-12	NA		1.22E-15	1.14E-08	1.07E-07	1.07E-07
OCDD	3.57E-04	3.49E-10	NA		1.19E-10	NA		5.31E-14	1.14E-08	4.65E-06	4.65E-06
OCDF	1.88E-05	1.84E-11	NA		6.29E-12	NA		2.80E-15	1.14E-08	2.45E-07	2.45E-07
		Total Risk (Hazard Index):		1.0	**Total Risk (Hazard Index):**		0.1	**Total Risk (Hazard Index):**		0.019	1.16

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **1**

Table 1-53
Risk Calculation Worksheet for Deep Soil - Carcinogenic Effects - Construction Exposure Scenario - Future Construction Worker Receptor - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Construction Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	1	yr
Soil Ingestion Rate	IR	330	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5700	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.8	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Metals											
Aluminum	1.30E+04	6.00E-04	NA		8.29E-05	NA		2.76E-08	NA		
Antimony	2.16E+02	9.96E-06	NA		1.38E-06	NA		4.59E-10	NA		
Arsenic	1.28E+01	5.90E-07	9.50E+00	**5.61E-06**	2.45E-07	9.50E+00	**2.33E-06**	2.72E-11	1.51E+01	4.09E-10	**7.93E-06**
Barium	3.50E+03	1.61E-04	NA		2.23E-05	NA		7.44E-09	NA		
Beryllium	6.74E-01	3.11E-08	NA		4.30E-09	NA		1.43E-12	8.40E+00	1.20E-11	1.20E-11
Cadmium	1.11E+01	5.12E-07	3.80E-01	1.95E-07	7.08E-09	3.80E-01	2.69E-09	2.36E-11	1.47E+01	3.47E-10	1.98E-07
Chromium	8.01E+01	3.69E-06	NA		5.11E-07	NA		1.70E-10	4.20E+01	7.15E-09	7.15E-09
Cobalt	1.19E+01	5.49E-07	NA		7.59E-08	NA		2.53E-11	9.80E+00	2.48E-10	2.48E-10
Copper	3.07E+02	1.42E-05	NA		1.96E-06	NA		6.52E-10	NA		
Iron	5.74E+04	2.65E-03	NA		3.66E-04	NA		1.22E-07	NA		
Lead	1.45E+03	6.69E-05	NA		9.24E-06	NA		3.08E-09	NA		
Manganese	8.57E+02	3.95E-05	NA		5.46E-06	NA		1.82E-09	NA		
Nickel	5.87E+01	2.71E-06	NA		3.74E-07	NA		1.25E-10	9.10E-01	1.13E-10	1.13E-10
Selenium	3.53E+00	1.63E-07	NA		2.25E-08	NA		7.50E-12	NA		
Silver	8.32E-01	3.84E-08	NA		5.30E-09	NA		1.77E-12	NA		
Thallium	3.81E+00	1.76E-07	NA		2.43E-08	NA		8.09E-12	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Vanadium	4.95E+01	2.28E-06	NA		3.16E-07	NA		1.05E-10	NA		
Zinc	8.03E+03	3.70E-04	NA		5.12E-05	NA		1.71E-08	NA		
Pesticides/PCBs											
4,4'-DDD	6.08E-02	2.80E-09	2.40E-01	6.73E-10	1.94E-09	2.40E-01	4.65E-10	1.29E-13	2.42E-01	3.12E-14	1.14E-09
4,4'-DDE	2.35E-02	1.08E-09	3.40E-01	3.69E-10	7.49E-10	3.40E-01	2.55E-10	4.99E-14	3.40E-01	1.69E-14	6.23E-10
4,4'-DDT	8.79E-03	4.05E-10	3.40E-01	1.38E-10	2.80E-10	3.40E-01	9.52E-11	1.87E-14	3.40E-01	6.34E-15	2.33E-10
Dieldrin	9.15E-03	4.22E-10	1.60E+01	6.75E-09	2.92E-10	1.60E+01	4.67E-09	1.94E-14	1.61E+01	3.13E-13	1.14E-08
Endrin	4.27E-03	1.97E-10	NA		1.36E-10	NA		9.07E-15	NA		
Endrin ketone	1.32E-02	6.09E-10	NA		4.21E-10	NA		2.80E-14	NA		
gamma-Chlordane	1.41E-03	6.50E-11	1.20E+00	7.80E-11	4.49E-11	1.20E+00	5.39E-11	3.00E-15	1.19E+00	3.56E-15	1.32E-10
Methoxychlor	9.90E-03	4.57E-10	NA		3.16E-10	NA		2.10E-14	NA		
SVOCs/VOCs											
2-Methylnaphthalene	1.91E+00	8.81E-08	NA		1.83E-07	NA		8.68E-08	NA		
Acenaphthylene	1.20E+00	5.54E-08	NA		1.15E-07	NA		2.55E-12	NA		
Anthracene	9.40E-01	4.34E-08	NA		8.99E-08	NA		3.04E-09	NA		
Benzo(a)anthracene	4.14E+00	1.91E-07	1.20E+00	2.29E-07	3.96E-07	1.20E+00	4.75E-07	8.79E-12	7.30E-01	6.42E-12	7.04E-07
Benzo(a)pyrene	8.90E+00	4.11E-07	1.20E+01	**4.93E-06**	8.51E-07	1.20E+01	**1.02E-05**	1.89E-11	7.30E+00	1.38E-10	**1.51E-05**
Benzo(b)fluoranthene	5.60E+00	2.58E-07	1.20E+00	3.10E-07	5.35E-07	1.20E+00	6.43E-07	1.19E-11	7.30E-01	8.68E-12	9.52E-07
Benzo(g,h,i)perylene	9.00E+00	4.15E-07	NA		8.60E-07	NA		1.91E-11	NA		
Benzo(k)fluoranthene	3.40E+00	1.57E-07	1.20E+00	1.88E-07	3.25E-07	1.20E+00	3.90E-07	7.22E-12	3.85E-01	2.78E-12	5.78E-07
Biphenyl (diphenyl)	1.60E-01	7.38E-09	NA		1.02E-08	NA		3.40E-13	NA		
Chrysene	6.50E+00	3.00E-07	1.20E-01	3.60E-08	6.21E-07	1.20E-01	7.46E-08	1.38E-11	3.85E-02	5.32E-13	1.11E-07
Dibenz(a,h)anthracene	1.02E+00	4.71E-08	7.30E+00	3.43E-07	9.75E-08	7.30E+00	7.12E-07	2.17E-12	7.30E+00	1.58E-11	**1.06E-06**
Fluoranthene	1.20E+01	5.54E-07	NA		1.15E-06	NA		2.55E-11	NA		
Fluorene	4.23E-01	1.95E-08	NA		4.04E-08	NA		2.11E-09	NA		
Indeno(1,2,3-c,d)pyrene	8.30E+00	3.83E-07	7.30E-01	2.79E-07	7.94E-07	7.30E-01	5.79E-07	1.76E-11	7.30E-01	1.29E-11	8.59E-07
Naphthalene	7.99E-01	3.69E-08	1.20E-01	4.42E-09	7.64E-08	1.20E-01	9.17E-09	3.63E-08	1.19E-01	4.32E-09	1.79E-08
Phenanthrene	4.40E+00	2.03E-07	NA		4.21E-07	NA		9.35E-12	NA		
Pyrene	1.60E+01	7.38E-07	NA		1.53E-06	NA		3.40E-11	NA		
Acetone	3.40E-02	1.57E-09	NA		2.17E-09	NA		8.79E-09	NA		
cis-1,2-Dichloroethene	2.00E-03	9.23E-11	NA		1.27E-10	NA		1.90E-09	NA		
Methyl ethyl ketone	1.94E-02	8.95E-10	NA		1.24E-09	NA		3.28E-09	NA		
Methylene chloride	4.00E-03	1.85E-10	1.40E-02	2.58E-12	2.55E-10	1.40E-02	3.57E-12	5.26E-09	3.50E-03	1.84E-11	2.46E-11
Toluene	7.76E-03	3.58E-10	NA		4.95E-10	NA		6.40E-09	NA		
Xylenes, total	5.00E-03	2.31E-10	NA		3.19E-10	NA		2.69E-09	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	3.51E-05	1.62E-12	1.50E+03	2.43E-09	6.71E-13	1.50E+03	1.01E-09	7.46E-17	1.50E+03	1.12E-13	3.44E-09
1,2,3,4,6,7,8-HpCDF	3.08E-05	1.42E-12	1.50E+03	2.13E-09	5.89E-13	1.50E+03	8.83E-10	6.54E-17	1.50E+03	9.81E-14	3.01E-09
1,2,3,4,7,8,9-HpCDF	2.83E-06	1.31E-13	1.50E+03	1.96E-10	5.41E-14	1.50E+03	8.12E-11	6.01E-18	1.50E+03	9.02E-15	2.77E-10
1,2,3,4,7,8-HxCDD	2.83E-06	1.31E-13	1.50E+04	1.96E-09	5.41E-14	1.50E+04	8.12E-10	6.01E-18	1.50E+04	9.02E-14	2.77E-09
1,2,3,4,7,8-HxCDF	1.74E-05	8.03E-13	1.50E+04	1.20E-08	3.33E-13	1.50E+04	4.99E-09	3.70E-17	1.50E+04	5.54E-13	1.70E-08
1,2,3,6,7,8-HxCDD	5.59E-06	2.58E-13	1.50E+04	3.87E-09	1.07E-13	1.50E+04	1.60E-09	1.19E-17	1.50E+04	1.78E-13	5.47E-09

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
1,2,3,6,7,8-HxCDF	1.13E-05	5.21E-13	1.50E+04	7.82E-09	2.16E-13	1.50E+04	3.24E-09	2.40E-17	1.50E+04	3.60E-13	1.11E-08
1,2,3,7,8,9-HxCDD	3.75E-06	1.73E-13	1.50E+04	2.59E-09	7.17E-14	1.50E+04	1.08E-09	7.97E-18	1.50E+04	1.19E-13	3.67E-09
1,2,3,7,8,9-HxCDF	3.79E-06	1.75E-13	1.50E+04	2.62E-09	7.25E-14	1.50E+04	1.09E-09	8.05E-18	1.50E+04	1.21E-13	3.71E-09
1,2,3,7,8-PeCDD	3.37E-06	1.55E-13	1.50E+05	2.33E-08	6.44E-14	1.50E+05	9.67E-09	7.16E-18	1.50E+05	1.07E-12	3.30E-08
1,2,3,7,8-PeCDF	3.91E-06	1.80E-13	7.50E+03	1.35E-09	7.48E-14	7.50E+03	5.61E-10	8.31E-18	7.50E+03	6.23E-14	1.91E-09
2,3,4,6,7,8-HxCDF	1.55E-05	7.15E-13	1.50E+04	1.07E-08	2.96E-13	1.50E+04	4.45E-09	3.29E-17	1.50E+04	4.94E-13	1.52E-08
2,3,4,7,8-PeCDF	3.32E-05	1.53E-12	7.50E+04	1.15E-07	6.35E-13	7.50E+04	4.76E-08	7.05E-17	7.50E+04	5.29E-12	1.62E-07
2,3,7,8-TCDD	8.98E-07	4.14E-14	1.50E+05	6.21E-09	1.72E-14	1.50E+05	2.58E-09	1.91E-18	1.50E+05	2.86E-13	8.79E-09
2,3,7,8-TCDF	8.22E-06	3.79E-13	1.50E+04	5.69E-09	1.57E-13	1.50E+04	2.36E-09	1.75E-17	1.50E+04	2.62E-13	8.05E-09
OCDD	3.57E-04	1.65E-11	1.50E+01	2.47E-10	6.83E-12	1.50E+01	1.02E-10	7.58E-16	1.50E+01	1.14E-14	3.49E-10
OCDF	1.88E-05	8.67E-13	1.50E+01	1.30E-11	3.59E-13	1.50E+01	5.39E-12	3.99E-17	1.50E+01	5.99E-16	1.84E-11
			Total Risk:	**1.23E-05**		**Total Risk:**	**1.55E-05**		**Total Risk:**	1.28E-08	**2.78E-05**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **3E-05**

Table 1-54
Risk Calculation Worksheet for Deep Soil - Noncarcinogenic Effects - Construction Exposure Scenario - Future Construction Worker Receptor - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Construction Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter (units)	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	1	yr
Soil Ingestion Rate	IR	330	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5700	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		day/yr
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.8	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Aluminum	1.30E+04	4.20E-02	1.00E+00	4.20E-02	5.80E-03	1.00E+00	5.80E-03	1.93E-06	1.40E-03	1.38E-03	4.92E-02
Antimony	2.16E+02	6.97E-04	4.00E-04	1.74E+00	9.64E-05	4.00E-04	2.41E-01	3.21E-08	NA		**1.98E+00**
Arsenic	1.28E+01	4.13E-05	3.00E-04	1.38E-01	1.71E-05	3.00E-04	5.71E-02	1.90E-09	8.57E-06	2.22E-04	**1.95E-01**
Barium	3.50E+03	1.13E-02	7.00E-02	1.61E-01	1.56E-03	7.00E-02	2.23E-02	5.20E-07	1.43E-04	3.64E-03	**1.87E-01**
Beryllium	6.74E-01	2.18E-06	2.00E-03	1.09E-03	3.01E-07	2.00E-03	1.50E-04	1.00E-10	5.71E-06	1.76E-05	1.26E-03
Cadmium	1.11E+01	3.58E-05	5.00E-04	7.17E-02	4.95E-07	5.00E-04	9.91E-04	1.65E-09	5.71E-06	2.89E-04	7.30E-02
Chromium	8.01E+01	2.59E-04	NA		3.57E-05	NA		1.19E-08	NA		
Cobalt	1.19E+01	3.84E-05	2.00E-02	1.92E-03	5.31E-06	2.00E-02	2.65E-04	1.77E-09	5.70E-06	3.10E-04	2.50E-03
Copper	3.07E+02	9.91E-04	4.00E-02	2.48E-02	1.37E-04	4.00E-02	3.42E-03	4.57E-08	NA		2.82E-02
Iron	5.74E+04	1.85E-01	3.00E-01	6.18E-01	2.56E-02	3.00E-01	8.54E-02	8.54E-06	NA		**7.03E-01**
Lead	1.45E+03	4.68E-03	NA		6.47E-04	NA		2.16E-07	NA		
Manganese	8.57E+02	2.77E-03	2.40E-02	1.15E-01	3.82E-04	2.40E-02	1.59E-02	1.27E-07	1.40E-05	9.10E-03	**1.40E-01**
Nickel	5.87E+01	1.90E-04	2.00E-02	9.48E-03	2.62E-05	2.00E-02	1.31E-03	8.73E-09	1.43E-05	6.11E-04	1.14E-02
Selenium	3.53E+00	1.14E-05	5.00E-03	2.28E-03	1.58E-06	5.00E-03	3.15E-04	5.25E-10	5.71E-03	9.19E-08	2.59E-03
Silver	8.32E-01	2.69E-06	5.00E-03	5.37E-04	3.71E-07	5.00E-03	7.42E-05	1.24E-10	NA		6.12E-04
Thallium	3.81E+00	1.23E-05	6.60E-05	1.86E-01	1.70E-06	6.60E-05	2.58E-02	5.67E-10	NA		**2.12E-01**
Vanadium	4.95E+01	1.60E-04	1.00E-03	1.60E-01	2.21E-05	1.00E-03	2.21E-02	7.36E-09	NA		**1.82E-01**
Zinc	8.03E+03	2.59E-02	3.00E-01	8.64E-02	3.58E-03	3.00E-01	1.19E-02	1.19E-06	NA		9.84E-02

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Pesticides/PCBs											
4,4'-DDD	6.08E-02	1.96E-07	NA		1.36E-07	NA		9.04E-12	NA		
4,4'-DDE	2.35E-02	7.59E-08	NA		5.24E-08	NA		3.49E-12	NA		
4,4'-DDT	8.79E-03	2.84E-08	5.00E-04	5.68E-05	1.96E-08	5.00E-04	3.92E-05	1.31E-12	5.00E-04	2.61E-09	9.60E-05
Dieldrin	9.15E-03	2.95E-08	5.00E-05	5.91E-04	2.04E-08	5.00E-05	4.08E-04	1.36E-12	5.00E-05	2.72E-08	9.99E-04
Endrin	4.27E-03	1.38E-08	3.00E-04	4.60E-05	9.53E-09	3.00E-04	3.18E-05	6.35E-13	3.00E-04	2.12E-09	7.77E-05
Endrin ketone	1.32E-02	4.26E-08	3.00E-04	1.42E-04	2.94E-08	3.00E-04	9.82E-05	1.96E-12	3.00E-04	6.54E-09	2.40E-04
gamma-Chlordane	1.41E-03	4.55E-09	5.00E-04	9.11E-06	3.15E-09	5.00E-04	6.29E-06	2.10E-13	2.00E-04	1.05E-09	1.54E-05
Methoxychlor	9.90E-03	3.20E-08	5.00E-03	6.39E-06	2.21E-08	5.00E-03	4.42E-06	1.47E-12	5.00E-03	2.94E-10	1.08E-05
SVOCs/VOCs											
2-Methylnaphthalene	1.91E+00	6.17E-06	4.00E-03	1.54E-03	1.28E-05	4.00E-03	3.20E-03	6.08E-06	NA		4.74E-03
Acenaphthylene	1.20E+00	3.87E-06	NA		8.03E-06	NA		1.78E-10	NA		
Anthracene	9.40E-01	3.04E-06	3.00E-01	1.01E-05	6.29E-06	3.00E-01	2.10E-05	2.13E-07	3.00E-01	7.10E-07	3.18E-05
Benzo(a)anthracene	4.14E+00	1.34E-05	NA		2.77E-05	NA		6.16E-10	NA		
Benzo(a)pyrene	8.90E+00	2.87E-05	NA		5.96E-05	NA		1.32E-09	NA		
Benzo(b)fluoranthene	5.60E+00	1.81E-05	NA		3.75E-05	NA		8.33E-10	NA		
Benzo(g,h,i)perylene	9.00E+00	2.91E-05	NA		6.02E-05	NA		1.34E-09	NA		
Benzo(k)fluoranthene	3.40E+00	1.10E-05	NA		2.28E-05	NA		5.06E-10	NA		
Biphenyl (diphenyl)	1.60E-01	5.17E-07	5.00E-02	1.03E-05	7.14E-07	5.00E-02	1.43E-05	2.38E-11	5.00E-02	4.76E-10	2.46E-05
Chrysene	6.50E+00	2.10E-05	NA		4.35E-05	NA		9.67E-10	NA		
Dibenz(a,h)anthracene	1.02E+00	3.29E-06	NA		6.83E-06	NA		1.52E-10	NA		
Fluoranthene	1.20E+01	3.87E-05	4.00E-02	9.69E-04	8.03E-05	4.00E-02	2.01E-03	1.78E-09	4.00E-02	4.46E-08	2.98E-03
Fluorene	4.23E-01	1.37E-06	4.00E-02	3.41E-05	2.83E-06	4.00E-02	7.08E-05	1.47E-07	4.00E-02	3.69E-06	1.09E-04
Indeno(1,2,3-c,d)pyrene	8.30E+00	2.68E-05	NA		5.55E-05	NA		1.23E-09	NA		
Naphthalene	7.99E-01	2.58E-06	2.00E-02	1.29E-04	5.35E-06	2.00E-02	2.67E-04	2.54E-06	8.57E-04	2.97E-03	3.36E-03
Phenanthrene	4.40E+00	1.42E-05	NA		2.94E-05	NA		6.54E-10	NA		
Pyrene	1.60E+01	5.17E-05	3.00E-02	1.72E-03	1.07E-04	3.00E-02	3.57E-03	2.38E-09	3.00E-02	7.93E-08	5.29E-03
Acetone	3.40E-02	1.10E-07	9.00E-01	1.22E-07	1.52E-07	9.00E-01	1.69E-07	6.15E-07	9.00E-01	6.83E-07	9.74E-07
cis-1,2-Dichloroethene	2.00E-03	6.46E-09	1.00E-02	6.46E-07	8.92E-09	1.00E-02	8.92E-07	1.33E-07	1.00E-02	1.33E-05	1.48E-05
Methyl ethyl ketone	1.94E-02	6.26E-08	6.00E-01	1.04E-07	8.66E-08	6.00E-01	1.44E-07	2.29E-07	1.40E+00	1.64E-07	4.13E-07
Methylene chloride	4.00E-03	1.29E-08	6.00E-02	2.15E-07	1.78E-08	6.00E-02	2.97E-07	3.68E-07	1.14E-01	3.22E-06	3.73E-06
Toluene	7.76E-03	2.51E-08	2.00E-01	1.25E-07	3.46E-08	2.00E-01	1.73E-07	4.48E-07	8.57E-02	5.22E-06	5.52E-06
Xylenes, total	5.00E-03	1.61E-08	2.00E-01	8.07E-08	2.23E-08	2.00E-01	1.12E-07	1.88E-07	2.90E-02	6.49E-06	6.68E-06
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	3.51E-05	1.13E-10	NA		4.70E-11	NA		5.22E-15	1.14E-08	4.57E-07	4.57E-07
1,2,3,4,6,7,8-HpCDF	3.08E-05	9.95E-11	NA		4.12E-11	NA		4.58E-15	1.14E-08	4.01E-07	4.01E-07
1,2,3,4,7,8,9-HpCDF	2.83E-06	9.14E-12	NA		3.79E-12	NA		4.21E-16	1.14E-08	3.68E-08	3.68E-08
1,2,3,4,7,8-HxCDD	2.83E-06	9.14E-12	NA		3.79E-12	NA		4.21E-16	1.14E-08	3.68E-08	3.68E-08
1,2,3,4,7,8-HxCDF	1.74E-05	5.62E-11	NA		2.33E-11	NA		2.59E-15	1.14E-08	2.26E-07	2.26E-07
1,2,3,6,7,8-HxCDD	5.59E-06	1.80E-11	NA		7.48E-12	NA		8.31E-16	1.14E-08	7.27E-08	7.27E-08
1,2,3,6,7,8-HxCDF	1.13E-05	3.65E-11	NA		1.51E-11	NA		1.68E-15	1.14E-08	1.47E-07	1.47E-07
1,2,3,7,8,9-HxCDD	3.75E-06	1.21E-11	NA		5.02E-12	NA		5.58E-16	1.14E-08	4.88E-08	4.88E-08
1,2,3,7,8,9-HxCDF	3.79E-06	1.22E-11	NA		5.07E-12	NA		5.64E-16	1.14E-08	4.93E-08	4.93E-08
1,2,3,7,8-PeCDD	3.37E-06	1.09E-11	NA		4.51E-12	NA		5.01E-16	1.14E-08	4.38E-08	4.38E-08
1,2,3,7,8-PeCDF	3.91E-06	1.26E-11	NA		5.23E-12	NA		5.81E-16	1.14E-08	5.09E-08	5.09E-08
2,3,4,6,7,8-HxCDF	1.55E-05	5.00E-11	NA		2.07E-11	NA		2.30E-15	1.14E-08	2.02E-07	2.02E-07
2,3,4,7,8-PeCDF	3.32E-05	1.07E-10	NA		4.44E-11	NA		4.94E-15	1.14E-08	4.32E-07	4.32E-07
2,3,7,8-TCDD	8.98E-07	2.90E-12	NA		1.20E-12	NA		1.34E-16	1.14E-08	1.17E-08	1.17E-08

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
2,3,7,8-TCDF	8.22E-06	2.65E-11	NA		1.10E-11	NA		1.22E-15	1.14E-08	1.07E-07	1.07E-07
OCDD	3.57E-04	1.15E-09	NA		4.78E-10	NA		5.31E-14	1.14E-08	4.65E-06	4.65E-06
OCDF	1.88E-05	6.07E-11	NA		2.52E-11	NA		2.80E-15	1.14E-08	2.45E-07	2.45E-07
		Total Risk (Hazard Index):		3.4	**Total Risk (Hazard Index):**		0.5	**Total Risk (Hazard Index):**		0.019	3.89

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **4**

Table 1-55
Cancer Risk Results Detailed Summary of Risk Drivers - Deep Soil - Future Industrial/Construction Worker - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Industrial Worker					Future Construction Worker				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	**4.2E-05**	**1.5E-05**	1.0E-08	**5.7E-05**	30%	**5.6E-06**	**2.3E-06**	4.1E-10	**7.9E-06**	28%
Cadmium	**1.5E-06**	1.7E-08	8.7E-09	**1.5E-06**	1%	1.9E-07	2.7E-09	3.5E-10	2.0E-07	1%
Subtotal Metals	**4.4E-05**	**1.5E-05**	2.1E-07	**5.9E-05**	31%	**5.8E-06**	**2.3E-06**	8.3E-09	**8.1E-06**	29%
SVOCs/VOCs										
Benzo(a)anthracene	**1.7E-06**	**3.0E-06**	1.6E-10	**4.7E-06**	2%	2.3E-07	4.7E-07	6.4E-12	7.0E-07	3%
Benzo(a)pyrene	**3.7E-05**	**6.4E-05**	3.5E-09	**1.0E-04**	53%	**4.9E-06**	**1.0E-05**	1.4E-10	**1.5E-05**	54%
Benzo(b)fluoranthene	**2.3E-06**	**4.0E-06**	2.2E-10	**6.4E-06**	3%	3.1E-07	6.4E-07	8.7E-12	9.5E-07	3%
Benzo(k)fluoranthene	**1.4E-06**	**2.4E-06**	7.0E-11	**3.9E-06**	2%	1.9E-07	3.9E-07	2.8E-12	5.8E-07	2%
Dibenz(a,h)anthracene	**2.6E-06**	**4.4E-06**	4.0E-10	**7.1E-06**	4%	3.4E-07	7.1E-07	1.6E-11	**1.1E-06**	4%
Indeno(1,2,3-c,d)pyrene	**2.1E-06**	**3.6E-06**	3.2E-10	**5.7E-06**	3%	2.8E-07	5.8E-07	1.3E-11	8.6E-07	3%
Subtotal SVOCs/VOCs	**4.8E-05**	**8.2E-05**	1.1E-07	**1.3E-04**	68%	**6.3E-06**	**1.3E-05**	4.5E-09	**1.9E-05**	70%
Dioxans/Furans										
2,3,4,7,8-PeCDF	8.7E-07	3.0E-07	1.3E-10	**1.2E-06**	1%	1.1E-07	4.8E-08	5.3E-12	1.6E-07	1%
Subtotal Dioxans/Furans	**1.5E-06**	5.1E-07	2.3E-10	**2.0E-06**	1%	2.0E-07	8.2E-08	9.1E-12	2.8E-07	1%
Total:	**9.3E-05**	**9.7E-05**	3.2E-07	**1.91E-04**		**1.2E-05**	**1.6E-05**	1.3E-08	**2.78E-05**	

Total Estimated Cancer Risk Across All Exposure Routes: **2E-04** **3E-05**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total cancer risk for all chemicals evaluated.

Table 1-56
Noncancer Risk Results Detailed Summary of Risk Drivers - Deep Soil - Future Industrial/Construction Worker - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Non-Carcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Industrial Worker					Future Construction Worker				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Antimony	**5.3E-01**	6.0E-02		**5.9E-01**	51%	**1.7E+00**	**2.4E-01**		**2.0E+00**	51%
Arsenic	4.2E-02	1.4E-02	2.2E-04	5.6E-02	5%	**1.4E-01**	5.7E-02	2.2E-04	**2.0E-01**	5%
Barium	4.9E-02	5.6E-03	3.6E-03	5.8E-02	5%	**1.6E-01**	2.2E-02	3.6E-03	**1.9E-01**	5%
Iron	**1.9E-01**	2.1E-02		**2.1E-01**	18%	**6.2E-01**	8.5E-02		**7.0E-01**	18%
Manganese	3.5E-02	4.0E-03	9.1E-03	4.8E-02	4%	**1.2E-01**	1.6E-02	9.1E-03	**1.4E-01**	4%
Thallium	5.6E-02	6.4E-03		6.3E-02	5%	**1.9E-01**	2.6E-02		**2.1E-01**	5%
Vanadium	4.8E-02	5.5E-03		5.4E-02	5%	**1.6E-01**	2.2E-02		**1.8E-01**	5%
Subtotal Metals	**1.0E+00**	**1.2E-01**	1.6E-02	**1.2E+00**	99%	**3.4E+00**	**4.9E-01**	1.6E-02	**3.9E+00**	100%
Total:	**1.0**	**0.1**	0.02	**1.2**		**3.4**	**0.5**	0.02	**3.9**	

Total Estimated Hazard Index Across All Exposure Routes: **1** **4**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.

Table 1-57
Exposure Point Concentrations - Shallow Soil - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (EPC)	EPC Basis
Metals			
Aluminum	mg/kg	9.21E+03	95% Approximate Gamma UCL
Antimony	mg/kg	3.50E+00	95% Approximate Gamma UCL
Arsenic	mg/kg	2.69E+01	95% Approximate Gamma UCL
Barium	mg/kg	9.37E+02	95% Chebyshev (Mean, Sd) UCL
Beryllium	mg/kg	3.03E-01	95% Student's-t UCL
Cadmium	mg/kg	2.45E+00	95% Chebyshev (Mean, Sd) UCL
Chromium	mg/kg	1.54E+02	95% Approximate Gamma UCL
Cobalt	mg/kg	7.06E+00	95% Student's-t UCL
Copper	mg/kg	1.49E+02	95% Approximate Gamma UCL
Iron	mg/kg	2.49E+04	95% Approximate Gamma UCL
Lead	mg/kg	4.36E+03	99% Chebyshev (Mean, Sd) UCL
Manganese	mg/kg	3.60E+02	95% Student's-t UCL
Nickel	mg/kg	2.58E+01	95% Student's-t UCL
Selenium	mg/kg	3.00E+00	Maximum Result
Silver	mg/kg	5.12E-01	95% Approximate Gamma UCL
Thallium	mg/kg	2.60E+00	Maximum Result
Vanadium	mg/kg	3.26E+01	95% Approximate Gamma UCL
Zinc	mg/kg	4.53E+02	95% Approximate Gamma UCL
Pesticides/PCBs			
4,4'-DDD	mg/kg	9.09E+00	95% Adjusted Gamma UCL
4,4'-DDE	mg/kg	5.26E+00	95% Adjusted Gamma UCL
4,4'-DDT	mg/kg	1.21E+02	95% Hall's Bootstrap UCL
alpha-BHC	mg/kg	6.00E-03	Maximum Result
alpha-Chlordane	mg/kg	8.10E-02	Maximum Result
beta-BHC	mg/kg	2.40E-02	Maximum Result
gamma-BHC	mg/kg	3.47E-01	99% Chebyshev (Mean, Sd) UCL
gamma-Chlordane	mg/kg	8.30E-02	Maximum Result
Dieldrin	mg/kg	8.60E-02	Maximum Result
Endosulfan sulfate	mg/kg	4.40E-03	Maximum Result
Endrin	mg/kg	1.40E-02	Maximum Result
Endrin aldehyde	mg/kg	4.90E-03	Maximum Result
Endrin ketone	mg/kg	6.90E-03	Maximum Result
Heptachlor	mg/kg	6.50E-04	Maximum Result
Heptachlor epoxide	mg/kg	2.80E-03	Maximum Result
Methoxychlor	mg/kg	7.00E-03	Maximum Result
Aroclor-1260	mg/kg	3.30E-02	Maximum Result
SVOCs/VOCs			
1,2-Dichlorobenzene	mg/kg	8.25E-03	95% Student's-t UCL
1,4-Dichlorobenzene	mg/kg	2.00E-03	Maximum Result
2-Methylnaphthalene	mg/kg	3.87E+00	99% Chebyshev (Mean, Sd) UCL
bis(2-Ethylhexyl)phthalate	mg/kg	1.07E+00	95% Chebyshev (Mean, Sd) UCL
Acetophenone	mg/kg	2.60E-01	95% Student's-t UCL
Benzo(a)anthracene	mg/kg	4.88E-01	95% H-UCL
Benzo(a)pyrene	mg/kg	6.51E-01	95% H-UCL
Benzo(b)fluoranthene	mg/kg	6.40E-01	95% Chebyshev (Mean, Sd) UCL
Benzo(g,h,i)perylene	mg/kg	6.60E-01	95% H-UCL
Benzo(k)fluoranthene	mg/kg	6.23E-01	95% Chebyshev (Mean, Sd) UCL

Table 1-57
Exposure Point Concentrations - Shallow Soil - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (EPC)	EPC Basis
Caprolactam	mg/kg	2.30E-01	Maximum Result
Chrysene	mg/kg	7.97E-01	95% Chebyshev (Mean, Sd) UCL
Dibenz(a,h)anthracene	mg/kg	3.13E-01	95% Student's-t UCL
Fluoranthene	mg/kg	6.68E-01	95% H-UCL
Indeno(1,2,3-c,d)pyrene	mg/kg	6.94E-01	95% H-UCL
Naphthalene	mg/kg	2.83E-01	95% Student's-t UCL
Phenanthrene	mg/kg	3.78E-01	95% H-UCL
Pyrene	mg/kg	1.35E+00	95% Chebyshev (Mean, Sd) UCL
Acetone	mg/kg	1.50E-01	Maximum Result
Chlorobenzene	mg/kg	2.22E-02	95% Chebyshev (Mean, Sd) UCL
cis-1,2-Dichloroethene	mg/kg	2.05E-02	95% Chebyshev (Mean, Sd) UCL
Ethylbenzene	mg/kg	2.05E-02	95% Chebyshev (Mean, Sd) UCL
Isopropylbenzene (cumene)	mg/kg	3.38E-01	99% Chebyshev (Mean, Sd) UCL
Methyl ethyl ketone	mg/kg	2.38E-02	95% Chebyshev (Mean, Sd) UCL
Methyl isobutyl ketone	mg/kg	6.85E-03	95% Student's-t UCL
Methylcyclohexane	mg/kg	3.46E-01	99% Chebyshev (Mean, Sd) UCL
Methylene chloride	mg/kg	6.66E-03	95% Student's-t UCL
Tetrachloroethene	mg/kg	6.66E-03	95% Student's-t UCL
Toluene	mg/kg	6.85E-02	95% Chebyshev (Mean, Sd) UCL
Trichloroethene	mg/kg	4.00E-03	Maximum Result
Xylenes, total	mg/kg	2.91E-01	99% Chebyshev (Mean, Sd) UCL

Notes:
EPC summary statistics are presented in Table 1-1.

Table 1-58
Exposure Point Concentrations - Deep Soil - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (EPC)	EPC Basis
Metals			
Aluminum	mg/kg	8.24E+03	95% Student's-t UCL
Antimony	mg/kg	3.48E+00	95% H-UCL
Arsenic	mg/kg	1.81E+01	95% Approximate Gamma UCL
Barium	mg/kg	6.52E+02	95% Chebyshev (Mean, Sd) UCL
Beryllium	mg/kg	2.81E-01	95% Approximate Gamma UCL
Cadmium	mg/kg	1.71E+00	95% Chebyshev (Mean, Sd) UCL
Chromium	mg/kg	1.66E+02	95% Chebyshev (Mean, Sd) UCL
Cobalt	mg/kg	6.47E+00	95% Student's-t UCL
Copper	mg/kg	1.14E+02	95% Approximate Gamma UCL
Iron	mg/kg	2.14E+04	95% Approximate Gamma UCL
Lead	mg/kg	2.75E+03	99% Chebyshev (Mean, Sd) UCL
Manganese	mg/kg	3.24E+02	95% Student's-t UCL
Nickel	mg/kg	2.45E+01	95% Student's-t UCL
Selenium	mg/kg	3.50E+00	Maximum Result
Silver	mg/kg	4.95E-01	95% H-UCL
Thallium	mg/kg	2.60E+00	Maximum Result
Vanadium	mg/kg	2.89E+01	95% Approximate Gamma UCL
Zinc	mg/kg	3.21E+02	95% Approximate Gamma UCL
Pesticides/PCBs			
4,4'-DDD	mg/kg	3.79E+00	95% Adjusted Gamma UCL
4,4'-DDE	mg/kg	2.10E+00	95% Adjusted Gamma UCL
4,4'-DDT	mg/kg	8.05E+01	99% Chebyshev (MVUE) UCL
alpha-BHC	mg/kg	6.00E-03	Maximum Result
alpha-Chlordane	mg/kg	8.10E-02	Maximum Result
beta-BHC	mg/kg	2.40E-02	Maximum Result
Dieldrin	mg/kg	8.60E-02	Maximum Result
Endosulfan I	mg/kg	7.40E-04	Maximum Result
Endosulfan sulfate	mg/kg	4.40E-03	Maximum Result
Endrin	mg/kg	1.40E-02	Maximum Result
Endrin aldehyde	mg/kg	4.90E-03	Maximum Result
Endrin ketone	mg/kg	6.90E-03	Maximum Result
gamma-BHC	mg/kg	2.16E-01	99% Chebyshev (Mean, Sd) UCL
gamma-Chlordane	mg/kg	8.30E-02	Maximum Result
Heptachlor	mg/kg	6.50E-04	Maximum Result
Heptachlor epoxide	mg/kg	2.80E-03	Maximum Result
Methoxychlor	mg/kg	7.00E-03	Maximum Result
Aroclor-1260	mg/kg	3.30E-02	Maximum Result
SVOCs/VOCs			
1,2-Dichlorobenzene	mg/kg	1.05E+00	99% Chebyshev (Mean, Sd) UCL
1,3-Dichlorobenzene	mg/kg	2.00E-03	Maximum Result
1,4-Dichlorobenzene	mg/kg	7.42E-02	95% Chebyshev (Mean, Sd) UCL
2-Methylnaphthalene	mg/kg	1.36E+00	95% Chebyshev (Mean, Sd) UCL
Acetophenone	mg/kg	2.36E-01	95% Student's-t UCL
Anthracene	mg/kg	8.10E-02	Maximum Result
Benzo(a)anthracene	mg/kg	4.95E-01	95% Chebyshev (Mean, Sd) UCL
Benzo(a)pyrene	mg/kg	6.17E-01	95% Chebyshev (Mean, Sd) UCL
Benzo(b)fluoranthene	mg/kg	5.01E-01	95% Chebyshev (Mean, Sd) UCL

Table 1-58
Exposure Point Concentrations - Deep Soil - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (EPC)	EPC Basis
Benzo(g,h,i)perylene	mg/kg	5.81E-01	95% Chebyshev (Mean, Sd) UCL
Benzo(k)fluoranthene	mg/kg	4.95E-01	95% Chebyshev (Mean, Sd) UCL
Benzyl butyl phthalate	mg/kg	2.70E-01	Maximum Result
bis(2-Ethylhexyl)phthalate	mg/kg	9.04E-01	95% Chebyshev (Mean, Sd) UCL
Caprolactam	mg/kg	2.30E-01	Maximum Result
Chrysene	mg/kg	5.97E-01	95% Chebyshev (Mean, Sd) UCL
Dibenz(a,h)anthracene	mg/kg	2.67E-01	95% Student's-t UCL
Fluoranthene	mg/kg	7.35E-01	95% Chebyshev (Mean, Sd) UCL
Indeno(1,2,3-c,d)pyrene	mg/kg	6.00E-01	95% Chebyshev (Mean, Sd) UCL
Naphthalene	mg/kg	2.49E-01	95% Student's-t UCL
Phenanthrene	mg/kg	3.08E-01	95% Student's-t UCL
Pyrene	mg/kg	1.02E+00	95% Chebyshev (Mean, Sd) UCL
1,1-Dichloroethane	mg/kg	6.83E-03	95% Student's-t UCL
Acetone	mg/kg	6.05E-02	95% Approximate Gamma UCL
Chlorobenzene	mg/kg	2.24E+00	99% Chebyshev (Mean, Sd) UCL
cis-1,2-Dichloroethene	mg/kg	1.80E-02	95% Chebyshev (Mean, Sd) UCL
Ethylbenzene	mg/kg	1.01E-02	95% Student's-t UCL
Isopropylbenzene (cumene)	mg/kg	1.05E-01	95% Chebyshev (Mean, Sd) UCL
Methyl ethyl ketone	mg/kg	1.79E-02	95% Chebyshev (Mean, Sd) UCL
Methyl isobutyl ketone	mg/kg	6.50E-03	95% Student's-t UCL
Methylcyclohexane	mg/kg	1.07E-01	95% Chebyshev (Mean, Sd) UCL
Methylene chloride	mg/kg	6.31E-03	95% Student's-t UCL
Tetrachloroethene	mg/kg	6.38E-03	95% Student's-t UCL
Toluene	mg/kg	4.40E-02	95% Chebyshev (Mean, Sd) UCL
Trichloroethene	mg/kg	4.00E-03	Maximum Result
Vinyl chloride	mg/kg	1.00E-03	Maximum Result
Xylenes, total	mg/kg	9.09E-02	95% Chebyshev (Mean, Sd) UCL

Notes:
EPC summary statistics are presented in Table 1-1.

Table 1-59
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Residential Exposure Scenario - Future Adult Resident Receptor - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	24	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	7.00E+01	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Adherence Factor	AF	0.07	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs	Chronic Daily Intake	Cancer Slope Factor, SF	Cancer Risk	Chronic Daily Intake	Cancer Slope Factor, SF	Cancer Risk	Chronic Daily Intake	Cancer Slope Factor, SF	Cancer Risk	Total Cancer Risk
	[mg/kg]	[mg/kg/day]	[mg/kg/day]-1	[-]	[mg/kg/day]	[mg/kg/day]-1	[-]	[mg/kg/day]	[mg/kg/day]-1	[-]	[-]
Metals											
Aluminum	9.21E+03	4.33E-03	NA		1.73E-04	NA		6.57E-07	NA		
Antimony	3.50E+00	1.64E-06	NA		6.56E-08	NA		2.50E-10	NA		
Arsenic	2.69E+01	1.26E-05	9.50E+00	1.20E-04	1.51E-06	9.50E+00	1.44E-05	1.92E-09	1.51E+01	2.89E-08	**1.34E-04**
Barium	9.37E+02	4.40E-04	NA		1.76E-05	NA		6.69E-08	NA		
Beryllium	3.03E-01	1.42E-07	NA		5.68E-09	NA		2.16E-11	8.40E+00	1.82E-10	1.82E-10
Cadmium	2.45E+00	1.15E-06	3.80E-01	4.37E-07	4.59E-09	3.80E-01	1.74E-09	1.75E-10	1.47E+01	2.57E-09	4.42E-07
Chromium	1.54E+02	7.23E-05	NA		2.89E-06	NA		1.10E-08	4.20E+01	4.62E-07	4.62E-07
Cobalt	7.06E+00	3.32E-06	NA		1.32E-07	NA		5.04E-10	9.80E+00	4.94E-09	4.94E-09
Copper	1.49E+02	7.00E-05	NA		2.79E-06	NA		1.06E-08	NA		
Iron	2.49E+04	1.17E-02	NA		4.67E-04	NA		1.78E-06	NA		
Lead	4.36E+03	2.05E-03	NA		8.17E-05	NA		3.11E-07	NA		
Manganese	3.60E+02	1.69E-04	NA		6.75E-06	NA		2.57E-08	NA		
Nickel	2.58E+01	1.21E-05	NA		4.83E-07	NA		1.84E-09	9.10E-01	1.68E-09	1.68E-09
Selenium	3.00E+00	1.41E-06	NA		5.62E-08	NA		2.14E-10	NA		
Silver	5.12E-01	2.40E-07	NA		9.59E-09	NA		3.65E-11	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs	Chronic Daily Intake	Cancer Slope Factor, SF	Cancer Risk	Chronic Daily Intake	Cancer Slope Factor, SF	Cancer Risk	Chronic Daily Intake	Cancer Slope Factor, SF	Cancer Risk	Total Cancer Risk
	[mg/kg]	[mg/kg/day]	[mg/kg/day]-1	[-]	[mg/kg/day]	[mg/kg/day]-1	[-]	[mg/kg/day]	[mg/kg/day]-1	[-]	[-]
Thallium	2.60E+00	1.22E-06	NA		4.87E-08	NA		1.86E-10	NA		
Vanadium	3.26E+01	1.53E-05	NA		6.11E-07	NA		2.33E-09	NA		
Zinc	4.53E+02	2.13E-04	NA		8.49E-06	NA		3.23E-08	NA		
Pesticides/PCBs											
4,4'-DDD	9.09E+00	4.27E-06	2.40E-01	1.02E-06	8.52E-07	2.40E-01	2.04E-07	6.49E-10	2.42E-01	1.57E-10	**1.23E-06**
4,4'-DDE	5.26E+00	2.47E-06	3.40E-01	8.40E-07	4.93E-07	3.40E-01	1.68E-07	3.75E-10	3.40E-01	1.27E-10	**1.01E-06**
4,4'-DDT	1.21E+02	5.68E-05	3.40E-01	1.93E-05	1.13E-05	3.40E-01	3.85E-06	8.64E-09	3.40E-01	2.93E-09	**2.32E-05**
alpha-BHC	6.00E-03	2.82E-09	6.30E+00	1.78E-08	5.62E-10	6.30E+00	3.54E-09	4.28E-13	6.30E+00	2.70E-12	2.13E-08
alpha-Chlordane	8.10E-02	3.80E-08	1.20E+00	4.57E-08	7.59E-09	1.20E+00	9.11E-09	5.78E-12	1.19E+00	6.88E-12	5.48E-08
beta-BHC	2.40E-02	1.13E-08	1.80E+00	2.03E-08	2.25E-09	1.80E+00	4.05E-09	1.71E-12	1.80E+00	3.08E-12	2.43E-08
gamma-BHC	3.47E-01	1.63E-07	1.30E+00	2.12E-07	3.25E-08	1.30E+00	4.23E-08	2.48E-11	1.30E+00	3.22E-11	2.54E-07
gamma-Chlordane	8.30E-02	3.90E-08	1.20E+00	4.68E-08	7.78E-09	1.20E+00	9.33E-09	5.92E-12	1.19E+00	7.05E-12	5.61E-08
Dieldrin	8.60E-02	4.04E-08	1.60E+01	6.46E-07	8.06E-09	1.60E+01	1.29E-07	6.14E-12	1.61E+01	9.88E-11	7.75E-07
Endosulfan sulfate	4.40E-03	2.07E-09	NA		4.12E-10	NA		3.14E-13	NA		
Endrin	1.40E-02	6.58E-09	NA		1.31E-09	NA		9.99E-13	NA		
Endrin aldehyde	4.90E-03	2.30E-09	NA		4.59E-10	NA		3.50E-13	NA		
Endrin ketone	6.90E-03	3.24E-09	NA		6.47E-10	NA		4.93E-13	NA		
Heptachlor	6.50E-04	3.05E-10	4.50E+00	1.37E-09	6.09E-11	4.50E+00	2.74E-10	4.64E-14	4.55E+00	2.11E-13	1.65E-09
Heptachlor epoxide	2.80E-03	1.32E-09	9.10E+00	1.20E-08	2.62E-10	9.10E+00	2.39E-09	2.00E-13	9.10E+00	1.82E-12	1.44E-08
Methoxychlor	7.00E-03	3.29E-09	NA		6.56E-10	NA		5.00E-13	NA		
Aroclor-1260	3.30E-02	1.55E-08	2.00E+00	3.10E-08	9.28E-09	2.00E+00	1.86E-08	2.36E-12	2.00E+00	4.71E-12	4.96E-08
SVOCs/VOCs											
1,2-Dichlorobenzene	8.25E-03	3.87E-09	NA		1.55E-09	NA		4.84E-08	NA		
1,4-Dichlorobenzene	2.00E-03	9.39E-10	2.40E-02	2.25E-11	3.75E-10	2.40E-02	9.00E-12	1.33E-08	3.85E-02	5.13E-10	5.45E-10
2-Methylnaphthalene	3.87E+00	1.82E-06	NA		1.09E-06	NA		5.91E-06	NA		
bis(2-Ethylhexyl)phthalate	1.07E+00	5.03E-07	1.40E-02	7.04E-09	2.01E-07	1.40E-02	2.81E-09	7.64E-11	1.40E-02	1.07E-12	9.84E-09
Acetophenone	2.60E-01	1.22E-07	NA		4.87E-08	NA		1.86E-11	NA		
Benzo(a)anthracene	4.88E-01	2.29E-07	1.20E+00	2.75E-07	1.37E-07	1.20E+00	1.65E-07	3.48E-11	7.30E-01	2.54E-11	4.40E-07
Benzo(a)pyrene	6.51E-01	3.06E-07	1.20E+01	3.67E-06	1.83E-07	1.20E+01	2.20E-06	4.65E-11	7.30E+00	3.39E-10	**5.87E-06**
Benzo(b)fluoranthene	6.40E-01	3.01E-07	1.20E+00	3.61E-07	1.80E-07	1.20E+00	2.16E-07	4.57E-11	7.30E-01	3.33E-11	5.77E-07
Benzo(g,h,i)perylene	6.60E-01	3.10E-07	NA		1.86E-07	NA		4.71E-11	NA		
Benzo(k)fluoranthene	6.23E-01	2.93E-07	1.20E+00	3.51E-07	1.75E-07	1.20E+00	2.10E-07	4.45E-11	3.85E-01	1.71E-11	5.61E-07
Caprolactam	2.30E-01	1.08E-07	NA		4.31E-08	NA		1.64E-11	NA		
Chrysene	7.97E-01	3.74E-07	1.20E-01	4.49E-08	2.24E-07	1.20E-01	2.69E-08	5.69E-11	3.85E-02	2.19E-12	7.18E-08
Dibenz(a,h)anthracene	3.13E-01	1.47E-07	7.30E+00	1.07E-06	8.80E-08	7.30E+00	6.42E-07	2.23E-11	7.30E+00	1.63E-10	**1.72E-06**
Fluoranthene	6.68E-01	3.14E-07	NA		1.88E-07	NA		4.77E-11	NA		
Indeno(1,2,3-c,d)pyrene	6.94E-01	3.26E-07	7.30E-01	2.38E-07	1.95E-07	7.30E-01	1.42E-07	4.95E-11	7.30E-01	3.62E-11	3.80E-07
Naphthalene	2.83E-01	1.33E-07	1.20E-01	1.59E-08	7.96E-08	1.20E-01	9.55E-09	4.32E-07	1.20E-01	5.19E-08	7.74E-08
Phenanthrene	3.78E-01	1.78E-07	NA		1.06E-07	NA		2.70E-11	NA		
Pyrene	1.35E+00	6.34E-07	NA		3.79E-07	NA		9.64E-11	NA		
Acetone	1.50E-01	7.05E-08	NA		2.81E-08	NA		1.30E-06	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs	Chronic Daily Intake	Cancer Slope Factor, SF	Cancer Risk	Chronic Daily Intake	Cancer Slope Factor, SF	Cancer Risk	Chronic Daily Intake	Cancer Slope Factor, SF	Cancer Risk	Total Cancer Risk
	[mg/kg]	[mg/kg/day]	[mg/kg/day]-1	[-]	[mg/kg/day]	[mg/kg/day]-1	[-]	[mg/kg/day]	[mg/kg/day]-1	[-]	[-]
Chlorobenzene	2.22E-02	1.04E-08	NA		4.16E-09	NA		3.07E-07	NA		
cis-1,2-Dichloroethene	2.05E-02	9.63E-09	NA		3.84E-09	NA		6.54E-07	NA		
Ethylbenzene	2.05E-02	9.63E-09	NA		3.84E-09	NA		3.27E-07	NA		
Isopropylbenzene (cumene)	3.38E-01	1.59E-07	NA		6.33E-08	NA		1.04E-05	NA		
Methyl ethyl ketone	2.38E-02	1.12E-08	NA		4.46E-09	NA		1.35E-07	NA		
Methyl isobutyl ketone	6.85E-03	3.22E-09	NA		1.28E-09	NA		3.00E-08	NA		
Methylcyclohexane	3.46E-01	1.63E-07	NA		6.48E-08	NA		1.88E-05	NA		
Methylene chloride	6.66E-03	3.13E-09	1.40E-02	4.38E-11	1.25E-09	1.40E-02	1.75E-11	2.94E-07	3.50E-03	1.03E-09	1.09E-09
Tetrachloroethene	6.66E-03	3.13E-09	5.40E-01	1.69E-09	1.25E-09	5.40E-01	6.74E-10	2.87E-07	2.07E-02	5.94E-09	8.30E-09
Toluene	6.85E-02	3.22E-08	NA		1.28E-08	NA		1.90E-06	NA		
Trichloroethene	4.00E-03	1.88E-09	4.00E-01	7.51E-10	7.50E-10	4.00E-01	3.00E-10	1.35E-07	4.00E-01	5.41E-08	5.51E-08
Xylenes, total	2.91E-01	1.37E-07	NA		5.45E-08	NA		5.26E-06	NA		
			Total Risk:	1.49E-04		**Total Risk:**	2.24E-05		**Total Risk:**	6.17E-07	**1.72E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **2E-04**

Table 1-60
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Residential Exposure Scenario - Future Adult Resident Receptor - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult/Child

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	24	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	7.00E+01	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Adherence Factor	AF	0.07	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Metals											
Aluminum	9.21E+03	1.26E-02	1.00E+00	1.26E-02	5.03E-04	1.00E+00	5.03E-04	1.92E-06	1.40E-03	1.37E-03	1.45E-02
Antimony	3.50E+00	4.79E-06	4.00E-04	1.20E-02	1.91E-07	4.00E-04	4.78E-04	7.29E-10	NA		1.25E-02
Arsenic	2.69E+01	3.68E-05	3.00E-04	1.23E-01	4.41E-06	3.00E-04	1.47E-02	5.60E-09	8.57E-06	6.53E-04	1.38E-01
Barium	9.37E+02	1.28E-03	7.00E-02	1.83E-02	5.12E-05	7.00E-02	7.32E-04	1.95E-07	1.43E-04	1.37E-03	2.04E-02
Beryllium	3.03E-01	4.15E-07	2.00E-03	2.08E-04	1.66E-08	2.00E-03	8.28E-06	6.31E-11	5.71E-06	1.10E-05	2.27E-04
Cadmium	2.45E+00	3.36E-06	5.00E-04	6.71E-03	1.34E-08	5.00E-04	2.68E-05	5.10E-10	5.71E-06	8.93E-05	6.83E-03
Chromium	1.54E+02	2.11E-04	NA		8.42E-06	NA		3.21E-08	NA		
Cobalt	7.06E+00	9.67E-06	2.00E-02	4.84E-04	3.86E-07	2.00E-02	1.93E-05	1.47E-09	5.70E-06	2.58E-04	7.61E-04
Copper	1.49E+02	2.04E-04	4.00E-02	5.10E-03	8.14E-06	4.00E-02	2.04E-04	3.10E-08	NA		5.31E-03
Iron	2.49E+04	3.41E-02	3.00E-01	1.14E-01	1.36E-03	3.00E-01	4.54E-03	5.18E-06	NA		1.18E-01
Lead	4.36E+03	5.97E-03	NA		2.38E-04	NA		9.08E-07	NA		
Manganese	3.60E+02	4.93E-04	2.40E-02	2.05E-02	1.97E-05	2.40E-02	8.20E-04	7.49E-08	1.40E-05	5.35E-03	2.67E-02
Nickel	2.58E+01	3.53E-05	2.00E-02	1.77E-03	1.41E-06	2.00E-02	7.05E-05	5.37E-09	1.43E-05	3.76E-04	2.21E-03
Selenium	3.00E+00	4.11E-06	5.00E-03	8.22E-04	1.64E-07	5.00E-03	3.28E-05	6.25E-10	5.71E-03	1.09E-07	8.55E-04
Silver	5.12E-01	7.01E-07	5.00E-03	1.40E-04	2.80E-08	5.00E-03	5.60E-06	1.07E-10	NA		1.46E-04

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Thallium	2.60E+00	3.56E-06	6.60E-05	5.40E-02	1.42E-07	6.60E-05	2.15E-03	5.41E-10	NA		5.61E-02
Vanadium	3.26E+01	4.47E-05	1.00E-03	4.47E-02	1.78E-06	1.00E-03	1.78E-03	6.79E-09	NA		4.64E-02
Zinc	4.53E+02	6.21E-04	3.00E-01	2.07E-03	2.48E-05	3.00E-01	8.25E-05	9.43E-08	NA		2.15E-03
Pesticides/PCBs											
4,4'-DDD	9.09E+00	1.25E-05	NA		2.48E-06	NA		1.89E-09	NA		
4,4'-DDE	5.26E+00	7.21E-06	NA		1.44E-06	NA		1.10E-09	NA		
4,4'-DDT	1.21E+02	1.66E-04	5.00E-04	3.32E-01	3.31E-05	5.00E-04	6.61E-02	2.52E-08	5.00E-04	5.04E-05	3.98E-01
alpha-BHC	6.00E-03	8.22E-09	5.00E-04	1.64E-05	1.64E-09	5.00E-04	3.28E-06	1.25E-12	5.00E-04	2.50E-09	1.97E-05
alpha-Chlordane	8.10E-02	1.11E-07	5.00E-04	2.22E-04	2.21E-08	5.00E-04	4.43E-05	1.69E-11	2.00E-04	8.43E-08	2.66E-04
beta-BHC	2.40E-02	3.29E-08	NA		6.56E-09	NA		5.00E-12	NA		
gamma-BHC	3.47E-01	4.75E-07	3.00E-04	1.58E-03	9.48E-08	3.00E-04	3.16E-04	7.22E-11	3.00E-04	2.41E-07	1.90E-03
gamma-Chlordane	8.30E-02	1.14E-07	5.00E-04	2.27E-04	2.27E-08	5.00E-04	4.54E-05	1.73E-11	2.00E-04	8.64E-08	2.73E-04
Dieldrin	8.60E-02	1.18E-07	5.00E-05	2.36E-03	2.35E-08	5.00E-05	4.70E-04	1.79E-11	5.00E-05	3.58E-07	2.83E-03
Endosulfan sulfate	4.40E-03	6.03E-09	6.00E-03	1.00E-06	1.20E-09	6.00E-03	2.00E-07	9.16E-13	6.00E-03	1.53E-10	1.21E-06
Endrin	1.40E-02	1.92E-08	3.00E-04	6.39E-05	3.83E-09	3.00E-04	1.28E-05	2.91E-12	3.00E-04	9.72E-09	7.67E-05
Endrin aldehyde	4.90E-03	6.71E-09	3.00E-04	2.24E-05	1.34E-09	3.00E-04	4.46E-06	1.02E-12	3.00E-04	3.40E-09	2.68E-05
Endrin ketone	6.90E-03	9.45E-09	3.00E-04	3.15E-05	1.89E-09	3.00E-04	6.29E-06	1.44E-12	3.00E-04	4.79E-09	3.78E-05
Heptachlor	6.50E-04	8.90E-10	5.00E-04	1.78E-06	1.78E-10	5.00E-04	3.55E-07	1.35E-13	5.00E-04	2.71E-10	2.14E-06
Heptachlor epoxide	2.80E-03	3.84E-09	1.30E-05	2.95E-04	7.65E-10	1.30E-05	5.89E-05	5.83E-13	1.30E-05	4.48E-08	3.54E-04
Methoxychlor	7.00E-03	9.59E-09	5.00E-03	1.92E-06	1.91E-09	5.00E-03	3.83E-07	1.46E-12	5.00E-03	2.91E-10	2.30E-06
Aroclor-1260	3.30E-02	4.52E-08	2.00E-05	2.26E-03	2.71E-08	2.00E-05	1.35E-03	6.87E-12	2.00E-05	3.44E-07	3.61E-03
SVOCs/VOCs											
1,2-Dichlorobenzene	8.25E-03	1.13E-08	9.00E-02	1.26E-07	4.51E-09	9.00E-02	5.01E-08	1.41E-07	5.71E-02	2.47E-06	2.65E-06
1,4-Dichlorobenzene	2.00E-03	2.74E-09	3.00E-02	9.13E-08	1.09E-09	3.00E-02	3.64E-08	3.89E-08	2.30E-01	1.69E-07	2.97E-07
2-Methylnaphthalene	3.87E+00	5.30E-06	4.00E-03	1.33E-03	3.17E-06	4.00E-03	7.93E-04	1.72E-05	NA		2.12E-03
bis(2-Ethylhexyl)phthalate	1.07E+00	1.47E-06	2.00E-02	7.33E-05	5.85E-07	2.00E-02	2.92E-05	2.23E-10	2.00E-02	1.11E-08	1.03E-04
Acetophenone	2.60E-01	3.56E-07	1.00E-01	3.56E-06	1.42E-07	1.00E-01	1.42E-06	5.41E-11	NA		4.98E-06
Benzo(a)anthracene	4.88E-01	6.68E-07	NA		4.00E-07	NA		1.02E-10	NA		
Benzo(a)pyrene	6.51E-01	8.92E-07	NA		5.34E-07	NA		1.36E-10	NA		
Benzo(b)fluoranthene	6.40E-01	8.77E-07	NA		5.25E-07	NA		1.33E-10	NA		
Benzo(g,h,i)perylene	6.60E-01	9.04E-07	NA		5.41E-07	NA		1.37E-10	NA		
Benzo(k)fluoranthene	6.23E-01	8.53E-07	NA		5.11E-07	NA		1.30E-10	NA		
Caprolactam	2.30E-01	3.15E-07	5.00E-01	6.30E-07	1.26E-07	5.00E-01	2.51E-07	4.79E-11	5.00E-01	9.58E-11	8.82E-07
Chrysene	7.97E-01	1.09E-06	NA		6.53E-07	NA		1.66E-10	NA		
Dibenz(a,h)anthracene	3.13E-01	4.29E-07	NA		2.57E-07	NA		6.52E-11	NA		
Fluoranthene	6.68E-01	9.15E-07	4.00E-02	2.29E-05	5.48E-07	4.00E-02	1.37E-05	1.39E-10	4.00E-02	3.48E-09	3.66E-05
Indeno(1,2,3-c,d)pyrene	6.94E-01	9.51E-07	NA		5.69E-07	NA		1.44E-10	NA		
Naphthalene	2.83E-01	3.88E-07	2.00E-02	1.94E-05	2.32E-07	2.00E-02	1.16E-05	1.26E-06	8.57E-04	1.47E-03	1.50E-03
Phenanthrene	3.78E-01	5.18E-07	NA		3.10E-07	NA		7.87E-11	NA		
Pyrene	1.35E+00	1.85E-06	3.00E-02	6.16E-05	1.11E-06	3.00E-02	3.69E-05	2.81E-10	3.00E-02	9.37E-09	9.85E-05
Acetone	1.50E-01	2.05E-07	9.00E-01	2.28E-07	8.20E-08	9.00E-01	9.11E-08	3.80E-06	9.00E-01	4.22E-06	4.54E-06
Chlorobenzene	2.22E-02	3.04E-08	2.00E-02	1.52E-06	1.21E-08	2.00E-02	6.07E-07	8.95E-07	1.70E-02	5.27E-05	5.48E-05

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
cis-1,2-Dichloroethene	2.05E-02	2.81E-08	1.00E-02	2.81E-06	1.12E-08	1.00E-02	1.12E-06	1.91E-06	1.00E-02	1.91E-04	1.95E-04
Ethylbenzene	2.05E-02	2.81E-08	1.00E-01	2.81E-07	1.12E-08	1.00E-01	1.12E-07	9.54E-07	2.90E-01	3.29E-06	3.68E-06
Isopropylbenzene (cumene)	3.38E-01	4.63E-07	1.00E-01	4.63E-06	1.85E-07	1.00E-01	1.85E-06	3.03E-05	1.10E-01	2.75E-04	2.82E-04
Methyl ethyl ketone	2.38E-02	3.26E-08	6.00E-01	5.43E-08	1.30E-08	6.00E-01	2.17E-08	3.94E-07	1.40E+00	2.81E-07	3.57E-07
Methyl isobutyl ketone	6.85E-03	9.38E-09	8.00E-02	1.17E-07	3.74E-09	8.00E-02	4.68E-08	8.76E-08	8.60E-01	1.02E-07	2.66E-07
Methylcyclohexane	3.46E-01	4.74E-07	8.60E-01	5.51E-07	1.89E-07	8.60E-01	2.20E-07	5.49E-05	8.60E-01	6.38E-05	6.46E-05
Methylene chloride	6.66E-03	9.12E-09	6.00E-02	1.52E-07	3.64E-09	6.00E-02	6.07E-08	8.58E-07	1.14E-01	7.51E-06	7.72E-06
Tetrachloroethene	6.66E-03	9.12E-09	1.00E-02	9.12E-07	3.64E-09	1.00E-02	3.64E-07	8.38E-07	1.00E-02	8.38E-05	8.51E-05
Toluene	6.85E-02	9.38E-08	2.00E-01	4.69E-07	3.74E-08	2.00E-01	1.87E-07	5.53E-06	8.57E-02	6.46E-05	6.52E-05
Trichloroethene	4.00E-03	5.48E-09	3.00E-04	1.83E-05	2.19E-09	3.00E-04	7.29E-06	3.94E-07	1.00E-02	3.94E-05	6.50E-05
Xylenes, total	2.91E-01	3.99E-07	2.00E-01	1.99E-06	1.59E-07	2.00E-01	7.95E-07	1.53E-05	2.90E-02	5.29E-04	5.32E-04
		Total Risk (Hazard Index):		0.76	Total Risk (Hazard Index):		0.10	Total Risk (Hazard Index):		0.012	0.86

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-Carcinogenic Risk (Hazard Index) Across All Exposure Routes : 0.9

Table 1-61
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Residential Exposure Scenario - Future Child Resident Receptor - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Child Resident
	Receptor Age:	Child (6 years)

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	6	yr
Soil Ingestion Rate	IR	200	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	10	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	2.90E+03	cm2/day [soil]
Body Weight	BW	1.50E+01	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Metals											
Aluminum	9.21E+03	1.01E-02	NA		2.93E-04	NA		3.83E-07	NA		
Antimony	3.50E+00	3.84E-06	NA		1.11E-07	NA		1.46E-10	NA		
Arsenic	2.69E+01	2.95E-05	9.50E+00	2.80E-04	2.56E-06	9.50E+00	2.44E-05	1.12E-09	1.51E+01	1.69E-08	**3.04E-04**
Barium	9.37E+02	1.03E-03	NA		2.98E-05	NA		3.90E-08	NA		
Beryllium	3.03E-01	3.32E-07	NA		9.63E-09	NA		1.26E-11	8.40E+00	1.06E-10	1.06E-10
Cadmium	2.45E+00	2.68E-06	3.80E-01	1.02E-06	7.79E-09	3.80E-01	2.96E-09	1.02E-10	1.47E+01	1.50E-09	**1.02E-06**
Chromium	1.54E+02	1.69E-04	NA		4.89E-06	NA		6.41E-09	4.20E+01	2.69E-07	2.69E-07
Cobalt	7.06E+00	7.74E-06	NA		2.24E-07	NA		2.94E-10	9.80E+00	2.88E-09	2.88E-09
Copper	1.49E+02	1.63E-04	NA		4.74E-06	NA		6.20E-09	NA		
Iron	2.49E+04	2.73E-02	NA		7.91E-04	NA		1.04E-06	NA		
Lead	4.36E+03	4.78E-03	NA		1.39E-04	NA		1.82E-07	NA		
Manganese	3.60E+02	3.95E-04	NA		1.14E-05	NA		1.50E-08	NA		
Nickel	2.58E+01	2.83E-05	NA		8.20E-07	NA		1.07E-09	9.10E-01	9.78E-10	9.78E-10
Selenium	3.00E+00	3.29E-06	NA		9.53E-08	NA		1.25E-10	NA		
Silver	5.12E-01	5.61E-07	NA		1.63E-08	NA		2.13E-11	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Thallium	2.60E+00	2.85E-06	NA		8.26E-08	NA		1.08E-10	NA		
Vanadium	3.26E+01	3.57E-05	NA		1.04E-06	NA		1.36E-09	NA		
Zinc	4.53E+02	4.96E-04	NA		1.44E-05	NA		1.89E-08	NA		
Pesticides/PCBs											
4,4'-DDD	9.09E+00	9.96E-06	2.40E-01	2.39E-06	1.44E-06	2.40E-01	3.47E-07	3.78E-10	2.42E-01	9.14E-11	**2.74E-06**
4,4'-DDE	5.26E+00	5.76E-06	3.40E-01	1.96E-06	8.36E-07	3.40E-01	2.84E-07	2.19E-10	3.40E-01	7.44E-11	**2.24E-06**
4,4'-DDT	1.21E+02	1.33E-04	3.40E-01	4.51E-05	1.92E-05	3.40E-01	6.54E-06	5.04E-09	3.40E-01	1.71E-09	**5.16E-05**
alpha-BHC	6.00E-03	6.58E-09	6.30E+00	4.14E-08	9.53E-10	6.30E+00	6.01E-09	2.50E-13	6.30E+00	1.57E-12	4.74E-08
alpha-Chlordane	8.10E-02	8.88E-08	1.20E+00	1.07E-07	1.29E-08	1.20E+00	1.54E-08	3.37E-12	1.19E+00	4.01E-12	1.22E-07
beta-BHC	2.40E-02	2.63E-08	1.80E+00	4.73E-08	3.81E-09	1.80E+00	6.86E-09	9.99E-13	1.80E+00	1.80E-12	5.42E-08
gamma-BHC	3.47E-01	3.80E-07	1.30E+00	4.94E-07	5.51E-08	1.30E+00	7.17E-08	1.44E-11	1.30E+00	1.88E-11	5.66E-07
gamma-Chlordane	8.30E-02	9.10E-08	1.20E+00	1.09E-07	1.32E-08	1.20E+00	1.58E-08	3.46E-12	1.19E+00	4.11E-12	1.25E-07
Dieldrin	8.60E-02	9.42E-08	1.60E+01	1.51E-06	1.37E-08	1.60E+01	2.19E-07	3.58E-12	1.61E+01	5.77E-11	**1.73E-06**
Endosulfan sulfate	4.40E-03	4.82E-09	NA		6.99E-10	NA		1.83E-13	NA		
Endrin	1.40E-02	1.53E-08	NA		2.22E-09	NA		5.83E-13	NA		
Endrin aldehyde	4.90E-03	5.37E-09	NA		7.79E-10	NA		2.04E-13	NA		
Endrin ketone	6.90E-03	7.56E-09	NA		1.10E-09	NA		2.87E-13	NA		
Heptachlor	6.50E-04	7.12E-10	4.50E+00	3.21E-09	1.03E-10	4.50E+00	4.65E-10	2.71E-14	4.55E+00	1.23E-13	3.67E-09
Heptachlor epoxide	2.80E-03	3.07E-09	9.10E+00	2.79E-08	4.45E-10	9.10E+00	4.05E-09	1.17E-13	9.10E+00	1.06E-12	3.20E-08
Methoxychlor	7.00E-03	7.67E-09	NA		1.11E-09	NA		2.91E-13	NA		
Aroclor-1260	3.30E-02	3.62E-08	2.00E+00	7.23E-08	1.57E-08	2.00E+00	3.15E-08	1.37E-12	2.00E+00	2.75E-12	1.04E-07
SVOCs/VOCs											
1,2-Dichlorobenzene	8.25E-03	9.04E-09	NA		2.62E-09	NA		2.83E-08	NA		
1,4-Dichlorobenzene	2.00E-03	2.19E-09	2.40E-02	5.26E-11	6.36E-10	2.40E-02	1.53E-11	7.77E-09	3.85E-02	2.99E-10	3.67E-10
2-Methylnaphthalene	3.87E+00	4.24E-06	NA		1.84E-06	NA		3.45E-06	NA		
bis(2-Ethylhexyl)phthalate	1.07E+00	1.17E-06	1.40E-02	1.64E-08	3.40E-07	1.40E-02	4.76E-09	4.46E-11	1.40E-02	6.24E-13	2.12E-08
Acetophenone	2.60E-01	2.85E-07	NA		8.26E-08	NA		1.08E-11	NA		
Benzo(a)anthracene	4.88E-01	5.35E-07	1.20E+00	6.42E-07	2.33E-07	1.20E+00	2.79E-07	2.03E-11	7.30E-01	1.48E-11	9.21E-07
Benzo(a)pyrene	6.51E-01	7.13E-07	1.20E+01	8.56E-06	3.10E-07	1.20E+01	3.72E-06	2.71E-11	7.30E+00	1.98E-10	**1.23E-05**
Benzo(b)fluoranthene	6.40E-01	7.01E-07	1.20E+00	8.42E-07	3.05E-07	1.20E+00	3.66E-07	2.66E-11	7.30E-01	1.95E-11	**1.21E-06**
Benzo(g,h,i)perylene	6.60E-01	7.23E-07	NA		3.15E-07	NA		2.75E-11	NA		
Benzo(k)fluoranthene	6.23E-01	6.83E-07	1.20E+00	8.19E-07	2.97E-07	1.20E+00	3.56E-07	2.59E-11	3.85E-01	9.99E-12	**1.18E-06**
Caprolactam	2.30E-01	2.52E-07	NA		7.31E-08	NA		9.58E-12	NA		
Chrysene	7.97E-01	8.73E-07	1.20E-01	1.05E-07	3.80E-07	1.20E-01	4.56E-08	3.32E-11	3.85E-02	1.28E-12	1.50E-07
Dibenz(a,h)anthracene	3.13E-01	3.43E-07	7.30E+00	2.50E-06	1.49E-07	7.30E+00	1.09E-06	1.30E-11	7.30E+00	9.51E-11	**3.59E-06**
Fluoranthene	6.68E-01	7.32E-07	NA		3.18E-07	NA		2.78E-11	NA		
Indeno(1,2,3-c,d)pyrene	6.94E-01	7.61E-07	7.30E-01	5.55E-07	3.31E-07	7.30E-01	2.42E-07	2.89E-11	7.30E-01	2.11E-11	7.97E-07
Naphthalene	2.83E-01	3.10E-07	1.20E-01	3.72E-08	1.35E-07	1.20E-01	1.62E-08	2.52E-07	1.20E-01	3.03E-08	8.37E-08
Phenanthrene	3.78E-01	4.14E-07	NA		1.80E-07	NA		1.57E-11	NA		
Pyrene	1.35E+00	1.48E-06	NA		6.44E-07	NA		5.62E-11	NA		
Acetone	1.50E-01	1.64E-07	NA		4.77E-08	NA		7.60E-07	NA		
Chlorobenzene	2.22E-02	2.43E-08	NA		7.06E-09	NA		1.79E-07	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
cis-1,2-Dichloroethene	2.05E-02	2.25E-08	NA		6.52E-09	NA		3.81E-07	NA		
Ethylbenzene	2.05E-02	2.25E-08	NA		6.52E-09	NA		1.91E-07	NA		
Isopropylbenzene (cumene)	3.38E-01	3.70E-07	NA		1.07E-07	NA		6.06E-06	NA		
Methyl ethyl ketone	2.38E-02	2.61E-08	NA		7.56E-09	NA		7.88E-08	NA		
Methyl isobutyl ketone	6.85E-03	7.51E-09	NA		2.18E-09	NA		1.75E-08	NA		
Methylcyclohexane	3.46E-01	3.79E-07	NA		1.10E-07	NA		1.10E-05	NA		
Methylene chloride	6.66E-03	7.30E-09	1.40E-02	1.02E-10	2.12E-09	1.40E-02	2.96E-11	1.72E-07	3.50E-03	6.01E-10	7.32E-10
Tetrachloroethene	6.66E-03	7.30E-09	5.40E-01	3.94E-09	2.12E-09	5.40E-01	1.14E-09	1.68E-07	2.07E-02	3.46E-09	8.55E-09
Toluene	6.85E-02	7.51E-08	NA		2.18E-08	NA		1.11E-06	NA		
Trichloroethene	4.00E-03	4.38E-09	4.00E-01	1.75E-09	1.27E-09	4.00E-01	5.08E-10	7.88E-08	4.00E-01	3.15E-08	3.38E-08
Xylenes, total	2.91E-01	3.19E-07	NA		9.25E-08	NA		3.07E-06	NA		
			Total Risk:	3.47E-04		**Total Risk:**	3.80E-05		**Total Risk:**	3.60E-07	**3.85E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **4E-04**

Table 1-62
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Residential Exposure Scenario - Future Child Resident Receptor - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Child Resident
	Receptor Age:	Child (6 years)

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	6	yr
Soil Ingestion Rate	IR	200	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	10	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	2.90E+03	cm2/day [soil]
Body Weight	BW	1.50E+01	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cw [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Aluminum	9.21E+03	1.18E-01	1.00E+00	1.18E-01	3.41E-03	1.00E+00	3.41E-03	4.47E-06	1.40E-03	3.20E-03	1.24E-01
Antimony	3.50E+00	4.47E-05	4.00E-04	1.12E-01	1.30E-06	4.00E-04	3.24E-03	1.70E-09	NA		1.15E-01
Arsenic	2.69E+01	3.44E-04	3.00E-04	1.15E+00	2.99E-05	3.00E-04	9.97E-02	1.31E-08	8.57E-06	1.52E-03	**1.25E+00**
Barium	9.37E+02	1.20E-02	7.00E-02	1.71E-01	3.47E-04	7.00E-02	4.96E-03	4.55E-07	1.43E-04	3.19E-03	1.79E-01
Beryllium	3.03E-01	3.87E-06	2.00E-03	1.94E-03	1.12E-07	2.00E-03	5.62E-05	1.47E-10	5.71E-06	2.58E-05	2.02E-03
Cadmium	2.45E+00	3.13E-05	1.10E-05	2.85E+00	9.08E-08	1.10E-05	8.26E-03	1.19E-09	5.71E-06	2.08E-04	**2.86E+00**
Chromium	1.54E+02	1.97E-03	NA		5.71E-05	NA		7.48E-08	NA		
Cobalt	7.06E+00	9.03E-05	2.00E-02	4.51E-03	2.62E-06	2.00E-02	1.31E-04	3.43E-09	5.70E-06	6.02E-04	5.25E-03
Copper	1.49E+02	1.91E-03	4.00E-02	4.76E-02	5.52E-05	4.00E-02	1.38E-03	7.24E-08	NA		4.90E-02
Iron	2.49E+04	3.18E-01	3.00E-01	1.06E+00	9.23E-03	3.00E-01	3.08E-02	1.21E-05	NA		**1.09E+00**
Lead	4.36E+03	5.57E-02	NA		1.62E-03	NA		2.12E-06	NA		
Manganese	3.60E+02	4.60E-03	2.40E-02	1.92E-01	1.33E-04	2.40E-02	5.56E-03	1.75E-07	1.40E-05	1.25E-02	2.10E-01
Nickel	2.58E+01	3.30E-04	1.10E-02	3.00E-02	9.57E-06	1.10E-02	8.70E-04	1.25E-08	1.43E-05	8.77E-04	3.17E-02
Selenium	3.00E+00	3.84E-05	5.00E-03	7.67E-03	1.11E-06	5.00E-03	2.22E-04	1.46E-09	5.71E-03	2.55E-07	7.89E-03
Silver	5.12E-01	6.55E-06	5.00E-03	1.31E-03	1.90E-07	5.00E-03	3.80E-05	2.49E-10	NA		1.35E-03

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Thallium	2.60E+00	3.32E-05	6.60E-05	5.04E-01	9.64E-07	6.60E-05	1.46E-02	1.26E-09	NA		5.18E-01
Vanadium	3.26E+01	4.17E-04	1.00E-03	4.17E-01	1.21E-05	1.00E-03	1.21E-02	1.58E-08	NA		4.29E-01
Zinc	4.53E+02	5.79E-03	3.00E-01	1.93E-02	1.68E-04	3.00E-01	5.60E-04	2.20E-07	NA		1.99E-02
Pesticides/PCBs											
4,4'-DDD	9.09E+00	1.16E-04	NA		1.69E-05	NA		4.42E-09	NA		
4,4'-DDE	5.26E+00	6.73E-05	NA		9.75E-06	NA		2.56E-09	NA		
4,4'-DDT	1.21E+02	1.55E-03	5.00E-04	3.09E+00	2.24E-04	5.00E-04	4.49E-01	5.88E-08	5.00E-04	1.18E-04	**3.54E+00**
alpha-BHC	6.00E-03	7.67E-08	5.00E-04	1.53E-04	1.11E-08	5.00E-04	2.22E-05	2.91E-12	5.00E-04	5.83E-09	1.76E-04
alpha-Chlordane	8.10E-02	1.04E-06	3.30E-05	3.14E-02	1.50E-07	3.30E-05	4.55E-03	3.93E-11	2.00E-04	1.97E-07	3.59E-02
beta-BHC	2.40E-02	3.07E-07	NA		4.45E-08	NA		1.17E-11	NA		
gamma-BHC	3.47E-01	4.44E-06	3.00E-04	1.48E-02	6.43E-07	3.00E-04	2.14E-03	1.69E-10	3.00E-04	5.62E-07	1.69E-02
gamma-Chlordane	8.30E-02	1.06E-06	3.30E-05	3.22E-02	1.54E-07	3.30E-05	4.66E-03	4.03E-11	2.00E-04	2.02E-07	3.68E-02
Dieldrin	8.60E-02	1.10E-06	5.00E-05	2.20E-02	1.59E-07	5.00E-05	3.19E-03	4.18E-11	5.00E-05	8.36E-07	2.52E-02
Endosulfan sulfate	4.40E-03	5.63E-08	6.00E-03	9.38E-06	8.16E-09	6.00E-03	1.36E-06	2.14E-12	6.00E-03	3.56E-10	1.07E-05
Endrin	1.40E-02	1.79E-07	3.00E-04	5.97E-04	2.60E-08	3.00E-04	8.65E-05	6.80E-12	3.00E-04	2.27E-08	6.83E-04
Endrin aldehyde	4.90E-03	6.26E-08	3.00E-04	2.09E-04	9.08E-09	3.00E-04	3.03E-05	2.38E-12	3.00E-04	7.93E-09	2.39E-04
Endrin ketone	6.90E-03	8.82E-08	3.00E-04	2.94E-04	1.28E-08	3.00E-04	4.26E-05	3.35E-12	3.00E-04	1.12E-08	3.37E-04
Heptachlor	6.50E-04	8.31E-09	3.00E-05	2.77E-04	1.21E-09	3.00E-05	4.02E-05	3.16E-13	3.00E-05	1.05E-08	3.17E-04
Heptachlor epoxide	2.80E-03	3.58E-08	1.30E-05	2.75E-03	5.19E-09	1.30E-05	3.99E-04	1.36E-12	1.30E-05	1.05E-07	3.15E-03
Methoxychlor	7.00E-03	8.95E-08	2.00E-05	4.47E-03	1.30E-08	2.00E-05	6.49E-04	3.40E-12	2.00E-05	1.70E-07	5.12E-03
Aroclor-1260	3.30E-02	4.22E-07	2.00E-05	2.11E-02	1.84E-07	2.00E-05	9.18E-03	1.60E-11	2.00E-05	8.02E-07	3.03E-02
SVOCs/VOCs											
1,2-Dichlorobenzene	8.25E-03	1.05E-07	9.00E-02	1.17E-06	3.06E-08	9.00E-02	3.40E-07	3.30E-07	5.71E-02	5.77E-06	7.28E-06
1,4-Dichlorobenzene	2.00E-03	2.56E-08	3.00E-02	8.52E-07	7.42E-09	3.00E-02	2.47E-07	9.07E-08	2.30E-01	3.94E-07	1.49E-06
2-Methylnaphthalene	3.87E+00	4.95E-05	4.00E-03	1.24E-02	2.15E-05	4.00E-03	5.38E-03	4.02E-05	NA		1.78E-02
bis(2-Ethylhexyl)phthalate	1.07E+00	1.37E-05	2.00E-02	6.84E-04	3.97E-06	2.00E-02	1.98E-04	5.20E-10	2.00E-02	2.60E-08	8.82E-04
Acetophenone	2.60E-01	3.32E-06	1.00E-01	3.32E-05	9.64E-07	1.00E-01	9.64E-06	1.26E-10	NA		4.29E-05
Benzo(a)anthracene	4.88E-01	6.24E-06	NA		2.71E-06	NA		2.37E-10	NA		
Benzo(a)pyrene	6.51E-01	8.32E-06	NA		3.62E-06	NA		3.16E-10	NA		
Benzo(b)fluoranthene	6.40E-01	8.18E-06	NA		3.56E-06	NA		3.11E-10	NA		
Benzo(g,h,i)perylene	6.60E-01	8.44E-06	NA		3.67E-06	NA		3.21E-10	NA		
Benzo(k)fluoranthene	6.23E-01	7.97E-06	NA		3.46E-06	NA		3.03E-10	NA		
Caprolactam	2.30E-01	2.94E-06	5.00E-01	5.88E-06	8.53E-07	5.00E-01	1.71E-06	1.12E-10	5.00E-01	2.23E-10	7.59E-06
Chrysene	7.97E-01	1.02E-05	NA		4.43E-06	NA		3.87E-10	NA		
Dibenz(a,h)anthracene	3.13E-01	4.00E-06	NA		1.74E-06	NA		1.52E-10	NA		
Fluoranthene	6.68E-01	8.54E-06	4.00E-02	2.14E-04	3.72E-06	4.00E-02	9.29E-05	3.24E-10	4.00E-02	8.11E-09	3.06E-04
Indeno(1,2,3-c,d)pyrene	6.94E-01	8.87E-06	NA		3.86E-06	NA		3.37E-10	NA		
Naphthalene	2.83E-01	3.62E-06	2.00E-02	1.81E-04	1.57E-06	2.00E-02	7.87E-05	2.94E-06	8.57E-04	3.43E-03	3.69E-03
Phenanthrene	3.78E-01	4.83E-06	NA		2.10E-06	NA		1.84E-10	NA		
Pyrene	1.35E+00	1.73E-05	3.00E-02	5.75E-04	7.51E-06	3.00E-02	2.50E-04	6.56E-10	3.00E-02	2.19E-08	8.26E-04
Acetone	1.50E-01	1.92E-06	9.00E-01	2.13E-06	5.56E-07	9.00E-01	6.18E-07	8.86E-06	9.00E-01	9.85E-06	1.26E-05
Chlorobenzene	2.22E-02	2.84E-07	2.00E-02	1.42E-05	8.23E-08	2.00E-02	4.12E-06	2.09E-06	1.70E-02	1.23E-04	1.41E-04

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
cis-1,2-Dichloroethene	2.05E-02	2.62E-07	1.00E-02	2.62E-05	7.60E-08	1.00E-02	7.60E-06	4.45E-06	1.00E-02	4.45E-04	4.79E-04
Ethylbenzene	2.05E-02	2.62E-07	1.00E-01	2.62E-06	7.60E-08	1.00E-01	7.60E-07	2.23E-06	2.90E-01	7.68E-06	1.11E-05
Isopropylbenzene (cumene)	3.38E-01	4.32E-06	1.00E-01	4.32E-05	1.25E-06	1.00E-01	1.25E-05	7.06E-05	1.10E-01	6.42E-04	6.98E-04
Methyl ethyl ketone	2.38E-02	3.04E-07	6.00E-01	5.07E-07	8.82E-08	6.00E-01	1.47E-07	9.19E-07	1.40E+00	6.57E-07	1.31E-06
Methyl isobutyl ketone	6.85E-03	8.76E-08	8.00E-02	1.09E-06	2.54E-08	8.00E-02	3.17E-07	2.04E-07	8.60E-01	2.38E-07	1.65E-06
Methylcyclohexane	3.46E-01	4.42E-06	8.60E-01	5.14E-06	1.28E-06	8.60E-01	1.49E-06	1.28E-04	8.60E-01	1.49E-04	1.56E-04
Methylene chloride	6.66E-03	8.52E-08	6.00E-02	1.42E-06	2.47E-08	6.00E-02	4.12E-07	2.00E-06	1.14E-01	1.75E-05	1.94E-05
Tetrachloroethene	6.66E-03	8.52E-08	1.00E-02	8.52E-06	2.47E-08	1.00E-02	2.47E-06	1.96E-06	1.00E-02	1.96E-04	2.07E-04
Toluene	6.85E-02	8.76E-07	2.00E-01	4.38E-06	2.54E-07	2.00E-01	1.27E-06	1.29E-05	8.57E-02	1.51E-04	1.56E-04
Trichloroethene	4.00E-03	5.11E-08	3.00E-04	1.70E-04	1.48E-08	3.00E-04	4.94E-05	9.20E-07	1.00E-02	9.20E-05	3.12E-04
Xylenes, total	2.91E-01	3.72E-06	2.00E-01	1.86E-05	1.08E-06	2.00E-01	5.39E-06	3.58E-05	2.90E-02	1.23E-03	1.26E-03
		Total Risk (Hazard Index):		9.92	**Total Risk (Hazard Index):**		0.67	**Total Risk (Hazard Index):**		0.03	**10.61**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-Carcinogenic Risk (Hazard Index) Across All Exposure Routes : **11**

Table 1-63
Cancer Risk Results - Detailed Summary of Risk Drivers - Future Adult/Child Resident - Shallow Soil - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	**1.2E-04**	**1.4E-05**	2.9E-08	**1.3E-04**	79%	**2.8E-04**	**2.4E-05**	1.7E-08	**3.0E-04**	80%
Cadmium	4.4E-07	1.7E-09	2.6E-09	4.4E-07	0.3%	**1.0E-06**	3.0E-09	1.5E-09	**1.0E-06**	0.3%
Subtotal Metals	**1.2E-04**	**1.4E-05**	5.0E-07	**1.4E-04**	79%	**2.8E-04**	**2.4E-05**	2.9E-07	**3.1E-04**	80%
Pesticides/PCBs										
4,4'-DDE	8.4E-07	1.7E-07	1.3E-10	**1.0E-06**	0.6%	**2.0E-06**	2.8E-07	7.4E-11	**2.2E-06**	0.6%
4,4'-DDT	**1.9E-05**	**3.9E-06**	2.9E-09	**2.3E-05**	14%	**4.5E-05**	**6.5E-06**	1.7E-09	**5.2E-05**	13%
Dieldrin	6.5E-07	1.3E-07	9.9E-11	7.8E-07	0.5%	**1.5E-06**	2.2E-07	5.8E-11	**1.7E-06**	0.5%
Subtotal Pesticides/PCBs	**2.1E-05**	**4.2E-06**	3.2E-09	**2.5E-05**	15%	**4.9E-05**	**7.2E-06**	1.9E-09	**5.7E-05**	15%
SVOCs/VOCs										
Benzo(a)pyrene	**3.7E-06**	**2.2E-06**	3.4E-10	**5.9E-06**	3%	**8.6E-06**	**3.7E-06**	2.0E-10	**1.2E-05**	3%
Benzo(b)fluoranthene	3.6E-07	2.2E-07	3.3E-11	5.8E-07	0.3%	8.4E-07	3.7E-07	1.9E-11	**1.2E-06**	0.3%
Benzo(k)fluoranthene	3.5E-07	2.1E-07	1.7E-11	5.6E-07	0.3%	8.2E-07	3.6E-07	1.0E-11	**1.2E-06**	0.3%
Dibenz(a,h)anthracene	**1.1E-06**	6.4E-07	1.6E-10	**1.7E-06**	1%	**2.5E-06**	**1.1E-06**	9.5E-11	**3.6E-06**	0.9%
Subtotal SVOCs/VOCs	**6.0E-06**	**3.6E-06**	1.1E-07	**9.8E-06**	6%	**1.4E-05**	**6.1E-06**	6.7E-08	**2.0E-05**	5%
Total:	**1.5E-04**	**2.2E-05**	6.2E-07	**1.7E-04**		**3.4E-04**	**3.8E-05**	3.6E-07	**3.8E-04**	

Total Estimated Cancer Risk Across All Exposure Routes:	**2E-04**	**4E-04**

Sum of Adult and Child Excess Lifetime Cancer Risk (30 year exposure):	**4.9E-04**	**6.0E-05**	**9.8E-07**	**5.53E-04**

Total Estimated Adult plus Child Cancer Risk Across All Exposure Routes:	**6E-04**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total cancer risk for all chemicals evaluated.

Table 1-64
Noncancer Risk Results - Detailed Summary of Risk Drivers - Future Adult/Child Resident - Shallow Soil - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Noncarcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Aluminum	1.3E-02	5.0E-04	1.4E-03	1.4E-02	2%	**1.2E-01**	3.4E-03	3.2E-03	**1.2E-01**	1%
Antimony	1.2E-02	4.8E-04		1.2E-02	1%	**1.1E-01**	3.2E-03		**1.2E-01**	1%
Arsenic	**1.2E-01**	1.5E-02	6.5E-04	**1.4E-01**	16%	**1.1E+00**	1.0E-01	1.5E-03	**1.2E+00**	12%
Barium	1.8E-02	7.3E-04	1.4E-03	2.0E-02	2%	**1.7E-01**	5.0E-03	3.2E-03	**1.8E-01**	2%
Iron	**1.1E-01**	4.5E-03		**1.2E-01**	14%	**1.1E+00**	3.1E-02		**1.1E+00**	10%
Manganese	2.1E-02	8.2E-04	5.4E-03	2.7E-02	3%	**1.9E-01**	5.6E-03	1.2E-02	**2.1E-01**	2%
Thallium	5.4E-02	2.2E-03		5.6E-02	6%	**5.0E-01**	1.5E-02		**5.2E-01**	5%
Vanadium	4.5E-02	1.8E-03		4.6E-02	5%	**4.2E-01**	1.2E-02		**4.3E-01**	4%
Subtotal Metals	**4.2E-01**	2.6E-02	9.5E-03	**4.5E-01**	52%	**6.7E+00**	**1.9E-01**	2.2E-02	**6.9E+00**	65%
Pesticides/PCBs										
4,4'-DDT	**3.3E-01**	6.6E-02	5.0E-05	**4.0E-01**	46%	**3.1E+00**	**4.5E-01**	1.2E-04	**3.5E+00**	33%
Subtotal Pesticides/PCBs	**3.4E-01**	6.8E-02	5.4E-05	**4.1E-01**	47%	**3.2E+00**	**4.7E-01**	1.3E-04	**3.7E+00**	35%
Total:	**0.8**	0.1	0.01	**0.9**		**9.9**	**0.7**	0.03	**10.6**	

Total Estimated Hazard Index Across All Exposure Routes: **0.9** **11**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total hazard quotient for all chemicals evaluated.

Table 1-65
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Occupational Exposure Scenario - Future Industrial Worker - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Occupational
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Industrial Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	25	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	25	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.03	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Metals											
Aluminum	9.21E+03	3.22E-03	NA		3.67E-04	NA		4.89E-07	NA		
Antimony	3.50E+00	1.22E-06	NA		1.39E-07	NA		1.86E-10	NA		
Arsenic	2.69E+01	9.40E-06	9.50E+00	8.93E-05	3.21E-06	9.50E+00	3.05E-05	1.43E-09	1.51E+01	2.15E-08	**1.20E-04**
Barium	9.37E+02	3.27E-04	NA		3.73E-05	NA		4.98E-08	NA		
Beryllium	3.03E-01	1.06E-07	NA		1.21E-08	NA		1.61E-11	8.40E+00	1.35E-10	1.35E-10
Cadmium	2.45E+00	8.56E-07	3.80E-01	3.25E-07	9.76E-09	3.80E-01	3.71E-09	1.30E-10	1.47E+01	1.91E-09	3.31E-07
Chromium	1.54E+02	5.38E-05	NA		6.14E-06	NA		8.18E-09	4.20E+01	3.44E-07	3.44E-07
Cobalt	7.06E+00	2.47E-06	NA		2.81E-07	NA		3.75E-10	9.80E+00	3.67E-09	3.67E-09
Copper	1.49E+02	5.21E-05	NA		5.94E-06	NA		7.91E-09	NA		
Iron	2.49E+04	8.70E-03	NA		9.92E-04	NA		1.32E-06	NA		
Lead	4.36E+03	1.52E-03	NA		1.74E-04	NA		2.32E-07	NA		
Manganese	3.60E+02	1.26E-04	NA		1.43E-05	NA		1.91E-08	NA		
Nickel	2.58E+01	9.02E-06	NA		1.03E-06	NA		1.37E-09	9.10E-01	1.25E-09	1.25E-09
Selenium	3.00E+00	1.05E-06	NA		1.20E-07	NA		1.59E-10	NA		
Silver	5.12E-01	1.79E-07	NA		2.04E-08	NA		2.72E-11	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Thallium	2.60E+00	9.09E-07	NA		1.04E-07	NA		1.38E-10	NA		
Vanadium	3.26E+01	1.14E-05	NA		1.30E-06	NA		1.73E-09	NA		
Zinc	4.53E+02	1.58E-04	NA		1.80E-05	NA		2.41E-08	NA		
Pesticides/PCBs											
4,4'-DDD	9.09E+00	3.18E-06	2.40E-01	7.62E-07	1.81E-06	2.40E-01	4.35E-07	4.83E-10	2.42E-01	1.17E-10	**1.20E-06**
4,4'-DDE	5.26E+00	1.84E-06	3.40E-01	6.25E-07	1.05E-06	3.40E-01	3.56E-07	2.79E-10	3.40E-01	9.48E-11	9.81E-07
4,4'-DDT	1.21E+02	4.23E-05	3.40E-01	1.44E-05	2.41E-05	3.40E-01	8.19E-06	6.43E-09	3.40E-01	2.18E-09	**2.26E-05**
alpha-BHC	6.00E-03	2.10E-09	6.30E+00	1.32E-08	1.20E-09	6.30E+00	7.53E-09	3.19E-13	6.30E+00	2.01E-12	2.07E-08
alpha-Chlordane	8.10E-02	2.83E-08	1.20E+00	3.40E-08	1.61E-08	1.20E+00	1.94E-08	4.30E-12	1.19E+00	5.12E-12	5.33E-08
beta-BHC	2.40E-02	8.39E-09	1.80E+00	1.51E-08	4.78E-09	1.80E+00	8.60E-09	1.27E-12	1.80E+00	2.29E-12	2.37E-08
gamma-BHC	3.47E-01	1.21E-07	1.30E+00	1.58E-07	6.91E-08	1.30E+00	8.99E-08	1.84E-11	1.30E+00	2.40E-11	2.48E-07
gamma-Chlordane	8.30E-02	2.90E-08	1.20E+00	3.48E-08	1.65E-08	1.20E+00	1.98E-08	4.41E-12	1.19E+00	5.25E-12	5.47E-08
Dieldrin	8.60E-02	3.01E-08	1.60E+01	4.81E-07	1.71E-08	1.60E+01	2.74E-07	4.57E-12	1.61E+01	7.35E-11	7.55E-07
Endosulfan sulfate	4.40E-03	1.54E-09	NA		8.76E-10	NA		2.34E-13	NA		
Endrin	1.40E-02	4.89E-09	NA		2.79E-09	NA		7.44E-13	NA		
Endrin aldehyde	4.90E-03	1.71E-09	NA		9.76E-10	NA		2.60E-13	NA		
Endrin ketone	6.90E-03	2.41E-09	NA		1.37E-09	NA		3.66E-13	NA		
Heptachlor	6.50E-04	2.27E-10	4.50E+00	1.02E-09	1.29E-10	4.50E+00	5.83E-10	3.45E-14	4.55E+00	1.57E-13	1.60E-09
Heptachlor epoxide	2.80E-03	9.78E-10	9.10E+00	8.90E-09	5.58E-10	9.10E+00	5.08E-09	1.49E-13	9.10E+00	1.35E-12	1.40E-08
Methoxychlor	7.00E-03	2.45E-09	NA		1.39E-09	NA		3.72E-13	NA		
Aroclor-1260	3.30E-02	1.15E-08	2.00E+00	2.31E-08	1.97E-08	2.00E+00	3.94E-08	1.75E-12	2.00E+00	3.51E-12	6.25E-08
SVOCs/VOCs											
1,2-Dichlorobenzene	8.25E-03	2.88E-09	NA		3.29E-09	NA		3.60E-08	NA		
1,4-Dichlorobenzene	2.00E-03	6.99E-10	2.40E-02	1.68E-11	7.97E-10	2.40E-02	1.91E-11	9.92E-09	3.85E-02	3.82E-10	4.18E-10
2-Methylnaphthalene	3.87E+00	1.35E-06	NA		2.31E-06	NA		4.40E-06	NA		
bis(2-Ethylhexyl)phthalate	1.07E+00	3.74E-07	1.40E-02	5.23E-09	4.26E-07	1.40E-02	5.97E-09	5.68E-11	1.40E-02	7.96E-13	1.12E-08
Acetophenone	2.60E-01	9.09E-08	NA		1.04E-07	NA		1.38E-11	NA		
Benzo(a)anthracene	4.88E-01	1.71E-07	1.20E+00	2.05E-07	2.92E-07	1.20E+00	3.50E-07	2.59E-11	7.30E-01	1.89E-11	5.55E-07
Benzo(a)pyrene	6.51E-01	2.27E-07	1.20E+01	2.73E-06	3.89E-07	1.20E+01	4.67E-06	3.46E-11	7.30E+00	2.52E-10	**7.40E-06**
Benzo(b)fluoranthene	6.40E-01	2.24E-07	1.20E+00	2.68E-07	3.82E-07	1.20E+00	4.59E-07	3.40E-11	7.30E-01	2.48E-11	7.27E-07
Benzo(g,h,i)perylene	6.60E-01	2.31E-07	NA		3.94E-07	NA		3.51E-11	NA		
Benzo(k)fluoranthene	6.23E-01	2.18E-07	1.20E+00	2.61E-07	3.72E-07	1.20E+00	4.47E-07	3.31E-11	3.85E-01	1.27E-11	7.08E-07
Caprolactam	2.30E-01	8.04E-08	NA		9.16E-08	NA		1.22E-11	NA		
Chrysene	7.97E-01	2.79E-07	1.20E-01	3.34E-08	4.76E-07	1.20E-01	5.72E-08	4.23E-11	3.85E-02	1.63E-12	9.06E-08
Dibenz(a,h)anthracene	3.13E-01	1.09E-07	7.30E+00	7.98E-07	1.87E-07	7.30E+00	1.37E-06	1.66E-11	7.30E+00	1.21E-10	**2.16E-06**
Fluoranthene	6.68E-01	2.33E-07	NA		3.99E-07	NA		3.55E-11	NA		
Indeno(1,2,3-c,d)pyrene	6.94E-01	2.43E-07	7.30E-01	1.77E-07	4.15E-07	7.30E-01	3.03E-07	3.69E-11	7.30E-01	2.69E-11	4.80E-07
Naphthalene	2.83E-01	9.89E-08	1.20E-01	1.19E-08	1.69E-07	1.20E-01	2.03E-08	3.22E-07	1.20E-01	3.86E-08	7.07E-08
Phenanthrene	3.78E-01	1.32E-07	NA		2.26E-07	NA		2.01E-11	NA		
Pyrene	1.35E+00	4.72E-07	NA		8.07E-07	NA		7.17E-11	NA		
Acetone	1.50E-01	5.24E-08	NA		5.98E-08	NA		9.69E-07	NA		
Chlorobenzene	2.22E-02	7.76E-09	NA		8.84E-09	NA		2.28E-07	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
cis-1,2-Dichloroethene	2.05E-02	7.16E-09	NA		8.17E-09	NA		4.86E-07	NA		
Ethylbenzene	2.05E-02	7.16E-09	NA		8.17E-09	NA		2.43E-07	NA		
Isopropylbenzene (cumene)	3.38E-01	1.18E-07	NA		1.35E-07	NA		7.72E-06	NA		
Methyl ethyl ketone	2.38E-02	8.32E-09	NA		9.48E-09	NA		1.01E-07	NA		
Methyl isobutyl ketone	6.85E-03	2.39E-09	NA		2.73E-09	NA		2.23E-08	NA		
Methylcyclohexane	3.46E-01	1.21E-07	NA		1.38E-07	NA		1.40E-05	NA		
Methylene chloride	6.66E-03	2.33E-09	1.40E-02	3.26E-11	2.65E-09	1.40E-02	3.71E-11	2.19E-07	3.50E-03	7.66E-10	8.36E-10
Tetrachloroethene	6.66E-03	2.33E-09	5.40E-01	1.26E-09	2.65E-09	5.40E-01	1.43E-09	2.14E-07	2.07E-02	4.42E-09	7.11E-09
Toluene	6.85E-02	2.39E-08	NA		2.73E-08	NA		1.41E-06	NA		
Trichloroethene	4.00E-03	1.40E-09	4.00E-01	5.59E-10	1.59E-09	4.00E-01	6.37E-10	1.01E-07	4.00E-01	4.02E-08	4.14E-08
Xylenes, total	2.91E-01	1.02E-07	NA		1.16E-07	NA		3.91E-06	NA		
			Total Risk:	1.11E-04		**Total Risk:**	4.77E-05		**Total Risk:**	4.59E-07	**1.59E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **2E-04**

Table 1-66
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Occupational Exposure Scenario - Future Industrial Worker - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Occupational
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Industrial Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	25	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	25	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.03	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Metals											
Aluminum	9.21E+03	9.01E-03	1.00E+00	9.01E-03	1.03E-03	1.00E+00	1.03E-03	1.37E-06	1.40E-03	9.78E-04	1.10E-02
Antimony	3.50E+00	3.42E-06	4.00E-04	8.56E-03	3.90E-07	4.00E-04	9.76E-04	5.20E-10	NA		9.54E-03
Arsenic	2.69E+01	2.63E-05	3.00E-04	8.77E-02	9.00E-06	3.00E-04	3.00E-02	4.00E-09	8.57E-06	4.67E-04	1.18E-01
Barium	9.37E+02	9.17E-04	7.00E-02	1.31E-02	1.05E-04	7.00E-02	1.49E-03	1.39E-07	1.43E-04	9.75E-04	1.56E-02
Beryllium	3.03E-01	2.96E-07	2.00E-03	1.48E-04	3.38E-08	2.00E-03	1.69E-05	4.51E-11	5.71E-06	7.89E-06	1.73E-04
Cadmium	2.45E+00	2.40E-06	5.00E-04	4.79E-03	2.73E-08	5.00E-04	5.47E-05	3.64E-10	5.71E-06	6.38E-05	4.91E-03
Chromium	1.54E+02	1.51E-04	NA		1.72E-05	NA		2.29E-08	NA		
Cobalt	7.06E+00	6.91E-06	2.00E-02	3.45E-04	7.88E-07	2.00E-02	3.94E-05	1.05E-09	5.70E-06	1.84E-04	5.69E-04
Copper	1.49E+02	1.46E-04	4.00E-02	3.64E-03	1.66E-05	4.00E-02	4.16E-04	2.22E-08	NA		4.06E-03
Iron	2.49E+04	2.44E-02	3.00E-01	8.12E-02	2.78E-03	3.00E-01	9.26E-03	3.70E-06	NA		9.05E-02
Lead	4.36E+03	4.27E-03	NA		4.86E-04	NA		6.48E-07	NA		
Manganese	3.60E+02	3.52E-04	2.40E-02	1.47E-02	4.02E-05	2.40E-02	1.67E-03	5.35E-08	1.40E-05	3.82E-03	2.02E-02
Nickel	2.58E+01	2.52E-05	2.00E-02	1.26E-03	2.88E-06	2.00E-02	1.44E-04	3.84E-09	1.43E-05	2.69E-04	1.67E-03
Selenium	3.00E+00	2.94E-06	5.00E-03	5.87E-04	3.35E-07	5.00E-03	6.69E-05	4.46E-10	5.71E-03	7.81E-08	6.54E-04
Silver	5.12E-01	5.01E-07	5.00E-03	1.00E-04	5.71E-08	5.00E-03	1.14E-05	7.61E-11	NA		1.12E-04

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Thallium	2.60E+00	2.54E-06	6.60E-05	3.85E-02	2.90E-07	6.60E-05	4.39E-03	3.87E-10	NA		4.29E-02
Vanadium	3.26E+01	3.19E-05	1.00E-03	3.19E-02	3.64E-06	1.00E-03	3.64E-03	4.85E-09	NA		3.55E-02
Zinc	4.53E+02	4.43E-04	3.00E-01	1.48E-03	5.05E-05	3.00E-01	1.68E-04	6.74E-08	NA		1.65E-03
Pesticides/PCBs											
4,4'-DDD	9.09E+00	8.89E-06	NA		5.07E-06	NA		1.35E-09	NA		
4,4'-DDE	5.26E+00	5.15E-06	NA		2.93E-06	NA		7.82E-10	NA		
4,4'-DDT	1.21E+02	1.18E-04	5.00E-04	2.37E-01	6.75E-05	5.00E-04	1.35E-01	1.80E-08	5.00E-04	3.60E-05	3.72E-01
alpha-BHC	6.00E-03	5.87E-09	5.00E-04	1.17E-05	3.35E-09	5.00E-04	6.69E-06	8.92E-13	5.00E-04	1.78E-09	1.84E-05
alpha-Chlordane	8.10E-02	7.93E-08	5.00E-04	1.59E-04	4.52E-08	5.00E-04	9.04E-05	1.20E-11	2.00E-04	6.02E-08	2.49E-04
beta-BHC	2.40E-02	2.35E-08	NA		1.34E-08	NA		3.57E-12	NA		
gamma-BHC	3.47E-01	3.40E-07	3.00E-04	1.13E-03	1.94E-07	3.00E-04	6.45E-04	5.16E-11	3.00E-04	1.72E-07	1.78E-03
gamma-Chlordane	8.30E-02	8.12E-08	5.00E-04	1.62E-04	4.63E-08	5.00E-04	9.26E-05	1.23E-11	2.00E-04	6.17E-08	2.55E-04
Dieldrin	8.60E-02	8.41E-08	5.00E-05	1.68E-03	4.80E-08	5.00E-05	9.59E-04	1.28E-11	5.00E-05	2.56E-07	2.64E-03
Endosulfan sulfate	4.40E-03	4.31E-09	6.00E-03	7.18E-07	2.45E-09	6.00E-03	4.09E-07	6.54E-13	6.00E-03	1.09E-10	1.13E-06
Endrin	1.40E-02	1.37E-08	3.00E-04	4.57E-05	7.81E-09	3.00E-04	2.60E-05	2.08E-12	3.00E-04	6.94E-09	7.17E-05
Endrin aldehyde	4.90E-03	4.79E-09	3.00E-04	1.60E-05	2.73E-09	3.00E-04	9.11E-06	7.29E-13	3.00E-04	2.43E-09	2.51E-05
Endrin ketone	6.90E-03	6.75E-09	3.00E-04	2.25E-05	3.85E-09	3.00E-04	1.28E-05	1.03E-12	3.00E-04	3.42E-09	3.53E-05
Heptachlor	6.50E-04	6.36E-10	5.00E-04	1.27E-06	3.63E-10	5.00E-04	7.25E-07	9.67E-14	5.00E-04	1.93E-10	2.00E-06
Heptachlor epoxide	2.80E-03	2.74E-09	1.30E-05	2.11E-04	1.56E-09	1.30E-05	1.20E-04	4.16E-13	1.30E-05	3.20E-08	3.31E-04
Methoxychlor	7.00E-03	6.85E-09	5.00E-03	1.37E-06	3.90E-09	5.00E-03	7.81E-07	1.04E-12	5.00E-03	2.08E-10	2.15E-06
Aroclor-1260	3.30E-02	3.23E-08	2.00E-05	1.61E-03	5.52E-08	2.00E-05	2.76E-03	4.91E-12	2.00E-05	2.45E-07	4.38E-03
SVOCs/VOCs											
1,2-Dichlorobenzene	8.25E-03	8.07E-09	9.00E-02	8.97E-08	9.20E-09	9.00E-02	1.02E-07	1.01E-07	5.71E-02	1.77E-06	1.96E-06
1,4-Dichlorobenzene	2.00E-03	1.96E-09	3.00E-02	6.52E-08	2.23E-09	3.00E-02	7.44E-08	2.78E-08	2.30E-01	1.21E-07	2.60E-07
2-Methylnaphthalene	3.87E+00	3.79E-06	4.00E-03	9.47E-04	6.48E-06	4.00E-03	1.62E-03	1.23E-05	NA		2.57E-03
bis(2-Ethylhexyl)phthalate	1.07E+00	1.05E-06	2.00E-02	5.23E-05	1.19E-06	2.00E-02	5.97E-05	1.59E-10	2.00E-02	7.96E-09	1.12E-04
Acetophenone	2.60E-01	2.54E-07	1.00E-01	2.54E-06	2.90E-07	1.00E-01	2.90E-06	3.87E-11	NA		5.44E-06
Benzo(a)anthracene	4.88E-01	4.77E-07	NA		8.17E-07	NA		7.26E-11	NA		
Benzo(a)pyrene	6.51E-01	6.37E-07	NA		1.09E-06	NA		9.68E-11	NA		
Benzo(b)fluoranthene	6.40E-01	6.26E-07	NA		1.07E-06	NA		9.52E-11	NA		
Benzo(g,h,i)perylene	6.60E-01	6.46E-07	NA		1.10E-06	NA		9.81E-11	NA		
Benzo(k)fluoranthene	6.23E-01	6.10E-07	NA		1.04E-06	NA		9.26E-11	NA		
Caprolactam	2.30E-01	2.25E-07	5.00E-01	4.50E-07	2.57E-07	5.00E-01	5.13E-07	3.42E-11	5.00E-01	6.84E-11	9.63E-07
Chrysene	7.97E-01	7.80E-07	NA		1.33E-06	NA		1.19E-10	NA		
Dibenz(a,h)anthracene	3.13E-01	3.06E-07	NA		5.24E-07	NA		4.65E-11	NA		
Fluoranthene	6.68E-01	6.54E-07	4.00E-02	1.63E-05	1.12E-06	4.00E-02	2.79E-05	9.93E-11	4.00E-02	2.48E-09	4.43E-05
Indeno(1,2,3-c,d)pyrene	6.94E-01	6.79E-07	NA		1.16E-06	NA		1.03E-10	NA		
Naphthalene	2.83E-01	2.77E-07	2.00E-02	1.38E-05	4.74E-07	2.00E-02	2.37E-05	9.00E-07	8.57E-04	1.05E-03	1.09E-03
Phenanthrene	3.78E-01	3.70E-07	NA		6.32E-07	NA		5.62E-11	NA		
Pyrene	1.35E+00	1.32E-06	3.00E-02	4.40E-05	2.26E-06	3.00E-02	7.53E-05	2.01E-10	3.00E-02	6.69E-09	1.19E-04
Acetone	1.50E-01	1.47E-07	9.00E-01	1.63E-07	1.67E-07	9.00E-01	1.86E-07	2.71E-06	9.00E-01	3.02E-06	3.36E-06
Chlorobenzene	2.22E-02	2.17E-08	2.00E-02	1.09E-06	2.48E-08	2.00E-02	1.24E-06	6.40E-07	1.70E-02	3.76E-05	3.99E-05

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
cis-1,2-Dichloroethene	2.05E-02	2.01E-08	1.00E-02	2.01E-06	2.29E-08	1.00E-02	2.29E-06	1.36E-06	1.00E-02	1.36E-04	1.40E-04
Ethylbenzene	2.05E-02	2.01E-08	1.00E-01	2.01E-07	2.29E-08	1.00E-01	2.29E-07	6.81E-07	2.90E-01	2.35E-06	2.78E-06
Isopropylbenzene (cumene)	3.38E-01	3.31E-07	1.00E-01	3.31E-06	3.77E-07	1.00E-01	3.77E-06	2.16E-05	1.10E-01	1.97E-04	2.04E-04
Methyl ethyl ketone	2.38E-02	2.33E-08	6.00E-01	3.88E-08	2.65E-08	6.00E-01	4.42E-08	2.81E-07	1.40E+00	2.01E-07	2.84E-07
Methyl isobutyl ketone	6.85E-03	6.70E-09	8.00E-02	8.38E-08	7.64E-09	8.00E-02	9.55E-08	6.25E-08	8.60E-01	7.27E-08	2.52E-07
Methylcyclohexane	3.46E-01	3.39E-07	8.60E-01	3.94E-07	3.86E-07	8.60E-01	4.49E-07	3.92E-05	8.60E-01	4.56E-05	4.64E-05
Methylene chloride	6.66E-03	6.52E-09	6.00E-02	1.09E-07	7.43E-09	6.00E-02	1.24E-07	6.13E-07	1.14E-01	5.36E-06	5.60E-06
Tetrachloroethene	6.66E-03	6.52E-09	1.00E-02	6.52E-07	7.43E-09	1.00E-02	7.43E-07	5.99E-07	1.00E-02	5.99E-05	6.13E-05
Toluene	6.85E-02	6.70E-08	2.00E-01	3.35E-07	7.64E-08	2.00E-01	3.82E-07	3.95E-06	8.57E-02	4.61E-05	4.68E-05
Trichloroethene	4.00E-03	3.91E-09	3.00E-04	1.30E-05	4.46E-09	3.00E-04	1.49E-05	2.82E-07	1.00E-02	2.82E-05	5.61E-05
Xylenes, total	2.91E-01	2.85E-07	2.00E-01	1.42E-06	3.25E-07	2.00E-01	1.62E-06	1.10E-05	2.90E-02	3.78E-04	3.81E-04
		Total Risk (Hazard Index):		5.40E-01	**Total Risk (Hazard Index):**		1.95E-01	**Total Risk (Hazard Index):**		8.80E-03	7.44E-01

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **0.7**

Table 1-67
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Construction Exposure Scenario - Future Construction Worker - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Construction Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	1	yr
Soil Ingestion Rate	IR	330	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Adherence Factor	AF	0.8	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Metals											
Aluminum	9.21E+03	4.25E-04	NA		5.87E-05	NA		1.96E-08	NA		
Antimony	3.50E+00	1.61E-07	NA		2.23E-08	NA		7.44E-12	NA		
Arsenic	2.69E+01	1.24E-06	9.50E+00	1.18E-05	5.14E-07	9.50E+00	4.89E-06	5.71E-11	1.51E+01	8.60E-10	**1.67E-05**
Barium	9.37E+02	4.32E-05	NA		5.97E-06	NA		1.99E-09	NA		
Beryllium	3.03E-01	1.40E-08	NA		1.93E-09	NA		6.44E-13	8.40E+00	5.41E-12	5.41E-12
Cadmium	2.45E+00	1.13E-07	3.80E-01	4.29E-08	1.56E-09	3.80E-01	5.93E-10	5.20E-12	1.47E+01	7.65E-11	4.36E-08
Chromium	1.54E+02	7.10E-06	NA		9.82E-07	NA		3.27E-10	4.20E+01	1.37E-08	1.37E-08
Cobalt	7.06E+00	3.26E-07	NA		4.50E-08	NA		1.50E-11	9.80E+00	1.47E-10	1.47E-10
Copper	1.49E+02	6.87E-06	NA		9.50E-07	NA		3.17E-10	NA		
Iron	2.49E+04	1.15E-03	NA		1.59E-04	NA		5.29E-08	NA		
Lead	4.36E+03	2.01E-04	NA		2.78E-05	NA		9.26E-09	NA		
Manganese	3.60E+02	1.66E-05	NA		2.29E-06	NA		7.65E-10	NA		
Nickel	2.58E+01	1.19E-06	NA		1.64E-07	NA		5.48E-11	9.10E-01	4.99E-11	4.99E-11
Selenium	3.00E+00	1.38E-07	NA		1.91E-08	NA		6.37E-12	NA		
Silver	5.12E-01	2.36E-08	NA		3.26E-09	NA		1.09E-12	NA		
Thallium	2.60E+00	1.20E-07	NA		1.66E-08	NA		5.52E-12	NA		
Vanadium	3.26E+01	1.50E-06	NA		2.08E-07	NA		6.93E-11	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Zinc	4.53E+02	2.09E-05	NA		2.89E-06	NA		9.62E-10	NA		
Pesticides/PCBs											
4,4'-DDD	9.09E+00	4.19E-07	2.40E-01	1.01E-07	2.90E-07	2.40E-01	6.95E-08	1.93E-11	2.42E-01	4.66E-12	1.70E-07
4,4'-DDE	5.26E+00	2.43E-07	3.40E-01	8.25E-08	1.68E-07	3.40E-01	5.70E-08	1.12E-11	3.40E-01	3.79E-12	1.39E-07
4,4'-DDT	1.21E+02	5.58E-06	3.40E-01	1.90E-06	3.86E-06	3.40E-01	1.31E-06	2.57E-10	3.40E-01	8.73E-11	**3.21E-06**
alpha-BHC	6.00E-03	2.77E-10	6.30E+00	1.74E-09	1.91E-10	6.30E+00	1.20E-09	1.27E-14	6.30E+00	8.03E-14	2.95E-09
alpha-Chlordane	8.10E-02	3.74E-09	1.20E+00	4.48E-09	2.58E-09	1.20E+00	3.10E-09	1.72E-13	1.19E+00	2.05E-13	7.58E-09
beta-BHC	2.40E-02	1.11E-09	1.80E+00	1.99E-09	7.65E-10	1.80E+00	1.38E-09	5.10E-14	1.80E+00	9.18E-14	3.37E-09
gamma-BHC	3.47E-01	1.60E-08	1.30E+00	2.08E-08	1.11E-08	1.30E+00	1.44E-08	7.37E-13	1.30E+00	9.58E-13	3.52E-08
gamma-Chlordane	8.30E-02	3.83E-09	1.20E+00	4.59E-09	2.65E-09	1.20E+00	3.17E-09	1.76E-13	1.19E+00	2.10E-13	7.77E-09
Dieldrin	8.60E-02	3.97E-09	1.60E+01	6.35E-08	2.74E-09	1.60E+01	4.39E-08	1.83E-13	1.61E+01	2.94E-12	1.07E-07
Endosulfan sulfate	4.40E-03	2.03E-10	NA		1.40E-10	NA		9.35E-15	NA		
Endrin	1.40E-02	6.46E-10	NA		4.46E-10	NA		2.97E-14	NA		
Endrin aldehyde	4.90E-03	2.26E-10	NA		1.56E-10	NA		1.04E-14	NA		
Endrin ketone	6.90E-03	3.18E-10	NA		2.20E-10	NA		1.47E-14	NA		
Heptachlor	6.50E-04	3.00E-11	4.50E+00	1.35E-10	2.07E-11	4.50E+00	9.32E-11	1.38E-15	4.55E+00	6.28E-15	2.28E-10
Heptachlor epoxide	2.80E-03	1.29E-10	9.10E+00	1.18E-09	8.92E-11	9.10E+00	8.12E-10	5.95E-15	9.10E+00	5.41E-14	1.99E-09
Methoxychlor	7.00E-03	3.23E-10	NA		2.23E-10	NA		1.49E-14	NA		
Aroclor-1260	3.30E-02	1.52E-09	2.00E+00	3.04E-09	3.16E-09	2.00E+00	6.31E-09	7.01E-14	2.00E+00	1.40E-13	9.35E-09
SVOCs/VOCs											
1,2-Dichlorobenzene	8.25E-03	3.81E-10	NA		5.26E-10	NA		1.44E-09	NA		
1,4-Dichlorobenzene	2.00E-03	9.23E-11	2.40E-02	2.21E-12	1.27E-10	2.40E-02	3.06E-12	3.97E-10	3.85E-02	1.53E-11	2.05E-11
2-Methylnaphthalene	3.87E+00	1.79E-07	NA		3.70E-07	NA		1.76E-07	NA		
bis(2-Ethylhexyl)phthalate	1.07E+00	4.94E-08	1.40E-02	6.91E-10	6.82E-08	1.40E-02	9.55E-10	2.27E-12	1.40E-02	3.18E-14	1.65E-09
Acetophenone	2.60E-01	1.20E-08	NA		1.66E-08	NA		5.52E-13	NA		
Benzo(a)anthracene	4.88E-01	2.25E-08	1.20E+00	2.70E-08	4.67E-08	1.20E+00	5.60E-08	1.04E-12	7.30E-01	7.57E-13	8.30E-08
Benzo(a)pyrene	6.51E-01	3.00E-08	1.20E+01	3.60E-07	6.22E-08	1.20E+01	7.47E-07	1.38E-12	7.30E+00	1.01E-11	**1.11E-06**
Benzo(b)fluoranthene	6.40E-01	2.95E-08	1.20E+00	3.54E-08	6.12E-08	1.20E+00	7.34E-08	1.36E-12	7.30E-01	9.92E-13	1.09E-07
Benzo(g,h,i)perylene	6.60E-01	3.04E-08	NA		6.31E-08	NA		1.40E-12	NA		
Benzo(k)fluoranthene	6.23E-01	2.87E-08	1.20E+00	3.45E-08	5.96E-08	1.20E+00	7.15E-08	1.32E-12	3.85E-01	5.10E-13	1.06E-07
Caprolactam	2.30E-01	1.06E-08	NA		1.47E-08	NA		4.89E-13	NA		
Chrysene	7.97E-01	3.68E-08	1.20E-01	4.41E-09	7.62E-08	1.20E-01	9.14E-09	1.69E-12	3.85E-02	6.52E-14	1.36E-08
Dibenz(a,h)anthracene	3.13E-01	1.44E-08	7.30E+00	1.05E-07	2.99E-08	7.30E+00	2.18E-07	6.65E-13	7.30E+00	4.85E-12	3.24E-07
Fluoranthene	6.68E-01	3.08E-08	NA		6.39E-08	NA		1.42E-12	NA		
Indeno(1,2,3-c,d)pyrene	6.94E-01	3.20E-08	7.30E-01	2.34E-08	6.64E-08	7.30E-01	4.84E-08	1.47E-12	7.30E-01	1.08E-12	7.18E-08
Naphthalene	2.83E-01	1.31E-08	1.20E-01	1.57E-09	2.71E-08	1.20E-01	3.25E-09	1.29E-08	1.20E-01	1.54E-09	6.36E-09
Phenanthrene	3.78E-01	1.74E-08	NA		3.61E-08	NA		8.03E-13	NA		
Pyrene	1.35E+00	6.23E-08	NA		1.29E-07	NA		2.87E-12	NA		
Acetone	1.50E-01	6.92E-09	NA		9.56E-09	NA		3.88E-08	NA		
Chlorobenzene	2.22E-02	1.02E-09	NA		1.42E-09	NA		9.14E-09	NA		
cis-1,2-Dichloroethene	2.05E-02	9.46E-10	NA		1.31E-09	NA		1.95E-08	NA		
Ethylbenzene	2.05E-02	9.46E-10	NA		1.31E-09	NA		9.74E-09	NA		
Isopropylbenzene (cumene)	3.38E-01	1.56E-08	NA		2.15E-08	NA		3.09E-07	NA		
Methyl ethyl ketone	2.38E-02	1.10E-09	NA		1.52E-09	NA		4.02E-09	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Methyl isobutyl ketone	6.85E-03	3.16E-10	NA		4.37E-10	NA		8.93E-10	NA		
Methylcyclohexane	3.46E-01	1.60E-08	NA		2.21E-08	NA		5.60E-07	NA		
Methylene chloride	6.66E-03	3.07E-10	1.40E-02	4.30E-12	4.25E-10	1.40E-02	5.94E-12	8.76E-09	3.50E-03	3.06E-11	4.09E-11
Tetrachloroethene	6.66E-03	3.07E-10	5.40E-01	1.66E-10	4.25E-10	5.40E-01	2.29E-10	8.55E-09	2.07E-02	1.77E-10	5.72E-10
Toluene	6.85E-02	3.16E-09	NA		4.37E-09	NA		5.65E-08	NA		
Trichloroethene	4.00E-03	1.85E-10	4.00E-01	7.38E-11	2.55E-10	4.00E-01	1.02E-10	4.02E-09	4.00E-01	1.61E-09	1.78E-09
Xylenes, total	2.91E-01	1.34E-08	NA		1.85E-08	NA		1.56E-07	NA		
			Total Risk:	1.46E-05		**Total Risk:**	7.63E-06		**Total Risk:**	1.84E-08	**2.23E-05**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **2E-05**

Table 1-68
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Construction Exposure Scenario - Future Construction Worker - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Construction Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter (units)	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	1	yr
Soil Ingestion Rate	IR	330	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Adherence Factor	AF	0.8	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Metals											
Aluminum	9.21E+03	2.97E-02	1.00E+00	2.97E-02	4.11E-03	1.00E+00	4.11E-03	1.37E-06	1.40E-03	9.78E-04	3.48E-02
Antimony	3.50E+00	1.13E-05	4.00E-04	2.83E-02	1.56E-06	4.00E-04	3.90E-03	5.20E-10	NA		3.22E-02
Arsenic	2.69E+01	8.69E-05	3.00E-04	2.90E-01	3.60E-05	3.00E-04	1.20E-01	4.00E-09	8.57E-06	4.67E-04	4.10E-01
Barium	9.37E+02	3.03E-03	7.00E-02	4.32E-02	4.18E-04	7.00E-02	5.97E-03	1.39E-07	1.43E-04	9.75E-04	5.02E-02
Beryllium	3.03E-01	9.78E-07	2.00E-03	4.89E-04	1.35E-07	2.00E-03	6.76E-05	4.51E-11	5.71E-06	7.89E-06	5.65E-04
Cadmium	2.45E+00	7.91E-06	5.00E-04	1.58E-02	1.09E-07	5.00E-04	2.19E-04	3.64E-10	5.71E-06	6.38E-05	1.61E-02
Chromium	1.54E+02	4.97E-04	NA		6.87E-05	NA		2.29E-08	NA		
Cobalt	7.06E+00	2.28E-05	2.00E-02	1.14E-03	3.15E-06	2.00E-02	1.58E-04	1.05E-09	5.70E-06	1.84E-04	1.48E-03
Copper	1.49E+02	4.81E-04	4.00E-02	1.20E-02	6.65E-05	4.00E-02	1.66E-03	2.22E-08	NA		1.37E-02
Iron	2.49E+04	8.04E-02	3.00E-01	2.68E-01	1.11E-02	3.00E-01	3.70E-02	3.70E-06	NA		3.05E-01
Lead	4.36E+03	1.41E-02	NA		1.95E-03	NA		6.48E-07	NA		
Manganese	3.60E+02	1.16E-03	2.40E-02	4.84E-02	1.61E-04	2.40E-02	6.69E-03	5.35E-08	1.40E-05	3.82E-03	5.90E-02
Nickel	2.58E+01	8.33E-05	2.00E-02	4.17E-03	1.15E-05	2.00E-02	5.76E-04	3.84E-09	1.43E-05	2.69E-04	5.01E-03
Selenium	3.00E+00	9.69E-06	5.00E-03	1.94E-03	1.34E-06	5.00E-03	2.68E-04	4.46E-10	5.71E-03	7.81E-08	2.21E-03
Silver	5.12E-01	1.65E-06	5.00E-03	3.31E-04	2.28E-07	5.00E-03	4.57E-05	7.61E-11	NA		3.76E-04
Thallium	2.60E+00	8.40E-06	6.60E-05	1.27E-01	1.16E-06	6.60E-05	1.76E-02	3.87E-10	NA		1.45E-01
Vanadium	3.26E+01	1.05E-04	1.00E-03	1.05E-01	1.45E-05	1.00E-03	1.45E-02	4.85E-09	NA		1.20E-01
Zinc	4.53E+02	1.46E-03	3.00E-01	4.88E-03	2.02E-04	3.00E-01	6.74E-04	6.74E-08	NA		5.55E-03

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Pesticides/PCBs											
4,4'-DDD	9.09E+00	2.94E-05	NA		2.03E-05	NA		1.35E-09	NA		
4,4'-DDE	5.26E+00	1.70E-05	NA		1.17E-05	NA		7.82E-10	NA		
4,4'-DDT	1.21E+02	3.91E-04	5.00E-04	7.81E-01	2.70E-04	5.00E-04	5.40E-01	1.80E-08	5.00E-04	3.60E-05	**1.32E+00**
alpha-BHC	6.00E-03	1.94E-08	5.00E-04	3.87E-05	1.34E-08	5.00E-04	2.68E-05	8.92E-13	5.00E-04	1.78E-09	6.55E-05
alpha-Chlordane	8.10E-02	2.62E-07	5.00E-04	5.23E-04	1.81E-07	5.00E-04	3.61E-04	1.20E-11	2.00E-04	6.02E-08	8.85E-04
beta-BHC	2.40E-02	7.75E-08	NA		5.35E-08	NA		3.57E-12	NA		
gamma-BHC	3.47E-01	1.12E-06	3.00E-04	3.73E-03	7.74E-07	3.00E-04	2.58E-03	5.16E-11	3.00E-04	1.72E-07	6.32E-03
gamma-Chlordane	8.30E-02	2.68E-07	5.00E-04	5.36E-04	1.85E-07	5.00E-04	3.70E-04	1.23E-11	2.00E-04	6.17E-08	9.06E-04
Dieldrin	8.60E-02	2.78E-07	5.00E-05	5.55E-03	1.92E-07	5.00E-05	3.84E-03	1.28E-11	5.00E-05	2.56E-07	9.39E-03
Endosulfan sulfate	4.40E-03	1.42E-08	6.00E-03	2.37E-06	9.82E-09	6.00E-03	1.64E-06	6.54E-13	6.00E-03	1.09E-10	4.00E-06
Endrin	1.40E-02	4.52E-08	3.00E-04	1.51E-04	3.12E-08	3.00E-04	1.04E-04	2.08E-12	3.00E-04	6.94E-09	2.55E-04
Endrin aldehyde	4.90E-03	1.58E-08	3.00E-04	5.27E-05	1.09E-08	3.00E-04	3.64E-05	7.29E-13	3.00E-04	2.43E-09	8.92E-05
Endrin ketone	6.90E-03	2.23E-08	3.00E-04	7.43E-05	1.54E-08	3.00E-04	5.13E-05	1.03E-12	3.00E-04	3.42E-09	1.26E-04
Heptachlor	6.50E-04	2.10E-09	5.00E-04	4.20E-06	1.45E-09	5.00E-04	2.90E-06	9.67E-14	5.00E-04	1.93E-10	7.10E-06
Heptachlor epoxide	2.80E-03	9.04E-09	1.30E-05	6.95E-04	6.25E-09	1.30E-05	4.81E-04	4.16E-13	1.30E-05	3.20E-08	1.18E-03
Methoxychlor	7.00E-03	2.26E-08	5.00E-03	4.52E-06	1.56E-08	5.00E-03	3.12E-06	1.04E-12	5.00E-03	2.08E-10	7.64E-06
Aroclor-1260	3.30E-02	1.07E-07	2.00E-05	5.33E-03	2.21E-07	2.00E-05	1.10E-02	4.91E-12	2.00E-05	2.45E-07	1.64E-02
SVOCs/VOCs											
1,2-Dichlorobenzene	8.25E-03	2.66E-08	9.00E-02	2.96E-07	3.68E-08	9.00E-02	4.09E-07	1.01E-07	5.71E-02	1.77E-06	2.47E-06
1,4-Dichlorobenzene	2.00E-03	6.46E-09	3.00E-02	2.15E-07	8.92E-09	3.00E-02	2.97E-07	2.78E-08	2.30E-01	1.21E-07	6.33E-07
2-Methylnaphthalene	3.87E+00	1.25E-05	4.00E-03	3.12E-03	2.59E-05	4.00E-03	6.48E-03	1.23E-05	NA		9.60E-03
bis(2-Ethylhexyl)phthalate	1.07E+00	3.45E-06	2.00E-02	1.73E-04	4.77E-06	2.00E-02	2.39E-04	1.59E-10	2.00E-02	7.96E-09	4.11E-04
Acetophenone	2.60E-01	8.40E-07	1.00E-01	8.40E-06	1.16E-06	1.00E-01	1.16E-05	3.87E-11	NA		2.00E-05
Benzo(a)anthracene	4.88E-01	1.58E-06	NA		3.27E-06	NA		7.26E-11	NA		
Benzo(a)pyrene	6.51E-01	2.10E-06	NA		4.36E-06	NA		9.68E-11	NA		
Benzo(b)fluoranthene	6.40E-01	2.07E-06	NA		4.28E-06	NA		9.52E-11	NA		
Benzo(g,h,i)perylene	6.60E-01	2.13E-06	NA		4.42E-06	NA		9.81E-11	NA		
Benzo(k)fluoranthene	6.23E-01	2.01E-06	NA		4.17E-06	NA		9.26E-11	NA		
Caprolactam	2.30E-01	7.43E-07	5.00E-01	1.49E-06	1.03E-06	5.00E-01	2.05E-06	3.42E-11	5.00E-01	6.84E-11	3.54E-06
Chrysene	7.97E-01	2.57E-06	NA		5.33E-06	NA		1.19E-10	NA		
Dibenz(a,h)anthracene	3.13E-01	1.01E-06	NA		2.09E-06	NA		4.65E-11	NA		
Fluoranthene	6.68E-01	2.16E-06	4.00E-02	5.39E-05	4.47E-06	4.00E-02	1.12E-04	9.93E-11	4.00E-02	2.48E-09	1.66E-04
Indeno(1,2,3-c,d)pyrene	6.94E-01	2.24E-06	NA		4.64E-06	NA		1.03E-10	NA		
Naphthalene	2.83E-01	9.14E-07	2.00E-02	4.57E-05	1.89E-06	2.00E-02	9.47E-05	9.00E-07	8.57E-04	1.05E-03	1.19E-03
Phenanthrene	3.78E-01	1.22E-06	NA		2.53E-06	NA		5.62E-11	NA		
Pyrene	1.35E+00	4.36E-06	3.00E-02	1.45E-04	9.04E-06	3.00E-02	3.01E-04	2.01E-10	3.00E-02	6.69E-09	4.46E-04
Acetone	1.50E-01	4.84E-07	9.00E-01	5.38E-07	6.69E-07	9.00E-01	7.44E-07	2.71E-06	9.00E-01	3.02E-06	4.30E-06
Chlorobenzene	2.22E-02	7.17E-08	2.00E-02	3.58E-06	9.91E-08	2.00E-02	4.95E-06	6.40E-07	1.70E-02	3.76E-05	4.62E-05
cis-1,2-Dichloroethene	2.05E-02	6.62E-08	1.00E-02	6.62E-06	9.15E-08	1.00E-02	9.15E-06	1.36E-06	1.00E-02	1.36E-04	1.52E-04
Ethylbenzene	2.05E-02	6.62E-08	1.00E-01	6.62E-07	9.15E-08	1.00E-01	9.15E-07	6.81E-07	2.90E-01	2.35E-06	3.93E-06
Isopropylbenzene (cumene)	3.38E-01	1.09E-06	1.00E-01	1.09E-05	1.51E-06	1.00E-01	1.51E-05	2.16E-05	1.10E-01	1.97E-04	2.23E-04
Methyl ethyl ketone	2.38E-02	7.68E-08	6.00E-01	1.28E-07	1.06E-07	6.00E-01	1.77E-07	2.81E-07	1.40E+00	2.01E-07	5.06E-07
Methyl isobutyl ketone	6.85E-03	2.21E-08	8.00E-02	2.76E-07	3.06E-08	8.00E-02	3.82E-07	6.25E-08	8.60E-01	7.27E-08	7.31E-07
Methylcyclohexane	3.46E-01	1.12E-06	8.60E-01	1.30E-06	1.54E-06	8.60E-01	1.80E-06	3.92E-05	8.60E-01	4.56E-05	4.87E-05

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Methylene chloride	6.66E-03	2.15E-08	6.00E-02	3.58E-07	2.97E-08	6.00E-02	4.95E-07	6.13E-07	1.14E-01	5.36E-06	6.22E-06
Tetrachloroethene	6.66E-03	2.15E-08	1.00E-02	2.15E-06	2.97E-08	1.00E-02	2.97E-06	5.99E-07	1.00E-02	5.99E-05	6.50E-05
Toluene	6.85E-02	2.21E-07	2.00E-01	1.11E-06	3.06E-07	2.00E-01	1.53E-06	3.95E-06	8.57E-02	4.61E-05	4.87E-05
Trichloroethene	4.00E-03	1.29E-08	3.00E-04	4.31E-05	1.78E-08	3.00E-04	5.95E-05	2.82E-07	1.00E-02	2.82E-05	1.31E-04
Xylenes, total	2.91E-01	9.40E-07	2.00E-01	4.70E-06	1.30E-06	2.00E-01	6.49E-06	1.10E-05	2.90E-02	3.78E-04	3.89E-04
		Total Risk (Hazard Index):		1.78E+00	**Total Risk (Hazard Index):**		7.80E-01	**Total Risk (Hazard Index):**		8.797E-03	**2.57E+00**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **3**

Table 1-69
Cancer Risk Results - Detailed Summary of Risk Drivers - Future Industrial/Construction Worker - Shallow Soil - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Future Industrial Worker					Future Construction Worker				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	**8.9E-05**	**3.1E-05**	2.2E-08	**1.2E-04**	75%	**1.2E-05**	**4.9E-06**	8.6E-10	**1.7E-05**	75%
Subtotal Metals	**9.0E-05**	**3.1E-05**	3.7E-07	**1.2E-04**	76%	**1.2E-05**	**4.9E-06**	1.5E-08	**1.7E-05**	75%
Pesticides/PCBs										
4,4'-DDD	7.6E-07	4.3E-07	1.2E-10	**1.2E-06**	1%	1.0E-07	7.0E-08	4.7E-12	1.7E-07	1%
4,4'-DDT	**1.4E-05**	**8.2E-06**	2.2E-09	**2.3E-05**	14%	**1.9E-06**	**1.3E-06**	8.7E-11	**3.2E-06**	14%
Subtotal Pesticides/PCBs	**1.7E-05**	**9.4E-06**	2.5E-09	**2.6E-05**	16%	**2.2E-06**	**1.5E-06**	1.0E-10	**3.7E-06**	17%
SVOCs/VOCs										
Benzo(a)pyrene	**2.7E-06**	**4.7E-06**	2.5E-10	**7.4E-06**	5%	3.6E-07	7.5E-07	1.0E-11	**1.1E-06**	5%
Dibenz(a,h)anthracene	8.0E-07	**1.4E-06**	1.2E-10	**2.2E-06**	1%	1.1E-07	2.2E-07	4.9E-12	3.2E-07	1%
Subtotal SVOCs/VOCs	**4.5E-06**	**7.7E-06**	8.5E-08	**1.2E-05**	8%	5.9E-07	**1.2E-06**	3.4E-09	**1.8E-06**	8%
Total:	**1.1E-04**	**4.8E-05**	4.6E-07	**1.59E-04**		**1.5E-05**	**7.6E-06**	1.8E-08	**2.23E-05**	

Total Estimated Cancer Risk Across All Exposure Routes: **2E-04** **2E-05**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total cancer risk for all chemicals evaluated.

Table 1-70
Noncancer Risk Results - Detailed Summary of Risk Drivers - Future Industrial/Construction Worker - Shallow Soil - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Noncarcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Future Industrial Worker					Future Construction Worker				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	8.8E-02	3.0E-02	4.7E-04	**1.2E-01**	16%	**2.9E-01**	**1.2E-01**	4.7E-04	**4.1E-01**	16%
Iron	8.1E-02	9.3E-03		9.0E-02	12%	**2.7E-01**	3.7E-02		**3.1E-01**	12%
Thallium	3.9E-02	4.4E-03		4.3E-02	6%	**1.3E-01**	1.8E-02		**1.4E-01**	6%
Vanadium	3.2E-02	3.6E-03		3.6E-02	5%	**1.1E-01**	1.5E-02		**1.2E-01**	5%
Subtotal Metals	**3.0E-01**	5.3E-02	6.8E-03	**3.6E-01**	48%	**9.8E-01**	**2.1E-01**	6.8E-03	**1.2E+00**	47%
Pesticides/PCBs										
4,4'-DDT	**2.4E-01**	**1.3E-01**	3.6E-05	**3.7E-01**	50%	**7.8E-01**	**5.4E-01**	3.6E-05	**1.3E+00**	51%
Subtotal Pesticides/PCBs	**2.4E-01**	**1.4E-01**	3.7E-05	**3.8E-01**	51%	**8.0E-01**	**5.6E-01**	3.7E-05	**1.4E+00**	53%
Total:	**0.5**	**0.2**	0.009	**0.7**		**1.8**	**0.8**	0.009	**2.6**	

Total Estimated Hazard Index Across All Exposure Routes: **0.7** **3**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total hazard quotient for all chemicals evaluated.

Table 1-71
Risk Calculation Worksheet for Deep Soil - Carcinogenic Effects - Residential Exposure Scenario - Future Adult Resident - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	24	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	7.00E+01	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Adherence Factor	AF	0.07	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Metals											
Aluminum	8.24E+03	3.87E-03	NA		1.54E-04	NA		5.88E-07	NA		
Antimony	3.48E+00	1.63E-06	NA		6.52E-08	NA		2.48E-10	NA		
Arsenic	1.81E+01	8.50E-06	9.50E+00	8.08E-05	1.02E-06	9.50E+00	9.67E-06	1.29E-09	1.51E+01	1.94E-08	**9.04E-05**
Barium	6.52E+02	3.06E-04	NA		1.22E-05	NA		4.65E-08	NA		
Beryllium	2.81E-01	1.32E-07	NA		5.27E-09	NA		2.01E-11	8.40E+00	1.68E-10	1.68E-10
Cadmium	1.71E+00	8.03E-07	3.80E-01	3.05E-07	3.20E-09	3.80E-01	1.22E-09	1.22E-10	1.47E+01	1.79E-09	3.08E-07
Chromium	1.66E+02	7.80E-05	NA		3.11E-06	NA		1.18E-08	4.20E+01	4.98E-07	4.98E-07
Cobalt	6.47E+00	3.04E-06	NA		1.21E-07	NA		4.62E-10	9.80E+00	4.53E-09	4.53E-09
Copper	1.14E+02	5.35E-05	NA		2.14E-06	NA		8.14E-09	NA		
Iron	2.14E+04	1.01E-02	NA		4.01E-04	NA		1.53E-06	NA		
Lead	2.75E+03	1.29E-03	NA		5.15E-05	NA		1.96E-07	NA		
Manganese	3.24E+02	1.52E-04	NA		6.07E-06	NA		2.31E-08	NA		
Nickel	2.45E+01	1.15E-05	NA		4.59E-07	NA		1.75E-09	9.10E-01	1.59E-09	1.59E-09
Selenium	3.50E+00	1.64E-06	NA		6.56E-08	NA		2.50E-10	NA		
Silver	4.95E-01	2.32E-07	NA		9.28E-09	NA		3.53E-11	NA		
Thallium	2.60E+00	1.22E-06	NA		4.87E-08	NA		1.86E-10	NA		

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Oral: Cancer Risk [-]	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Dermal: Cancer Risk [-]	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Inhalation: Cancer Risk [-]	Total Cancer Risk [-]
Vanadium	2.89E+01	1.36E-05	NA		5.42E-07	NA		2.06E-09	NA		
Zinc	3.21E+02	1.51E-04	NA		6.02E-06	NA		2.29E-08	NA		
Pesticides/PCBs											
4,4'-DDD	3.79E+00	1.78E-06	2.40E-01	4.27E-07	3.55E-07	2.40E-01	8.52E-08	2.71E-10	2.42E-01	6.53E-11	5.13E-07
4,4'-DDE	2.10E+00	9.86E-07	3.40E-01	3.35E-07	1.97E-07	3.40E-01	6.69E-08	1.50E-10	3.40E-01	5.09E-11	4.02E-07
4,4'-DDT	8.05E+01	3.78E-05	3.40E-01	1.29E-05	7.54E-06	3.40E-01	2.56E-06	5.75E-09	3.40E-01	1.95E-09	**1.54E-05**
alpha-BHC	6.00E-03	2.82E-09	6.30E+00	1.78E-08	5.62E-10	6.30E+00	3.54E-09	4.28E-13	6.30E+00	2.70E-12	2.13E-08
alpha-Chlordane	8.10E-02	3.80E-08	1.20E+00	4.57E-08	7.59E-09	1.20E+00	9.11E-09	5.78E-12	1.19E+00	6.88E-12	5.48E-08
beta-BHC	2.40E-02	1.13E-08	1.80E+00	2.03E-08	2.25E-09	1.80E+00	4.05E-09	1.71E-12	1.80E+00	3.08E-12	2.43E-08
Dieldrin	8.60E-02	4.04E-08	1.60E+01	6.46E-07	8.06E-09	1.60E+01	1.29E-07	6.14E-12	1.61E+01	9.88E-11	7.75E-07
Endosulfan I	7.40E-04	3.48E-10	NA		6.93E-11	NA		5.28E-14	NA		
Endosulfan sulfate	4.40E-03	2.07E-09	NA		4.12E-10	NA		3.14E-13	NA		
Endrin	1.40E-02	6.58E-09	NA		1.31E-09	NA		9.99E-13	NA		
Endrin aldehyde	4.90E-03	2.30E-09	NA		4.59E-10	NA		3.50E-13	NA		
Endrin ketone	6.90E-03	3.24E-09	NA		6.47E-10	NA		4.93E-13	NA		
gamma-BHC	2.16E-01	1.01E-07	1.30E+00	1.32E-07	2.02E-08	1.30E+00	2.63E-08	1.54E-11	1.30E+00	2.00E-11	1.58E-07
gamma-Chlordane	8.30E-02	3.90E-08	1.20E+00	4.68E-08	7.78E-09	1.20E+00	9.33E-09	5.92E-12	1.19E+00	7.05E-12	5.61E-08
Heptachlor	6.50E-04	3.05E-10	4.50E+00	1.37E-09	6.09E-11	4.50E+00	2.74E-10	4.64E-14	4.55E+00	2.11E-13	1.65E-09
Heptachlor epoxide	2.80E-03	1.32E-09	9.10E+00	1.20E-08	2.62E-10	9.10E+00	2.39E-09	2.00E-13	9.10E+00	1.82E-12	1.44E-08
Methoxychlor	7.00E-03	3.29E-09	NA		6.56E-10	NA		5.00E-13	NA		
Aroclor-1260	3.30E-02	1.55E-08	2.00E+00	3.10E-08	9.28E-09	2.00E+00	1.86E-08	2.36E-12	2.00E+00	4.71E-12	4.96E-08
SVOCs/VOCs											
1,2-Dichlorobenzene	1.05E+00	4.93E-07	NA		1.97E-07	NA		6.16E-06	NA		
1,3-Dichlorobenzene	2.00E-03	9.39E-10	NA		3.75E-10	NA		1.17E-08	NA		
1,4-Dichlorobenzene	7.42E-02	3.48E-08	2.40E-02	8.36E-10	1.39E-08	2.40E-02	3.34E-10	4.94E-07	3.85E-02	1.90E-08	2.02E-08
2-Methylnaphthalene	1.36E+00	6.39E-07	NA		3.82E-07	NA		2.08E-06	NA		
Acetophenone	2.36E-01	1.11E-07	NA		4.42E-08	NA		1.68E-11	NA		
Anthracene	8.10E-02	3.80E-08	NA		2.28E-08	NA		8.82E-09	NA		
Benzo(a)anthracene	4.95E-01	2.32E-07	1.20E+00	2.79E-07	1.39E-07	1.20E+00	1.67E-07	3.53E-11	7.30E-01	2.58E-11	4.46E-07
Benzo(a)pyrene	6.17E-01	2.90E-07	1.20E+01	3.48E-06	1.73E-07	1.20E+01	2.08E-06	4.40E-11	7.30E+00	3.21E-10	**5.56E-06**
Benzo(b)fluoranthene	5.01E-01	2.35E-07	1.20E+00	2.82E-07	1.41E-07	1.20E+00	1.69E-07	3.58E-11	7.30E-01	2.61E-11	4.51E-07
Benzo(g,h,i)perylene	5.81E-01	2.73E-07	NA		1.63E-07	NA		4.15E-11	NA		
Benzo(k)fluoranthene	4.95E-01	2.32E-07	1.20E+00	2.79E-07	1.39E-07	1.20E+00	1.67E-07	3.53E-11	3.85E-01	1.36E-11	4.46E-07
Benzyl butyl phthalate	2.70E-01	1.27E-07	NA		5.06E-08	NA		1.93E-11	NA		
bis(2-Ethylhexyl)phthalate	9.04E-01	4.25E-07	1.40E-02	5.94E-09	1.69E-07	1.40E-02	2.37E-09	6.45E-11	1.40E-02	9.03E-13	8.32E-09
Caprolactam	2.30E-01	1.08E-07	NA		4.31E-08	NA		1.64E-11	NA		
Chrysene	5.97E-01	2.80E-07	1.20E-01	3.36E-08	1.68E-07	1.20E-01	2.01E-08	4.26E-11	3.85E-02	1.64E-12	5.38E-08
Dibenz(a,h)anthracene	2.67E-01	1.25E-07	7.30E+00	9.15E-07	7.51E-08	7.30E+00	5.48E-07	1.91E-11	7.30E+00	1.39E-10	**1.46E-06**
Fluoranthene	7.35E-01	3.45E-07	NA		2.07E-07	NA		5.25E-11	NA		
Indeno(1,2,3-c,d)pyrene	6.00E-01	2.82E-07	7.30E-01	2.06E-07	1.69E-07	7.30E-01	1.23E-07	4.28E-11	7.30E-01	3.13E-11	3.29E-07
Naphthalene	2.49E-01	1.17E-07	1.20E-01	1.40E-08	7.00E-08	1.20E-01	8.40E-09	3.80E-07	1.20E-01	4.56E-08	6.81E-08
Phenanthrene	3.08E-01	1.45E-07	NA		8.66E-08	NA		2.20E-11	NA		
Pyrene	1.02E+00	4.79E-07	NA		2.87E-07	NA		7.28E-11	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
1,1-Dichloroethane	6.83E-03	3.21E-09	5.70E-03	1.83E-11	1.28E-09	5.70E-03	7.30E-12	2.65E-07	5.60E-03	1.48E-09	1.51E-09
Acetone	6.05E-02	2.84E-08	NA		1.13E-08	NA		5.25E-07	NA		
Chlorobenzene	2.24E+00	1.05E-06	NA		4.20E-07	NA		3.10E-05	NA		
cis-1,2-Dichloroethene	1.80E-02	8.45E-09	NA		3.37E-09	NA		5.74E-07	NA		
Ethylbenzene	1.01E-02	4.74E-09	NA		1.89E-09	NA		1.61E-07	NA		
Isopropylbenzene (cumene)	1.05E-01	4.93E-08	NA		1.97E-08	NA		3.22E-06	NA		
Methyl ethyl ketone	1.79E-02	8.41E-09	NA		3.35E-09	NA		1.02E-07	NA		
Methyl isobutyl ketone	6.50E-03	3.05E-09	NA		1.22E-09	NA		2.85E-08	NA		
Methylcyclohexane	1.07E-01	5.03E-08	NA		2.01E-08	NA		5.82E-06	NA		
Methylene chloride	6.31E-03	2.96E-09	1.40E-02	4.15E-11	1.18E-09	1.40E-02	1.66E-11	2.79E-07	3.50E-03	9.76E-10	1.03E-09
Tetrachloroethene	6.38E-03	3.00E-09	5.40E-01	1.62E-09	1.20E-09	5.40E-01	6.46E-10	2.75E-07	2.07E-02	5.69E-09	7.95E-09
Toluene	4.40E-02	2.07E-08	NA		8.25E-09	NA		1.22E-06	NA		
Trichloroethene	4.00E-03	1.88E-09	4.00E-01	7.51E-10	7.50E-10	4.00E-01	3.00E-10	1.35E-07	4.00E-01	5.41E-08	5.51E-08
Vinyl chloride	1.00E-03	4.70E-10	1.50E+00	7.05E-10	1.87E-10	1.50E+00	2.81E-10	1.06E-07	2.73E-01	2.88E-08	2.98E-08
Xylenes, total	9.09E-02	4.27E-08	NA		1.70E-08	NA		1.64E-06	NA		
			Total Risk:	1.01E-04		**Total Risk:**	1.59E-05		**Total Risk:**	6.84E-07	**1.18E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **1E-04**

Table 1-72
Risk Calculation Worksheet for Deep Soil - Noncarcinogenic Effects - Residential Exposure Scenario - Future Adult Resident - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter (units)	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	24	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	7.00E+01	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Adherence Factor	AF	0.07	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Metals											
Aluminum	8.24E+03	1.13E-02	1.00E+00	1.13E-02	4.50E-04	1.00E+00	4.50E-04	1.72E-06	1.40E-03	1.23E-03	1.30E-02
Antimony	3.48E+00	4.77E-06	4.00E-04	1.19E-02	1.90E-07	4.00E-04	4.76E-04	7.24E-10	NA		1.24E-02
Arsenic	1.81E+01	2.48E-05	3.00E-04	8.26E-02	2.97E-06	3.00E-04	9.89E-03	3.77E-09	8.57E-06	4.40E-04	9.30E-02
Barium	6.52E+02	8.93E-04	7.00E-02	1.28E-02	3.56E-05	7.00E-02	5.09E-04	1.36E-07	1.43E-04	9.50E-04	1.42E-02
Beryllium	2.81E-01	3.85E-07	2.00E-03	1.92E-04	1.54E-08	2.00E-03	7.68E-06	5.85E-11	5.71E-06	1.02E-05	2.10E-04
Cadmium	1.71E+00	2.34E-06	5.00E-04	4.68E-03	9.35E-09	5.00E-04	1.87E-05	3.56E-10	5.71E-06	6.23E-05	4.77E-03
Chromium	1.66E+02	2.27E-04	NA		9.07E-06	NA		3.46E-08	NA		
Cobalt	6.47E+00	8.86E-06	2.00E-02	4.43E-04	3.54E-07	2.00E-02	1.77E-05	1.35E-09	5.70E-06	2.36E-04	6.97E-04
Copper	1.14E+02	1.56E-04	4.00E-02	3.90E-03	6.23E-06	4.00E-02	1.56E-04	2.37E-08	NA		4.06E-03
Iron	2.14E+04	2.93E-02	3.00E-01	9.77E-02	1.17E-03	3.00E-01	3.90E-03	4.46E-06	NA		1.02E-01
Lead	2.75E+03	3.77E-03	NA		1.50E-04	NA		5.73E-07	NA		
Manganese	3.24E+02	4.44E-04	2.40E-02	1.85E-02	1.77E-05	2.40E-02	7.38E-04	6.75E-08	1.40E-05	4.82E-03	2.40E-02
Nickel	2.45E+01	3.36E-05	2.00E-02	1.68E-03	1.34E-06	2.00E-02	6.70E-05	5.10E-09	1.43E-05	3.57E-04	2.10E-03
Selenium	3.50E+00	4.79E-06	5.00E-03	9.59E-04	1.91E-07	5.00E-03	3.83E-05	7.29E-10	5.71E-03	1.28E-07	9.97E-04
Silver	4.95E-01	6.78E-07	5.00E-03	1.36E-04	2.71E-08	5.00E-03	5.41E-06	1.03E-10	NA		1.41E-04
Thallium	2.60E+00	3.56E-06	6.60E-05	5.40E-02	1.42E-07	6.60E-05	2.15E-03	5.41E-10	NA		5.61E-02
Vanadium	2.89E+01	3.96E-05	1.00E-03	3.96E-02	1.58E-06	1.00E-03	1.58E-03	6.02E-09	NA		4.12E-02

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Zinc	3.21E+02	4.40E-04	3.00E-01	1.47E-03	1.75E-05	3.00E-01	5.85E-05	6.68E-08	NA		1.52E-03
Pesticides/PCBs											
4,4'-DDD	3.79E+00	5.19E-06	NA		1.04E-06	NA		7.89E-10	NA		
4,4'-DDE	2.10E+00	2.88E-06	NA		5.74E-07	NA		4.37E-10	NA		
4,4'-DDT	8.05E+01	1.10E-04	5.00E-04	2.21E-01	2.20E-05	5.00E-04	4.40E-02	1.68E-08	5.00E-04	3.35E-05	2.65E-01
alpha-BHC	6.00E-03	8.22E-09	5.00E-04	1.64E-05	1.64E-09	5.00E-04	3.28E-06	1.25E-12	5.00E-04	2.50E-09	1.97E-05
alpha-Chlordane	8.10E-02	1.11E-07	5.00E-04	2.22E-04	2.21E-08	5.00E-04	4.43E-05	1.69E-11	2.00E-04	8.43E-08	2.66E-04
beta-BHC	2.40E-02	3.29E-08	NA		6.56E-09	NA		5.00E-12	NA		
Dieldrin	8.60E-02	1.18E-07	5.00E-05	2.36E-03	2.35E-08	5.00E-05	4.70E-04	1.79E-11	5.00E-05	3.58E-07	2.83E-03
Endosulfan I	7.40E-04	1.01E-09	6.00E-03	1.69E-07	2.02E-10	6.00E-03	3.37E-08	1.54E-13	6.00E-03	2.57E-11	2.03E-07
Endosulfan sulfate	4.40E-03	6.03E-09	6.00E-03	1.00E-06	1.20E-09	6.00E-03	2.00E-07	9.16E-13	6.00E-03	1.53E-10	1.21E-06
Endrin	1.40E-02	1.92E-08	3.00E-04	6.39E-05	3.83E-09	3.00E-04	1.28E-05	2.91E-12	3.00E-04	9.72E-09	7.67E-05
Endrin aldehyde	4.90E-03	6.71E-09	3.00E-04	2.24E-05	1.34E-09	3.00E-04	4.46E-06	1.02E-12	3.00E-04	3.40E-09	2.68E-05
Endrin ketone	6.90E-03	9.45E-09	3.00E-04	3.15E-05	1.89E-09	3.00E-04	6.29E-06	1.44E-12	3.00E-04	4.79E-09	3.78E-05
gamma-BHC	2.16E-01	2.96E-07	3.00E-04	9.86E-04	5.90E-08	3.00E-04	1.97E-04	4.50E-11	3.00E-04	1.50E-07	1.18E-03
gamma-Chlordane	8.30E-02	1.14E-07	5.00E-04	2.27E-04	2.27E-08	5.00E-04	4.54E-05	1.73E-11	2.00E-04	8.64E-08	2.73E-04
Heptachlor	6.50E-04	8.90E-10	5.00E-04	1.78E-06	1.78E-10	5.00E-04	3.55E-07	1.35E-13	5.00E-04	2.71E-10	2.14E-06
Heptachlor epoxide	2.80E-03	3.84E-09	1.30E-05	2.95E-04	7.65E-10	1.30E-05	5.89E-05	5.83E-13	1.30E-05	4.48E-08	3.54E-04
Methoxychlor	7.00E-03	9.59E-09	5.00E-03	1.92E-06	1.91E-09	5.00E-03	3.83E-07	1.46E-12	5.00E-03	2.91E-10	2.30E-06
Aroclor-1260	3.30E-02	4.52E-08	2.00E-05	2.26E-03	2.71E-08	2.00E-05	1.35E-03	6.87E-12	2.00E-05	3.44E-07	3.61E-03
SVOCs/VOCs											
1,2-Dichlorobenzene	1.05E+00	1.44E-06	9.00E-02	1.60E-05	5.74E-07	9.00E-02	6.38E-06	1.80E-05	5.71E-02	3.15E-04	3.37E-04
1,3-Dichlorobenzene	2.00E-03	2.74E-09	3.00E-02	9.13E-08	1.09E-09	3.00E-02	3.64E-08	3.42E-08	3.00E-02	1.14E-06	1.27E-06
1,4-Dichlorobenzene	7.42E-02	1.02E-07	3.00E-02	3.39E-06	4.06E-08	3.00E-02	1.35E-06	1.44E-06	2.30E-01	6.27E-06	1.10E-05
2-Methylnaphthalene	1.36E+00	1.86E-06	4.00E-03	4.66E-04	1.12E-06	4.00E-03	2.79E-04	6.06E-06	NA		7.45E-04
Acetophenone	2.36E-01	3.23E-07	1.00E-01	3.23E-06	1.29E-07	1.00E-01	1.29E-06	4.91E-11	NA		4.52E-06
Anthracene	8.10E-02	1.11E-07	3.00E-01	3.70E-07	6.64E-08	3.00E-01	2.21E-07	2.57E-08	3.00E-01	8.57E-08	6.77E-07
Benzo(a)anthracene	4.95E-01	6.78E-07	NA		4.06E-07	NA		1.03E-10	NA		
Benzo(a)pyrene	6.17E-01	8.45E-07	NA		5.06E-07	NA		1.28E-10	NA		
Benzo(b)fluoranthene	5.01E-01	6.86E-07	NA		4.11E-07	NA		1.04E-10	NA		
Benzo(g,h,i)perylene	5.81E-01	7.96E-07	NA		4.76E-07	NA		1.21E-10	NA		
Benzo(k)fluoranthene	4.95E-01	6.78E-07	NA		4.06E-07	NA		1.03E-10	NA		
Benzyl butyl phthalate	2.70E-01	3.70E-07	2.00E-01	1.85E-06	1.48E-07	2.00E-01	7.38E-07	5.62E-11	2.00E-01	2.81E-10	2.59E-06
bis(2-Ethylhexyl)phthalate	9.04E-01	1.24E-06	2.00E-02	6.19E-05	4.94E-07	2.00E-02	2.47E-05	1.88E-10	2.00E-02	9.41E-09	8.66E-05
Caprolactam	2.30E-01	3.15E-07	5.00E-01	6.30E-07	1.26E-07	5.00E-01	2.51E-07	4.79E-11	5.00E-01	9.58E-11	8.82E-07
Chrysene	5.97E-01	8.18E-07	NA		4.89E-07	NA		1.24E-10	NA		
Dibenz(a,h)anthracene	2.67E-01	3.66E-07	NA		2.19E-07	NA		5.56E-11	NA		
Fluoranthene	7.35E-01	1.01E-06	4.00E-02	2.52E-05	6.03E-07	4.00E-02	1.51E-05	1.53E-10	4.00E-02	3.83E-09	4.02E-05
Indeno(1,2,3-c,d)pyrene	6.00E-01	8.22E-07	NA		4.92E-07	NA		1.25E-10	NA		
Naphthalene	2.49E-01	3.41E-07	2.00E-02	1.71E-05	2.04E-07	2.00E-02	1.02E-05	1.11E-06	8.57E-04	1.29E-03	1.32E-03
Phenanthrene	3.08E-01	4.22E-07	NA		2.53E-07	NA		6.41E-11	NA		
Pyrene	1.02E+00	1.40E-06	3.00E-02	4.66E-05	8.36E-07	3.00E-02	2.79E-05	2.12E-10	3.00E-02	7.08E-09	7.45E-05
1,1-Dichloroethane	6.83E-03	9.36E-09	1.00E-01	9.36E-08	3.73E-09	1.00E-01	3.73E-08	7.73E-07	1.43E-01	5.41E-06	5.54E-06
Acetone	6.05E-02	8.29E-08	9.00E-01	9.21E-08	3.31E-08	9.00E-01	3.67E-08	1.53E-06	9.00E-01	1.70E-06	1.83E-06

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Chlorobenzene	2.24E+00	3.07E-06	2.00E-02	1.53E-04	1.22E-06	2.00E-02	6.12E-05	9.03E-05	1.70E-02	5.31E-03	5.53E-03
cis-1,2-Dichloroethene	1.80E-02	2.47E-08	1.00E-02	2.47E-06	9.84E-09	1.00E-02	9.84E-07	1.67E-06	1.00E-02	1.67E-04	1.71E-04
Ethylbenzene	1.01E-02	1.38E-08	1.00E-01	1.38E-07	5.52E-09	1.00E-01	5.52E-08	4.70E-07	2.90E-01	1.62E-06	1.81E-06
Isopropylbenzene (cumene)	1.05E-01	1.44E-07	1.00E-01	1.44E-06	5.74E-08	1.00E-01	5.74E-07	9.41E-06	1.10E-01	8.55E-05	8.75E-05
Methyl ethyl ketone	1.79E-02	2.45E-08	6.00E-01	4.09E-08	9.78E-09	6.00E-01	1.63E-08	2.96E-07	1.40E+00	2.12E-07	2.69E-07
Methyl isobutyl ketone	6.50E-03	8.90E-09	8.00E-02	1.11E-07	3.55E-09	8.00E-02	4.44E-08	8.31E-08	8.60E-01	9.66E-08	2.52E-07
Methylcyclohexane	1.07E-01	1.47E-07	8.60E-01	1.70E-07	5.85E-08	8.60E-01	6.80E-08	1.70E-05	8.60E-01	1.97E-05	2.00E-05
Methylene chloride	6.31E-03	8.64E-09	6.00E-02	1.44E-07	3.45E-09	6.00E-02	5.75E-08	8.13E-07	1.14E-01	7.11E-06	7.32E-06
Tetrachloroethene	6.38E-03	8.74E-09	1.00E-02	8.74E-07	3.49E-09	1.00E-02	3.49E-07	8.03E-07	1.00E-02	8.03E-05	8.15E-05
Toluene	4.40E-02	6.03E-08	2.00E-01	3.01E-07	2.40E-08	2.00E-01	1.20E-07	3.55E-06	8.57E-02	4.15E-05	4.19E-05
Trichloroethene	4.00E-03	5.48E-09	3.00E-04	1.83E-05	2.19E-09	3.00E-04	7.29E-06	3.94E-07	1.00E-02	3.94E-05	6.50E-05
Vinyl chloride	1.00E-03	1.37E-09	3.00E-03	4.57E-07	5.47E-10	3.00E-03	1.82E-07	3.08E-07	2.86E-02	1.08E-05	1.14E-05
Xylenes, total	9.09E-02	1.25E-07	2.00E-01	6.23E-07	4.97E-08	2.00E-01	2.48E-07	4.79E-06	2.90E-02	1.65E-04	1.66E-04
		Total Risk (Hazard Index):		5.70E-01	**Total Risk (Hazard Index):**		6.67E-02	**Total Risk (Hazard Index):**		1.57E-02	6.52E-01

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **0.7**

Table 1-73
Risk Calculation Worksheet for Deep Soil - Carcinogenic Effects - Residential Exposure Scenario - Future Child Resident - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Child Resident
	Receptor Age:	Child (6 years)

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	6	yr
Soil Ingestion Rate	IR	200	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	10	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	2.90E+03	cm2/day [soil]
Body Weight	BW	1.50E+01	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Metals											
Aluminum	8.24E+03	9.03E-03	NA		2.62E-04	NA		3.43E-07	NA		
Antimony	3.48E+00	3.81E-06	NA		1.11E-07	NA		1.45E-10	NA		
Arsenic	1.81E+01	1.98E-05	9.50E+00	1.88E-04	1.73E-06	9.50E+00	1.64E-05	7.54E-10	1.51E+01	1.13E-08	**2.05E-04**
Barium	6.52E+02	7.15E-04	NA		2.07E-05	NA		2.71E-08	NA		
Beryllium	2.81E-01	3.08E-07	NA		8.93E-09	NA		1.17E-11	8.40E+00	9.83E-11	9.83E-11
Cadmium	1.71E+00	1.87E-06	3.80E-01	7.12E-07	5.43E-09	3.80E-01	2.07E-09	7.12E-11	1.47E+01	1.05E-09	7.15E-07
Chromium	1.66E+02	1.82E-04	NA		5.28E-06	NA		6.91E-09	4.20E+01	2.90E-07	2.90E-07
Cobalt	6.47E+00	7.09E-06	NA		2.06E-07	NA		2.69E-10	9.80E+00	2.64E-09	2.64E-09
Copper	1.14E+02	1.25E-04	NA		3.62E-06	NA		4.75E-09	NA		
Iron	2.14E+04	2.35E-02	NA		6.80E-04	NA		8.91E-07	NA		
Lead	2.75E+03	3.01E-03	NA		8.74E-05	NA		1.15E-07	NA		
Manganese	3.24E+02	3.55E-04	NA		1.03E-05	NA		1.35E-08	NA		
Nickel	2.45E+01	2.68E-05	NA		7.79E-07	NA		1.02E-09	9.10E-01	9.28E-10	9.28E-10
Selenium	3.50E+00	3.84E-06	NA		1.11E-07	NA		1.46E-10	NA		
Silver	4.95E-01	5.42E-07	NA		1.57E-08	NA		2.06E-11	NA		
Thallium	2.60E+00	2.85E-06	NA		8.26E-08	NA		1.08E-10	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Vanadium	2.89E+01	3.17E-05	NA		9.18E-07	NA		1.20E-09	NA		
Zinc	3.21E+02	3.52E-04	NA		1.02E-05	NA		1.34E-08	NA		
Pesticides/PCBs											
4,4'-DDD	3.79E+00	4.15E-06	2.40E-01	9.97E-07	6.02E-07	2.40E-01	1.45E-07	1.58E-10	2.42E-01	3.81E-11	**1.14E-06**
4,4'-DDE	2.10E+00	2.30E-06	3.40E-01	7.82E-07	3.34E-07	3.40E-01	1.13E-07	8.74E-11	3.40E-01	2.97E-11	8.96E-07
4,4'-DDT	8.05E+01	8.82E-05	3.40E-01	3.00E-05	1.28E-05	3.40E-01	4.35E-06	3.35E-09	3.40E-01	1.14E-09	**3.43E-05**
alpha-BHC	6.00E-03	6.58E-09	6.30E+00	4.14E-08	9.53E-10	6.30E+00	6.01E-09	2.50E-13	6.30E+00	1.57E-12	4.74E-08
alpha-Chlordane	8.10E-02	8.88E-08	1.20E+00	1.07E-07	1.29E-08	1.20E+00	1.54E-08	3.37E-12	1.19E+00	4.01E-12	1.22E-07
beta-BHC	2.40E-02	2.63E-08	1.80E+00	4.73E-08	3.81E-09	1.80E+00	6.86E-09	9.99E-13	1.80E+00	1.80E-12	5.42E-08
Dieldrin	8.60E-02	9.42E-08	1.60E+01	1.51E-06	1.37E-08	1.60E+01	2.19E-07	3.58E-12	1.61E+01	5.77E-11	**1.73E-06**
Endosulfan I	7.40E-04	8.11E-10	NA		1.18E-10	NA		3.08E-14	NA		
Endosulfan sulfate	4.40E-03	4.82E-09	NA		6.99E-10	NA		1.83E-13	NA		
Endrin	1.40E-02	1.53E-08	NA		2.22E-09	NA		5.83E-13	NA		
Endrin aldehyde	4.90E-03	5.37E-09	NA		7.79E-10	NA		2.04E-13	NA		
Endrin ketone	6.90E-03	7.56E-09	NA		1.10E-09	NA		2.87E-13	NA		
gamma-BHC	2.16E-01	2.37E-07	1.30E+00	3.08E-07	3.43E-08	1.30E+00	4.46E-08	8.99E-12	1.30E+00	1.17E-11	3.52E-07
gamma-Chlordane	8.30E-02	9.10E-08	1.20E+00	1.09E-07	1.32E-08	1.20E+00	1.58E-08	3.46E-12	1.19E+00	4.11E-12	1.25E-07
Heptachlor	6.50E-04	7.12E-10	4.50E+00	3.21E-09	1.03E-10	4.50E+00	4.65E-10	2.71E-14	4.55E+00	1.23E-13	3.67E-09
Heptachlor epoxide	2.80E-03	3.07E-09	9.10E+00	2.79E-08	4.45E-10	9.10E+00	4.05E-09	1.17E-13	9.10E+00	1.06E-12	3.20E-08
Methoxychlor	7.00E-03	7.67E-09	NA		1.11E-09	NA		2.91E-13	NA		
Aroclor-1260	3.30E-02	3.62E-08	2.00E+00	7.23E-08	1.57E-08	2.00E+00	3.15E-08	1.37E-12	2.00E+00	2.75E-12	1.04E-07
SVOCs/VOCs											
1,2-Dichlorobenzene	1.05E+00	1.15E-06	NA		3.34E-07	NA		3.60E-06	NA		
1,3-Dichlorobenzene	2.00E-03	2.19E-09	NA		6.36E-10	NA		6.85E-09	NA		
1,4-Dichlorobenzene	7.42E-02	8.13E-08	2.40E-02	1.95E-09	2.36E-08	2.40E-02	5.66E-10	2.88E-07	3.85E-02	1.11E-08	1.36E-08
2-Methylnaphthalene	1.36E+00	1.49E-06	NA		6.48E-07	NA		1.21E-06	NA		
Acetophenone	2.36E-01	2.59E-07	NA		7.50E-08	NA		9.83E-12	NA		
Anthracene	8.10E-02	8.88E-08	NA		3.86E-08	NA		5.14E-09	NA		
Benzo(a)anthracene	4.95E-01	5.42E-07	1.20E+00	6.51E-07	2.36E-07	1.20E+00	2.83E-07	2.06E-11	7.30E-01	1.50E-11	9.34E-07
Benzo(a)pyrene	6.17E-01	6.76E-07	1.20E+01	8.11E-06	2.94E-07	1.20E+01	3.53E-06	2.57E-11	7.30E+00	1.88E-10	**1.16E-05**
Benzo(b)fluoranthene	5.01E-01	5.49E-07	1.20E+00	6.59E-07	2.39E-07	1.20E+00	2.87E-07	2.09E-11	7.30E-01	1.52E-11	9.45E-07
Benzo(g,h,i)perylene	5.81E-01	6.37E-07	NA		2.77E-07	NA		2.42E-11	NA		
Benzo(k)fluoranthene	4.95E-01	5.42E-07	1.20E+00	6.51E-07	2.36E-07	1.20E+00	2.83E-07	2.06E-11	3.85E-01	7.94E-12	9.34E-07
Benzyl butyl phthalate	2.70E-01	2.96E-07	NA		8.58E-08	NA		1.12E-11	NA		
bis(2-Ethylhexyl)phthalate	9.04E-01	9.91E-07	1.40E-02	1.39E-08	2.87E-07	1.40E-02	4.02E-09	3.76E-11	1.40E-02	5.27E-13	1.79E-08
Caprolactam	2.30E-01	2.52E-07	NA		7.31E-08	NA		9.58E-12	NA		
Chrysene	5.97E-01	6.54E-07	1.20E-01	7.85E-08	2.85E-07	1.20E-01	3.42E-08	2.49E-11	3.85E-02	9.57E-13	1.13E-07
Dibenz(a,h)anthracene	2.67E-01	2.93E-07	7.30E+00	2.14E-06	1.27E-07	7.30E+00	9.29E-07	1.11E-11	7.30E+00	8.12E-11	**3.07E-06**
Fluoranthene	7.35E-01	8.05E-07	NA		3.50E-07	NA		3.06E-11	NA		
Indeno(1,2,3-c,d)pyrene	6.00E-01	6.58E-07	7.30E-01	4.80E-07	2.86E-07	7.30E-01	2.09E-07	2.50E-11	7.30E-01	1.82E-11	6.89E-07
Naphthalene	2.49E-01	2.73E-07	1.20E-01	3.27E-08	1.19E-07	1.20E-01	1.42E-08	2.22E-07	1.20E-01	2.66E-08	7.36E-08
Phenanthrene	3.08E-01	3.38E-07	NA		1.47E-07	NA		1.28E-11	NA		
Pyrene	1.02E+00	1.12E-06	NA		4.86E-07	NA		4.25E-11	NA		
1,1-Dichloroethane	6.83E-03	7.48E-09	5.70E-03	4.27E-11	2.17E-09	5.70E-03	1.24E-11	1.55E-07	5.60E-03	8.66E-10	9.21E-10
Acetone	6.05E-02	6.63E-08	NA		1.92E-08	NA		3.06E-07	NA		
Chlorobenzene	2.24E+00	2.45E-06	NA		7.12E-07	NA		1.81E-05	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
cis-1,2-Dichloroethene	1.80E-02	1.97E-08	NA		5.72E-09	NA		3.35E-07	NA		
Ethylbenzene	1.01E-02	1.11E-08	NA		3.21E-09	NA		9.40E-08	NA		
Isopropylbenzene (cumene)	1.05E-01	1.15E-07	NA		3.34E-08	NA		1.88E-06	NA		
Methyl ethyl ketone	1.79E-02	1.96E-08	NA		5.69E-09	NA		5.93E-08	NA		
Methyl isobutyl ketone	6.50E-03	7.12E-09	NA		2.07E-09	NA		1.66E-08	NA		
Methylcyclohexane	1.07E-01	1.17E-07	NA		3.40E-08	NA		3.39E-06	NA		
Methylene chloride	6.31E-03	6.92E-09	1.40E-02	9.68E-11	2.01E-09	1.40E-02	2.81E-11	1.63E-07	3.50E-03	5.69E-10	6.94E-10
Tetrachloroethene	6.38E-03	6.99E-09	5.40E-01	3.78E-09	2.03E-09	5.40E-01	1.09E-09	1.61E-07	2.07E-02	3.32E-09	8.19E-09
Toluene	4.40E-02	4.82E-08	NA		1.40E-08	NA		7.11E-07	NA		
Trichloroethene	4.00E-03	4.38E-09	4.00E-01	1.75E-09	1.27E-09	4.00E-01	5.08E-10	7.88E-08	4.00E-01	3.15E-08	3.38E-08
Vinyl chloride	1.00E-03	1.10E-09	1.50E+00	1.64E-09	3.18E-10	1.50E+00	4.77E-10	6.16E-08	2.73E-01	1.68E-08	1.89E-08
Xylenes, total	9.09E-02	9.96E-08	NA		2.89E-08	NA		9.58E-07	NA		
			Total Risk:	2.36E-04		**Total Risk:**	2.69E-05		**Total Risk:**	3.99E-07	**2.63E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes :

3E-04

Table 1-74
Risk Calculation Worksheet for Deep Soil - Noncarcinogenic Effects - Residential Exposure Scenario - Future Child Resident - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Child Resident
	Receptor Age:	Child (6 years)

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter (units)	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	6	yr
Soil Ingestion Rate	IR	200	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	10	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	2.90E+03	cm2/day [soil]
Body Weight	BW	1.50E+01	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Metals											
Aluminum	8.24E+03	1.05E-01	1.00E+00	1.05E-01	3.06E-03	1.00E+00	3.06E-03	4.00E-06	1.40E-03	2.86E-03	**1.11E-01**
Antimony	3.48E+00	4.45E-05	4.00E-04	1.11E-01	1.29E-06	4.00E-04	3.23E-03	1.69E-09	NA		**1.14E-01**
Arsenic	1.81E+01	2.31E-04	3.00E-04	7.71E-01	2.01E-05	3.00E-04	6.71E-02	8.79E-09	8.57E-06	1.03E-03	**8.40E-01**
Barium	6.52E+02	8.34E-03	7.00E-02	1.19E-01	2.42E-04	7.00E-02	3.45E-03	3.17E-07	1.43E-04	2.22E-03	**1.25E-01**
Beryllium	2.81E-01	3.59E-06	2.00E-03	1.80E-03	1.04E-07	2.00E-03	5.21E-05	1.37E-10	5.71E-06	2.39E-05	1.87E-03
Cadmium	1.71E+00	2.19E-05	1.10E-05	1.99E+00	6.34E-08	1.10E-05	5.76E-03	8.31E-10	5.71E-06	1.45E-04	**1.99E+00**
Chromium	1.66E+02	2.12E-03	NA		6.15E-05	NA		8.06E-08	NA		
Cobalt	6.47E+00	8.27E-05	2.00E-02	4.14E-03	2.40E-06	2.00E-02	1.20E-04	3.14E-09	5.70E-06	5.51E-04	4.81E-03
Copper	1.14E+02	1.46E-03	4.00E-02	3.64E-02	4.23E-05	4.00E-02	1.06E-03	5.54E-08	NA		3.75E-02
Iron	2.14E+04	2.74E-01	3.00E-01	9.12E-01	7.93E-03	3.00E-01	2.64E-02	1.04E-05	NA		**9.38E-01**
Lead	2.75E+03	3.52E-02	NA		1.02E-03	NA		1.34E-06	NA		
Manganese	3.24E+02	4.14E-03	2.40E-02	1.73E-01	1.20E-04	2.40E-02	5.01E-03	1.57E-07	1.40E-05	1.12E-02	**1.89E-01**
Nickel	2.45E+01	3.13E-04	1.10E-02	2.85E-02	9.08E-06	1.10E-02	8.26E-04	1.19E-08	1.43E-05	8.33E-04	3.01E-02
Selenium	3.50E+00	4.47E-05	5.00E-03	8.95E-03	1.30E-06	5.00E-03	2.60E-04	1.70E-09	5.71E-03	2.98E-07	9.21E-03
Silver	4.95E-01	6.33E-06	5.00E-03	1.27E-03	1.84E-07	5.00E-03	3.67E-05	2.40E-10	NA		1.30E-03
Thallium	2.60E+00	3.32E-05	6.60E-05	5.04E-01	9.64E-07	6.60E-05	1.46E-02	1.26E-09	NA		**5.18E-01**
Vanadium	2.89E+01	3.69E-04	1.00E-03	3.69E-01	1.07E-05	1.00E-03	1.07E-02	1.40E-08	NA		**3.80E-01**

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Zinc	3.21E+02	4.10E-03	3.00E-01	1.37E-02	1.19E-04	3.00E-01	3.97E-04	1.56E-07	NA		1.41E-02
Pesticides/PCBs											
4,4'-DDD	3.79E+00	4.85E-05	NA		7.03E-06	NA		1.84E-09	NA		
4,4'-DDE	2.10E+00	2.68E-05	NA		3.89E-06	NA		1.02E-09	NA		
4,4'-DDT	8.05E+01	1.03E-03	5.00E-04	2.06E+00	1.49E-04	5.00E-04	2.98E-01	3.91E-08	5.00E-04	7.82E-05	**2.36E+00**
alpha-BHC	6.00E-03	7.67E-08	5.00E-04	1.53E-04	1.11E-08	5.00E-04	2.22E-05	2.91E-12	5.00E-04	5.83E-09	1.76E-04
alpha-Chlordane	8.10E-02	1.04E-06	3.30E-05	3.14E-02	1.50E-07	3.30E-05	4.55E-03	3.93E-11	2.00E-04	1.97E-07	3.59E-02
beta-BHC	2.40E-02	3.07E-07	NA		4.45E-08	NA		1.17E-11	NA		
Dieldrin	8.60E-02	1.10E-06	5.00E-05	2.20E-02	1.59E-07	5.00E-05	3.19E-03	4.18E-11	5.00E-05	8.36E-07	2.52E-02
Endosulfan I	7.40E-04	9.46E-09	6.00E-03	1.58E-06	1.37E-09	6.00E-03	2.29E-07	3.59E-13	6.00E-03	5.99E-11	1.81E-06
Endosulfan sulfate	4.40E-03	5.63E-08	6.00E-03	9.38E-06	8.16E-09	6.00E-03	1.36E-06	2.14E-12	6.00E-03	3.56E-10	1.07E-05
Endrin	1.40E-02	1.79E-07	3.00E-04	5.97E-04	2.60E-08	3.00E-04	8.65E-05	6.80E-12	3.00E-04	2.27E-08	6.83E-04
Endrin aldehyde	4.90E-03	6.26E-08	3.00E-04	2.09E-04	9.08E-09	3.00E-04	3.03E-05	2.38E-12	3.00E-04	7.93E-09	2.39E-04
Endrin ketone	6.90E-03	8.82E-08	3.00E-04	2.94E-04	1.28E-08	3.00E-04	4.26E-05	3.35E-12	3.00E-04	1.12E-08	3.37E-04
gamma-BHC	2.16E-01	2.76E-06	3.00E-04	9.21E-03	4.00E-07	3.00E-04	1.33E-03	1.05E-10	3.00E-04	3.50E-07	1.05E-02
gamma-Chlordane	8.30E-02	1.06E-06	3.30E-05	3.22E-02	1.54E-07	3.30E-05	4.66E-03	4.03E-11	2.00E-04	2.02E-07	3.68E-02
Heptachlor	6.50E-04	8.31E-09	3.00E-05	2.77E-04	1.21E-09	3.00E-05	4.02E-05	3.16E-13	3.00E-05	1.05E-08	3.17E-04
Heptachlor epoxide	2.80E-03	3.58E-08	1.30E-05	2.75E-03	5.19E-09	1.30E-05	3.99E-04	1.36E-12	1.30E-05	1.05E-07	3.15E-03
Methoxychlor	7.00E-03	8.95E-08	2.00E-05	4.47E-03	1.30E-08	2.00E-05	6.49E-04	3.40E-12	2.00E-05	1.70E-07	5.12E-03
Aroclor-1260	3.30E-02	4.22E-07	2.00E-05	2.11E-02	1.84E-07	2.00E-05	9.18E-03	1.60E-11	2.00E-05	8.02E-07	3.03E-02
SVOCs/VOCs											
1,2-Dichlorobenzene	1.05E+00	1.34E-05	9.00E-02	1.49E-04	3.89E-06	9.00E-02	4.33E-05	4.19E-05	5.71E-02	7.34E-04	9.27E-04
1,3-Dichlorobenzene	2.00E-03	2.56E-08	3.00E-02	8.52E-07	7.42E-09	3.00E-02	2.47E-07	7.99E-08	3.00E-02	2.66E-06	3.76E-06
1,4-Dichlorobenzene	7.42E-02	9.49E-07	3.00E-02	3.16E-05	2.75E-07	3.00E-02	9.17E-06	3.36E-06	2.30E-01	1.46E-05	5.54E-05
2-Methylnaphthalene	1.36E+00	1.74E-05	4.00E-03	4.35E-03	7.56E-06	4.00E-03	1.89E-03	1.41E-05	NA		6.24E-03
Acetophenone	2.36E-01	3.02E-06	1.00E-01	3.02E-05	8.75E-07	1.00E-01	8.75E-06	1.15E-10	NA		3.89E-05
Anthracene	8.10E-02	1.04E-06	3.00E-01	3.45E-06	4.50E-07	3.00E-01	1.50E-06	6.00E-08	3.00E-01	2.00E-07	5.15E-06
Benzo(a)anthracene	4.95E-01	6.33E-06	NA		2.75E-06	NA		2.40E-10	NA		
Benzo(a)pyrene	6.17E-01	7.89E-06	NA		3.43E-06	NA		3.00E-10	NA		
Benzo(b)fluoranthene	5.01E-01	6.41E-06	NA		2.79E-06	NA		2.43E-10	NA		
Benzo(g,h,i)perylene	5.81E-01	7.43E-06	NA		3.23E-06	NA		2.82E-10	NA		
Benzo(k)fluoranthene	4.95E-01	6.33E-06	NA		2.75E-06	NA		2.40E-10	NA		
Benzyl butyl phthalate	2.70E-01	3.45E-06	2.00E-01	1.73E-05	1.00E-06	2.00E-01	5.01E-06	1.31E-10	2.00E-01	6.56E-10	2.23E-05
bis(2-Ethylhexyl)phthalate	9.04E-01	1.16E-05	2.00E-02	5.78E-04	3.35E-06	2.00E-02	1.68E-04	4.39E-10	2.00E-02	2.20E-08	7.46E-04
Caprolactam	2.30E-01	2.94E-06	5.00E-01	5.88E-06	8.53E-07	5.00E-01	1.71E-06	1.12E-10	5.00E-01	2.23E-10	7.59E-06
Chrysene	5.97E-01	7.63E-06	NA		3.32E-06	NA		2.90E-10	NA		
Dibenz(a,h)anthracene	2.67E-01	3.41E-06	NA		1.48E-06	NA		1.30E-10	NA		
Fluoranthene	7.35E-01	9.40E-06	4.00E-02	2.35E-04	4.09E-06	4.00E-02	1.02E-04	3.57E-10	4.00E-02	8.93E-09	3.37E-04
Indeno(1,2,3-c,d)pyrene	6.00E-01	7.67E-06	NA		3.34E-06	NA		2.91E-10	NA		
Naphthalene	2.49E-01	3.18E-06	2.00E-02	1.59E-04	1.38E-06	2.00E-02	6.92E-05	2.59E-06	8.57E-04	3.02E-03	3.25E-03
Phenanthrene	3.08E-01	3.94E-06	NA		1.71E-06	NA		1.50E-10	NA		
Pyrene	1.02E+00	1.30E-05	3.00E-02	4.35E-04	5.67E-06	3.00E-02	1.89E-04	4.95E-10	3.00E-02	1.65E-08	6.24E-04
1,1-Dichloroethane	6.83E-03	8.73E-08	1.00E-01	8.73E-07	2.53E-08	1.00E-01	2.53E-07	1.80E-06	1.43E-01	1.26E-05	1.38E-05
Acetone	6.05E-02	7.74E-07	9.00E-01	8.59E-07	2.24E-07	9.00E-01	2.49E-07	3.58E-06	9.00E-01	3.97E-06	5.08E-06

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Chlorobenzene	2.24E+00	2.86E-05	2.00E-02	1.43E-03	8.31E-06	2.00E-02	4.15E-04	2.11E-04	1.70E-02	1.24E-02	1.42E-02
cis-1,2-Dichloroethene	1.80E-02	2.30E-07	1.00E-02	2.30E-05	6.67E-08	1.00E-02	6.67E-06	3.91E-06	1.00E-02	3.91E-04	4.20E-04
Ethylbenzene	1.01E-02	1.29E-07	1.00E-01	1.29E-06	3.74E-08	1.00E-01	3.74E-07	1.10E-06	2.90E-01	3.78E-06	5.45E-06
Isopropylbenzene (cumene)	1.05E-01	1.34E-06	1.00E-01	1.34E-05	3.89E-07	1.00E-01	3.89E-06	2.19E-05	1.10E-01	2.00E-04	2.17E-04
Methyl ethyl ketone	1.79E-02	2.29E-07	6.00E-01	3.81E-07	6.64E-08	6.00E-01	1.11E-07	6.91E-07	1.40E+00	4.94E-07	9.86E-07
Methyl isobutyl ketone	6.50E-03	8.31E-08	8.00E-02	1.04E-06	2.41E-08	8.00E-02	3.01E-07	1.94E-07	8.60E-01	2.25E-07	1.57E-06
Methylcyclohexane	1.07E-01	1.37E-06	8.60E-01	1.59E-06	3.97E-07	8.60E-01	4.61E-07	3.96E-05	8.60E-01	4.60E-05	4.81E-05
Methylene chloride	6.31E-03	8.07E-08	6.00E-02	1.34E-06	2.34E-08	6.00E-02	3.90E-07	1.90E-06	1.14E-01	1.66E-05	1.83E-05
Tetrachloroethene	6.38E-03	8.16E-08	1.00E-02	8.16E-06	2.37E-08	1.00E-02	2.37E-06	1.87E-06	1.00E-02	1.87E-04	1.98E-04
Toluene	4.40E-02	5.63E-07	2.00E-01	2.81E-06	1.63E-07	2.00E-01	8.16E-07	8.29E-06	8.57E-02	9.67E-05	1.00E-04
Trichloroethene	4.00E-03	5.11E-08	3.00E-04	1.70E-04	1.48E-08	3.00E-04	4.94E-05	9.20E-07	1.00E-02	9.20E-05	3.12E-04
Vinyl chloride	1.00E-03	1.28E-08	3.00E-03	4.26E-06	3.71E-09	3.00E-03	1.24E-06	7.18E-07	2.86E-02	2.51E-05	3.06E-05
Xylenes, total	9.09E-02	1.16E-06	2.00E-01	5.81E-06	3.37E-07	2.00E-01	1.69E-06	1.12E-05	2.90E-02	3.85E-04	3.93E-04
		Total Risk (Hazard Index):		7.3	**Total Risk (Hazard Index):**		0.47	**Total Risk (Hazard Index):**		0.037	**7.8**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **8**

Table 1-75
Cancer Risk Results - Detailed Summary of Risk Drivers - Future Adult/Child Resident - Deep Soil - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	**8.1E-05**	**9.7E-06**	1.9E-08	**9.0E-05**	77%	**1.6E-05**	1.1E-08	**2.0E-04**	**2.0E-04**	78%
Subtotal Metals	**8.1E-05**	**9.7E-06**	5.3E-07	**9.1E-05**	78%	**1.6E-05**	3.1E-07	**2.1E-04**	**2.1E-04**	78%
Pesticides/PCBs										
4,4'-DDD	4.3E-07	8.5E-08	6.5E-11	5.1E-07	0.4%	1.4E-07	3.8E-11	**1.1E-06**	**1.1E-06**	0.4%
4,4'-DDT	**1.3E-05**	**2.6E-06**	2.0E-09	**1.5E-05**	13%	**4.3E-06**	1.1E-09	**3.4E-05**	**3.4E-05**	13%
Dieldrin	6.5E-07	1.3E-07	9.9E-11	7.8E-07	0.7%	2.2E-07	5.8E-11	**1.7E-06**	**1.7E-06**	0.7%
Subtotal Pest/PCBs	**1.5E-05**	**2.9E-06**	2.2E-09	**1.7E-05**	15%	**4.9E-06**	1.3E-09	**3.9E-05**	**3.9E-05**	15%
Semivolatile Organic Compounds										
Benzo(a)pyrene	**3.5E-06**	**2.1E-06**	3.2E-10	**5.6E-06**	5%	**3.5E-06**	1.9E-10	**1.2E-05**	**1.2E-05**	4%
Dibenz(a,h)anthracene	9.2E-07	5.5E-07	1.4E-10	**1.5E-06**	1%	9.3E-07	8.1E-11	**3.1E-06**	**3.1E-06**	1%
Subtotal SVOCs/VOCs	**5.5E-06**	**3.3E-06**	1.6E-07	**8.9E-06**	8%	**5.6E-06**	9.1E-08	**1.8E-05**	**1.8E-05**	7%
Total:	**1.0E-04**	**1.6E-05**	6.8E-07	**1.2E-04**		**2.7E-05**	4.0E-07	**2.6E-04**	**2.6E-04**	

Total Estimated Cancer Risk Across All Exposure Routes:	**1E-04**	**3E-04**

Sum of Adult and Child Excess Lifetime Cancer Risk (30 year exposure):	**2.2E-04**	**4.3E-05**	**1.1E-06**	**3.81E-04**

Total Estimated Adult plus Child Cancer Risk Across All Exposure Routes:	**4E-04**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total cancer risk for all chemicals evaluated.

Table 1-76
Noncancer Risk Results - Detailed Summary of Risk Drivers - Future Adult/Child Resident - Deep Soil - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Noncarcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Aluminum	1.1E-02	4.5E-04	1.2E-03	1.3E-02	2%	**1.1E-01**	3.1E-03	2.9E-03	**1.1E-01**	1%
Antimony	1.2E-02	4.8E-04		1.2E-02	2%	**1.1E-01**	3.2E-03		**1.1E-01**	1%
Arsenic	8.3E-02	9.9E-03	4.4E-04	9.3E-02	14%	**7.7E-01**	6.7E-02	1.0E-03	**8.4E-01**	11%
Barium	1.3E-02	5.1E-04	9.5E-04	1.4E-02	2%	**1.2E-01**	3.5E-03	2.2E-03	**1.2E-01**	2%
Iron	9.8E-02	3.9E-03		**1.0E-01**	16%	**9.1E-01**	2.6E-02		**9.4E-01**	12%
Manganese	1.8E-02	7.4E-04	4.8E-03	2.4E-02	4%	**1.7E-01**	5.0E-03	1.1E-02	**1.9E-01**	2%
Thallium	5.4E-02	2.2E-03		5.6E-02	9%	**5.0E-01**	1.5E-02		**5.2E-01**	7%
Vanadium	4.0E-02	1.6E-03		4.1E-02	6%	**3.7E-01**	1.1E-02		**3.8E-01**	5%
Subtotal Metals	**3.4E-01**	2.0E-02	8.1E-03	**3.7E-01**	57%	**5.1E+00**	**1.4E-01**	1.9E-02	**5.3E+00**	68%
Pesticides/PCBs										
4,4'-DDT	**2.2E-01**	4.4E-02	3.4E-05	**2.6E-01**	41%	**2.1E+00**	**3.0E-01**	7.8E-05	**2.4E+00**	30%
Subtotal Pest/PCBs	**2.3E-01**	4.6E-02	3.5E-05	**2.7E-01**	42%	**2.2E+00**	**3.2E-01**	8.1E-05	**2.5E+00**	32%
Total:	**0.6**	0.07	0.015	**0.7**		**7.3**	**0.5**	0.04	**7.8**	

Total Estimated Hazard Index Across All Exposure Routes: **0.7** **8**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total hazard quotient for all chemicals evaluated.

Table 1-77
Risk Calculation Worksheet for Deep Soil - Carcinogenic Effects - Occupational Exposure Scenario - Future Industrial Worker - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Occupational
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Industrial Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	25	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	25	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.03	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Metals											
Aluminum	8.24E+03	2.88E-03	NA		3.28E-04	NA		4.38E-07	NA		
Antimony	3.48E+00	1.22E-06	NA		1.39E-07	NA		1.85E-10	NA		
Arsenic	1.81E+01	6.33E-06	9.50E+00	6.01E-05	2.16E-06	9.50E+00	2.06E-05	9.61E-10	1.51E+01	1.45E-08	**8.07E-05**
Barium	6.52E+02	2.28E-04	NA		2.60E-05	NA		3.46E-08	NA		
Beryllium	2.81E-01	9.82E-08	NA		1.12E-08	NA		1.49E-11	8.40E+00	1.25E-10	1.25E-10
Cadmium	1.71E+00	5.98E-07	3.80E-01	2.27E-07	6.81E-09	3.80E-01	2.59E-09	9.08E-11	1.47E+01	1.33E-09	2.31E-07
Chromium	1.66E+02	5.80E-05	NA		6.61E-06	NA		8.82E-09	4.20E+01	3.70E-07	3.70E-07
Cobalt	6.47E+00	2.26E-06	NA		2.58E-07	NA		3.44E-10	9.80E+00	3.37E-09	3.37E-09
Copper	1.14E+02	3.98E-05	NA		4.54E-06	NA		6.05E-09	NA		
Iron	2.14E+04	7.48E-03	NA		8.53E-04	NA		1.14E-06	NA		
Lead	2.75E+03	9.61E-04	NA		1.10E-04	NA		1.46E-07	NA		
Manganese	3.24E+02	1.13E-04	NA		1.29E-05	NA		1.72E-08	NA		
Nickel	2.45E+01	8.56E-06	NA		9.76E-07	NA		1.30E-09	9.10E-01	1.18E-09	1.18E-09
Selenium	3.50E+00	1.22E-06	NA		1.39E-07	NA		1.86E-10	NA		
Silver	4.95E-01	1.73E-07	NA		1.97E-08	NA		2.63E-11	NA		
Thallium	2.60E+00	9.09E-07	NA		1.04E-07	NA		1.38E-10	NA		
Vanadium	2.89E+01	1.01E-05	NA		1.15E-06	NA		1.53E-09	NA		
Zinc	3.21E+02	1.12E-04	NA		1.28E-05	NA		1.70E-08	NA		

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Oral: Cancer Risk [-]	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Dermal: Cancer Risk [-]	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Inhalation: Cancer Risk [-]	Total Cancer Risk [-]
Pesticides/PCBs											
4,4'-DDD	3.79E+00	1.32E-06	2.40E-01	3.18E-07	7.55E-07	2.40E-01	1.81E-07	2.01E-10	2.42E-01	4.86E-11	4.99E-07
4,4'-DDE	2.10E+00	7.34E-07	3.40E-01	2.50E-07	4.18E-07	3.40E-01	1.42E-07	1.12E-10	3.40E-01	3.79E-11	3.92E-07
4,4'-DDT	8.05E+01	2.81E-05	3.40E-01	9.56E-06	1.60E-05	3.40E-01	5.45E-06	4.28E-09	3.40E-01	1.45E-09	**1.50E-05**
alpha-BHC	6.00E-03	2.10E-09	6.30E+00	1.32E-08	1.20E-09	6.30E+00	7.53E-09	3.19E-13	6.30E+00	2.01E-12	2.07E-08
alpha-Chlordane	8.10E-02	2.83E-08	1.20E+00	3.40E-08	1.61E-08	1.20E+00	1.94E-08	4.30E-12	1.19E+00	5.12E-12	5.33E-08
beta-BHC	2.40E-02	8.39E-09	1.80E+00	1.51E-08	4.78E-09	1.80E+00	8.60E-09	1.27E-12	1.80E+00	2.29E-12	2.37E-08
Dieldrin	8.60E-02	3.01E-08	1.60E+01	4.81E-07	1.71E-08	1.60E+01	2.74E-07	4.57E-12	1.61E+01	7.35E-11	7.55E-07
Endosulfan I	7.40E-04	2.59E-10	NA		1.47E-10	NA		3.93E-14	NA		
Endosulfan sulfate	4.40E-03	1.54E-09	NA		8.76E-10	NA		2.34E-13	NA		
Endrin	1.40E-02	4.89E-09	NA		2.79E-09	NA		7.44E-13	NA		
Endrin aldehyde	4.90E-03	1.71E-09	NA		9.76E-10	NA		2.60E-13	NA		
Endrin ketone	6.90E-03	2.41E-09	NA		1.37E-09	NA		3.66E-13	NA		
gamma-BHC	2.16E-01	7.55E-08	1.30E+00	9.81E-08	4.30E-08	1.30E+00	5.59E-08	1.15E-11	1.30E+00	1.49E-11	1.54E-07
gamma-Chlordane	8.30E-02	2.90E-08	1.20E+00	3.48E-08	1.65E-08	1.20E+00	1.98E-08	4.41E-12	1.19E+00	5.25E-12	5.47E-08
Heptachlor	6.50E-04	2.27E-10	4.50E+00	1.02E-09	1.29E-10	4.50E+00	5.83E-10	3.45E-14	4.55E+00	1.57E-13	1.60E-09
Heptachlor epoxide	2.80E-03	9.78E-10	9.10E+00	8.90E-09	5.58E-10	9.10E+00	5.08E-09	1.49E-13	9.10E+00	1.35E-12	1.40E-08
Methoxychlor	7.00E-03	2.45E-09	NA		1.39E-09	NA		3.72E-13	NA		
Aroclor-1260	3.30E-02	1.15E-08	2.00E+00	2.31E-08	1.97E-08	2.00E+00	3.94E-08	1.75E-12	2.00E+00	3.51E-12	6.25E-08
SVOCs/VOCs											
1,2-Dichlorobenzene	1.05E+00	3.67E-07	NA		4.18E-07	NA		4.59E-06	NA		
1,3-Dichlorobenzene	2.00E-03	6.99E-10	NA		7.97E-10	NA		8.74E-09	NA		
1,4-Dichlorobenzene	7.42E-02	2.59E-08	2.40E-02	6.22E-10	2.96E-08	2.40E-02	7.09E-10	3.68E-07	3.85E-02	1.42E-08	1.55E-08
2-Methylnaphthalene	1.36E+00	4.75E-07	NA		8.13E-07	NA		1.55E-06	NA		
Acetophenone	2.36E-01	8.25E-08	NA		9.40E-08	NA		1.25E-11	NA		
Anthracene	8.10E-02	2.83E-08	NA		4.84E-08	NA		6.56E-09	NA		
Benzo(a)anthracene	4.95E-01	1.73E-07	1.20E+00	2.08E-07	2.96E-07	1.20E+00	3.55E-07	2.63E-11	7.30E-01	1.92E-11	5.63E-07
Benzo(a)pyrene	6.17E-01	2.16E-07	1.20E+01	2.59E-06	3.69E-07	1.20E+01	4.42E-06	3.28E-11	7.30E+00	2.39E-10	**7.01E-06**
Benzo(b)fluoranthene	5.01E-01	1.75E-07	1.20E+00	2.10E-07	2.99E-07	1.20E+00	3.59E-07	2.66E-11	7.30E-01	1.94E-11	5.69E-07
Benzo(g,h,i)perylene	5.81E-01	2.03E-07	NA		3.47E-07	NA		3.09E-11	NA		
Benzo(k)fluoranthene	4.95E-01	1.73E-07	1.20E+00	2.08E-07	2.96E-07	1.20E+00	3.55E-07	2.63E-11	3.85E-01	1.01E-11	5.63E-07
Benzyl butyl phthalate	2.70E-01	9.44E-08	NA		1.08E-07	NA		1.43E-11	NA		
bis(2-Ethylhexyl)phthalate	9.04E-01	3.16E-07	1.40E-02	4.42E-09	3.60E-07	1.40E-02	5.04E-09	4.80E-11	1.40E-02	6.72E-13	9.47E-09
Caprolactam	2.30E-01	8.04E-08	NA		9.16E-08	NA		1.22E-11	NA		
Chrysene	5.97E-01	2.09E-07	1.20E-01	2.50E-08	3.57E-07	1.20E-01	4.28E-08	3.17E-11	3.85E-02	1.22E-12	6.78E-08
Dibenz(a,h)anthracene	2.67E-01	9.33E-08	7.30E+00	6.81E-07	1.60E-07	7.30E+00	1.16E-06	1.42E-11	7.30E+00	1.04E-10	**1.85E-06**
Fluoranthene	7.35E-01	2.57E-07	NA		4.39E-07	NA		3.90E-11	NA		
Indeno(1,2,3-c,d)pyrene	6.00E-01	2.10E-07	7.30E-01	1.53E-07	3.59E-07	7.30E-01	2.62E-07	3.19E-11	7.30E-01	2.33E-11	4.15E-07
Naphthalene	2.49E-01	8.70E-08	1.20E-01	1.04E-08	1.49E-07	1.20E-01	1.79E-08	2.83E-07	1.20E-01	3.40E-08	6.22E-08
Phenanthrene	3.08E-01	1.08E-07	NA		1.84E-07	NA		1.64E-11	NA		
Pyrene	1.02E+00	3.56E-07	NA		6.10E-07	NA		5.42E-11	NA		
1,1-Dichloroethane	6.83E-03	2.39E-09	5.70E-03	1.36E-11	2.72E-09	5.70E-03	1.55E-11	1.97E-07	5.60E-03	1.10E-09	1.13E-09
Acetone	6.05E-02	2.11E-08	NA		2.41E-08	NA		3.91E-07	NA		
Chlorobenzene	2.24E+00	7.83E-07	NA		8.92E-07	NA		2.30E-05	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
cis-1,2-Dichloroethene	1.80E-02	6.29E-09	NA		7.17E-09	NA		4.27E-07	NA		
Ethylbenzene	1.01E-02	3.53E-09	NA		4.02E-09	NA		1.20E-07	NA		
Isopropylbenzene (cumene)	1.05E-01	3.67E-08	NA		4.18E-08	NA		2.40E-06	NA		
Methyl ethyl ketone	1.79E-02	6.26E-09	NA		7.13E-09	NA		7.56E-08	NA		
Methyl isobutyl ketone	6.50E-03	2.27E-09	NA		2.59E-09	NA		2.12E-08	NA		
Methylcyclohexane	1.07E-01	3.74E-08	NA		4.26E-08	NA		4.33E-06	NA		
Methylene chloride	6.31E-03	2.21E-09	1.40E-02	3.09E-11	2.51E-09	1.40E-02	3.52E-11	2.07E-07	3.50E-03	7.26E-10	7.92E-10
Tetrachloroethene	6.38E-03	2.23E-09	5.40E-01	1.20E-09	2.54E-09	5.40E-01	1.37E-09	2.05E-07	2.07E-02	4.23E-09	6.81E-09
Toluene	4.40E-02	1.54E-08	NA		1.75E-08	NA		9.07E-07	NA		
Trichloroethene	4.00E-03	1.40E-09	4.00E-01	5.59E-10	1.59E-09	4.00E-01	6.37E-10	1.01E-07	4.00E-01	4.02E-08	4.14E-08
Vinyl chloride	1.00E-03	3.49E-10	1.50E+00	5.24E-10	3.98E-10	1.50E+00	5.98E-10	7.85E-08	2.73E-01	2.14E-08	2.26E-08
Xylenes, total	9.09E-02	3.18E-08	NA		3.62E-08	NA		1.22E-06	NA		
			Total Risk:	7.52E-05		**Total Risk:**	3.37E-05		**Total Risk:**	5.09E-07	**1.10E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes :

1E-04

Table 1-78
Risk Calculation Worksheet for Deep Soil - Noncarcinogenic Effects - Occupational Exposure Scenario - Future Industrial Worker - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information	Exposure Scenario:	Occupational
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Industrial Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	25	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	25	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.03	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Metals											
Aluminum	8.240E+03	8.06E-03	1.00E+00	8.06E-03	9.19E-04	1.00E+00	9.19E-04	1.23E-06	1.40E-03	8.75E-04	9.86E-03
Antimony	3.480E+00	3.41E-06	4.00E-04	8.51E-03	3.88E-07	4.00E-04	9.70E-04	5.17E-10	NA		9.48E-03
Arsenic	1.810E+01	1.77E-05	3.00E-04	5.90E-02	6.06E-06	3.00E-04	2.02E-02	2.69E-09	8.57E-06	3.14E-04	7.95E-02
Barium	6.520E+02	6.38E-04	7.00E-02	9.11E-03	7.27E-05	7.00E-02	1.04E-03	9.70E-08	1.43E-04	6.79E-04	1.08E-02
Beryllium	2.810E-01	2.75E-07	2.00E-03	1.37E-04	3.13E-08	2.00E-03	1.57E-05	4.18E-11	5.71E-06	7.32E-06	1.60E-04
Cadmium	1.710E+00	1.67E-06	5.00E-04	3.35E-03	1.91E-08	5.00E-04	3.81E-05	2.54E-10	5.71E-06	4.45E-05	3.43E-03
Chromium	1.660E+02	1.62E-04	NA		1.85E-05	NA		2.47E-08	NA		
Cobalt	6.470E+00	6.33E-06	2.00E-02	3.17E-04	7.22E-07	2.00E-02	3.61E-05	9.62E-10	5.70E-06	1.69E-04	5.21E-04
Copper	1.140E+02	1.12E-04	4.00E-02	2.79E-03	1.27E-05	4.00E-02	3.18E-04	1.70E-08	NA		3.11E-03
Iron	2.140E+04	2.09E-02	3.00E-01	6.98E-02	2.39E-03	3.00E-01	7.96E-03	3.18E-06	NA		7.78E-02
Lead	2.750E+03	2.69E-03	NA		3.07E-04	NA		4.09E-07	NA		
Manganese	3.240E+02	3.17E-04	2.40E-02	1.32E-02	3.61E-05	2.40E-02	1.51E-03	4.82E-08	1.40E-05	3.44E-03	1.82E-02
Nickel	2.450E+01	2.40E-05	2.00E-02	1.20E-03	2.73E-06	2.00E-02	1.37E-04	3.64E-09	1.43E-05	2.55E-04	1.59E-03
Selenium	3.500E+00	3.42E-06	5.00E-03	6.85E-04	3.90E-07	5.00E-03	7.81E-05	5.20E-10	5.71E-03	9.11E-08	7.63E-04
Silver	4.950E-01	4.84E-07	5.00E-03	9.69E-05	5.52E-08	5.00E-03	1.10E-05	7.36E-11	NA		1.08E-04
Thallium	2.600E+00	2.54E-06	6.60E-05	3.85E-02	2.90E-07	6.60E-05	4.39E-03	3.87E-10	NA		4.29E-02
Vanadium	2.890E+01	2.83E-05	1.00E-03	2.83E-02	3.22E-06	1.00E-03	3.22E-03	4.30E-09	NA		3.15E-02
Zinc	3.210E+02	3.14E-04	3.00E-01	1.05E-03	3.58E-05	3.00E-01	1.19E-04	4.77E-08	NA		1.17E-03
Pesticides/PCBs											
4,4'-DDD	3.790E+00	3.71E-06	NA		2.11E-06	NA		5.64E-10	NA		
4,4'-DDE	2.100E+00	2.05E-06	NA		1.17E-06	NA		3.12E-10	NA		
4,4'-DDT	8.050E+01	7.88E-05	5.00E-04	1.58E-01	4.49E-05	5.00E-04	8.98E-02	1.20E-08	5.00E-04	2.39E-05	**2.47E-01**

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
alpha-BHC	6.000E-03	5.87E-09	5.00E-04	1.17E-05	3.35E-09	5.00E-04	6.69E-06	8.92E-13	5.00E-04	1.78E-09	1.84E-05
alpha-Chlordane	8.100E-02	7.93E-08	5.00E-04	1.59E-04	4.52E-08	5.00E-04	9.04E-05	1.20E-11	2.00E-04	6.02E-08	2.49E-04
beta-BHC	2.400E-02	2.35E-08	NA		1.34E-08	NA		3.57E-12	NA		
Dieldrin	8.600E-02	8.41E-08	5.00E-05	1.68E-03	4.80E-08	5.00E-05	9.59E-04	1.28E-11	5.00E-05	2.56E-07	2.64E-03
Endosulfan I	7.400E-04	7.24E-10	6.00E-03	1.21E-07	4.13E-10	6.00E-03	6.88E-08	1.10E-13	6.00E-03	1.83E-11	1.89E-07
Endosulfan sulfate	4.400E-03	4.31E-09	6.00E-03	7.18E-07	2.45E-09	6.00E-03	4.09E-07	6.54E-13	6.00E-03	1.09E-10	1.13E-06
Endrin	1.400E-02	1.37E-08	3.00E-04	4.57E-05	7.81E-09	3.00E-04	2.60E-05	2.08E-12	3.00E-04	6.94E-09	7.17E-05
Endrin aldehyde	4.900E-03	4.79E-09	3.00E-04	1.60E-05	2.73E-09	3.00E-04	9.11E-06	7.29E-13	3.00E-04	2.43E-09	2.51E-05
Endrin ketone	6.900E-03	6.75E-09	3.00E-04	2.25E-05	3.85E-09	3.00E-04	1.28E-05	1.03E-12	3.00E-04	3.42E-09	3.53E-05
gamma-BHC	2.160E-01	2.11E-07	3.00E-04	7.05E-04	1.20E-07	3.00E-04	4.02E-04	3.21E-11	3.00E-04	1.07E-07	1.11E-03
gamma-Chlordane	8.300E-02	8.12E-08	5.00E-04	1.62E-04	4.63E-08	5.00E-04	9.26E-05	1.23E-11	2.00E-04	6.17E-08	2.55E-04
Heptachlor	6.500E-04	6.36E-10	5.00E-04	1.27E-06	3.63E-10	5.00E-04	7.25E-07	9.67E-14	5.00E-04	1.93E-10	2.00E-06
Heptachlor epoxide	2.800E-03	2.74E-09	1.30E-05	2.11E-04	1.56E-09	1.30E-05	1.20E-04	4.16E-13	1.30E-05	3.20E-08	3.31E-04
Methoxychlor	7.000E-03	6.85E-09	5.00E-03	1.37E-06	3.90E-09	5.00E-03	7.81E-07	1.04E-12	5.00E-03	2.08E-10	2.15E-06
Aroclor-1260	3.300E-02	3.23E-08	2.00E-05	1.61E-03	5.52E-08	2.00E-05	2.76E-03	4.91E-12	2.00E-05	2.45E-07	4.38E-03
SVOCs/VOCs											
1,2-Dichlorobenzene	1.050E+00	1.03E-06	9.00E-02	1.14E-05	1.17E-06	9.00E-02	1.30E-05	1.28E-05	5.71E-02	2.25E-04	2.49E-04
1,3-Dichlorobenzene	2.000E-03	1.96E-09	3.00E-02	6.52E-08	2.23E-09	3.00E-02	7.44E-08	2.45E-08	3.00E-02	8.15E-07	9.55E-07
1,4-Dichlorobenzene	7.420E-02	7.26E-08	3.00E-02	2.42E-06	8.28E-08	3.00E-02	2.76E-06	1.03E-06	2.30E-01	4.48E-06	9.66E-06
2-Methylnaphthalene	1.360E+00	1.33E-06	4.00E-03	3.33E-04	2.28E-06	4.00E-03	5.69E-04	4.33E-06	NA		9.02E-04
Acetophenone	2.360E-01	2.31E-07	1.00E-01	2.31E-06	2.63E-07	1.00E-01	2.63E-06	3.51E-11	NA		4.94E-06
Anthracene	8.100E-02	7.93E-08	3.00E-01	2.64E-07	1.36E-07	3.00E-01	4.52E-07	1.84E-08	3.00E-01	6.12E-08	7.77E-07
Benzo(a)anthracene	4.950E-01	4.84E-07	NA		8.28E-07	NA		7.36E-11	NA		
Benzo(a)pyrene	6.170E-01	6.04E-07	NA		1.03E-06	NA		9.18E-11	NA		
Benzo(b)fluoranthene	5.010E-01	4.90E-07	NA		8.38E-07	NA		7.45E-11	NA		
Benzo(g,h,i)perylene	5.810E-01	5.68E-07	NA		9.72E-07	NA		8.64E-11	NA		
Benzo(k)fluoranthene	4.950E-01	4.84E-07	NA		8.28E-07	NA		7.36E-11	NA		
Benzyl butyl phthalate	2.700E-01	2.64E-07	2.00E-01	1.32E-06	3.01E-07	2.00E-01	1.51E-06	4.02E-11	2.00E-01	2.01E-10	2.83E-06
bis(2-Ethylhexyl)phthalate	9.040E-01	8.85E-07	2.00E-02	4.42E-05	1.01E-06	2.00E-02	5.04E-05	1.34E-10	2.00E-02	6.72E-09	9.47E-05
Caprolactam	2.300E-01	2.25E-07	5.00E-01	4.50E-07	2.57E-07	5.00E-01	5.13E-07	3.42E-11	5.00E-01	6.84E-11	9.63E-07
Chrysene	5.970E-01	5.84E-07	NA		9.99E-07	NA		8.88E-11	NA		
Dibenz(a,h)anthracene	2.670E-01	2.61E-07	NA		4.47E-07	NA		3.97E-11	NA		
Fluoranthene	7.350E-01	7.19E-07	4.00E-02	1.80E-05	1.23E-06	4.00E-02	3.07E-05	1.09E-10	4.00E-02	2.73E-09	4.87E-05
Indeno(1,2,3-c,d)pyrene	6.000E-01	5.87E-07	NA		1.00E-06	NA		8.92E-11	NA		
Naphthalene	2.490E-01	2.44E-07	2.00E-02	1.22E-05	4.17E-07	2.00E-02	2.08E-05	7.92E-07	8.57E-04	9.24E-04	9.57E-04
Phenanthrene	3.080E-01	3.01E-07	NA		5.15E-07	NA		4.58E-11	NA		
Pyrene	1.020E+00	9.98E-07	3.00E-02	3.33E-05	1.71E-06	3.00E-02	5.69E-05	1.52E-10	3.00E-02	5.06E-09	9.02E-05
1,1-Dichloroethane	6.830E-03	6.68E-09	1.00E-01	6.68E-08	7.62E-09	1.00E-01	7.62E-08	5.52E-07	1.43E-01	3.86E-06	4.01E-06
Acetone	6.050E-02	5.92E-08	9.00E-01	6.58E-08	6.75E-08	9.00E-01	7.50E-08	1.09E-06	9.00E-01	1.22E-06	1.36E-06
Chlorobenzene	2.240E+00	2.19E-06	2.00E-02	1.10E-04	2.50E-06	2.00E-02	1.25E-04	6.45E-05	1.70E-02	3.80E-03	4.03E-03
cis-1,2-Dichloroethene	1.800E-02	1.76E-08	1.00E-02	1.76E-06	2.01E-08	1.00E-02	2.01E-06	1.20E-06	1.00E-02	1.20E-04	1.23E-04
Ethylbenzene	1.010E-02	9.88E-09	1.00E-01	9.88E-08	1.13E-08	1.00E-01	1.13E-07	3.36E-07	2.90E-01	1.16E-06	1.37E-06
Isopropylbenzene (cumene)	1.050E-01	1.03E-07	1.00E-01	1.03E-06	1.17E-07	1.00E-01	1.17E-06	6.72E-06	1.10E-01	6.11E-05	6.33E-05
Methyl ethyl ketone	1.790E-02	1.75E-08	6.00E-01	2.92E-08	2.00E-08	6.00E-01	3.33E-08	2.12E-07	1.40E+00	1.51E-07	2.14E-07
Methyl isobutyl ketone	6.500E-03	6.36E-09	8.00E-02	7.95E-08	7.25E-09	8.00E-02	9.06E-08	5.93E-08	8.60E-01	6.90E-08	2.39E-07
Methylcyclohexane	1.070E-01	1.05E-07	8.60E-01	1.22E-07	1.19E-07	8.60E-01	1.39E-07	1.21E-05	8.60E-01	1.41E-05	1.44E-05
Methylene chloride	6.310E-03	6.17E-09	6.00E-02	1.03E-07	7.04E-09	6.00E-02	1.17E-07	5.81E-07	1.14E-01	5.08E-06	5.30E-06
Tetrachloroethene	6.380E-03	6.24E-09	1.00E-02	6.24E-07	7.12E-09	1.00E-02	7.12E-07	5.74E-07	1.00E-02	5.74E-05	5.87E-05
Toluene	4.400E-02	4.31E-08	2.00E-01	2.15E-07	4.91E-08	2.00E-01	2.45E-07	2.54E-06	8.57E-02	2.96E-05	3.01E-05

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Trichloroethene	4.000E-03	3.91E-09	3.00E-04	1.30E-05	4.46E-09	3.00E-04	1.49E-05	2.82E-07	1.00E-02	2.82E-05	5.61E-05
Vinyl chloride	1.000E-03	9.78E-10	3.00E-03	3.26E-07	1.12E-09	3.00E-03	3.72E-07	2.20E-07	2.86E-02	7.70E-06	8.39E-06
Xylenes, total	9.090E-02	8.89E-08	2.00E-01	4.45E-07	1.01E-07	2.00E-01	5.07E-07	3.42E-06	2.90E-02	1.18E-04	1.19E-04
		Total Risk (Hazard Index):		4.07E-01	**Total Risk (Hazard Index):**		1.36E-01	**Total Risk (Hazard Index):**		1.12E-02	**5.54E-01**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **1**

Table 1-79
Risk Calculation Worksheet for Deep Soil - Carcinogenic Effects - Construction Exposure Scenario - Future Construction Worker - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Construction Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	1	yr
Soil Ingestion Rate	IR	330	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Adherence Factor	AF	0.8	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Metals											
Aluminum	8.24E+03	3.80E-04	NA		5.25E-05	NA		1.75E-08	NA		
Antimony	3.48E+00	1.61E-07	NA		2.22E-08	NA		7.39E-12	NA		
Arsenic	1.81E+01	8.35E-07	9.50E+00	7.93E-06	3.46E-07	9.50E+00	3.29E-06	3.85E-11	1.51E+01	5.79E-10	**1.12E-05**
Barium	6.52E+02	3.01E-05	NA		4.16E-06	NA		1.39E-09	NA		
Beryllium	2.81E-01	1.30E-08	NA		1.79E-09	NA		5.97E-13	8.40E+00	5.01E-12	5.01E-12
Cadmium	1.71E+00	7.89E-08	3.80E-01	3.00E-08	1.09E-09	3.80E-01	4.14E-10	3.63E-12	1.47E+01	5.34E-11	3.04E-08
Chromium	1.66E+02	7.66E-06	NA		1.06E-06	NA		3.53E-10	4.20E+01	1.48E-08	1.48E-08
Cobalt	6.47E+00	2.98E-07	NA		4.12E-08	NA		1.37E-11	9.80E+00	1.35E-10	1.35E-10
Copper	1.14E+02	5.26E-06	NA		7.27E-07	NA		2.42E-10	NA		
Iron	2.14E+04	9.87E-04	NA		1.36E-04	NA		4.55E-08	NA		
Lead	2.75E+03	1.27E-04	NA		1.75E-05	NA		5.84E-09	NA		
Manganese	3.24E+02	1.49E-05	NA		2.07E-06	NA		6.88E-10	NA		
Nickel	2.45E+01	1.13E-06	NA		1.56E-07	NA		5.20E-11	9.10E-01	4.74E-11	4.74E-11
Selenium	3.50E+00	1.61E-07	NA		2.23E-08	NA		7.44E-12	NA		
Silver	4.95E-01	2.28E-08	NA		3.16E-09	NA		1.05E-12	NA		
Thallium	2.60E+00	1.20E-07	NA		1.66E-08	NA		5.52E-12	NA		
Vanadium	2.89E+01	1.33E-06	NA		1.84E-07	NA		6.14E-11	NA		
Zinc	3.21E+02	1.48E-05	NA		2.05E-06	NA		6.82E-10	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Pesticides/PCBs											
4,4'-DDD	3.79E+00	1.75E-07	2.40E-01	4.20E-08	1.21E-07	2.40E-01	2.90E-08	8.05E-12	2.42E-01	1.94E-12	7.09E-08
4,4'-DDE	2.10E+00	9.69E-08	3.40E-01	3.29E-08	6.69E-08	3.40E-01	2.28E-08	4.46E-12	3.40E-01	1.51E-12	5.57E-08
4,4'-DDT	8.05E+01	3.71E-06	3.40E-01	1.26E-06	2.57E-06	3.40E-01	8.72E-07	1.71E-10	3.40E-01	5.81E-11	**2.13E-06**
alpha-BHC	6.00E-03	2.77E-10	6.30E+00	1.74E-09	1.91E-10	6.30E+00	1.20E-09	1.27E-14	6.30E+00	8.03E-14	2.95E-09
alpha-Chlordane	8.10E-02	3.74E-09	1.20E+00	4.48E-09	2.58E-09	1.20E+00	3.10E-09	1.72E-13	1.19E+00	2.05E-13	7.58E-09
beta-BHC	2.40E-02	1.11E-09	1.80E+00	1.99E-09	7.65E-10	1.80E+00	1.38E-09	5.10E-14	1.80E+00	9.18E-14	3.37E-09
Dieldrin	8.60E-02	3.97E-09	1.60E+01	6.35E-08	2.74E-09	1.60E+01	4.39E-08	1.83E-13	1.61E+01	2.94E-12	1.07E-07
Endosulfan I	7.40E-04	3.41E-11	NA		2.36E-11	NA		1.57E-15	NA		
Endosulfan sulfate	4.40E-03	2.03E-10	NA		1.40E-10	NA		9.35E-15	NA		
Endrin	1.40E-02	6.46E-10	NA		4.46E-10	NA		2.97E-14	NA		
Endrin aldehyde	4.90E-03	2.26E-10	NA		1.56E-10	NA		1.04E-14	NA		
Endrin ketone	6.90E-03	3.18E-10	NA		2.20E-10	NA		1.47E-14	NA		
gamma-BHC	2.16E-01	9.96E-09	1.30E+00	1.30E-08	6.88E-09	1.30E+00	8.95E-09	4.59E-13	1.30E+00	5.97E-13	2.19E-08
gamma-Chlordane	8.30E-02	3.83E-09	1.20E+00	4.59E-09	2.65E-09	1.20E+00	3.17E-09	1.76E-13	1.19E+00	2.10E-13	7.77E-09
Heptachlor	6.50E-04	3.00E-11	4.50E+00	1.35E-10	2.07E-11	4.50E+00	9.32E-11	1.38E-15	4.55E+00	6.28E-15	2.28E-10
Heptachlor epoxide	2.80E-03	1.29E-10	9.10E+00	1.18E-09	8.92E-11	9.10E+00	8.12E-10	5.95E-15	9.10E+00	5.41E-14	1.99E-09
Methoxychlor	7.00E-03	3.23E-10	NA		2.23E-10	NA		1.49E-14	NA		
Aroclor-1260	3.30E-02	1.52E-09	2.00E+00	3.04E-09	3.16E-09	2.00E+00	6.31E-09	7.01E-14	2.00E+00	1.40E-13	9.35E-09
SVOCs/VOCs											
1,2-Dichlorobenzene	1.05E+00	4.84E-08	NA		6.69E-08	NA		1.83E-07	NA		
1,3-Dichlorobenzene	2.00E-03	9.23E-11	NA		1.27E-10	NA		3.49E-10	NA		
1,4-Dichlorobenzene	7.42E-02	3.42E-09	2.40E-02	8.21E-11	4.73E-09	2.40E-02	1.14E-10	1.47E-08	3.85E-02	5.67E-10	7.62E-10
2-Methylnaphthalene	1.36E+00	6.27E-08	NA		1.30E-07	NA		6.18E-08	NA		
Acetophenone	2.36E-01	1.09E-08	NA		1.50E-08	NA		5.01E-13	NA		
Anthracene	8.10E-02	3.74E-09	NA		7.74E-09	NA		2.62E-10	NA		
Benzo(a)anthracene	4.95E-01	2.28E-08	1.20E+00	2.74E-08	4.73E-08	1.20E+00	5.68E-08	1.05E-12	7.30E-01	7.68E-13	8.42E-08
Benzo(a)pyrene	6.17E-01	2.85E-08	1.20E+01	3.42E-07	5.90E-08	1.20E+01	7.08E-07	1.31E-12	7.30E+00	9.57E-12	**1.05E-06**
Benzo(b)fluoranthene	5.01E-01	2.31E-08	1.20E+00	2.77E-08	4.79E-08	1.20E+00	5.75E-08	1.06E-12	7.30E-01	7.77E-13	8.52E-08
Benzo(g,h,i)perylene	5.81E-01	2.68E-08	NA		5.55E-08	NA		1.23E-12	NA		
Benzo(k)fluoranthene	4.95E-01	2.28E-08	1.20E+00	2.74E-08	4.73E-08	1.20E+00	5.68E-08	1.05E-12	3.85E-01	4.05E-13	8.42E-08
Benzyl butyl phthalate	2.70E-01	1.25E-08	NA		1.72E-08	NA		5.74E-13	NA		
bis(2-Ethylhexyl)phthalate	9.04E-01	4.17E-08	1.40E-02	5.84E-10	5.76E-08	1.40E-02	8.07E-10	1.92E-12	1.40E-02	2.69E-14	1.39E-09
Caprolactam	2.30E-01	1.06E-08	NA		1.47E-08	NA		4.89E-13	NA		
Chrysene	5.97E-01	2.75E-08	1.20E-01	3.30E-09	5.71E-08	1.20E-01	6.85E-09	1.27E-12	3.85E-02	4.88E-14	1.02E-08
Dibenz(a,h)anthracene	2.67E-01	1.23E-08	7.30E+00	8.99E-08	2.55E-08	7.30E+00	1.86E-07	5.67E-13	7.30E+00	4.14E-12	2.76E-07
Fluoranthene	7.35E-01	3.39E-08	NA		7.03E-08	NA		1.56E-12	NA		
Indeno(1,2,3-c,d)pyrene	6.00E-01	2.77E-08	7.30E-01	2.02E-08	5.74E-08	7.30E-01	4.19E-08	1.27E-12	7.30E-01	9.30E-13	6.21E-08
Naphthalene	2.49E-01	1.15E-08	1.20E-01	1.38E-09	2.38E-08	1.20E-01	2.86E-09	1.13E-08	1.20E-01	1.36E-09	5.59E-09
Phenanthrene	3.08E-01	1.42E-08	NA		2.94E-08	NA		6.54E-13	NA		
Pyrene	1.02E+00	4.71E-08	NA		9.75E-08	NA		2.17E-12	NA		
1,1-Dichloroethane	6.83E-03	3.15E-10	5.70E-03	1.80E-12	4.35E-10	5.70E-03	2.48E-12	7.89E-09	5.60E-03	4.42E-11	4.84E-11
Acetone	6.05E-02	2.79E-09	NA		3.86E-09	NA		1.56E-08	NA		
Chlorobenzene	2.24E+00	1.03E-07	NA		1.43E-07	NA		9.22E-07	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
cis-1,2-Dichloroethene	1.80E-02	8.30E-10	NA		1.15E-09	NA		1.71E-08	NA		
Ethylbenzene	1.01E-02	4.66E-10	NA		6.44E-10	NA		4.80E-09	NA		
Isopropylbenzene (cumene)	1.05E-01	4.84E-09	NA		6.69E-09	NA		9.60E-08	NA		
Methyl ethyl ketone	1.79E-02	8.26E-10	NA		1.14E-09	NA		3.02E-09	NA		
Methyl isobutyl ketone	6.50E-03	3.00E-10	NA		4.14E-10	NA		8.48E-10	NA		
Methylcyclohexane	1.07E-01	4.94E-09	NA		6.82E-09	NA		1.73E-07	NA		
Methylene chloride	6.31E-03	2.91E-10	1.40E-02	4.07E-12	4.02E-10	1.40E-02	5.63E-12	8.30E-09	3.50E-03	2.90E-11	3.87E-11
Tetrachloroethene	6.38E-03	2.94E-10	5.40E-01	1.59E-10	4.07E-10	5.40E-01	2.20E-10	8.19E-09	2.07E-02	1.69E-10	5.48E-10
Toluene	4.40E-02	2.03E-09	NA		2.80E-09	NA		3.63E-08	NA		
Trichloroethene	4.00E-03	1.85E-10	4.00E-01	7.38E-11	2.55E-10	4.00E-01	1.02E-10	4.02E-09	4.00E-01	1.61E-09	1.78E-09
Vinyl chloride	1.00E-03	4.61E-11	1.50E+00	6.92E-11	6.37E-11	1.50E+00	9.56E-11	3.14E-09	2.73E-01	8.58E-10	1.02E-09
Xylenes, total	9.09E-02	4.19E-09	NA		5.79E-09	NA		4.89E-08	NA		
			Total Risk:	9.93E-06		**Total Risk:**	5.40E-06		**Total Risk:**	2.03E-08	**1.54E-05**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **2E-05**

Table 1-80
Risk Calculation Worksheet for Deep Soil - Noncarcinogenic Effects - Construction Exposure Scenario - Future Construction Worker - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Deep Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Construction Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter (units)	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	1	yr
Soil Ingestion Rate	IR	330	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Adherence Factor	AF	0.8	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Aluminum	8.240E+03	2.66E-02	1.00E+00	2.66E-02	3.68E-03	1.00E+00	3.68E-03	1.23E-06	1.40E-03	8.75E-04	3.12E-02
Antimony	3.480E+00	1.12E-05	4.00E-04	2.81E-02	1.55E-06	4.00E-04	3.88E-03	5.17E-10	NA		3.20E-02
Arsenic	1.810E+01	5.84E-05	3.00E-04	1.95E-01	2.42E-05	3.00E-04	8.08E-02	2.69E-09	8.57E-06	3.14E-04	**2.76E-01**
Barium	6.520E+02	2.11E-03	7.00E-02	3.01E-02	2.91E-04	7.00E-02	4.16E-03	9.70E-08	1.43E-04	6.79E-04	3.49E-02
Beryllium	2.810E-01	9.07E-07	2.00E-03	4.54E-04	1.25E-07	2.00E-03	6.27E-05	4.18E-11	5.71E-06	7.32E-06	5.24E-04
Cadmium	1.710E+00	5.52E-06	5.00E-04	1.10E-02	7.63E-08	5.00E-04	1.53E-04	2.54E-10	5.71E-06	4.45E-05	1.12E-02
Chromium	1.660E+02	5.36E-04	NA		7.41E-05	NA		2.47E-08	NA		
Cobalt	6.470E+00	2.09E-05	2.00E-02	1.04E-03	2.89E-06	2.00E-02	1.44E-04	9.62E-10	5.70E-06	1.69E-04	1.36E-03
Copper	1.140E+02	3.68E-04	4.00E-02	9.20E-03	5.09E-05	4.00E-02	1.27E-03	1.70E-08	NA		1.05E-02
Iron	2.140E+04	6.91E-02	3.00E-01	2.30E-01	9.55E-03	3.00E-01	3.18E-02	3.18E-06	NA		**2.62E-01**
Lead	2.750E+03	8.88E-03	NA		1.23E-03	NA		4.09E-07	NA		
Manganese	3.240E+02	1.05E-03	2.40E-02	4.36E-02	1.45E-04	2.40E-02	6.02E-03	4.82E-08	1.40E-05	3.44E-03	5.31E-02
Nickel	2.450E+01	7.91E-05	2.00E-02	3.96E-03	1.09E-05	2.00E-02	5.47E-04	3.64E-09	1.43E-05	2.55E-04	4.76E-03
Selenium	3.500E+00	1.13E-05	5.00E-03	2.26E-03	1.56E-06	5.00E-03	3.12E-04	5.20E-10	5.71E-03	9.11E-08	2.57E-03
Silver	4.950E-01	1.60E-06	5.00E-03	3.20E-04	2.21E-07	5.00E-03	4.42E-05	7.36E-11	NA		3.64E-04
Thallium	2.600E+00	8.40E-06	6.60E-05	1.27E-01	1.16E-06	6.60E-05	1.76E-02	3.87E-10	NA		**1.45E-01**
Vanadium	2.890E+01	9.33E-05	1.00E-03	9.33E-02	1.29E-05	1.00E-03	1.29E-02	4.30E-09	NA		**1.06E-01**
Zinc	3.210E+02	1.04E-03	3.00E-01	3.45E-03	1.43E-04	3.00E-01	4.77E-04	4.77E-08	NA		3.93E-03
Pesticides/PCBs											
4,4'-DDD	3.790E+00	1.22E-05	NA		8.46E-06	NA		5.64E-10	NA		
4,4'-DDE	2.100E+00	6.78E-06	NA		4.68E-06	NA		3.12E-10	NA		
4,4'-DDT	8.050E+01	2.60E-04	5.00E-04	5.20E-01	1.80E-04	5.00E-04	3.59E-01	1.20E-08	5.00E-04	2.39E-05	**8.79E-01**

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
alpha-BHC	6.000E-03	1.94E-08	5.00E-04	3.87E-05	1.34E-08	5.00E-04	2.68E-05	8.92E-13	5.00E-04	1.78E-09	6.55E-05
alpha-Chlordane	8.100E-02	2.62E-07	5.00E-04	5.23E-04	1.81E-07	5.00E-04	3.61E-04	1.20E-11	2.00E-04	6.02E-08	8.85E-04
beta-BHC	2.400E-02	7.75E-08	NA		5.35E-08	NA		3.57E-12	NA		
Dieldrin	8.600E-02	2.78E-07	5.00E-05	5.55E-03	1.92E-07	5.00E-05	3.84E-03	1.28E-11	5.00E-05	2.56E-07	9.39E-03
Endosulfan I	7.400E-04	2.39E-09	6.00E-03	3.98E-07	1.65E-09	6.00E-03	2.75E-07	1.10E-13	6.00E-03	1.83E-11	6.73E-07
Endosulfan sulfate	4.400E-03	1.42E-08	6.00E-03	2.37E-06	9.82E-09	6.00E-03	1.64E-06	6.54E-13	6.00E-03	1.09E-10	4.00E-06
Endrin	1.400E-02	4.52E-08	3.00E-04	1.51E-04	3.12E-08	3.00E-04	1.04E-04	2.08E-12	3.00E-04	6.94E-09	2.55E-04
Endrin aldehyde	4.900E-03	1.58E-08	3.00E-04	5.27E-05	1.09E-08	3.00E-04	3.64E-05	7.29E-13	3.00E-04	2.43E-09	8.92E-05
Endrin ketone	6.900E-03	2.23E-08	3.00E-04	7.43E-05	1.54E-08	3.00E-04	5.13E-05	1.03E-12	3.00E-04	3.42E-09	1.26E-04
gamma-BHC	2.160E-01	6.97E-07	3.00E-04	2.32E-03	4.82E-07	3.00E-04	1.61E-03	3.21E-11	3.00E-04	1.07E-07	3.93E-03
gamma-Chlordane	8.300E-02	2.68E-07	5.00E-04	5.36E-04	1.85E-07	5.00E-04	3.70E-04	1.23E-11	2.00E-04	6.17E-08	9.06E-04
Heptachlor	6.500E-04	2.10E-09	5.00E-04	4.20E-06	1.45E-09	5.00E-04	2.90E-06	9.67E-14	5.00E-04	1.93E-10	7.10E-06
Heptachlor epoxide	2.800E-03	9.04E-09	1.30E-05	6.95E-04	6.25E-09	1.30E-05	4.81E-04	4.16E-13	1.30E-05	3.20E-08	1.18E-03
Methoxychlor	7.000E-03	2.26E-08	5.00E-03	4.52E-06	1.56E-08	5.00E-03	3.12E-06	1.04E-12	5.00E-03	2.08E-10	7.64E-06
Aroclor-1260	3.300E-02	1.07E-07	2.00E-05	5.33E-03	2.21E-07	2.00E-05	1.10E-02	4.91E-12	2.00E-05	2.45E-07	1.64E-02
SVOCs/VOCs											
1,2-Dichlorobenzene	1.050E+00	3.39E-06	9.00E-02	3.77E-05	4.68E-06	9.00E-02	5.21E-05	1.28E-05	5.71E-02	2.25E-04	3.14E-04
1,3-Dichlorobenzene	2.000E-03	6.46E-09	3.00E-02	2.15E-07	8.92E-09	3.00E-02	2.97E-07	2.45E-08	3.00E-02	8.15E-07	1.33E-06
1,4-Dichlorobenzene	7.420E-02	2.40E-07	3.00E-02	7.99E-06	3.31E-07	3.00E-02	1.10E-05	1.03E-06	2.30E-01	4.48E-06	2.35E-05
2-Methylnaphthalene	1.360E+00	4.39E-06	4.00E-03	1.10E-03	9.10E-06	4.00E-03	2.28E-03	4.33E-06	NA		3.37E-03
Acetophenone	2.360E-01	7.62E-07	1.00E-01	7.62E-06	1.05E-06	1.00E-01	1.05E-05	3.51E-11	NA		1.82E-05
Anthracene	8.100E-02	2.62E-07	3.00E-01	8.72E-07	5.42E-07	3.00E-01	1.81E-06	1.84E-08	3.00E-01	6.12E-08	2.74E-06
Benzo(a)anthracene	4.950E-01	1.60E-06	NA		3.31E-06	NA		7.36E-11	NA		
Benzo(a)pyrene	6.170E-01	1.99E-06	NA		4.13E-06	NA		9.18E-11	NA		
Benzo(b)fluoranthene	5.010E-01	1.62E-06	NA		3.35E-06	NA		7.45E-11	NA		
Benzo(g,h,i)perylene	5.810E-01	1.88E-06	NA		3.89E-06	NA		8.64E-11	NA		
Benzo(k)fluoranthene	4.950E-01	1.60E-06	NA		3.31E-06	NA		7.36E-11	NA		
Benzyl butyl phthalate	2.700E-01	8.72E-07	2.00E-01	4.36E-06	1.20E-06	2.00E-01	6.02E-06	4.02E-11	2.00E-01	2.01E-10	1.04E-05
bis(2-Ethylhexyl)phthalate	9.040E-01	2.92E-06	2.00E-02	1.46E-04	4.03E-06	2.00E-02	2.02E-04	1.34E-10	2.00E-02	6.72E-09	3.48E-04
Caprolactam	2.300E-01	7.43E-07	5.00E-01	1.49E-06	1.03E-06	5.00E-01	2.05E-06	3.42E-11	5.00E-01	6.84E-11	3.54E-06
Chrysene	5.970E-01	1.93E-06	NA		4.00E-06	NA		8.88E-11	NA		
Dibenz(a,h)anthracene	2.670E-01	8.62E-07	NA		1.79E-06	NA		3.97E-11	NA		
Fluoranthene	7.350E-01	2.37E-06	4.00E-02	5.93E-05	4.92E-06	4.00E-02	1.23E-04	1.09E-10	4.00E-02	2.73E-09	1.82E-04
Indeno(1,2,3-c,d)pyrene	6.000E-01	1.94E-06	NA		4.02E-06	NA		8.92E-11	NA		
Naphthalene	2.490E-01	8.04E-07	2.00E-02	4.02E-05	1.67E-06	2.00E-02	8.33E-05	7.92E-07	8.57E-04	9.24E-04	1.05E-03
Phenanthrene	3.080E-01	9.95E-07	NA		2.06E-06	NA		4.58E-11	NA		
Pyrene	1.020E+00	3.29E-06	3.00E-02	1.10E-04	6.83E-06	3.00E-02	2.28E-04	1.52E-10	3.00E-02	5.06E-09	3.37E-04
1,1-Dichloroethane	6.830E-03	2.21E-08	1.00E-01	2.21E-07	3.05E-08	1.00E-01	3.05E-07	5.52E-07	1.43E-01	3.86E-06	4.39E-06
Acetone	6.050E-02	1.95E-07	9.00E-01	2.17E-07	2.70E-07	9.00E-01	3.00E-07	1.09E-06	9.00E-01	1.22E-06	1.73E-06
Chlorobenzene	2.240E+00	7.23E-06	2.00E-02	3.62E-04	9.99E-06	2.00E-02	5.00E-04	6.45E-05	1.70E-02	3.80E-03	4.66E-03
cis-1,2-Dichloroethene	1.800E-02	5.81E-08	1.00E-02	5.81E-06	8.03E-08	1.00E-02	8.03E-06	1.20E-06	1.00E-02	1.20E-04	1.33E-04
Ethylbenzene	1.010E-02	3.26E-08	1.00E-01	3.26E-07	4.51E-08	1.00E-01	4.51E-07	3.36E-07	2.90E-01	1.16E-06	1.93E-06
Isopropylbenzene (cumene)	1.050E-01	3.39E-07	1.00E-01	3.39E-06	4.68E-07	1.00E-01	4.68E-06	6.72E-06	1.10E-01	6.11E-05	6.91E-05
Methyl ethyl ketone	1.790E-02	5.78E-08	6.00E-01	9.63E-08	7.99E-08	6.00E-01	1.33E-07	2.12E-07	1.40E+00	1.51E-07	3.81E-07
Methyl isobutyl ketone	6.500E-03	2.10E-08	8.00E-02	2.62E-07	2.90E-08	8.00E-02	3.63E-07	5.93E-08	8.60E-01	6.90E-08	6.94E-07
Methylcyclohexane	1.070E-01	3.45E-07	8.60E-01	4.02E-07	4.77E-07	8.60E-01	5.55E-07	1.21E-05	8.60E-01	1.41E-05	1.51E-05
Methylene chloride	6.310E-03	2.04E-08	6.00E-02	3.40E-07	2.82E-08	6.00E-02	4.69E-07	5.81E-07	1.14E-01	5.08E-06	5.89E-06
Tetrachloroethene	6.380E-03	2.06E-08	1.00E-02	2.06E-06	2.85E-08	1.00E-02	2.85E-06	5.74E-07	1.00E-02	5.74E-05	6.23E-05
Toluene	4.400E-02	1.42E-07	2.00E-01	7.10E-07	1.96E-07	2.00E-01	9.82E-07	2.54E-06	8.57E-02	2.96E-05	3.13E-05

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Trichloroethene	4.000E-03	1.29E-08	3.00E-04	4.31E-05	1.78E-08	3.00E-04	5.95E-05	2.82E-07	1.00E-02	2.82E-05	1.31E-04
Vinyl chloride	1.000E-03	3.23E-09	3.00E-03	1.08E-06	4.46E-09	3.00E-03	1.49E-06	2.20E-07	2.86E-02	7.70E-06	1.03E-05
Xylenes, total	9.090E-02	2.94E-07	2.00E-01	1.47E-06	4.06E-07	2.00E-01	2.03E-06	3.42E-06	2.90E-02	1.18E-04	1.21E-04
		Total Risk (Hazard Index):		1.34E+00	**Total Risk (Hazard Index):**		5.44E-01	**Total Risk (Hazard Index):**		1.12E-02	**1.90E+00**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **2**

Table 1-81
Cancer Risk Results - Detailed Summary of Risk Drivers - Future Industrial/Construction Worker - Deep Soil - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Future Industrial Worker					Future Construction Worker				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	**6.0E-05**	**2.1E-05**	1.4E-08	**8.1E-05**	74%	**7.9E-06**	**3.3E-06**	5.8E-10	**1.1E-05**	73%
Subtotal Metals	**6.0E-05**	**2.1E-05**	3.9E-07	**8.1E-05**	74%	**8.0E-06**	**3.3E-06**	1.6E-08	**1.1E-05**	73%
Pesticides/PCBs										
4,4'-DDT	**9.6E-06**	**5.5E-06**	1.5E-09	**1.5E-05**	14%	**1.3E-06**	8.7E-07	5.8E-11	**2.1E-06**	14%
Subtotal Pesticides/PCBs	**1.1E-05**	**6.2E-06**	1.6E-09	**1.7E-05**	16%	**1.4E-06**	9.9E-07	6.6E-11	**2.4E-06**	16%
SVOCs/VOCs										
Benzo(a)pyrene	**2.6E-06**	**4.4E-06**	2.4E-10	**7.0E-06**	6%	3.4E-07	7.1E-07	9.6E-12	**1.0E-06**	7%
Dibenz(a,h)anthracene	6.8E-07	**1.2E-06**	1.0E-10	**1.8E-06**	2%	9.0E-08	1.9E-07	4.1E-12	2.8E-07	2%
Subtotal SVOCs/VOCs	**4.1E-06**	**7.0E-06**	1.2E-07	**1.1E-05**	10%	5.4E-07	**1.1E-06**	4.7E-09	**1.7E-06**	11%
Total:	**7.5E-05**	**3.4E-05**	5.1E-07	**1.10E-04**		**9.9E-06**	**5.4E-06**	2.0E-08	**1.54E-05**	

Total Estimated Cancer Risk Across All Exposure Routes: **1E-04** **2E-05**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total cancer risk for all chemicals evaluated.

Table 1-82
Noncancer Risk Results - Detailed Summary of Risk Drivers - Future Industrial/Construction Worker - Deep Soil - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Noncarcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Future Industrial Worker					Future Construction Worker				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	5.9E-02	2.0E-02	3.1E-04	8.0E-02	14%	**1.9E-01**	8.1E-02	3.1E-04	**2.8E-01**	15%
Iron	7.0E-02	8.0E-03		7.8E-02	14%	**2.3E-01**	3.2E-02		**2.6E-01**	14%
Thallium	3.9E-02	4.4E-03		4.3E-02	8%	**1.3E-01**	1.8E-02		**1.4E-01**	8%
Vanadium	2.8E-02	3.2E-03		3.2E-02	6%	9.3E-02	1.3E-02		**1.1E-01**	6%
Subtotal Metals	**2.4E-01**	4.1E-02	5.8E-03	**2.9E-01**	53%	**8.1E-01**	**1.6E-01**	5.8E-03	**9.8E-01**	52%
Pesticides/PCBs										
4,4'-DDT	**1.6E-01**	9.0E-02	2.4E-05	**2.5E-01**	45%	**5.2E-01**	**3.6E-01**	2.4E-05	**8.8E-01**	47%
Subtotal Pesticides/PCBs	**1.6E-01**	9.2E-02	2.4E-05	**2.5E-01**	46%	**5.3E-01**	**3.7E-01**	2.4E-05	**9.0E-01**	48%
Total:	**0.4**	**0.1**	0.01	**0.55**		**1.3**	**0.5**	0.01	**1.9**	

Total Estimated Hazard Index Across All Exposure Routes: **1** **2**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total hazard quotient for all chemicals evaluated.

Table 1-83
Exposure Point Concentrations - Shallow Soil - Small Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Units	Exposure Point Concentration (EPC)	EPC Basis
Metals			
Aluminum	mg/kg	8.02E+03	Maximum Result
Arsenic	mg/kg	1.42E+01	Maximum Result
Barium	mg/kg	2.78E+02	Maximum Result
Beryllium	mg/kg	2.90E-01	Maximum Result
Cadmium	mg/kg	2.10E+00	Maximum Result
Cobalt	mg/kg	6.70E+00	Maximum Result
Copper	mg/kg	9.58E+01	Maximum Result
Iron	mg/kg	1.63E+04	Maximum Result
Lead	mg/kg	3.86E+02	Maximum Result
Nickel	mg/kg	2.38E+01	Maximum Result
Silver	mg/kg	6.50E-01	Maximum Result
Vanadium	mg/kg	2.65E+01	Maximum Result
Zinc	mg/kg	7.36E+02	Maximum Result
Pesticides/PCBs			
4,4'-DDD	mg/kg	5.90E+00	Maximum Result
4,4'-DDE	mg/kg	1.80E+01	Maximum Result
4,4'-DDT	mg/kg	4.50E+01	Maximum Result
alpha-Chlordane	mg/kg	8.20E+00	Maximum Result
Dieldrin	mg/kg	1.30E+00	Maximum Result
gamma-Chlordane	mg/kg	5.90E+00	Maximum Result

Table 1-84
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Residential Exposure Scenario - Future Adult Resident Receptor - Small Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	24	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.03	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.07	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Metals											
Aluminum	8.02E+03	3.77E-03	NA		1.50E-04	NA		5.72E-07	NA		
Arsenic	1.42E+01	6.67E-06	9.50E+00	6.34E-05	7.98E-07	9.50E+00	7.58E-06	1.01E-09	1.51E+01	1.53E-08	**7.10E-05**
Barium	2.78E+02	1.31E-04	NA		5.21E-06	NA		1.98E-08	NA		
Beryllium	2.90E-01	1.36E-07	NA		5.43E-09	NA		2.07E-11	8.40E+00	1.74E-10	1.74E-10
Cadmium	2.10E+00	9.86E-07	3.80E-01	3.75E-07	3.94E-09	3.80E-01	1.50E-09	1.50E-10	1.47E+01	2.20E-09	3.78E-07
Cobalt	6.70E+00	3.15E-06	NA		1.26E-07	NA		4.78E-10	9.80E+00	4.69E-09	4.69E-09
Copper	9.58E+01	4.50E-05	NA		1.80E-06	NA		6.84E-09	NA		
Iron	1.63E+04	7.66E-03	NA		3.05E-04	NA		1.16E-06	NA		
Lead	3.86E+02	1.81E-04	NA		7.23E-06	NA		2.76E-08	NA		
Nickel	2.38E+01	1.12E-05	NA		4.46E-07	NA		1.70E-09	9.10E-01	1.55E-09	1.55E-09
Silver	6.50E-01	3.05E-07	NA		1.22E-08	NA		4.64E-11	NA		
Vanadium	2.65E+01	1.24E-05	NA		4.97E-07	NA		1.89E-09	NA		
Zinc	7.36E+02	3.46E-04	NA		1.38E-05	NA		5.25E-08	NA		
Pesticides/PCBs											
4,4'-DDD	5.90E+00	2.77E-06	2.40E-01	6.65E-07	5.53E-07	2.40E-01	1.33E-07	4.21E-10	2.42E-01	1.02E-10	7.98E-07
4,4'-DDE	1.80E+01	8.45E-06	3.40E-01	2.87E-06	1.69E-06	3.40E-01	5.73E-07	1.28E-09	3.40E-01	4.36E-10	**3.45E-06**
4,4'-DDT	4.50E+01	2.11E-05	3.40E-01	7.19E-06	4.22E-06	3.40E-01	1.43E-06	3.21E-09	3.40E-01	1.09E-09	**8.62E-06**
alpha-Chlordane	8.20E+00	3.85E-06	1.20E+00	4.62E-06	7.68E-07	1.20E+00	9.22E-07	5.85E-10	1.19E+00	6.97E-10	**5.54E-06**

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Dieldrin	1.30E+00	6.11E-07	1.60E+01	9.77E-06	1.22E-07	1.60E+01	1.95E-06	9.28E-11	1.61E+01	1.49E-09	**1.17E-05**
gamma-Chlordane	5.90E+00	2.77E-06	1.20E+00	3.33E-06	5.53E-07	1.20E+00	6.63E-07	4.21E-10	1.19E+00	5.01E-10	**3.99E-06**
			Total Risk:	9.22E-05		**Total Risk:**	1.33E-05		**Total Risk:**	2.82E-08	**1.05E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **1E-04**

Table 1-85
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Residential Exposure Scenario - Future Adult Resident - Small Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	24	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.03	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.07	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Aluminum	8.02E+03	1.10E-02	1.00E+00	1.10E-02	4.38E-04	1.00E+00	4.38E-04	1.67E-06	1.40E-03	1.19E-03	1.26E-02
Arsenic	1.42E+01	1.95E-05	3.00E-04	6.48E-02	2.33E-06	3.00E-04	7.76E-03	2.96E-09	8.57E-06	3.45E-04	7.29E-02
Barium	2.78E+02	3.81E-04	7.00E-02	5.44E-03	1.52E-05	7.00E-02	2.17E-04	5.79E-08	1.43E-04	4.05E-04	6.06E-03
Beryllium	2.90E-01	3.97E-07	2.00E-03	1.99E-04	1.59E-08	2.00E-03	7.93E-06	6.04E-11	5.71E-06	1.06E-05	2.17E-04
Cadmium	2.10E+00	2.88E-06	5.00E-04	5.75E-03	1.15E-08	5.00E-04	2.30E-05	4.37E-10	5.71E-06	7.65E-05	5.85E-03
Cobalt	6.70E+00	9.18E-06	2.00E-02	4.59E-04	3.66E-07	2.00E-02	1.83E-05	1.39E-09	5.70E-06	2.45E-04	7.22E-04
Copper	9.58E+01	1.31E-04	4.00E-02	3.28E-03	5.24E-06	4.00E-02	1.31E-04	1.99E-08	NA		3.41E-03
Iron	1.63E+04	2.23E-02	3.00E-01	7.44E-02	8.91E-04	3.00E-01	2.97E-03	3.39E-06	NA		7.74E-02
Lead	3.86E+02	5.29E-04	NA		2.11E-05	NA		8.04E-08	NA		
Nickel	2.38E+01	3.26E-05	2.00E-02	1.63E-03	1.30E-06	2.00E-02	6.50E-05	4.95E-09	1.43E-05	3.47E-04	2.04E-03
Silver	6.50E-01	8.90E-07	5.00E-03	1.78E-04	3.55E-08	5.00E-03	7.11E-06	1.35E-10	NA		1.85E-04
Vanadium	2.65E+01	3.63E-05	1.00E-03	3.63E-02	1.45E-06	1.00E-03	1.45E-03	5.52E-09	NA		3.77E-02
Zinc	7.36E+02	1.01E-03	3.00E-01	3.36E-03	4.02E-05	3.00E-01	1.34E-04	1.53E-07	NA		3.49E-03

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Pesticides/PCBs											
4,4'-DDD	5.90E+00	8.08E-06	NA		1.61E-06	NA		1.23E-09	NA		
4,4'-DDE	1.80E+01	2.47E-05	NA		4.92E-06	NA		3.75E-09	NA		
4,4'-DDT	4.50E+01	6.16E-05	5.00E-04	1.23E-01	1.23E-05	5.00E-04	2.46E-02	9.37E-09	5.00E-04	1.87E-05	**1.48E-01**
alpha-Chlordane	8.20E+00	1.12E-05	5.00E-04	2.25E-02	2.24E-06	5.00E-04	4.48E-03	1.71E-09	2.00E-04	8.54E-06	2.70E-02
Dieldrin	1.30E+00	1.78E-06	5.00E-05	3.56E-02	3.55E-07	5.00E-05	7.11E-03	2.71E-10	5.00E-05	5.41E-06	4.27E-02
gamma-Chlordane	5.90E+00	8.08E-06	5.00E-04	1.62E-02	1.61E-06	5.00E-04	3.22E-03	1.23E-09	2.00E-04	6.14E-06	1.94E-02
		Total Risk (Hazard Index):		4.0E-01	**Total Risk (Hazard Index):**		5.3E-02	**Total Risk (Hazard Index):**		2.7E-03	**4.6E-01**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-Carcinogenic Risk (Hazard Index) Across All Exposure Routes : **0.5**

Table 1-86
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Residential Exposure Scenario - Future Child Resident Receptor - Small Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Child Resident
	Receptor Age:	Child (0 to 6 yrs)

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	6	yr
Soil Ingestion Rate	IR	200	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	10	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	2.90E+03	cm2/day [soil]
Body Weight	BW	15	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.03	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Metals											
Aluminum	8.02E+03	8.79E-03	NA		2.55E-04	NA		3.34E-07	NA		
Arsenic	1.42E+01	1.56E-05	9.50E+00	1.48E-04	1.35E-06	9.50E+00	1.29E-05	5.91E-10	1.51E+01	8.90E-09	**1.61E-04**
Barium	2.78E+02	3.05E-04	NA		8.84E-06	NA		1.16E-08	NA		
Beryllium	2.90E-01	3.18E-07	NA		9.22E-09	NA		1.21E-11	8.40E+00	1.01E-10	1.01E-10
Cadmium	2.10E+00	2.30E-06	3.80E-01	8.75E-07	6.67E-09	3.80E-01	2.54E-09	8.74E-11	1.47E+01	1.29E-09	8.78E-07
Cobalt	6.70E+00	7.34E-06	NA		2.13E-07	NA		2.79E-10	9.80E+00	2.73E-09	2.73E-09
Copper	9.58E+01	1.05E-04	NA		3.04E-06	NA		3.99E-09	NA		
Iron	1.63E+04	1.79E-02	NA		5.18E-04	NA		6.79E-07	NA		
Lead	3.86E+02	4.23E-04	NA		1.23E-05	NA		1.61E-08	NA		
Nickel	2.38E+01	2.61E-05	NA		7.56E-07	NA		9.91E-10	9.10E-01	9.02E-10	9.02E-10
Silver	6.50E-01	7.12E-07	NA		2.07E-08	NA		2.71E-11	NA		
Vanadium	2.65E+01	2.90E-05	NA		8.42E-07	NA		1.10E-09	NA		
Zinc	7.36E+02	8.07E-04	NA		2.34E-05	NA		3.06E-08	NA		
Pesticides/PCBs											
4,4'-DDD	5.90E+00	6.47E-06	2.40E-01	1.55E-06	9.38E-07	2.40E-01	2.25E-07	2.46E-10	2.42E-01	5.93E-11	**1.78E-06**
4,4'-DDE	1.80E+01	1.97E-05	3.40E-01	6.71E-06	2.86E-06	3.40E-01	9.72E-07	7.49E-10	3.40E-01	2.54E-10	**7.68E-06**
4,4'-DDT	4.50E+01	4.93E-05	3.40E-01	1.68E-05	7.15E-06	3.40E-01	2.43E-06	1.87E-09	3.40E-01	6.36E-10	**1.92E-05**
alpha-Chlordane	8.20E+00	8.99E-06	1.20E+00	1.08E-05	1.30E-06	1.20E+00	1.56E-06	3.41E-10	1.19E+00	4.06E-10	**1.23E-05**

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Dieldrin	1.30E+00	1.42E-06	1.60E+01	2.28E-05	2.07E-07	1.60E+01	3.31E-06	5.41E-11	1.61E+01	8.71E-10	**2.61E-05**
gamma-Chlordane	5.90E+00	6.47E-06	1.20E+00	7.76E-06	9.38E-07	1.20E+00	1.13E-06	2.46E-10	1.19E+00	2.92E-10	**8.88E-06**
			Total Risk:	2.15E-04		**Total Risk:**	2.25E-05		**Total Risk:**	1.64E-08	**2.38E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **2E-04**

Table 1-87
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Residential Exposure Scenario - Future Child Resident Receptor - Small Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Child Resident
	Receptor Age:	Child (0 to 6 yrs)

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	6	yr
Soil Ingestion Rate	IR	200	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	10	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	2.90E+03	cm2/day [soil]
Body Weight	BW	15	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.03	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Aluminum	8.02E+03	1.03E-01	1.00E+00	1.03E-01	2.97E-03	1.00E+00	2.97E-03	3.90E-06	1.40E-03	2.78E-03	**1.1E-01**
Arsenic	1.42E+01	1.82E-04	3.00E-04	6.05E-01	1.58E-05	3.00E-04	5.27E-02	6.90E-09	8.57E-06	8.05E-04	**6.6E-01**
Barium	2.78E+02	3.55E-03	7.00E-02	5.08E-02	1.03E-04	7.00E-02	1.47E-03	1.35E-07	1.43E-04	9.45E-04	5.3E-02
Beryllium	2.90E-01	3.71E-06	2.00E-03	1.85E-03	1.08E-07	2.00E-03	5.38E-05	1.41E-10	5.71E-06	2.47E-05	1.9E-03
Cadmium	2.10E+00	2.68E-05	1.10E-05	2.44E+00	7.79E-08	1.10E-05	7.08E-03	1.02E-09	5.71E-06	1.79E-04	**2.4E+00**
Cobalt	6.70E+00	8.57E-05	2.00E-02	4.28E-03	2.48E-06	2.00E-02	1.24E-04	3.25E-09	5.70E-06	5.71E-04	5.0E-03
Copper	9.58E+01	1.22E-03	4.00E-02	3.06E-02	3.55E-05	4.00E-02	8.88E-04	4.65E-08	NA		3.2E-02
Iron	1.63E+04	2.08E-01	3.00E-01	6.95E-01	6.04E-03	3.00E-01	2.01E-02	7.92E-06	NA		**7.1E-01**
Lead	3.86E+02	4.94E-03	NA		1.43E-04	NA		1.88E-07	NA		
Nickel	2.38E+01	3.04E-04	1.10E-02	2.77E-02	8.82E-06	1.10E-02	8.02E-04	1.16E-08	1.43E-05	8.09E-04	2.9E-02
Silver	6.50E-01	8.31E-06	5.00E-03	1.66E-03	2.41E-07	5.00E-03	4.82E-05	3.16E-10	NA		1.7E-03

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Vanadium	2.65E+01	3.39E-04	1.00E-03	3.39E-01	9.83E-06	1.00E-03	9.83E-03	1.29E-08	NA		**3.5E-01**
Zinc	7.36E+02	9.41E-03	3.00E-01	3.14E-02	2.73E-04	3.00E-01	9.10E-04	3.58E-07	NA		3.2E-02
Pesticides/PCBs											
4,4'-DDD	5.90E+00	7.54E-05	NA		1.09E-05	NA		2.87E-09	NA		
4,4'-DDE	1.80E+01	2.30E-04	NA		3.34E-05	NA		8.74E-09	NA		
4,4'-DDT	4.50E+01	5.75E-04	5.00E-04	1.15E+00	8.34E-05	5.00E-04	1.67E-01	2.19E-08	5.00E-04	4.37E-05	**1.3E+00**
alpha-Chlordane	8.20E+00	1.05E-04	3.30E-05	3.18E+00	1.52E-05	3.30E-05	4.61E-01	3.98E-09	2.00E-04	1.99E-05	**3.6E+00**
Dieldrin	1.30E+00	1.66E-05	5.00E-05	3.32E-01	2.41E-06	5.00E-05	4.82E-02	6.31E-10	5.00E-05	1.26E-05	**3.8E-01**
gamma-Chlordane	5.90E+00	7.54E-05	3.30E-05	2.29E+00	1.09E-05	3.30E-05	3.31E-01	2.87E-09	2.00E-04	1.43E-05	**2.6E+00**
		Total Risk (Hazard Index):		1.13E+01	**Total Risk (Hazard Index):**		1.10E+00	**Total Risk (Hazard Index):**		6.21E-03	**1.2E+01**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-Carcinogenic Risk (Hazard Index) Across All Exposure Routes : **12**

Table 1-88
Cancer Risk Results Detailed Summary for Risk Drivers - Future Adult/Child Resident - Shallow Soil - Small Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	**6.3E-05**	**7.6E-06**	1.5E-08	**7.1E-05**	67%	**1.5E-04**	**1.3E-05**	8.9E-09	**1.6E-04**	68%
Subtotal Metals	**6.4E-05**	**7.6E-06**	2.4E-08	**7.1E-05**	68%	**1.5E-04**	**1.3E-05**	1.4E-08	**1.6E-04**	68%
Pesticides/PCBs										
4,4'-DDD	6.7E-07	1.3E-07	1.0E-10	8.0E-07	0.8%	**1.6E-06**	2.3E-07	5.9E-11	**1.8E-06**	0.7%
4,4'-DDE	**2.9E-06**	5.7E-07	4.4E-10	**3.4E-06**	3%	**6.7E-06**	9.7E-07	2.5E-10	**7.7E-06**	3%
4,4'-DDT	**7.2E-06**	**1.4E-06**	1.1E-09	**8.6E-06**	8%	**1.7E-05**	**2.4E-06**	6.4E-10	**1.9E-05**	8%
alpha-Chlordane	**4.6E-06**	9.2E-07	7.0E-10	**5.5E-06**	5%	**1.1E-05**	**1.6E-06**	4.1E-10	**1.2E-05**	5%
Dieldrin	**9.8E-06**	**1.9E-06**	1.5E-09	**1.2E-05**	11%	**2.3E-05**	**3.3E-06**	8.7E-10	**2.6E-05**	11%
gamma-Chlordane	**3.3E-06**	6.6E-07	5.0E-10	**4.0E-06**	4%	**7.8E-06**	**1.1E-06**	2.9E-10	**8.9E-06**	4%
Subtotal Pesticides/PCBs	**2.8E-05**	**5.7E-06**	4.3E-09	**3.4E-05**	32%	**6.6E-05**	**9.6E-06**	2.5E-09	**7.6E-05**	32%
Total:	**9.2E-05**	**1.3E-05**	2.8E-08	**1.1E-04**		**2.2E-04**	**2.2E-05**	1.6E-08	**2.4E-04**	

Total Estimated Cancer Risk Across All Exposure Routes:	**1E-04**					**2E-04**
Sum of Adult and Child Excess Lifetime Cancer Risk (30 year exposure):				**3.1E-04**	**3.6E-05**	**4.5E-08**	**3.43E-04**
Total Estimated Adult plus Child Cancer Risk Across All Exposure Routes:						**3E-04**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total hazard quotient for all chemicals evaluated.

Table 1-89
Noncancer Risk Results Detailed Summary for Risk Drivers - Future Adult/Child Resident - Shallow Soil - Small Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Non-Carcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Aluminum	1.1E-02	4.4E-04	1.2E-03	1.3E-02	3%	**1.0E-01**	3.0E-03	2.8E-03	**1.1E-01**	1%
Arsenic	6.5E-02	7.8E-03	3.4E-04	7.3E-02	16%	**6.1E-01**	5.3E-02	8.0E-04	**6.6E-01**	5%
Iron	7.4E-02	3.0E-03		7.7E-02	17%	**6.9E-01**	2.0E-02		**7.1E-01**	6%
Vanadium	3.6E-02	1.4E-03		3.8E-02	8%	**3.4E-01**	9.8E-03		**3.5E-01**	3%
Subtotal Metals	**2.1E-01**	1.3E-02	2.6E-03	**2.2E-01**	48%	**4.3E+00**	9.7E-02	6.1E-03	**4.4E+00**	36%
Pesticides/PCBs										
4,4'-DDT	**1.2E-01**	2.5E-02	1.9E-05	**1.5E-01**	32%	**1.2E+00**	**1.7E-01**	4.4E-05	**1.3E+00**	11%
alpha-Chlordane	2.2E-02	4.5E-03	8.5E-06	2.7E-02	6%	**3.2E+00**	**4.6E-01**	2.0E-05	**3.6E+00**	29%
Dieldrin	3.6E-02	7.1E-03	5.4E-06	4.3E-02	9%	**3.3E-01**	4.8E-02	1.3E-05	**3.8E-01**	3%
gamma-Chlordane	1.6E-02	3.2E-03	6.1E-06	1.9E-02	4%	**2.3E+00**	**3.3E-01**	1.4E-05	**2.6E+00**	21%
Subtotal Pesticides/PCBs	**2.0E-01**	3.9E-02	3.9E-05	**2.4E-01**	52%	**6.9E+00**	**1.0E+00**	9.1E-05	**8.0E+00**	64%
Total:	**0.4**	0.1	0.003	**0.5**		**11.3**	**1.1**	0.01	**12.4**	

Total Estimated Hazard Index Across All Exposure Routes: **0.5** **12**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total hazard quotient for all chemicals evaluated.

Table 1-90
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Occupational Exposure Scenario - Future Industrial Worker - Small Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information	Exposure Scenario:	Occupational
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Industrial Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	25	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	25	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.03	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
Metals											
Aluminum	8.02E+03	2.80E-03	NA		3.19E-04	NA		4.26E-07	NA		
Arsenic	1.42E+01	4.96E-06	9.50E+00	4.71E-05	1.70E-06	9.50E+00	1.61E-05	7.54E-10	1.51E+01	1.13E-08	**6.33E-05**
Barium	2.78E+02	9.71E-05	NA		1.11E-05	NA		1.48E-08	NA		
Beryllium	2.90E-01	1.01E-07	NA		1.16E-08	NA		1.54E-11	8.40E+00	1.29E-10	1.29E-10
Cadmium	2.10E+00	7.34E-07	3.80E-01	2.79E-07	8.37E-09	3.80E-01	3.18E-09	1.12E-10	1.47E+01	1.64E-09	2.84E-07
Cobalt	6.70E+00	2.34E-06	NA		2.67E-07	NA		3.56E-10	9.80E+00	3.49E-09	3.49E-09
Copper	9.58E+01	3.35E-05	NA		3.82E-06	NA		5.09E-09	NA		
Iron	1.63E+04	5.70E-03	NA		6.49E-04	NA		8.66E-07	NA		
Lead	3.86E+02	1.35E-04	NA		1.54E-05	NA		2.05E-08	NA		
Nickel	2.38E+01	8.32E-06	NA		9.48E-07	NA		1.26E-09	9.10E-01	1.15E-09	1.15E-09
Silver	6.50E-01	2.27E-07	NA		2.59E-08	NA		3.45E-11	NA		
Vanadium	2.65E+01	9.26E-06	NA		1.06E-06	NA		1.41E-09	NA		
Zinc	7.36E+02	2.57E-04	NA		2.93E-05	NA		3.91E-08	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Pesticides/PCBs											
4,4'-DDD	5.90E+00	2.06E-06	2.40E-01	4.95E-07	1.18E-06	2.40E-01	2.82E-07	3.13E-10	2.42E-01	7.57E-11	7.77E-07
4,4'-DDE	1.80E+01	6.29E-06	3.40E-01	2.14E-06	3.59E-06	3.40E-01	1.22E-06	9.56E-10	3.40E-01	3.25E-10	**3.36E-06**
4,4'-DDT	4.50E+01	1.57E-05	3.40E-01	5.35E-06	8.96E-06	3.40E-01	3.05E-06	2.39E-09	3.40E-01	8.11E-10	**8.40E-06**
alpha-Chlordane	8.20E+00	2.87E-06	1.20E+00	3.44E-06	1.63E-06	1.20E+00	1.96E-06	4.35E-10	1.19E+00	5.18E-10	**5.40E-06**
Dieldrin	1.30E+00	4.54E-07	1.60E+01	7.27E-06	2.59E-07	1.60E+01	4.14E-06	6.90E-11	1.61E+01	1.11E-09	**1.14E-05**
gamma-Chlordane	5.90E+00	2.06E-06	1.20E+00	2.47E-06	1.18E-06	1.20E+00	1.41E-06	3.13E-10	1.19E+00	3.73E-10	**3.88E-06**
			Total Risk:	6.86E-05		**Total Risk:**	2.82E-05		**Total Risk:**	2.10E-08	**9.68E-05**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **1E-04**

Table 1-91
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Occupational Exposure Scenario - Future Industrial Worker - Small Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Occupational
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Industrial Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	25	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	25	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.03	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Aluminum	8.02E+03	7.85E-03	1.00E+00	7.85E-03	8.95E-04	1.00E+00	8.95E-04	1.19E-06	1.40E-03	8.52E-04	9.59E-03
Arsenic	1.42E+01	1.39E-05	3.00E-04	4.63E-02	4.75E-06	3.00E-04	1.58E-02	2.11E-09	8.57E-06	2.46E-04	6.24E-02
Barium	2.78E+02	2.72E-04	7.00E-02	3.89E-03	3.10E-05	7.00E-02	4.43E-04	4.13E-08	1.43E-04	2.89E-04	4.62E-03
Beryllium	2.90E-01	2.84E-07	2.00E-03	1.42E-04	3.23E-08	2.00E-03	1.62E-05	4.31E-11	5.71E-06	7.55E-06	1.66E-04
Cadmium	2.10E+00	2.05E-06	5.00E-04	4.11E-03	2.34E-08	5.00E-04	4.68E-05	3.12E-10	5.71E-06	5.46E-05	4.21E-03
Cobalt	6.70E+00	6.56E-06	2.00E-02	3.28E-04	7.47E-07	2.00E-02	3.74E-05	9.96E-10	5.70E-06	1.75E-04	5.40E-04
Copper	9.58E+01	9.37E-05	4.00E-02	2.34E-03	1.07E-05	4.00E-02	2.67E-04	1.42E-08	NA		2.61E-03
Iron	1.63E+04	1.59E-02	3.00E-01	5.32E-02	1.82E-03	3.00E-01	6.06E-03	2.42E-06	NA		5.92E-02
Lead	3.86E+02	3.78E-04	NA		4.31E-05	NA		5.74E-08	NA		
Nickel	2.38E+01	2.33E-05	2.00E-02	1.16E-03	2.65E-06	2.00E-02	1.33E-04	3.54E-09	1.43E-05	2.48E-04	1.54E-03
Silver	6.50E-01	6.36E-07	5.00E-03	1.27E-04	7.25E-08	5.00E-03	1.45E-05	9.67E-11	NA		1.42E-04
Vanadium	2.65E+01	2.59E-05	1.00E-03	2.59E-02	2.96E-06	1.00E-03	2.96E-03	3.94E-09	NA		2.89E-02
Zinc	7.36E+02	7.20E-04	3.00E-01	2.40E-03	8.21E-05	3.00E-01	2.74E-04	1.09E-07	NA		2.67E-03

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Pesticides/PCBs											
4,4'-DDD	5.90E+00	5.77E-06	NA		3.29E-06	NA		8.77E-10	NA		
4,4'-DDE	1.80E+01	1.76E-05	NA		1.00E-05	NA		2.68E-09	NA		
4,4'-DDT	4.50E+01	4.40E-05	5.00E-04	8.81E-02	2.51E-05	5.00E-04	5.02E-02	6.69E-09	5.00E-04	1.34E-05	1.38E-01
alpha-Chlordane	8.20E+00	8.02E-06	5.00E-04	1.60E-02	4.57E-06	5.00E-04	9.15E-03	1.22E-09	2.00E-04	6.10E-06	2.52E-02
Dieldrin	1.30E+00	1.27E-06	5.00E-05	2.54E-02	7.25E-07	5.00E-05	1.45E-02	1.93E-10	5.00E-05	3.87E-06	3.99E-02
gamma-Chlordane	5.90E+00	5.77E-06	5.00E-04	1.15E-02	3.29E-06	5.00E-04	6.58E-03	8.77E-10	2.00E-04	4.39E-06	1.81E-02
		Total Risk (Hazard Index):		2.89E-01	**Total Risk (Hazard Index):**		1.07E-01	**Total Risk (Hazard Index):**		1.90E-03	3.98E-01

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **0.4**

Table 1-92
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Construction Exposure Scenario - Future Construction Worker - Small Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Construction Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	1	yr
Soil Ingestion Rate	IR	330	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.03	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.8	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Metals											
Aluminum	8.02E+03	3.70E-04	NA		5.11E-05	NA		1.70E-08	NA		
Arsenic	1.42E+01	6.55E-07	9.50E+00	6.22E-06	2.72E-07	9.50E+00	2.58E-06	3.02E-11	1.51E+01	4.54E-10	**8.80E-06**
Barium	2.78E+02	1.28E-05	NA		1.77E-06	NA		5.91E-10	NA		
Beryllium	2.90E-01	1.34E-08	NA		1.85E-09	NA		6.16E-13	8.40E+00	5.17E-12	5.17E-12
Cadmium	2.10E+00	9.69E-08	3.80E-01	3.68E-08	1.34E-09	3.80E-01	5.09E-10	4.46E-12	1.47E+01	6.56E-11	3.74E-08
Cobalt	6.70E+00	3.09E-07	NA		4.27E-08	NA		1.42E-11	9.80E+00	1.39E-10	1.39E-10
Copper	9.58E+01	4.42E-06	NA		6.11E-07	NA		2.04E-10	NA		
Iron	1.63E+04	7.52E-04	NA		1.04E-04	NA		3.46E-08	NA		
Lead	3.86E+02	1.78E-05	NA		2.46E-06	NA		8.20E-10	NA		
Nickel	2.38E+01	1.10E-06	NA		1.52E-07	NA		5.06E-11	9.10E-01	4.60E-11	4.60E-11
Silver	6.50E-01	3.00E-08	NA		4.14E-09	NA		1.38E-12	NA		
Vanadium	2.65E+01	1.22E-06	NA		1.69E-07	NA		5.63E-11	NA		
Zinc	7.36E+02	3.40E-05	NA		4.69E-06	NA		1.56E-09	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
Pesticides/PCBs											
4,4'-DDD	5.90E+00	2.72E-07	2.40E-01	6.53E-08	1.88E-07	2.40E-01	4.51E-08	1.25E-11	2.42E-01	3.03E-12	1.10E-07
4,4'-DDE	1.80E+01	8.30E-07	3.40E-01	2.82E-07	5.74E-07	3.40E-01	1.95E-07	3.82E-11	3.40E-01	1.30E-11	4.77E-07
4,4'-DDT	4.50E+01	2.08E-06	3.40E-01	7.06E-07	1.43E-06	3.40E-01	4.88E-07	9.56E-11	3.40E-01	3.25E-11	**1.19E-06**
alpha-Chlordane	8.20E+00	3.78E-07	1.20E+00	4.54E-07	2.61E-07	1.20E+00	3.14E-07	1.74E-11	1.19E+00	2.07E-11	7.68E-07
Dieldrin	1.30E+00	6.00E-08	1.60E+01	9.59E-07	4.14E-08	1.60E+01	6.63E-07	2.76E-12	1.61E+01	4.45E-11	**1.62E-06**
gamma-Chlordane	5.90E+00	2.72E-07	1.20E+00	3.27E-07	1.88E-07	1.20E+00	2.26E-07	1.25E-11	1.19E+00	1.49E-11	5.52E-07
			Total Risk:	9.05E-06		**Total Risk:**	4.51E-06		**Total Risk:**	8.39E-10	**1.36E-05**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **1E-05**

Table 1-93
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Construction Exposure Scenario - Future Construction Worker - Small Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	OnSite
	Receptor Population:	Future Construction Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter (units)	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	1	yr
Soil Ingestion Rate	IR	330	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Skin Surface Area (Soil Contact; 1 event per day)	SA_s	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.03	unitless
Pesticides	ABSpest	0.05	unitless
Semi-Volatiles (Organics)	ABSsvoc	0.1	unitless
Volatiles (Organics)	ABSvoc	0.1	unitless
PAHs and PCBs	ABSpah	0.15	unitless
Dioxins and Furans	ABSdioxin	0.03	unitless
Adherence Factor	AF	0.8	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Metals											
Aluminum	8.02E+03	2.59E-02	1.00E+00	2.59E-02	3.58E-03	1.00E+00	3.58E-03	1.19E-06	1.40E-03	8.52E-04	3.03E-02
Arsenic	1.42E+01	4.59E-05	3.00E-04	1.53E-01	1.90E-05	3.00E-04	6.34E-02	2.11E-09	8.57E-06	2.46E-04	**2.16E-01**
Barium	2.78E+02	8.98E-04	7.00E-02	1.28E-02	1.24E-04	7.00E-02	1.77E-03	4.13E-08	1.43E-04	2.89E-04	1.49E-02
Beryllium	2.90E-01	9.36E-07	2.00E-03	4.68E-04	1.29E-07	2.00E-03	6.47E-05	4.31E-11	5.71E-06	7.55E-06	5.40E-04
Cadmium	2.10E+00	6.78E-06	5.00E-04	1.36E-02	9.37E-08	5.00E-04	1.87E-04	3.12E-10	5.71E-06	5.46E-05	1.38E-02
Cobalt	6.70E+00	2.16E-05	2.00E-02	1.08E-03	2.99E-06	2.00E-02	1.49E-04	9.96E-10	5.70E-06	1.75E-04	1.41E-03
Copper	9.58E+01	3.09E-04	4.00E-02	7.73E-03	4.27E-05	4.00E-02	1.07E-03	1.42E-08	NA		8.80E-03
Iron	1.63E+04	5.26E-02	3.00E-01	1.75E-01	7.27E-03	3.00E-01	2.42E-02	2.42E-06	NA		**2.00E-01**
Lead	3.86E+02	1.25E-03	NA		1.72E-04	NA		5.74E-08	NA		
Nickel	2.38E+01	7.68E-05	2.00E-02	3.84E-03	1.06E-05	2.00E-02	5.31E-04	3.54E-09	1.43E-05	2.48E-04	4.62E-03
Silver	6.50E-01	2.10E-06	5.00E-03	4.20E-04	2.90E-07	5.00E-03	5.80E-05	9.67E-11	NA		4.78E-04
Vanadium	2.65E+01	8.56E-05	1.00E-03	8.56E-02	1.18E-05	1.00E-03	1.18E-02	3.94E-09	NA		9.74E-02
Zinc	7.36E+02	2.38E-03	3.00E-01	7.92E-03	3.28E-04	3.00E-01	1.09E-03	1.09E-07	NA		9.02E-03
Pesticides/PCBs											
4,4'-DDD	5.90E+00	1.91E-05	NA		1.32E-05	NA		8.77E-10	NA		
4,4'-DDE	1.80E+01	5.81E-05	NA		4.02E-05	NA		2.68E-09	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cs [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
4,4'-DDT	4.50E+01	1.45E-04	5.00E-04	2.91E-01	1.00E-04	5.00E-04	2.01E-01	6.69E-09	5.00E-04	1.34E-05	**4.91E-01**
alpha-Chlordane	8.20E+00	2.65E-05	5.00E-04	5.30E-02	1.83E-05	5.00E-04	3.66E-02	1.22E-09	2.00E-04	6.10E-06	8.95E-02
Dieldrin	1.30E+00	4.20E-06	5.00E-05	8.40E-02	2.90E-06	5.00E-05	5.80E-02	1.93E-10	5.00E-05	3.87E-06	**1.42E-01**
gamma-Chlordane	5.90E+00	1.91E-05	5.00E-04	3.81E-02	1.32E-05	5.00E-04	2.63E-02	8.77E-10	2.00E-04	4.39E-06	6.44E-02
		Total Risk (Hazard Index):		9.53E-01	**Total Risk (Hazard Index):**		4.30E-01	**Total Risk (Hazard Index):**		1.900E-03	**1.38E+00**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **1**

Table 1-94
Cancer Risk Results Detailed Summary for Risk Drivers - Future Industrial/Construction Worker - Shallow Soil - Small Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Future Industrial Worker					Future Construction Worker				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	**4.7E-05**	**1.6E-05**	1.1E-08	**6.3E-05**	65%	**6.2E-06**	**2.6E-06**	4.5E-10	**8.8E-06**	65%
Subtotal Metals	**4.7E-05**	**1.6E-05**	1.8E-08	**6.4E-05**	66%	**6.3E-06**	**2.6E-06**	7.1E-10	**8.8E-06**	65%
Pesticides/PCBs										
4,4'-DDE	**2.1E-06**	**1.2E-06**	3.2E-10	**3.4E-06**	3%	2.8E-07	2.0E-07	1.3E-11	4.8E-07	4%
4,4'-DDT	**5.3E-06**	**3.0E-06**	8.1E-10	**8.4E-06**	9%	7.1E-07	4.9E-07	3.2E-11	**1.2E-06**	9%
alpha-Chlordane	**3.4E-06**	**2.0E-06**	5.2E-10	**5.4E-06**	6%	4.5E-07	3.1E-07	2.1E-11	7.7E-07	6%
Dieldrin	**7.3E-06**	**4.1E-06**	1.1E-09	**1.1E-05**	12%	9.6E-07	6.6E-07	4.4E-11	**1.6E-06**	12%
gamma-Chlordane	**2.5E-06**	**1.4E-06**	3.7E-10	**3.9E-06**	4%	3.3E-07	2.3E-07	1.5E-11	5.5E-07	4%
Subtotal Pesticides/PCBs	**2.1E-05**	**1.2E-05**	3.2E-09	**3.3E-05**	34%	**2.8E-06**	**1.9E-06**	1.3E-10	**4.7E-06**	35%
Total:	**6.9E-05**	**2.8E-05**	2.1E-08	**9.68E-05**		**9.1E-06**	**4.5E-06**	8.4E-10	**1.36E-05**	

Total Estimated Cancer Risk Across All Exposure Routes: **1E-04** **1E-05**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total cancer risk for all chemicals evaluated.

Table 1-95

Noncancer Risk Results Detailed Summary for Risk Drivers - Future Industrial/Construction Worker - Shallow Soil - Small Vacant Lot

Baseline Human Health Risk Assessment

AMCO Chemical Superfund Site, Oakland, California

Non-Carcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Future Industrial Worker					Future Construction Worker				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	4.6E-02	1.6E-02	2.5E-04	6.2E-02	16%	**1.5E-01**	6.3E-02	2.5E-04	**2.2E-01**	16%
Iron	5.3E-02	6.1E-03		5.9E-02	15%	**1.8E-01**	2.4E-02		**2.0E-01**	14%
Subtotal Metals	**1.5E-01**	2.7E-02	1.9E-03	**1.8E-01**	44%	**4.9E-01**	**1.1E-01**	1.9E-03	**6.0E-01**	43%
Pesticides/PCBs										
4,4'-DDT	8.8E-02	5.0E-02	1.3E-05	**1.4E-01**	35%	**2.9E-01**	**2.0E-01**	1.3E-05	**4.9E-01**	35%
Dieldrin	2.5E-02	1.5E-02	3.9E-06	4.0E-02	10%	8.4E-02	5.8E-02	3.9E-06	**1.4E-01**	10%
Subtotal Pesticides/PCBs	**1.4E-01**	8.0E-02	2.8E-05	**2.2E-01**	56%	**4.7E-01**	**3.2E-01**	2.8E-05	**7.9E-01**	57%
Total:	**0.3**	**0.1**	0.002	**0.4**		**1.0**	**0.4**	0.002	**1.4**	

Total Estimated Hazard Index Across All Exposure Routes: **0.4** **1**

Notes:

Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.

% Contribution (Subtotal % Contribution) = Percent contribution of total hazard quotient for all chemicals evaluated.

Table 1-96
Soil Exposure Point Concentrations for City of Oakland Background
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Constituent	Units	Exposure Point Concentration
Metals		
Antimony	mg/kg	5.90E+00
Arsenic	mg/kg	1.40E+01
Beryllium	mg/kg	9.00E-01
Cadmium	mg/kg	1.50E+00
Chromium	mg/kg	9.14E+01
Copper	mg/kg	5.96E+01
Lead	mg/kg	1.47E+01
Mercury	mg/kg	4.00E-01
Nickel	mg/kg	1.20E+02
Selenium	mg/kg	5.60E+00
Silver	mg/kg	1.70E+00
Thallium	mg/kg	4.25E+01
Zinc	mg/kg	9.15E+01

Notes:
Oakland Urban Land Redevelopment Program, City of Oakland, Survey of Background Metal Concentration Studies (Colluvian and Fill).

Table 1-97
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Residential Exposure Scenario - Future Adult Resident Receptor - Background
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	Background
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	24	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	
Arsenic	ABSas	0.03	unitless
Cadmium	ABScd	0.001	unitless
Adherence Factor	AF	0.07	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
Metals											
Antimony	5.90E+00	2.77E-06	NA		1.11E-07	NA		4.21E-10	NA		
Arsenic	1.40E+01	6.58E-06	9.50E+00	6.25E-05	7.87E-07	9.50E+00	7.48E-06	9.99E-10	1.51E+01	1.50E-08	**7.00E-05**
Beryllium	9.00E-01	4.23E-07	NA		1.69E-08	NA		6.42E-11	8.40E+00	5.40E-10	5.40E-10
Cadmium	1.50E+00	7.05E-07	3.80E-01	2.68E-07	2.81E-09	3.80E-01	1.07E-09	1.07E-10	1.47E+01	1.57E-09	2.70E-07
Chromium	9.14E+01	4.29E-05	NA		1.71E-06	NA		6.52E-09	4.20E+01	2.74E-07	2.74E-07
Copper	5.96E+01	2.80E-05	NA		1.12E-06	NA		4.25E-09	NA		
Lead	1.47E+01	6.90E-06	NA		2.75E-07	NA		1.05E-09	NA		
Mercury	4.00E-01	1.88E-07	NA		7.50E-09	NA		2.86E-11	NA		
Nickel	1.20E+02	5.65E-05	NA		2.25E-06	NA		8.58E-09	9.10E-01	7.81E-09	7.81E-09
Selenium	5.60E+00	2.63E-06	NA		1.05E-07	NA		4.00E-10	NA		
Silver	1.70E+00	7.98E-07	NA		3.19E-08	NA		1.21E-10	NA		
Thallium	4.25E+01	2.00E-05	NA		7.96E-07	NA		3.03E-09	NA		
Zinc	9.15E+01	4.30E-05	NA		1.71E-06	NA		6.53E-09	NA		
			Total Risk:	6.27E-05		**Total Risk:**	7.48E-06		**Total Risk:**	2.99E-07	**7.05E-05**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **7.1E-05**

Table 1-98
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Residential Exposure Scenario - Future Adult Resident Receptor - Background
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	Background
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	24	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	
Arsenic	ABSas	0.03	unitless
Cadmium	ABScd	0.001	unitless
Adherence Factor	AF	0.07	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/kg]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Metals											
Antimony	5.90E+00	8.08E-06	4.00E-04	2.02E-02	3.22E-07	4.00E-04	8.06E-04	1.23E-09	NA		2.10E-02
Arsenic	1.40E+01	1.92E-05	3.00E-04	6.39E-02	2.30E-06	3.00E-04	7.65E-03	2.91E-09	8.57E-06	3.40E-04	7.19E-02
Beryllium	9.00E-01	1.23E-06	2.00E-03	6.16E-04	4.92E-08	2.00E-03	2.46E-05	1.87E-10	5.71E-06	3.28E-05	6.74E-04
Cadmium	1.50E+00	2.05E-06	5.00E-04	4.11E-03	8.20E-09	5.00E-04	1.64E-05	3.12E-10	5.71E-06	5.46E-05	4.18E-03
Chromium	9.14E+01	1.25E-04	NA		5.00E-06	NA		1.90E-08	NA		
Copper	5.96E+01	8.16E-05	4.00E-02	2.04E-03	3.26E-06	4.00E-02	8.14E-05	1.24E-08	NA		2.12E-03
Lead	1.47E+01	2.01E-05	NA		8.03E-07	NA		3.06E-09	NA		
Mercury	4.00E-01	5.48E-07	3.00E-04	1.83E-03	2.19E-08	3.00E-04	7.29E-05	8.33E-11	NA		1.90E-03
Nickel	1.20E+02	1.65E-04	2.00E-02	8.23E-03	6.57E-06	2.00E-02	3.28E-04	2.50E-08	1.43E-05	1.75E-03	1.03E-02
Selenium	5.60E+00	7.67E-06	5.00E-03	1.53E-03	3.06E-07	5.00E-03	6.12E-05	1.17E-09	5.71E-03	2.04E-07	1.60E-03
Silver	1.70E+00	2.33E-06	5.00E-03	4.66E-04	9.29E-08	5.00E-03	1.86E-05	3.54E-10	NA		4.84E-04
Thallium	4.25E+01	5.82E-05	6.60E-05	8.82E-01	2.32E-06	6.60E-05	3.52E-02	8.85E-09	NA		9.17E-01
Zinc	9.15E+01	1.25E-04	3.00E-01	4.18E-04	5.00E-06	3.00E-01	1.67E-05	1.90E-08	NA		4.34E-04
		Total Risk (Hazard Index):		9.9E-01	**Total Risk (Hazard Index):**		4.4E-02	**Total Risk (Hazard Index):**		2.2E-03	1.0E+00

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-Carcinogenic Risk (Hazard Index) Across All Exposure Routes : **1**

Table 1-99

Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Residential Exposure Scenario - Future Child Resident Receptor - Background

Baseline Human Health Risk Assessment

AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	Background
	Receptor Population:	Future Child Resident
	Receptor Age:	Child (0 to 6 yrs)

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	6	yr
Soil Ingestion Rate	IR	200	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	10	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA	2.90E+03	cm2/day [soil]
Body Weight	BW	15	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	
Arsenic	ABSas	0.03	unitless
Cadmium	ABScd	0.001	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
Metals											
Antimony	5.90E+00	6.47E-06	NA		1.88E-07	NA		2.46E-10	NA		
Arsenic	1.40E+01	1.53E-05	9.50E+00	1.46E-04	1.33E-06	9.50E+00	1.27E-05	5.83E-10	1.51E+01	8.77E-09	**1.58E-04**
Beryllium	9.00E-01	9.86E-07	NA		2.86E-08	NA		3.75E-11	8.40E+00	3.15E-10	3.15E-10
Cadmium	1.50E+00	1.64E-06	3.80E-01	6.25E-07	4.77E-09	3.80E-01	1.81E-09	6.25E-11	1.47E+01	9.18E-10	6.27E-07
Chromium	9.14E+01	1.00E-04	NA		2.90E-06	NA		3.81E-09	4.20E+01	1.60E-07	1.60E-07
Copper	5.96E+01	6.53E-05	NA		1.89E-06	NA		2.48E-09	NA		
Lead	1.47E+01	1.61E-05	NA		4.67E-07	NA		6.12E-10	NA		
Mercury	4.00E-01	4.38E-07	NA		1.27E-08	NA		1.67E-11	NA		
Nickel	1.20E+02	1.32E-04	NA		3.82E-06	NA		5.00E-09	9.10E-01	4.55E-09	4.55E-09
Selenium	5.60E+00	6.14E-06	NA		1.78E-07	NA		2.33E-10	NA		
Silver	1.70E+00	1.86E-06	NA		5.40E-08	NA		7.08E-11	NA		
Thallium	4.25E+01	4.66E-05	NA		1.35E-06	NA		1.77E-09	NA		
Zinc	9.15E+01	1.00E-04	NA		2.91E-06	NA		3.81E-09	NA		
			Total Risk:	1.46E-04		**Total Risk:**	1.27E-05		**Total Risk:**	1.74E-07	**1.59E-04**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **2E-04**

Table 1-100

Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Shallow Soil Exposure Scenario - Future Child Resident Receptor - Background

Baseline Human Health Risk Assessment

AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Shallow Soil
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	Background
	Receptor Population:	Future Child Resident
	Receptor Age:	Child (0 to 6 yrs)

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	day/yr
Exposure Duration	ED	6	yr
Soil Ingestion Rate	IR	200	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	10	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA	2.90E+03	cm2/day [soil]
Body Weight	BW	15	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	
Arsenic	ABSas	0.03	unitless
Cadmium	ABScd	0.001	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cw [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Antimony	5.90E+00	7.54E-05	4.00E-04	**1.89E-01**	2.19E-06	4.00E-04	5.47E-03	2.87E-09	**NA**		**1.94E-01**
Arsenic	1.40E+01	1.79E-04	3.00E-04	**5.97E-01**	1.56E-05	3.00E-04	5.19E-02	6.80E-09	8.57E-06	7.93E-04	**6.49E-01**
Beryllium	9.00E-01	1.15E-05	2.00E-03	5.75E-03	3.34E-07	2.00E-03	1.67E-04	4.37E-10	5.71E-06	7.66E-05	6.00E-03
Cadmium	1.50E+00	1.92E-05	1.10E-05	**1.74E+00**	5.56E-08	1.10E-05	5.06E-03	7.29E-10	5.71E-06	1.28E-04	**1.75E+00**
Chromium	9.14E+01	1.17E-03	**NA**		3.39E-05	**NA**		4.44E-08	**NA**		
Copper	5.96E+01	7.62E-04	4.00E-02	1.91E-02	2.21E-05	4.00E-02	5.52E-04	2.90E-08	**NA**		1.96E-02
Lead	1.47E+01	1.88E-04	**NA**		5.45E-06	**NA**		7.14E-09	**NA**		
Mercury	4.00E-01	5.11E-06	3.00E-04	1.70E-02	1.48E-07	3.00E-04	4.94E-04	1.94E-10	**NA**		1.75E-02
Nickel	1.20E+02	1.54E-03	1.10E-02	**1.40E-01**	4.46E-05	1.10E-02	4.05E-03	5.84E-08	1.43E-05	4.09E-03	**1.48E-01**
Selenium	5.60E+00	7.16E-05	5.00E-03	1.43E-02	2.08E-06	5.00E-03	4.15E-04	2.72E-09	5.71E-03	4.76E-07	1.47E-02
Silver	1.70E+00	2.17E-05	5.00E-03	4.35E-03	6.30E-07	5.00E-03	1.26E-04	8.26E-10	**NA**		4.47E-03
Thallium	4.25E+01	5.43E-04	6.60E-05	**8.23E+00**	1.58E-05	6.60E-05	**2.39E-01**	2.06E-08	**NA**		**8.47E+00**
Zinc	9.15E+01	1.17E-03	**3.00E-01**	3.90E-03	3.39E-05	**3.00E-01**	1.13E-04	4.44E-08	**NA**		4.01E-03
		Total Risk (Hazard Index):		**1.10E+01**	**Total Risk (Hazard Index):**		**3.07E-01**	**Total Risk (Hazard Index):**		5.09E-03	**1.13E+01**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-Carcinogenic Risk (Hazard Index) Across All Exposure Routes : **11**

Table 1-101
Cancer Risk Results Detailed Summary of Risk Drivers - Future Adult/Child Resident - Shallow Soil - Background
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	**6.2E-05**	**7.5E-06**	1.5E-08	**7.0E-05**	99%	**1.5E-04**	**1.3E-05**	8.8E-09	**1.6E-04**	100%
Subtotal Metals	**6.3E-05**	**7.5E-06**	3.0E-07	**7.1E-05**	100%	**1.5E-04**	**1.3E-05**	1.7E-07	**1.6E-04**	100%
Total:	**6.3E-05**	**7.5E-06**	3.0E-07	**7.1E-05**	100%	**1.5E-04**	**1.3E-05**	1.7E-07	**1.6E-04**	100%

Total Estimated Cancer Risk Across All Exposure Routes: **7E-05** **2E-04**

Sum of Adult and Child Excess Lifetime Cancer Risk (30 year exposure):	**2.1E-04**	**2.0E-05**	**4.7E-07**	**2.30E-04**

Total Estimated Adult plus Child Cancer Risk Across All Exposure Routes: **2E-04**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total cancer risk for all chemicals evaluated.

Table 1-102
Noncancer Risk Results Detailed Summary of Risk Drivers - Future Adult/Child Resident - Shallow Soil - Background
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Non-Carcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Antimony	2.0E-02	8.1E-04		2.1E-02	2%	**1.9E-01**	5.5E-03		**1.9E-01**	2%
Arsenic	6.4E-02	7.7E-03	3.4E-04	7.2E-02	7%	**6.0E-01**	5.2E-02	7.9E-04	**6.5E-01**	6%
Thallium	**8.8E-01**	3.5E-02		**9.2E-01**	88%	**8.2E+00**	**2.4E-01**		**8.5E+00**	75%
Subtotal Metals	**9.9E-01**	4.4E-02	2.2E-03	**1.04E+00**	100%	**1.1E+01**	**3.1E-01**	5.1E-03	**1.1E+01**	100%
Total:	**1.0**	0.04	0.002	**1.0**	100%	**11.0**	**0.3**	0.005	**11.3**	100%

Total Estimated Hazard Index Across All Exposure Routes: **1** **11**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total hazard quotient for all chemicals evaluated.

Table 1-103
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Occupational Exposure Scenario - Future Industrial Worker Receptor - Background
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Occupational
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	Background
	Receptor Population:	Future Industrial Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	25	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	25	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	
Arsenic	ABSas	0.03	unitless
Cadmium	ABScd	0.001	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs** [mg/kg]	**Chronic Daily Intake** [mg/kg/day]	**Cancer Slope Factor, SF** [mg/kg/day]-1	**Cancer Risk** [-]	**Chronic Daily Intake** [mg/kg/day]	**Cancer Slope Factor, SF** [mg/kg/day]-1	**Cancer Risk** [-]	**Chronic Daily Intake** [mg/kg/day]	**Cancer Slope Factor, SF** [mg/kg/day]-1	**Cancer Risk** [-]	**Total Cancer Risk** [-]
Metals											
Antimony	5.90E+00	2.06E-06	NA		2.35E-07	NA		3.13E-10	NA		
Arsenic	1.40E+01	4.89E-06	9.50E+00	4.65E-05	1.67E-06	9.50E+00	1.59E-05	7.44E-10	1.51E+01	1.12E-08	**6.24E-05**
Beryllium	9.00E-01	3.15E-07	NA		3.59E-08	NA		4.78E-11	8.40E+00	4.02E-10	4.02E-10
Cadmium	1.50E+00	5.24E-07	3.80E-01	1.99E-07	5.98E-09	3.80E-01	2.27E-09	7.97E-11	1.47E+01	1.17E-09	2.03E-07
Chromium	9.14E+01	3.19E-05	NA		3.64E-06	NA		4.85E-09	4.20E+01	2.04E-07	2.04E-07
Copper	5.96E+01	2.08E-05	NA		2.37E-06	NA		3.17E-09	NA		
Lead	1.47E+01	5.14E-06	NA		5.86E-07	NA		7.81E-10	NA		
Mercury	4.00E-01	1.40E-07	NA		1.59E-08	NA		2.12E-11	NA		
Nickel	1.20E+02	4.20E-05	NA		4.79E-06	NA		6.38E-09	9.10E-01	5.81E-09	5.81E-09
Selenium	5.60E+00	1.96E-06	NA		2.23E-07	NA		2.97E-10	NA		
Silver	1.70E+00	5.94E-07	NA		6.77E-08	NA		9.03E-11	NA		
Thallium	4.25E+01	1.49E-05	NA		1.69E-06	NA		2.26E-09	NA		
Zinc	9.15E+01	3.20E-05	NA		3.65E-06	NA		4.86E-09	NA		
			Total Risk:	4.67E-05		**Total Risk:**	1.59E-05		**Total Risk:**	2.22E-07	**6.28E-05**

Notes:
NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.
RME = reasonable maximum exposure.
EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **6E-05**

Table 1-104
Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Occupational Exposure Scenario - Future Industrial Worker Receptor - Background
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Occupational
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	Background
	Receptor Population:	Future Industrial Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	**Variable**	**Value**	**Units**
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	25	yr
Soil Ingestion Rate	IR	100	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	25	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	
Arsenic	ABSas	0.03	unitless
Cadmium	ABScd	0.001	unitless
Adherence Factor	AF	0.2	mg/cm2

Risk Calculations

		Exposure Route = Oral			**Exposure Route = Dermal**			**Exposure Route = Inhalation**			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Antimony	5.90E+00	5.77E-06	4.00E-04	1.44E-02	6.58E-07	4.00E-04	1.65E-03	8.77E-10	NA		1.61E-02
Arsenic	1.40E+01	1.37E-05	3.00E-04	4.57E-02	4.68E-06	3.00E-04	1.56E-02	2.08E-09	8.57E-06	2.43E-04	6.15E-02
Beryllium	9.00E-01	8.81E-07	2.00E-03	4.40E-04	1.00E-07	2.00E-03	5.02E-05	1.34E-10	5.71E-06	2.34E-05	5.14E-04
Cadmium	1.50E+00	1.47E-06	5.00E-04	2.94E-03	1.67E-08	5.00E-04	3.35E-05	2.23E-10	5.71E-06	3.90E-05	3.01E-03
Chromium	9.14E+01	8.94E-05	NA		1.02E-05	NA		1.36E-08	NA		
Copper	5.96E+01	5.83E-05	4.00E-02	1.46E-03	6.65E-06	4.00E-02	1.66E-04	8.86E-09	NA		1.62E-03
Lead	1.47E+01	1.44E-05	NA		1.64E-06	NA		2.19E-09	NA		
Mercury	4.00E-01	3.91E-07	3.00E-04	1.30E-03	4.46E-08	3.00E-04	1.49E-04	5.95E-11	NA		1.45E-03
Nickel	1.20E+02	1.18E-04	2.00E-02	5.88E-03	1.34E-05	2.00E-02	6.70E-04	1.79E-08	1.43E-05	1.25E-03	7.80E-03
Selenium	5.60E+00	5.48E-06	5.00E-03	1.10E-03	6.25E-07	5.00E-03	1.25E-04	8.33E-10	5.71E-03	1.46E-07	1.22E-03
Silver	1.70E+00	1.66E-06	5.00E-03	3.33E-04	1.90E-07	5.00E-03	3.79E-05	2.53E-10	NA		3.71E-04
Thallium	4.25E+01	4.16E-05	6.60E-05	6.30E-01	4.74E-06	6.60E-05	7.18E-02	6.32E-09	NA		7.02E-01
Zinc	9.15E+01	8.95E-05	3.00E-01	2.98E-04	1.02E-05	3.00E-01	3.40E-05	1.36E-08	NA		3.32E-04
			Total Risk:	7.04E-01		**Total Risk:**	9.04E-02		**Total Risk:**	1.56E-03	7.96E-01

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Non-carcinogenic Risk (Hazard Index) Across All Exposure Routes : **0.8**

Table 1-105
Risk Calculation Worksheet for Shallow Soil - Carcinogenic Effects - Construction Exposure Scenario - Future Construction Worker Receptor - Background
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	Background
	Receptor Population:	Future Construction Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	1	yr
Soil Ingestion Rate	IR	330	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	
Arsenic	ABSas	0.03	unitless
Cadmium	ABScd	0.001	unitless
Adherence Factor	AF	0.8	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
Metals											
Antimony	5.90E+00	2.72E-07	NA		3.76E-08	NA		1.25E-11	NA		
Arsenic	1.40E+01	6.46E-07	9.50E+00	6.14E-06	2.68E-07	9.50E+00	2.54E-06	2.97E-11	1.51E+01	4.48E-10	**8.68E-06**
Beryllium	9.00E-01	4.15E-08	NA		5.74E-09	NA		1.91E-12	8.40E+00	1.61E-11	1.61E-11
Cadmium	1.50E+00	6.92E-08	3.80E-01	2.63E-08	9.56E-10	3.80E-01	3.63E-10	3.19E-12	1.47E+01	4.68E-11	2.67E-08
Chromium	9.14E+01	4.22E-06	NA		5.83E-07	NA		1.94E-10	4.20E+01	8.15E-09	8.15E-09
Copper	5.96E+01	2.75E-06	NA		3.80E-07	NA		1.27E-10	NA		
Lead	1.47E+01	6.78E-07	NA		9.37E-08	NA		3.12E-11	NA		
Mercury	4.00E-01	1.85E-08	NA		2.55E-09	NA		8.50E-13	NA		
Nickel	1.20E+02	5.54E-06	NA		7.66E-07	NA		2.55E-10	9.10E-01	2.32E-10	2.32E-10
Selenium	5.60E+00	2.58E-07	NA		3.57E-08	NA		1.19E-11	NA		
Silver	1.70E+00	7.84E-08	NA		1.08E-08	NA		3.61E-12	NA		
Thallium	4.25E+01	1.96E-06	NA		2.71E-07	NA		9.03E-11	NA		
Zinc	9.15E+01	4.22E-06	NA		5.83E-07	NA		1.94E-10	NA		
			Total Risk:	6.16E-06		**Total Risk:**	2.54E-06		**Total Risk:**	8.90E-09	**8.71E-06**

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **9E-06**

Table 1-106

Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Construction Exposure Scenario - Future Construction Worker Receptor - Background

Baseline Human Health Risk Assessment

AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	Background
	Receptor Population:	Future Construction Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter (units)	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	1	yr
Soil Ingestion Rate	IR	330	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	
Arsenic	ABSas	0.03	unitless
Cadmium	ABScd	0.001	unitless
Adherence Factor	AF	0.8	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Antimony	5.90E+00	1.91E-05	4.00E-04	4.76E-02	2.63E-06	4.00E-04	6.58E-03	8.77E-10	NA		5.42E-02
Arsenic	1.40E+01	4.52E-05	3.00E-04	1.51E-01	1.87E-05	3.00E-04	6.25E-02	2.08E-09	8.57E-06	2.43E-04	2.13E-01
Beryllium	9.00E-01	2.91E-06	2.00E-03	1.45E-03	4.02E-07	2.00E-03	2.01E-04	1.34E-10	5.71E-06	2.34E-05	1.68E-03
Cadmium	1.50E+00	4.84E-06	5.00E-04	9.69E-03	6.69E-08	5.00E-04	1.34E-04	2.23E-10	5.71E-06	3.90E-05	9.86E-03
Chromium	9.14E+01	2.95E-04	NA		4.08E-05	NA		1.36E-08	NA		
Copper	5.96E+01	1.92E-04	4.00E-02	4.81E-03	2.66E-05	4.00E-02	6.65E-04	8.86E-09	NA		5.48E-03
Lead	1.47E+01	4.75E-05	NA		6.56E-06	NA		2.19E-09	NA		
Mercury	4.00E-01	1.29E-06	3.00E-04	4.31E-03	1.78E-07	3.00E-04	5.95E-04	5.95E-11	NA		4.90E-03
Nickel	1.20E+02	3.88E-04	2.00E-02	1.94E-02	5.36E-05	2.00E-02	2.68E-03	1.79E-08	1.43E-05	1.25E-03	2.33E-02
Selenium	5.60E+00	1.81E-05	5.00E-03	3.62E-03	2.50E-06	5.00E-03	5.00E-04	8.33E-10	5.71E-03	1.46E-07	4.12E-03
Silver	1.70E+00	5.49E-06	5.00E-03	1.10E-03	7.59E-07	5.00E-03	1.52E-04	2.53E-10	NA		1.25E-03
Thallium	4.25E+01	1.37E-04	6.60E-05	2.08E+00	1.90E-05	6.60E-05	2.87E-01	6.32E-09	NA		2.37E+00
Zinc	9.15E+01	2.95E-04	3.00E-01	9.85E-04	4.08E-05	3.00E-01	1.36E-04	1.36E-08	NA		1.12E-03
			Total Risk:	2.32E+00		**Total Risk:**	3.61E-01		**Total Risk:**	1.56E-03	2.69

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **3**

Table 1-106

Risk Calculation Worksheet for Shallow Soil - Noncarcinogenic Effects - Construction Exposure Scenario - Future Construction Worker Receptor - Background

Baseline Human Health Risk Assessment

AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Shallow Soil
	Exposure Point:	Background
	Receptor Population:	Future Construction Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter (units)	Variable	Value	Units
Exposure Frequency	EF	250	day/yr
Exposure Duration	ED	1	yr
Soil Ingestion Rate	IR	330	mg/day
Inhalation Rate (Soil Particulate Inhalation)	InR	20	m3/day
Skin Surface Area (Soil Contact; 1 event per day)	SA	5.70E+03	cm2/day [soil]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (yr to day)	CF3	2.74E-03	yrs/day
Conversion Factor (mg to kg)	CF4	1.00E-06	kg/mg
Particulate Emission Factor	PEF	1.32E+09	m3/kg
Chemical Specific skin absorption defaults	ABS		
Inorganics	ABSin	0.01	
Arsenic	ABSas	0.03	unitless
Cadmium	ABScd	0.001	unitless
Adherence Factor	AF	0.8	mg/cm2

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cs [mg/kg]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Antimony	5.90E+00	1.91E-05	4.00E-04	4.76E-02	2.63E-06	4.00E-04	6.58E-03	8.77E-10	NA		5.42E-02
Arsenic	1.40E+01	4.52E-05	3.00E-04	1.51E-01	1.87E-05	3.00E-04	6.25E-02	2.08E-09	8.57E-06	2.43E-04	2.13E-01
Beryllium	9.00E-01	2.91E-06	2.00E-03	1.45E-03	4.02E-07	2.00E-03	2.01E-04	1.34E-10	5.71E-06	2.34E-05	1.68E-03
Cadmium	1.50E+00	4.84E-06	5.00E-04	9.69E-03	6.69E-08	5.00E-04	1.34E-04	2.23E-10	5.71E-06	3.90E-05	9.86E-03
Chromium	9.14E+01	2.95E-04	NA		4.08E-05	NA		1.36E-08	NA		
Copper	5.96E+01	1.92E-04	4.00E-02	4.81E-03	2.66E-05	4.00E-02	6.65E-04	8.86E-09	NA		5.48E-03
Lead	1.47E+01	4.75E-05	NA		6.56E-06	NA		2.19E-09	NA		
Mercury	4.00E-01	1.29E-06	3.00E-04	4.31E-03	1.78E-07	3.00E-04	5.95E-04	5.95E-11	NA		4.90E-03
Nickel	1.20E+02	3.88E-04	2.00E-02	1.94E-02	5.36E-05	2.00E-02	2.68E-03	1.79E-08	1.43E-05	1.25E-03	2.33E-02
Selenium	5.60E+00	1.81E-05	5.00E-03	3.62E-03	2.50E-06	5.00E-03	5.00E-04	8.33E-10	5.71E-03	1.46E-07	4.12E-03
Silver	1.70E+00	5.49E-06	5.00E-03	1.10E-03	7.59E-07	5.00E-03	1.52E-04	2.53E-10	NA		1.25E-03
Thallium	4.25E+01	1.37E-04	6.60E-05	2.08E+00	1.90E-05	6.60E-05	2.87E-01	6.32E-09	NA		2.37E+00
Zinc	9.15E+01	2.95E-04	3.00E-01	9.85E-04	4.08E-05	3.00E-01	1.36E-04	1.36E-08	NA		1.12E-03
			Total Risk:	2.32E+00		**Total Risk:**	3.61E-01		**Total Risk:**	1.56E-03	2.69

Notes:

NA = no data; this toxicity value is not available in the standard U.S. EPA toxicity value databases.

RME = reasonable maximum exposure.

EPC = exposure point concentration.

Total Estimated Carcinogenic Risk Across All Exposure Routes : **3**

Table 1-107
Cancer Risk Results Detailed Summary of Risk Drivers - Future Industrial/Construction Worker - Shallow Soil - Background
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Future Industrial Worker					Future Construction Worker				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	**4.6E-05**	**1.6E-05**	1.1E-08	**6.2E-05**	99%	**6.1E-06**	**2.5E-06**	4.5E-10	**8.7E-06**	100%
Subtotal Metals	**4.7E-05**	**1.6E-05**	2.2E-07	**6.3E-05**	100%	**6.2E-06**	**2.5E-06**	8.9E-09	**8.7E-06**	100%
Total:	**4.7E-05**	**1.6E-05**	2.2E-07	**6.28E-05**		**6.2E-06**	**2.5E-06**	8.9E-09	**8.71E-06**	

Total Estimated Cancer Risk Across All Exposure Routes: **6E-05** **9E-06**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total cancer risk for all chemicals evaluated.

Table 1-108
Noncancer Risk Results Detailed Summary of Risk Drivers - Future Industrial/Construction Worker - Shallow Soil - Background
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Non-Carcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Future Industrial Worker					Future Construction Worker				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	4.6E-02	1.6E-02	2.4E-04	6.2E-02	8%	**1.5E-01**	6.2E-02	2.4E-04	**2.1E-01**	8%
Thallium	**6.3E-01**	7.2E-02		**7.0E-01**	88%	**2.1E+00**	**2.9E-01**		**2.4E+00**	88%
Subtotal Metals	**7.0E-01**	9.0E-02	1.6E-03	**8.0E-01**	100%	**2.3E+00**	**3.6E-01**	1.6E-03	**2.7E+00**	100%
Total:	0.7	0.1	0.002	0.8		2.3	0.4	0.002	2.7	

Total Estimated Hazard Index Across All Exposure Routes: **0.8** **3**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total hazard quotient for all chemicals evaluated.

Table 1-109
Summary of Cancer Risks and Noncancer Hazards - Soil
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario/ Receptor	Former AMCO Chemical Facility		Parking Lot		Large Vacant Lot		Small Vacant Lot	
	Cancer	Noncancer	Cancer	Noncancer	Cancer	Noncancer	Cancer	Noncancer
Worker								
Shallow Soil								
Industrial Worker	1E-04	2	1E-04	1	2E-04	0.7	1E-04	0.4
Construction Worker	1E-05	4	2E-05	4	2E-05	3	1E-05	1
Deep Soil								
Industrial Worker	2E-04	2	2E-04	1	1E-04	0.6		
Construction Worker	2E-05	5	3E-05	4	2E-05	2		
Future Resident								
Shallow Soil								
Adult	1.6E-04	3	1.3E-04	2	1.7E-04	0.9	1.1E-04	0.5
Child	2.3E-04	12	3.0E-04	16	3.9E-04	8	2.4E-04	4
Total	4E-04		4E-04		6E-04		3E-04	
Deep Soil								
Adult	1.8E-04	3	1.7E-04	2	1.2E-04	0.7		
Child	2.5E-04	13	3.7E-04	14	2.6E-04	6		
Total	4E-04		5E-04		4E-04			

Table 1-110
Summary of Cancer Risks - Resident Receptors - Soil plus Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario / Receptor	Cancer Risk			
	Former AMCO Chemical Facility	Parking Lot	Large Vacant Lot	Small Vacant Lot
Future Resident				
Shallow Soil plus Groundwater				
Adult (Soil)	2E-04	1E-04	2E-04	1E-04
Child (Soil)	2E-04	3E-04	4E-04	2E-04
Groundwater (Adult plus Child)	1E-01	1E-01	1E-01	1E-01
Combined Cancer Risk	1E-01	1E-01	1E-01	1E-01
Deep Soil plus Groundwater				
Future Resident	2E-04	2E-04	1E-04	
Child (Soil)	3E-04	4E-04	3E-04	
Groundwater (Adult plus Child)	1E-01	1E-01	1E-01	
Combined Cancer Risk	1E-01	1E-01	1E-01	

Table 1-111
Summary of Target Organ / Endpoint for Health Hazards
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical	Target Organ / Endpoint	Source
1,2,4-Trimethylbenzene	Decreased body weight	PPRTV
1,3,5-Trimethylbenzene	Decreased body weight	PPRTV
2-Methylnaphthalene	Lungs	IRIS
4,4'-DDT	Liver	IRIS
Aldrin	Liver	IRIS
Aluminum	NA	PPRTV
alpha-Chlordane	Liver	IRIS
Antimony	Blood (glucose), Mortality	IRIS
Aroclor-1260*	Eyes	IRIS
Arsenic	Skin, Circulatory System	IRIS
Barium	Kidney	IRIS
Benzene	Immune system (decreased lymphocyte count)	IRIS
Beryllium	GI (Small intestinal lesions)	IRIS
Cadmium	Kidney	IRIS
Chlorobenzene	Liver	IRIS
Chloromethane	Brain (cerebellar lesions)	IRIS
cis-1,2-Dichloroethene	Decreased hematocrit and hemoglobin (Blood)	PPRTV
Copper	GI	HEAST
Dieldrin	Liver	IRIS
gamma-Chlordane	Liver	IRIS
Iron	Liver, Blood	NCEA
Manganese	CNS	IRIS
Mercury	CNS	IRIS
Naphthalene	Decreased body weight	IRIS
Nickel	Whole body	IRIS
Selenium	Respiratory system - selenosis	IRIS
Silver	Skin	IRIS
Tetrachloroethene	Kidney	OEHHA
Thallium**	Liver enzyme increase	IRIS
Toluene	Kidney	IRIS
Trichloroethene	Nervous system	NCEA
Vanadium	Respiratory system	NCEA
Vinyl chloride	Liver	IRIS
Xylenes, total	Decreased body weight, increased mortality	IRIS
Zinc	Red blood cells	IRIS

Notes
NA = Target organ data not available
*Aroclor 1254 used as surrogate
**Thallium chloride used as a surrogate
PPRTV = Provisional Peer Reviewed Toxicity Value
IRIS = Integrated Risk Information System
NCEA = National Center for Environmental Assessment
OEHHA = Office of Environmental Health Hazard Assessment

Table 1-112
Noncancer Health Hazard - Risk Drivers for Future Adult Residents - Shallow and Deep Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Shallow Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
cis-1,2-Dichloroethene	1	48%	Decreased hematocrit and hemoglobin (Blood)
Xylenes, total	0.3	10%	Decreased body weight, increased mortality
Naphthalene	0.3	9%	Decreased body weight
Iron	0.1	4%	Liver, Blood
Toluene	0.1	4%	Kidney
Manganese	0.08	3%	CNS
Aldrin	0.07	2%	Liver
Aroclor-1260	0.07	2%	Eyes
Thallium	0.07	2%	Liver enzyme increase
2-Methylnaphthalene	0.06	2%	Lungs
Total Hazard Index[1]	**3**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Blood	1
Decreased body weight	0.6
Liver	0.3
Kidney	0.1
CNS	0.08
Eyes	0.07
Lungs	0.06

Table 1-112
Noncancer Health Hazard - Risk Drivers for Future Adult Residents - Shallow and Deep Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Deep Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
cis-1,2-Dichloroethene	1	44%	Decreased hematocrit and hemoglobin (Blood)
Naphthalene	0.3	9%	Decreased body weight
Xylenes, total	0.3	9%	Decreased body weight, increased mortality
2-Methylnaphthalene	0.2	8%	Lungs
Iron	0.1	4%	Liver, Blood
Aroclor-1260	0.1	4%	Eyes
Antimony	0.07	3%	Blood (glucose), Mortality
Dieldrin	0.07	2%	Liver
Manganese	0.06	2%	CNS
Thallium	0.06	2%	Liver enzyme increase
Total Hazard Index[1]	**3**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Blood	1
Decreased body weight	0.5
Lungs	0.2
Liver	0.2
Eyes	0.1
CNS	0.06

Notes
NA = Target organ data not available
CNS = Central Nervous System
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Table 1-113
Noncancer Health Hazard - Risk Drivers for Future Child Residents - Shallow and Deep Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Shallow Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
cis-1,2-Dichloroethene	3	29%	Decreased hematocrit and hemoglobin (Blood)
Iron	1	10%	Liver, Blood
Naphthalene	0.7	6%	Decreased body weight
Xylenes, total	0.7	6%	Decreased body weight, increased mortality
Manganese	0.7	6%	CNS
Thallium	0.6	5%	Liver enzyme increase
Aldrin	0.6	5%	Liver
Aroclor-1260	0.6	5%	Eyes
Vanadium	0.5	5%	Respiratory system
2-Methylnaphthalene	0.5	4%	Lungs
Total Hazard Index[1]	**12**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Blood	3
Liver	2
Decreased body weight	1
CNS	0.7
Eyes	0.6
Respiratory system	0.5
Lungs	0.5

Table 1-113
Noncancer Health Hazard - Risk Drivers for Future Child Residents - Shallow and Deep Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Deep Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
cis-1,2-Dichloroethene	3	24%	Decreased hematocrit and hemoglobin (Blood)
2-Methylnaphthalene	2	14%	Lungs
Iron	1	8%	Liver, Blood
Aroclor-1260	0.9	7%	Eyes
Antimony	0.7	5%	Blood (glucose), Mortality
Naphthalene	0.7	5%	Decreased body weight
Dieldrin	0.6	5%	Liver
Xylenes, total	0.6	5%	Decreased body weight, increased mortality
Thallium	0.6	4%	Liver enzyme increase
Vanadium	0.5	4%	Respiratory system
Total Hazard Index[1]	**13**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Blood	4
Liver	2
Lungs	2
Decreased body weight	1
Eyes	0.9
Respiratory system	0.5

Notes
NA = Target organ data not available
CNS = Central Nervous System
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Table 1-114
Noncancer Health Hazard - Risk Drivers for Industrial Worker - Shallow and Deep Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Shallow Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
cis-1,2-Dichloroethene	1	45%	Decreased hematocrit and hemoglobin (Blood)
Xylenes, total	0.2	9%	Decreased body weight, increased mortality
Naphthalene	0.2	9%	Decreased body weight
Iron	0.09	4%	Liver, Blood
Aroclor-1260	0.08	4%	Eyes
2-Methylnaphthalene	0.08	3%	Lungs
Aldrin	0.07	3%	Liver
Manganese	0.06	3%	CNS
Thallium	0.05	2%	Liver enzyme increase
Vanadium	0.05	2%	Respiratory system
Total Hazard Index[1]	**2**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Blood	1
Decreased body weight	0.4
Liver	0.2
Eyes	0.08
Lungs	0.08
CNS	0.06
Respiratory System	0.05

Table 1-114
Noncancer Health Hazard - Risk Drivers for Industrial Worker - Shallow and Deep Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Deep Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
cis-1,2-Dichloroethene	0.9	40%	Decreased hematocrit and hemoglobin (Blood)
2-Methylnaphthalene	0.3	12%	Lungs
Naphthalene	0.2	9%	Decreased body weight
Xylenes, total	0.2	8%	Decreased body weight, increased mortality
Aroclor-1260	0.1	6%	Eyes
Iron	0.09	4%	Liver, Blood
Dieldrin	0.06	3%	Liver
Antimony	0.06	2%	Blood (glucose), Mortality
Thallium	0.05	2%	Liver enzyme increase
Aldrin	0.05	2%	Liver
Total Hazard Index[1]	**2**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Blood	1
Decreased body weight	0.4
Lungs	0.3
Liver	0.2
Eyes	0.1

Notes
NA = Target organ data not available
CNS = Central Nervous System
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Table 1-115
Noncancer Health Hazard - Risk Drivers for Future Construction Workers - Shallow and Deep Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Shallow Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
cis-1,2-Dichloroethene	1	28%	Decreased hematocrit and hemoglobin (Blood)
Iron	0.3	8%	Liver, Blood
Aroclor-1260	0.3	8%	Eyes
2-Methylnaphthalene	0.3	7%	Lungs
Aldrin	0.2	6%	Liver
Naphthalene	0.2	6%	Decreased body weight
Xylenes, total	0.2	5%	Decreased body weight, increased mortality
Manganese	0.2	5%	CNS
Thallium	0.2	4%	Liver enzyme increase
Vanadium	0.2	4%	Respiratory system
Total Hazard Index[1]	**4**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Blood	1
Liver	0.7
Decreased Body Weight	0.4
Eyes	0.3
Lungs	0.3
CNS	0.2
Respiratory system	0.2

Table 1-115
Noncancer Health Hazard - Risk Drivers for Future Construction Workers - Shallow and Deep Soil - Former AMCO Chemical Facility
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Deep Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
2-Methylnaphthalene	1	21%	Lungs
cis-1,2-Dichloroethene	1	21%	Decreased hematocrit and hemoglobin (Blood)
Aroclor-1260	0.5	10%	Eyes
Iron	0.3	6%	Liver, Blood
Dieldrin	0.2	5%	Liver
Naphthalene	0.2	5%	Decreased body weight
Antimony	0.2	4%	Blood (glucose), Mortality
Xylenes, total	0.2	4%	Decreased body weight, increased mortality
Aldrin	0.2	4%	Liver
Thallium	0.2	3%	Liver enzyme increase
Total Hazard Index[1]	**5**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Lungs	1
Blood	1
Liver	0.8
Eyes	0.5
Decreased Body Weight	0.4

Notes
NA = Target organ data not available
CNS = Central Nervous System
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Table 1-116
Noncancer Health Hazard - Risk Drivers for Future Adult Residents - Shallow and Deep Soil - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Shallow Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
Antimony	0.8	45%	Blood (glucose), Mortality
Iron	0.4	21%	Liver, Blood
Thallium	0.1	6%	Liver enzyme increase
Arsenic	0.1	6%	Skin, Circulatory System
Vanadium	0.09	5%	Respiratory system
Barium	0.08	5%	Kidney
Manganese	0.08	5%	CNS
Zinc	0.04	2%	Red blood cells
Cadmium	0.03	2%	Kidney
Aluminum	0.02	1%	NA
Total Hazard Index[1]	**2**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Blood	0.8
Liver	0.5
Kidney	0.1
Skin	0.1
Respiratory System	0.09
CNS	0.08

Table 1-116
Noncancer Health Hazard - Risk Drivers for Future Adult Residents - Shallow and Deep Soil - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Deep Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
Antimony	0.8	51%	Blood (glucose), Mortality
Iron	0.3	18%	Liver, Blood
Thallium	0.08	5%	Liver enzyme increase
Barium	0.08	5%	Kidney
Vanadium	0.07	5%	Respiratory system
Arsenic	0.07	4%	Skin, Circulatory System
Manganese	0.06	4%	CNS
Zinc	0.04	3%	Red blood cells
Cadmium	0.03	2%	Kidney
Aluminum	0.02	1%	NA
Total Hazard Index[1]	**2**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Blood	0.8
Liver	0.4
Kidney	0.1
Skin	0.07
Respiratory System	0.07
CNS	0.06

Notes
NA = Target organ data not available
CNS = Central Nervous System
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Table 1-117
Noncancer Health Hazard - Risk Drivers for Future Child Residents - Shallow and Deep Soil - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Shallow Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
Antimony	7	46%	Blood (glucose), Mortality
Iron	3	21%	Liver, Blood
Thallium	1	6%	Liver enzyme increase
Arsenic	0.9	6%	Skin, Circulatory System
Vanadium	0.8	5%	Respiratory system
Barium	0.7	5%	Kidney
Manganese	0.6	4%	CNS
Zinc	0.4	2%	Red blood cells
Cadmium	0.3	2%	Kidney
Aluminum	0.2	1%	NA
Total Hazard Index[1]	**16**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Blood	7
Liver	4
Kidney	1
Skin	0.9
Respiratory system	0.8
CNS	0.6

Table 1-117
Noncancer Health Hazard - Risk Drivers for Future Child Residents - Shallow and Deep Soil - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Deep Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
Antimony	7	51%	Blood (glucose), Mortality
Iron	3	18%	Liver, Blood
Thallium	0.8	6%	Liver enzyme increase
Barium	0.7	5%	Kidney
Vanadium	0.7	5%	Respiratory system
Arsenic	0.6	4%	Skin, Circulatory System
Manganese	0.5	4%	CNS
Zinc	0.4	3%	Red blood cells
Cadmium	0.3	2%	Kidney
Aluminum	0.2	1%	NA
Total Hazard Index[1]	**14**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Blood	7
Liver	3
Kidney	1
Respiratory system	0.7
Skin	0.6
CNS	0.5

Notes
NA = Target organ data not available
CNS = Central Nervous System
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Table 1-118
Noncancer Health Hazard - Risk Drivers for Industrial Worker - Shallow and Deep Soil - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Shallow Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
Antimony	0.6	45%	Blood (glucose), Mortality
Iron	0.3	21%	Liver, Blood
Arsenic	0.09	7%	Skin, Circulatory System
Thallium	0.08	6%	Liver enzyme increase
Vanadium	0.07	5%	Respiratory system
Barium	0.06	5%	Kidney
Manganese	0.06	5%	CNS
Zinc	0.03	2%	Red blood cells
Cadmium	0.02	2%	Kidney
Aluminum	0.02	1%	NA
Total Hazard Index[1]	**1**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Blood	1
Liver	0.4
Skin	0.09
Kidney	0.09
Respiratory system	0.07
CNS	0.06

Table 1-118
Noncancer Health Hazard - Risk Drivers for Industrial Worker - Shallow and Deep Soil - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Deep Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
Antimony	0.6	51%	Blood (glucose), Mortality
Iron	0.2	18%	Liver, Blood
Thallium	0.06	5%	Liver enzyme increase
Barium	0.06	5%	Kidney
Arsenic	0.06	5%	Skin, Circulatory System
Vanadium	0.05	5%	Respiratory system
Manganese	0.05	4%	CNS
Zinc	0.03	3%	Red blood cells
Cadmium	0.02	2%	Kidney
Aluminum	0.02	1%	NA
Total Hazard Index[1]	**1**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Blood	0.6
Liver	0.3
Kidney	0.08
Skin	0.06
Respiratory system	0.05
CNS	0.05

Notes
NA = Target organ data not available
CNS = Central Nervous System
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Table 1-119
Noncancer Health Hazard - Risk Drivers for Future Construction Worker - Shallow and Deep Soil - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Shallow Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
Antimony	2	45%	Blood (glucose), Mortality
Iron	0.9	21%	Liver, Blood
Arsenic	0.3	7%	Skin, Circulatory System
Thallium	0.3	6%	Liver enzyme increase
Vanadium	0.2	5%	Respiratory system
Barium	0.2	5%	Kidney
Manganese	0.2	4%	CNS
Zinc	0.1	2%	Red blood cells
Cadmium	0.07	2%	Kidney
Aluminum	0.05	1%	NA
Total Hazard Index[1]	**4**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Blood	2
Liver	1
Skin	0.3
Kidney	0.3
Respiratory system	0.2
CNS	0.2

Table 1-119
Noncancer Health Hazard - Risk Drivers for Future Construction Worker - Shallow and Deep Soil - Parking Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Deep Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
Antimony	2	51%	Blood (glucose), Mortality
Iron	0.7	18%	Liver, Blood
Thallium	0.2	5%	Liver enzyme increase
Arsenic	0.2	5%	Skin, Circulatory System
Barium	0.2	5%	Kidney
Vanadium	0.2	5%	Respiratory system
Manganese	0.1	4%	CNS
Zinc	0.1	3%	Red blood cells
Cadmium	0.07	2%	Kidney
Aluminum	0.05	1%	NA
Total Hazard Index[1]	**4**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Blood	2
Liver	0.9
Kidney	0.3
Skin	0.2
Respiratory system	0.2
CNS	0.1

Notes
NA = Target organ data not available
CNS = Central Nervous System
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Table 1-120
Noncancer Health Hazard - Risk Drivers for Future Child Residents - Shallow and Deep Soil - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Shallow Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
4,4'-DDT	4	46%	Liver
Arsenic	1	16%	Skin, Circulatory System
Iron	1	14%	Liver, Blood
Thallium	0.5	7%	Liver enzyme increase
Vanadium	0.4	6%	Respiratory system
Manganese	0.2	3%	CNS
Barium	0.2	2%	Kidney
Aluminum	0.1	2%	NA
Antimony	0.1	1%	Blood (glucose), Mortality
Cadmium	0.06	0.8%	Kidney
Total Hazard Index[1]	**8**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Liver	5
Skin	1
Respiratory system	0.4
CNS	0.2
Kidney	0.2
Blood	0.1

Table 1-120
Noncancer Health Hazard - Risk Drivers for Future Child Residents - Shallow and Deep Soil - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Deep Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
4,4'-DDT	2	41%	Liver
Iron	0.9	16%	Liver, Blood
Arsenic	0.8	14%	Skin, Circulatory System
Thallium	0.5	9%	Liver enzyme increase
Vanadium	0.4	7%	Respiratory system
Manganese	0.2	3%	CNS
Barium	0.1	2%	Kidney
Antimony	0.1	2%	Blood (glucose), Mortality
Aluminum	0.1	2%	NA
Cadmium	0.04	0.8%	Kidney
Total Hazard Index[1]	**6**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Liver	4
Skin	0.8
Respiratory system	0.4
CNS	0.2
Kidney	0.2
Blood	0.1

Notes
NA = Target organ data not available
CNS = Central Nervous System
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Table 1-121
Noncancer Health Hazard - Risk Drivers for Future Construction Workers - Shallow and Deep Soil - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Shallow Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
4,4'-DDT	1	51%	Liver
Arsenic	0.4	16%	Skin, Circulatory System
Iron	0.3	12%	Liver, Blood
Thallium	0.1	6%	Liver enzyme increase
Vanadium	0.1	5%	Respiratory system
Manganese	0.06	2%	CNS
Barium	0.05	2%	Kidney
Aluminum	0.03	1%	NA
Antimony	0.03	1%	Blood (glucose), Mortality
Aroclor-1260	0.02	0.6%	Eyes
Total Hazard Index[1]	**3**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Liver	2
Skin	0.4
Respiratory system	0.1
CNS	0.06
Kidney	0.05
Blood	0.03
Eyes	0.02

Table 1-121
Noncancer Health Hazard - Risk Drivers for Future Construction Workers - Shallow and Deep Soil - Large Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Deep Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
4,4'-DDT	0.9	46%	Liver
Arsenic	0.3	15%	Skin, Circulatory System
Iron	0.3	14%	Liver, Blood
Thallium	0.1	8%	Liver enzyme increase
Vanadium	0.1	6%	Respiratory system
Manganese	0.05	3%	CNS
Barium	0.03	2%	Kidney
Aluminum	0.03	2%	NA
Antimony	0.03	2%	Blood (glucose), Mortality
Aroclor-1260	0.02	0.9%	Eyes
Total Hazard Index[1]	**2**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Liver	1
Skin	0.3
Respiratory system	0.1
CNS	0.05
Kidney	0.03
Blood	0.03
Eyes	0.02

Notes
NA = Target organ data not available
CNS = Central Nervous System
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Table 1-122
Noncancer Health Hazard - Risk Drivers for Future Child Residents - Shallow Soil - Small Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Shallow Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
4,4'-DDT	1	32%	Liver
Iron	0.7	17%	Liver, Blood
Arsenic	0.7	16%	Skin, Circulatory System
Dieldrin	0.4	9%	Liver
Vanadium	0.3	8%	Respiratory system
alpha-Chlordane	0.2	6%	Liver
gamma-Chlordane	0.2	4%	Liver
Aluminum	0.1	3%	NA
Cadmium	0.05	1%	Kidney
Barium	0.05	1%	Kidney
Total Hazard Index[1]	**4**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Liver	3
Skin	0.7
Respiratory system	0.3
Kidney	0.1

Notes
NA = Target organ data not available
CNS = Central Nervous System
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Table 1-123
Noncancer Health Hazard - Risk Drivers for Future Construction Workers - Shallow Soil - Small Vacant Lot
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Shallow Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
4,4'-DDT	0.5	35%	Liver
Arsenic	0.2	16%	Skin, Circulatory System
Iron	0.2	14%	Liver, Blood
Dieldrin	0.1	10%	Liver
Vanadium	0.1	7%	Respiratory system
alpha-Chlordane	0.09	6%	Liver
gamma-Chlordane	0.06	5%	Liver
Aluminum	0.03	2%	NA
Barium	0.01	1%	Kidney
Cadmium	0.01	1%	Kidney
Total Hazard Index[1]	**1**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Liver	1
Skin	0.2
Respiratory system	0.1
Kidney	0.03

Notes
NA = Target organ data not available
CNS = Central Nervous System
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Table 1-124
Noncancer Health Hazard - Risk Drivers for Future Adult Residents - Shallow Soil - Background
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Shallow Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
Thallium	0.9	89%	Liver enzyme increase
Arsenic	0.07	7%	Skin, Circulatory System
Antimony	0.02	2%	Blood (glucose), Mortality
Nickel	0.01	1%	Whole body
Cadmium	0.004	0.4%	Kidney
Copper	0.002	0.2%	GI
Mercury	0.002	0.2%	CNS
Selenium	0.002	0.2%	Respiratory system - selenosis
Beryllium	0.001	0.1%	GI (Small intestinal lesions)
Silver	0.0005	0.05%	Skin
Total Hazard Index[1]	**1**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Liver	0.9
Skin	0.07
Blood	0.02
Whole Body	0.01
Kidney	0.004
GI	0.003
CNS	0.002
Respiratory	0.002

Notes
NA = Target organ data not available
CNS = Central Nervous System
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Table 1-125
Noncancer Health Hazard - Risk Drivers for Future Child Residents - Shallow Soil - Background
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Shallow Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
Thallium	8	89%	Liver enzyme increase
Arsenic	0.6	7%	Skin, Circulatory System
Antimony	0.2	2%	Blood (glucose), Mortality
Nickel	0.08	1%	Whole body
Cadmium	0.04	0.4%	Kidney
Copper	0.02	0.2%	GI
Mercury	0.02	0.2%	CNS
Selenium	0.01	0.2%	Respiratory system - selenosis
Beryllium	0.006	0.1%	GI (Small intestinal lesions)
Silver	0.004	0.05%	Skin
Total Hazard Index[1]	**10**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Liver	8
Skin	0.7
Blood	0.2
Whole Body	0.08
Kidney	0.04
GI	0.03
CNS	0.02
Respiratory	0.01

Notes
NA = Target organ data not available
CNS = Central Nervous System
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Table 1-126
Noncancer Health Hazard - Risk Drivers for Future Construction Workers - Shallow Soil - Background
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Shallow Soil

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
Thallium	2	88%	Liver enzyme increase
Arsenic	0.2	8%	Skin, Circulatory System
Antimony	0.05	2%	Blood (glucose), Mortality
Nickel	0.02	0.9%	Whole body
Cadmium	0.01	0.4%	Kidney
Copper	0.005	0.2%	GI
Mercury	0.005	0.2%	CNS
Selenium	0.004	0.2%	Respiratory system - selenosis
Beryllium	0.002	0.06%	GI (Small intestinal lesions)
Silver	0.001	0.05%	Skin
Total Hazard Index[1]	**3**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Liver	2
Skin	0.2
Blood	0.05
Whole body	0.02
Kidney	0.01
GI	0.007
CNS	0.005
Respiratory System	0.004

Notes
NA = Target organ data not available
CNS = Central Nervous System
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Attachment 2
Detailed Risk and Hazard Results for Exposure to Groundwater

Attachment 2 - Table of Contents - Groundwater Risk Calculations
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Table 2-1
AMCO Summary Statistics and Exposure Point Concentrations for Groundwater Exposure Area
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Number of Detects	Number of Analyses	Percent Detects	Units	Minimum Detected Value	Maximum Detected Value	Minimum Non-detected Value	Maximum Non-detected Value	Location of Maximum Detected Value	Arithmetic Mean Value	Standard Deviation	Exposure Point Concentration	EPC Basis	Final Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
GrabShallowData combined with 2005-2006 ShallowZoneData															
Metals															
Aluminum	54	68	79	ug/L	215	62700	200	400	BPZ-01	2890	8590	9398	97.5% Chebyshev (Mean, Sd) UCL	9398	97.5% Chebyshev (Mean, Sd) UCL
Antimony	8	68	12	ug/L	0.81	4.7	1.0	4.0	BPZ-01	1.37	0.68	1.51	95% Student's-t UCL	12143	97.5% Chebyshev (Mean, Sd) UCL
Arsenic	67	68	99	ug/L	0.66	2020	2.0	2.0	RMW-09-15	136	324	287	95% H-UCL	1.62	95% Student's-t UCL
Barium	68	68	100	ug/L	15.2	828	NA	NA	RMW-02-13	137	171	168	95% H-UCL	334	97.5% Chebyshev (Mean, Sd) UCL
Beryllium	9	67	13	ug/L	0.09	1.5	0.5	2.0	BPZ-01	0.61	0.29	0.76	95% Chebyshev (Mean, Sd) UCL	179	95% H-UCL
Boron	18	18	100	ug/L	359	9560	NA	NA	BPZ-01	3010	2640	4307	95% Approximate Gamma UCL	0.81	95% Chebyshev (Mean, Sd) UCL
Cadmium	25	67	37	ug/L	0.03	5.8	1.0	2.0	BPZ-01	0.764	0.92	1.26	95% Chebyshev (Mean, Sd) UCL	4307	95% Approximate Gamma UCL
Chromium	48	68	71	ug/L	2.2	187	2.0	4.0	BPZ-01	13.5	29.3	35.7	97.5% Chebyshev (Mean, Sd) UCL	21.7	95% H-UCL
Chromium (VI)	1	6	17	ug/L	0.35	0.35	0.2	1.0	RMW-06-15	0.275	0.20	0.63	95% Chebyshev (Mean, Sd) UCL	0.35	Maximum Result
Cobalt	63	68	93	ug/L	0.35	40.8	1.0	1.0	RMW-10-15	7.11	8.37	8.89	95% Approximate Gamma UCL	9.52	95% Approximate Gamma UCL
Copper	66	68	97	ug/L	0.8	1650	2.0	4.0	BMW-08	47	202	46.6	95% H-UCL	264	97.5% Chebyshev (Mean, Sd) UCL
Iron	65	68	96	ug/L	103	105000	100	100	BPZ-01	12700	21700	53504	95% Chebyshev (MVUE) UCL	61.4	95% H-UCL
Lead	65	68	96	ug/L	0.18	1050	1.0	1.0	BPZ-01	32.2	134	40.0	95% H-UCL	50.9	95% H-UCL
Manganese	68	68	100	ug/L	19.5	14900	NA	NA	RMW-09-15	3390	3650	4331	95% Approximate Gamma UCL	0.17	95% Chebyshev (Mean, Sd) UCL
Mercury	18	67	27	ug/L	0.029	0.83	0.03	0.2	RMW-02-13	0.102	0.094	0.12	95% Student's-t UCL	5.64	95% Chebyshev (Mean, Sd) UCL
Molybdenum	4	18	22	ug/L	0.78	8.6	5.0	10	RMW-04-15	3.42	2.16	5.64	95% Chebyshev (Mean, Sd) UCL		
Nickel	68	68	100	ug/L	3.1	376	NA	NA	RMW-10-15	42.5	63.4	54.6	95% H-UCL		
Selenium	27	68	40	ug/L	0.59	174	5.0	10	BMW-08	7.43	21.7	18.9	95% Chebyshev (Mean, Sd) UCL		
Silver	1	68	1	ug/L	0.12	0.12	0.5	2.0	RMW-01-17	0.616	0.23	0.66	95% Student's-t UCL	24.1	95% Chebyshev (Mean, Sd) UCL
Thallium	1	67	1	ug/L	0.05	0.05	1.0	2.0	RMW-10-15	0.62	0.23	0.67	95% Student's-t UCL	0.05	Maximum Result
Vanadium	62	68	91	ug/L	1.2	186	1.0	2.0	BPZ-01	12.5	25.6	31.9	97.5% Chebyshev (Mean, Sd) UCL	38.8	97.5% Chebyshev (Mean, Sd) UCL
Zinc	65	65	100	ug/L	1.3	6870	NA	NA	RMW-10-15	338	1190	303	95% H-UCL	2200	99% Chebyshev (Mean, Sd) UCL
Cyanide	3	6	50	ug/L	2.8	62.9	10	10	RMW-03-15	14.4	23.8	111	99% Chebyshev (Mean, Sd) UCL	62.9	Maximum Result
Pesticides/PCBs															
4,4'-DDD	24	60	40	ug/L	0.007	17	0.02	10	RMW-02-13	1.02	3.10	5.00	99% Chebyshev (Mean, Sd) UCL	5.00	99% Chebyshev (Mean, Sd) UCL
4,4'-DDE	23	60	38	ug/L	0.00022	2	0.02	10	RMW-02-13	0.201	0.71	0.78	97.5% Chebyshev (Mean, Sd) UCL	0.78	97.5% Chebyshev (Mean, Sd) UCL
4,4'-DDT	6	58	10	ug/L	0.0015	0.18	0.02	10	RMW-02-13	0.112	0.65	0.65	97.5% Chebyshev (Mean, Sd) UCL	0.18	Maximum Result
Aldrin	14	60	23	ug/L	0.0066	1.4	0.01	5.0	RMW-02-13	0.104	0.37	0.40	97.5% Chebyshev (Mean, Sd) UCL	0.40	97.5% Chebyshev (Mean, Sd) UCL
alpha-BHC	9	60	15	ug/L	0.0049	0.3	0.01	5.0	MW-12	0.0596	0.32	0.32	97.5% Chebyshev (Mean, Sd) UCL	0.30	Maximum Result
alpha-Chlordane	9	59	15	ug/L	0.0035	0.5	0.01	5.0	RMW-10-15	0.0657	0.33	0.33	97.5% Chebyshev (Mean, Sd) UCL	0.33	97.5% Chebyshev (Mean, Sd) UCL
Atrazine	1	67	1	ug/L	2	2	0.10	50	RMW-02-13	2.78	5.51	9.48	99% Chebyshev (Mean, Sd) UCL	2.00	Maximum Result
beta-BHC	8	60	13	ug/L	0.0075	1.1	0.01	5.0	MW-12	0.0855	0.35	0.37	97.5% Chebyshev (Mean, Sd) UCL	0.37	97.5% Chebyshev (Mean, Sd) UCL
delta-BHC	6	59	10	ug/L	0.0056	0.16	0.01	5.0	RMW-10-15	0.0592	0.32	0.32	97.5% Chebyshev (Mean, Sd) UCL	0.16	Maximum Result
Diazinon	1	17	6	ug/L	0.69	0.69	0.05	0.5	MW-12	0.0832	0.17	0.26	95% Chebyshev (Mean, Sd) UCL	0.26	95% Chebyshev (Mean, Sd) UCL
Dieldrin	20	59	34	ug/L	0.0014	2.8	0.02	10	RMW-02-13	0.273	0.80	0.92	97.5% Chebyshev (Mean, Sd) UCL	0.92	97.5% Chebyshev (Mean, Sd) UCL
Endosulfan I	6	59	10	ug/L	0.0057	0.42	0.01	5.0	MW-12	0.0646	0.33	0.33	97.5% Chebyshev (Mean, Sd) UCL	0.33	97.5% Chebyshev (Mean, Sd) UCL
Endosulfan II	3	58	5	ug/L	0.027	0.23	0.02	10	MW-12	0.114	0.65	0.65	97.5% Chebyshev (Mean, Sd) UCL	0.23	Maximum Result
Endosulfan sulfate	8	59	14	ug/L	0.0011	0.092	0.02	10	RMW-10-15	0.108	0.65	0.64	97.5% Chebyshev (Mean, Sd) UCL	0.09	Maximum Result
Endrin	6	60	10	ug/L	0.0013	0.7	0.02	10	MW-12	0.124	0.65	0.65	97.5% Chebyshev (Mean, Sd) UCL	0.65	97.5% Chebyshev (Mean, Sd) UCL
Endrin aldehyde	5	58	9	ug/L	0.0037	0.14	0.02	10	RMW-02-13	0.11	0.65	0.65	97.5% Chebyshev (Mean, Sd) UCL	0.14	Maximum Result
Endrin ketone	6	58	10	ug/L	0.00042	0.17	0.02	10	BMW-03	0.113	0.65	0.65	97.5% Chebyshev (Mean, Sd) UCL	0.17	Maximum Result
gamma-BHC	9	60	15	ug/L	0.0064	0.36	0.01	5.0	MW-12	0.0664	0.32	0.33	97.5% Chebyshev (Mean, Sd) UCL	0.33	97.5% Chebyshev (Mean, Sd) UCL
gamma-Chlordane	9	60	15	ug/L	0.0013	0.25	0.01	5.0	RMW-10-15	0.0601	0.32	0.32	97.5% Chebyshev (Mean, Sd) UCL	0.25	Maximum Result
Heptachlor	5	59	8	ug/L	0.0016	0.76	0.01	0.10	BPZ-01	0.029	0.10	0.11	97.5% Chebyshev (Mean, Sd) UCL	0.11	97.5% Chebyshev (Mean, Sd) UCL
Heptachlor epoxide	8	60	13	ug/L	0.00011	0.12	0.01	5.0	RMW-10-15	0.0574	0.32	0.32	97.5% Chebyshev (Mean, Sd) UCL	0.12	Maximum Result
Methoxychlor	3	59	5	ug/L	0.014	0.12	0.10	50	MW-12	0.54	3.24	3.18	97.5% Chebyshev (Mean, Sd) UCL	0.12	Maximum Result
Aroclor-1260	2	58	3	ug/L	4.3	6.3	0.20	2.0	RMW-02-13	0.405	0.97	0.96	95% Chebyshev (Mean, Sd) UCL	0.96	95% Chebyshev (Mean, Sd) UCL

Table 2-1
AMCO Summary Statistics and Exposure Point Concentrations for Groundwater Exposure Area
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Number of Detects	Number of Analyses	Percent Detects	Units	Minimum Detected Value	Maximum Detected Value	Minimum Non-detected Value	Maximum Non-detected Value	Location of Maximum Detected Value	Arithmetic Mean Value	Standard Deviation	Exposure Point Concentration	EPC Basis	Final Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
SVOCs/VOCs															
1,4-Dioxane (p-dioxane)	52	95	55	ug/L	0.1	780	0.10	20000	RGW-16	309	1170	1499	99% Chebyshev (Mean, Sd) UCL	780	Maximum Result
2,4,6-Trichlorophenol	4	68	6	ug/L	0.2	10	0.04	50	RMW-02-13	2.97	5.51	7.14	97.5% Chebyshev (Mean, Sd) UCL	7.14	97.5% Chebyshev (Mean, Sd) UCL
2,4-Dimethylphenol	7	67	10	ug/L	3.2	300	5.0	25	RMW-02-13	24.7	70.7	78.7	97.5% Chebyshev (Mean, Sd) UCL	78.7	97.5% Chebyshev (Mean, Sd) UCL
2-Chlorophenol	3	68	4	ug/L	3	4.3	5.0	100	RMW-01-17	5.27	7.43	9.19	95% Chebyshev (Mean, Sd) UCL	4.30	Maximum Result
2-Methylnaphthalene	14	67	21	ug/L	0.12	860	0.10	20	RMW-02-13	45	148	226	99% Chebyshev (Mean, Sd) UCL	226	99% Chebyshev (Mean, Sd) UCL
2-Methylphenol	7	67	10	ug/L	110	540	5.0	25	MW-12	38.5	111	123	97.5% Chebyshev (Mean, Sd) UCL	123	97.5% Chebyshev (Mean, Sd) UCL
2-Nitroaniline	4	65	6	ug/L	0.3	10	0.10	200	RMW-02-13	10.8	17.8	32.8	99% Chebyshev (Mean, Sd) UCL	10	Maximum Result
3,4-methylphenol	1	1	100	ug/L	840	840	NA	NA	MW-12	NA	NA	.		840	Maximum Result
4-Chloro-3-methylphenol	3	68	4	ug/L	58	180	5.0	100	MW-12	9.93	26.2	23.8	95% Chebyshev (Mean, Sd) UCL	23.8	95% Chebyshev (Mean, Sd) UCL
4-Methylphenol	8	66	12	ug/L	4	960	5.0	25	RMW-02-13	56.5	178	194	97.5% Chebyshev (Mean, Sd) UCL	194	97.5% Chebyshev (Mean, Sd) UCL
Acenaphthene	6	66	9	ug/L	0.53	4.5	0.10	100	RMW-02-13	3.92	7.20	9.45	97.5% Chebyshev (Mean, Sd) UCL	4.5	Maximum Result
Acenaphthylene	3	67	4	ug/L	0.051	11	0.10	100	MW-12	4.04	7.20	9.54	97.5% Chebyshev (Mean, Sd) UCL	9.54	97.5% Chebyshev (Mean, Sd) UCL
Anthracene	2	68	3	ug/L	0.17	3.2	0.10	100	RMW-02-13	3.91	7.09	9.29	97.5% Chebyshev (Mean, Sd) UCL	3.20	Maximum Result
Benzo(a)anthracene	7	67	10	ug/L	0.04	0.9	0.01	50	RMW-02-13	1.39	4.29	6.61	99% Chebyshev (Mean, Sd) UCL	0.90	Maximum Result
Benzo(a)pyrene	8	67	12	ug/L	0.01	0.5	0.01	50	RMW-02-13	1.38	4.30	6.60	99% Chebyshev (Mean, Sd) UCL	0.50	Maximum Result
Benzo(b)fluoranthene	6	67	9	ug/L	0.02	0.76	0.01	50	RMW-02-13	1.39	4.30	6.61	99% Chebyshev (Mean, Sd) UCL	0.76	Maximum Result
Benzo(g,h,i)perylene	12	68	18	ug/L	0.01	0.2	0.01	50	RMW-02-13	1.35	4.27	6.50	99% Chebyshev (Mean, Sd) UCL	0.20	Maximum Result
Benzo(k)fluoranthene	4	67	6	ug/L	0.03	0.46	0.01	50	RMW-02-13	1.37	4.30	6.60	99% Chebyshev (Mean, Sd) UCL	0.46	Maximum Result
Biphenyl (Diphenyl)	1	65	2	ug/L	1.3	1.3	5.0	100	RMW-02-13	5.37	7.59	9.47	95% Chebyshev (Mean, Sd) UCL	1.30	Maximum Result
bis(2-Chloroethoxy)methane	3	68	4	ug/L	0.02	0.2	0.1	50	BPZ-01	2.73	5.48	9.34	99% Chebyshev (Mean, Sd) UCL	0.20	Maximum Result
bis(2-Ethylhexyl)phthalate	5	67	7	ug/L	1	120	0.1	50	RMW-05-15	5.27	15.3	16.9	97.5% Chebyshev (Mean, Sd) UCL	16.9	97.5% Chebyshev (Mean, Sd) UCL
Bromoform	1	119	1	ug/L	12	12	0.5	400	RMW-02-13	2.34	18.3	12.8	97.5% Chebyshev (Mean, Sd) UCL	12.0	Maximum Result
Caprolactam	1	65	2	ug/L	2.4	2.4	5.0	100	BMW-08	5.38	7.58	9.48	95% Chebyshev (Mean, Sd) UCL	2.40	Maximum Result
Carbazole	6	51	12	ug/L	0.1	39	0.04	25	RMW-02-13	2.9	6.91	12.5	99% Chebyshev (Mean, Sd) UCL	12.5	99% Chebyshev (Mean, Sd) UCL
Chrysene	6	67	9	ug/L	0.03	1.1	0.10	100	RMW-02-13	3.32	7.34	12.2	99% Chebyshev (Mean, Sd) UCL	1.10	Maximum Result
Dibenz(a,h)anthracene	5	68	7	ug/L	0.02	0.045	0.01	50	RMW-10-15	1.34	4.27	6.50	99% Chebyshev (Mean, Sd) UCL	0.05	Maximum Result
Diethylphthalate	2	67	3	ug/L	1	38	1.0	100	MW-12	5.78	8.50	10.3	95% Chebyshev (Mean, Sd) UCL	10.3	95% Chebyshev (Mean, Sd) UCL
Di-n-butyl phthalate	5	66	8	ug/L	0.58	69	1.0	100	RMW-02-13	5.94	10.6	11.7	95% Chebyshev (Mean, Sd) UCL	11.7	95% Chebyshev (Mean, Sd) UCL
Fluoranthene	5	67	7	ug/L	0.062	2.4	0.10	100	RMW-02-13	3.94	7.14	9.38	97.5% Chebyshev (Mean, Sd) UCL	2.40	Maximum Result
Fluorene	3	66	4.54545	ug/L	0.26	2.6	0.10	100	RMW-02-13	3.92	7.19	9.45	97.5% Chebyshev (Mean, Sd) UCL	2.60	Maximum Result
Hexachloroethane	3	67	4	ug/L	0.04	1	0.10	50	RMW-02-13	2.73	5.52	9.45	99% Chebyshev (Mean, Sd) UCL	1.00	Maximum Result
Indeno(1,2,3-c,d)pyrene	9	68	13	ug/L	0.01	0.2	0.01	50	RMW-02-13	1.35	4.27	6.50	99% Chebyshev (Mean, Sd) UCL	0.20	Maximum Result
Naphthalene	30	117	26	ug/L	0.067	670	0.10	20	RMW-02-13	36.1	109	136	99% Chebyshev (Mean, Sd) UCL	136	99% Chebyshev (Mean, Sd) UCL
Nitrobenzene	3	67	4	ug/L	1	2	0.10	50	RMW-01-17	2.83	5.49	9.51	99% Chebyshev (Mean, Sd) UCL	2.00	Maximum Result
N-Nitrosodi-n-propylamine	3	67	4	ug/L	0.3	2	0.01	50	RMW-01-17	2.77	5.51	9.47	99% Chebyshev (Mean, Sd) UCL	2.00	Maximum Result
N-Nitrosodiphenylamine	1	66	2	ug/L	1.2	1.2	5.0	100	RMW-02-13	5.32	7.54	9.37	95% Chebyshev (Mean, Sd) UCL	1.20	Maximum Result
Pentachlorophenol	9	67	13	ug/L	0.2	85	0.20	50	RMW-02-13	3.01	10.8	11.3	97.5% Chebyshev (Mean, Sd) UCL	11.3	97.5% Chebyshev (Mean, Sd) UCL
Phenanthrene	5	68	7	ug/L	0.048	6	0.10	100	RMW-02-13	3.91	7.10	9.29	97.5% Chebyshev (Mean, Sd) UCL	6.00	Maximum Result
Phenol	10	68	15	ug/L	1.1	190	5.0	25	MW-12	16.4	41.8	48.0	97.5% Chebyshev (Mean, Sd) UCL	48.0	97.5% Chebyshev (Mean, Sd) UCL
Pyrene	4	68	6	ug/L	0.076	2.4	0.10	100	RMW-02-13	3.9	7.09	9.28	97.5% Chebyshev (Mean, Sd) UCL	2.40	Maximum Result
1,1-Dichloroethane	66	120	55	ug/L	0.2	3200	0.50	10	MW-12	138	461	557	99% Chebyshev (Mean, Sd) UCL	557	99% Chebyshev (Mean, Sd) UCL
1,1-Dichloroethene	24	119	20	ug/L	0.3	250	0.50	500	RMW-02-13	13.3	49.4	41.6	97.5% Chebyshev (Mean, Sd) UCL	41.6	97.5% Chebyshev (Mean, Sd) UCL
1,1,1-Trichloroethane	7	120	6	ug/L	1.4	960	0.50	500	MW-12	32.7	150	118	97.5% Chebyshev (Mean, Sd) UCL	118	97.5% Chebyshev (Mean, Sd) UCL
1,1,2-Trichloroethane	7	120	6	ug/L	3.1	18	0.50	400	MW-12	2.84	18.4	13.3	97.5% Chebyshev (Mean, Sd) UCL	13.3	97.5% Chebyshev (Mean, Sd) UCL
1,1,2,2-Tetrachloroethane	3	120	3	ug/L	0.09	18	0.50	400	RMW-02-13	2.48	18.3	12.9	97.5% Chebyshev (Mean, Sd) UCL	12.9	97.5% Chebyshev (Mean, Sd) UCL
1,2,3-Trichlorobenzene	10	103	10	ug/L	0.15	20	0.50	25	RGW-12	1.09	2.65	2.72	97.5% Chebyshev (Mean, Sd) UCL	2.72	97.5% Chebyshev (Mean, Sd) UCL
1,2,4-Trichlorobenzene	11	119	9	ug/L	0.14	85	0.50	400	RGW-12	3.63	20.0	15.1	97.5% Chebyshev (Mean, Sd) UCL	15.1	97.5% Chebyshev (Mean, Sd) UCL
1,2,4-Trimethylbenzene	23	64	36	ug/L	0.2	650	0.50	100	MW-12	66.3	170	278	99% Chebyshev (Mean, Sd) UCL	278	99% Chebyshev (Mean, Sd) UCL
1,2-Dibromo-3-chloropropane	1	116	1	ug/L	2.4	2.4	0.05	100	RGW-16	1.57	5.40	4.70	97.5% Chebyshev (Mean, Sd) UCL	2.40	Maximum Result
1,2-Dichlorobenzene	32	120	27	ug/L	0.13	7800	0.50	250	RGW-12	87.3	712	734	99% Chebyshev (Mean, Sd) UCL	734	99% Chebyshev (Mean, Sd) UCL
1,2-Dichloroethane	11	120	9	ug/L	0.4	38	0.50	400	RMW-02-13	3.53	19.0	14.4	97.5% Chebyshev (Mean, Sd) UCL	14.4	97.5% Chebyshev (Mean, Sd) UCL
1,2-Dichloropropane	8	120	7	ug/L	0.2	5.1	0.50	400	MW-12	2.44	18.3	12.8	97.5% Chebyshev (Mean, Sd) UCL	5.10	Maximum Result

Table 2-1
AMCO Summary Statistics and Exposure Point Concentrations for Groundwater Exposure Area
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Number of Detects	Number of Analyses	Percent Detects	Units	Minimum Detected Value	Maximum Detected Value	Minimum Non-detected Value	Maximum Non-detected Value	Location of Maximum Detected Value	Arithmetic Mean Value	Standard Deviation	Exposure Point Concentration	EPC Basis	Final Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
1,3-Dichlorobenzene	14	119	12	ug/L	0.14	360	0.50	400	RGW-12	5.59	37.6	27.1	97.5% Chebyshev (Mean, Sd) UCL	27.1	97.5% Chebyshev (Mean, Sd) UCL
1,3,5-Trimethylbenzene	17	64	27	ug/L	0.2	270	0.50	100	MW-12	26.9	67.0	110	99% Chebyshev (Mean, Sd) UCL	110	99% Chebyshev (Mean, Sd) UCL
1,4-Dichlorobenzene	25	119	21	ug/L	0.2	3500	0.50	400	RGW-12	34	321	218	97.5% Chebyshev (Mean, Sd) UCL	218	97.5% Chebyshev (Mean, Sd) UCL
2-Chlorotoluene	2	50	4	ug/L	0.2	7.4	0.50	25	RGW-12	0.962	2.18	2.89	97.5% Chebyshev (Mean, Sd) UCL	3	97.5% Chebyshev (Mean, Sd) UCL
2-Hexanone	4	97	4	ug/L	7.6	190	4.0	400	RMW-02-13	10.4	29.9	23.5	95% Chebyshev (Mean, Sd) UCL	23.5	95% Chebyshev (Mean, Sd) UCL
2,2-Dichloropropane	1	50	2	ug/L	0.5	0.5	0.50	25	RMW-02-13	0.82	1.97	2.04	95% Chebyshev (Mean, Sd) UCL	0.50	Maximum Result
Acetone	37	121	31	ug/L	2.2	3300	4.0	5000	RMW-02-13	164	567	485	97.5% Chebyshev (Mean, Sd) UCL	485	97.5% Chebyshev (Mean, Sd) UCL
Benzene	54	122	44	ug/L	0.16	4000	0.50	500	MW-12	64.7	372	400	99% Chebyshev (Mean, Sd) UCL	400	99% Chebyshev (Mean, Sd) UCL
Carbon disulfide	9	100	9	ug/L	0.19	3.1	0.50	400	MW-12	2.76	20.0	15.2	97.5% Chebyshev (Mean, Sd) UCL	3.10	Maximum Result
Carbon tetrachloride	1	120	1	ug/L	0.3	0.3	0.50	400	RGW-11	2.32	18.3	12.7	97.5% Chebyshev (Mean, Sd) UCL	0.30	Maximum Result
Chlorobenzene	31	120	26	ug/L	0.2	6700	0.50	400	RGW-12	105	627	674	99% Chebyshev (Mean, Sd) UCL	674	99% Chebyshev (Mean, Sd) UCL
Chloroethane	18	120	15	ug/L	0.17	680	0.50	250	RGW-03	21	84.1	97.4	99% Chebyshev (Mean, Sd) UCL	97.4	99% Chebyshev (Mean, Sd) UCL
Chloroform	3	119	3	ug/L	0.35	4.4	0.50	400	RGW-12	2.34	18.3	12.8	97.5% Chebyshev (Mean, Sd) UCL	4.40	Maximum Result
Chloromethane	10	121	8	ug/L	0.2	7.4	0.50	400	MW-12	2.5	18.2	12.8	97.5% Chebyshev (Mean, Sd) UCL	7.40	Maximum Result
cis-1,2-Dichloroethene	67	121	55	ug/L	0.28	90000	0.50	10	MW-12	2810	12100	13720	99% Chebyshev (Mean, Sd) UCL	13720	99% Chebyshev (Mean, Sd) UCL
cis-1,3-Dichloropropene	2	120	2	ug/L	0.74	4.2	0.50	400	RGW-16	2.36	18.3	12.8	97.5% Chebyshev (Mean, Sd) UCL	4.20	Maximum Result
Cyclohexane	7	80	9	ug/L	0.21	18	0.50	400	RMW-02-13	3.69	22.5	19.4	97.5% Chebyshev (Mean, Sd) UCL	18.0	Maximum Result
Ethyl tert-butyl ether (ETBE)	1	93	1	ug/L	1.2	1.2	0.50	200	MW-12	7.3	14.7	16.8	97.5% Chebyshev (Mean, Sd) UCL	1.20	Maximum Result
Ethylbenzene	27	120	23	ug/L	0.2	4000	0.50	500	MW-12	82.9	403	449	99% Chebyshev (Mean, Sd) UCL	449	99% Chebyshev (Mean, Sd) UCL
Isopropyl ether	1	6	17	ug/L	430	430	4.0	8	RMW-02-13	73.7	175	.		430	Maximum Result
Isopropylbenzene (cumene)	22	120	18	ug/L	0.2	46	0.50	500	RGW-12	8.72	32.2	27.1	97.5% Chebyshev (Mean, Sd) UCL	27.1	97.5% Chebyshev (Mean, Sd) UCL
Methyl acetate	2	79	3	ug/L	69	80	0.50	400	MW-12	4.86	25.2	22.5	97.5% Chebyshev (Mean, Sd) UCL	22.5	97.5% Chebyshev (Mean, Sd) UCL
Methyl ethyl ketone	19	118	16	ug/L	0.82	3800	4.0	100	RMW-02-13	118	543	430	97.5% Chebyshev (Mean, Sd) UCL	430	97.5% Chebyshev (Mean, Sd) UCL
Methyl isobutyl ketone	11	98	11	ug/L	1.1	40000	4.0	5000	MW-12	708	4130	4858	99% Chebyshev (Mean, Sd) UCL	4858	99% Chebyshev (Mean, Sd) UCL
Methyl tert-butyl ether	26	121	21	ug/L	0.055	83	0.50	400	RMW-02-13	6.46	24.1	20.1	97.5% Chebyshev (Mean, Sd) UCL	20.1	97.5% Chebyshev (Mean, Sd) UCL
Methylcyclohexane	5	80	6	ug/L	4.8	44	0.50	400	RMW-02-13	5.84	26.7	24.5	97.5% Chebyshev (Mean, Sd) UCL	24.5	97.5% Chebyshev (Mean, Sd) UCL
Methylene chloride	22	120	18	ug/L	0.39	110	0.50	25	RMW-02-13	2.35	10.2	8.19	97.5% Chebyshev (Mean, Sd) UCL	8.19	97.5% Chebyshev (Mean, Sd) UCL
n-Butylbenzene	7	50	14	ug/L	0.4	23	0.50	10	MW-12	1.9	4.77	6.12	97.5% Chebyshev (Mean, Sd) UCL	6.12	97.5% Chebyshev (Mean, Sd) UCL
n-Propylbenzene	13	50	26	ug/L	0.5	150	0.50	10	RGW-12	13	30.7	56.1	99% Chebyshev (Mean, Sd) UCL	56.1	99% Chebyshev (Mean, Sd) UCL
p-Cymene (p-isopropyltoluene)	12	50	24	ug/L	0.4	210	0.50	10	MW-12	15.7	44.6	78.6	99% Chebyshev (Mean, Sd) UCL	78.6	99% Chebyshev (Mean, Sd) UCL
sec-Butylbenzene	10	50	20	ug/L	0.3	13	0.50	25	RMW-01-17	2.09	4.02	5.64	97.5% Chebyshev (Mean, Sd) UCL	5.64	97.5% Chebyshev (Mean, Sd) UCL
Styrene	3	118	3	ug/L	23	37	0.50	400	MW-12	3.06	18.9	13.9	97.5% Chebyshev (Mean, Sd) UCL	13.9	97.5% Chebyshev (Mean, Sd) UCL
tert-Butyl alcohol	25	76	33	ug/L	10	260	10	1000	BPZ-01	50.1	93.2	117	97.5% Chebyshev (Mean, Sd) UCL	117	97.5% Chebyshev (Mean, Sd) UCL
tert-Butylbenzene	4	50	8	ug/L	0.7	2.1	0.50	25	RMW-02-13	NA	1.98	2.14	95% Chebyshev (Mean, Sd) UCL	2.10	Maximum Result
Tetrachloroethene	14	120	12	ug/L	0.15	12	0.50	400	RGW-12	2.55	18.3	13.0	97.5% Chebyshev (Mean, Sd) UCL	12.0	Maximum Result
Toluene	36	121	30	ug/L	0.074	31000	0.50	110	RMW-02-13	1470	5130	6112	99% Chebyshev (Mean, Sd) UCL	6112	99% Chebyshev (Mean, Sd) UCL
trans-1,2-Dichloroethene	37	120	31	ug/L	0.06	4000	0.50	500	MW-12	58.3	378	401	99% Chebyshev (Mean, Sd) UCL	401	99% Chebyshev (Mean, Sd) UCL
trans-1,3-Dichloropropene	2	120	2	ug/L	0.36	4.1	0.50	500	RMW-10-15	4.44	29.1	21.00	97.5% Chebyshev (Mean, Sd) UCL	4.10	Maximum Result
Trichloroethene	41	120	34	ug/L	0.096	880	0.50	100	RGW-09	11.1	80.4	57.0	97.5% Chebyshev (Mean, Sd) UCL	57.0	97.5% Chebyshev (Mean, Sd) UCL
Vinyl chloride	47	120	39	ug/L	0.2	8400	0.50	400	MW-12	361	1390	1627	99% Chebyshev (Mean, Sd) UCL	1627	99% Chebyshev (Mean, Sd) UCL
m,p-Xylene	26	71	37	ug/L	0.18	4000	0.50	10	RMW-02-13	187	641	944	99% Chebyshev (Mean, Sd) UCL	944	99% Chebyshev (Mean, Sd) UCL
o-Xylene	23	70	33	ug/L	0.2	1600	0.50	10	RMW-02-13	97.2	292	445	99% Chebyshev (Mean, Sd) UCL	445	99% Chebyshev (Mean, Sd) UCL
Xylenes, total	10	50	20	ug/L	0.25	4600	0.50	0.5	RMW-02-13	267	948	1600	99% Chebyshev (Mean, Sd) UCL	1600	99% Chebyshev (Mean, Sd) UCL
Dioxins/Furans															
1,2,3,4,6,7,8-HpCDD	7	23	30	pg/L	2.92	634	0.49	11.2	RMW-02-13	75.8	187	464	99% Chebyshev (Mean, Sd) UCL	464	99% Chebyshev (Mean, Sd) UCL
1,2,3,4,6,7,8-HpCDF	4	23	17	pg/L	2.49	147	0.36	19.7	RMW-02-13	14.8	38.6	94.9	99% Chebyshev (Mean, Sd) UCL	94.9	99% Chebyshev (Mean, Sd) UCL
1,2,3,4,7,8,9-HpCDF	3	23	13	pg/L	1.83	14.1	0.49	15.7	RMW-02-13	1.98	3.76	9.79	99% Chebyshev (Mean, Sd) UCL	9.79	99% Chebyshev (Mean, Sd) UCL
1,2,3,4,7,8-HxCDD	2	23	9	pg/L	2.77	5.3	0.85	10.7	RMW-02-13	1.35	1.4	2.62	95% Chebyshev (Mean, Sd) UCL	2.62	95% Chebyshev (Mean, Sd) UCL
1,2,3,4,7,8-HxCDF	2	23	9	pg/L	1.79	15.7	0.25	13.4	RMW-02-13	1.41	3.41	8.49	99% Chebyshev (Mean, Sd) UCL	8.49	99% Chebyshev (Mean, Sd) UCL
1,2,3,6,7,8-HxCDD	4	23	17	pg/L	2.44	20	0.88	9	RMW-02-13	2.75	5.08	13.3	99% Chebyshev (Mean, Sd) UCL	13.3	99% Chebyshev (Mean, Sd) UCL
1,2,3,6,7,8-HxCDF	2	23	9	pg/L	1.35	4.56	0.26	3.86	RMW-02-13	0.703	1.01	1.62	95% Chebyshev (Mean, Sd) UCL	1.62	95% Chebyshev (Mean, Sd) UCL
1,2,3,7,8,9-HxCDD	2	23	9	pg/L	4.89	13	1.05	10.6	RMW-02-13	1.91	2.74	4.40	95% Chebyshev (Mean, Sd) UCL	4.40	95% Chebyshev (Mean, Sd) UCL
1,2,3,7,8,9-HxCDF	1	23	4	pg/L	6.5	6.5	0.28	7.3	RMW-02-13	0.844	1.46	3.87	99% Chebyshev (Mean, Sd) UCL	3.87	99% Chebyshev (Mean, Sd) UCL

Table 2-1
AMCO Summary Statistics and Exposure Point Concentrations for Groundwater Exposure Area
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical of Potential Concern	Number of Detects	Number of Analyses	Percent Detects	Units	Minimum Detected Value	Maximum Detected Value	Minimum Non-detected Value	Maximum Non-detected Value	Location of Maximum Detected Value	Arithmetic Mean Value	Standard Deviation	Exposure Point Concentration	EPC Basis	Final Exposure Point Concentration (may be Max)	EPC Basis (may be Max)
1,2,3,7,8-PeCDD	2	23	9	pg/L	1.13	4.3	0.39	3.8	RMW-02-13	0.769	0.896	1.08	95% H-UCL	1.08	95% H-UCL
1,2,3,7,8-PeCDF	2	23	9	pg/L	1.37	4.3	0.79	11.6	RMW-02-13	1.08	1.32	2.28	95% Chebyshev (Mean, Sd) UCL	2.28	95% Chebyshev (Mean, Sd) UCL
2,3,4,6,7,8-HxCDF	1	23	4	pg/L	6.6	6.6	0.27	6.27	RMW-02-13	0.875	1.48	3.94	99% Chebyshev (Mean, Sd) UCL	3.94	99% Chebyshev (Mean, Sd) UCL
2,3,4,7,8-PeCDF	2	23	9	pg/L	1.71	5.5	0.83	9.72	RMW-02-13	1.27	1.5	2.64	95% Chebyshev (Mean, Sd) UCL	2.64	95% Chebyshev (Mean, Sd) UCL
2,3,7,8-TCDF	1	23	4	pg/L	4.25	4.25	0.35	4.6	RMW-02-13	0.795	0.973	1.68	95% Chebyshev (Mean, Sd) UCL	1.68	95% Chebyshev (Mean, Sd) UCL
OCDD	10	23	43	pg/L	5.76	10500	1.3	35.2	RMW-02-13	1370	3440	2180	95% Hall's Bootstrap UCL	2180	95% Hall's Bootstrap UCL
OCDF	6	23	26	pg/L	19.6	1050	1.5	21	RMW-02-13	115	303	744	99% Chebyshev (Mean, Sd) UCL	744	99% Chebyshev (Mean, Sd) UCL

Table 2-2
Groundwater Exposure Assumptions - Future Residents
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Parameter		Units	Reasonable Maximum Exposure (RME) Scenario: Residential Adult		Residential Child		Intake Equation
Ingestion of Groundwater							
Concentration in Groundwater	C_{gw}	mg/L	Chemical specific		Chemical specific		$\frac{C_{gw} \times IngR \times EF \times ED}{BW \times AT}$
Ingestion Rate	IngR	L/day	2	EPA, 1989	1	EPA, 1989	
Exposure Frequency	EF	days/year	350	EPA, 1989	350	EPA, 1989	
Exposure Duration	ED	years	24	EPA, 1989	6	EPA, 1989	
Body Weight	BW	kg	70	EPA, 1989	15	EPA, 2004[b]	
Averaging Time for carcinogens	AT_C	days	25,550	EPA, 1989	25,550	EPA, 1989	
Averaging Time for noncarcinogens	AT_{NC}	days	8,760	EPA, 1989	2,190	EPA, 1989	
Inhalation of VOCs in Groundwater							
Concentration in Groundwater	C_{gw}	mg/L	Chemical specific		Chemical specific		$\frac{C_{gw} \times InhR \times VF \times ET \times EF \times ED}{BW \times AT}$
Inhalation Rate	InhR	m^3/day	20	EPA, 1989	10	EPA, 1989	
Volatilization Factor	VF	L/m^3	0.5	EPA, 2004[b]	0.5	EPA, 2004[b]	
Exposure Time	ET	hours/day	24	EPA, 1989	24	EPA, 1989	
Exposure Frequency	EF	days/year	350	EPA, 1989	350	EPA, 1989	
Exposure Duration	ED	years	24	EPA, 1989	6	EPA, 1989	
Body Weight	BW	kg	70	EPA, 1989	15	EPA, 1989	
Averaging Time for carcinogens	AT_C	days	25,550	EPA, 1989	25,550	EPA, 1989	
Averaging Time for noncarcinogens	AT_{NC}	days	8,760	EPA, 1989	2,190	EPA, 1989	
Dermal Contact with Groundwater While Showering							
Concentration in Groundwater	C_{gw}	mg/L	Chemical specific		Chemical specific		$\frac{DA_{event} \times SA \times EF \times ED}{BW \times AT}$
Absorbed dose per event per area of skin exposed	DA_{event}	mg/cm^2-event	Chemical specific	EPA, 2004[a]	Chemical specific	EPA, 2004[a]	Where for Organics:
Event Duration	t_{event}	hours/event	0.58	EPA, 2004[a]	1	EPA, 2004[a]	
Time to reach steady state	t*	hours	Chemical specific	EPA, 2004[a]	Chemical specific	EPA, 2004[a]	
Skin Permeability Constant for chemicals in groundwater	K_P	cm/hour	Chemical specific	EPA, 2004[a]	Chemical specific	EPA, 2004[a]	If $t_{event} > t^*$
Lag time per event	τ	hours/event	Chemical specific	EPA, 2004[a]	Chemical specific	EPA, 2004[a]	$DA_{event} = FA \times K_p \times C_{gw} \left[\frac{t_{event}}{1+B} + 2\tau \times \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right]$
Dimensionless coefficient	B	cm/hour	Chemical specific	EPA, 2004[a]	Chemical specific	EPA, 2004[a]	
Fraction Absorbed	FA	unitless	Chemical specific	EPA, 2004[a]	Chemical specific	EPA, 2004[a]	
Skin Surface Area	SA	cm^2/day	18,000	EPA, 1997	6,600	EPA, 2004[a]	If $t_{event} < t^*$
Exposure Frequency	EF	days/year	350	EPA, 1989	350	EPA, 1989	$DA_{event} = 2\ FA \times K_p \times C_{gw} \sqrt{\frac{6\tau \times t_{event}}{\Pi}}$
Exposure Duration	ED	years	24	EPA, 1989	6	EPA, 1989	
Body Weight	BW	kg	70	EPA, 1997	15	EPA, 1989	For Inorganics:
Averaging Time for carcinogens	AT_C	days	25,550	EPA, 1989	25,550	EPA, 1989	$DA_{event} = K_p \times C_{gw} \times t_{event}$
Averaging Time for noncarcinogens	AT_{NC}	days	8,760	EPA, 1989	2,190	EPA, 1989	

Notes:
AT_C = 70 years x 365 days/year
AT_{NC} = ED (years) x 365 days/year
RME = Reasonable maximum exposure.
EPA, 1989: Risk Assessment Guidance for Superfund (RAGS) Volume I Human Health Evaluation Manual Part A.
EPA, 1997: Exposure Factors Handbook. Volume I, General Factors. August.
EPA, 2004[a]: RAGS Part E, Supplemental Guidance for Dermal Risk Assessment.
EPA, 2004[b]: User's Guide and Background Technical Document for Preliminary Remediation Goals Table. Region 9. October.

Table 2-3
Groundwater Exposure Assumptions - Trench Workers
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

		Reasonable Maximum Exposure (RME) Scenario			Intake Equation
		Units	Trench Worker		
Inhalation of VOCs in Groundwater While Working in a Trench					
Concentration in Groundwater	C_{gw}	mg/L	Chemical specific		
Concentration (VOCs) in breathing zone	C_{air}	ug/m^3	Chemical specific	CalEPA, 2006	
Total emission rate	Ei	mg/s	Chemical specific	CalEPA, 2006	$\frac{C_{air} \times InhR \times ET \times EF \times ED \times CF_1}{BW \times AT}$
Inhalation Rate	InhR	m^3/hour	2.5	CalEPA, 2005	
Assumed velocity of air in the trench	u	m/s	0.152	CalEPA, 2006	
Mixing Height (adult breating zone)	H	m	1.83	CalEPA, 2006	
Width of trench perpendicular to wind direction	W	m	3.05	CalEPA, 2006	
Overall mass transfer coefficient	Ki	cm/s	Chemical specific	CalEPA, 2006	
Bottom area of the trench covered with contaminated water	A_w	cm^2	65,032	CalEPA, 2006	$C_{air} = \frac{E_i \times CF_2}{u \times H \times W}$
Exposure Time	ET	hours/day	8	CalEPA, 2005	
Exposure Frequency	EF	days/year	90	CalEPA, 2006	
Exposure Duration	ED	years	1	CalEPA, 2006	
Conversion Factor$_1$	CF_1	mg/ug	0.001		
Conversion Factor$_2$	CF_2	ug/mg	1000		$E_i = K_i \times A_w \times C_{gw}$
Body Weight	BW	kg	70	EPA, 1989	
Averaging Time for carcinogens	ATc	days	25,550	EPA, 1989	
Averaging Time for noncarcinogens	ATnc	days	365	CalEPA, 2006	
Dermal Contact with Groundwater While Working in a Trench					
Concentration in Groundwater	C_{gw}	mg/L	Chemical specific		
Absorbed dose per event per area of skin exposed	DA_{event}	mg/cm^2-event	Chemical specific	EPA, 2004	$\frac{DA_{event} \times SA \times EF \times ED}{BW \times AT}$
Event Duration	t_{event}	hours/event	8	CalEPA, 2005	For Organics:
Time to reach steady state	t*	hours	Chemical specific	EPA, 2004	
Skin Permeability Constant for chemicals in groundwater	K_P	cm/hour	Chemical specific	EPA, 2004	If $t_{event} < t^*$
Lag time per event	τ	hours/event	Chemical specific	EPA, 2004	$DA_{event} = FA \times K_p C_{gw} \left[\frac{t_{event}}{1+B} + 2\tau \times \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right]$
Dimensionless coefficient	B	cm/hour	Chemical specific	EPA, 2004	
Fraction Absorbed	FA	unitless	Chemical specific	EPA, 2004	
Skin Surface Area	SA	cm^2/day	5,700	CalEPA, 2005	If $t_{event} > t^*$
Exposure Frequency	EF	days/year	90	CalEPA, 2006	$DA_{event} = 2\ FA \times K_p \times C_{gw} \sqrt{\frac{6\tau \times t_{event}}{\Pi}}$
Exposure Duration	ED	years	1	CalEPA, 2006	
Body Weight	BW	kg	70	EPA, 1989	For Inorganics:
Averaging Time for carcinogens	ATc	days	25,550	EPA, 1989	$DA_{event} = K_p \times C_{gw} \times t_{event}$
Averaging Time for noncarcinogens	ATnc	days	365	CalEPA, 2006	

Notes:
RME = Reasonable maximum exposure.
EPA, 1989: Risk Assessment Guidance for Superfund (RAGS) Volume I Human Health Evaluation Manual Part A.
EPA, 2004: RAGS Part E, Supplemental Guidance for Dermal Risk Assessment.
CalEPA, DTSC, HERD, 2005: Recommended DTSC Default Exposure Factors for Use in Risk Assessment at California Military Facilities.
CalEPA, DTSC, HERD, 2006: Memorandum: Risk Assessment Issues, PAHs and Exposure Routes…,T.Taros, Staff Toxicologist, DTSC, 8810 Cal Center Drive, Sacramento, CA. August 11.

Table 2-4
Dermal Permeability Constants and Volatile Compounds - Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical	Kp[a] (cm/hr)	Volatility[b]
Metals		
Aluminum	1.0E-03	NV
Antimony	1.0E-03	NV
Arsenic	1.0E-03	NV
Barium	1.0E-03	NV
Beryllium	1.0E-03	NV
Boron	1.0E-03	NV
Cadmium	1.0E-03	NV
Chromium	1.0E-03	NV
Chromium (VI)	2.0E-03	NV
Cobalt	4.0E-04	NV
Copper	1.0E-03	NV
Iron	1.0E-03	NV
Lead	1.0E-04	NV
Manganese	1.0E-03	NV
Mercury	1.0E-03	NV
Molybdenum	1.0E-03	NV
Nickel	2.0E-04	NV
Selenium	1.0E-03	NV
Silver	6.0E-04	NV
Thallium	1.0E-03	NV
Vanadium	1.0E-03	NV
Zinc	6.0E-04	NV
Cyanide	1.0E-03	NV
Pesticides/PCBs		
4,4'-DDD	1.8E-01	NV
4,4'-DDE	1.6E-01	NV
4,4'-DDT	2.7E-01	NV
Aldrin	1.4E-03	NV
alpha-BHC	1.1E-02	NV
alpha-Chlordane	3.4E-02	NV
Atrazine	5.2E-03	NV
beta-BHC	1.1E-02	NV
delta-BHC	1.1E-02	NV
Diazinon	1.0E-02	NV
Dieldrin	1.2E-02	NV
Endosulfan I	2.8E-03	NV
Endosulfan II	1.8E-03	NV
Endosulfan sulfate	NA	NV
Endrin	1.2E-02	NV
Endrin aldehyde	NA	NV
Endrin ketone	NA	NV
gamma-BHC	1.1E-02	NV
gamma-Chlordane	3.4E-02	NV
Heptachlor	8.6E-03	NV
Heptachlor epoxide	2.0E-02	NV
Methoxychlor	4.1E-02	NV

Table 2-4
Dermal Permeability Constants and Volatile Compounds - Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical	Kp[a] (cm/hr)	Volatility[b]
Aroclor-1260	7.5E-01	NV
SVOCs/VOCs		
1,4-Dioxane (p-dioxane)	3.3E-04	NV
2,4,6-Trichlorophenol	3.5E-02	NV
2,4-Dimethylphenol	1.1E-02	NV
2-Chlorophenol	8.0E-03	V
2-Methylnaphthalene	8.9E-02	V
2-Methylphenol	7.7E-03	NV
2-Nitroaniline	4.4E-03	NV
3,4-methylphenol	7.7E-03	NV
4-Chloro-3-methylphenol	NA	NV
4-Methylphenol	7.7E-03	NV
Acenaphthene	1.3E-01	V
Acenaphthylene	1.4E-01	V
Anthracene	2.3E-01	V
Benzo(a)anthracene	4.7E-01	NV
Benzo(a)pyrene	7.0E-01	NV
Benzo(b)fluoranthene	7.0E-01	NV
Benzo(g,h,i)perylene	1.1E+00	NV
Benzo(k)fluoranthene	6.6E-01	NV
Biphenyl (Diphenyl)	9.2E-02	NV
bis(2-Chloroethoxy)methane	1.2E-03	V
bis(2-Ethylhexyl)phthalate	2.5E-02	NV
Bromoform	2.2E-03	V
Caprolactam	1.0E-03	NV
Carbazole	5.2E-02	NV
Chrysene	4.7E-01	NV
Dibenz(a,h)anthracene	1.5E+00	NV
Diethylphthalate	3.9E-03	NV
Di-n-butyl phthalate	2.4E-02	NV
Fluoranthene	2.2E-01	NV
Fluorene	1.7E-01	V
Hexachloroethane	3.0E-02	NV
Indeno(1,2,3-c,d)pyrene	1.0E+00	NV
Naphthalene	4.7E-02	V
Nitrobenzene	5.4E-03	V
N-Nitrosodi-n-propylamine	2.3E-03	NV
N-Nitrosodiphenylamine	2.6E-02	NV
Pentachlorophenol	3.9E-01	NV
Phenanthrene	1.4E-01	NV
Pyrene	3.2E-01	V
1,1,1-Trichloroethane	1.3E-02	V
1,1,2,2-Tetrachloroethane	6.9E-03	V
1,1,2-Trichloroethane	6.4E-03	V
1,1-Dichloroethane	6.7E-03	V
1,1-Dichloroethene	1.2E-02	V
1,2,3-Trichlorobenzene	NA	V

Table 2-4
Dermal Permeability Constants and Volatile Compounds - Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical	Kp[a] (cm/hr)	Volatility[b]
1,2,4-Trichlorobenzene	6.6E-02	V
1,2,4-Trimethylbenzene	8.4E-02	V
1,2-Dibromo-3-chloropropane	6.8E-03	V
1,2-Dichlorobenzene	4.1E-02	V
1,2-Dichloroethane	6.7E-03	V
1,2-Dichloropropane	7.8E-03	V
1,3,5-Trimethylbenzene	6.1E-02	V
1,3-Dichlorobenzene	5.8E-02	V
1,4-Dichlorobenzene	4.2E-02	V
2-Chlorotoluene	NA	V
2-Hexanone	3.5E-03	V
2,2-Dichloropropane	NA	V
Acetone	5.2E-04	V
Benzene	1.5E-02	V
Carbon disulfide	1.7E-02	V
Carbon tetrachloride	1.6E-02	V
Chlorobenzene	2.8E-02	V
Chloroethane	6.1E-03	V
Chloroform	6.8E-03	V
Chloromethane	3.3E-03	V
cis-1,2-Dichloroethene	1.1E-02	V
cis-1,3-Dichloropropene	4.3E-03	V
Cyclohexane	1.0E-01	V
Ethyl tert-butyl ether (ETBE)	NA	V
Ethylbenzene	4.9E-02	V
Isopropyl ether	NA	V
Isopropylbenzene (cumene)	8.8E-02	V
Methyl acetate	8.0E-04	V
Methyl ethyl ketone	9.6E-04	V
Methyl isobutyl ketone	2.7E-03	V
Methyl tert-butyl ether	2.1E-03	V
Methylcyclohexane	1.1E-01	V
Methylene chloride	3.5E-03	V
n-Butylbenzene	NA	V
n-Propylbenzene	NA	V
p-Cymene (p-isopropyltoluene)	NA	V
Phenol	4.3E-03	NV
sec-Butylbenzene	NA	V
Styrene	3.7E-02	V
tert-Butylbenzene	NA	V
tert-Butyl alcohol	NA	V
Tetrachloroethene	3.3E-02	V
Toluene	3.1E-02	V
trans-1,2-Dichloroethene	7.7E-03	V
trans-1,3-Dichloropropene	4.3E-03	V
Trichloroethene	1.2E-02	V
Vinyl chloride	5.6E-03	V

Table 2-4
Dermal Permeability Constants and Volatile Compounds - Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical	Kp[a] (cm/hr)	Volatility[b]
m,p-Xylene	5.3E-02	V
o-Xylene	7.0E-02	V
Xylenes, total	5.3E-02	V
Dioxans/Furans		
1,2,3,4,6,7,8-HpCDD	8.1E-01	NV
1,2,3,4,6,7,8-HpCDF	8.1E-01	NV
1,2,3,4,7,8,9-HpCDF	8.1E-01	NV
1,2,3,4,7,8-HxCDD	8.1E-01	NV
1,2,3,4,7,8-HxCDF	8.1E-01	NV
1,2,3,6,7,8-HxCDD	8.1E-01	NV
1,2,3,6,7,8-HxCDF	8.1E-01	NV
1,2,3,7,8,9-HxCDD	8.1E-01	NV
1,2,3,7,8,9-HxCDF	8.1E-01	NV
1,2,3,7,8-PeCDD	8.1E-01	NV
1,2,3,7,8-PeCDF	8.1E-01	NV
2,3,4,6,7,8-HxCDF	8.1E-01	NV
2,3,4,7,8-PeCDF	8.1E-01	NV
2,3,7,8-TCDF	8.1E-01	NV
OCDF	8.1E-01	NV
OCDD	8.1E-01	NV

Notes:
NA = no Kp value available
NV = Nonvolatile, V = Volatile
[a] EPA RAGS Part E, 2004
[b] EPA Region 9 PRGs, 2004

Table 2-5
Exposure Point Concentrations for Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical	Units	Exposure Point Concentration	EPC Basis
Metals			
Aluminum	mg/L	9.40E+00	97.5% Chebyshev (Mean, Sd) UCL
Antimony	mg/L	1.51E-03	95% Student's-t UCL
Arsenic	mg/L	2.87E-01	95% H-UCL
Barium	mg/L	1.68E-01	95% H-UCL
Beryllium	mg/L	7.64E-04	95% Chebyshev (Mean, Sd) UCL
Boron	mg/L	4.31E+00	95% Approximate Gamma UCL
Cadmium	mg/L	1.26E-03	95% Chebyshev (Mean, Sd) UCL
Chromium	mg/L	3.57E-02	97.5% Chebyshev (Mean, Sd) UCL
Chromium (VI)	mg/L	3.50E-04	Maximum Result
Cobalt	mg/L	8.89E-03	95% Approximate Gamma UCL
Copper	mg/L	4.66E-02	95% H-UCL
Iron	mg/L	5.35E+01	95% Chebyshev (MVUE) UCL
Lead	mg/L	4.00E-02	95% H-UCL
Manganese	mg/L	4.33E+00	95% Approximate Gamma UCL
Mercury	mg/L	1.21E-04	95% Student's-t UCL
Molybdenum	mg/L	5.64E-03	95% Chebyshev (Mean, Sd) UCL
Nickel	mg/L	5.46E-02	95% H-UCL
Selenium	mg/L	1.89E-02	95% Chebyshev (Mean, Sd) UCL
Silver	mg/L	1.20E-04	Maximum Result
Thallium	mg/L	5.00E-05	Maximum Result
Vanadium	mg/L	3.19E-02	97.5% Chebyshev (Mean, Sd) UCL
Zinc	mg/L	3.03E-01	95% H-UCL
Cyanide	mg/L	6.29E-02	Maximum Result
Pesticides/PCBs			
4,4'-DDD	mg/L	5.00E-03	99% Chebyshev (Mean, Sd) UCL
4,4'-DDE	mg/L	7.76E-04	97.5% Chebyshev (Mean, Sd) UCL
4,4'-DDT	mg/L	1.80E-04	Maximum Result
Aldrin	mg/L	4.05E-04	97.5% Chebyshev (Mean, Sd) UCL
alpha-BHC	mg/L	3.00E-04	Maximum Result
alpha-Chlordane	mg/L	3.34E-04	97.5% Chebyshev (Mean, Sd) UCL
Atrazine	mg/L	2.00E-03	Maximum Result
beta-BHC	mg/L	3.69E-04	97.5% Chebyshev (Mean, Sd) UCL
delta-BHC	mg/L	1.60E-04	Maximum Result
Diazinon	mg/L	2.60E-04	95% Chebyshev (Mean, Sd) UCL
Dieldrin	mg/L	9.24E-04	97.5% Chebyshev (Mean, Sd) UCL
Endosulfan I	mg/L	3.31E-04	97.5% Chebyshev (Mean, Sd) UCL
Endosulfan II	mg/L	2.30E-04	Maximum Result
Endosulfan sulfate	mg/L	9.20E-05	Maximum Result
Endrin	mg/L	6.46E-04	97.5% Chebyshev (Mean, Sd) UCL
Endrin aldehyde	mg/L	1.40E-04	Maximum Result
Endrin ketone	mg/L	1.70E-04	Maximum Result
gamma-BHC	mg/L	3.28E-04	97.5% Chebyshev (Mean, Sd) UCL
gamma-Chlordane	mg/L	2.50E-04	Maximum Result
Heptachlor	mg/L	1.11E-04	97.5% Chebyshev (Mean, Sd) UCL
Heptachlor epoxide	mg/L	1.20E-04	Maximum Result
Methoxychlor	mg/L	1.20E-04	Maximum Result

Table 2-5
Exposure Point Concentrations for Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical	Units	Exposure Point Concentration	EPC Basis
Aroclor-1260	mg/L	9.63E-04	95% Chebyshev (Mean, Sd) UCL
SVOCs/VOCs			
1,4-Dioxane (p-dioxane)	mg/L	7.80E-01	Maximum Result
2,4,6-Trichlorophenol	mg/L	7.14E-03	97.5% Chebyshev (Mean, Sd) UCL
2,4-Dimethylphenol	mg/L	7.87E-02	97.5% Chebyshev (Mean, Sd) UCL
2-Chlorophenol	mg/L	4.30E-03	Maximum Result
2-Methylnaphthalene	mg/L	2.26E-01	99% Chebyshev (Mean, Sd) UCL
2-Methylphenol	mg/L	1.23E-01	97.5% Chebyshev (Mean, Sd) UCL
2-Nitroaniline	mg/L	1.00E-02	Maximum Result
3,4-methylphenol	mg/L	8.40E-01	Maximum Result
4-Chloro-3-methylphenol	mg/L	2.38E-02	95% Chebyshev (Mean, Sd) UCL
4-Methylphenol	mg/L	1.94E-01	97.5% Chebyshev (Mean, Sd) UCL
Acenaphthene	mg/L	4.50E-03	Maximum Result
Acenaphthylene	mg/L	9.54E-03	97.5% Chebyshev (Mean, Sd) UCL
Anthracene	mg/L	3.20E-03	Maximum Result
Benzo(a)anthracene	mg/L	9.00E-04	Maximum Result
Benzo(a)pyrene	mg/L	5.00E-04	Maximum Result
Benzo(b)fluoranthene	mg/L	7.60E-04	Maximum Result
Benzo(g,h,i)perylene	mg/L	2.00E-04	Maximum Result
Benzo(k)fluoranthene	mg/L	4.60E-04	Maximum Result
Biphenyl (Diphenyl)	mg/L	1.30E-03	Maximum Result
bis(2-Chloroethoxy)methane	mg/L	2.00E-04	Maximum Result
bis(2-Ethylhexyl)phthalate	mg/L	1.69E-02	97.5% Chebyshev (Mean, Sd) UCL
Bromoform	mg/L	1.20E-02	Maximum Result
Caprolactam	mg/L	2.40E-03	Maximum Result
Carbazole	mg/L	1.25E-02	99% Chebyshev (Mean, Sd) UCL
Chrysene	mg/L	1.10E-03	Maximum Result
Dibenz(a,h)anthracene	mg/L	4.50E-05	Maximum Result
Diethylphthalate	mg/L	1.03E-02	95% Chebyshev (Mean, Sd) UCL
Di-n-butyl phthalate	mg/L	1.17E-02	95% Chebyshev (Mean, Sd) UCL
Fluoranthene	mg/L	2.40E-03	Maximum Result
Fluorene	mg/L	2.60E-03	Maximum Result
Hexachloroethane	mg/L	1.00E-03	Maximum Result
Indeno(1,2,3-c,d)pyrene	mg/L	2.00E-04	Maximum Result
Naphthalene	mg/L	1.36E-01	99% Chebyshev (Mean, Sd) UCL
Nitrobenzene	mg/L	2.00E-03	Maximum Result
N-Nitrosodi-n-propylamine	mg/L	2.00E-03	Maximum Result
N-Nitrosodiphenylamine	mg/L	1.20E-03	Maximum Result
Pentachlorophenol	mg/L	1.13E-02	97.5% Chebyshev (Mean, Sd) UCL
Phenanthrene	mg/L	6.00E-03	Maximum Result
Pyrene	mg/L	2.40E-03	Maximum Result
1,1-Dichloroethane	mg/L	5.57E-01	99% Chebyshev (Mean, Sd) UCL
1,1-Dichloroethene	mg/L	4.16E-02	97.5% Chebyshev (Mean, Sd) UCL
1,1,1-Trichloroethane	mg/L	1.18E-01	97.5% Chebyshev (Mean, Sd) UCL
1,1,2-Trichloroethane	mg/L	1.33E-02	97.5% Chebyshev (Mean, Sd) UCL
1,1,2,2-Tetrachloroethane	mg/L	1.29E-02	97.5% Chebyshev (Mean, Sd) UCL
1,2,3-Trichlorobenzene	mg/L	2.72E-03	97.5% Chebyshev (Mean, Sd) UCL

Table 2-5
Exposure Point Concentrations for Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical	Units	Exposure Point Concentration	EPC Basis
1,2,4-Trichlorobenzene	mg/L	1.51E-02	97.5% Chebyshev (Mean, Sd) UCL
1,2,4-Trimethylbenzene	mg/L	2.78E-01	99% Chebyshev (Mean, Sd) UCL
1,2-Dibromo-3-chloropropane	mg/L	2.40E-03	Maximum Result
1,2-Dichlorobenzene	mg/L	7.34E-01	99% Chebyshev (Mean, Sd) UCL
1,2-Dichloroethane	mg/L	1.44E-02	97.5% Chebyshev (Mean, Sd) UCL
1,2-Dichloropropane	mg/L	5.10E-03	Maximum Result
1,3-Dichlorobenzene	mg/L	2.71E-02	97.5% Chebyshev (Mean, Sd) UCL
1,3,5-Trimethylbenzene	mg/L	1.10E-01	99% Chebyshev (Mean, Sd) UCL
1,4-Dichlorobenzene	mg/L	2.18E-01	97.5% Chebyshev (Mean, Sd) UCL
2-Chlorotoluene	mg/L	2.89E-03	97.5% Chebyshev (Mean, Sd) UCL
2-Hexanone	mg/L	2.35E-02	95% Chebyshev (Mean, Sd) UCL
2,2-Dichloropropane	mg/L	5.00E-04	Maximum Result
Acetone	mg/L	4.85E-01	97.5% Chebyshev (Mean, Sd) UCL
Benzene	mg/L	4.00E-01	99% Chebyshev (Mean, Sd) UCL
Carbon disulfide	mg/L	3.10E-03	Maximum Result
Carbon tetrachloride	mg/L	3.00E-04	Maximum Result
Chlorobenzene	mg/L	6.74E-01	99% Chebyshev (Mean, Sd) UCL
Chloroethane	mg/L	9.74E-02	99% Chebyshev (Mean, Sd) UCL
Chloroform	mg/L	4.40E-03	Maximum Result
Chloromethane	mg/L	7.40E-03	Maximum Result
cis-1,2-Dichloroethene	mg/L	1.37E+01	99% Chebyshev (Mean, Sd) UCL
cis-1,3-Dichloropropene	mg/L	4.20E-03	Maximum Result
Cyclohexane	mg/L	1.80E-02	Maximum Result
Ethyl tert-butyl ether (ETBE)	mg/L	1.20E-03	Maximum Result
Ethylbenzene	mg/L	4.49E-01	99% Chebyshev (Mean, Sd) UCL
Isopropyl ether	mg/L	4.30E-01	Maximum Result
Isopropylbenzene (cumene)	mg/L	2.71E-02	97.5% Chebyshev (Mean, Sd) UCL
Methyl acetate	mg/L	2.25E-02	97.5% Chebyshev (Mean, Sd) UCL
Methyl ethyl ketone	mg/L	4.30E-01	97.5% Chebyshev (Mean, Sd) UCL
Methyl isobutyl ketone	mg/L	4.86E+00	99% Chebyshev (Mean, Sd) UCL
Methyl tert-butyl ether	mg/L	2.01E-02	97.5% Chebyshev (Mean, Sd) UCL
Methylcyclohexane	mg/L	2.45E-02	97.5% Chebyshev (Mean, Sd) UCL
Methylene chloride	mg/L	8.19E-03	97.5% Chebyshev (Mean, Sd) UCL
n-Butylbenzene	mg/L	6.12E-03	97.5% Chebyshev (Mean, Sd) UCL
n-Propylbenzene	mg/L	5.61E-02	99% Chebyshev (Mean, Sd) UCL
p-Cymene (p-isopropyltoluene)	mg/L	7.86E-02	99% Chebyshev (Mean, Sd) UCL
Phenol	mg/L	4.80E-02	97.5% Chebyshev (Mean, Sd) UCL
sec-Butylbenzene	mg/L	5.64E-03	97.5% Chebyshev (Mean, Sd) UCL
Styrene	mg/L	1.39E-02	97.5% Chebyshev (Mean, Sd) UCL
tert-Butylbenzene	mg/L	2.10E-03	Maximum Result
tert-Butyl alcohol	mg/L	1.17E-01	97.5% Chebyshev (Mean, Sd) UCL
Tetrachloroethene	mg/L	1.20E-02	Maximum Result
Toluene	mg/L	6.11E+00	99% Chebyshev (Mean, Sd) UCL
trans-1,2-Dichloroethene	mg/L	4.01E-01	99% Chebyshev (Mean, Sd) UCL
trans-1,3-Dichloropropene	mg/L	4.10E-03	Maximum Result
Trichloroethene	mg/L	5.70E-02	97.5% Chebyshev (Mean, Sd) UCL
Vinyl chloride	mg/L	1.63E+00	99% Chebyshev (Mean, Sd) UCL

Table 2-5
Exposure Point Concentrations for Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical	Units	Exposure Point Concentration	EPC Basis
m,p-Xylene	mg/L	9.44E-01	99% Chebyshev (Mean, Sd) UCL
o-Xylene	mg/L	4.45E-01	99% Chebyshev (Mean, Sd) UCL
Xylenes, total	mg/L	1.60E+00	99% Chebyshev (Mean, Sd) UCL
Dioxans/Furans			
1,2,3,4,6,7,8-HpCDD	mg/L	4.64E-07	99% Chebyshev (Mean, Sd) UCL
1,2,3,4,6,7,8-HpCDF	mg/L	9.49E-08	99% Chebyshev (Mean, Sd) UCL
1,2,3,4,7,8,9-HpCDF	mg/L	9.79E-09	99% Chebyshev (Mean, Sd) UCL
1,2,3,4,7,8-HxCDD	mg/L	2.62E-09	95% Chebyshev (Mean, Sd) UCL
1,2,3,4,7,8-HxCDF	mg/L	8.49E-09	99% Chebyshev (Mean, Sd) UCL
1,2,3,6,7,8-HxCDD	mg/L	1.33E-08	99% Chebyshev (Mean, Sd) UCL
1,2,3,6,7,8-HxCDF	mg/L	1.62E-09	95% Chebyshev (Mean, Sd) UCL
1,2,3,7,8,9-HxCDD	mg/L	4.40E-09	95% Chebyshev (Mean, Sd) UCL
1,2,3,7,8,9-HxCDF	mg/L	3.87E-09	99% Chebyshev (Mean, Sd) UCL
1,2,3,7,8-PeCDD	mg/L	1.08E-09	95% H-UCL
1,2,3,7,8-PeCDF	mg/L	2.28E-09	95% Chebyshev (Mean, Sd) UCL
2,3,4,6,7,8-HxCDF	mg/L	3.94E-09	99% Chebyshev (Mean, Sd) UCL
2,3,4,7,8-PeCDF	mg/L	2.64E-09	95% Chebyshev (Mean, Sd) UCL
2,3,7,8-TCDF	mg/L	1.68E-09	95% Chebyshev (Mean, Sd) UCL
OCDF	mg/L	7.44E-07	99% Chebyshev (Mean, Sd) UCL
OCDD	mg/L	2.18E-06	95% Hall's Bootstrap UCL

Table 2-6
Risk Calculation Worksheet for Groundwater - Carcinogenic Effects - Residential Exposure Scenario - Future Adult Resident
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Groundwater
	Exposure Point:	OnSite
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	days/yr
Exposure Time for dermal exposure	ET_d	0.58	hr/day
Exposure Time for inhalation of volatiles	ET_i	24	hr/day
Exposure Duration	ED	24	years
Ingestion Rate	IngR	2	L/day
Inhalation Rate	InhR	0.83	m3/hr
Volatilization Factor	VFw	0.5	L/m3
Skin Surface Area	SA	18000	cm2
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor 1	CF1	1.00E-03	L/cm3
Conversion Factor 2	CF2	1.00E+06	cm3/m3
Conversion Factor 3	CF3	2.74E-03	yr/day
Constituent Specific Permeability Constant	Kp	Chemical Specific	cm/hr

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cw [mg/L]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
Metals											
Aluminum	9.40E+00	8.83E-02	NA		4.61E-04	NA		NV	NA		
Antimony	1.51E-03	1.42E-05	NA		7.41E-08	NA		NV	NA		
Arsenic	2.87E-01	2.69E-03	9.50E+00	2.56E-02	1.41E-05	9.50E+00	1.34E-04	NV	1.51E+01		**2.57E-02**
Barium	1.68E-01	1.57E-03	NA		8.22E-06	NA		NV	NA		
Beryllium	7.64E-04	7.18E-06	NA		3.75E-08	NA		NV	8.40E+00		
Boron	4.31E+00	4.05E-02	NA		2.11E-04	NA		NV	NA		
Cadmium	1.26E-03	1.18E-05	3.80E-01	4.48E-06	6.16E-08	3.80E-01	2.34E-08	NV	1.47E+01		**4.51E-06**
Chromium	3.57E-02	3.35E-04	NA		1.75E-06	NA		NV	4.20E+01		
Chromium (VI)	3.50E-04	3.29E-06	NA		3.43E-08	NA		NV	2.90E+02		
Cobalt	8.89E-03	8.35E-05	NA		1.74E-07	NA		NV	9.80E+00		
Copper	4.66E-02	4.38E-04	NA		2.28E-06	NA		NV	NA		
Iron	5.35E+01	5.03E-01	NA		2.62E-03	NA		NV	NA		
Lead	4.00E-02	3.76E-04	NA		1.96E-07	NA		NV	NA		
Manganese	4.33E+00	4.07E-02	NA		2.12E-04	NA		NV	NA		
Mercury	1.21E-04	1.14E-06	NA		5.93E-09	NA		NV	NA		
Molybdenum	5.64E-03	5.29E-05	NA		2.76E-07	NA		NV	NA		
Nickel	5.46E-02	5.13E-04	NA		5.35E-07	NA		NV	9.10E-01		
Selenium	1.89E-02	1.78E-04	NA		9.27E-07	NA		NV	NA		
Silver	1.20E-04	1.13E-06	NA		3.53E-09	NA		NV	NA		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/L]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Thallium	5.00E-05	4.70E-07	NA		2.45E-09	NA		NV	NA		
Vanadium	3.19E-02	3.00E-04	NA		1.57E-06	NA		NV	NA		
Zinc	3.03E-01	2.85E-03	NA		8.91E-06	NA		NV	NA		
Cyanide	6.29E-02	5.91E-04	NA		3.08E-06	NA		NV	NA		
Pesticides/PCBs											
4,4'-DDD	5.00E-03	4.69E-05	2.40E-01	1.13E-05	3.27E-04	2.40E-01	7.84E-05	NV	2.42E-01		**8.97E-05**
4,4'-DDE	7.76E-04	7.29E-06	3.40E-01	2.48E-06	4.45E-05	3.40E-01	1.51E-05	NV	3.40E-01		**1.76E-05**
4,4'-DDT	1.80E-04	1.69E-06	3.40E-01	5.75E-07	1.94E-05	3.40E-01	6.58E-06	NV	3.40E-01		**7.16E-06**
Aldrin	4.05E-04	3.80E-06	1.70E+01	6.46E-05	3.44E-07	1.70E+01	5.85E-06	NV	1.72E+01		**7.04E-05**
alpha-BHC	3.00E-04	2.82E-06	6.30E+00	1.78E-05	1.24E-06	6.30E+00	7.82E-06	NV	6.30E+00		**2.56E-05**
alpha-Chlordane	3.34E-04	3.14E-06	1.20E+00	3.76E-06	6.45E-06	1.20E+00	7.74E-06	NV	1.19E+00		**1.15E-05**
Atrazine	2.00E-03	1.88E-05	2.30E-01	4.32E-06	2.40E-06	2.30E-01	5.53E-07	NV	2.22E-01		**4.87E-06**
beta-BHC	3.69E-04	3.46E-06	1.80E+00	6.23E-06	1.53E-06	1.80E+00	2.75E-06	NV	1.80E+00		**8.98E-06**
delta-BHC	1.60E-04	1.50E-06	NA		6.62E-07	NA		NV	NA		
Diazinon	2.60E-04	2.44E-06	NA		1.09E-06	NA		NV	NA		
Dieldrin	9.24E-04	8.68E-06	1.60E+01	1.39E-04	5.97E-06	1.60E+01	9.55E-05	NV	1.61E+01		**2.34E-04**
Endosulfan I	3.31E-04	3.11E-06	NA		7.41E-07	NA		NV	NA		
Endosulfan II	2.30E-04	2.16E-06	NA		3.21E-07	NA		NV	NA		
Endosulfan sulfate	9.20E-05	8.64E-07	NA		NA	NA		NV	NA		
Endrin	6.46E-04	6.07E-06	NA		4.18E-06	NA		NV	NA		
Endrin aldehyde	1.40E-04	1.32E-06	NA		NA	NA		NV	NA		
Endrin ketone	1.70E-04	1.60E-06	NA		NA	NA		NV	NA		
gamma-BHC	3.28E-04	3.08E-06	1.30E+00	4.00E-06	1.36E-06	1.30E+00	1.76E-06	NV	1.30E+00		**5.76E-06**
gamma-Chlordane	2.50E-04	2.35E-06	1.20E+00	2.82E-06	4.83E-06	1.20E+00	5.79E-06	NV	1.19E+00		**8.61E-06**
Heptachlor	1.11E-04	1.04E-06	4.50E+00	4.68E-06	4.88E-07	4.50E+00	2.20E-06	NV	4.55E+00		**6.88E-06**
Heptachlor epoxide	1.20E-04	1.13E-06	9.10E+00	1.03E-05	1.73E-06	9.10E+00	1.57E-05	NV	9.10E+00		**2.60E-05**
Methoxychlor	1.20E-04	1.13E-06	NA		2.66E-06	NA		NV	NA		
Aroclor-1260	9.63E-04	9.04E-06	2.00E+00	1.81E-05	3.20E-04	2.00E+00	6.39E-04	NV	2.00E+00		**6.58E-04**
SVOCs/VOCs											
1,4-Dioxane (p-dioxane)	7.80E-01	7.33E-03	2.70E-02	1.98E-04	2.62E-05	2.70E-02	7.08E-07	NV	2.70E-02		**1.99E-04**
2,4,6-Trichlorophenol	7.14E-03	6.71E-05	7.00E-02	4.69E-06	5.15E-05	7.00E-02	3.60E-06	NV	7.00E-02		**8.30E-06**
2,4-Dimethylphenol	7.87E-02	7.39E-04	NA		1.10E-04	NA		NV	NA		
2-Chlorophenol	4.30E-03	4.04E-05	NA		4.55E-06	NA		2.01E-04	NA		
2-Methylnaphthalene	2.26E-01	2.12E-03	NA		2.91E-03	NA		1.05E-02	NA		
2-Methylphenol	1.23E-01	1.15E-03	NA		1.10E-04	NA		NV	NA		
2-Nitroaniline	1.00E-02	9.39E-05	NA		6.24E-06	NA		NV	NA		
3,4-methylphenol	8.40E-01	7.89E-03	NA		7.49E-04	NA		NV	NA		
4-Chloro-3-methylphenol	2.38E-02	2.24E-04	NA		NA	NA		NV	NA		
4-Methylphenol	1.94E-01	1.82E-03	NA		1.73E-04	NA		NV	NA		
Acenaphthene	4.50E-03	4.23E-05	NA		9.33E-05	NA		2.11E-04	NA		
Acenaphthylene	9.54E-03	8.96E-05	NA		2.07E-04	NA		4.46E-04	NA		
Anthracene	3.20E-03	3.01E-05	NA		1.31E-04	NA		1.50E-04	NA		
Benzo(a)anthracene	9.00E-04	8.45E-06	1.20E+00	1.01E-05	1.06E-04	1.20E+00	1.28E-04	NV	7.30E-01		**1.38E-04**
Benzo(a)pyrene	5.00E-04	4.70E-06	1.20E+01	5.64E-05	1.01E-04	1.20E+01	1.21E-03	NV	7.30E+00		**1.27E-03**
Benzo(b)fluoranthene	7.60E-04	7.14E-06	1.20E+00	8.57E-06	1.56E-04	1.20E+00	1.87E-04	NV	7.30E-01		**1.96E-04**
Benzo(g,h,i)perylene	2.00E-04	1.88E-06	NA		7.32E-05	NA		NV	NA		

Risk Calculations

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Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/L]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Benzo(k)fluoranthene	4.60E-04	4.32E-06	1.20E+00	5.19E-06	8.91E-05	1.20E+00	1.07E-04	NV	3.85E-01		**1.12E-04**
Biphenyl (Diphenyl)	1.30E-03	1.22E-05	NA		1.86E-05	NA		NV	NA		
bis(2-Chloroethoxy)methane	2.00E-04	1.88E-06	NA		4.32E-08	NA		9.36E-06	NA		
bis(2-Ethylhexyl)phthalate	1.69E-02	1.59E-04	1.40E-02	2.22E-06	3.03E-04	1.40E-02	4.25E-06	NV	1.40E-02		**6.47E-06**
Bromoform	1.20E-02	1.13E-04	7.90E-03	8.90E-07	7.77E-06	7.90E-03	6.14E-08	5.61E-04	3.85E-03	2.16E-06	**3.11E-06**
Caprolactam	2.40E-03	2.25E-05	NA		2.89E-07	NA		NV	NA		
Carbazole	1.25E-02	1.18E-04	2.00E-02	2.35E-06	1.11E-04	2.00E-02	2.22E-06	NV	2.00E-02		**4.58E-06**
Chrysene	1.10E-03	1.03E-05	1.20E-01	1.24E-06	1.30E-04	1.20E-01	1.56E-05	NV	3.85E-02		**1.68E-05**
Dibenz(a,h)anthracene	4.50E-05	4.23E-07	7.30E+00	3.09E-06	1.41E-05	7.30E+00	1.03E-04	NV	7.30E+00		**1.06E-04**
Diethylphthalate	1.03E-02	9.68E-05	NA		9.70E-06	NA		NV	NA		
Di-n-butyl phthalate	1.17E-02	1.09E-04	NA		8.72E-05	NA		NV	NA		
Fluoranthene	2.40E-03	2.25E-05	NA		1.12E-04	NA		NV	NA		
Fluorene	2.60E-03	2.44E-05	NA		7.49E-05	NA		1.22E-04	NA		
Hexachloroethane	1.00E-03	9.39E-06	3.90E-02	3.66E-07	7.96E-06	3.90E-02	3.11E-07	NV	3.85E-01		6.77E-07
Indeno(1,2,3-c,d)pyrene	2.00E-04	1.88E-06	7.30E-01	1.37E-06	4.11E-05	7.30E-01	3.00E-05	NV	7.30E-01		**3.14E-05**
Naphthalene	1.36E-01	1.28E-03	1.20E-01	1.54E-04	8.44E-04	1.20E-01	1.01E-04	6.37E-03	1.19E-01	7.58E-04	**1.01E-03**
Nitrobenzene	2.00E-03	1.88E-05	NA		1.38E-06	NA		9.36E-05	NA		
N-Nitrosodi-n-propylamine	2.00E-03	1.88E-05	7.00E+00	1.32E-04	6.24E-07	7.00E+00	4.37E-06	NV	7.00E+00		**1.36E-04**
N-Nitrosodiphenylamine	1.20E-03	1.13E-05	9.00E-03	1.01E-07	6.46E-06	9.00E-03	5.82E-08	NV	9.10E-03		1.60E-07
Pentachlorophenol	1.13E-02	1.06E-04	1.20E-01	1.27E-05	1.27E-03	1.20E-01	1.53E-04	NV	1.20E-01		**1.66E-04**
Phenanthrene	6.00E-03	5.64E-05	NA		1.53E-04	NA		NV	NA		
Pyrene	2.40E-03	2.25E-05	NA		1.65E-04	NA		1.12E-04	NA		
1,1,1-Trichloroethane	1.18E-01	1.11E-03	NA		2.09E-04	NA		5.52E-03	NA		
1,1,2,2-Tetrachloroethane	1.29E-02	1.21E-04	2.70E-01	3.28E-05	1.52E-05	2.70E-01	4.10E-06	6.04E-04	2.00E-01	1.21E-04	**1.58E-04**
1,1,2-Trichloroethane	1.33E-02	1.25E-04	7.20E-02	9.01E-06	1.16E-05	7.20E-02	8.37E-07	6.23E-04	5.60E-02	3.49E-05	**4.48E-05**
1,1-Dichloroethane	5.57E-01	5.23E-03	5.70E-03	2.98E-05	4.08E-04	5.70E-03	2.32E-06	2.61E-02	5.60E-03	1.46E-04	**1.78E-04**
1,1-Dichloroethene	4.16E-02	3.91E-04	9.10E-02	3.55E-05	5.38E-05	9.10E-02	4.89E-06	1.94E-03	9.10E-02	1.77E-04	**2.17E-04**
1,2,3-Trichlorobenzene	2.72E-03	2.56E-05	NA		NA	NA		1.27E-04	NA		
1,2,4-Trichlorobenzene	1.51E-02	1.42E-04	3.60E-03	5.10E-07	1.85E-04	3.60E-03	6.67E-07	7.06E-04	NA		**1.18E-06**
1,2,4-Trimethylbenzene	2.78E-01	2.61E-03	NA		2.91E-03	NA		1.30E-02	NA		
1,2-Dibromo-3-chloropropane	2.40E-03	2.25E-05	7.00E+00	1.58E-04	4.30E-06	7.00E+00	3.01E-05	1.12E-04	6.65E+00	7.47E-04	**9.34E-04**
1,2-Dichlorobenzene	7.34E-01	6.90E-03	NA		4.48E-03	NA		3.44E-02	NA		
1,2-Dichloroethane	1.44E-02	1.35E-04	9.10E-02	1.23E-05	1.05E-05	9.10E-02	9.57E-07	6.72E-04	9.10E-02	6.11E-05	**7.44E-05**
1,2-Dichloropropane	5.10E-03	4.79E-05	6.80E-02	3.26E-06	4.76E-06	6.80E-02	3.23E-07	2.39E-04	6.80E-02	1.62E-05	**1.98E-05**
1,3,5-Trimethylbenzene	1.10E-01	1.04E-03	NA		8.40E-04	NA		5.16E-03	NA		
1,3-Dichlorobenzene	2.71E-02	2.55E-04	NA		2.34E-04	NA		1.27E-03	NA		
1,4-Dichlorobenzene	2.18E-01	2.05E-03	2.40E-02	4.91E-05	1.36E-03	2.40E-02	3.27E-05	1.02E-02	3.85E-02	3.92E-04	**4.74E-04**
2-Chlorotoluene	2.89E-03	2.71E-05	NA		NA	NA		1.35E-04	NA		
2-Hexanone	2.35E-02	2.21E-04	NA		9.19E-06	NA		1.10E-03	NA		
2,2-Dichloropropane	5.00E-04	4.70E-06	NA		NA	NA		2.34E-05	NA		
Acetone	4.85E-01	4.56E-03	NA		2.19E-05	NA		2.27E-02	NA		
Benzene	4.00E-01	3.76E-03	1.00E-01	3.76E-04	5.73E-04	1.00E-01	5.73E-05	1.87E-02	1.02E-01	1.90E-03	**2.33E-03**
Carbon disulfide	3.10E-03	2.91E-05	NA		5.09E-06	NA		1.45E-04	NA		
Carbon tetrachloride	3.00E-04	2.82E-06	1.50E-01	4.23E-07	7.47E-07	1.50E-01	1.12E-07	1.40E-05	1.47E-01	2.06E-06	**2.60E-06**
Chlorobenzene	6.74E-01	6.33E-03	NA		2.25E-03	NA		3.15E-02	NA		
Chloroethane	9.74E-02	9.15E-04	2.90E-03	2.65E-06	5.33E-05	2.90E-03	1.55E-07	4.56E-03	2.90E-03	1.32E-05	**1.60E-05**

Risk Calculations

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Chloroform	4.40E-03	4.13E-05	3.10E-02	1.28E-06	3.73E-06	3.10E-02	1.16E-07	2.06E-04	8.10E-02	1.67E-05	**1.81E-05**
Chloromethane	7.40E-03	6.95E-05	NA		2.03E-06	NA		3.46E-04	NA		
cis-1,2-Dichloroethene	1.37E+01	1.29E-01	NA		1.61E-02	NA		6.42E-01	NA		
cis-1,3-Dichloropropene	4.20E-03	3.95E-05	1.00E-01	3.95E-06	2.13E-06	1.00E-01	2.13E-07	1.96E-04	5.60E-02	1.10E-05	**1.52E-05**
Cyclohexane	1.80E-02	1.69E-04	NA		1.78E-04	NA		8.42E-04	NA		
Ethyl tert-butyl ether (ETBE)	1.20E-03	1.13E-05	NA		NA	NA		5.61E-05	NA		
Ethylbenzene	4.49E-01	4.22E-03	NA		2.52E-03	NA		2.10E-02	NA		
Isopropyl ether	4.30E-01	4.04E-03	NA		NA	NA		2.01E-02	NA		
Isopropylbenzene (cumene)	2.71E-02	2.54E-04	NA		2.97E-04	NA		1.27E-03	NA		
Methyl acetate	2.25E-02	2.12E-04	NA		1.68E-06	NA		1.05E-03	NA		
Methyl ethyl ketone	4.30E-01	4.04E-03	NA		3.79E-05	NA		2.01E-02	NA		
Methyl isobutyl ketone	4.86E+00	4.56E-02	NA		1.42E-03	NA		2.27E-01	NA		
Methyl tert-butyl ether	2.01E-02	1.89E-04	1.80E-03	3.40E-07	4.35E-06	1.80E-03	7.84E-09	9.42E-04	9.10E-04	8.57E-07	**1.21E-06**
Methylcyclohexane	2.45E-02	2.30E-04	NA		2.87E-04	NA		1.15E-03	NA		
Methylene chloride	8.19E-03	7.69E-05	1.40E-02	1.08E-06	2.86E-06	1.40E-02	4.00E-08	3.83E-04	3.50E-03	1.34E-06	**2.46E-06**
n-Butylbenzene	6.12E-03	5.74E-05	NA		NA	NA		2.86E-04	NA		
n-Propylbenzene	5.61E-02	5.27E-04	NA		NA	NA		2.63E-03	NA		
p-Cymene (p-isopropyltoluene)	7.86E-02	7.38E-04	NA		NA	NA		3.67E-03	NA		
Phenol	4.80E-02	4.51E-04	NA		2.19E-05	NA		NV	NA		
sec-Butylbenzene	5.64E-03	5.30E-05	NA		NA	NA		2.64E-04	NA		
Styrene	1.39E-02	1.31E-04	NA		5.82E-05	NA		6.51E-04	NA		
tert-Butylbenzene	2.10E-03	1.97E-05	NA		NA	NA		9.82E-05	NA		
tert-Butyl alcohol	1.17E-01	1.10E-03	NA		NA	NA		5.47E-03	NA		
Tetrachloroethene	1.20E-02	1.13E-04	5.40E-01	6.09E-05	6.66E-05	5.40E-01	3.59E-05	5.61E-04	2.07E-02	1.16E-05	**1.08E-04**
Toluene	6.11E+00	5.74E-02	NA		1.98E-02	NA		2.86E-01	NA		
trans-1,2-Dichloroethene	4.01E-01	3.77E-03	NA		3.33E-04	NA		1.88E-02	NA		
trans-1,3-Dichloropropene	4.10E-03	3.85E-05	1.00E-01	3.85E-06	2.08E-06	1.00E-01	2.08E-07	1.92E-04	5.60E-02	1.07E-05	**1.48E-05**
Trichloroethene	5.70E-02	5.35E-04	4.00E-01	2.14E-04	9.20E-05	4.00E-01	3.68E-05	2.66E-03	4.00E-01	1.07E-03	**1.32E-03**
Vinyl chloride	1.63E+00	1.53E-02	1.50E+00	2.29E-02	8.08E-04	1.50E+00	1.21E-03	7.61E-02	2.73E-01	2.08E-02	**4.49E-02**
m,p-Xylene	9.44E-01	8.87E-03	NA		NA	NA		4.42E-02	NA		
o-Xylene	4.45E-01	4.18E-03	NA		3.58E-03	NA		2.08E-02	NA		
Xylenes, total	1.60E+00	1.50E-02	NA		9.71E-03	NA		7.49E-02	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	4.64E-07	4.36E-09	1.50E+03	6.54E-06	1.68E-07	1.50E+03	2.53E-04	NV	1.50E+03		**2.59E-04**
1,2,3,4,6,7,8-HpCDF	9.49E-08	8.92E-10	1.50E+03	1.34E-06	3.11E-08	1.50E+03	4.66E-05	NV	1.50E+03		**4.79E-05**
1,2,3,4,7,8,9-HpCDF	9.79E-09	9.20E-11	1.50E+03	1.38E-07	3.20E-09	1.50E+03	4.80E-06	NV	1.50E+03		**4.94E-06**
1,2,3,4,7,8-HxCDD	2.62E-09	2.46E-11	1.50E+04	3.70E-07	7.62E-10	1.50E+04	1.14E-05	NV	1.50E+04		**1.18E-05**
1,2,3,4,7,8-HxCDF	8.49E-09	7.98E-11	1.50E+04	1.20E-06	2.23E-09	1.50E+04	3.34E-05	NV	1.50E+04		**3.46E-05**
1,2,3,6,7,8-HxCDD	1.33E-08	1.25E-10	1.50E+04	1.87E-06	3.86E-09	1.50E+04	5.79E-05	NV	1.50E+04		**5.98E-05**
1,2,3,6,7,8-HxCDF	1.62E-09	1.52E-11	1.50E+04	2.28E-07	4.24E-10	1.50E+04	6.35E-06	NV	1.50E+04		**6.58E-06**
1,2,3,7,8,9-HxCDD	4.40E-09	4.14E-11	1.50E+04	6.20E-07	1.28E-09	1.50E+04	1.92E-05	NV	1.50E+04		**1.98E-05**
1,2,3,7,8,9-HxCDF	3.87E-09	3.63E-11	1.50E+04	5.45E-07	1.01E-09	1.50E+04	1.52E-05	NV	1.50E+04		**1.57E-05**
1,2,3,7,8-PeCDD	1.08E-09	1.01E-11	1.50E+05	1.52E-06	2.51E-10	1.50E+05	3.77E-05	NV	1.50E+05		**3.92E-05**
1,2,3,7,8-PeCDF	2.28E-09	2.14E-11	7.50E+03	1.61E-07	4.78E-10	7.50E+03	3.59E-06	NV	7.50E+03		**3.75E-06**
2,3,4,6,7,8-HxCDF	3.94E-09	3.70E-11	1.50E+04	5.56E-07	1.03E-09	1.50E+04	1.55E-05	NV	1.50E+04		**1.61E-05**
2,3,4,7,8-PeCDF	2.64E-09	2.48E-11	7.50E+04	1.86E-06	5.53E-10	7.50E+04	4.15E-05	NV	7.50E+04		**4.33E-05**

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/L]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
2,3,7,8-TCDF	1.68E-09	1.58E-11	1.50E+04	2.37E-07	2.82E-10	1.50E+04	4.23E-06	NV	1.50E+04		**4.47E-06**
OCDF	7.44E-07	6.98E-09	1.50E+01	1.05E-07	3.04E-07	1.50E+01	4.56E-06	NV	1.50E+01		**4.66E-06**
OCDD	2.18E-06	2.05E-08	1.50E+01	3.07E-07	9.87E-07	1.50E+01	1.48E-05	NV	1.50E+01		**1.51E-05**
			Total Risk:	5.04E-02		**Total Risk:**	5.06E-03		**Total Risk:**	2.63E-02	**8.17E-02**

Total Estimated Carcinogenic Risk Across All Exposure Routes : **8.2E-02**

Notes:

NA = One or more of the following: no toxicity value available in standard U.S. EPA toxicity value databases; no Kp value available; no Henry's Law constant.

RME = Reasonable maximum exposure.

EPC = Exposure point concentration.

NV = Chemical classified as Nonvolatile thus no CDI was calculated.

Table 2-7
Risk Calculation Worksheet for Groundwater - Noncarcinogenic Effects - Residential Exposure Scenario - Future Adult Resident
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Groundwater
	Exposure Point:	OnSite
	Receptor Population:	Future Adult Resident
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	days/yr
Exposure Time for dermal exposure	ET_d	0.58	hr/day
Exposure Time for inhalation of volatiles	ET_i	24	hr/day
Exposure Duration	ED	24	years
Ingestion Rate	IngR	2	L/day
Inhalation Rate	InhR	0.83	m3/hr
Volatilization Factor	VFw	0.5	L/m3
Skin Surface Area	SA	18000	cm2
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	24	yr
Conversion Factor 1	CF1	1.00E-03	L/cm3
Conversion Factor 2	CF2	1.00E+06	cm3/m3
Conversion Factor 3	CF3	2.74E-03	yr/day
Constituent Specific Permeability Constant	Kp	Chemical Specific	cm/hr

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cw [mg/L]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Aluminum	9.40E+00	2.57E-01	1.00E+00	2.57E-01	1.34E-03	1.00E+00	1.34E-03	NV	1.40E-03		**2.59E-01**
Antimony	1.51E-03	4.14E-05	4.00E-04	1.04E-01	2.16E-07	4.00E-04	5.41E-04	NV	NA		**1.04E-01**
Arsenic	2.87E-01	7.86E-03	3.00E-04	2.62E+01	4.10E-05	3.00E-04	1.37E-01	NV	8.57E-06		**2.63E+01**
Barium	1.68E-01	4.59E-03	7.00E-02	6.56E-02	2.40E-05	7.00E-02	3.43E-04	NV	1.43E-04		6.60E-02
Beryllium	7.64E-04	2.09E-05	2.00E-03	1.05E-02	1.09E-07	2.00E-03	5.46E-05	NV	5.71E-06		1.05E-02
Boron	4.31E+00	1.18E-01	2.00E-01	5.90E-01	6.16E-04	2.00E-01	3.08E-03	NV	5.70E-03		**5.93E-01**
Cadmium	1.26E-03	3.44E-05	5.00E-04	6.88E-02	1.80E-07	5.00E-04	3.59E-04	NV	5.71E-06		6.92E-02
Chromium	3.57E-02	9.78E-04	NA		5.10E-06	NA		NV	NA		
Chromium (VI)	3.50E-04	9.59E-06	3.00E-03	3.20E-03	1.00E-07	3.00E-03	3.34E-05	NV	2.20E-06		3.23E-03
Cobalt	8.89E-03	2.44E-04	2.00E-02	1.22E-02	5.09E-07	2.00E-02	2.54E-05	NV	5.70E-06		1.22E-02
Copper	4.66E-02	1.28E-03	4.00E-02	3.19E-02	6.66E-06	4.00E-02	1.67E-04	NV	NA		3.21E-02
Iron	5.35E+01	1.47E+00	3.00E-01	4.89E+00	7.65E-03	3.00E-01	2.55E-02	NV	NA		**4.91E+00**
Lead	4.00E-02	1.10E-03	NA		5.72E-07	NA		NV	NA		
Manganese	4.33E+00	1.19E-01	2.40E-02	4.94E+00	6.19E-04	2.40E-02	2.58E-02	NV	1.40E-05		**4.97E+00**
Mercury	1.21E-04	3.32E-06	3.00E-04	1.11E-02	1.73E-08	3.00E-04	5.77E-05	NV	NA		1.11E-02
Molybdenum	5.64E-03	1.54E-04	5.00E-03	3.09E-02	8.06E-07	5.00E-03	1.61E-04	NV	NA		3.10E-02
Nickel	5.46E-02	1.50E-03	2.00E-02	7.48E-02	1.56E-06	2.00E-02	7.81E-05	NV	1.43E-05		7.49E-02
Selenium	1.89E-02	5.18E-04	5.00E-03	1.04E-01	2.70E-06	5.00E-03	5.41E-04	NV	5.71E-03		**1.04E-01**
Silver	1.20E-04	3.29E-06	5.00E-03	6.58E-04	1.03E-08	5.00E-03	2.06E-06	NV	NA		6.60E-04
Thallium	5.00E-05	1.37E-06	6.60E-05	2.08E-02	7.15E-09	6.60E-05	1.08E-04	NV	NA		2.09E-02

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/L]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
Vanadium	3.19E-02	8.75E-04	1.00E-03	8.75E-01	4.57E-06	1.00E-03	4.57E-03	NV	NA		**8.80E-01**
Zinc	3.03E-01	8.30E-03	3.00E-01	2.77E-02	2.60E-05	3.00E-01	8.67E-05	NV	NA		2.78E-02
Cyanide	6.29E-02	1.72E-03	2.00E-02	8.62E-02	9.00E-06	2.00E-02	4.50E-04	NV	NA		8.66E-02
Pesticides/PCBs											
4,4'-DDD	5.00E-03	1.37E-04	NA		9.53E-04	NA		NV	NA		
4,4'-DDE	7.76E-04	2.13E-05	NA		1.30E-04	NA		NV	NA		
4,4'-DDT	1.80E-04	4.93E-06	5.00E-04	9.86E-03	5.65E-05	5.00E-04	1.13E-01	NV	5.00E-04		**1.23E-01**
Aldrin	4.05E-04	1.11E-05	3.00E-05	3.69E-01	1.00E-06	3.00E-05	3.34E-02	NV	3.00E-05		**4.03E-01**
alpha-BHC	3.00E-04	8.22E-06	5.00E-04	1.64E-02	3.62E-06	5.00E-04	7.24E-03	NV	5.00E-04		2.37E-02
alpha-Chlordane	3.34E-04	9.15E-06	5.00E-04	1.83E-02	1.88E-05	5.00E-04	3.76E-02	NV	2.00E-04		5.59E-02
Atrazine	2.00E-03	5.48E-05	3.50E-02	1.57E-03	7.01E-06	3.50E-02	2.00E-04	NV	3.50E-02		1.77E-03
beta-BHC	3.69E-04	1.01E-05	NA		4.45E-06	NA		NV	NA		
delta-BHC	1.60E-04	4.38E-06	NA		1.93E-06	NA		NV	NA		
Diazinon	2.60E-04	7.11E-06	9.00E-04	7.90E-03	3.18E-06	9.00E-04	3.54E-03	NV	9.00E-04		1.14E-02
Dieldrin	9.24E-04	2.53E-05	5.00E-05	5.06E-01	1.74E-05	5.00E-05	3.48E-01	NV	5.00E-05		**8.54E-01**
Endosulfan I	3.31E-04	9.07E-06	6.00E-03	1.51E-03	2.16E-06	6.00E-03	3.60E-04	NV	6.00E-03		1.87E-03
Endosulfan II	2.30E-04	6.30E-06	6.00E-03	1.05E-03	9.37E-07	6.00E-03	1.56E-04	NV	6.00E-03		1.21E-03
Endosulfan sulfate	9.20E-05	2.52E-06	6.00E-03	4.20E-04	NA	6.00E-03		NV	6.00E-03		4.20E-04
Endrin	6.46E-04	1.77E-05	3.00E-04	5.90E-02	1.22E-05	3.00E-04	4.06E-02	NV	3.00E-04		9.96E-02
Endrin aldehyde	1.40E-04	3.84E-06	3.00E-04	1.28E-02	NA	3.00E-04		NV	3.00E-04		1.28E-02
Endrin ketone	1.70E-04	4.66E-06	3.00E-04	1.55E-02	NA	3.00E-04		NV	3.00E-04		1.55E-02
gamma-BHC	3.28E-04	8.97E-06	3.00E-04	2.99E-02	3.95E-06	3.00E-04	1.32E-02	NV	3.00E-04		4.31E-02
gamma-Chlordane	2.50E-04	6.85E-06	5.00E-04	1.37E-02	1.41E-05	5.00E-04	2.82E-02	NV	2.00E-04		4.19E-02
Heptachlor	1.11E-04	3.03E-06	5.00E-04	6.07E-03	1.42E-06	5.00E-04	2.85E-03	NV	5.00E-04		8.92E-03
Heptachlor epoxide	1.20E-04	3.29E-06	1.30E-05	2.53E-01	5.04E-06	1.30E-05	3.87E-01	NV	1.30E-05		**6.40E-01**
Methoxychlor	1.20E-04	3.29E-06	5.00E-03	6.58E-04	7.77E-06	5.00E-03	1.55E-03	NV	5.00E-03		2.21E-03
Aroclor-1260	9.63E-04	2.64E-05	2.00E-05	1.32E+00	9.33E-04	2.00E-05	4.66E+01	NV	2.00E-05		**4.79E+01**
SVOCs/VOCs											
1,4-Dioxane (p-dioxane)	7.80E-01	2.14E-02	NA		7.65E-05	NA		NV	8.57E-01		
2,4,6-Trichlorophenol	7.14E-03	1.96E-04	1.00E-04	1.96E+00	1.50E-04	1.00E-04	1.50E+00	NV	1.00E-04		**3.46E+00**
2,4-Dimethylphenol	7.87E-02	2.16E-03	2.00E-02	1.08E-01	3.20E-04	2.00E-02	1.60E-02	NV	2.00E-02		**1.24E-01**
2-Chlorophenol	4.30E-03	1.18E-04	5.00E-03	2.36E-02	1.33E-05	5.00E-03	2.65E-03	5.87E-04	5.00E-03	1.17E-01	**1.44E-01**
2-Methylnaphthalene	2.26E-01	6.18E-03	4.00E-03	1.54E+00	8.49E-03	4.00E-03	2.12E+00	3.08E-02	NA		**3.67E+00**
2-Methylphenol	1.23E-01	3.37E-03	5.00E-02	6.73E-02	3.20E-04	5.00E-02	6.39E-03	NV	5.00E-02		7.37E-02
2-Nitroaniline	1.00E-02	2.74E-04	3.00E-03	9.13E-02	1.82E-05	3.00E-03	6.07E-03	NV	3.00E-05		9.74E-02
3,4-methylphenol	8.40E-01	2.30E-02	5.00E-02	4.60E-01	2.19E-03	5.00E-02	4.37E-02	NV	5.00E-02		**5.04E-01**
4-Chloro-3-methylphenol	2.38E-02	6.52E-04	NA		NA	NA		NV	NA		
4-Methylphenol	1.94E-01	5.31E-03	5.00E-03	1.06E+00	5.04E-04	5.00E-03	1.01E-01	NV	5.00E-03		**1.16E+00**
Acenaphthene	4.50E-03	1.23E-04	6.00E-02	2.05E-03	2.72E-04	6.00E-02	4.54E-03	6.14E-04	6.00E-02	1.02E-02	1.68E-02
Acenaphthylene	9.54E-03	2.61E-04	NA		6.04E-04	NA		1.30E-03	NA		
Anthracene	3.20E-03	8.77E-05	3.00E-01	2.92E-04	3.82E-04	3.00E-01	1.27E-03	4.37E-04	3.00E-01	1.46E-03	3.02E-03
Benzo(a)anthracene	9.00E-04	2.47E-05	NA		3.10E-04	NA		NV	NA		
Benzo(a)pyrene	5.00E-04	1.37E-05	NA		2.95E-04	NA		NV	NA		
Benzo(b)fluoranthene	7.60E-04	2.08E-05	NA		4.55E-04	NA		NV	NA		
Benzo(g,h,i)perylene	2.00E-04	5.48E-06	NA		2.13E-04	NA		NV	NA		
Benzo(k)fluoranthene	4.60E-04	1.26E-05	NA		2.60E-04	NA		NV	NA		
Biphenyl (Diphenyl)	1.30E-03	3.56E-05	5.00E-02	7.12E-04	5.43E-05	5.00E-02	1.09E-03	NV	5.00E-02		1.80E-03

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/L]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
bis(2-Chloroethoxy)methane	2.00E-04	5.48E-06	NA		1.26E-07	NA		2.73E-05	NA		
bis(2-Ethylhexyl)phthalate	1.69E-02	4.63E-04	2.00E-02	2.32E-02	8.85E-04	2.00E-02	4.43E-02	NV	2.00E-02		6.74E-02
Bromoform	1.20E-02	3.29E-04	2.00E-02	1.64E-02	2.27E-05	2.00E-02	1.13E-03	1.64E-03	2.00E-02	8.19E-02	9.94E-02
Caprolactam	2.40E-03	6.58E-05	5.00E-01	1.32E-04	8.42E-07	5.00E-01	1.68E-06	NV	5.00E-01		1.33E-04
Carbazole	1.25E-02	3.43E-04	NA		3.24E-04	NA		NV	NA		
Chrysene	1.10E-03	3.01E-05	NA		3.79E-04	NA		NV	NA		
Dibenz(a,h)anthracene	4.50E-05	1.23E-06	NA		4.10E-05	NA		NV	NA		
Diethylphthalate	1.03E-02	2.82E-04	8.00E-01	3.53E-04	2.83E-05	8.00E-01	3.54E-05	NV	8.00E-01		3.88E-04
Di-n-butyl phthalate	1.17E-02	3.19E-04	1.00E-01	3.19E-03	2.54E-04	1.00E-01	2.54E-03	NV	1.00E-01		5.74E-03
Fluoranthene	2.40E-03	6.58E-05	4.00E-02	1.64E-03	3.27E-04	4.00E-02	8.19E-03	NV	4.00E-02		9.83E-03
Fluorene	2.60E-03	7.12E-05	4.00E-02	1.78E-03	2.19E-04	4.00E-02	5.46E-03	3.55E-04	4.00E-02	8.87E-03	1.61E-02
Hexachloroethane	1.00E-03	2.74E-05	1.00E-03	2.74E-02	2.32E-05	1.00E-03	2.32E-02	NV	1.00E-03		5.06E-02
Indeno(1,2,3-c,d)pyrene	2.00E-04	5.48E-06	NA		1.20E-04	NA		NV	NA		
Naphthalene	1.36E-01	3.73E-03	2.00E-02	1.87E-01	2.46E-03	2.00E-02	1.23E-01	1.86E-02	8.57E-04	2.17E+01	**2.20E+01**
Nitrobenzene	2.00E-03	5.48E-05	5.00E-04	1.10E-01	4.01E-06	5.00E-04	8.03E-03	2.73E-04	5.71E-04	4.78E-01	**5.95E-01**
N-Nitrosodi-n-propylamine	2.00E-03	5.48E-05	NA		1.82E-06	NA		NV	NA		
N-Nitrosodiphenylamine	1.20E-03	3.29E-05	2.00E-02	1.64E-03	1.89E-05	2.00E-02	9.43E-04	NV	2.00E-02		2.59E-03
Pentachlorophenol	1.13E-02	3.09E-04	3.00E-02	1.03E-02	3.71E-03	3.00E-02	1.24E-01	NV	3.00E-02		**1.34E-01**
Phenanthrene	6.00E-03	1.64E-04	NA		4.46E-04	NA		NV	NA		
Pyrene	2.40E-03	6.58E-05	3.00E-02	2.19E-03	4.82E-04	3.00E-02	1.61E-02	3.27E-04	3.00E-02	1.09E-02	2.92E-02
1,1,1-Trichloroethane	1.18E-01	3.23E-03	2.80E-01	1.15E-02	6.10E-04	2.80E-01	2.18E-03	1.61E-02	6.30E-01	2.56E-02	3.93E-02
1,1,2,2-Tetrachloroethane	1.29E-02	3.54E-04	6.00E-02	5.90E-03	4.43E-05	6.00E-02	7.38E-04	1.76E-03	6.00E-02	2.94E-02	3.60E-02
1,1,2-Trichloroethane	1.33E-02	3.65E-04	4.00E-03	9.13E-02	3.39E-05	4.00E-03	8.48E-03	1.82E-03	4.00E-03	4.55E-01	**5.54E-01**
1,1-Dichloroethane	5.57E-01	1.53E-02	1.00E-01	1.53E-01	1.19E-03	1.00E-01	1.19E-02	7.60E-02	1.43E-01	5.32E-01	**6.96E-01**
1,1-Dichloroethene	4.16E-02	1.14E-03	2.00E-02	5.70E-02	1.57E-04	2.00E-02	7.84E-03	5.67E-03	2.00E-02	2.84E-01	**3.48E-01**
1,2,3-Trichlorobenzene	2.72E-03	7.46E-05	NA		NA	NA		3.72E-04	NA		
1,2,4-Trichlorobenzene	1.51E-02	4.13E-04	1.00E-02	4.13E-02	5.40E-04	1.00E-02	5.40E-02	2.06E-03	1.00E-03	2.06E+00	**2.15E+00**
1,2,4-Trimethylbenzene	2.78E-01	7.61E-03	5.00E-02	1.52E-01	8.49E-03	5.00E-02	1.70E-01	3.79E-02	1.70E-03	2.23E+01	**2.26E+01**
1,2-Dibromo-3-chloropropane	2.40E-03	6.58E-05	5.70E-05	1.15E+00	1.25E-05	5.70E-05	2.20E-01	3.27E-04	5.70E-05	5.74E+00	**7.12E+00**
1,2-Dichlorobenzene	7.34E-01	2.01E-02	9.00E-02	2.24E-01	1.31E-02	9.00E-02	1.45E-01	1.00E-01	5.71E-02	1.75E+00	**2.12E+00**
1,2-Dichloroethane	1.44E-02	3.94E-04	2.00E-02	1.97E-02	3.07E-05	2.00E-02	1.53E-03	1.96E-03	1.40E-03	1.40E+00	**1.42E+00**
1,2-Dichloropropane	5.10E-03	1.40E-04	1.10E-03	1.27E-01	1.39E-05	1.10E-03	1.26E-02	6.96E-04	1.10E-03	6.33E-01	**7.72E-01**
1,3,5-Trimethylbenzene	1.10E-01	3.02E-03	5.00E-02	6.04E-02	2.45E-03	5.00E-02	4.90E-02	1.50E-02	1.70E-03	8.85E+00	**8.96E+00**
1,3-Dichlorobenzene	2.71E-02	7.42E-04	3.00E-02	2.47E-02	6.82E-04	3.00E-02	2.27E-02	3.70E-03	3.00E-02	1.23E-01	**1.71E-01**
1,4-Dichlorobenzene	2.18E-01	5.97E-03	3.00E-02	1.99E-01	3.97E-03	3.00E-02	1.32E-01	2.97E-02	2.30E-01	1.29E-01	**4.61E-01**
2-Chlorotoluene	2.89E-03	7.91E-05	2.00E-02	3.95E-03	NA	2.00E-02		3.94E-04	2.00E-02	1.97E-02	2.36E-02
2-Hexanone	2.35E-02	6.45E-04	NA		2.68E-05	NA		3.21E-03	NA		
2,2-Dichloropropane	5.00E-04	1.37E-05	NA		NA	NA		6.82E-05	NA		
Acetone	4.85E-01	1.33E-02	9.00E-01	1.48E-02	6.38E-05	9.00E-01	7.09E-05	6.62E-02	9.00E-01	7.36E-02	8.84E-02
Benzene	4.00E-01	1.10E-02	4.00E-03	2.74E+00	1.67E-03	4.00E-03	4.18E-01	5.46E-02	8.57E-03	6.37E+00	**9.53E+00**
Carbon disulfide	3.10E-03	8.49E-05	1.00E-01	8.49E-04	1.49E-05	1.00E-01	1.49E-04	4.23E-04	2.00E-01	2.11E-03	3.11E-03
Carbon tetrachloride	3.00E-04	8.22E-06	7.00E-04	1.17E-02	2.18E-06	7.00E-04	3.11E-03	4.09E-05	7.00E-04	5.85E-02	7.33E-02
Chlorobenzene	6.74E-01	1.85E-02	2.00E-02	9.23E-01	6.57E-03	2.00E-02	3.28E-01	9.20E-02	1.70E-02	5.41E+00	**6.66E+00**
Chloroethane	9.74E-02	2.67E-03	4.00E-01	6.67E-03	1.55E-04	4.00E-01	3.89E-04	1.33E-02	2.86E+00	4.65E-03	1.17E-02
Chloroform	4.40E-03	1.21E-04	1.00E-02	1.21E-02	1.09E-05	1.00E-02	1.09E-03	6.00E-04	1.40E-02	4.29E-02	5.60E-02
Chloromethane	7.40E-03	2.03E-04	2.60E-02	7.80E-03	5.91E-06	2.60E-02	2.27E-04	1.01E-03	2.60E-02	3.88E-02	4.69E-02
cis-1,2-Dichloroethene	1.37E+01	3.76E-01	1.00E-02	3.76E+01	4.69E-02	1.00E-02	4.69E+00	1.87E+00	1.00E-02	1.87E+02	**2.29E+02**

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/L]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
cis-1,3-Dichloropropene	4.20E-03	1.15E-04	3.00E-02	3.84E-03	6.22E-06	3.00E-02	2.07E-04	5.73E-04	5.71E-03	1.00E-01	**1.04E-01**
Cyclohexane	1.80E-02	4.93E-04	1.70E+00	2.90E-04	5.20E-04	1.70E+00	3.06E-04	2.46E-03	1.70E+00	1.44E-03	2.04E-03
Ethyl tert-butyl ether (ETBE)	1.20E-03	3.29E-05	NA		NA	NA		1.64E-04	NA		
Ethylbenzene	4.49E-01	1.23E-02	1.00E-01	1.23E-01	7.34E-03	1.00E-01	7.34E-02	6.12E-02	2.90E-01	2.11E-01	**4.08E-01**
Isopropyl ether	4.30E-01	1.18E-02	NA		NA	NA		5.87E-02	NA		
Isopropylbenzene (cumene)	2.71E-02	7.41E-04	1.00E-01	7.41E-03	8.66E-04	1.00E-01	8.66E-03	3.69E-03	1.10E-01	3.36E-02	4.96E-02
Methyl acetate	2.25E-02	6.17E-04	1.00E+00	6.17E-04	4.90E-06	1.00E+00	4.90E-06	3.07E-03	1.00E+00	3.07E-03	3.70E-03
Methyl ethyl ketone	4.30E-01	1.18E-02	6.00E-01	1.96E-02	1.11E-04	6.00E-01	1.84E-04	5.87E-02	1.40E+00	4.19E-02	6.17E-02
Methyl isobutyl ketone	4.86E+00	1.33E-01	8.00E-02	1.66E+00	4.15E-03	8.00E-02	5.19E-02	6.63E-01	8.60E-01	7.71E-01	**2.49E+00**
Methyl tert-butyl ether	2.01E-02	5.52E-04	8.57E-01	6.44E-04	1.27E-05	8.57E-01	1.48E-05	2.75E-03	8.57E-01	3.21E-03	3.86E-03
Methylcyclohexane	2.45E-02	6.72E-04	8.60E-01	7.81E-04	8.38E-04	8.60E-01	9.74E-04	3.35E-03	8.60E-01	3.89E-03	5.65E-03
Methylene chloride	8.19E-03	2.24E-04	6.00E-02	3.74E-03	8.34E-06	6.00E-02	1.39E-04	1.12E-03	1.14E-01	9.77E-03	1.37E-02
n-Butylbenzene	6.12E-03	1.68E-04	4.00E-02	4.19E-03	NA	4.00E-02		8.34E-04	4.00E-02	2.09E-02	2.50E-02
n-Propylbenzene	5.61E-02	1.54E-03	4.00E-02	3.85E-02	NA	4.00E-02		7.66E-03	4.00E-02	1.91E-01	**2.30E-01**
p-Cymene (p-isopropyltoluene)	7.86E-02	2.15E-03	NA		NA	NA		1.07E-02	NA		
Phenol	4.80E-02	1.32E-03	3.00E-01	4.39E-03	6.38E-05	3.00E-01	2.13E-04	NV	5.71E-02		4.60E-03
sec-Butylbenzene	5.64E-03	1.54E-04	4.00E-02	3.86E-03	NA	4.00E-02		7.69E-04	4.00E-02	1.92E-02	2.31E-02
Styrene	1.39E-02	3.81E-04	2.00E-01	1.91E-03	1.70E-04	2.00E-01	8.48E-04	1.90E-03	2.57E-01	7.39E-03	1.01E-02
tert-Butylbenzene	2.10E-03	5.75E-05	4.00E-02	1.44E-03	NA	4.00E-02		2.87E-04	4.00E-02	7.16E-03	8.60E-03
tert-Butyl alcohol	1.17E-01	3.20E-03	1.00E-01	3.20E-02	NA	1.00E-01		1.59E-02	2.60E-03	6.13E+00	**6.17E+00**
Tetrachloroethene	1.20E-02	3.29E-04	1.00E-02	3.29E-02	1.94E-04	1.00E-02	1.94E-02	1.64E-03	1.00E-02	1.64E-01	**2.16E-01**
Toluene	6.11E+00	1.67E-01	2.00E-01	8.37E-01	5.77E-02	2.00E-01	2.89E-01	8.34E-01	8.57E-02	9.73E+00	**1.09E+01**
trans-1,2-Dichloroethene	4.01E-01	1.10E-02	2.00E-02	5.50E-01	9.72E-04	2.00E-02	4.86E-02	5.48E-02	2.00E-02	2.74E+00	**3.34E+00**
trans-1,3-Dichloropropene	4.10E-03	1.12E-04	3.00E-02	3.74E-03	6.07E-06	3.00E-02	2.02E-04	5.59E-04	5.71E-03	9.79E-02	**1.02E-01**
Trichloroethene	5.70E-02	1.56E-03	3.00E-04	5.20E+00	2.68E-04	3.00E-04	8.95E-01	7.77E-03	1.00E-02	7.77E-01	**6.87E+00**
Vinyl chloride	1.63E+00	4.46E-02	3.00E-03	1.49E+01	2.36E-03	3.00E-03	7.86E-01	2.22E-01	2.86E-02	7.77E+00	**2.34E+01**
m,p-Xylene	9.44E-01	2.59E-02	2.00E-01	1.29E-01	NA	2.00E-01		1.29E-01	2.90E-02	4.44E+00	**4.57E+00**
o-Xylene	4.45E-01	1.22E-02	2.00E-01	6.09E-02	1.04E-02	2.00E-01	5.22E-02	6.07E-02	2.90E-02	2.09E+00	**2.21E+00**
Xylenes, total	1.60E+00	4.38E-02	2.00E-01	2.19E-01	2.83E-02	2.00E-01	1.42E-01	2.18E-01	2.90E-02	7.53E+00	**7.89E+00**
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	4.64E-07	1.27E-08	NA		4.91E-07	NA		NV	1.14E-08		
1,2,3,4,6,7,8-HpCDF	9.49E-08	2.60E-09	NA		9.06E-08	NA		NV	1.14E-08		
1,2,3,4,7,8,9-HpCDF	9.79E-09	2.68E-10	NA		9.34E-09	NA		NV	1.14E-08		
1,2,3,4,7,8-HxCDD	2.62E-09	7.19E-11	NA		2.22E-09	NA		NV	1.14E-08		
1,2,3,4,7,8-HxCDF	8.49E-09	2.33E-10	NA		6.49E-09	NA		NV	1.14E-08		
1,2,3,6,7,8-HxCDD	1.33E-08	3.64E-10	NA		1.13E-08	NA		NV	1.14E-08		
1,2,3,6,7,8-HxCDF	1.62E-09	4.43E-11	NA		1.24E-09	NA		NV	1.14E-08		
1,2,3,7,8,9-HxCDD	4.40E-09	1.21E-10	NA		3.73E-09	NA		NV	1.14E-08		
1,2,3,7,8,9-HxCDF	3.87E-09	1.06E-10	NA		2.95E-09	NA		NV	1.14E-08		
1,2,3,7,8-PeCDD	1.08E-09	2.96E-11	NA		7.32E-10	NA		NV	1.14E-08		
1,2,3,7,8-PeCDF	2.28E-09	6.25E-11	NA		1.40E-09	NA		NV	1.14E-08		
2,3,4,6,7,8-HxCDF	3.94E-09	1.08E-10	NA		3.01E-09	NA		NV	1.14E-08		
2,3,4,7,8-PeCDF	2.64E-09	7.22E-11	NA		1.61E-09	NA		NV	1.14E-08		
2,3,7,8-TCDF	1.68E-09	4.60E-11	NA		8.23E-10	NA		NV	1.14E-08		

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/L]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
OCDF	7.44E-07	2.04E-08	NA		8.86E-07	NA		NV	1.14E-08		
OCDD	2.18E-06	5.97E-08	NA		2.88E-06	NA		NV	1.14E-08		
			Total Hazard Index:	1.14E+02			Total Hazard Index:	6.07E+01		Total Hazard Index:	3.09E+02	**4.84E+02**

Total Estimated Hazard Index Across All Exposure Routes : **484**

Notes:

NA = One or more of the following: no toxicity value available in standard U.S. EPA toxicity value databases; no Kp value available; no Henry's Law constan

RME = Reasonable maximum exposure.

EPC = Exposure point concentration.

NV = Chemical classified as Nonvolatile thus no CDI was calculated.

Table 2-8
Risk Calculation Worksheet for Groundwater - Carcinogenic Effects - Residential Exposure Scenario - Future Child Resident
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Groundwater
	Exposure Point:	OnSite
	Receptor Population:	Future Child Resident
	Receptor Age:	Child
Exposure Scenario/Exposure Area Description		
Site Risks		

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	days/yr
Exposure Time for dermal exposure	ET_d	1.0	hr/day
Exposure Time for inhalation of volatiles	ET_i	24	hr/day
Exposure Duration	ED	6	years
Ingestion Rate	IngR	1	L/day
Inhalation Rate	InhR	0.42	m3/hr
Volatilization Factor	VFw	0.5	L/m3
Skin Surface Area	SA	6600	cm2
Body Weight	BW	15	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor 1	CF1	1.00E-03	L/cm3
Conversion Factor 2	CF2	1.00E+06	cm3/m3
Conversion Factor 3	CF3	2.74E-03	yr/day
Constituent Specific Permeability Constant	Kp	Chemical Specific	cm/hr

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cw [mg/L]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
Metals											
Aluminum	9.40E+00	5.15E-02	NA		3.40E-04	NA		NV	NA		
Antimony	1.51E-03	8.29E-06	NA		5.47E-08	NA		NV	NA		
Arsenic	2.87E-01	1.57E-03	9.50E+00	1.49E-02	1.04E-05	9.50E+00	9.85E-05	NV	1.51E+01		**1.50E-02**
Barium	1.68E-01	9.19E-04	NA		6.06E-06	NA		NV	NA		
Beryllium	7.64E-04	4.19E-06	NA		2.76E-08	NA		NV	8.40E+00		
Boron	4.31E+00	2.36E-02	NA		1.56E-04	NA		NV	NA		
Cadmium	1.26E-03	6.88E-06	3.80E-01	2.61E-06	4.54E-08	3.80E-01	1.73E-08	NV	1.47E+01		**2.63E-06**
Chromium	3.57E-02	1.96E-04	NA		1.29E-06	NA		NV	4.20E+01		
Chromium (VI)	3.50E-04	1.92E-06	NA		2.53E-08	NA		NV	2.90E+02		
Cobalt	8.89E-03	4.87E-05	NA		1.29E-07	NA		NV	9.80E+00		
Copper	4.66E-02	2.55E-04	NA		1.68E-06	NA		NV	NA		
Iron	5.35E+01	2.93E-01	NA		1.93E-03	NA		NV	NA		
Lead	4.00E-02	2.19E-04	NA		1.45E-07	NA		NV	NA		
Manganese	4.33E+00	2.37E-02	NA		1.57E-04	NA		NV	NA		
Mercury	1.21E-04	6.63E-07	NA		4.38E-09	NA		NV	NA		
Molybdenum	5.64E-03	3.09E-05	NA		2.04E-07	NA		NV	NA		
Nickel	5.46E-02	2.99E-04	NA		3.95E-07	NA		NV	9.10E-01		
Selenium	1.89E-02	1.04E-04	NA		6.83E-07	NA		NV	NA		
Silver	1.20E-04	6.58E-07	NA		2.60E-09	NA		NV	NA		
Thallium	5.00E-05	2.74E-07	NA		1.81E-09	NA		NV	NA		
Vanadium	3.19E-02	1.75E-04	NA		1.16E-06	NA		NV	NA		
Zinc	3.03E-01	1.66E-03	NA		6.57E-06	NA		NV	NA		
Cyanide	6.29E-02	3.45E-04	NA		2.27E-06	NA		NV	NA		

Risk Calculations											
		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/L]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Pesticides/PCBs											
4,4'-DDD	5.00E-03	2.74E-05	2.40E-01	6.57E-06	1.84E-04	2.40E-01	4.41E-05	NV	2.42E-01		**5.06E-05**
4,4'-DDE	7.76E-04	4.25E-06	3.40E-01	1.45E-06	2.50E-05	3.40E-01	8.51E-06	NV	3.40E-01		**9.95E-06**
4,4'-DDT	1.80E-04	9.86E-07	3.40E-01	3.35E-07	1.09E-05	3.40E-01	3.70E-06	NV	3.40E-01		**4.03E-06**
Aldrin	4.05E-04	2.22E-06	1.70E+01	3.77E-05	1.93E-07	1.70E+01	3.28E-06	NV	1.72E+01		**4.10E-05**
alpha-BHC	3.00E-04	1.64E-06	6.30E+00	1.04E-05	6.98E-07	6.30E+00	4.39E-06	NV	6.30E+00		**1.48E-05**
alpha-Chlordane	3.34E-04	1.83E-06	1.20E+00	2.19E-06	3.62E-06	1.20E+00	4.34E-06	NV	1.19E+00		**6.54E-06**
Atrazine	2.00E-03	1.10E-05	2.30E-01	2.52E-06	1.35E-06	2.30E-01	3.11E-07	NV	2.22E-01		**2.83E-06**
beta-BHC	3.69E-04	2.02E-06	1.80E+00	3.64E-06	8.57E-07	1.80E+00	1.54E-06	NV	1.80E+00		**5.18E-06**
delta-BHC	1.60E-04	8.77E-07	NA		3.72E-07	NA		NV	NA		
Diazinon	2.60E-04	1.42E-06	NA		6.13E-07	NA		NV	NA		
Dieldrin	9.24E-04	5.06E-06	1.60E+01	8.10E-05	3.35E-06	1.60E+01	5.36E-05	NV	1.61E+01		**1.35E-04**
Endosulfan I	3.31E-04	1.81E-06	NA		4.16E-07	NA		NV	NA		
Endosulfan II	2.30E-04	1.26E-06	NA		1.80E-07	NA		NV	NA		
Endosulfan sulfate	9.20E-05	5.04E-07	NA		NA	NA		NV	NA		
Endrin	6.46E-04	3.54E-06	NA		2.35E-06	NA		NV	NA		
Endrin aldehyde	1.40E-04	7.67E-07	NA		NA	NA		NV	NA		
Endrin ketone	1.70E-04	9.32E-07	NA		NA	NA		NV	NA		
gamma-BHC	3.28E-04	1.79E-06	1.30E+00	2.33E-06	7.62E-07	1.30E+00	9.90E-07	NV	1.30E+00		**3.32E-06**
gamma-Chlordane	2.50E-04	1.37E-06	1.20E+00	1.64E-06	2.71E-06	1.20E+00	3.25E-06	NV	1.19E+00		**4.90E-06**
Heptachlor	1.11E-04	6.07E-07	4.50E+00	2.73E-06	2.74E-07	4.50E+00	1.23E-06	NV	4.55E+00		**3.96E-06**
Heptachlor epoxide	1.20E-04	6.58E-07	9.10E+00	5.98E-06	9.70E-07	9.10E+00	8.82E-06	NV	9.10E+00		**1.48E-05**
Methoxychlor	1.20E-04	6.58E-07	NA		1.50E-06	NA		NV	NA		
Aroclor-1260	9.63E-04	5.27E-06	2.00E+00	1.05E-05	1.80E-04	2.00E+00	3.59E-04	NV	2.00E+00		**3.70E-04**
SVOCs/VOCs											
1,4-Dioxane (p-dioxane)	7.80E-01	4.27E-03	2.70E-02	1.15E-04	1.54E-05	2.70E-02	4.16E-07	NV	2.70E-02		**1.16E-04**
2,4,6-Trichlorophenol	7.14E-03	3.91E-05	7.00E-02	2.74E-06	2.89E-05	7.00E-02	2.02E-06	NV	7.00E-02		**4.76E-06**
2,4-Dimethylphenol	7.87E-02	4.31E-04	NA		6.17E-05	NA		NV	NA		
2-Chlorophenol	4.30E-03	2.36E-05	NA		2.55E-06	NA		1.19E-04	NA		
2-Methylnaphthalene	2.26E-01	1.24E-03	NA		1.63E-03	NA		6.23E-03	NA		
2-Methylphenol	1.23E-01	6.73E-04	NA		6.16E-05	NA		NV	NA		
2-Nitroaniline	1.00E-02	5.48E-05	NA		3.51E-06	NA		NV	NA		
3,4-methylphenol	8.40E-01	4.60E-03	NA		4.21E-04	NA		NV	NA		
4-Chloro-3-methylphenol	2.38E-02	1.30E-04	NA		NA	NA		NV	NA		
4-Methylphenol	1.94E-01	1.06E-03	NA		9.70E-05	NA		NV	NA		
Acenaphthene	4.50E-03	2.47E-05	NA		5.24E-05	NA		1.24E-04	NA		
Acenaphthylene	9.54E-03	5.23E-05	NA		1.16E-04	NA		2.63E-04	NA		
Anthracene	3.20E-03	1.75E-05	NA		7.36E-05	NA		8.84E-05	NA		
Benzo(a)anthracene	9.00E-04	4.93E-06	1.20E+00	5.92E-06	5.97E-05	1.20E+00	7.17E-05	NV	7.30E-01		**7.76E-05**
Benzo(a)pyrene	5.00E-04	2.74E-06	1.20E+01	3.29E-05	5.69E-05	1.20E+01	6.82E-04	NV	7.30E+00		**7.15E-04**
Benzo(b)fluoranthene	7.60E-04	4.16E-06	1.20E+00	5.00E-06	8.76E-05	1.20E+00	1.05E-04	NV	7.30E-01		**1.10E-04**
Benzo(g,h,i)perylene	2.00E-04	1.10E-06	NA		4.11E-05	NA		NV	NA		
Benzo(k)fluoranthene	4.60E-04	2.52E-06	1.20E+00	3.02E-06	5.01E-05	1.20E+00	6.01E-05	NV	3.85E-01		**6.31E-05**
Biphenyl (Diphenyl)	1.30E-03	7.12E-06	NA		1.05E-05	NA		NV	NA		
bis(2-Chloroethoxy)methane	2.00E-04	1.10E-06	NA		2.43E-08	NA		5.52E-06	NA		
bis(2-Ethylhexyl)phthalate	1.69E-02	9.27E-05	1.40E-02	1.30E-06	1.70E-04	1.40E-02	2.39E-06	NV	1.40E-02		**3.68E-06**
Bromoform	1.20E-02	6.58E-05	7.90E-03	5.19E-07	4.36E-06	7.90E-03	3.45E-08	3.31E-04	3.85E-03	1.28E-06	**1.83E-06**
Caprolactam	2.40E-03	1.32E-05	NA		1.62E-07	NA		NV	NA		
Carbazole	1.25E-02	6.86E-05	2.00E-02	1.37E-06	6.25E-05	2.00E-02	1.25E-06	NV	2.00E-02		**2.62E-06**

Risk Calculations											
		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/L]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Chrysene	1.10E-03	6.03E-06	1.20E-01	7.23E-07	7.30E-05	1.20E-01	8.76E-06	NV	3.85E-02		**9.49E-06**
Dibenz(a,h)anthracene	4.50E-05	2.47E-07	7.30E+00	1.80E-06	7.90E-06	7.30E+00	5.77E-05	NV	7.30E+00		**5.95E-05**
Diethylphthalate	1.03E-02	5.64E-05	NA		5.45E-06	NA		NV	NA		
Di-n-butyl phthalate	1.17E-02	6.38E-05	NA		4.90E-05	NA		NV	NA		
Fluoranthene	2.40E-03	1.32E-05	NA		6.31E-05	NA		NV	NA		
Fluorene	2.60E-03	1.42E-05	NA		4.21E-05	NA		7.18E-05	NA		
Hexachloroethane	1.00E-03	5.48E-06	3.90E-02	2.14E-07	4.47E-06	3.90E-02	1.74E-07	NV	3.85E-01		3.88E-07
Indeno(1,2,3-c,d)pyrene	2.00E-04	1.10E-06	7.30E-01	8.00E-07	2.31E-05	7.30E-01	1.69E-05	NV	7.30E-01		**1.77E-05**
Naphthalene	1.36E-01	7.47E-04	1.20E-01	8.96E-05	4.74E-04	1.20E-01	5.69E-05	3.76E-03	1.19E-01	4.48E-04	**5.94E-04**
Nitrobenzene	2.00E-03	1.10E-05	NA		7.73E-07	NA		5.52E-05	NA		
N-Nitrosodi-n-propylamine	2.00E-03	1.10E-05	7.00E+00	7.67E-05	3.51E-07	7.00E+00	2.45E-06	NV	7.00E+00		**7.92E-05**
N-Nitrosodiphenylamine	1.20E-03	6.58E-06	9.00E-03	5.92E-08	3.63E-06	9.00E-03	3.27E-08	NV	9.10E-03		9.19E-08
Pentachlorophenol	1.13E-02	6.18E-05	1.20E-01	7.42E-06	7.15E-04	1.20E-01	8.58E-05	NV	1.20E-01		**9.32E-05**
Phenanthrene	6.00E-03	3.29E-05	NA		8.59E-05	NA		NV	NA		
Pyrene	2.40E-03	1.32E-05	NA		9.29E-05	NA		6.63E-05	NA		
1,1,1-Trichloroethane	1.18E-01	6.47E-04	NA		1.18E-04	NA		3.26E-03	NA		
1,1,2,2-Tetrachloroethane	1.29E-02	7.08E-05	2.70E-01	1.91E-05	8.53E-06	2.70E-01	2.30E-06	3.57E-04	2.00E-01	7.14E-05	**9.28E-05**
1,1,2-Trichloroethane	1.33E-02	7.30E-05	7.20E-02	5.26E-06	6.53E-06	7.20E-02	4.70E-07	3.68E-04	5.60E-02	2.06E-05	**2.63E-05**
1,1-Dichloroethane	5.57E-01	3.05E-03	5.70E-03	1.74E-05	2.36E-04	5.70E-03	1.34E-06	1.54E-02	5.60E-03	8.61E-05	**1.05E-04**
1,1-Dichloroethene	4.16E-02	2.28E-04	9.10E-02	2.07E-05	3.11E-05	9.10E-02	2.83E-06	1.15E-03	9.10E-02	1.04E-04	**1.28E-04**
1,2,3-Trichlorobenzene	2.72E-03	1.49E-05	NA		NA	NA		7.52E-05	NA		
1,2,4-Trichlorobenzene	1.51E-02	8.27E-05	3.60E-03	2.98E-07	1.04E-04	3.60E-03	3.75E-07	4.17E-04	NA		6.72E-07
1,2,4-Trimethylbenzene	2.78E-01	1.52E-03	NA		1.63E-03	NA		7.67E-03	NA		
1,2-Dibromo-3-chloropropane	2.40E-03	1.32E-05	7.00E+00	9.21E-05	2.41E-06	7.00E+00	1.69E-05	6.63E-05	6.65E+00	4.41E-04	**5.50E-04**
1,2-Dichlorobenzene	7.34E-01	4.02E-03	NA		2.52E-03	NA		2.03E-02	NA		
1,2-Dichloroethane	1.44E-02	7.87E-05	9.10E-02	7.16E-06	6.08E-06	9.10E-02	5.54E-07	3.97E-04	9.10E-02	3.61E-05	**4.38E-05**
1,2-Dichloropropane	5.10E-03	2.79E-05	6.80E-02	1.90E-06	2.67E-06	6.80E-02	1.82E-07	1.41E-04	6.80E-02	9.58E-06	**1.17E-05**
1,3,5-Trimethylbenzene	1.10E-01	6.04E-04	NA		4.72E-04	NA		3.04E-03	NA		
1,3-Dichlorobenzene	2.71E-02	1.48E-04	NA		1.31E-04	NA		7.48E-04	NA		
1,4-Dichlorobenzene	2.18E-01	1.19E-03	2.40E-02	2.86E-05	7.65E-04	2.40E-02	1.84E-05	6.02E-03	3.85E-02	2.32E-04	**2.79E-04**
2-Chlorotoluene	2.89E-03	1.58E-05	NA		NA	NA		7.97E-05	NA		
2-Hexanone	2.35E-02	1.29E-04	NA		5.32E-06	NA		6.50E-04	NA		
2,2-Dichloropropane	5.00E-04	2.74E-06	NA		NA	NA		1.38E-05	NA		
Acetone	4.85E-01	2.66E-03	NA		1.32E-05	NA		1.34E-02	NA		
Benzene	4.00E-01	2.19E-03	1.00E-01	2.19E-04	3.38E-04	1.00E-01	3.38E-05	1.10E-02	1.02E-01	1.12E-03	**1.37E-03**
Carbon disulfide	3.10E-03	1.70E-05	NA		2.99E-06	NA		8.56E-05	NA		
Carbon tetrachloride	3.00E-04	1.64E-06	1.50E-01	2.47E-07	4.19E-07	1.50E-01	6.29E-08	8.28E-06	1.47E-01	1.22E-06	**1.53E-06**
Chlorobenzene	6.74E-01	3.69E-03	NA		1.26E-03	NA		1.86E-02	NA		
Chloroethane	9.74E-02	5.34E-04	2.90E-03	1.55E-06	3.17E-05	2.90E-03	9.18E-08	2.69E-03	2.90E-03	7.80E-06	**9.44E-06**
Chloroform	4.40E-03	2.41E-05	3.10E-02	7.47E-07	2.09E-06	3.10E-02	6.49E-08	1.22E-04	8.10E-02	9.84E-06	**1.07E-05**
Chloromethane	7.40E-03	4.05E-05	NA		1.23E-06	NA		2.04E-04	NA		
cis-1,2-Dichloroethene	1.37E+01	7.52E-02	NA		9.31E-03	NA		3.79E-01	NA		
cis-1,3-Dichloropropene	4.20E-03	2.30E-05	1.00E-01	2.30E-06	1.20E-06	1.00E-01	1.20E-07	1.16E-04	5.60E-02	6.50E-06	**8.92E-06**
Cyclohexane	1.80E-02	9.86E-05	NA		1.02E-04	NA		4.97E-04	NA		
Ethyl tert-butyl ether (ETBE)	1.20E-03	6.58E-06	NA		NA	NA		3.31E-05	NA		
Ethylbenzene	4.49E-01	2.46E-03	NA		1.45E-03	NA		1.24E-02	NA		
Isopropyl ether	4.30E-01	2.36E-03	NA		NA	NA		1.19E-02	NA		
Isopropylbenzene (cumene)	2.71E-02	1.48E-04	NA		1.67E-04	NA		7.47E-04	NA		
Methyl acetate	2.25E-02	1.23E-04	NA		1.01E-06	NA		6.22E-04	NA		

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/L]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Oral: Cancer Risk [-]	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Dermal: Cancer Risk [-]	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Cancer Slope Factor, SF [mg/kg/day]-1	Exposure Route = Inhalation: Cancer Risk [-]	Total Cancer Risk [-]
Methyl ethyl ketone	4.30E-01	2.36E-03	NA		2.29E-05	NA		1.19E-02	NA		
Methyl isobutyl ketone	4.86E+00	2.66E-02	NA		8.24E-04	NA		1.34E-01	NA		
Methyl tert-butyl ether	2.01E-02	1.10E-04	1.80E-03	1.99E-07	2.55E-06	1.80E-03	4.60E-09	5.56E-04	9.10E-04	5.06E-07	7.09E-07
Methylcyclohexane	2.45E-02	1.34E-04	NA		1.66E-04	NA		6.77E-04	NA		
Methylene chloride	8.19E-03	4.49E-05	1.40E-02	6.28E-07	1.68E-06	1.40E-02	2.36E-08	2.26E-04	3.50E-03	7.91E-07	**1.44E-06**
n-Butylbenzene	6.12E-03	3.35E-05	NA		NA	NA		1.69E-04	NA		
n-Propylbenzene	5.61E-02	3.08E-04	NA		NA	NA		1.55E-03	NA		
p-Cymene (p-isopropyltoluene)	7.86E-02	4.30E-04	NA		NA	NA		2.17E-03	NA		
Phenol	4.80E-02	2.63E-04	NA		1.27E-05	NA		NV	NA		
sec-Butylbenzene	5.64E-03	3.09E-05	NA		NA	NA		1.56E-04	NA		
Styrene	1.39E-02	7.63E-05	NA		3.34E-05	NA		3.85E-04	NA		
tert-Butylbenzene	2.10E-03	1.15E-05	NA		NA	NA		5.80E-05	NA		
tert-Butyl alcohol	1.17E-01	6.41E-04	NA		NA	NA		3.23E-03	NA		
Tetrachloroethene	1.20E-02	6.58E-05	5.40E-01	3.55E-05	3.74E-05	5.40E-01	2.02E-05	3.31E-04	2.07E-02	6.84E-06	**6.25E-05**
Toluene	6.11E+00	3.35E-02	NA		1.14E-02	NA		1.69E-01	NA		
trans-1,2-Dichloroethene	4.01E-01	2.20E-03	NA		1.93E-04	NA		1.11E-02	NA		
trans-1,3-Dichloropropene	4.10E-03	2.25E-05	1.00E-01	2.25E-06	1.17E-06	1.00E-01	1.17E-07	1.13E-04	5.60E-02	6.34E-06	**8.70E-06**
Trichloroethene	5.70E-02	3.12E-04	4.00E-01	1.25E-04	5.17E-05	4.00E-01	2.07E-05	1.57E-03	4.00E-01	6.29E-04	**7.75E-04**
Vinyl chloride	1.63E+00	8.91E-03	1.50E+00	1.34E-02	4.82E-04	1.50E+00	7.23E-04	4.49E-02	2.73E-01	1.23E-02	**2.64E-02**
m,p-Xylene	9.44E-01	5.17E-03	NA		NA	NA		2.61E-02	NA		
o-Xylene	4.45E-01	2.44E-03	NA		2.07E-03	NA		1.23E-02	NA		
Xylenes, total	1.60E+00	8.77E-03	NA		5.59E-03	NA		4.42E-02	NA		
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	4.64E-07	2.54E-09	1.50E+03	3.82E-06	9.46E-08	1.50E+03	1.42E-04	NV	1.50E+03		**1.46E-04**
1,2,3,4,6,7,8-HpCDF	9.49E-08	5.20E-10	1.50E+03	7.80E-07	1.74E-08	1.50E+03	2.62E-05	NV	1.50E+03		**2.69E-05**
1,2,3,4,7,8,9-HpCDF	9.79E-09	5.36E-11	1.50E+03	8.05E-08	1.80E-09	1.50E+03	2.70E-06	NV	1.50E+03		**2.78E-06**
1,2,3,4,7,8-HxCDD	2.62E-09	1.44E-11	1.50E+04	2.16E-07	4.28E-10	1.50E+04	6.42E-06	NV	1.50E+04		**6.64E-06**
1,2,3,4,7,8-HxCDF	8.49E-09	4.65E-11	1.50E+04	6.98E-07	1.25E-09	1.50E+04	1.87E-05	NV	1.50E+04		**1.94E-05**
1,2,3,6,7,8-HxCDD	1.33E-08	7.28E-11	1.50E+04	1.09E-06	2.17E-09	1.50E+04	3.25E-05	NV	1.50E+04		**3.36E-05**
1,2,3,6,7,8-HxCDF	1.62E-09	8.86E-12	1.50E+04	1.33E-07	2.38E-10	1.50E+04	3.57E-06	NV	1.50E+04		**3.70E-06**
1,2,3,7,8,9-HxCDD	4.40E-09	2.41E-11	1.50E+04	3.62E-07	7.18E-10	1.50E+04	1.08E-05	NV	1.50E+04		**1.11E-05**
1,2,3,7,8,9-HxCDF	3.87E-09	2.12E-11	1.50E+04	3.18E-07	5.69E-10	1.50E+04	8.53E-06	NV	1.50E+04		**8.85E-06**
1,2,3,7,8-PeCDD	1.08E-09	5.91E-12	1.50E+05	8.87E-07	1.41E-10	1.50E+05	2.11E-05	NV	1.50E+05		**2.20E-05**
1,2,3,7,8-PeCDF	2.28E-09	1.25E-11	7.50E+03	9.37E-08	2.69E-10	7.50E+03	2.01E-06	NV	7.50E+03		**2.11E-06**
2,3,4,6,7,8-HxCDF	3.94E-09	2.16E-11	1.50E+04	3.24E-07	5.80E-10	1.50E+04	8.71E-06	NV	1.50E+04		**9.03E-06**
2,3,4,7,8-PeCDF	2.64E-09	1.44E-11	7.50E+04	1.08E-06	3.11E-10	7.50E+04	2.33E-05	NV	7.50E+04		**2.44E-05**
2,3,7,8-TCDF	1.68E-09	9.20E-12	1.50E+04	1.38E-07	1.59E-10	1.50E+04	2.38E-06	NV	1.50E+04		**2.52E-06**
OCDF	7.44E-07	4.07E-09	1.50E+01	6.11E-08	1.71E-07	1.50E+01	2.56E-06	NV	1.50E+01		**2.62E-06**
OCDD	2.18E-06	1.19E-08	1.50E+01	1.79E-07	5.54E-07	1.50E+01	8.32E-06	NV	1.50E+01		**8.50E-06**
			Total Risk:	2.94E-02		**Total Risk:**	2.91E-03		**Total Risk:**	1.55E-02	**4.78E-02**

Total Estimated Carcinogenic Risk Across All Exposure Routes : 4.8E-02

Notes:

NA = One or more of the following: no toxicity value available in standard U.S. EPA toxicity value databases; no Kp value available; no Henry's Law constant.

RME = Reasonable maximum exposure.

EPC = Exposure point concentration.

NV = Chemical classified as Nonvolatile thus no CDI was calculated.

Table 2-9
Risk Calculation Worksheet for Groundwater - Noncarcinogenic Effects - Residential Exposure Scenario - Future Child Resident
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information	Exposure Scenario:	Residential
	Scenario Timeframe:	Chronic
	Exposure Medium:	Groundwater
	Exposure Point:	OnSite
	Receptor Population:	Future Child Resident
	Receptor Age:	Child

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	350	days/yr
Exposure Time for dermal exposure	ET_d	1	hr/day
Exposure Time for inhalation of volatiles	ET_i	24	hr/day
Exposure Duration	ED	6	years
Ingestion Rate	IngR	1	L/day
Inhalation Rate	InhR	0.42	m3/hr
Volatilization Factor	VFw	0.5	L/m3
Skin Surface Area	SA	6600	cm2
Body Weight	BW	15	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	6	yr
Conversion Factor 1	CF1	1.00E-03	L/cm3
Conversion Factor 2	CF2	1.00E+06	cm3/m3
Conversion Factor 3	CF3	2.74E-03	yr/day
Constituent Specific Permeability Constant	Kp	Chemical Specific	cm/hr

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	**RME Medium EPC Value, Cw [mg/L]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals											
Aluminum	9.40E+00	6.01E-01	1.00E+00	6.01E-01	3.96E-03	1.00E+00	3.96E-03	NV	1.40E-03		**6.05E-01**
Antimony	1.51E-03	9.67E-05	4.00E-04	2.42E-01	6.38E-07	4.00E-04	1.59E-03	NV	NA		**2.43E-01**
Arsenic	2.87E-01	1.83E-02	3.00E-04	6.11E+01	1.21E-04	3.00E-04	4.03E-01	NV	8.57E-06		**6.15E+01**
Barium	1.68E-01	1.07E-02	7.00E-02	1.53E-01	7.07E-05	7.00E-02	1.01E-03	NV	1.43E-04		**1.54E-01**
Beryllium	7.64E-04	4.88E-05	2.00E-03	2.44E-02	3.22E-07	2.00E-03	1.61E-04	NV	5.71E-06		2.46E-02
Boron	4.31E+00	2.75E-01	2.00E-01	1.38E+00	1.82E-03	2.00E-01	9.09E-03	NV	5.70E-03		**1.39E+00**
Cadmium	1.26E-03	8.03E-05	1.10E-05	7.30E+00	5.30E-07	1.10E-05	4.82E-02	NV	5.71E-06		**7.35E+00**
Chromium	3.57E-02	2.28E-03	NA		1.51E-05	NA		NV	NA		
Chromium (VI)	3.50E-04	2.24E-05	3.00E-03	7.46E-03	2.95E-07	3.00E-03	9.84E-05	NV	2.20E-06		7.56E-03
Cobalt	8.89E-03	5.68E-04	2.00E-02	2.84E-02	1.50E-06	2.00E-02	7.50E-05	NV	5.70E-06		2.85E-02
Copper	4.66E-02	2.98E-03	4.00E-02	7.44E-02	1.97E-05	4.00E-02	4.91E-04	NV	NA		7.49E-02
Iron	5.35E+01	3.42E+00	3.00E-01	1.14E+01	2.26E-02	3.00E-01	7.52E-02	NV	NA		**1.15E+01**
Lead	4.00E-02	2.56E-03	NA		1.69E-06	NA		NV	NA		
Manganese	4.33E+00	2.77E-01	2.40E-02	1.15E+01	1.83E-03	2.40E-02	7.61E-02	NV	1.40E-05		**1.16E+01**
Mercury	1.21E-04	7.74E-06	3.00E-04	2.58E-02	5.11E-08	3.00E-04	1.70E-04	NV	NA		2.60E-02
Molybdenum	5.64E-03	3.60E-04	5.00E-03	7.21E-02	2.38E-06	5.00E-03	4.76E-04	NV	NA		7.25E-02
Nickel	5.46E-02	3.49E-03	1.10E-02	3.17E-01	4.61E-06	1.10E-02	4.19E-04	NV	1.43E-05		**3.18E-01**
Selenium	1.89E-02	1.21E-03	5.00E-03	2.42E-01	7.97E-06	5.00E-03	1.59E-03	NV	5.71E-03		**2.43E-01**
Silver	1.20E-04	7.67E-06	5.00E-03	1.53E-03	3.04E-08	5.00E-03	6.08E-06	NV	NA		1.54E-03
Thallium	5.00E-05	3.20E-06	6.60E-05	4.84E-02	2.11E-08	6.60E-05	3.20E-04	NV	NA		4.87E-02
Vanadium	3.19E-02	2.04E-03	1.00E-03	2.04E+00	1.35E-05	1.00E-03	1.35E-02	NV	NA		**2.06E+00**
Zinc	3.03E-01	1.94E-02	3.00E-01	6.46E-02	7.67E-05	3.00E-01	2.56E-04	NV	NA		6.48E-02
Cyanide	6.29E-02	4.02E-03	2.00E-02	2.01E-01	2.65E-05	2.00E-02	1.33E-03	NV	NA		**2.02E-01**
Pesticides/PCBs											
4,4'-DDD	5.00E-03	3.19E-04	NA		2.14E-03	NA		NV	NA		
4,4'-DDE	7.76E-04	4.96E-05	NA		2.92E-04	NA		NV	NA		

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/L]	Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			Total Hazard Quotient [-]
		Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	
4,4'-DDT	1.80E-04	1.15E-05	5.00E-04	2.30E-02	1.27E-04	5.00E-04	2.54E-01	NV	5.00E-04		**2.77E-01**
Aldrin	4.05E-04	2.59E-05	3.00E-05	8.62E-01	2.25E-06	3.00E-05	7.51E-02	NV	3.00E-05		**9.37E-01**
alpha-BHC	3.00E-04	1.92E-05	5.00E-04	3.84E-02	8.14E-06	5.00E-04	1.63E-02	NV	5.00E-04		5.46E-02
alpha-Chlordane	3.34E-04	2.13E-05	3.30E-05	6.47E-01	4.22E-05	3.30E-05	1.28E+00	NV	2.00E-04		**1.93E+00**
Atrazine	2.00E-03	1.28E-04	6.00E-03	2.13E-02	1.58E-05	6.00E-03	2.63E-03	NV	3.50E-02		2.39E-02
beta-BHC	3.69E-04	2.36E-05	NA		1.00E-05	NA		NV	NA		
delta-BHC	1.60E-04	1.02E-05	NA		4.34E-06	NA		NV	NA		
Diazinon	2.60E-04	1.66E-05	9.00E-04	1.84E-02	7.15E-06	9.00E-04	7.95E-03	NV	9.00E-04		2.64E-02
Dieldrin	9.24E-04	5.90E-05	5.00E-05	1.18E+00	3.91E-05	5.00E-05	7.82E-01	NV	5.00E-05		**1.96E+00**
Endosulfan I	3.31E-04	2.12E-05	6.00E-03	3.53E-03	4.85E-06	6.00E-03	8.09E-04	NV	6.00E-03		4.34E-03
Endosulfan II	2.30E-04	1.47E-05	6.00E-03	2.45E-03	2.10E-06	6.00E-03	3.51E-04	NV	6.00E-03		2.80E-03
Endosulfan sulfate	9.20E-05	5.88E-06	6.00E-03	9.80E-04	NA	6.00E-03		NV	6.00E-03		9.80E-04
Endrin	6.46E-04	4.13E-05	3.00E-04	1.38E-01	2.74E-05	3.00E-04	9.12E-02	NV	3.00E-04		**2.29E-01**
Endrin aldehyde	1.40E-04	8.95E-06	3.00E-04	2.98E-02	NA	3.00E-04		NV	3.00E-04		2.98E-02
Endrin ketone	1.70E-04	1.09E-05	3.00E-04	3.62E-02	NA	3.00E-04		NV	3.00E-04		3.62E-02
gamma-BHC	3.28E-04	2.09E-05	3.00E-04	6.98E-02	8.88E-06	3.00E-04	2.96E-02	NV	3.00E-04		9.94E-02
gamma-Chlordane	2.50E-04	1.60E-05	3.30E-05	4.84E-01	3.16E-05	3.30E-05	9.59E-01	NV	2.00E-04		**1.44E+00**
Heptachlor	1.11E-04	7.08E-06	3.00E-05	2.36E-01	3.20E-06	3.00E-05	1.07E-01	NV	5.00E-04		**3.43E-01**
Heptachlor epoxide	1.20E-04	7.67E-06	1.30E-05	5.90E-01	1.13E-05	1.30E-05	8.70E-01	NV	1.30E-05		**1.46E+00**
Methoxychlor	1.20E-04	7.67E-06	2.00E-05	3.84E-01	1.75E-05	2.00E-05	8.73E-01	NV	5.00E-03		**1.26E+00**
Aroclor-1260	9.63E-04	6.15E-05	2.00E-05	3.08E+00	2.10E-03	2.00E-05	1.05E+02	NV	2.00E-05		**1.08E+02**
SVOCs/VOCs											
1,4-Dioxane (p-dioxane)	7.80E-01	4.99E-02	NA		1.80E-04	NA		NV	8.57E-01		
2,4,6-Trichlorophenol	7.14E-03	4.56E-04	1.00E-04	4.56E+00	3.37E-04	1.00E-04	3.37E+00	NV	1.00E-04		**7.94E+00**
2,4-Dimethylphenol	7.87E-02	5.03E-03	2.00E-02	2.51E-01	7.20E-04	2.00E-02	3.60E-02	NV	2.00E-02		**2.87E-01**
2-Chlorophenol	4.30E-03	2.75E-04	5.00E-03	5.50E-02	2.98E-05	5.00E-03	5.96E-03	1.39E-03	5.00E-03	2.77E-01	**3.38E-01**
2-Methylnaphthalene	2.26E-01	1.44E-02	4.00E-03	3.60E+00	1.91E-02	4.00E-03	4.77E+00	7.27E-02	NA		**8.37E+00**
2-Methylphenol	1.23E-01	7.86E-03	5.00E-02	1.57E-01	7.18E-04	5.00E-02	1.44E-02	NV	5.00E-02		**1.71E-01**
2-Nitroaniline	1.00E-02	6.39E-04	3.00E-03	2.13E-01	4.09E-05	3.00E-03	1.36E-02	NV	3.00E-05		**2.27E-01**
3,4-methylphenol	8.40E-01	5.37E-02	5.00E-02	1.07E+00	4.91E-03	5.00E-02	9.82E-02	NV	5.00E-02		**1.17E+00**
4-Chloro-3-methylphenol	2.38E-02	1.52E-03	NA		NA	NA		NV	NA		
4-Methylphenol	1.94E-01	1.24E-02	5.00E-03	2.48E+00	1.13E-03	5.00E-03	2.26E-01	NV	5.00E-03		**2.70E+00**
Acenaphthene	4.50E-03	2.88E-04	6.00E-02	4.79E-03	6.12E-04	6.00E-02	1.02E-02	1.45E-03	6.00E-02	2.42E-02	3.92E-02
Acenaphthylene	9.54E-03	6.10E-04	NA		1.36E-03	NA		3.07E-03	NA		
Anthracene	3.20E-03	2.05E-04	3.00E-01	6.82E-04	8.59E-04	3.00E-01	2.86E-03	1.03E-03	3.00E-01	3.44E-03	6.98E-03
Benzo(a)anthracene	9.00E-04	5.75E-05	NA		6.97E-04	NA		NV	NA		
Benzo(a)pyrene	5.00E-04	3.20E-05	NA		6.63E-04	NA		NV	NA		
Benzo(b)fluoranthene	7.60E-04	4.86E-05	NA		1.02E-03	NA		NV	NA		
Benzo(g,h,i)perylene	2.00E-04	1.28E-05	NA		4.79E-04	NA		NV	NA		
Benzo(k)fluoranthene	4.60E-04	2.94E-05	NA		5.84E-04	NA		NV	NA		
Biphenyl (Diphenyl)	1.30E-03	8.31E-05	5.00E-02	1.66E-03	1.22E-04	5.00E-02	2.44E-03	NV	5.00E-02		4.10E-03
bis(2-Chloroethoxy)methane	2.00E-04	1.28E-05	NA		2.83E-07	NA		6.44E-05	NA		
bis(2-Ethylhexyl)phthalate	1.69E-02	1.08E-03	2.00E-02	5.41E-02	1.99E-03	2.00E-02	9.94E-02	NV	2.00E-02		**1.53E-01**
Bromoform	1.20E-02	7.67E-04	2.00E-02	3.84E-02	5.09E-05	2.00E-02	2.55E-03	3.87E-03	2.00E-02	1.93E-01	**2.34E-01**
Caprolactam	2.40E-03	1.53E-04	5.00E-01	3.07E-04	1.89E-06	5.00E-01	3.78E-06	NV	5.00E-01		3.11E-04
Carbazole	1.25E-02	8.01E-04	NA		7.29E-04	NA		NV	NA		
Chrysene	1.10E-03	7.03E-05	NA		8.52E-04	NA		NV	NA		
Dibenz(a,h)anthracene	4.50E-05	2.88E-06	NA		9.22E-05	NA		NV	NA		
Diethylphthalate	1.03E-02	6.59E-04	8.00E-01	8.23E-04	6.36E-05	8.00E-01	7.95E-05	NV	8.00E-01		9.03E-04
Di-n-butyl phthalate	1.17E-02	7.45E-04	1.00E-01	7.45E-03	5.71E-04	1.00E-01	5.71E-03	NV	1.00E-01		1.32E-02
Fluoranthene	2.40E-03	1.53E-04	4.00E-02	3.84E-03	7.36E-04	4.00E-02	1.84E-02	NV	4.00E-02		2.22E-02
Fluorene	2.60E-03	1.66E-04	4.00E-02	4.16E-03	4.91E-04	4.00E-02	1.23E-02	8.38E-04	4.00E-02	2.09E-02	3.74E-02

Risk Calculations

		Exposure Route = Oral			Exposure Route = Dermal			Exposure Route = Inhalation			
Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/L]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Hexachloroethane	1.00E-03	6.39E-05	1.00E-03	6.39E-02	5.22E-05	1.00E-03	5.22E-02	NV	1.00E-03		**1.16E-01**
Indeno(1,2,3-c,d)pyrene	2.00E-04	1.28E-05	NA		2.69E-04	NA		NV	NA		
Naphthalene	1.36E-01	8.71E-03	2.00E-02	4.35E-01	5.53E-03	2.00E-02	2.77E-01	4.39E-02	8.57E-04	5.12E+01	**5.19E+01**
Nitrobenzene	2.00E-03	1.28E-04	5.00E-04	2.56E-01	9.02E-06	5.00E-04	1.80E-02	6.44E-04	5.71E-04	1.13E+00	**1.40E+00**
N-Nitrosodi-n-propylamine	2.00E-03	1.28E-04	NA		4.09E-06	NA		NV	NA		
N-Nitrosodiphenylamine	1.20E-03	7.67E-05	2.00E-02	3.84E-03	4.24E-05	2.00E-02	2.12E-03	NV	2.00E-02		5.95E-03
Pentachlorophenol	1.13E-02	7.21E-04	1.00E-03	7.21E-01	8.34E-03	1.00E-03	8.34E+00	NV	3.00E-02		**9.07E+00**
Phenanthrene	6.00E-03	3.84E-04	NA		1.00E-03	NA		NV	NA		
Pyrene	2.40E-03	1.53E-04	3.00E-02	5.11E-03	1.08E-03	3.00E-02	3.61E-02	7.73E-04	3.00E-02	2.58E-02	6.70E-02
1,1,1-Trichloroethane	1.18E-01	7.54E-03	2.80E-01	2.69E-02	1.37E-03	2.80E-01	4.90E-03	3.80E-02	6.30E-01	6.04E-02	9.22E-02
1,1,2,2-Tetrachloroethane	1.29E-02	8.26E-04	6.00E-02	1.38E-02	9.95E-05	6.00E-02	1.66E-03	4.16E-03	6.00E-02	6.94E-02	8.48E-02
1,1,2-Trichloroethane	1.33E-02	8.52E-04	4.00E-03	2.13E-01	7.62E-05	4.00E-03	1.91E-02	4.29E-03	4.00E-03	1.07E+00	**1.31E+00**
1,1-Dichloroethane	5.57E-01	3.56E-02	1.00E-01	3.56E-01	2.75E-03	1.00E-01	2.75E-02	1.79E-01	1.43E-01	1.26E+00	**1.64E+00**
1,1-Dichloroethene	4.16E-02	2.66E-03	2.00E-02	1.33E-01	3.63E-04	2.00E-02	1.81E-02	1.34E-02	2.00E-02	6.70E-01	**8.21E-01**
1,2,3-Trichlorobenzene	2.72E-03	1.74E-04	NA		NA	NA		8.77E-04	NA		
1,2,4-Trichlorobenzene	1.51E-02	9.65E-04	1.00E-02	9.65E-02	1.21E-03	1.00E-02	1.21E-01	4.86E-03	1.00E-03	4.86E+00	**5.08E+00**
1,2,4-Trimethylbenzene	2.78E-01	1.77E-02	5.00E-02	3.55E-01	1.91E-02	5.00E-02	3.81E-01	8.94E-02	1.70E-03	5.26E+01	**5.34E+01**
1,2-Dibromo-3-chloropropane	2.40E-03	1.53E-04	5.70E-05	2.69E+00	2.82E-05	5.70E-05	4.94E-01	7.73E-04	5.70E-05	1.36E+01	**1.68E+01**
1,2-Dichlorobenzene	7.34E-01	4.70E-02	9.00E-02	5.22E-01	2.94E-02	9.00E-02	3.26E-01	2.37E-01	5.71E-02	4.14E+00	**4.99E+00**
1,2-Dichloroethane	1.44E-02	9.18E-04	2.00E-02	4.59E-02	7.10E-05	2.00E-02	3.55E-03	4.63E-03	1.40E-03	3.31E+00	**3.36E+00**
1,2-Dichloropropane	5.10E-03	3.26E-04	1.10E-03	2.96E-01	3.12E-05	1.10E-03	2.83E-02	1.64E-03	1.10E-03	1.49E+00	**1.82E+00**
1,3,5-Trimethylbenzene	1.10E-01	7.05E-03	5.00E-02	1.41E-01	5.50E-03	5.00E-02	1.10E-01	3.55E-02	1.70E-03	2.09E+01	**2.11E+01**
1,3-Dichlorobenzene	2.71E-02	1.73E-03	3.00E-02	5.77E-02	1.53E-03	3.00E-02	5.11E-02	8.73E-03	3.00E-02	2.91E-01	**4.00E-01**
1,4-Dichlorobenzene	2.18E-01	1.39E-02	3.00E-02	4.64E-01	8.93E-03	3.00E-02	2.98E-01	7.02E-02	2.30E-01	3.05E-01	**1.07E+00**
2-Chlorotoluene	2.89E-03	1.84E-04	2.00E-02	9.22E-03	NA	2.00E-02		9.30E-04	2.00E-02	4.65E-02	5.57E-02
2-Hexanone	2.35E-02	1.51E-03	NA		6.21E-05	NA		7.59E-03	NA		
2,2-Dichloropropane	5.00E-04	3.20E-05	NA		NA	NA		1.61E-04	NA		
Acetone	4.85E-01	3.10E-02	9.00E-01	3.45E-02	1.54E-04	9.00E-01	1.71E-04	1.56E-01	9.00E-01	1.74E-01	**2.08E-01**
Benzene	4.00E-01	2.56E-02	4.00E-03	6.39E+00	3.94E-03	4.00E-03	9.85E-01	1.29E-01	8.57E-03	1.50E+01	**2.24E+01**
Carbon disulfide	3.10E-03	1.98E-04	1.00E-01	1.98E-03	3.49E-05	1.00E-01	3.49E-04	9.99E-04	2.00E-01	4.99E-03	7.32E-03
Carbon tetrachloride	3.00E-04	1.92E-05	7.00E-04	2.74E-02	4.89E-06	7.00E-04	6.99E-03	9.67E-05	7.00E-04	1.38E-01	**1.72E-01**
Chlorobenzene	6.74E-01	4.31E-02	2.00E-02	2.15E+00	1.48E-02	2.00E-02	7.38E-01	2.17E-01	1.70E-02	1.28E+01	**1.57E+01**
Chloroethane	9.74E-02	6.23E-03	4.00E-01	1.56E-02	3.69E-04	4.00E-01	9.23E-04	3.14E-02	2.86E+00	1.10E-02	2.75E-02
Chloroform	4.40E-03	2.81E-04	1.00E-02	2.81E-02	2.44E-05	1.00E-02	2.44E-03	1.42E-03	1.40E-02	1.01E-01	**1.32E-01**
Chloromethane	7.40E-03	4.73E-04	2.60E-02	1.82E-02	1.44E-05	2.60E-02	5.54E-04	2.38E-03	2.60E-02	9.17E-02	**1.10E-01**
cis-1,2-Dichloroethene	1.37E+01	8.77E-01	1.00E-02	8.77E+01	1.09E-01	1.00E-02	1.09E+01	4.42E+00	1.00E-02	4.42E+02	**5.41E+02**
cis-1,3-Dichloropropene	4.20E-03	2.68E-04	3.00E-02	8.95E-03	1.40E-05	3.00E-02	4.66E-04	1.35E-03	5.71E-03	2.37E-01	**2.46E-01**
Cyclohexane	1.80E-02	1.15E-03	1.70E+00	6.77E-04	1.19E-03	1.70E+00	6.98E-04	5.80E-03	1.70E+00	3.41E-03	4.79E-03
Ethyl tert-butyl ether (ETBE)	1.20E-03	7.67E-05	NA		NA	NA		3.87E-04	NA		
Ethylbenzene	4.49E-01	2.87E-02	1.00E-01	2.87E-01	1.69E-02	1.00E-01	1.69E-01	1.45E-01	2.90E-01	4.99E-01	**9.54E-01**
Isopropyl ether	4.30E-01	2.75E-02	NA		NA	NA		1.39E-01	NA		
Isopropylbenzene (cumene)	2.71E-02	1.73E-03	1.00E-01	1.73E-02	1.95E-03	1.00E-01	1.95E-02	8.72E-03	1.10E-01	7.92E-02	**1.16E-01**
Methyl acetate	2.25E-02	1.44E-03	1.00E+00	1.44E-03	1.18E-05	1.00E+00	1.18E-05	7.26E-03	1.00E+00	7.26E-03	8.71E-03
Methyl ethyl ketone	4.30E-01	2.75E-02	6.00E-01	4.58E-02	2.67E-04	6.00E-01	4.44E-04	1.39E-01	1.40E+00	9.90E-02	**1.45E-01**
Methyl isobutyl ketone	4.86E+00	3.11E-01	8.00E-02	3.88E+00	9.61E-03	8.00E-02	1.20E-01	1.57E+00	8.60E-01	1.82E+00	**5.82E+00**
Methyl tert-butyl ether	2.01E-02	1.29E-03	8.57E-01	1.50E-03	2.98E-05	8.57E-01	3.48E-05	6.49E-03	8.57E-01	7.57E-03	9.11E-03
Methylcyclohexane	2.45E-02	1.57E-03	8.60E-01	1.82E-03	1.94E-03	8.60E-01	2.25E-03	7.90E-03	8.60E-01	9.19E-03	1.33E-02
Methylene chloride	8.19E-03	5.23E-04	6.00E-02	8.72E-03	1.96E-05	6.00E-02	3.27E-04	2.64E-03	1.14E-01	2.31E-02	3.21E-02
n-Butylbenzene	6.12E-03	3.91E-04	4.00E-02	9.77E-03	NA	4.00E-02		1.97E-03	4.00E-02	4.93E-02	5.90E-02
n-Propylbenzene	5.61E-02	3.59E-03	4.00E-02	8.97E-02	NA	4.00E-02		1.81E-02	4.00E-02	4.52E-01	**5.42E-01**
p-Cymene (p-isopropyltoluene)	7.86E-02	5.02E-03	NA		NA	NA		2.53E-02	NA		
Phenol	4.80E-02	3.07E-03	3.00E-01	1.02E-02	1.48E-04	3.00E-01	4.95E-04	NV	5.71E-02		1.07E-02

Risk Calculations

Chemical of Potential Concern	RME Medium EPC Value, Cw [mg/L]	Exposure Route = Oral: Chronic Daily Intake [mg/kg/day]	Exposure Route = Oral: Reference Dose [mg/kg/day]	Exposure Route = Oral: Hazard Quotient	Exposure Route = Dermal: Chronic Daily Intake [mg/kg/day]	Exposure Route = Dermal: Reference Dose [mg/kg/day]	Exposure Route = Dermal: Hazard Quotient	Exposure Route = Inhalation: Chronic Daily Intake [mg/kg/day]	Exposure Route = Inhalation: Reference Dose [mg/kg/day]	Exposure Route = Inhalation: Hazard Quotient	Total Hazard Quotient [-]
sec-Butylbenzene	5.64E-03	3.60E-04	4.00E-02	9.01E-03	NA	4.00E-02		1.82E-03	4.00E-02	4.54E-02	5.44E-02
Styrene	1.39E-02	8.90E-04	2.00E-01	4.45E-03	3.90E-04	2.00E-01	1.95E-03	4.49E-03	2.57E-01	1.74E-02	2.38E-02
tert-Butylbenzene	2.10E-03	1.34E-04	4.00E-02	3.36E-03	NA	4.00E-02		6.77E-04	4.00E-02	1.69E-02	2.03E-02
tert-Butyl alcohol	1.17E-01	7.47E-03	1.00E-01	7.47E-02	NA	1.00E-01		3.77E-02	2.60E-03	1.45E+01	**1.46E+01**
Tetrachloroethene	1.20E-02	7.67E-04	1.00E-02	7.67E-02	4.36E-04	1.00E-02	4.36E-02	3.87E-03	1.00E-02	3.87E-01	**5.07E-01**
Toluene	6.11E+00	3.91E-01	2.00E-01	1.95E+00	1.33E-01	2.00E-01	6.66E-01	1.97E+00	8.57E-02	2.30E+01	**2.56E+01**
trans-1,2-Dichloroethene	4.01E-01	2.57E-02	2.00E-02	1.28E+00	2.25E-03	2.00E-02	1.13E-01	1.29E-01	2.00E-02	6.47E+00	**7.86E+00**
trans-1,3-Dichloropropene	4.10E-03	2.62E-04	3.00E-02	8.74E-03	1.36E-05	3.00E-02	4.55E-04	1.32E-03	5.71E-03	2.31E-01	**2.40E-01**
Trichloroethene	5.70E-02	3.64E-03	3.00E-04	1.21E+01	6.03E-04	3.00E-04	2.01E+00	1.84E-02	1.00E-02	1.84E+00	**1.60E+01**
Vinyl chloride	1.63E+00	1.04E-01	3.00E-03	3.47E+01	5.62E-03	3.00E-03	1.87E+00	5.24E-01	2.86E-02	1.83E+01	**5.49E+01**
m,p-Xylene	9.44E-01	6.04E-02	2.00E-01	3.02E-01	NA	2.00E-01		3.04E-01	2.90E-02	1.05E+01	**1.08E+01**
o-Xylene	4.45E-01	2.84E-02	2.00E-01	1.42E-01	2.42E-02	2.00E-01	1.21E-01	1.43E-01	2.90E-02	4.94E+00	**5.20E+00**
Xylenes, total	1.60E+00	1.02E-01	2.00E-01	5.11E-01	6.52E-02	2.00E-01	3.26E-01	5.16E-01	2.90E-02	1.78E+01	**1.86E+01**
Dioxans/Furans											
1,2,3,4,6,7,8-HpCDD	4.64E-07	2.97E-08	NA		1.10E-06	NA		NV	1.14E-08		
1,2,3,4,6,7,8-HpCDF	9.49E-08	6.07E-09	NA		2.03E-07	NA		NV	1.14E-08		
1,2,3,4,7,8,9-HpCDF	9.79E-09	6.26E-10	NA		2.10E-08	NA		NV	1.14E-08		
1,2,3,4,7,8-HxCDD	2.62E-09	1.68E-10	NA		4.99E-09	NA		NV	1.14E-08		
1,2,3,4,7,8-HxCDF	8.49E-09	5.43E-10	NA		1.46E-08	NA		NV	1.14E-08		
1,2,3,6,7,8-HxCDD	1.33E-08	8.50E-10	NA		2.53E-08	NA		NV	1.14E-08		
1,2,3,6,7,8-HxCDF	1.62E-09	1.03E-10	NA		2.78E-09	NA		NV	1.14E-08		
1,2,3,7,8,9-HxCDD	4.40E-09	2.81E-10	NA		8.38E-09	NA		NV	1.14E-08		
1,2,3,7,8,9-HxCDF	3.87E-09	2.47E-10	NA		6.64E-09	NA		NV	1.14E-08		
1,2,3,7,8-PeCDD	1.08E-09	6.90E-11	NA		1.64E-09	NA		NV	1.14E-08		
1,2,3,7,8-PeCDF	2.28E-09	1.46E-10	NA		3.13E-09	NA		NV	1.14E-08		
2,3,4,6,7,8-HxCDF	3.94E-09	2.52E-10	NA		6.77E-09	NA		NV	1.14E-08		
2,3,4,7,8-PeCDF	2.64E-09	1.69E-10	NA		3.62E-09	NA		NV	1.14E-08		
2,3,7,8-TCDF	1.68E-09	1.07E-10	NA		1.85E-09	NA		NV	1.14E-08		
OCDF	7.44E-07	4.75E-08	NA		1.99E-06	NA		NV	1.14E-08		
OCDD	2.18E-06	1.39E-07	NA		6.47E-06	NA		NV	1.14E-08		
		Total Hazard Index:		2.76E+02	**Total Hazard Index:**		1.48E+02	**Total Hazard Index:**		7.29E+02	**1.15E+03**

Total Estimated Hazard Index Across All Exposure Routes : **1153**

Notes:

NA = One or more of the following: no toxicity value available in standard U.S. EPA toxicity value databases; no Kp value available; no Henry's Law constant.

RME = Reasonable maximum exposure.

EPC = Exposure point concentration.

NV = Chemical classified as Nonvolatile thus no CDI was calculated.

Table 2-10
Cancer Risk Results Detailed Summary for Risk Drivers - Future Adult/Child Resident - Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Arsenic	**2.6E-02**	**1.3E-04**		**2.6E-02**	31%	**1.5E-02**	**9.9E-05**		**1.5E-02**	31%
Cadmium	**4.5E-06**	2.3E-08		**4.5E-06**	0.01%	**2.6E-06**	1.7E-08		**2.6E-06**	0.01%
Subtotal Metals	**2.6E-02**	**1.3E-04**		**2.6E-02**	31%	**1.5E-02**	**9.9E-05**		**1.5E-02**	31%
Pesticides/PCBs										
4,4'-DDD	**1.1E-05**	**7.8E-05**		**9.0E-05**	0.1%	**6.6E-06**	**4.4E-05**		**5.1E-05**	0.1%
4,4'-DDE	**2.5E-06**	**1.5E-05**		**1.8E-05**	0.02%	**1.4E-06**	**8.5E-06**		**1.0E-05**	0.02%
4,4'-DDT	5.7E-07	**6.6E-06**		**7.2E-06**	0.009%	3.4E-07	**3.7E-06**		**4.0E-06**	0.008%
Aldrin	**6.5E-05**	**5.8E-06**		**7.0E-05**	0.1%	**3.8E-05**	**3.3E-06**		**4.1E-05**	0.1%
alpha-BHC	**1.8E-05**	**7.8E-06**		**2.6E-05**	0.03%	**1.0E-05**	**4.4E-06**		**1.5E-05**	0.03%
alpha-Chlordane	**3.8E-06**	**7.7E-06**		**1.1E-05**	0.01%	**2.2E-06**	**4.3E-06**		**6.5E-06**	0.01%
Atrazine	**4.3E-06**	5.5E-07		**4.9E-06**	0.006%	**2.5E-06**	3.1E-07		**2.8E-06**	0.006%
beta-BHC	**6.2E-06**	**2.7E-06**		**9.0E-06**	0.01%	**3.6E-06**	**1.5E-06**		**5.2E-06**	0.01%
Dieldrin	**1.4E-04**	**9.5E-05**		**2.3E-04**	0.3%	**8.1E-05**	**5.4E-05**		**1.3E-04**	0.3%
gamma-BHC	**4.0E-06**	**1.8E-06**		**5.8E-06**	0.007%	**2.3E-06**	9.9E-07		**3.3E-06**	0.007%
gamma-Chlordane	**2.8E-06**	**5.8E-06**		**8.6E-06**	0.01%	**1.6E-06**	**3.3E-06**		**4.9E-06**	0.01%
Heptachlor	**4.7E-06**	**2.2E-06**		**6.9E-06**	0.008%	**2.7E-06**	**1.2E-06**		**4.0E-06**	0.008%
Heptachlor epoxide	**1.0E-05**	**1.6E-05**		**2.6E-05**	0.03%	**6.0E-06**	**8.8E-06**		**1.5E-05**	0.03%
Aroclor-1260	**1.8E-05**	**6.4E-04**		**6.6E-04**	0.8%	**1.1E-05**	**3.6E-04**		**3.7E-04**	0.8%
Subtotal Pesticides/PCBs	**2.9E-04**	**8.9E-04**		**1.2E-03**	1%	**1.7E-04**	**5.0E-04**		**6.7E-04**	1%
SVOCs/VOCs										
1,4-Dioxane (p-dioxane)	**2.0E-04**	7.1E-07		**2.0E-04**	0.2%	**1.2E-04**	4.2E-07		**1.2E-04**	0.2%
2,4,6-Trichlorophenol	**4.7E-06**	**3.6E-06**		**8.3E-06**	0.01%	**2.7E-06**	**2.0E-06**		**4.8E-06**	0.01%
Benzo(a)anthracene	**1.0E-05**	**1.3E-04**		**1.4E-04**	0.2%	**5.9E-06**	**7.2E-05**		**7.8E-05**	0.2%
Benzo(a)pyrene	**5.6E-05**	**1.2E-03**		**1.3E-03**	2%	**3.3E-05**	**6.8E-04**		**7.2E-04**	1%
Benzo(b)fluoranthene	**8.6E-06**	**1.9E-04**		**2.0E-04**	0.2%	**5.0E-06**	**1.1E-04**		**1.1E-04**	0.2%
Benzo(k)fluoranthene	**5.2E-06**	**1.1E-04**		**1.1E-04**	0.1%	**3.0E-06**	**6.0E-05**		**6.3E-05**	0.1%
bis(2-Ethylhexyl)phthalate	**2.2E-06**	**4.2E-06**		**6.5E-06**	0.008%	**1.3E-06**	**2.4E-06**		**3.7E-06**	0.008%
Bromoform	8.9E-07	6.1E-08	**2.2E-06**	**3.1E-06**	0.004%	5.2E-07	3.4E-08	**1.3E-06**	**1.8E-06**	0.004%
Carbazole	**2.4E-06**	**2.2E-06**		**4.6E-06**	0.006%	**1.4E-06**	**1.2E-06**		**2.6E-06**	0.005%
Chrysene	**1.2E-06**	**1.6E-05**		**1.7E-05**	0.02%	7.2E-07	**8.8E-06**		**9.5E-06**	0.02%

Table 2-10
Cancer Risk Results Detailed Summary for Risk Drivers - Future Adult/Child Resident - Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Dibenz(a,h)anthracene	**3.1E-06**	**1.0E-04**		**1.1E-04**	0.1%	**1.8E-06**	**5.8E-05**		**5.9E-05**	0.1%
Indeno(1,2,3-c,d)pyrene	**1.4E-06**	**3.0E-05**		**3.1E-05**	0.04%	8.0E-07	**1.7E-05**		**1.8E-05**	0.04%
Naphthalene	**1.5E-04**	**1.0E-04**	**7.6E-04**	**1.0E-03**	1%	**9.0E-05**	**5.7E-05**	**4.5E-04**	**5.9E-04**	1%
N-Nitrosodi-n-propylamine	**1.3E-04**	**4.4E-06**		**1.4E-04**	0.2%	**7.7E-05**	**2.5E-06**		**7.9E-05**	0.2%
Pentachlorophenol	**1.3E-05**	**1.5E-04**		**1.7E-04**	0.2%	**7.4E-06**	**8.6E-05**		**9.3E-05**	0.2%
1,1,2,2-Tetrachloroethane	**3.3E-05**	**4.1E-06**	**1.2E-04**	**1.6E-04**	0.2%	**1.9E-05**	**2.3E-06**	**7.1E-05**	**9.3E-05**	0.2%
1,1,2-Trichloroethane	**9.0E-06**	8.4E-07	**3.5E-05**	**4.5E-05**	0.1%	**5.3E-06**	4.7E-07	**2.1E-05**	**2.6E-05**	0.06%
1,1-Dichloroethane	**3.0E-05**	**2.3E-06**	**1.5E-04**	**1.8E-04**	0.2%	**1.7E-05**	**1.3E-06**	**8.6E-05**	**1.0E-04**	0.2%
1,1-Dichloroethene	**3.6E-05**	**4.9E-06**	**1.8E-04**	**2.2E-04**	0.3%	**2.1E-05**	**2.8E-06**	**1.0E-04**	**1.3E-04**	0.3%
1,2,4-Trichlorobenzene	5.1E-07	6.7E-07		**1.2E-06**	0.001%	3.0E-07	3.7E-07		6.7E-07	0.001%
1,2-Dibromo-3-chloropropane	**1.6E-04**	**3.0E-05**	**7.5E-04**	**9.3E-04**	1%	**9.2E-05**	**1.7E-05**	**4.4E-04**	**5.5E-04**	1%
1,2-Dichloroethane	**1.2E-05**	9.6E-07	**6.1E-05**	**7.4E-05**	0.1%	**7.2E-06**	5.5E-07	**3.6E-05**	**4.4E-05**	0.09%
1,2-Dichloropropane	**3.3E-06**	3.2E-07	**1.6E-05**	**2.0E-05**	0.02%	**1.9E-06**	1.8E-07	**9.6E-06**	**1.2E-05**	0.02%
1,4-Dichlorobenzene	**4.9E-05**	**3.3E-05**	**3.9E-04**	**4.7E-04**	0.6%	**2.9E-05**	**1.8E-05**	**2.3E-04**	**2.8E-04**	0.6%
Benzene	**3.8E-04**	**5.7E-05**	**1.9E-03**	**2.3E-03**	3%	**2.2E-04**	**3.4E-05**	**1.1E-03**	**1.4E-03**	3%
Carbon tetrachloride	4.2E-07	1.1E-07	**2.1E-06**	**2.6E-06**	0.003%	2.5E-07	6.3E-08	**1.2E-06**	**1.5E-06**	0.003%
Chloroethane	**2.7E-06**	1.5E-07	**1.3E-05**	**1.6E-05**	0.02%	**1.5E-06**	9.2E-08	**7.8E-06**	**9.4E-06**	0.02%
Chloroform	**1.3E-06**	1.2E-07	**1.7E-05**	**1.8E-05**	0.02%	7.5E-07	6.5E-08	**9.8E-06**	**1.1E-05**	0.02%
cis-1,3-Dichloropropene	**3.9E-06**	2.1E-07	**1.1E-05**	**1.5E-05**	0.02%	**2.3E-06**	1.2E-07	**6.5E-06**	**8.9E-06**	0.02%
Methyl tert-butyl ether	3.4E-07	7.8E-09	8.6E-07	**1.2E-06**	0.001%	2.0E-07	4.6E-09	5.1E-07	7.1E-07	0.001%
Methylene chloride	**1.1E-06**	4.0E-08	**1.3E-06**	**2.5E-06**	0.003%	6.3E-07	2.4E-08	7.9E-07	**1.4E-06**	0.003%
Tetrachloroethene	**6.1E-05**	**3.6E-05**	**1.2E-05**	**1.1E-04**	0.1%	**3.6E-05**	**2.0E-05**	**6.8E-06**	**6.3E-05**	0.1%
trans-1,3-Dichloropropene	**3.9E-06**	2.1E-07	**1.1E-05**	**1.5E-05**	0.02%	**2.2E-06**	1.2E-07	**6.3E-06**	**8.7E-06**	0.02%
Trichloroethene	**2.1E-04**	**3.7E-05**	**1.1E-03**	**1.3E-03**	2%	**1.2E-04**	**2.1E-05**	**6.3E-04**	**7.7E-04**	2%
Vinyl chloride	**2.3E-02**	**1.2E-03**	**2.1E-02**	**4.5E-02**	55%	**1.3E-02**	**7.2E-04**	**1.2E-02**	**2.6E-02**	55%
Subtotal SVOCs/VOCs	**2.5E-02**	**3.5E-03**	**2.6E-02**	**5.4E-02**	66%	**1.4E-02**	**2.0E-03**	**1.6E-02**	**3.2E-02**	66%
Dioxans/Furans										
1,2,3,4,6,7,8-HpCDD	**6.5E-06**	**2.5E-04**		**2.6E-04**	0.3%	**3.8E-06**	**1.4E-04**		**1.5E-04**	0.3%
1,2,3,4,6,7,8-HpCDF	**1.3E-06**	**4.7E-05**		**4.8E-05**	0.06%	7.8E-07	**2.6E-05**		**2.7E-05**	0.06%
1,2,3,4,7,8,9-HpCDF	1.4E-07	**4.8E-06**		**4.9E-06**	0.01%	8.0E-08	**2.7E-06**		**2.8E-06**	0.01%
1,2,3,4,7,8-HxCDD	3.7E-07	**1.1E-05**		**1.2E-05**	0.01%	2.2E-07	**6.4E-06**		**6.6E-06**	0.01%
1,2,3,4,7,8-HxCDF	**1.2E-06**	**3.3E-05**		**3.5E-05**	0.04%	7.0E-07	**1.9E-05**		**1.9E-05**	0.04%

Table 2-10
Cancer Risk Results Detailed Summary for Risk Drivers - Future Adult/Child Resident - Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
1,2,3,6,7,8-HxCDD	**1.9E-06**	**5.8E-05**		**6.0E-05**	0.07%	**1.1E-06**	**3.3E-05**		**3.4E-05**	0.07%
1,2,3,6,7,8-HxCDF	2.3E-07	**6.4E-06**		**6.6E-06**	0.01%	1.3E-07	**3.6E-06**		**3.7E-06**	0.01%
1,2,3,7,8,9-HxCDD	6.2E-07	**1.9E-05**		**2.0E-05**	0.02%	3.6E-07	**1.1E-05**		**1.1E-05**	0.02%
1,2,3,7,8,9-HxCDF	5.4E-07	**1.5E-05**		**1.6E-05**	0.02%	3.2E-07	**8.5E-06**		**8.9E-06**	0.02%
1,2,3,7,8-PeCDD	**1.5E-06**	**3.8E-05**		**3.9E-05**	0.0%	8.9E-07	**2.1E-05**		**2.2E-05**	0.05%
1,2,3,7,8-PeCDF	1.6E-07	**3.6E-06**		**3.7E-06**	0.00%	9.4E-08	**2.0E-06**		**2.1E-06**	0.004%
2,3,4,6,7,8-HxCDF	5.6E-07	**1.5E-05**		**1.6E-05**	0.02%	3.2E-07	**8.7E-06**		**9.0E-06**	0.02%
2,3,4,7,8-PeCDF	**1.9E-06**	**4.1E-05**		**4.3E-05**	0.05%	**1.1E-06**	**2.3E-05**		**2.4E-05**	0.05%
2,3,7,8-TCDF	2.4E-07	**4.2E-06**		**4.5E-06**	0.005%	1.4E-07	**2.4E-06**		**2.5E-06**	0.005%
OCDF	1.0E-07	**4.6E-06**		**4.7E-06**	0.006%	6.1E-08	**2.6E-06**		**2.6E-06**	0.005%
OCDD	3.1E-07	**1.5E-05**		**1.5E-05**	0.02%	1.8E-07	**8.3E-06**		**8.5E-06**	0.02%
Subtotal Dioxans/Furans	**1.8E-05**	**5.7E-04**		**5.9E-04**	0.7%	**1.0E-05**	**3.2E-04**		**3.3E-04**	0.7%
Total:	**5.0E-02**	**5.1E-03**	**2.6E-02**	**8.17E-02**		**2.9E-02**	**2.9E-03**	**1.6E-02**	**4.78E-02**	

Total Estimated Cancer Risk Across All Exposure Routes: **8E-02** **5E-02**

Sum of Adult and Child Excess Lifetime Cancer Risk (30 year exposure):	**8.0E-02**	**8.0E-03**	**4.2E-02**	**1.30E-01**

Total Estimated Adult plus Child Cancer Risk Across All Exposure Routes: **1E-01**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total cancer risk for all chemicals evaluated.

Table 2-11
Noncancer Risk Results Detailed Summary for Risk Drivers - Future Adult/Child Resident - Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Non-Carcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
Metals										
Aluminum	**2.6E-01**	1.3E-03		**2.6E-01**	0.1%	**6.0E-01**	4.0E-03		**6.0E-01**	0.1%
Antimony	**1.0E-01**	5.4E-04		**1.0E-01**	0.02%	**2.4E-01**	1.6E-03		**2.4E-01**	0.02%
Arsenic	**2.6E+01**	**1.4E-01**		**2.6E+01**	5%	**6.1E+01**	**4.0E-01**		**6.2E+01**	5%
Barium	6.6E-02	3.4E-04		6.6E-02	0.01%	**1.5E-01**	1.0E-03		**1.5E-01**	0.01%
Boron	**5.9E-01**	3.1E-03		**5.9E-01**	0.1%	**1.4E+00**	9.1E-03		**1.4E+00**	0.1%
Cadmium	6.9E-02	3.6E-04		6.9E-02	0.01%	**7.3E+00**	4.8E-02		**7.3E+00**	0.64%
Iron	**4.9E+00**	2.6E-02		**4.9E+00**	1%	**1.1E+01**	7.5E-02		**1.1E+01**	1%
Manganese	**4.9E+00**	2.6E-02		**5.0E+00**	1%	**1.2E+01**	7.6E-02		**1.2E+01**	1%
Nickel	7.5E-02	7.8E-05		7.5E-02	0.02%	**3.2E-01**	4.2E-04		**3.2E-01**	0.03%
Selenium	**1.0E-01**	5.4E-04		**1.0E-01**	0.02%	**2.4E-01**	1.6E-03		**2.4E-01**	0.02%
Vanadium	**8.8E-01**	4.6E-03		**8.8E-01**	0.2%	**2.0E+00**	1.3E-02		**2.1E+00**	0.2%
Cyanide	8.6E-02	4.5E-04		8.7E-02	0.02%	**2.0E-01**	1.3E-03		**2.0E-01**	0.02%
Subtotal Metals	**3.8E+01**	**2.0E-01**		**3.9E+01**	8%	**9.7E+01**	**6.4E-01**		**9.8E+01**	8%
Pesticides/PCBs										
4,4'-DDT	9.9E-03	**1.1E-01**		**1.2E-01**	0.03%	2.3E-02	**2.5E-01**		**2.8E-01**	0.02%
Aldrin	**3.7E-01**	3.3E-02		**4.0E-01**	0.1%	**8.6E-01**	7.5E-02		**9.4E-01**	0.1%
alpha-Chlordane	1.8E-02	3.8E-02		5.6E-02	0.01%	**6.5E-01**	**1.3E+00**		**1.9E+00**	0.17%
Dieldrin	**5.1E-01**	**3.5E-01**		**8.5E-01**	0.2%	**1.2E+00**	**7.8E-01**		**2.0E+00**	0.2%
Endrin	5.9E-02	4.1E-02		1.0E-01	0.02%	**1.4E-01**	9.1E-02		**2.3E-01**	0.02%
Heptachlor epoxide	**2.5E-01**	**3.9E-01**		**6.4E-01**	0.1%	**5.9E-01**	**8.7E-01**		**1.5E+00**	0.1%
Aroclor-1260	**1.3E+00**	**4.7E+01**		**4.8E+01**	10%	**3.1E+00**	**1.0E+02**		**1.1E+02**	9%
Subtotal Pesticides/PCBs	**2.6E+00**	**4.8E+01**		**5.0E+01**	10%	**7.8E+00**	**1.1E+02**		**1.2E+02**	10%
SVOCs/VOCs										
2,4,6-Trichlorophenol	**2.0E+00**	**1.5E+00**		**3.5E+00**	0.7%	**4.6E+00**	**3.4E+00**		**7.9E+00**	0.7%
2,4-Dimethylphenol	**1.1E-01**	1.6E-02		**1.2E-01**	0.03%	**2.5E-01**	3.6E-02		**2.9E-01**	0.02%
2-Chlorophenol	2.4E-02	2.7E-03	**1.2E-01**	**1.4E-01**	0.03%	5.5E-02	6.0E-03	**2.8E-01**	**3.4E-01**	0.03%
2-Methylnaphthalene	**1.5E+00**	**2.1E+00**		**3.7E+00**	0.8%	**3.6E+00**	**4.8E+00**		**8.4E+00**	0.7%
2-Methylphenol	6.7E-02	6.4E-03		7.4E-02	0.02%	**1.6E-01**	1.4E-02		**1.7E-01**	0.01%
2-Nitroaniline	9.1E-02	6.1E-03		9.7E-02	0.02%	**2.1E-01**	1.4E-02		**2.3E-01**	0.02%
3,4-methylphenol	**4.6E-01**	4.4E-02		**5.0E-01**	0.1%	**1.1E+00**	9.8E-02		**1.2E+00**	0.1%
4-Methylphenol	**1.1E+00**	**1.0E-01**		**1.2E+00**	0.2%	**2.5E+00**	**2.3E-01**		**2.7E+00**	0.2%

Table 2-11
Noncancer Risk Results Detailed Summary for Risk Drivers - Future Adult/Child Resident - Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Non-Carcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
bis(2-Ethylhexyl)phthalate	2.3E-02	4.4E-02		6.7E-02	0.01%	5.4E-02	9.9E-02		**1.5E-01**	0.01%
Bromoform	1.6E-02	1.1E-03	8.2E-02	9.9E-02	0.02%	3.8E-02	2.5E-03	**1.9E-01**	**2.3E-01**	0.02%
Hexachloroethane	2.7E-02	2.3E-02		5.1E-02	0.01%	6.4E-02	5.2E-02		**1.2E-01**	0.01%
Naphthalene	**1.9E-01**	**1.2E-01**	**2.2E+01**	**2.2E+01**	5%	**4.4E-01**	**2.8E-01**	**5.1E+01**	**5.2E+01**	5%
Nitrobenzene	**1.1E-01**	8.0E-03	**4.8E-01**	**6.0E-01**	0.1%	**2.6E-01**	1.8E-02	**1.1E+00**	**1.4E+00**	0.1%
Pentachlorophenol	1.0E-02	**1.2E-01**		**1.3E-01**	0.03%	**7.2E-01**	**8.3E+00**		**9.1E+00**	0.79%
1,1,2-Trichloroethane	9.1E-02	8.5E-03	**4.5E-01**	**5.5E-01**	0.1%	**2.1E-01**	1.9E-02	**1.1E+00**	**1.3E+00**	0.1%
1,1-Dichloroethane	**1.5E-01**	1.2E-02	**5.3E-01**	**7.0E-01**	0.1%	**3.6E-01**	2.8E-02	**1.3E+00**	**1.6E+00**	0.1%
1,1-Dichloroethene	5.7E-02	7.8E-03	**2.8E-01**	**3.5E-01**	0.1%	**1.3E-01**	1.8E-02	**6.7E-01**	**8.2E-01**	0.1%
1,2,4-Trichlorobenzene	4.1E-02	5.4E-02	**2.1E+00**	**2.2E+00**	0.4%	9.6E-02	**1.2E-01**	**4.9E+00**	**5.1E+00**	0.4%
1,2,4-Trimethylbenzene	**1.5E-01**	**1.7E-01**	**2.2E+01**	**2.3E+01**	5%	**3.5E-01**	**3.8E-01**	**5.3E+01**	**5.3E+01**	5%
1,2-Dibromo-3-chloropropane	**1.2E+00**	**2.2E-01**	**5.7E+00**	**7.1E+00**	1%	**2.7E+00**	**4.9E-01**	**1.4E+01**	**1.7E+01**	1%
1,2-Dichlorobenzene	**2.2E-01**	**1.5E-01**	**1.8E+00**	**2.1E+00**	0.4%	**5.2E-01**	**3.3E-01**	**4.1E+00**	**5.0E+00**	0.4%
1,2-Dichloroethane	2.0E-02	1.5E-03	**1.4E+00**	**1.4E+00**	0.3%	4.6E-02	3.5E-03	**3.3E+00**	**3.4E+00**	0.3%
1,2-Dichloropropane	**1.3E-01**	1.3E-02	**6.3E-01**	**7.7E-01**	0.2%	**3.0E-01**	2.8E-02	**1.5E+00**	**1.8E+00**	0.2%
1,3,5-Trimethylbenzene	6.0E-02	4.9E-02	**8.8E+00**	**9.0E+00**	2%	**1.4E-01**	**1.1E-01**	**2.1E+01**	**2.1E+01**	2%
1,3-Dichlorobenzene	2.5E-02	2.3E-02	**1.2E-01**	**1.7E-01**	0.04%	5.8E-02	5.1E-02	**2.9E-01**	**4.0E-01**	0.03%
1,4-Dichlorobenzene	**2.0E-01**	**1.3E-01**	**1.3E-01**	**4.6E-01**	0.1%	**4.6E-01**	**3.0E-01**	**3.1E-01**	**1.1E+00**	0.1%
Acetone	1.5E-02	7.1E-05	7.4E-02	8.8E-02	0.02%	3.4E-02	1.7E-04	**1.7E-01**	**2.1E-01**	0.02%
Benzene	**2.7E+00**	**4.2E-01**	**6.4E+00**	**9.5E+00**	2%	**6.4E+00**	**9.9E-01**	**1.5E+01**	**2.2E+01**	2%
Carbon tetrachloride	1.2E-02	3.1E-03	5.8E-02	7.3E-02	0.02%	2.7E-02	7.0E-03	**1.4E-01**	**1.7E-01**	0.01%
Chlorobenzene	**9.2E-01**	**3.3E-01**	**5.4E+00**	**6.7E+00**	1%	**2.2E+00**	**7.4E-01**	**1.3E+01**	**1.6E+01**	1%
Chloroform	1.2E-02	1.1E-03	4.3E-02	5.6E-02	0.01%	2.8E-02	2.4E-03	**1.0E-01**	**1.3E-01**	0.01%
Chloromethane	7.8E-03	2.3E-04	3.9E-02	4.7E-02	0.01%	1.8E-02	5.5E-04	9.2E-02	**1.1E-01**	0.01%
cis-1,2-Dichloroethene	**3.8E+01**	**4.7E+00**	**1.9E+02**	**2.3E+02**	47%	**8.8E+01**	**1.1E+01**	**4.4E+02**	**5.4E+02**	47%
cis-1,3-Dichloropropene	3.8E-03	2.1E-04	**1.0E-01**	**1.0E-01**	0.02%	8.9E-03	4.7E-04	**2.4E-01**	**2.5E-01**	0.02%
Ethylbenzene	**1.2E-01**	7.3E-02	**2.1E-01**	**4.1E-01**	0.1%	**2.9E-01**	**1.7E-01**	**5.0E-01**	**9.5E-01**	0.1%
Isopropylbenzene (cumene)	7.4E-03	8.7E-03	3.4E-02	5.0E-02	0.01%	1.7E-02	1.9E-02	7.9E-02	**1.2E-01**	0.01%
Methyl ethyl ketone	2.0E-02	1.8E-04	4.2E-02	6.2E-02	0.01%	4.6E-02	4.4E-04	9.9E-02	**1.5E-01**	0.01%
Methyl isobutyl ketone	**1.7E+00**	5.2E-02	**7.7E-01**	**2.5E+00**	0.5%	**3.9E+00**	**1.2E-01**	**1.8E+00**	**5.8E+00**	0.50%
n-Propylbenzene	3.8E-02		**1.9E-01**	**2.3E-01**	0.05%	9.0E-02		**4.5E-01**	**5.4E-01**	0.05%
tert-Butyl alcohol	3.2E-02		**6.1E+00**	**6.2E+00**	1%	7.5E-02		**1.4E+01**	**1.5E+01**	1%
Tetrachloroethene	3.3E-02	1.9E-02	**1.6E-01**	**2.2E-01**	0.04%	7.7E-02	4.4E-02	**3.9E-01**	**5.1E-01**	0.04%
Toluene	**8.4E-01**	**2.9E-01**	**9.7E+00**	**1.1E+01**	2%	**2.0E+00**	**6.7E-01**	**2.3E+01**	**2.6E+01**	2%

Table 2-11
Noncancer Risk Results Detailed Summary for Risk Drivers - Future Adult/Child Resident - Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Non-Carcinogenic Effects Risk Results - Hazard Quotients										
Chemical of Potential Concern	Future Residential									
	Adult Resident					Child Resident				
	Reasonable Maximum Exposure									
	Ingestion	Dermal	Inhalation	Total	% Contribution	Ingestion	Dermal	Inhalation	Total	% Contribution
trans-1,2-Dichloroethene	**5.5E-01**	4.9E-02	**2.7E+00**	**3.3E+00**	0.7%	**1.3E+00**	**1.1E-01**	**6.5E+00**	**7.9E+00**	0.68%
trans-1,3-Dichloropropene	3.7E-03	2.0E-04	9.8E-02	**1.0E-01**	0.02%	8.7E-03	4.5E-04	**2.3E-01**	**2.4E-01**	0.02%
Trichloroethene	**5.2E+00**	**8.9E-01**	**7.8E-01**	**6.9E+00**	1%	**1.2E+01**	**2.0E+00**	**1.8E+00**	**1.6E+01**	1%
Vinyl chloride	**1.5E+01**	**7.9E-01**	**7.8E+00**	**2.3E+01**	5%	**3.5E+01**	**1.9E+00**	**1.8E+01**	**5.5E+01**	5%
m,p-Xylene	**1.3E-01**		**4.4E+00**	**4.6E+00**	1%	**3.0E-01**		**1.0E+01**	**1.1E+01**	1%
o-Xylene	6.1E-02	5.2E-02	**2.1E+00**	**2.2E+00**	0.5%	**1.4E-01**	**1.2E-01**	**4.9E+00**	**5.2E+00**	0.5%
Xylenes, total	**2.2E-01**	**1.4E-01**	**7.5E+00**	**7.9E+00**	2%	**5.1E-01**	**3.3E-01**	**1.8E+01**	**1.9E+01**	2%
Subtotal SVOCs/VOCs	**7.3E+01**	**1.3E+01**	**3.1E+02**	**3.9E+02**	82%	**1.7E+02**	**3.7E+01**	**7.3E+02**	**9.4E+02**	81%
Total:	**1.1E+02**	**6.1E+01**	**3.1E+02**	**4.84E+02**		**2.8E+02**	**1.5E+02**	**7.3E+02**	**1.15E+03**	

Total Estimated Hazard Index Across All Exposure Routes: **484** **1153**

Notes:
Subtotals and Total: Cumulative Hazard Index of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total hazard index for all chemicals evaluated.

Table 2-12

Risk Calculation Worksheet for Groundwater - Carcinogenic Effects - Construction Exposure Scenario - Trench Worker

Baseline Human Health Risk Assessment

AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information		
	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Groundwater
	Exposure Point:	OnSite
	Receptor Population:	Trench Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	**Variable**	**Value**	**Units**
Exposure Frequency	EF	90	day/yr
Exposure Duration	ED	1	yr
Exposure Time	ET	8	hr/day
Inhalation Rate (VOCs in Water Inhalation)	InRw	2.5	m3/hr
Skin Surface Area (Water Contact)	SA_w	5700	cm2 [water]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (L/cm^3)	CF	1.00E-03	L/cm3
Conversion Factor (yr/day)	CF	2.74E-03	yr/day
Conversion Factor (mg/ug)	CF	1.00E-03	mg/ug
Constituent Specific Permeability Constant	Kp	Chemical Specific	cm/hr

Risk Calculations

		Exposure Route = Dermal			**Exposure Route = Inhalation**				
Chemical of Potential Concern	**RME Medium EPC Value, Cgw [mg/L]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Concentration in Air, Cair [ug/m3]**	**Chronic Daily Intake [mg/kg/day]**	**Cancer Slope Factor, SF [mg/kg/day]-1**	**Cancer Risk [-]**	**Total Cancer Risk [-]**
Metals									
Aluminum	9.40E+00	2.16E-05	NA		NA	NV	NA		
Antimony	1.51E-03	3.47E-09	NA		NA	NV	NA		
Arsenic	2.87E-01	6.58E-07	9.50E+00	6.25E-06	NA	NV	1.51E+01		**6.25E-06**
Barium	1.68E-01	3.85E-07	NA		NA	NV	NA		
Beryllium	7.64E-04	1.75E-09	NA		NA	NV	8.40E+00		
Boron	4.31E+00	9.88E-06	NA		NA	NV	NA		
Cadmium	1.26E-03	2.88E-09	3.80E-01	1.10E-09	NA	NV	1.47E+01		1.10E-09
Chromium	3.57E-02	8.19E-08	NA		NA	NV	4.20E+01		
Chromium (VI)	3.50E-04	1.61E-09	NA		NA	NV	2.90E+02		
Cobalt	8.89E-03	8.16E-09	NA		NA	NV	9.80E+00		
Copper	4.66E-02	1.07E-07	NA		NA	NV	NA		
Iron	5.35E+01	1.23E-04	NA		NA	NV	NA		
Lead	4.00E-02	9.18E-09	NA		NA	NV	NA		
Manganese	4.33E+00	9.94E-06	NA		NA	NV	NA		
Mercury	1.21E-04	2.78E-10	NA		NA	NV	NA		
Molybdenum	5.64E-03	1.29E-08	NA		NA	NV	NA		
Nickel	5.46E-02	2.51E-08	NA		NA	NV	9.10E-01		
Selenium	1.89E-02	4.34E-08	NA		NA	NV	NA		

Risk Calculations

		Exposure Route = Dermal			Exposure Route = Inhalation				
Chemical of Potential Concern	RME Medium EPC Value, Cgw [mg/L]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Concentration in Air, Cair [ug/m3]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Silver	1.20E-04	1.65E-10	NA		NA	NV	NA		
Thallium	5.00E-05	1.15E-10	NA		NA	NV	NA		
Vanadium	3.19E-02	7.33E-08	NA		NA	NV	NA		
Zinc	3.03E-01	4.17E-07	NA		NA	NV	NA		
Cyanide	6.29E-02	1.44E-07	NA		NA	NV	NA		
Pesticides/PCBs									
4,4'-DDD	5.00E-03	4.12E-06	2.40E-01	9.88E-07	NA	NV	2.42E-01		9.88E-07
4,4'-DDE	7.76E-04	5.61E-07	3.40E-01	1.91E-07	NA	NV	3.40E-01		1.91E-07
4,4'-DDT	1.80E-04	2.44E-07	3.40E-01	8.30E-08	NA	NV	3.40E-01		8.30E-08
Aldrin	4.05E-04	4.33E-09	1.70E+01	7.37E-08	NA	NV	1.72E+01		7.37E-08
alpha-BHC	3.00E-04	1.56E-08	6.30E+00	9.86E-08	NA	NV	6.30E+00		9.86E-08
alpha-Chlordane	3.34E-04	8.12E-08	1.20E+00	9.75E-08	NA	NV	1.19E+00		9.75E-08
Atrazine	2.00E-03	3.35E-08	2.30E-01	7.71E-09	NA	NV	2.22E-01		7.71E-09
beta-BHC	3.69E-04	1.92E-08	1.80E+00	3.46E-08	NA	NV	1.80E+00		3.46E-08
delta-BHC	1.60E-04	8.35E-09	NA		NA	NV	NA		
Diazinon	2.60E-04	1.38E-08	NA		NA	NV	NA		
Dieldrin	9.24E-04	7.52E-08	1.60E+01	1.20E-06	NA	NV	1.61E+01		**1.20E-06**
Endosulfan I	3.31E-04	9.33E-09	NA		NA	NV	NA		
Endosulfan II	2.30E-04	4.05E-09	NA		NA	NV	NA		
Endosulfan sulfate	9.20E-05	NA	NA		NA	NV	NA		
Endrin	6.46E-04	5.26E-08	NA		NA	NV	NA		
Endrin aldehyde	1.40E-04	NA	NA		NA	NV	NA		
Endrin ketone	1.70E-04	NA	NA		NA	NV	NA		
gamma-BHC	3.28E-04	1.71E-08	1.30E+00	2.22E-08	NA	NV	1.30E+00		2.22E-08
gamma-Chlordane	2.50E-04	6.08E-08	1.20E+00	7.30E-08	NA	NV	1.19E+00		7.30E-08
Heptachlor	1.11E-04	6.15E-09	4.50E+00	2.77E-08	NA	NV	4.55E+00		2.77E-08
Heptachlor epoxide	1.20E-04	2.18E-08	9.10E+00	1.98E-07	NA	NV	9.10E+00		1.98E-07
Methoxychlor	1.20E-04	3.36E-08	NA		NA	NV	NA		
Aroclor-1260	9.63E-04	4.03E-06	2.00E+00	8.06E-06	NA	NV	2.00E+00		**8.06E-06**
SVOCs/VOCs									
1,4-Dioxane (p-dioxane)	7.80E-01	6.38E-07	2.70E-02	1.72E-08	NA	NV	2.70E-02		1.72E-08
2,4,6-Trichlorophenol	7.14E-03	7.10E-07	7.00E-02	4.97E-08	NA	NV	7.00E-02		4.97E-08
2,4-Dimethylphenol	7.87E-02	2.16E-06	NA		NA	NV	NA		
2-Chlorophenol	4.30E-03	8.75E-08	NA		2.86E-01	2.87E-07	NA		
2-Methylnaphthalene	2.26E-01	4.33E-05	NA		NA	NA	NA		
2-Methylphenol	1.23E-01	2.34E-06	NA		NA	NV	NA		
2-Nitroaniline	1.00E-02	1.16E-07	NA		NA	NV	NA		
3,4-methylphenol	8.40E-01	1.60E-05	NA		NA	NV	NA		
4-Chloro-3-methylphenol	2.38E-02	NA	NA		NA	NV	NA		
4-Methylphenol	1.94E-01	3.69E-06	NA		NA	NV	NA		

Risk Calculations

		Exposure Route = Dermal			Exposure Route = Inhalation				
Chemical of Potential Concern	RME Medium EPC Value, Cgw [mg/L]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Concentration in Air, Cair [ug/m3]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
Acenaphthene	4.50E-03	1.25E-06	NA		2.32E-01	2.33E-07	NA		
Acenaphthylene	9.54E-03	2.75E-06	NA		1.14E-01	1.14E-07	NA		
Anthracene	3.20E-03	1.56E-06	NA		1.14E-01	1.14E-07	NA		
Benzo(a)anthracene	9.00E-04	1.34E-06	1.20E+00	1.61E-06	NA	NV	7.30E-01		**1.61E-06**
Benzo(a)pyrene	5.00E-04	1.28E-06	1.20E+01	1.53E-05	NA	NV	7.30E+00		**1.53E-05**
Benzo(b)fluoranthene	7.60E-04	1.97E-06	1.20E+00	2.36E-06	NA	NV	7.30E-01		**2.36E-06**
Benzo(g,h,i)perylene	2.00E-04	9.22E-07	NA		NA	NV	NA		
Benzo(k)fluoranthene	4.60E-04	1.12E-06	1.20E+00	1.35E-06	NA	NV	3.85E-01		**1.35E-06**
Biphenyl (Diphenyl)	1.30E-03	2.64E-07	NA		NA	NV	NA		
bis(2-Chloroethoxy)methane	2.00E-04	6.99E-10	NA		NA	NA	NA		
bis(2-Ethylhexyl)phthalate	1.69E-02	3.82E-06	1.40E-02	5.35E-08	NA	NV	1.40E-02		5.35E-08
Bromoform	1.20E-02	1.02E-07	7.90E-03	8.04E-10	5.98E-01	6.02E-07	3.85E-03	2.32E-09	3.12E-09
Caprolactam	2.40E-03	6.14E-09	NA		NA	NV	NA		
Carbazole	1.25E-02	1.62E-06	2.00E-02	3.24E-08	NA	NV	2.00E-02		3.24E-08
Chrysene	1.10E-03	1.64E-06	1.20E-01	1.97E-07	NA	NV	3.85E-02		1.97E-07
Dibenz(a,h)anthracene	4.50E-05	1.77E-07	7.30E+00	1.29E-06	NA	NV	7.30E+00		**1.29E-06**
Diethylphthalate	1.03E-02	1.34E-07	NA		NA	NV	NA		
Di-n-butyl phthalate	1.17E-02	1.10E-06	NA		NA	NV	NA		
Fluoranthene	2.40E-03	1.35E-06	NA		NA	NV	NA		
Fluorene	2.60E-03	9.34E-07	NA		1.02E-01	1.03E-07	NA		
Hexachloroethane	1.00E-03	1.03E-07	3.90E-02	4.03E-09	NA	NV	3.85E-01		4.03E-09
Indeno(1,2,3-c,d)pyrene	2.00E-04	5.18E-07	7.30E-01	3.78E-07	NA	NV	7.30E-01		3.78E-07
Naphthalene	1.36E-01	1.46E-05	1.20E-01	1.75E-06	9.34E+00	9.40E-06	1.19E-01	1.12E-06	**2.87E-06**
Nitrobenzene	2.00E-03	2.74E-08	NA		4.65E-02	4.68E-08	NA		
N-Nitrosodi-n-propylamine	2.00E-03	1.21E-08	7.00E+00	8.50E-08	NA	NV	7.00E+00		8.50E-08
N-Nitrosodiphenylamine	1.20E-03	9.04E-08	9.00E-03	8.13E-10	NA	NV	9.10E-03		8.13E-10
Pentachlorophenol	1.13E-02	1.60E-05	1.20E-01	1.93E-06	NA	NV	1.20E-01		**1.93E-06**
Phenanthrene	6.00E-03	1.92E-06	NA		NA	NV	NA		
Pyrene	2.40E-03	1.95E-06	NA		2.53E-02	2.55E-08	NA		
1,1-Dichloroethene	4.16E-02	1.20E-06	9.10E-02	1.10E-07	3.65E+00	3.68E-06	9.10E-02	3.35E-07	4.44E-07
1,1-Dichloroethane	5.57E-01	9.18E-06	5.70E-03	5.23E-08	4.80E+01	4.83E-05	5.60E-03	2.71E-07	3.23E-07
1,1,2-Trichloroethane	1.33E-02	2.20E-07	7.20E-02	1.58E-08	9.44E-01	9.50E-07	5.60E-02	5.32E-08	6.90E-08
1,1,2,2-Tetrachloroethane	1.29E-02	2.46E-07	2.70E-01	6.65E-08	7.47E-01	7.51E-07	2.00E-01	1.50E-07	2.17E-07
1,1,1-Trichloroethane	1.18E-01	3.87E-06	NA		8.85E+00	8.90E-06	NA		
1,1,2-Trichloroethane	1.33E-02	2.20E-07	7.20E-02	1.58E-08	9.44E-01	9.50E-07	5.60E-02	5.32E-08	6.90E-08
1,1,2,2-Tetrachloroethane	1.29E-02	2.46E-07	2.70E-01	6.65E-08	7.47E-01	7.51E-07	2.00E-01	1.50E-07	2.17E-07
1,2,3-Trichlorobenzene	2.72E-03	NA	NA		1.69E-01	1.70E-07	NA		
1,2,4-Trichlorobenzene	1.51E-02	2.53E-06	3.60E-03	9.10E-09	9.37E-01	9.43E-07	NA		9.10E-09
1,2,4-Trimethylbenzene	2.78E-01	4.82E-05	NA		2.17E+01	2.19E-05	NA		
1,2-Dibromo-3-chloropropane	2.40E-03	5.73E-08	7.00E+00	4.01E-07	1.00E-01	1.01E-07	6.65E+00	6.71E-07	**1.07E-06**

Risk Calculations

		Exposure Route = Dermal			Exposure Route = Inhalation				
Chemical of Potential Concern	RME Medium EPC Value, Cgw [mg/L]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Concentration in Air, Cair [ug/m3]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
1,2-Dichlorobenzene	7.34E-01	7.23E-05	NA		5.10E+01	5.14E-05	NA		
1,2-Dichloroethane	1.44E-02	2.37E-07	9.10E-02	2.15E-08	1.18E+00	1.19E-06	9.10E-02	1.08E-07	1.30E-07
1,2-Dichloropropane	5.10E-03	9.91E-08	6.80E-02	6.74E-09	4.08E-01	4.10E-07	6.80E-02	2.79E-08	3.46E-08
1,3-Dichlorobenzene	2.71E-02	3.63E-06	NA		1.88E+00	1.90E-06	NA		
1,3,5-Trimethylbenzene	1.10E-01	1.46E-05	NA		8.65E+00	8.71E-06	NA		
1,4-Dichlorobenzene	2.18E-01	2.19E-05	2.40E-02	5.26E-07	1.52E+01	1.53E-05	3.85E-02	5.90E-07	**1.12E-06**
2-Chlorotoluene	2.89E-03	NA	NA		NA	NA	NA		
2-Hexanone	2.35E-02	2.08E-07	NA		NA	NA	NA		
2,2-Dichloropropane	5.00E-04	NA	NA		NA	NA	NA		
Acetone	4.85E-01	6.11E-07	NA		2.07E+01	2.08E-05	NA		
Benzene	4.00E-01	1.41E-05	1.00E-01	1.41E-06	3.88E+01	3.91E-05	1.02E-01	3.97E-06	**5.38E-06**
Carbon disulfide	3.10E-03	1.24E-07	NA		3.08E-01	3.10E-07	NA		
Carbon tetrachloride	3.00E-04	1.25E-08	1.50E-01	1.87E-09	2.09E-02	2.11E-08	1.47E-01	3.10E-09	4.97E-09
Chlorobenzene	6.74E-01	4.43E-05	NA		5.41E+01	5.45E-05	NA		
Chloroethane	9.74E-02	1.42E-06	2.90E-03	4.12E-09	1.04E+01	1.05E-05	2.90E-03	3.04E-08	3.45E-08
Chloroform	4.40E-03	7.54E-08	3.10E-02	2.34E-09	3.44E-01	3.47E-07	8.10E-02	2.81E-08	3.04E-08
Chloromethane	7.40E-03	5.84E-08	NA		8.96E-01	9.02E-07	NA		
cis-1,2-Dichloroethene	1.37E+01	3.62E-04	NA		1.19E+03	1.20E-03	NA		
cis-1,3-Dichloropropene	4.20E-03	4.54E-08	1.00E-01	4.54E-09	3.45E-01	3.47E-07	5.60E-02	1.94E-08	2.40E-08
Cyclohexane	1.80E-02	3.47E-06	NA		1.70E+00	1.71E-06	NA		
Ethyl tert-butyl ether (ETBE)	1.20E-03	NA	NA		NA	NA	NA		
Ethylbenzene	4.49E-01	4.85E-05	NA		3.75E+01	3.77E-05	NA		
Isopropyl ether	4.30E-01	NA	NA		NA	NA	NA		
Isopropylbenzene (cumene)	2.71E-02	4.88E-06	NA		NA	NA	NA		
Methyl acetate	2.25E-02	4.42E-08	NA		5.64E-01	5.68E-07	NA		
Methyl ethyl ketone	4.30E-01	1.01E-06	NA		1.34E+01	1.35E-05	NA		
Methyl isobutyl ketone	4.86E+00	3.22E-05	NA		2.96E+02	2.98E-04	NA		
Methyl tert-butyl ether	2.01E-02	1.05E-07	1.80E-03	1.90E-10	NA	NA	9.10E-04		1.90E-10
Methylcyclohexane	2.45E-02	5.08E-06	NA		2.15E+00	2.16E-06	NA		
Methylene chloride	8.19E-03	7.02E-08	1.40E-02	9.83E-10	7.49E-01	7.54E-07	3.50E-03	2.64E-09	3.62E-09
n-Butylbenzene	6.12E-03	NA	NA		4.56E-01	4.59E-07	NA		
n-Propylbenzene	5.61E-02	NA	NA		4.42E+00	4.45E-06	NA		
Phenol	4.80E-02	5.09E-07	NA		NA	NV	NA		
p-Cymene (p-isopropyltoluene)	7.86E-02	NA	NA		NA	NA	NA		
sec-Butylbenzene	5.64E-03	NA	NA		4.21E-01	4.23E-07	NA		
Styrene	1.39E-02	1.17E-06	NA		1.16E+00	1.17E-06	NA		
tert-Butylbenzene	2.10E-03	NA	NA		1.56E-01	1.58E-07	NA		
tert-Butyl alcohol	1.17E-01	NA	NA		NA	NA	NA		
Tetrachloroethene	1.20E-02	1.02E-06	5.40E-01	5.49E-07	8.06E-01	8.11E-07	2.07E-02	1.67E-08	5.65E-07
Toluene	6.11E+00	4.32E-04	NA		5.48E+02	5.51E-04	NA		

Risk Calculations

		Exposure Route = Dermal			Exposure Route = Inhalation				
Chemical of Potential Concern	RME Medium EPC Value, Cgw [mg/L]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Concentration in Air, Cair [ug/m3]	Chronic Daily Intake [mg/kg/day]	Cancer Slope Factor, SF [mg/kg/day]-1	Cancer Risk [-]	Total Cancer Risk [-]
trans-1,2-Dichloroethene	4.01E-01	7.56E-06	NA		3.51E+01	3.53E-05	NA		
trans-1,3-Dichloropropene	4.10E-03	4.43E-08	1.00E-01	4.43E-09	3.36E-01	3.39E-07	5.60E-02	1.90E-08	2.34E-08
Trichloroethene	5.70E-02	1.73E-06	4.00E-01	6.90E-07	4.29E+00	4.32E-06	4.00E-01	1.73E-06	**2.42E-06**
Vinyl chloride	1.63E+00	2.18E-05	1.50E+00	3.27E-05	1.77E+02	1.78E-04	2.73E-01	4.87E-05	**8.14E-05**
m,p-Xylene	9.44E-01	NA	NA		7.88E+01	7.93E-05	NA		
o-Xylene	4.45E-01	6.56E-05	NA		3.70E+01	3.72E-05	NA		
Xylenes, total	1.60E+00	1.85E-04	NA		1.33E+02	1.34E-04	NA		
Dioxans/Furans									
1,2,3,4,6,7,8-HpCDD	4.64E-07	2.12E-09	1.50E+03	3.18E-06	NA	NV	1.50E+03		**3.18E-06**
1,2,3,4,6,7,8-HpCDF	9.49E-08	3.91E-10	1.50E+03	5.87E-07	NA	NV	1.50E+03		5.87E-07
1,2,3,4,7,8,9-HpCDF	9.79E-09	4.04E-11	1.50E+03	6.05E-08	NA	NV	1.50E+03		6.05E-08
1,2,3,4,7,8-HxCDD	2.62E-09	9.60E-12	1.50E+04	1.44E-07	NA	NV	1.50E+04		1.44E-07
1,2,3,4,7,8-HxCDF	8.49E-09	2.80E-11	1.50E+04	4.21E-07	NA	NV	1.50E+04		4.21E-07
1,2,3,6,7,8-HxCDD	1.33E-08	4.87E-11	1.50E+04	7.30E-07	NA	NV	1.50E+04		7.30E-07
1,2,3,6,7,8-HxCDF	1.62E-09	5.34E-12	1.50E+04	8.01E-08	NA	NV	1.50E+04		8.01E-08
1,2,3,7,8,9-HxCDD	4.40E-09	1.61E-11	1.50E+04	2.42E-07	NA	NV	1.50E+04		2.42E-07
1,2,3,7,8,9-HxCDF	3.87E-09	1.28E-11	1.50E+04	1.91E-07	NA	NV	1.50E+04		1.91E-07
1,2,3,7,8-PeCDD	1.08E-09	3.16E-12	1.50E+05	4.74E-07	NA	NV	1.50E+05		4.74E-07
1,2,3,7,8-PeCDF	2.28E-09	6.03E-12	7.50E+03	4.52E-08	NA	NV	7.50E+03		4.52E-08
2,3,4,6,7,8-HxCDF	3.94E-09	1.30E-11	1.50E+04	1.95E-07	NA	NV	1.50E+04		1.95E-07
2,3,4,7,8-PeCDF	2.64E-09	6.97E-12	7.50E+04	5.23E-07	NA	NV	7.50E+04		5.23E-07
2,3,7,8-TCDF	1.68E-09	3.56E-12	1.50E+04	5.34E-08	NA	NV	1.50E+04		5.34E-08
OCDD	2.18E-06	1.24E-08	1.50E+01	1.87E-07	NA	NV	1.50E+01		1.87E-07
OCDF	7.44E-07	3.83E-09	1.50E+01	5.74E-08	NA	NV	1.50E+01		5.74E-08
			Total Risk:	8.77E-05			**Total Risk:**	5.81E-05	1.46E-04

Total Estimated Carcinogenic Risk Across All Exposure Routes : **1.5E-04**

Notes:

NA = One or more of the following: no toxicity value available in standard U.S. EPA toxicity value databases; no Kp value available; no Henry's Law constant.

RME = Reasonable maximum exposure.

EPC = Exposure point concentration.

Table 2-13
Risk Calculation Worksheet for Groundwater - Noncarcinogenic Effects - Construction Exposure Scenario - Trench Worker
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario Information	Exposure Scenario:	Construction
	Scenario Timeframe:	Chronic
	Exposure Medium:	Groundwater
	Exposure Point:	OnSite
	Receptor Population:	Trench Worker
	Receptor Age:	Adult

Exposure Scenario/Exposure Area Description

Site Risks

Exposure Parameter	Variable	Value	Units
Exposure Frequency	EF	90	day/yr
Exposure Duration	ED	1	yr
Exposure Time	ET	8	hr/day
Inhalation Rate (VOCs in Water Inhalation)	InRw	2.5	m3/hr
Skin Surface Area (Water Contact)	SA_w	5.70E+03	cm2 [water]
Body Weight	BW	70	kg
Averaging Time for carcinogens	ATc	70	yr
Averaging Time for noncarcinogens	ATnc	1	yr
Conversion Factor (L/cm^3)	CF	1.00E-03	L/cm3
Conversion Factor (yr/day)	CF	2.74E-03	yr/day
Conversion Factor (mg/ug)	CF	1.00E-03	mg/ug

Risk Calculations

		Exposure Route = Dermal			Exposure Route = Inhalation				
Chemical of Potential Concern	**RME Medium EPC Value, Cgw [mg/L]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Concentration in Air, Cair [ug/m3]**	**Chronic Daily Intake [mg/kg/day]**	**Reference Dose [mg/kg/day]**	**Hazard Quotient**	**Total Hazard Quotient [-]**
Metals									
Aluminum	9.40E+00	1.51E-03	1.00E+00	1.51E-03	NA	NV	1.40E-03		1.51E-03
Antimony	1.51E-03	2.43E-07	4.00E-04	6.07E-04	NA	NV	NA		6.07E-04
Arsenic	2.87E-01	4.61E-05	3.00E-04	1.54E-01	NA	NV	8.57E-06		1.54E-01
Barium	1.68E-01	2.69E-05	7.00E-02	3.85E-04	NA	NV	1.43E-04		3.85E-04
Beryllium	7.64E-04	1.23E-07	2.00E-03	6.14E-05	NA	NV	5.71E-06		6.14E-05
Boron	4.31E+00	6.92E-04	2.00E-01	3.46E-03	NA	NV	5.70E-03		3.46E-03
Cadmium	1.26E-03	2.02E-07	5.00E-04	4.03E-04	NA	NV	5.71E-06		4.03E-04
Chromium	3.57E-02	5.73E-06	NA		NA	NV	NA		
Chromium (VI)	3.50E-04	1.12E-07	3.00E-03	3.75E-05	NA	NV	2.20E-06		3.75E-05
Cobalt	8.89E-03	5.71E-07	2.00E-02	2.86E-05	NA	NV	5.70E-06		2.86E-05
Copper	4.66E-02	7.48E-06	4.00E-02	1.87E-04	NA	NV	NA		1.87E-04
Iron	5.35E+01	8.59E-03	3.00E-01	2.86E-02	NA	NV	NA		2.86E-02

Risk Calculations

		Exposure Route = Dermal			Exposure Route = Inhalation				
Chemical of Potential Concern	RME Medium EPC Value, Cgw [mg/L]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Concentration in Air, Cair [ug/m3]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Lead	4.00E-02	6.42E-07	NA		NA	NV	NA		
Manganese	4.33E+00	6.96E-04	2.40E-02	2.90E-02	NA	NV	1.40E-05		2.90E-02
Mercury	1.21E-04	1.94E-08	3.00E-04	6.48E-05	NA	NV	NA		6.48E-05
Molybdenum	5.64E-03	9.05E-07	5.00E-03	1.81E-04	NA	NV	NA		1.81E-04
Nickel	5.46E-02	1.75E-06	2.00E-02	8.77E-05	NA	NV	1.43E-05		8.77E-05
Selenium	1.89E-02	3.04E-06	5.00E-03	6.07E-04	NA	NV	5.71E-03		6.07E-04
Silver	1.20E-04	1.16E-08	5.00E-03	2.31E-06	NA	NV	NA		2.31E-06
Thallium	5.00E-05	8.03E-09	6.60E-05	1.22E-04	NA	NV	NA		1.22E-04
Vanadium	3.19E-02	5.13E-06	1.00E-03	5.13E-03	NA	NV	NA		5.13E-03
Zinc	3.03E-01	2.92E-05	3.00E-01	9.73E-05	NA	NV	NA		9.73E-05
Cyanide	6.29E-02	1.01E-05	2.00E-02	5.05E-04	NA	NV	NA		5.05E-04
Pesticides/PCBs									
4,4'-DDD	5.00E-03	2.88E-04	NA		NA	NV	NA		
4,4'-DDE	7.76E-04	3.93E-05	NA		NA	NV	NA		
4,4'-DDT	1.80E-04	1.71E-05	5.00E-04	3.42E-02	NA	NV	5.00E-04		3.42E-02
Aldrin	4.05E-04	3.03E-07	3.00E-05	1.01E-02	NA	NV	3.00E-05		1.01E-02
alpha-BHC	3.00E-04	1.10E-06	5.00E-04	2.19E-03	NA	NV	5.00E-04		2.19E-03
alpha-Chlordane	3.34E-04	5.69E-06	5.00E-04	1.14E-02	NA	NV	2.00E-04		1.14E-02
Atrazine	2.00E-03	2.35E-06	3.50E-02	6.70E-05	NA	NV	3.50E-02		6.70E-05
beta-BHC	3.69E-04	1.35E-06	NA		NA	NV	NA		
delta-BHC	1.60E-04	5.84E-07	NA		NA	NV	NA		
Diazinon	2.60E-04	9.63E-07	9.00E-04	1.07E-03	NA	NV	9.00E-04		1.07E-03
Dieldrin	9.24E-04	5.26E-06	5.00E-05	1.05E-01	NA	NV	5.00E-05		1.05E-01
Endosulfan I	3.31E-04	6.53E-07	6.00E-03	1.09E-04	NA	NV	6.00E-03		1.09E-04
Endosulfan II	2.30E-04	2.83E-07	6.00E-03	4.72E-05	NA	NA	6.00E-03		4.72E-05
Endosulfan sulfate	9.20E-05	NA	6.00E-03		NA	NV	6.00E-03		
Endrin	6.46E-04	3.68E-06	3.00E-04	1.23E-02	NA	NV	3.00E-04		1.23E-02
Endrin aldehyde	1.40E-04	NA	3.00E-04		NA	NV	3.00E-04		
Endrin ketone	1.70E-04	NA	3.00E-04		NA	NV	3.00E-04		
gamma-BHC	3.28E-04	1.20E-06	3.00E-04	3.99E-03	NA	NV	3.00E-04		3.99E-03
gamma-Chlordane	2.50E-04	4.26E-06	5.00E-04	8.52E-03	NA	NV	2.00E-04		8.52E-03
Heptachlor	1.11E-04	4.31E-07	5.00E-04	8.62E-04	NA	NV	5.00E-04		8.62E-04
Heptachlor epoxide	1.20E-04	1.52E-06	1.30E-05	1.17E-01	NA	NV	1.30E-05		1.17E-01
Methoxychlor	1.20E-04	2.35E-06	5.00E-03	4.70E-04	NA	NV	5.00E-03		4.70E-04
Aroclor-1260	9.63E-04	2.82E-04	2.00E-05	1.41E+01	NA	NV	2.00E-05		**1.41E+01**
SVOCs/VOCs									
1,4-Dioxane (p-dioxane)	7.80E-01	4.47E-05	NA		NA	NV	8.57E-01		
2,4,6-Trichlorophenol	7.14E-03	4.97E-05	1.00E-04	4.97E-01	NA	NV	1.00E-04		4.97E-01
2,4-Dimethylphenol	7.87E-02	1.51E-04	2.00E-02	7.56E-03	NA	NV	2.00E-02		7.56E-03
2-Chlorophenol	4.30E-03	6.13E-06	5.00E-03	1.23E-03	2.86E-01	2.01E-05	5.00E-03	4.02E-03	5.25E-03
2-Methylnaphthalene	2.26E-01	3.03E-03	4.00E-03	7.57E-01	NA	NA	NA		7.57E-01

Risk Calculations

		Exposure Route = Dermal			Exposure Route = Inhalation				
Chemical of Potential Concern	RME Medium EPC Value, Cgw [mg/L]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Concentration in Air, Cair [ug/m3]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
2-Methylphenol	1.23E-01	1.64E-04	5.00E-02	3.28E-03	NA	NV	5.00E-02		3.28E-03
2-Nitroaniline	1.00E-02	8.13E-06	3.00E-03	2.71E-03	NA	NV	3.00E-05		2.71E-03
3,4-methylphenol	8.40E-01	1.12E-03	5.00E-02	2.24E-02	NA	NV	5.00E-02		2.24E-02
4-Chloro-3-methylphenol	2.38E-02	NA	NA		NA	NV	NA		
4-Methylphenol	1.94E-01	2.58E-04	5.00E-03	5.17E-02	NA	NV	5.00E-03		5.17E-02
Acenaphthene	4.50E-03	8.72E-05	6.00E-02	1.45E-03	2.32E-01	1.63E-05	6.00E-02	2.72E-04	1.73E-03
Acenaphthylene	9.54E-03	1.93E-04	NA		1.14E-01	8.01E-06	NA		
Anthracene	3.20E-03	1.09E-04	3.00E-01	3.63E-04	1.14E-01	8.01E-06	3.00E-01	2.67E-05	3.90E-04
Benzo(a)anthracene	9.00E-04	9.38E-05	NA		NA	NV	NA		
Benzo(a)pyrene	5.00E-04	8.93E-05	NA		NA	NV	NA		
Benzo(b)fluoranthene	7.60E-04	1.38E-04	NA		NA	NV	NA		
Benzo(g,h,i)perylene	2.00E-04	6.45E-05	NA		NA	NV	NA		
Benzo(k)fluoranthene	4.60E-04	7.86E-05	NA		NA	NV	NA		
Biphenyl (Diphenyl)	1.30E-03	1.85E-05	5.00E-02	3.70E-04	NA	NV	5.00E-02		3.70E-04
bis(2-Chloroethoxy)methane	2.00E-04	4.89E-08	NA		NA	NA	NA		
bis(2-Ethylhexyl)phthalate	1.69E-02	2.68E-04	2.00E-02	1.34E-02	NA	NV	2.00E-02		1.34E-02
Bromoform	1.20E-02	7.12E-06	2.00E-02	3.56E-04	5.98E-01	4.21E-05	2.00E-02	2.11E-03	2.46E-03
Caprolactam	2.40E-03	4.30E-07	5.00E-01	8.59E-07	NA	NV	5.00E-01		8.59E-07
Carbazole	1.25E-02	1.13E-04	NA		NA	NV	NA		
Chrysene	1.10E-03	1.15E-04	NA		NA	NV	NA		
Dibenz(a,h)anthracene	4.50E-05	1.24E-05	NA		NA	NV	NA		
Diethylphthalate	1.03E-02	9.35E-06	8.00E-01	1.17E-05	NA	NV	8.00E-01		1.17E-05
Di-n-butyl phthalate	1.17E-02	7.69E-05	1.00E-01	7.69E-04	NA	NV	1.00E-01		7.69E-04
Fluoranthene	2.40E-03	9.43E-05	4.00E-02	2.36E-03	NA	NV	4.00E-02		2.36E-03
Fluorene	2.60E-03	6.54E-05	4.00E-02	1.63E-03	1.02E-01	7.21E-06	4.00E-02	1.80E-04	1.81E-03
Hexachloroethane	1.00E-03	7.24E-06	1.00E-03	7.24E-03	NA	NV	1.00E-03		7.24E-03
Indeno(1,2,3-c,d)pyrene	2.00E-04	3.63E-05	NA		NA	NV	NA		
Naphthalene	1.36E-01	1.02E-03	2.00E-02	5.12E-02	9.34E+00	6.58E-04	8.57E-04	7.68E-01	8.19E-01
Nitrobenzene	2.00E-03	1.92E-06	5.00E-04	3.84E-03	4.65E-02	3.27E-06	5.71E-04	5.73E-03	9.57E-03
N-Nitrosodi-n-propylamine	2.00E-03	8.50E-07	NA		NA	NV	NA		
N-Nitrosodiphenylamine	1.20E-03	6.33E-06	2.00E-02	3.16E-04	NA	NV	2.00E-02		3.16E-04
Pentachlorophenol	1.13E-02	1.12E-03	3.00E-02	3.74E-02	NA	NV	3.00E-02		3.74E-02
Phenanthrene	6.00E-03	1.35E-04	NA		NA	NV	NA		
Pyrene	2.40E-03	1.36E-04	3.00E-02	4.54E-03	2.53E-02	1.78E-06	3.00E-02	5.95E-05	4.60E-03
1,1-Dichloroethane	5.57E-01	6.42E-04	1.00E-01	6.42E-03	4.80E+01	3.38E-03	1.43E-01	2.37E-02	3.01E-02
1,1-Dichloroethene	4.16E-02	8.43E-05	2.00E-02	4.22E-03	3.65E+00	2.57E-04	2.00E-02	1.29E-02	1.71E-02
1,1,1-Trichloroethane	1.18E-01	2.71E-04	2.80E-01	9.69E-04	8.85E+00	6.23E-04	6.30E-01	9.89E-04	1.96E-03
1,1,2-Trichloroethane	1.33E-02	1.54E-05	4.00E-03	3.85E-03	9.44E-01	6.65E-05	4.00E-03	1.66E-02	2.05E-02
1,1,2,2-Tetrachloroethane	1.29E-02	1.72E-05	6.00E-02	2.87E-04	7.47E-01	5.26E-05	6.00E-02	8.77E-04	1.16E-03
1,2,3-Trichlorobenzene	2.72E-03	NA	NA		1.69E-01	1.19E-05	NA		
1,2,4-Trichlorobenzene	1.51E-02	1.77E-04	1.00E-02	1.77E-02	9.37E-01	6.60E-05	1.00E-03	6.60E-02	8.37E-02

Risk Calculations

		Exposure Route = Dermal			Exposure Route = Inhalation				
Chemical of Potential Concern	RME Medium EPC Value, Cgw [mg/L]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Concentration in Air, Cair [ug/m3]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
1,2,4-Trimethylbenzene	2.78E-01	3.37E-03	5.00E-02	6.75E-02	2.17E+01	1.53E-03	1.70E-03	9.01E-01	9.68E-01
1,2-Dibromo-3-chloropropane	2.40E-03	4.01E-06	5.70E-05	7.03E-02	1.00E-01	7.06E-06	5.70E-05	1.24E-01	1.94E-01
1,2-Dichlorobenzene	7.34E-01	5.06E-03	9.00E-02	5.63E-02	5.10E+01	3.60E-03	5.71E-02	6.29E-02	1.19E-01
1,2-Dichloroethane	1.44E-02	1.66E-05	2.00E-02	8.28E-04	1.18E+00	8.32E-05	1.40E-03	5.94E-02	6.02E-02
1,2-Dichloropropane	5.10E-03	6.94E-06	1.10E-03	6.31E-03	4.08E-01	2.87E-05	1.10E-03	2.61E-02	3.24E-02
1,3-Dichlorobenzene	2.71E-02	2.54E-04	3.00E-02	8.48E-03	1.88E+00	1.33E-04	3.00E-02	4.42E-03	1.29E-02
1,3,5-Trimethylbenzene	1.10E-01	1.02E-03	5.00E-02	2.05E-02	8.65E+00	6.10E-04	1.70E-03	3.59E-01	3.79E-01
1,4-Dichlorobenzene	2.18E-01	1.54E-03	3.00E-02	5.12E-02	1.52E+01	1.07E-03	2.30E-01	4.67E-03	5.58E-02
2-Chlorotoluene	2.89E-03	NA	2.00E-02		NA	NA	2.00E-02		
2-Hexanone	2.35E-02	1.45E-05	NA		NA	NA	NA		
2,2-Dichloropropane	5.00E-04	NA	NA		NA	NA	NA		
Acetone	4.85E-01	4.28E-05	9.00E-01	4.75E-05	2.07E+01	1.46E-03	9.00E-01	1.62E-03	1.67E-03
Benzene	4.00E-01	9.90E-04	4.00E-03	2.47E-01	3.88E+01	2.74E-03	8.57E-03	3.19E-01	5.67E-01
Carbon disulfide	3.10E-03	8.66E-06	1.00E-01	8.66E-05	3.08E-01	2.17E-05	2.00E-01	1.08E-04	1.95E-04
Carbon tetrachloride	3.00E-04	8.75E-07	7.00E-04	1.25E-03	2.09E-02	1.47E-06	7.00E-04	2.11E-03	3.36E-03
Chlorobenzene	6.74E-01	3.10E-03	2.00E-02	1.55E-01	5.41E+01	3.81E-03	1.70E-02	2.24E-01	3.79E-01
Chloroethane	9.74E-02	9.95E-05	4.00E-01	2.49E-04	1.04E+01	7.34E-04	2.86E+00	2.57E-04	5.06E-04
Chloroform	4.40E-03	5.28E-06	1.00E-02	5.28E-04	3.44E-01	2.43E-05	1.40E-02	1.73E-03	2.26E-03
Chloromethane	7.40E-03	4.09E-06	2.60E-02	1.57E-04	8.96E-01	6.31E-05	2.60E-02	2.43E-03	2.59E-03
cis-1,2-Dichloroethene	1.37E+01	2.53E-02	1.00E-02	2.53E+00	1.19E+03	8.39E-02	1.00E-02	8.39E+00	**1.09E+01**
cis-1,3-Dichloropropene	4.20E-03	3.18E-06	3.00E-02	1.06E-04	3.45E-01	2.43E-05	5.71E-03	4.25E-03	4.35E-03
Cyclohexane	1.80E-02	2.43E-04	1.70E+00	1.43E-04	1.70E+00	1.20E-04	1.70E+00	7.06E-05	2.14E-04
Ethyl tert-butyl ether (ETBE)	1.20E-03	NA	NA		NA	NA	NA		
Ethylbenzene	4.49E-01	3.39E-03	1.00E-01	3.39E-02	3.75E+01	2.64E-03	2.90E-01	9.11E-03	4.30E-02
Isopropyl ether	4.30E-01	NA	NA		NA	NA	NA		
Isopropylbenzene (cumene)	2.71E-02	3.41E-04	1.00E-01	3.41E-03	NA	NA	1.10E-01		3.41E-03
Methyl acetate	2.25E-02	3.09E-06	1.00E+00	3.09E-06	5.64E-01	3.97E-05	1.00E+00	3.97E-05	4.28E-05
Methyl ethyl ketone	4.30E-01	7.05E-05	6.00E-01	1.18E-04	1.34E+01	9.43E-04	1.40E+00	6.73E-04	7.91E-04
Methyl isobutyl ketone	4.86E+00	2.26E-03	8.00E-02	2.82E-02	2.96E+02	2.08E-02	8.60E-01	2.42E-02	5.24E-02
Methyl tert-butyl ether	2.01E-02	7.38E-06	8.57E-01	8.61E-06	NA	NA	8.57E-01		8.61E-06
Methylcyclohexane	2.45E-02	3.55E-04	8.60E-01	4.13E-04	2.15E+00	1.51E-04	8.60E-01	1.76E-04	5.89E-04
Methylene chloride	8.19E-03	4.91E-06	6.00E-02	8.19E-05	7.49E-01	5.28E-05	1.14E-01	4.62E-04	5.44E-04
n-Butylbenzene	6.12E-03	NA	4.00E-02		4.56E-01	3.21E-05	4.00E-02	8.03E-04	8.03E-04
n-Propylbenzene	5.61E-02	NA	4.00E-02		4.42E+00	3.12E-04	4.00E-02	7.79E-03	7.79E-03
Phenol	4.80E-02	3.56E-05	3.00E-01	1.19E-04	NA	NV	5.71E-02		1.19E-04
p-Cymene (p-isopropyltoluene)	7.86E-02	NA	NA		NA	NA	NA		
sec-Butylbenzene	5.64E-03	NA	4.00E-02		4.21E-01	2.96E-05	4.00E-02	7.41E-04	7.41E-04
Styrene	1.39E-02	8.18E-05	2.00E-01	4.09E-04	1.16E+00	8.16E-05	2.57E-01	3.17E-04	7.26E-04
tert-Butylbenzene	2.10E-03	NA	4.00E-02		1.56E-01	1.10E-05	4.00E-02	2.76E-04	2.76E-04
tert-Butyl alcohol	1.17E-01	NA	1.00E-01		NA	NA	2.60E-03		
Tetrachloroethene	1.20E-02	7.11E-05	1.00E-02	7.11E-03	8.06E-01	5.68E-05	1.00E-02	5.68E-03	1.28E-02

Risk Calculations

		Exposure Route = Dermal			Exposure Route = Inhalation				
Chemical of Potential Concern	RME Medium EPC Value, Cgw [mg/L]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Concentration in Air, Cair [ug/m3]	Chronic Daily Intake [mg/kg/day]	Reference Dose [mg/kg/day]	Hazard Quotient	Total Hazard Quotient [-]
Toluene	6.11E+00	3.02E-02	2.00E-01	1.51E-01	5.48E+02	3.86E-02	8.57E-02	4.50E-01	6.01E-01
trans-1,2-Dichloroethene	4.01E-01	5.29E-04	2.00E-02	2.65E-02	3.51E+01	2.47E-03	2.00E-02	1.24E-01	1.50E-01
trans-1,3-Dichloropropene	4.10E-03	3.10E-06	3.00E-02	1.03E-04	3.36E-01	2.37E-05	5.71E-03	4.15E-03	4.25E-03
Trichloroethene	5.70E-02	1.21E-04	3.00E-04	4.03E-01	4.29E+00	3.02E-04	1.00E-02	3.02E-02	4.33E-01
Vinyl chloride	1.63E+00	1.53E-03	3.00E-03	5.09E-01	1.77E+02	1.25E-02	2.86E-02	4.37E-01	9.46E-01
m,p-Xylene	9.44E-01	NA	2.00E-01		7.88E+01	5.55E-03	2.90E-02	1.91E-01	1.91E-01
o-Xylene	4.45E-01	4.59E-03	2.00E-01	2.29E-02	3.70E+01	2.61E-03	2.90E-02	8.99E-02	1.13E-01
Xylenes, total	1.60E+00	1.30E-02	2.00E-01	6.48E-02	1.33E+02	9.38E-03	2.90E-02	3.23E-01	3.88E-01
Dioxans/Furans									
1,2,3,4,6,7,8-HpCDD	4.64E-07	1.49E-07	NA		NA	NV	1.14E-08		
1,2,3,4,6,7,8-HpCDF	9.49E-08	2.74E-08	NA		NA	NV	1.14E-08		
1,2,3,4,7,8,9-HpCDF	9.79E-09	2.83E-09	NA		NA	NV	1.14E-08		
1,2,3,4,7,8-HxCDD	2.62E-09	6.72E-10	NA		NA	NV	1.14E-08		
1,2,3,4,7,8-HxCDF	8.49E-09	1.96E-09	NA		NA	NV	1.14E-08		
1,2,3,6,7,8-HxCDD	1.33E-08	3.41E-09	NA		NA	NV	1.14E-08		
1,2,3,6,7,8-HxCDF	1.62E-09	3.74E-10	NA		NA	NV	1.14E-08		
1,2,3,7,8,9-HxCDD	4.40E-09	1.13E-09	NA		NA	NV	1.14E-08		
1,2,3,7,8,9-HxCDF	3.87E-09	8.93E-10	NA		NA	NV	1.14E-08		
1,2,3,7,8-PeCDD	1.08E-09	2.21E-10	NA		NA	NV	1.14E-08		
1,2,3,7,8-PeCDF	2.28E-09	4.22E-10	NA		NA	NV	1.14E-08		
2,3,4,6,7,8-HxCDF	3.94E-09	9.11E-10	NA		NA	NA	1.14E-08		
2,3,4,7,8-PeCDF	2.64E-09	4.88E-10	NA		NA	NA	1.14E-08		
2,3,7,8-TCDF	1.68E-09	2.49E-10	NA		NA	NA	1.14E-08		
OCDD	2.18E-06	8.71E-07	NA		NA	NA	1.14E-08		
OCDF	7.44E-07	2.68E-07	NA		NA	NA	1.14E-08		
			Total Hazard Index:	2.06E+01			**Total Hazard Index:**	1.31E+01	**3.37E+01**

Total Estimated Non-carcinogenic Hazard Index Across All Exposure Routes : **34**

Notes:

NA = One or more of the following: no toxicity value available in standard U.S. EPA toxicity value databases; no Kp value available; no Henry's Law constant.

Table 2-14
Cancer Risk Results Detailed Summary - Trench Worker
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Carcinogenic Effects Risk Results - Excess Lifetime Cancer Risk Estimates				
Chemical of Potential Concern	**Trench Worker Reasonable Maximum Exposure**			
	Dermal	**Inhalation**	**Total**	**%Contribution**
Metals				
Arsenic	**6.3E-06**		**6.3E-06**	4%
Subtotal Metals	**6.3E-06**		**6.3E-06**	4%
Pesticides/PCBs				
Dieldrin	**1.2E-06**		**1.2E-06**	0.8%
Aroclor-1260	**8.1E-06**		**8.1E-06**	6%
Subtotal Pesticides/PCBs	**1.1E-05**		**1.1E-05**	8%
SVOCs/VOCs				
Benzo(a)anthracene	**1.6E-06**		**1.6E-06**	1%
Benzo(a)pyrene	**1.5E-05**		**1.5E-05**	11%
Benzo(b)fluoranthene	**2.4E-06**		**2.4E-06**	1.6%
Benzo(k)fluoranthene	**1.3E-06**		**1.3E-06**	1%
Dibenz(a,h)anthracene	**1.3E-06**		**1.3E-06**	1%
Naphthalene	**1.8E-06**	**1.1E-06**	**2.9E-06**	2%
Pentachlorophenol	**1.9E-06**		**1.9E-06**	1%
1,2-Dibromo-3-chloropropane	4.0E-07	6.7E-07	**1.1E-06**	1%
1,4-Dichlorobenzene	5.3E-07	5.9E-07	**1.1E-06**	1%
Benzene	**1.4E-06**	**4.0E-06**	**5.4E-06**	4%
Trichloroethene	6.9E-07	**1.7E-06**	**2.4E-06**	2%
Vinyl chloride	**3.3E-05**	**4.9E-05**	**8.1E-05**	56%
Subtotal SVOCs/VOCs	**6.3E-05**	**5.8E-05**	**1.2E-04**	83%
Dioxans/Furans				
1,2,3,4,6,7,8-HpCDD	**3.2E-06**		**3.2E-06**	2%
Subtotal Dioxans/Furans	**7.2E-06**		**7.2E-06**	5%
Total:	**8.8E-05**	**5.8E-05**	**1.5E-04**	

Total Estimated Cancer Risk Across All Exposure Routes: **1E-04**

Notes:
Subtotals and Total: Cumulative risk of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total cancer risk for all chemicals evaluated.

Table 2-15
Noncancer Risk Results Detailed Summary - Trench Worker
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Non-Carcinogenic Effects Risk Results - Hazard Quotients				
Chemical of Potential Concern	**Trench Worker Reasonable Maximum Exposure**			
	Dermal	**Inhalation**	**Total**	**%Contribution**
Metals				
Arsenic	**1.5E-01**		**1.5E-01**	0.5%
Subtotal Metals	**2.2E-01**		**2.2E-01**	0.7%
Pesticides/PCBs				
Dieldrin	**1.1E-01**		**1.1E-01**	0.3%
Heptachlor epoxide	**1.2E-01**		**1.2E-01**	0.3%
Aroclor-1260	**1.4E+01**		**1.4E+01**	42%
Subtotal Pesticides/PCBs	**1.4E+01**		**1.4E+01**	43%
SVOCs/VOCs				
2-Methylnaphthalene	**7.6E-01**		**7.6E-01**	2%
Naphthalene	5.1E-02	**7.7E-01**	**8.2E-01**	2%
1,2,4-Trimethylbenzene	6.7E-02	**9.0E-01**	**9.7E-01**	3%
1,2-Dibromo-3-chloropropane	7.0E-02	**1.2E-01**	**1.9E-01**	0.6%
1,2-Dichlorobenzene	5.6E-02	6.3E-02	**1.2E-01**	0.4%
1,3,5-Trimethylbenzene	2.0E-02	**3.6E-01**	**3.8E-01**	1%
Benzene	**2.5E-01**	**3.2E-01**	**5.7E-01**	2%
Chlorobenzene	**1.5E-01**	**2.2E-01**	**3.8E-01**	1%
cis-1,2-Dichloroethene	**2.5E+00**	**8.4E+00**	**1.1E+01**	32%
Toluene	**1.5E-01**	**4.5E-01**	**6.0E-01**	2%
trans-1,2-Dichloroethene	2.6E-02	**1.2E-01**	**1.5E-01**	0.4%
Trichloroethene	**4.0E-01**	3.0E-02	**4.3E-01**	1%
Vinyl chloride	**5.1E-01**	**4.4E-01**	**9.5E-01**	3%
m,p-Xylene		**1.9E-01**	**1.9E-01**	0.6%
o-Xylene	2.3E-02	9.0E-02	**1.1E-01**	0.3%
Xylenes, total	6.5E-02	**3.2E-01**	**3.9E-01**	1%
Subtotal SVOCs/VOCs	**6.0E+00**	**1.3E+01**	**1.9E+01**	57%
Total:	**20.6**	**13.1**	**33.7**	

Total Estimated Noncancer Hazard Across All Exposure Routes: **34**

Notes:
Subtotals and Total: Cumulative Hazard Index of all chemicals evaluated is summed.
% Contribution (Subtotal % Contribution) = Percent contribution of total hazard index for all chemicals evaluated.

Table 2-16
Model for Estimating Dermal Exposure from Contact with Chemicals in Water - Future Adult Resident
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Source: EPA, 2004. RAGS Part E

ORGANICS

If $t_{event} \le t^*$:

$$DA_{event\_1} = 2 \times FA \times K_p \times C_v \sqrt{\frac{6 \times tau \times t_{event}}{\Pi}}$$

If $t_{event} > t^*$:

$$DA_{event\_2} = FA \times K_p \times C_v \left[\frac{t_{event}}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right]$$

INORGANICS

$$DA_{event} = K_p \times C_v \times t_{event}$$

$$DAD = \frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT \times 365\, days/year}$$

$$\log K_p = -2.8 + 0.66 \log K_{ow} - 0.0056 MW$$

$$B = K_p \frac{\sqrt{MW}}{2.6}$$

$$If\ B \le 0.6\ then\ t^* = 2.4\tau$$

$$If\ B > 0.6\ then\ t^* = 6\left(b - \sqrt{b^2 - c^2}\right)\tau$$

$$b = \frac{2}{\pi}(1+B)^2 - c \qquad c = \frac{1+3B+3B^2}{3(1+B)}$$

$$\log \frac{D_{sc}}{l_{sc}} = -2.80 - 0.0056\, MW$$

$$\tau = \frac{l_{sc}^{\ 2}}{6\ D_{sc}}$$

Dermally-absorbed dose	DAD	calculated	mg/kg-day
Concentration in water	Conc (Cv)	chem-specific	mg/cm3
permeability coefficient	Kp	calculated	cm/hr
Lag time per event (hours)	*tau (τ)*	calculated	hours
Time to reach steady-state (hours)	t*	calculated	hours
Dimensionless coefficient	B	calculated	
Pi	π	3.1416	
Exposure Time	t_event	0.58	hr/event
Number of exposure events	EV	1	event/day
Exposure Duration	ED	24	year
Exposure Frequency	EF	350	days/year
Exposed Skin Surface Area	SA	18000	cm2
Body Weight	BW	70	kg
Averaging time - noncarcinogenic	AT_N	24	years
Averaging time - carcinogenic	AT_C	70	years
Conversion Factor		0.001	mg/ug

Thickness of stratum corneum	*lsc* (cm)	0.001
Molecular Weight	g/mol	chem-specific
log octanol-water partition coefficient	Log Kow	chem-specific
log permeability coefficient	log Kp	calculated
Permeability coefficient (cm/hr)	Kp	calculated
Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	B	calculated
across the stratum corneum (cm2/hr)	Dsc	calculated
Lag time per event (hours)	τ	calculated
Time to reach steady-state (hours)	t*	calculated
methodology (see equations A7 and A8, USEPA, 2001)	b,c	calculated

Constituent	Conc (mg/L)	Conc (mg/cm3)	MW	FA	Log Kow	Kp (cm/hr) Select	Log Kp	B	Dsc/lsc	Dsc (cm2/hr)	τ (hours)	b	c	t* (hours)	DA_inorg (mg/cm2-event)	DA_1 (mg/cm2-event)	DA_2 (mg/cm2-event)	Selected DA (mg/cm2-event)
Metals																		
Aluminum	9.4E+00	9.4E-03	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	5.45E-06	NA	NA	5.45E-06
Antimony	1.5E-03	1.5E-06	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	8.77E-10	NA	NA	8.77E-10
Arsenic	2.9E-01	2.9E-04	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	1.66E-07	NA	NA	1.66E-07
Barium	1.7E-01	1.7E-04	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	9.72E-08	NA	NA	9.72E-08
Beryllium	7.6E-04	7.6E-07	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	4.43E-10	NA	NA	4.43E-10
Boron	4.3E+00	4.3E-03	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	2.50E-06	NA	NA	2.50E-06

Constituent	Conc (mg/L)	Conc (mg/cm3)	MW	FA	Log Kow	Kp (cm/hr) Select	Log Kp	B	Dsc/Isc	Dsc (cm2/hr)	τ (hours)	b	c	t* (hours)	DA_inorg (mg/cm2-event)	DA_1 (mg/cm2-event)	DA_2 (mg/cm2-event)	Selected DA (mg/cm2-event)
Cadmium	1.3E-03	1.3E-06	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	7.28E-10	NA	NA	7.28E-10
Chromium	3.6E-02	3.6E-05	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	2.07E-08	NA	NA	2.07E-08
Chromium (VI)	3.5E-04	3.5E-07	NA	1.0	NA	2.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	4.06E-10	NA	NA	4.06E-10
Cobalt	8.9E-03	8.9E-06	NA	1.0	NA	4.00E-04	NA	NA	NA	NA	NA	NA	NA	NA	2.06E-09	NA	NA	2.06E-09
Copper	4.7E-02	4.7E-05	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	2.70E-08	NA	NA	2.70E-08
Iron	5.4E+01	5.4E-02	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	3.10E-05	NA	NA	3.10E-05
Lead	4.0E-02	4.0E-05	NA	1.0	NA	1.00E-04	NA	NA	NA	NA	NA	NA	NA	NA	2.32E-09	NA	NA	2.32E-09
Manganese	4.3E+00	4.3E-03	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	2.51E-06	NA	NA	2.51E-06
Mercury	1.2E-04	1.2E-07	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	7.02E-11	NA	NA	7.02E-11
Molybdenum	5.6E-03	5.6E-06	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	3.27E-09	NA	NA	3.27E-09
Nickel	5.5E-02	5.5E-05	NA	1.0	NA	2.00E-04	NA	NA	NA	NA	NA	NA	NA	NA	6.33E-09	NA	NA	6.33E-09
Selenium	1.9E-02	1.9E-05	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	1.10E-08	NA	NA	1.10E-08
Silver	1.2E-04	1.2E-07	NA	1.0	NA	6.00E-04	NA	NA	NA	NA	NA	NA	NA	NA	4.18E-11	NA	NA	4.18E-11
Thallium	5.0E-05	5.0E-08	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	2.90E-11	NA	NA	2.90E-11
Vanadium	3.2E-02	3.2E-05	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	1.85E-08	NA	NA	1.85E-08
Zinc	3.0E-01	3.0E-04	NA	1.0	NA	6.00E-04	NA	NA	NA	NA	NA	NA	NA	NA	1.05E-07	NA	NA	1.05E-07
Cyanide	6.3E-02	6.3E-05	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	3.65E-08	NA	NA	3.65E-08
Pesticides/PCBs																		
4,4'-DDD	5.0E-03	5.0E-06	3.2E+02	0.8	5.8E+00	1.80E-01	-7.64E-01	1.24E+00	2.56E-05	2.56E-08	6.51E+00	1.8	1.39	2.55E+01	NA	3.87E-06	1.76E-05	3.87E-06
4,4'-DDE	7.8E-04	7.8E-07	3.2E+02	0.8	5.7E+00	1.60E-01	-8.25E-01	1.10E+00	2.63E-05	2.63E-08	6.35E+00	1.5	1.26	2.46E+01	NA	5.27E-07	2.29E-06	5.27E-07
4,4'-DDT	1.8E-04	1.8E-07	3.6E+02	0.7	6.4E+00	2.70E-01	-5.90E-01	1.96E+00	1.63E-05	1.63E-08	1.02E+01	3.5	2.07	4.16E+01	NA	2.29E-07	1.47E-06	2.29E-07
Aldrin	4.0E-04	4.0E-07	3.7E+02	1.0	3.0E+00	1.40E-03	-2.86E+00	1.03E-02	1.43E-05	1.43E-08	1.16E+01	0.3	0.34	2.79E+01	NA	4.07E-09	1.36E-08	4.07E-09
alpha-BHC	3.0E-04	3.0E-07	2.9E+02	1.0	4.1E+00	1.10E-02	-1.70E+00	7.22E-02	3.73E-05	3.73E-08	4.47E+00	0.3	0.38	1.07E+01	NA	1.47E-08	3.34E-08	1.47E-08
alpha-Chlordane	3.3E-04	3.3E-07	4.1E+02	0.7	5.5E+00	3.40E-02	-1.49E+00	2.65E-01	8.02E-06	8.02E-09	2.08E+01	0.5	0.53	4.99E+01	NA	7.62E-08	4.18E-07	7.62E-08
Atrazine	2.0E-03	2.0E-06	2.2E+02	1.0	2.6E+00	5.18E-03	-2.29E+00	2.93E-02	9.82E-05	9.82E-08	1.70E+00	0.3	0.35	4.07E+00	NA	2.84E-08	4.21E-08	2.84E-08
beta-BHC	3.7E-04	3.7E-07	2.9E+02	1.0	4.1E+00	1.10E-02	-1.70E+00	7.22E-02	3.73E-05	3.73E-08	4.47E+00	0.3	0.38	1.07E+01	NA	1.81E-08	4.11E-08	1.81E-08
delta-BHC	1.6E-04	1.6E-07	2.9E+02	1.0	4.1E+00	1.10E-02	-1.70E+00	7.22E-02	3.73E-05	3.73E-08	4.47E+00	0.3	0.38	1.07E+01	NA	7.83E-09	1.78E-08	7.83E-09
Diazinon	2.6E-04	2.6E-07	3.0E+02	1.0	3.8E+00	1.02E-02	-1.99E+00	6.87E-02	3.13E-05	3.13E-08	5.32E+00	0.3	0.38	1.28E+01	NA	1.29E-08	3.17E-08	1.29E-08
Dieldrin	9.2E-04	9.2E-07	3.8E+02	0.8	4.6E+00	1.20E-02	-1.92E+00	9.01E-02	1.17E-05	1.17E-08	1.43E+01	0.4	0.40	3.43E+01	NA	7.06E-08	2.81E-07	7.06E-08
Endosulfan I	3.3E-04	3.3E-07	4.1E+02	1.0	3.8E+00	2.81E-03	-2.55E+00	2.18E-02	8.34E-06	8.34E-09	2.00E+01	0.3	0.35	4.80E+01	NA	8.76E-09	3.85E-08	8.76E-09
Endosulfan II	2.3E-04	2.3E-07	4.1E+02	1.0	3.5E+00	1.76E-03	-2.76E+00	1.36E-02	8.34E-06	8.34E-09	2.00E+01	0.3	0.34	4.80E+01	NA	3.80E-09	1.66E-08	3.80E-09
Endosulfan sulfate	9.2E-05	9.2E-08	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	6.5E-04	6.5E-07	3.8E+02	0.8	4.6E+00	1.20E-02	-1.92E+00	9.01E-02	1.17E-05	1.17E-08	1.43E+01	0.4	0.40	3.43E+01	NA	4.94E-08	1.97E-07	4.94E-08
Endrin aldehyde	1.4E-04	1.4E-07	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	1.7E-04	1.7E-07	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC	3.3E-04	3.3E-07	2.9E+02	1.0	4.1E+00	1.10E-02	-1.70E+00	7.22E-02	3.73E-05	3.73E-08	4.47E+00	0.3	0.38	1.07E+01	NA	1.60E-08	3.65E-08	1.60E-08
gamma-Chlordane	2.5E-04	2.5E-07	4.1E+02	0.7	5.5E+00	3.40E-02	-1.49E+00	2.65E-01	8.02E-06	8.02E-09	2.08E+01	0.5	0.53	4.99E+01	NA	5.71E-08	3.13E-07	5.71E-08
Heptachlor	1.1E-04	1.1E-07	3.7E+02	0.8	4.3E+00	8.60E-03	-2.07E+00	6.39E-02	1.28E-05	1.28E-08	1.30E+01	0.3	0.38	3.12E+01	NA	5.78E-09	2.15E-08	5.78E-09
Heptachlor epoxide	1.2E-04	1.2E-07	3.9E+02	1.0	5.0E+00	2.03E-02	-1.69E+00	1.54E-01	1.05E-05	1.05E-08	1.59E+01	0.4	0.44	3.82E+01	NA	2.04E-08	9.03E-08	2.04E-08
Methoxychlor	1.2E-04	1.2E-07	3.5E+02	1.0	5.1E+00	4.14E-02	-1.38E+00	2.96E-01	1.84E-05	1.84E-08	9.07E+00	0.5	0.55	2.18E+01	NA	3.15E-08	1.18E-07	3.15E-08
Aroclor-1260	9.6E-04	9.6E-07	4.0E+02	0.6	8.3E+00	7.50E-01	4.44E-01	5.74E+00	9.69E-06	9.69E-09	1.72E+01	23.1	5.78	7.60E+01	NA	3.78E-06	3.84E-05	3.78E-06
SVOCs/VOCs																		
1,4-Dioxane (p-dioxane)	7.8E-01	7.8E-04	8.8E+01	1.0	-2.7E-01	3.30E-04	-3.47E+00	1.19E-03	5.09E-04	5.09E-07	3.27E-01	0.3	0.33	7.86E-01	NA	3.10E-07	3.18E-07	3.10E-07
2,4,6-Trichlorophenol	7.1E-03	7.1E-06	2.0E+02	1.0	3.7E+00	3.50E-02	-1.47E+00	1.89E-01	1.24E-04	1.24E-07	1.34E+00	0.4	0.47	3.22E+00	NA	6.09E-07	9.15E-07	6.09E-07
2,4-Dimethylphenol	7.9E-02	7.9E-05	1.2E+02	1.0	2.3E+00	1.10E-02	-1.97E+00	4.68E-02	3.28E-04	3.28E-07	5.08E-01	0.3	0.37	1.22E+00	NA	1.30E-06	1.40E-06	1.30E-06
2-Chlorophenol	4.3E-03	4.3E-06	1.3E+02	1.0	2.2E+00	8.00E-03	-2.10E+00	3.49E-02	3.02E-04	3.02E-07	5.52E-01	0.3	0.36	1.33E+00	NA	5.38E-08	5.86E-08	5.38E-08
2-Methylnaphthalene	2.3E-01	2.3E-04	1.4E+02	1.0	3.9E+00	8.94E-02	-1.05E+00	4.10E-01	2.53E-04	2.53E-07	6.58E-01	0.6	0.65	1.58E+00	NA	3.44E-05	4.48E-05	3.44E-05
2-Methylphenol	1.2E-01	1.2E-04	1.1E+02	1.0	2.0E+00	7.70E-03	-2.12E+00	3.08E-02	3.93E-04	3.93E-07	4.24E-01	0.3	0.35	1.02E+00	NA	1.30E-06	1.36E-06	1.30E-06
2-Nitroaniline	1.0E-02	1.0E-05	1.4E+02	1.0	1.9E+00	4.44E-03	-2.35E+00	2.01E-02	2.67E-04	2.67E-07	6.24E-01	0.3	0.35	1.50E+00	NA	7.39E-08	8.18E-08	7.39E-08
3,4-methylphenol	8.4E-01	8.4E-04	1.1E+02	1.0	2.0E+00	7.70E-03	-2.12E+00	3.08E-02	3.93E-04	3.93E-07	4.24E-01	0.3	0.35	1.02E+00	NA	8.86E-06	9.29E-06	8.86E-06
4-Chloro-3-methylphenol	2.4E-02	2.4E-05	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	1.9E-01	1.9E-04	1.1E+02	1.0	2.0E+00	7.70E-03	-2.12E+00	3.08E-02	3.93E-04	3.93E-07	4.24E-01	0.3	0.35	1.02E+00	NA	2.04E-06	2.14E-06	2.04E-06
Acenaphthene	4.5E-03	4.5E-06	1.5E+02	1.0	3.9E+00	1.33E-01	-1.08E+00	6.35E-01	2.17E-04	2.17E-07	7.68E-01	0.9	0.84	3.04E+00	NA	1.10E-06	1.63E-06	1.10E-06
Acenaphthylene	9.5E-03	9.5E-06	1.5E+02	1.0	3.9E+00	1.41E-01	-1.05E+00	6.69E-01	2.23E-04	2.23E-07	7.48E-01	0.9	0.87	2.93E+00	NA	2.45E-06	3.61E-06	2.45E-06
Anthracene	3.2E-03	3.2E-06	1.8E+02	1.0	4.5E+00	2.25E-01	-8.61E-01	1.16E+00	1.59E-04	1.59E-07	1.05E+00	1.6	1.31	4.07E+00	NA	1.55E-06	2.94E-06	1.55E-06
Benzo(a)anthracene	9.0E-04	9.0E-07	2.3E+02	1.0	5.7E+00	4.70E-01	-3.43E-01	2.73E+00	8.35E-05	8.35E-08	2.00E+00	6.0	2.82	8.37E+00	NA	1.26E-06	3.90E-06	1.26E-06
Benzo(a)pyrene	5.0E-04	5.0E-07	2.5E+02	1.0	6.1E+00	7.00E-01	-1.74E-01	4.26E+00	6.31E-05	6.31E-08	2.64E+00	13.3	4.32	1.15E+01	NA	1.20E-06	4.60E-06	1.20E-06
Benzo(b)fluoranthene	7.6E-04	7.6E-07	2.5E+02	1.0	5.8E+00	6.99E-01	-3.98E-01	4.27E+00	6.12E-05	6.12E-08	2.72E+00	13.4	4.33	1.18E+01	NA	1.84E-06	7.19E-06	1.84E-06
Benzo(g,h,i)perylene	2.0E-04	2.0E-07	2.8E+02	1.0	6.6E+00	1.07E+00	2.83E-02	6.82E+00	4.49E-05	4.49E-08	3.71E+00	32.1	6.87	1.65E+01	NA	8.65E-07	4.19E-06	8.65E-07
Benzo(k)fluoranthene	4.6E-04	4.6E-07	2.5E+02	1.0	6.1E+00	6.60E-01	-1.80E-01	4.03E+00	6.12E-05	6.12E-08	2.72E+00	12.0	4.10	1.18E+01	NA	1.05E-06	4.07E-06	1.05E-06
Biphenyl (Diphenyl)	1.3E-03	1.3E-06	1.5E+02	1.0	4.0E+00	9.19E-02	-1.04E+00	4.39E-01	2.17E-04	2.17E-07	7.68E-01	0.6	0.67	1.84E+00	NA	2.20E-07	3.05E-07	2.20E-07
bis(2-Chloroethoxy)methane	2.0E-04	2.0E-07	1.7E+02	1.0	1.3E+00	1.23E-03	-2.91E+00	6.21E-03	1.70E-04	1.70E-07	9.79E-01	0.3	0.34	2.35E+00	NA	5.11E-10	6.25E-10	5.11E-10
bis(2-Ethylhexyl)phthalate	1.7E-02	1.7E-05	3.9E+02	1.0	5.1E+00	2.50E-02	-1.62E+00	1.90E-01	1.02E-05	1.02E-08	1.63E+01	0.4	0.47	3.91E+01	NA	3.59E-06	1.65E-05	3.59E-06
Bromoform	1.2E-02	1.2E-05	2.5E+02	1.0	2.4E+00	2.20E-03	-2.63E+00	1.35E-02	6.09E-05	6.09E-08	2.74E+00	0.3	0.34	6.56E+00	NA	9.19E-08	1.61E-07	9.19E-08

Constituent	Conc (mg/L)	Conc (mg/cm3)	MW	FA	Log Kow	Kp (cm/hr) Select	Log Kp	B	Dsc/lsc	Dsc (cm2/hr)	τ (hours)	b	c	t* (hours)	DA_inorg (mg/cm2-event)	DA_1 (mg/cm2-event)	DA_2 (mg/cm2-event)	Selected DA (mg/cm2-event)
Caprolactam	2.4E-03	2.4E-06	1.1E+02	1.0	6.6E-01	1.00E-03	-3.00E+00	4.11E-03	3.68E-04	3.68E-07	4.52E-01	0.3	0.34	1.09E+00	NA	3.41E-09	3.58E-09	3.41E-09
Carbazole	1.3E-02	1.3E-05	1.7E+02	1.0	3.7E+00	5.23E-02	-1.28E+00	2.60E-01	1.83E-04	1.83E-07	9.08E-01	0.5	0.52	2.18E+00	NA	1.32E-06	1.79E-06	1.32E-06
Chrysene	1.1E-03	1.1E-06	2.3E+02	1.0	5.7E+00	4.70E-01	-3.43E-01	2.73E+00	8.35E-05	8.35E-08	2.00E+00	6.0	2.82	8.37E+00	NA	1.54E-06	4.76E-06	1.54E-06
Dibenz(a,h)anthracene	4.5E-05	4.5E-08	2.8E+02	0.6	6.5E+00	1.50E+00	-4.24E-02	9.63E+00	4.38E-05	4.38E-08	3.81E+00	62.2	9.66	1.72E+01	NA	1.66E-07	8.43E-07	1.66E-07
Diethylphthalate	1.0E-02	1.0E-05	2.2E+02	1.0	2.5E+00	3.90E-03	-2.41E+00	2.23E-02	9.05E-05	9.05E-08	1.84E+00	0.3	0.35	4.42E+00	NA	1.15E-07	1.74E-07	1.15E-07
Di-n-butyl phthalate	1.2E-02	1.2E-05	2.8E+02	0.9	4.1E+00	2.40E-02	-1.63E+00	1.54E-01	4.40E-05	4.40E-08	3.79E+00	0.4	0.44	9.10E+00	NA	1.03E-06	2.32E-06	1.03E-06
Fluoranthene	2.4E-03	2.4E-06	2.0E+02	1.0	5.0E+00	2.20E-01	-6.66E-01	1.20E+00	1.17E-04	1.17E-07	1.43E+00	1.7	1.35	5.57E+00	NA	1.33E-06	2.92E-06	1.33E-06
Fluorene	2.6E-03	2.6E-06	1.7E+02	1.0	4.2E+00	1.71E-01	-9.72E-01	8.48E-01	1.86E-04	1.86E-07	8.97E-01	1.1	1.03	3.45E+00	NA	8.86E-07	1.47E-06	8.86E-07
Hexachloroethane	1.0E-03	1.0E-06	2.4E+02	1.0	3.9E+00	3.00E-02	-1.53E+00	1.78E-01	7.49E-05	7.49E-08	2.23E+00	0.4	0.46	5.34E+00	NA	9.42E-08	1.71E-07	9.42E-08
Indeno(1,2,3-c,d)pyrene	2.0E-04	2.0E-07	2.8E+02	0.6	6.6E+00	1.00E+00	-4.48E-03	6.39E+00	4.49E-05	4.49E-08	3.71E+00	28.4	6.44	1.65E+01	NA	4.86E-07	2.33E-06	4.86E-07
Naphthalene	1.4E-01	1.4E-04	1.3E+02	1.0	3.3E+00	4.70E-02	-1.34E+00	2.05E-01	3.03E-04	3.03E-07	5.49E-01	0.4	0.48	1.32E+00	NA	9.99E-06	1.15E-05	9.99E-06
Nitrobenzene	2.0E-03	2.0E-06	1.2E+02	1.0	1.9E+00	5.39E-03	-2.27E+00	2.30E-02	3.24E-04	3.24E-07	5.14E-01	0.3	0.35	1.23E+00	NA	1.63E-08	1.75E-08	1.63E-08
N-Nitrosodi-n-propylamine	2.0E-03	2.0E-06	1.3E+02	1.0	1.4E+00	2.34E-03	-2.63E+00	1.03E-02	2.96E-04	2.96E-07	5.64E-01	0.3	0.34	1.35E+00	NA	7.38E-09	8.00E-09	7.38E-09
N-Nitrosodiphenylamine	1.2E-03	1.2E-06	2.0E+02	1.0	3.1E+00	2.60E-02	-1.84E+00	1.41E-01	1.23E-04	1.23E-07	1.35E+00	0.4	0.43	3.25E+00	NA	7.64E-08	1.12E-07	7.64E-08
Pentachlorophenol	1.1E-02	1.1E-05	2.7E+02	0.9	5.9E+00	3.90E-01	-4.24E-01	2.45E+00	5.11E-05	5.11E-08	3.26E+00	5.0	2.54	1.36E+01	NA	1.51E-05	5.79E-05	1.51E-05
Phenanthrene	6.0E-03	6.0E-06	1.8E+02	1.0	4.5E+00	1.40E-01	-8.54E-01	7.19E-01	1.59E-04	1.59E-07	1.05E+00	1.0	0.91	4.05E+00	NA	1.81E-06	3.08E-06	1.81E-06
Pyrene	2.4E-03	2.4E-06	2.0E+02	1.0	4.9E+00	3.24E-01	-7.12E-01	1.77E+00	1.17E-04	1.17E-07	1.43E+00	3.0	1.89	5.76E+00	NA	1.96E-06	4.71E-06	1.96E-06
1,1,1-Trichloroethane	1.2E-01	1.2E-04	1.3E+02	1.0	2.5E+00	1.30E-02	-1.90E+00	5.77E-02	2.84E-04	2.84E-07	5.87E-01	0.3	0.37	1.41E+00	NA	2.47E-06	2.75E-06	2.47E-06
1,1,2,2-Tetrachloroethane	1.3E-02	1.3E-05	1.7E+02	1.0	2.4E+00	6.90E-03	-2.16E+00	3.44E-02	1.82E-04	1.82E-07	9.16E-01	0.3	0.36	2.20E+00	NA	1.80E-07	2.19E-07	1.80E-07
1,1,2-Trichloroethane	1.3E-02	1.3E-05	1.3E+02	1.0	2.1E+00	6.40E-03	-2.19E+00	2.84E-02	2.84E-04	2.84E-07	5.87E-01	0.3	0.35	1.41E+00	NA	1.38E-07	1.51E-07	1.38E-07
1,1-Dichloroethane	5.6E-01	5.6E-04	9.9E+01	1.0	1.8E+00	6.70E-03	-2.17E+00	2.56E-02	4.42E-04	4.42E-07	3.77E-01	0.3	0.35	9.05E-01	NA	4.82E-06	5.00E-06	4.82E-06
1,1-Dichloroethene	4.2E-02	4.2E-05	9.7E+01	1.0	2.1E+00	1.20E-02	-1.94E+00	4.54E-02	4.54E-04	4.54E-07	3.67E-01	0.3	0.36	8.80E-01	NA	6.36E-07	6.59E-07	6.36E-07
1,2,3-Trichlorobenzene	2.7E-03	2.7E-06	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	1.5E-02	1.5E-05	1.8E+02	1.0	4.0E+00	6.60E-02	-1.19E+00	3.42E-01	1.53E-04	1.53E-07	1.09E+00	0.6	0.59	2.62E+00	NA	2.19E-06	3.30E-06	2.19E-06
1,2,4-Trimethylbenzene	2.8E-01	2.8E-04	1.2E+02	1.0	3.6E+00	8.37E-02	-1.08E+00	3.53E-01	3.36E-04	3.36E-07	4.95E-01	0.6	0.60	1.19E+00	NA	3.44E-05	4.06E-05	3.44E-05
1,2-Dibromo-3-chloropropane	2.4E-03	2.4E-06	2.4E+02	1.0	3.0E+00	6.76E-03	-2.17E+00	4.00E-02	7.53E-05	7.53E-08	2.21E+00	0.3	0.36	5.32E+00	NA	5.08E-08	8.38E-08	5.08E-08
1,2-Dichlorobenzene	7.3E-01	7.3E-04	1.5E+02	1.0	3.4E+00	4.10E-02	-1.39E+00	1.91E-01	2.38E-04	2.38E-07	7.00E-01	0.4	0.47	1.68E+00	NA	5.30E-05	6.47E-05	5.30E-05
1,2-Dichloroethane	1.4E-02	1.4E-05	9.9E+01	1.0	1.5E+00	6.70E-03	-2.38E+00	2.56E-02	4.42E-04	4.42E-07	3.77E-01	0.3	0.35	9.05E-01	NA	1.24E-07	1.29E-07	1.24E-07
1,2-Dichloropropane	5.1E-03	5.1E-06	1.1E+02	1.0	2.0E+00	7.80E-03	-2.11E+00	3.19E-02	3.69E-04	3.69E-07	4.51E-01	0.3	0.35	1.08E+00	NA	5.63E-08	5.94E-08	5.63E-08
1,3,5-Trimethylbenzene	1.1E-01	1.1E-04	1.2E+02	1.0	3.4E+00	6.08E-02	-1.22E+00	2.56E-01	3.36E-04	3.36E-07	4.95E-01	0.5	0.52	1.19E+00	NA	9.93E-06	1.14E-05	9.93E-06
1,3-Dichlorobenzene	2.7E-02	2.7E-05	1.5E+02	1.0	3.6E+00	5.80E-02	-1.25E+00	2.70E-01	2.38E-04	2.38E-07	7.00E-01	0.5	0.53	1.68E+00	NA	2.77E-06	3.49E-06	2.77E-06
1,4-Dichlorobenzene	2.2E-01	2.2E-04	1.5E+02	1.0	3.4E+00	4.20E-02	-1.39E+00	1.96E-01	2.38E-04	2.38E-07	7.00E-01	0.4	0.47	1.68E+00	NA	1.61E-05	1.97E-05	1.61E-05
2-Chlorotoluene	2.9E-03	2.9E-06	1.3E+02	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	2.4E-02	2.4E-05	1.0E+02	1.0	1.4E+00	3.55E-03	-2.45E+00	1.37E-02	4.36E-04	4.36E-07	3.83E-01	0.3	0.34	9.18E-01	NA	1.09E-07	1.13E-07	1.09E-07
2,2-Dichloropropane	5.0E-04	5.0E-07	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	4.9E-01	4.9E-04	5.8E+01	1.0	-2.4E-01	5.20E-04	-3.28E+00	1.53E-03	7.49E-04	7.49E-07	2.22E-01	0.3	0.33	5.34E-01	NA	2.51E-07	2.59E-07	2.59E-07
Benzene	4.0E-01	4.0E-04	7.8E+01	1.0	2.1E+00	1.50E-02	-1.83E+00	5.10E-02	5.79E-04	5.79E-07	2.88E-01	0.3	0.37	6.91E-01	NA	6.78E-06	6.94E-06	6.78E-06
Carbon disulfide	3.1E-03	3.1E-06	8.0E+01	1.0	2.2E+00	1.70E-02	-1.77E+00	5.85E-02	5.65E-04	5.65E-07	2.95E-01	0.3	0.37	7.08E-01	NA	6.03E-08	6.18E-08	6.03E-08
Carbon tetrachloride	3.0E-04	3.0E-07	1.5E+02	1.0	2.8E+00	1.60E-02	-1.79E+00	7.63E-02	2.18E-04	2.18E-07	7.64E-01	0.4	0.39	1.83E+00	NA	8.83E-09	1.05E-08	8.83E-09
Chlorobenzene	6.7E-01	6.7E-04	1.1E+02	1.0	2.8E+00	2.80E-02	-1.56E+00	1.14E-01	3.71E-04	3.71E-07	4.49E-01	0.4	0.41	1.08E+00	NA	2.66E-05	2.87E-05	2.66E-05
Chloroethane	9.7E-02	9.7E-05	6.5E+01	1.0	1.4E+00	6.10E-03	-2.22E+00	1.88E-02	6.90E-04	6.90E-07	2.42E-01	0.3	0.35	5.80E-01	NA	6.15E-07	6.31E-07	6.31E-07
Chloroform	4.4E-03	4.4E-06	1.2E+02	1.0	2.0E+00	6.80E-03	-2.17E+00	2.86E-02	3.40E-04	3.40E-07	4.90E-01	0.3	0.35	1.18E+00	NA	4.41E-08	4.71E-08	4.41E-08
Chloromethane	7.4E-03	7.4E-06	5.1E+01	1.0	9.1E-01	3.30E-03	-2.48E+00	9.02E-03	8.26E-04	8.26E-07	2.02E-01	0.3	0.34	4.84E-01	NA	2.31E-08	2.40E-08	2.40E-08
cis-1,2-Dichloroethene	1.4E+01	1.4E-02	9.7E+01	1.0	2.1E+00	1.09E-02	-1.96E+00	4.12E-02	4.54E-04	4.54E-07	3.67E-01	0.3	0.36	8.81E-01	NA	1.90E-04	1.97E-04	1.90E-04
cis-1,3-Dichloropropene	4.2E-03	4.2E-06	1.1E+02	1.0	1.6E+00	4.30E-03	-2.37E+00	1.74E-02	3.79E-04	3.79E-07	4.40E-01	0.3	0.35	1.06E+00	NA	2.52E-08	2.65E-08	2.52E-08
Cyclohexane	1.8E-02	1.8E-05	8.4E+01	1.0	3.4E+00	9.98E-02	-1.00E+00	3.52E-01	5.35E-04	5.35E-07	3.11E-01	0.6	0.60	7.47E-01	NA	2.11E-06	2.26E-06	2.11E-06
Ethyl tert-butyl ether (ETBE)	1.2E-03	1.2E-06	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	4.5E-01	4.5E-04	1.1E+02	1.0	3.2E+00	4.90E-02	-1.32E+00	1.94E-01	4.03E-04	4.03E-07	4.14E-01	0.4	0.47	9.93E-01	NA	2.98E-05	3.23E-05	2.98E-05
Isopropyl ether	4.3E-01	4.3E-04	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene (cumene)	2.7E-02	2.7E-05	1.2E+02	1.0	3.7E+00	8.76E-02	-1.06E+00	3.69E-01	3.36E-04	3.36E-07	4.95E-01	0.6	0.61	1.19E+00	NA	3.51E-06	4.16E-06	3.51E-06
Methyl acetate	2.3E-02	2.3E-05	7.4E+01	1.0	1.8E-01	8.02E-04	-3.10E+00	2.65E-03	6.10E-04	6.10E-07	2.73E-01	0.3	0.34	6.56E-01	NA	1.99E-08	2.03E-08	1.99E-08
Methyl ethyl ketone	4.3E-01	4.3E-04	7.2E+01	1.0	2.9E-01	9.60E-04	-3.01E+00	3.13E-03	6.26E-04	6.26E-07	2.66E-01	0.3	0.34	6.39E-01	NA	4.48E-07	4.59E-07	4.48E-07
Methyl isobutyl ketone	4.9E+00	4.9E-03	1.0E+02	1.0	1.2E+00	2.66E-03	-2.57E+00	1.02E-02	4.37E-04	4.37E-07	3.82E-01	0.3	0.34	9.16E-01	NA	1.68E-05	1.74E-05	1.68E-05
Methyl tert-butyl ether	2.0E-02	2.0E-05	8.8E+01	1.0	9.4E-01	2.12E-03	-2.67E+00	7.66E-03	5.09E-04	5.09E-07	3.28E-01	0.3	0.34	7.87E-01	NA	5.15E-08	5.28E-08	5.15E-08
Methylcyclohexane	2.5E-02	2.5E-05	9.8E+01	1.0	3.6E+00	1.08E-01	-9.67E-01	4.11E-01	4.47E-04	4.47E-07	3.73E-01	0.6	0.65	8.95E-01	NA	3.40E-06	3.80E-06	3.40E-06
Methylene chloride	8.2E-03	8.2E-06	8.5E+01	1.0	1.3E+00	3.50E-03	-2.45E+00	1.24E-02	5.30E-04	5.30E-07	3.14E-01	0.3	0.34	7.54E-01	NA	3.38E-08	3.47E-08	3.38E-08
n-Butylbenzene	6.1E-03	6.1E-06	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	5.6E-02	5.6E-05	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
p-Cymene (p-isopropyltoluene)	7.9E-02	7.9E-05	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	4.8E-02	4.8E-05	9.4E+01	1.0	1.5E+00	4.30E-03	-2.36E+00	1.60E-02	4.71E-04	4.71E-07	3.54E-01	0.3	0.34	8.49E-01	NA	2.59E-07	2.66E-07	2.59E-07
sec-Butylbenzene	5.6E-03	5.6E-06	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	1.4E-02	1.4E-05	1.0E+02	1.0	3.0E+00	3.70E-02	-1.44E+00	1.45E-01	4.14E-04	4.14E-07	4.03E-01	0.4	0.44	9.66E-01	NA	6.88E-07	7.35E-07	6.88E-07
tert-Butylbenzene	2.1E-03	2.1E-06	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butyl alcohol	1.2E-01	1.2E-04	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Constituent	Conc (mg/L)	Conc (mg/cm3)	MW	FA	Log Kow	Kp (cm/hr) Select	Log Kp	B	Dsc/Isc	Dsc (cm2/hr)	τ (hours)	b	c	t* (hours)	DA_inorg (mg/cm2-event)	DA_1 (mg/cm2-event)	DA_2 (mg/cm2-event)	Selected DA (mg/cm2-event)
Tetrachloroethene	1.2E-02	1.2E-05	1.7E+02	1.0	3.4E+00	3.30E-02	-1.48E+00	1.63E-01	1.87E-04	1.87E-07	8.92E-01	0.4	0.45	2.14E+00	NA	7.87E-07	1.02E-06	7.87E-07
Toluene	6.1E+00	6.1E-03	9.2E+01	1.0	2.7E+00	3.10E-02	-1.51E+00	1.14E-01	4.83E-04	4.83E-07	3.45E-01	0.4	0.41	8.28E-01	NA	2.34E-04	2.44E-04	2.34E-04
trans-1,2-Dichloroethene	4.0E-01	4.0E-04	9.7E+01	1.0	1.9E+00	7.70E-03	-2.12E+00	2.92E-02	4.54E-04	4.54E-07	3.67E-01	0.3	0.35	8.80E-01	NA	3.94E-06	4.08E-06	3.94E-06
trans-1,3-Dichloropropene	4.1E-03	4.1E-06	1.1E+02	1.0	1.6E+00	4.30E-03	-2.37E+00	1.74E-02	3.79E-04	3.79E-07	4.40E-01	0.3	0.35	1.06E+00	NA	2.46E-08	2.58E-08	2.46E-08
Trichloroethene	5.7E-02	5.7E-05	1.3E+02	1.0	2.4E+00	1.20E-02	-1.94E+00	5.29E-02	2.91E-04	2.91E-07	5.72E-01	0.3	0.37	1.37E+00	NA	1.09E-06	1.20E-06	1.09E-06
Vinyl chloride	1.6E+00	1.6E-03	6.3E+01	1.0	1.4E+00	5.60E-03	-2.25E+00	1.70E-02	7.08E-04	7.08E-07	2.35E-01	0.3	0.34	5.65E-01	NA	9.30E-06	9.56E-06	9.56E-06
m,p-Xylene	9.4E-01	9.4E-04	1.1E+02	1.0	NA	5.30E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	4.4E-01	4.4E-04	1.1E+02	1.0	3.1E+00	7.04E-02	-1.34E+00	2.79E-01	4.03E-04	4.03E-07	4.13E-01	0.5	0.54	9.92E-01	NA	4.24E-05	4.70E-05	4.24E-05
Xylenes, total	1.6E+00	1.6E-03	1.1E+02	1.0	3.2E+00	5.30E-02	-1.28E+00	2.10E-01	4.03E-04	4.03E-07	4.14E-01	0.4	0.49	9.93E-01	NA	1.15E-04	1.25E-04	1.15E-04
Dioxans/Furans																		
1,2,3,4,6,7,8-HpCDD	4.6E-07	4.6E-10	4.3E+02	0.5	8.2E+00	8.10E-01	2.30E-01	6.42E+00	6.58E-06	6.58E-09	2.53E+01	28.6	6.47	1.13E+02	NA	1.99E-09	2.49E-08	1.99E-09
1,2,3,4,6,7,8-HpCDF	9.5E-08	9.5E-11	4.1E+02	0.5	7.9E+00	8.10E-01	1.35E-01	6.30E+00	8.09E-06	8.09E-09	2.06E+01	27.6	6.35	9.15E+01	NA	3.67E-10	4.13E-09	3.67E-10
1,2,3,4,7,8,9-HpCDF	9.8E-09	9.8E-12	4.1E+02	0.5	7.9E+00	8.10E-01	1.35E-01	6.30E+00	8.09E-06	8.09E-09	2.06E+01	27.6	6.35	9.15E+01	NA	3.79E-11	4.26E-10	3.79E-11
1,2,3,4,7,8-HxCDD	2.6E-09	2.6E-12	3.9E+02	0.5	8.2E+00	8.10E-01	4.30E-01	6.16E+00	1.03E-05	1.03E-08	1.62E+01	26.4	6.21	7.20E+01	NA	9.01E-12	8.99E-11	9.01E-12
1,2,3,4,7,8-HxCDF	8.5E-09	8.5E-12	3.7E+02	0.5	7.6E+00	8.10E-01	1.04E-01	6.03E+00	1.26E-05	1.26E-08	1.32E+01	25.4	6.08	5.85E+01	NA	2.63E-11	2.36E-10	2.63E-11
1,2,3,6,7,8-HxCDD	1.3E-08	1.3E-11	3.9E+02	0.5	8.2E+00	8.10E-01	4.30E-01	6.16E+00	1.03E-05	1.03E-08	1.62E+01	26.4	6.21	7.20E+01	NA	4.57E-11	4.55E-10	4.57E-11
1,2,3,6,7,8-HxCDF	1.6E-09	1.6E-12	3.7E+02	0.5	7.6E+00	8.10E-01	1.04E-01	6.03E+00	1.26E-05	1.26E-08	1.32E+01	25.4	6.08	5.85E+01	NA	5.01E-12	4.49E-11	5.01E-12
1,2,3,7,8,9-HxCDD	4.4E-09	4.4E-12	3.9E+02	0.5	8.2E+00	8.10E-01	4.30E-01	6.16E+00	1.03E-05	1.03E-08	1.62E+01	26.4	6.21	7.20E+01	NA	1.51E-11	1.51E-10	1.51E-11
1,2,3,7,8,9-HxCDF	3.9E-09	3.9E-12	3.7E+02	0.5	7.6E+00	8.10E-01	1.04E-01	6.03E+00	1.26E-05	1.26E-08	1.32E+01	25.4	6.08	5.85E+01	NA	1.20E-11	1.07E-10	1.20E-11
1,2,3,7,8-PeCDD	1.1E-09	1.1E-12	3.6E+02	0.5	6.3E+00	8.10E-01	-6.38E-01	5.88E+00	1.60E-05	1.60E-08	1.04E+01	24.2	5.93	4.61E+01	NA	2.97E-12	2.36E-11	2.97E-12
1,2,3,7,8-PeCDF	2.3E-09	2.3E-12	3.4E+02	0.5	6.8E+00	8.10E-01	-2.25E-01	5.75E+00	1.97E-05	1.97E-08	8.48E+00	23.2	5.80	3.74E+01	NA	5.66E-12	4.04E-11	5.66E-12
2,3,4,6,7,8-HxCDF	3.9E-09	3.9E-12	3.7E+02	0.5	7.6E+00	8.10E-01	1.04E-01	6.03E+00	1.26E-05	1.26E-08	1.32E+01	25.4	6.08	5.85E+01	NA	1.22E-11	1.10E-10	1.22E-11
2,3,4,7,8-PeCDF	2.6E-09	2.6E-12	3.4E+02	0.5	6.8E+00	8.10E-01	-2.25E-01	5.75E+00	1.97E-05	1.97E-08	8.48E+00	23.2	5.80	3.74E+01	NA	6.54E-12	4.67E-11	6.54E-12
2,3,7,8-TCDF	1.7E-09	1.7E-12	3.1E+02	0.5	6.5E+00	8.10E-01	-2.04E-01	5.45E+00	3.07E-05	3.07E-08	5.44E+00	21.0	5.50	2.39E+01	NA	3.34E-12	1.90E-11	3.34E-12
OCDF	7.4E-07	7.4E-10	4.4E+02	0.5	8.6E+00	8.10E-01	3.91E-01	6.56E+00	5.19E-06	5.19E-09	3.21E+01	29.8	6.61	1.43E+02	NA	3.59E-09	5.07E-08	3.59E-09
OCDD	2.2E-06	2.2E-09	4.6E+02	0.5	9.5E+00	8.10E-01	8.95E-01	6.68E+00	4.22E-06	4.22E-09	3.95E+01	30.8	6.72	1.76E+02	NA	1.17E-08	1.83E-07	1.17E-08

Table 2-17
Model for Estimating Dermal Exposure from Contact with Chemicals in Water - Future Child Resident
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Source: EPA, 2004. RAGS Part E

ORGANICS

If $t_{event} \leq t^*$:

$$DA_{event\_1} = 2 \times FA \times K_p \times C_v \sqrt{\frac{6 \times tau \times t_{event}}{\Pi}}$$

If $t_{event} > t^*$:

$$DA_{event\_2} = FA \times K_p \times C_v \left[\frac{t_{event}}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right]$$

INORGANICS

$$DA_{event} = K_p \times C_v \times t_{event}$$

$$DAD = \frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT \times 365\, days/year}$$

$$\log K_p = -2.8 + 0.66 \log K_{ow} - 0.0056 MW$$

$$B = K_p \frac{\sqrt{MW}}{2.6}$$

$$If\ B \leq 0.6\ then\ t^* = 2.4\tau$$

$$If\ B > 0.6\ \ then\ \ t^* = 6\left(b - \sqrt{b^2 - c^2}\right)\tau$$

$$b = \frac{2}{\pi}(1+B)^2 - c \qquad c = \frac{1+3B+3B^2}{3(1+B)}$$

$$\log \frac{D_{sc}}{l_{sc}} = -2.80 - 0.0056 MW$$

$$\tau = \frac{l_{sc}^{\ 2}}{6\ D_{sc}}$$

Dermally-absorbed dose	DAD	calculated	mg/kg-day
Concentration in water	Conc (Cv)	chem-specific	mg/cm3
permeability coefficient	Kp	calculated	cm/hr
Lag time per event (hours)	*tau (τ)*	calculated	hours
Time to reach steady-state (hours)	t*	calculated	hours
Dimensionless coefficient	B	calculated	
Pi	π	3.141592654	
Exposure Time	t_event	1	hr/event
Number of exposure events	EV	1	event/day
Exposure Duration	ED	6	year
Exposure Frequency	EF	350	days/year
Exposed Skin Surface Area	SA	6600	cm2
Body Weight	BW	15	kg
Averaging time - noncarcinogenic	AT_N	6	years
Averaging time - carcinogenic	AT_C	70	years
Conversion Factor		0.001	mg/ug

Thickness of stratum corneum	*lsc* (cm)	0.001
Molecular Weight	g/mol	chem-specific
log octanol-water partition coefficient	Log Kow	chem-specific
log permeability coefficient	log Kp	calculated
Permeability coefficient (cm/hr)	Kp	calculated
Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	B	calculated
across the stratum corneum (cm2/hr)	Dsc	calculated
Lag time per event (hours)	τ	calculated
Time to reach steady-state (hours)	t*	calculated
methodology (see equations A7 and A8, USEPA, 2001)	b,c	calculated

Constituent	Conc (mg/L)	Conc (mg/cm3)	MW	FA	Log Kow	Kp (cm/hr) Select	Log Kp	B	Dsc/lsc	Dsc (cm2/hr)	τ (hours)	b	c	t* (hours)	DA_inorg (mg/cm2-event)	DA_1 (mg/cm2-event)	DA_2 (mg/cm2-event)	Selected DA (mg/cm2-event)
Metals																		
Aluminum	9.4E+00	9.4E-03	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	9.40E-06	NA	NA	9.40E-06
Antimony	1.5E-03	1.5E-06	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	1.51E-09	NA	NA	1.51E-09
Arsenic	2.9E-01	2.9E-04	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	2.87E-07	NA	NA	2.87E-07
Barium	1.7E-01	1.7E-04	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	1.68E-07	NA	NA	1.68E-07
Beryllium	7.6E-04	7.6E-07	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	7.64E-10	NA	NA	7.64E-10

Constituent	Conc (mg/L)	Conc (mg/cm3)	MW	FA	Log Kow	Kp (cm/hr) Select	Log Kp	B	Dsc/Isc	Dsc (cm2/hr)	τ (hours)	b	c	t* (hours)	DA_inorg (mg/cm2-event)	DA_1 (mg/cm2-event)	DA_2 (mg/cm2-event)	Selected DA (mg/cm2-event)
Boron	4.3E+00	4.3E-03	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	4.31E-06	NA	NA	4.31E-06
Cadmium	1.3E-03	1.3E-06	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	1.26E-09	NA	NA	1.26E-09
Chromium	3.6E-02	3.6E-05	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	3.57E-08	NA	NA	3.57E-08
Chromium (VI)	3.5E-04	3.5E-07	NA	1.0	NA	2.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	7.00E-10	NA	NA	7.00E-10
Cobalt	8.9E-03	8.9E-06	NA	1.0	NA	4.00E-04	NA	NA	NA	NA	NA	NA	NA	NA	3.56E-09	NA	NA	3.56E-09
Copper	4.7E-02	4.7E-05	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	4.66E-08	NA	NA	4.66E-08
Iron	5.4E+01	5.4E-02	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	5.35E-05	NA	NA	5.35E-05
Lead	4.0E-02	4.0E-05	NA	1.0	NA	1.00E-04	NA	NA	NA	NA	NA	NA	NA	NA	4.00E-09	NA	NA	4.00E-09
Manganese	4.3E+00	4.3E-03	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	4.33E-06	NA	NA	4.33E-06
Mercury	1.2E-04	1.2E-07	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	1.21E-10	NA	NA	1.21E-10
Molybdenum	5.6E-03	5.6E-06	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	5.64E-09	NA	NA	5.64E-09
Nickel	5.5E-02	5.5E-05	NA	1.0	NA	2.00E-04	NA	NA	NA	NA	NA	NA	NA	NA	1.09E-08	NA	NA	1.09E-08
Selenium	1.9E-02	1.9E-05	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	1.89E-08	NA	NA	1.89E-08
Silver	1.2E-04	1.2E-07	NA	1.0	NA	6.00E-04	NA	NA	NA	NA	NA	NA	NA	NA	7.20E-11	NA	NA	7.20E-11
Thallium	5.0E-05	5.0E-08	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	5.00E-11	NA	NA	5.00E-11
Vanadium	3.2E-02	3.2E-05	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	3.19E-08	NA	NA	3.19E-08
Zinc	3.0E-01	3.0E-04	NA	1.0	NA	6.00E-04	NA	NA	NA	NA	NA	NA	NA	NA	1.82E-07	NA	NA	1.82E-07
Cyanide	6.3E-02	6.3E-05	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	6.29E-08	NA	NA	6.29E-08
Pesticides/PCBs																		
4,4'-DDD	5.0E-03	5.0E-06	3.2E+02	0.8	5.8E+00	1.80E-01	-7.64E-01	1.24E+00	2.56E-05	2.56E-08	6.51E+00	1.8	1.39	2.55E+01	NA	5.08E-06	1.77E-05	5.08E-06
4,4'-DDE	7.8E-04	7.8E-07	3.2E+02	0.8	5.7E+00	1.60E-01	-8.25E-01	1.10E+00	2.63E-05	2.63E-08	6.35E+00	1.5	1.26	2.46E+01	NA	6.92E-07	2.31E-06	6.92E-07
4,4'-DDT	1.8E-04	1.8E-07	3.6E+02	0.7	6.4E+00	2.70E-01	-5.90E-01	1.96E+00	1.63E-05	1.63E-08	1.02E+01	3.5	2.07	4.16E+01	NA	3.01E-07	1.47E-06	3.01E-07
Aldrin	4.0E-04	4.0E-07	3.7E+02	1.0	3.0E+00	1.40E-03	-2.86E+00	1.03E-02	1.43E-05	1.43E-08	1.16E+01	0.3	0.34	2.79E+01	NA	5.34E-09	1.39E-08	5.34E-09
alpha-BHC	3.0E-04	3.0E-07	2.9E+02	1.0	4.1E+00	1.10E-02	-1.70E+00	7.22E-02	3.73E-05	3.73E-08	4.47E+00	0.3	0.38	1.07E+01	NA	1.93E-08	3.47E-08	1.93E-08
alpha-Chlordane	3.3E-04	3.3E-07	4.1E+02	0.7	5.5E+00	3.40E-02	-1.49E+00	2.65E-01	8.02E-06	8.02E-09	2.08E+01	0.5	0.53	4.99E+01	NA	1.00E-07	4.20E-07	1.00E-07
Atrazine	2.0E-03	2.0E-06	2.2E+02	1.0	2.6E+00	5.18E-03	-2.29E+00	2.93E-02	9.82E-05	9.82E-08	1.70E+00	0.3	0.35	4.07E+00	NA	3.73E-08	4.63E-08	3.73E-08
beta-BHC	3.7E-04	3.7E-07	2.9E+02	1.0	4.1E+00	1.10E-02	-1.70E+00	7.22E-02	3.73E-05	3.73E-08	4.47E+00	0.3	0.38	1.07E+01	NA	2.37E-08	4.27E-08	2.37E-08
delta-BHC	1.6E-04	1.6E-07	2.9E+02	1.0	4.1E+00	1.10E-02	-1.70E+00	7.22E-02	3.73E-05	3.73E-08	4.47E+00	0.3	0.38	1.07E+01	NA	1.03E-08	1.85E-08	1.03E-08
Diazinon	2.6E-04	2.6E-07	3.0E+02	1.0	3.8E+00	1.02E-02	-1.99E+00	6.87E-02	3.13E-05	3.13E-08	5.32E+00	0.3	0.38	1.28E+01	NA	1.69E-08	3.27E-08	1.69E-08
Dieldrin	9.2E-04	9.2E-07	3.8E+02	0.8	4.6E+00	1.20E-02	-1.92E+00	9.01E-02	1.17E-05	1.17E-08	1.43E+01	0.4	0.40	3.43E+01	NA	9.27E-08	2.84E-07	9.27E-08
Endosulfan I	3.3E-04	3.3E-07	4.1E+02	1.0	3.8E+00	2.81E-03	-2.55E+00	2.18E-02	8.34E-06	8.34E-09	2.00E+01	0.3	0.35	4.80E+01	NA	1.15E-08	3.89E-08	1.15E-08
Endosulfan II	2.3E-04	2.3E-07	4.1E+02	1.0	3.5E+00	1.76E-03	-2.76E+00	1.36E-02	8.34E-06	8.34E-09	2.00E+01	0.3	0.34	4.80E+01	NA	4.99E-09	1.68E-08	4.99E-09
Endosulfan sulfate	9.2E-05	9.2E-08	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	6.5E-04	6.5E-07	3.8E+02	0.8	4.6E+00	1.20E-02	-1.92E+00	9.01E-02	1.17E-05	1.17E-08	1.43E+01	0.4	0.40	3.43E+01	NA	6.48E-08	1.99E-07	6.48E-08
Endrin aldehyde	1.4E-04	1.4E-07	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	1.7E-04	1.7E-07	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC	3.3E-04	3.3E-07	2.9E+02	1.0	4.1E+00	1.10E-02	-1.70E+00	7.22E-02	3.73E-05	3.73E-08	4.47E+00	0.3	0.38	1.07E+01	NA	2.11E-08	3.79E-08	2.11E-08
gamma-Chlordane	2.5E-04	2.5E-07	4.1E+02	0.7	5.5E+00	3.40E-02	-1.49E+00	2.65E-01	8.02E-06	8.02E-09	2.08E+01	0.5	0.53	4.99E+01	NA	7.50E-08	3.15E-07	7.50E-08
Heptachlor	1.1E-04	1.1E-07	3.7E+02	0.8	4.3E+00	8.60E-03	-2.07E+00	6.39E-02	1.28E-05	1.28E-08	1.30E+01	0.3	0.38	3.12E+01	NA	7.59E-09	2.18E-08	7.59E-09
Heptachlor epoxide	1.2E-04	1.2E-07	3.9E+02	1.0	5.0E+00	2.03E-02	-1.69E+00	1.54E-01	1.05E-05	1.05E-08	1.59E+01	0.4	0.44	3.82E+01	NA	2.68E-08	9.12E-08	2.68E-08
Methoxychlor	1.2E-04	1.2E-07	3.5E+02	1.0	5.1E+00	4.14E-02	-1.38E+00	2.96E-01	1.84E-05	1.84E-08	9.07E+00	0.5	0.55	2.18E+01	NA	4.14E-08	1.19E-07	4.14E-08
Aroclor-1260	9.6E-04	9.6E-07	4.0E+02	0.6	8.3E+00	7.50E-01	4.44E-01	5.74E+00	9.69E-06	9.69E-09	1.72E+01	23.1	5.78	7.60E+01	NA	4.97E-06	3.85E-05	4.97E-06
SVOCs/VOCs																		
1,4-Dioxane (p-dioxane)	7.8E-01	7.8E-04	8.8E+01	1.0	-2.7E-01	3.30E-04	-3.47E+00	1.19E-03	5.09E-04	5.09E-07	3.27E-01	0.3	0.33	7.86E-01	NA	4.07E-07	4.26E-07	4.26E-07
2,4,6-Trichlorophenol	7.1E-03	7.1E-06	2.0E+02	1.0	3.7E+00	3.50E-02	-1.47E+00	1.89E-01	1.24E-04	1.24E-07	1.34E+00	0.4	0.47	3.22E+00	NA	8.00E-07	1.00E-06	8.00E-07
2,4-Dimethylphenol	7.9E-02	7.9E-05	1.2E+02	1.0	2.3E+00	1.10E-02	-1.97E+00	4.68E-02	3.28E-04	3.28E-07	5.08E-01	0.3	0.37	1.22E+00	NA	1.71E-06	1.75E-06	1.71E-06
2-Chlorophenol	4.3E-03	4.3E-06	1.3E+02	1.0	2.2E+00	8.00E-03	-2.10E+00	3.49E-02	3.02E-04	3.02E-07	5.52E-01	0.3	0.36	1.33E+00	NA	7.06E-08	7.25E-08	7.06E-08
2-Methylnaphthalene	2.3E-01	2.3E-04	1.4E+02	1.0	3.9E+00	8.94E-02	-1.05E+00	4.10E-01	2.53E-04	2.53E-07	6.58E-01	0.6	0.65	1.58E+00	NA	4.52E-05	5.08E-05	4.52E-05
2-Methylphenol	1.2E-01	1.2E-04	1.1E+02	1.0	2.0E+00	7.70E-03	-2.12E+00	3.08E-02	3.93E-04	3.93E-07	4.24E-01	0.3	0.35	1.02E+00	NA	1.70E-06	1.74E-06	1.70E-06
2-Nitroaniline	1.0E-02	1.0E-05	1.4E+02	1.0	1.9E+00	4.44E-03	-2.35E+00	2.01E-02	2.67E-04	2.67E-07	6.24E-01	0.3	0.35	1.50E+00	NA	9.70E-08	1.00E-07	9.70E-08
3,4-methylphenol	8.4E-01	8.4E-04	1.1E+02	1.0	2.0E+00	7.70E-03	-2.12E+00	3.08E-02	3.93E-04	3.93E-07	4.24E-01	0.3	0.35	1.02E+00	NA	1.16E-05	1.19E-05	1.16E-05
4-Chloro-3-methylphenol	2.4E-02	2.4E-05	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	1.9E-01	1.9E-04	1.1E+02	1.0	2.0E+00	7.70E-03	-2.12E+00	3.08E-02	3.93E-04	3.93E-07	4.24E-01	0.3	0.35	1.02E+00	NA	2.68E-06	2.75E-06	2.68E-06
Acenaphthene	4.5E-03	4.5E-06	1.5E+02	1.0	3.9E+00	1.33E-01	-1.08E+00	6.35E-01	2.17E-04	2.17E-07	7.68E-01	0.9	0.84	3.04E+00	NA	1.45E-06	1.78E-06	1.45E-06
Acenaphthylene	9.5E-03	9.5E-06	1.5E+02	1.0	3.9E+00	1.41E-01	-1.05E+00	6.69E-01	2.23E-04	2.23E-07	7.48E-01	0.9	0.87	2.93E+00	NA	3.22E-06	3.95E-06	3.22E-06
Anthracene	3.2E-03	3.2E-06	1.8E+02	1.0	4.5E+00	2.25E-01	-8.61E-01	1.16E+00	1.59E-04	1.59E-07	1.05E+00	1.6	1.31	4.07E+00	NA	2.04E-06	3.08E-06	2.04E-06
Benzo(a)anthracene	9.0E-04	9.0E-07	2.3E+02	1.0	5.7E+00	4.70E-01	-3.43E-01	2.73E+00	8.35E-05	8.35E-08	2.00E+00	6.0	2.82	8.37E+00	NA	1.65E-06	3.94E-06	1.65E-06
Benzo(a)pyrene	5.0E-04	5.0E-07	2.5E+02	1.0	6.1E+00	7.00E-01	-1.74E-01	4.26E+00	6.31E-05	6.31E-08	2.64E+00	13.3	4.32	1.15E+01	NA	1.57E-06	4.63E-06	1.57E-06
Benzo(b)fluoranthene	7.6E-04	7.6E-07	2.5E+02	1.0	5.8E+00	6.99E-01	-3.98E-01	4.27E+00	6.12E-05	6.12E-08	2.72E+00	13.4	4.33	1.18E+01	NA	2.42E-06	7.23E-06	2.42E-06
Benzo(g,h,i)perylene	2.0E-04	2.0E-07	2.8E+02	1.0	6.6E+00	1.07E+00	2.83E-02	6.82E+00	4.49E-05	4.49E-08	3.71E+00	32.1	6.87	1.65E+01	NA	1.14E-06	4.20E-06	1.14E-06
Benzo(k)fluoranthene	4.6E-04	4.6E-07	2.5E+02	1.0	6.1E+00	6.60E-01	-1.80E-01	4.03E+00	6.12E-05	6.12E-08	2.72E+00	12.0	4.10	1.18E+01	NA	1.38E-06	4.10E-06	1.38E-06
Biphenyl (Diphenyl)	1.3E-03	1.3E-06	1.5E+02	1.0	4.0E+00	9.19E-02	-1.04E+00	4.39E-01	2.17E-04	2.17E-07	7.68E-01	0.6	0.67	1.84E+00	NA	2.89E-07	3.40E-07	2.89E-07
bis(2-Chloroethoxy)methane	2.0E-04	2.0E-07	1.7E+02	1.0	1.3E+00	1.23E-03	-2.91E+00	6.21E-03	1.70E-04	1.70E-07	9.79E-01	0.3	0.34	2.35E+00	NA	6.71E-10	7.28E-10	6.71E-10
bis(2-Ethylhexyl)phthalate	1.7E-02	1.7E-05	3.9E+02	1.0	5.1E+00	2.50E-02	-1.62E+00	1.90E-01	1.02E-05	1.02E-08	1.63E+01	0.4	0.47	3.91E+01	NA	4.71E-06	1.67E-05	4.71E-06

Constituent	Conc (mg/L)	Conc (mg/cm3)	MW	FA	Log Kow	Kp (cm/hr) Select	Log Kp	B	Dsc/Isc	Dsc (cm2/hr)	τ (hours)	b	c	t* (hours)	DA_inorg (mg/cm2-event)	DA_1 (mg/cm2-event)	DA_2 (mg/cm2-event)	Selected DA (mg/cm2-event)
Bromoform	1.2E-02	1.2E-05	2.5E+02	1.0	2.4E+00	2.20E-03	-2.63E+00	1.35E-02	6.09E-05	6.09E-08	2.74E+00	0.3	0.34	6.56E+00	NA	1.21E-07	1.72E-07	1.21E-07
Caprolactam	2.4E-03	2.4E-06	1.1E+02	1.0	6.6E-01	1.00E-03	-3.00E+00	4.11E-03	3.68E-04	3.68E-07	4.52E-01	0.3	0.34	1.09E+00	NA	4.48E-09	4.59E-09	4.48E-09
Carbazole	1.3E-02	1.3E-05	1.7E+02	1.0	3.7E+00	5.23E-02	-1.28E+00	2.60E-01	1.83E-04	1.83E-07	9.08E-01	0.5	0.52	2.18E+00	NA	1.73E-06	2.01E-06	1.73E-06
Chrysene	1.1E-03	1.1E-06	2.3E+02	1.0	5.7E+00	4.70E-01	-3.43E-01	2.73E+00	8.35E-05	8.35E-08	2.00E+00	6.0	2.82	8.37E+00	NA	2.02E-06	4.82E-06	2.02E-06
Dibenz(a,h)anthracene	4.5E-05	4.5E-08	2.8E+02	0.6	6.5E+00	1.50E+00	-4.24E-02	9.63E+00	4.38E-05	4.38E-08	3.81E+00	62.2	9.66	1.72E+01	NA	2.18E-07	8.45E-07	2.18E-07
Diethylphthalate	1.0E-02	1.0E-05	2.2E+02	1.0	2.5E+00	3.90E-03	-2.41E+00	2.23E-02	9.05E-05	9.05E-08	1.84E+00	0.3	0.35	4.42E+00	NA	1.51E-07	1.91E-07	1.51E-07
Di-n-butyl phthalate	1.2E-02	1.2E-05	2.8E+02	0.9	4.1E+00	2.40E-02	-1.63E+00	1.54E-01	4.40E-05	4.40E-08	3.79E+00	0.4	0.44	9.10E+00	NA	1.35E-06	2.41E-06	1.35E-06
Fluoranthene	2.4E-03	2.4E-06	2.0E+02	1.0	5.0E+00	2.20E-01	-6.66E-01	1.20E+00	1.17E-04	1.17E-07	1.43E+00	1.7	1.35	5.57E+00	NA	1.74E-06	3.02E-06	1.74E-06
Fluorene	2.6E-03	2.6E-06	1.7E+02	1.0	4.2E+00	1.71E-01	-9.72E-01	8.48E-01	1.86E-04	1.86E-07	8.97E-01	1.1	1.03	3.45E+00	NA	1.16E-06	1.57E-06	1.16E-06
Hexachloroethane	1.0E-03	1.0E-06	2.4E+02	1.0	3.9E+00	3.00E-02	-1.53E+00	1.78E-01	7.49E-05	7.49E-08	2.23E+00	0.4	0.46	5.34E+00	NA	1.24E-07	1.82E-07	1.24E-07
Indeno(1,2,3-c,d)pyrene	2.0E-04	2.0E-07	2.8E+02	0.6	6.6E+00	1.00E+00	-4.48E-03	6.39E+00	4.49E-05	4.49E-08	3.71E+00	28.4	6.44	1.65E+01	NA	6.39E-07	2.34E-06	6.39E-07
Naphthalene	1.4E-01	1.4E-04	1.3E+02	1.0	3.3E+00	4.70E-02	-1.34E+00	2.05E-01	3.03E-04	3.03E-07	5.49E-01	0.4	0.48	1.32E+00	NA	1.31E-05	1.37E-05	1.31E-05
Nitrobenzene	2.0E-03	2.0E-06	1.2E+02	1.0	1.9E+00	5.39E-03	-2.27E+00	2.30E-02	3.24E-04	3.24E-07	5.14E-01	0.3	0.35	1.23E+00	NA	2.14E-08	2.19E-08	2.14E-08
N-Nitrosodi-n-propylamine	2.0E-03	2.0E-06	1.3E+02	1.0	1.4E+00	2.34E-03	-2.63E+00	1.03E-02	2.96E-04	2.96E-07	5.64E-01	0.3	0.34	1.35E+00	NA	9.69E-09	9.94E-09	9.69E-09
N-Nitrosodiphenylamine	1.2E-03	1.2E-06	2.0E+02	1.0	3.1E+00	2.60E-02	-1.84E+00	1.41E-01	1.23E-04	1.23E-07	1.35E+00	0.4	0.43	3.25E+00	NA	1.00E-07	1.24E-07	1.00E-07
Pentachlorophenol	1.1E-02	1.1E-05	2.7E+02	0.9	5.9E+00	3.90E-01	-4.24E-01	2.45E+00	5.11E-05	5.11E-08	3.26E+00	5.0	2.54	1.36E+01	NA	1.98E-05	5.84E-05	1.98E-05
Phenanthrene	6.0E-03	6.0E-06	1.8E+02	1.0	4.5E+00	1.40E-01	-8.54E-01	7.19E-01	1.59E-04	1.59E-07	1.05E+00	1.0	0.91	4.05E+00	NA	2.38E-06	3.29E-06	2.38E-06
Pyrene	2.4E-03	2.4E-06	2.0E+02	1.0	4.9E+00	3.24E-01	-7.12E-01	1.77E+00	1.17E-04	1.17E-07	1.43E+00	3.0	1.89	5.76E+00	NA	2.57E-06	4.83E-06	2.57E-06
1,1,1-Trichloroethane	1.2E-01	1.2E-04	1.3E+02	1.0	2.5E+00	1.30E-02	-1.90E+00	5.77E-02	2.84E-04	2.84E-07	5.87E-01	0.3	0.37	1.41E+00	NA	3.25E-06	3.36E-06	3.25E-06
1,1,2,2-Tetrachloroethane	1.3E-02	1.3E-05	1.7E+02	1.0	2.4E+00	6.90E-03	-2.16E+00	3.44E-02	1.82E-04	1.82E-07	9.16E-01	0.3	0.36	2.20E+00	NA	2.36E-07	2.55E-07	2.36E-07
1,1,2-Trichloroethane	1.3E-02	1.3E-05	1.3E+02	1.0	2.1E+00	6.40E-03	-2.19E+00	2.84E-02	2.84E-04	2.84E-07	5.87E-01	0.3	0.35	1.41E+00	NA	1.81E-07	1.86E-07	1.81E-07
1,1-Dichloroethane	5.6E-01	5.6E-04	9.9E+01	1.0	1.8E+00	6.70E-03	-2.17E+00	2.56E-02	4.42E-04	4.42E-07	3.77E-01	0.3	0.35	9.05E-01	NA	6.33E-06	6.52E-06	6.52E-06
1,1-Dichloroethene	4.2E-02	4.2E-05	9.7E+01	1.0	2.1E+00	1.20E-02	-1.94E+00	4.54E-02	4.54E-04	4.54E-07	3.67E-01	0.3	0.36	8.80E-01	NA	8.35E-07	8.60E-07	8.60E-07
1,2,3-Trichlorobenzene	2.7E-03	2.7E-06	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	1.5E-02	1.5E-05	1.8E+02	1.0	4.0E+00	6.60E-02	-1.19E+00	3.42E-01	1.53E-04	1.53E-07	1.09E+00	0.6	0.59	2.62E+00	NA	2.88E-06	3.61E-06	2.88E-06
1,2,4-Trimethylbenzene	2.8E-01	2.8E-04	1.2E+02	1.0	3.6E+00	8.37E-02	-1.08E+00	3.53E-01	3.36E-04	3.36E-07	4.95E-01	0.6	0.60	1.19E+00	NA	4.52E-05	4.78E-05	4.52E-05
1,2-Dibromo-3-chloropropane	2.4E-03	2.4E-06	2.4E+02	1.0	3.0E+00	6.76E-03	-2.17E+00	4.00E-02	7.53E-05	7.53E-08	2.21E+00	0.3	0.36	5.32E+00	NA	6.68E-08	9.04E-08	6.68E-08
1,2-Dichlorobenzene	7.3E-01	7.3E-04	1.5E+02	1.0	3.4E+00	4.10E-02	-1.39E+00	1.91E-01	2.38E-04	2.38E-07	7.00E-01	0.4	0.47	1.68E+00	NA	6.96E-05	7.53E-05	6.96E-05
1,2-Dichloroethane	1.4E-02	1.4E-05	9.9E+01	1.0	1.5E+00	6.70E-03	-2.38E+00	2.56E-02	4.42E-04	4.42E-07	3.77E-01	0.3	0.35	9.05E-01	NA	1.63E-07	1.68E-07	1.68E-07
1,2-Dichloropropane	5.1E-03	5.1E-06	1.1E+02	1.0	2.0E+00	7.80E-03	-2.11E+00	3.19E-02	3.69E-04	3.69E-07	4.51E-01	0.3	0.35	1.08E+00	NA	7.39E-08	7.56E-08	7.39E-08
1,3,5-Trimethylbenzene	1.1E-01	1.1E-04	1.2E+02	1.0	3.4E+00	6.08E-02	-1.22E+00	2.56E-01	3.36E-04	3.36E-07	4.95E-01	0.5	0.52	1.19E+00	NA	1.30E-05	1.36E-05	1.30E-05
1,3-Dichlorobenzene	2.7E-02	2.7E-05	1.5E+02	1.0	3.6E+00	5.80E-02	-1.25E+00	2.70E-01	2.38E-04	2.38E-07	7.00E-01	0.5	0.53	1.68E+00	NA	3.63E-06	4.01E-06	3.63E-06
1,4-Dichlorobenzene	2.2E-01	2.2E-04	1.5E+02	1.0	3.4E+00	4.20E-02	-1.39E+00	1.96E-01	2.38E-04	2.38E-07	7.00E-01	0.4	0.47	1.68E+00	NA	2.12E-05	2.29E-05	2.12E-05
2-Chlorotoluene	2.9E-03	2.9E-06	1.3E+02	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	2.4E-02	2.4E-05	1.0E+02	1.0	1.4E+00	3.55E-03	-2.45E+00	1.37E-02	4.36E-04	4.36E-07	3.83E-01	0.3	0.34	9.18E-01	NA	1.43E-07	1.47E-07	1.47E-07
2,2-Dichloropropane	5.0E-04	5.0E-07	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	4.9E-01	4.9E-04	5.8E+01	1.0	-2.4E-01	5.20E-04	-3.28E+00	1.53E-03	7.49E-04	7.49E-07	2.22E-01	0.3	0.33	5.34E-01	NA	3.29E-07	3.65E-07	3.65E-07
Benzene	4.0E-01	4.0E-04	7.8E+01	1.0	2.1E+00	1.50E-02	-1.83E+00	5.10E-02	5.79E-04	5.79E-07	2.88E-01	0.3	0.37	6.91E-01	NA	8.90E-06	9.34E-06	9.34E-06
Carbon disulfide	3.1E-03	3.1E-06	8.0E+01	1.0	2.2E+00	1.70E-02	-1.77E+00	5.85E-02	5.65E-04	5.65E-07	2.95E-01	0.3	0.37	7.08E-01	NA	7.91E-08	8.27E-08	8.27E-08
Carbon tetrachloride	3.0E-04	3.0E-07	1.5E+02	1.0	2.8E+00	1.60E-02	-1.79E+00	7.63E-02	2.18E-04	2.18E-07	7.64E-01	0.4	0.39	1.83E+00	NA	1.16E-08	1.24E-08	1.16E-08
Chlorobenzene	6.7E-01	6.7E-04	1.1E+02	1.0	2.8E+00	2.80E-02	-1.56E+00	1.14E-01	3.71E-04	3.71E-07	4.49E-01	0.4	0.41	1.08E+00	NA	3.50E-05	3.58E-05	3.50E-05
Chloroethane	9.7E-02	9.7E-05	6.5E+01	1.0	1.4E+00	6.10E-03	-2.22E+00	1.88E-02	6.90E-04	6.90E-07	2.42E-01	0.3	0.35	5.80E-01	NA	8.07E-07	8.75E-07	8.75E-07
Chloroform	4.4E-03	4.4E-06	1.2E+02	1.0	2.0E+00	6.80E-03	-2.17E+00	2.86E-02	3.40E-04	3.40E-07	4.90E-01	0.3	0.35	1.18E+00	NA	5.79E-08	5.93E-08	5.79E-08
Chloromethane	7.4E-03	7.4E-06	5.1E+01	1.0	9.1E-01	3.30E-03	-2.48E+00	9.02E-03	8.26E-04	8.26E-07	2.02E-01	0.3	0.34	4.84E-01	NA	3.03E-08	3.41E-08	3.41E-08
cis-1,2-Dichloroethene	1.4E+01	1.4E-02	9.7E+01	1.0	2.1E+00	1.09E-02	-1.96E+00	4.12E-02	4.54E-04	4.54E-07	3.67E-01	0.3	0.36	8.81E-01	NA	2.50E-04	2.57E-04	2.57E-04
cis-1,3-Dichloropropene	4.2E-03	4.2E-06	1.1E+02	1.0	1.6E+00	4.30E-03	-2.37E+00	1.74E-02	3.79E-04	3.79E-07	4.40E-01	0.3	0.35	1.06E+00	NA	3.31E-08	3.39E-08	3.31E-08
Cyclohexane	1.8E-02	1.8E-05	8.4E+01	1.0	3.4E+00	9.98E-02	-1.00E+00	3.52E-01	5.35E-04	5.35E-07	3.11E-01	0.6	0.60	7.47E-01	NA	2.77E-06	2.81E-06	2.81E-06
Ethyl tert-butyl ether (ETBE)	1.2E-03	1.2E-06	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	4.5E-01	4.5E-04	1.1E+02	1.0	3.2E+00	4.90E-02	-1.32E+00	1.94E-01	4.03E-04	4.03E-07	4.14E-01	0.4	0.47	9.93E-01	NA	3.91E-05	4.00E-05	4.00E-05
Isopropyl ether	4.3E-01	4.3E-04	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene (cumene)	2.7E-02	2.7E-05	1.2E+02	1.0	3.7E+00	8.76E-02	-1.06E+00	3.69E-01	3.36E-04	3.36E-07	4.95E-01	0.6	0.61	1.19E+00	NA	4.61E-06	4.88E-06	4.61E-06
Methyl acetate	2.3E-02	2.3E-05	7.4E+01	1.0	1.8E-01	8.02E-04	-3.10E+00	2.65E-03	6.10E-04	6.10E-07	2.73E-01	0.3	0.34	6.56E-01	NA	2.61E-08	2.79E-08	2.79E-08
Methyl ethyl ketone	4.3E-01	4.3E-04	7.2E+01	1.0	2.9E-01	9.60E-04	-3.01E+00	3.13E-03	6.26E-04	6.26E-07	2.66E-01	0.3	0.34	6.39E-01	NA	5.89E-07	6.32E-07	6.32E-07
Methyl isobutyl ketone	4.9E+00	4.9E-03	1.0E+02	1.0	1.2E+00	2.66E-03	-2.57E+00	1.02E-02	4.37E-04	4.37E-07	3.82E-01	0.3	0.34	9.16E-01	NA	2.21E-05	2.28E-05	2.28E-05
Methyl tert-butyl ether	2.0E-02	2.0E-05	8.8E+01	1.0	9.4E-01	2.12E-03	-2.67E+00	7.66E-03	5.09E-04	5.09E-07	3.28E-01	0.3	0.34	7.87E-01	NA	6.76E-08	7.06E-08	7.06E-08
Methylcyclohexane	2.5E-02	2.5E-05	9.8E+01	1.0	3.6E+00	1.08E-01	-9.67E-01	4.11E-01	4.47E-04	4.47E-07	3.73E-01	0.6	0.65	8.95E-01	NA	4.46E-06	4.59E-06	4.59E-06
Methylene chloride	8.2E-03	8.2E-06	8.5E+01	1.0	1.3E+00	3.50E-03	-2.45E+00	1.24E-02	5.30E-04	5.30E-07	3.14E-01	0.3	0.34	7.54E-01	NA	4.44E-08	4.65E-08	4.65E-08
n-Butylbenzene	6.1E-03	6.1E-06	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	5.6E-02	5.6E-05	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
p-Cymene (p-isopropyltoluene)	7.9E-02	7.9E-05	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	4.8E-02	4.8E-05	9.4E+01	1.0	1.5E+00	4.30E-03	-2.36E+00	1.60E-02	4.71E-04	4.71E-07	3.54E-01	0.3	0.34	8.49E-01	NA	3.40E-07	3.52E-07	3.52E-07
sec-Butylbenzene	5.6E-03	5.6E-06	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	1.4E-02	1.4E-05	1.0E+02	1.0	3.0E+00	3.70E-02	-1.44E+00	1.45E-01	4.14E-04	4.14E-07	4.03E-01	0.4	0.44	9.66E-01	NA	9.03E-07	9.24E-07	9.24E-07
tert-Butylbenzene	2.1E-03	2.1E-06	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Constituent	Conc (mg/L)	Conc (mg/cm3)	MW	FA	Log Kow	Kp (cm/hr) Select	Log Kp	B	Dsc/Isc	Dsc (cm2/hr)	τ (hours)	b	c	t* (hours)	DA_inorg (mg/cm2-event)	DA_1 (mg/cm2-event)	DA_2 (mg/cm2-event)	Selected DA (mg/cm2-event)
tert-Butyl alcohol	1.2E-01	1.2E-04	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1.2E-02	1.2E-05	1.7E+02	1.0	3.4E+00	3.30E-02	-1.48E+00	1.63E-01	1.87E-04	1.87E-07	8.92E-01	0.4	0.45	2.14E+00	NA	1.03E-06	1.16E-06	1.03E-06
Toluene	6.1E+00	6.1E-03	9.2E+01	1.0	2.7E+00	3.10E-02	-1.51E+00	1.14E-01	4.83E-04	4.83E-07	3.45E-01	0.4	0.41	8.28E-01	NA	3.08E-04	3.15E-04	3.15E-04
trans-1,2-Dichloroethene	4.0E-01	4.0E-04	9.7E+01	1.0	1.9E+00	7.70E-03	-2.12E+00	2.92E-02	4.54E-04	4.54E-07	3.67E-01	0.3	0.35	8.80E-01	NA	5.17E-06	5.34E-06	5.34E-06
trans-1,3-Dichloropropene	4.1E-03	4.1E-06	1.1E+02	1.0	1.6E+00	4.30E-03	-2.37E+00	1.74E-02	3.79E-04	3.79E-07	4.40E-01	0.3	0.35	1.06E+00	NA	3.23E-08	3.31E-08	3.23E-08
Trichloroethene	5.7E-02	5.7E-05	1.3E+02	1.0	2.4E+00	1.20E-02	-1.94E+00	5.29E-02	2.91E-04	2.91E-07	5.72E-01	0.3	0.37	1.37E+00	NA	1.43E-06	1.47E-06	1.43E-06
Vinyl chloride	1.6E+00	1.6E-03	6.3E+01	1.0	1.4E+00	5.60E-03	-2.25E+00	1.70E-02	7.08E-04	7.08E-07	2.35E-01	0.3	0.34	5.65E-01	NA	1.22E-05	1.33E-05	1.33E-05
m,p-Xylene	9.4E-01	9.4E-04	1.1E+02	1.0	NA	5.30E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	4.4E-01	4.4E-04	1.1E+02	1.0	3.1E+00	7.04E-02	-1.34E+00	2.79E-01	4.03E-04	4.03E-07	4.13E-01	0.5	0.54	9.92E-01	NA	5.56E-05	5.72E-05	5.72E-05
Xylenes, total	1.6E+00	1.6E-03	1.1E+02	1.0	3.2E+00	5.30E-02	-1.28E+00	2.10E-01	4.03E-04	4.03E-07	4.14E-01	0.4	0.49	9.93E-01	NA	1.51E-04	1.55E-04	1.55E-04
Dioxans/Furans																		
1,2,3,4,6,7,8-HpCDD	4.6E-07	4.6E-10	4.3E+02	0.5	8.2E+00	8.10E-01	2.30E-01	6.42E+00	6.58E-06	6.58E-09	2.53E+01	28.6	6.47	1.13E+02	NA	2.62E-09	2.49E-08	2.62E-09
1,2,3,4,6,7,8-HpCDF	9.5E-08	9.5E-11	4.1E+02	0.5	7.9E+00	8.10E-01	1.35E-01	6.30E+00	8.09E-06	8.09E-09	2.06E+01	27.6	6.35	9.15E+01	NA	4.82E-10	4.14E-09	4.82E-10
1,2,3,4,7,8,9-HpCDF	9.8E-09	9.8E-12	4.1E+02	0.5	7.9E+00	8.10E-01	1.35E-01	6.30E+00	8.09E-06	8.09E-09	2.06E+01	27.6	6.35	9.15E+01	NA	4.97E-11	4.27E-10	4.97E-11
1,2,3,4,7,8-HxCDD	2.6E-09	2.6E-12	3.9E+02	0.5	8.2E+00	8.10E-01	4.30E-01	6.16E+00	1.03E-05	1.03E-08	1.62E+01	26.4	6.21	7.20E+01	NA	1.18E-11	8.99E-11	1.18E-11
1,2,3,4,7,8-HxCDF	8.5E-09	8.5E-12	3.7E+02	0.5	7.6E+00	8.10E-01	1.04E-01	6.03E+00	1.26E-05	1.26E-08	1.32E+01	25.4	6.08	5.85E+01	NA	3.46E-11	2.36E-10	3.46E-11
1,2,3,6,7,8-HxCDD	1.3E-08	1.3E-11	3.9E+02	0.5	8.2E+00	8.10E-01	4.30E-01	6.16E+00	1.03E-05	1.03E-08	1.62E+01	26.4	6.21	7.20E+01	NA	6.00E-11	4.56E-10	6.00E-11
1,2,3,6,7,8-HxCDF	1.6E-09	1.6E-12	3.7E+02	0.5	7.6E+00	8.10E-01	1.04E-01	6.03E+00	1.26E-05	1.26E-08	1.32E+01	25.4	6.08	5.85E+01	NA	6.58E-12	4.50E-11	6.58E-12
1,2,3,7,8,9-HxCDD	4.4E-09	4.4E-12	3.9E+02	0.5	8.2E+00	8.10E-01	4.30E-01	6.16E+00	1.03E-05	1.03E-08	1.62E+01	26.4	6.21	7.20E+01	NA	1.99E-11	1.51E-10	1.99E-11
1,2,3,7,8,9-HxCDF	3.9E-09	3.9E-12	3.7E+02	0.5	7.6E+00	8.10E-01	1.04E-01	6.03E+00	1.26E-05	1.26E-08	1.32E+01	25.4	6.08	5.85E+01	NA	1.57E-11	1.08E-10	1.57E-11
1,2,3,7,8-PeCDD	1.1E-09	1.1E-12	3.6E+02	0.5	6.3E+00	8.10E-01	-6.38E-01	5.88E+00	1.60E-05	1.60E-08	1.04E+01	24.2	5.93	4.61E+01	NA	3.90E-12	2.36E-11	3.90E-12
1,2,3,7,8-PeCDF	2.3E-09	2.3E-12	3.4E+02	0.5	6.8E+00	8.10E-01	-2.25E-01	5.75E+00	1.97E-05	1.97E-08	8.48E+00	23.2	5.80	3.74E+01	NA	7.43E-12	4.05E-11	7.43E-12
2,3,4,6,7,8-HxCDF	3.9E-09	3.9E-12	3.7E+02	0.5	7.6E+00	8.10E-01	1.04E-01	6.03E+00	1.26E-05	1.26E-08	1.32E+01	25.4	6.08	5.85E+01	NA	1.60E-11	1.10E-10	1.60E-11
2,3,4,7,8-PeCDF	2.6E-09	2.6E-12	3.4E+02	0.5	6.8E+00	8.10E-01	-2.25E-01	5.75E+00	1.97E-05	1.97E-08	8.48E+00	23.2	5.80	3.74E+01	NA	8.59E-12	4.68E-11	8.59E-12
2,3,7,8-TCDF	1.7E-09	1.7E-12	3.1E+02	0.5	6.5E+00	8.10E-01	-2.04E-01	5.45E+00	3.07E-05	3.07E-08	5.44E+00	21.0	5.50	2.39E+01	NA	4.38E-12	1.90E-11	4.38E-12
OCDF	7.4E-07	7.4E-10	4.4E+02	0.5	8.6E+00	8.10E-01	3.91E-01	6.56E+00	5.19E-06	5.19E-09	3.21E+01	29.8	6.61	1.43E+02	NA	4.72E-09	5.08E-08	4.72E-09
OCDD	2.2E-06	2.2E-09	4.6E+02	0.5	9.5E+00	8.10E-01	8.95E-01	6.68E+00	4.22E-06	4.22E-09	3.95E+01	30.8	6.72	1.76E+02	NA	1.53E-08	1.83E-07	1.53E-08

Table 2-18
Model for Estimating Dermal Exposure from Contact with Chemicals in Water - Adult Trench Worker
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Source: EPA, 2004. RAGS Part E
ORGANICS

If $t_{event} \leq t^*$:

$$DA_{event\_1} = 2 \times FA \times K_p \times C_v \sqrt{\frac{6 \times tau \times t_{event}}{\Pi}}$$

If $t_{event} > t^*$:

$$DA_{event\_2} = FA \times K_p \times C_v \left[\frac{t_{event}}{1+B} + 2 \times tau \times \left(\frac{1+3B+3B^2}{(1+B)^2} \right) \right]$$

INORGANICS

$$DA_{event} = K_p \times C_v \times t_{event}$$

$$DAD = \frac{DA_{event} \times EV \times ED \times EF \times SA}{BW \times AT \times 365\, days/year}$$

$$\log K_p = -2.8 + 0.66 \log K_{ow} - 0.0056 MW$$

$$B = K_p \frac{\sqrt{MW}}{2.6}$$

$$If\ B \leq 0.6\ then\ t^* = 2.4\tau$$

$$If\ B > 0.6\ then\ t^* = 6\left(b - \sqrt{b^2 - c^2}\right)\tau$$

$$b = \frac{2}{\pi}(1+B)^2 - c \qquad c = \frac{1+3B+3B^2}{3(1+B)}$$

$$\log \frac{D_{sc}}{l_{sc}} = -2.80 - 0.0056 MW$$

$$\tau = \frac{l_{sc}^{\ 2}}{6\ D_{sc}}$$

Dermally-absorbed dose	DAD	calculated	mg/kg-day
Concentration in water	Conc (Cv)	chem-specific	mg/cm3
permeability coefficient	Kp	calculated	cm/hr
Lag time per event (hours)	tau *(τ)*	calculated	hours
Time to reach steady-state (hours)	t*	calculated	hours
Dimensionless coefficient	B	calculated	
Pi	π	3.1416	
Exposure Time	t_event	8	hr/event
Number of exposure events	EV	1	event/day
Exposure Duration	ED	1	year
Exposure Frequency	EF	90	days/year
Exposed Skin Surface Area	SA	5700	cm2
Body Weight	BW	70	kg
Averaging time - noncarcinogenic	AT_N	1	years
Averaging time - carcinogenic	AT_C	70	years
Conversion Factor		0.001	mg/ug

Thickness of stratum corneum	*lsc* (cm)	0.001
Molecular Weight	g/mol	chem-specific
log octanol-water partition coefficient	Log Kow	chem-specific
log permeability coefficient	log Kp	calculated
Permeability coefficient (cm/hr)	Kp	calculated
Dimensionless ratio of the permeability coefficient of a compound through the stratum corneum relative to its permeability coefficient across the viable epidermis	B	calculated
across the stratum corneum (cm2/hr)	Dsc	calculated
Lag time per event (hours)	*τ*	calculated
Time to reach steady-state (hours)	t*	calculated
USEPA's methodology (see equations A7 and A8,	b,c	calculated

Constituent	Conc (mg/L)	Conc (mg/cm3)	MW	FA	Log Kow	Kp (cm/hr) Select	Log Kp	B	Dsc/lsc	Dsc (cm2/hr)	τ (hours)	b	c	t* (hours)	DA_inorg (mg/cm2-event)	DA_1 (mg/cm2-event)	DA_2 (mg/cm2-event)	Selected DA (mg/cm2-event)
Metals																		
Aluminum	9.4E+00	9.4E-03	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	7.52E-05	NA	NA	7.52E-05
Antimony	1.5E-03	1.5E-06	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	1.21E-08	NA	NA	1.21E-08
Arsenic	2.9E-01	2.9E-04	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	2.29E-06	NA	NA	2.29E-06
Barium	1.7E-01	1.7E-04	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	1.34E-06	NA	NA	1.34E-06
Beryllium	7.6E-04	7.6E-07	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	6.11E-09	NA	NA	6.11E-09
Boron	4.3E+00	4.3E-03	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	3.45E-05	NA	NA	3.45E-05
Cadmium	1.3E-03	1.3E-06	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	1.00E-08	NA	NA	1.00E-08
Chromium	3.6E-02	3.6E-05	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	2.86E-07	NA	NA	2.86E-07
Chromium (VI)	3.5E-04	3.5E-07	NA	1.0	NA	2.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	5.60E-09	NA	NA	5.60E-09
Cobalt	8.9E-03	8.9E-06	NA	1.0	NA	4.00E-04	NA	NA	NA	NA	NA	NA	NA	NA	2.85E-08	NA	NA	2.85E-08
Copper	4.7E-02	4.7E-05	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	3.73E-07	NA	NA	3.73E-07

Constituent	Conc (mg/L)	Conc (mg/cm3)	MW	FA	Log Kow	Kp (cm/hr) Select	Log Kp	B	Dsc/Isc	Dsc (cm2/hr)	τ (hours)	b	c	t* (hours)	DA_inorg (mg/cm2-event)	DA_1 (mg/cm2-event)	DA_2 (mg/cm2-event)	Selected DA (mg/cm2-event)
Iron	5.4E+01	5.4E-02	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	4.28E-04	NA	NA	4.28E-04
Lead	4.0E-02	4.0E-05	NA	1.0	NA	1.00E-04	NA	NA	NA	NA	NA	NA	NA	NA	3.20E-08	NA	NA	3.20E-08
Manganese	4.3E+00	4.3E-03	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	3.46E-05	NA	NA	3.46E-05
Mercury	1.2E-04	1.2E-07	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	9.68E-10	NA	NA	9.68E-10
Molybdenum	5.6E-03	5.6E-06	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	4.51E-08	NA	NA	4.51E-08
Nickel	5.5E-02	5.5E-05	NA	1.0	NA	2.00E-04	NA	NA	NA	NA	NA	NA	NA	NA	8.73E-08	NA	NA	8.73E-08
Selenium	1.9E-02	1.9E-05	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	1.51E-07	NA	NA	1.51E-07
Silver	1.2E-04	1.2E-07	NA	1.0	NA	6.00E-04	NA	NA	NA	NA	NA	NA	NA	NA	5.76E-10	NA	NA	5.76E-10
Thallium	5.0E-05	5.0E-08	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	4.00E-10	NA	NA	4.00E-10
Vanadium	3.2E-02	3.2E-05	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	2.56E-07	NA	NA	2.56E-07
Zinc	3.0E-01	3.0E-04	NA	1.0	NA	6.00E-04	NA	NA	NA	NA	NA	NA	NA	NA	1.45E-06	NA	NA	1.45E-06
Cyanide	6.3E-02	6.3E-05	NA	1.0	NA	1.00E-03	NA	NA	NA	NA	NA	NA	NA	NA	5.03E-07	NA	NA	5.03E-07
Pesticides/PCBs																		
4,4'-DDD	5.0E-03	5.0E-06	3.2E+02	0.8	5.8E+00	1.80E-01	-7.64E-01	1.24E+00	2.56E-05	2.56E-08	6.51E+00	1.8	1.39	2.55E+01	NA	1.44E-05	2.00E-05	1.44E-05
4,4'-DDE	7.8E-04	7.8E-07	3.2E+02	0.8	5.7E+00	1.60E-01	-8.25E-01	1.10E+00	2.63E-05	2.63E-08	6.35E+00	1.5	1.26	2.46E+01	NA	1.96E-06	2.65E-06	1.96E-06
4,4'-DDT	1.8E-04	1.8E-07	3.6E+02	0.7	6.4E+00	2.70E-01	-5.90E-01	1.96E+00	1.63E-05	1.63E-08	1.02E+01	3.5	2.07	4.16E+01	NA	8.51E-07	1.55E-06	8.51E-07
Aldrin	4.0E-04	4.0E-07	3.7E+02	1.0	3.0E+00	1.40E-03	-2.86E+00	1.03E-02	1.43E-05	1.43E-08	1.16E+01	0.3	0.34	2.79E+01	NA	1.51E-08	1.78E-08	1.51E-08
alpha-BHC	3.0E-04	3.0E-07	2.9E+02	1.0	4.1E+00	1.10E-02	-1.70E+00	7.22E-02	3.73E-05	3.73E-08	4.47E+00	0.3	0.38	1.07E+01	NA	5.46E-08	5.63E-08	5.46E-08
alpha-Chlordane	3.3E-04	3.3E-07	4.1E+02	0.7	5.5E+00	3.40E-02	-1.49E+00	2.65E-01	8.02E-06	8.02E-09	2.08E+01	0.5	0.53	4.99E+01	NA	2.83E-07	4.64E-07	2.83E-07
Atrazine	2.0E-03	2.0E-06	2.2E+02	1.0	2.6E+00	5.18E-03	-2.29E+00	2.93E-02	9.82E-05	9.82E-08	1.70E+00	0.3	0.35	4.07E+00	NA	1.06E-07	1.17E-07	1.17E-07
beta-BHC	3.7E-04	3.7E-07	2.9E+02	1.0	4.1E+00	1.10E-02	-1.70E+00	7.22E-02	3.73E-05	3.73E-08	4.47E+00	0.3	0.38	1.07E+01	NA	6.70E-08	6.91E-08	6.70E-08
delta-BHC	1.6E-04	1.6E-07	2.9E+02	1.0	4.1E+00	1.10E-02	-1.70E+00	7.22E-02	3.73E-05	3.73E-08	4.47E+00	0.3	0.38	1.07E+01	NA	2.91E-08	3.00E-08	2.91E-08
Diazinon	2.6E-04	2.6E-07	3.0E+02	1.0	3.8E+00	1.02E-02	-1.99E+00	6.87E-02	3.13E-05	3.13E-08	5.32E+00	0.3	0.38	1.28E+01	NA	4.79E-08	5.01E-08	4.79E-08
Dieldrin	9.2E-04	9.2E-07	3.8E+02	0.8	4.6E+00	1.20E-02	-1.92E+00	9.01E-02	1.17E-05	1.17E-08	1.43E+01	0.4	0.40	3.43E+01	NA	2.62E-07	3.41E-07	2.62E-07
Endosulfan I	3.3E-04	3.3E-07	4.1E+02	1.0	3.8E+00	2.81E-03	-2.55E+00	2.18E-02	8.34E-06	8.34E-09	2.00E+01	0.3	0.35	4.80E+01	NA	3.25E-08	4.53E-08	3.25E-08
Endosulfan II	2.3E-04	2.3E-07	4.1E+02	1.0	3.5E+00	1.76E-03	-2.76E+00	1.36E-02	8.34E-06	8.34E-09	2.00E+01	0.3	0.34	4.80E+01	NA	1.41E-08	1.95E-08	1.41E-08
Endosulfan sulfate	9.2E-05	9.2E-08	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	6.5E-04	6.5E-07	3.8E+02	0.8	4.6E+00	1.20E-02	-1.92E+00	9.01E-02	1.17E-05	1.17E-08	1.43E+01	0.4	0.40	3.43E+01	NA	1.83E-07	2.39E-07	1.83E-07
Endrin aldehyde	1.4E-04	1.4E-07	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	1.7E-04	1.7E-07	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
gamma-BHC	3.3E-04	3.3E-07	2.9E+02	1.0	4.1E+00	1.10E-02	-1.70E+00	7.22E-02	3.73E-05	3.73E-08	4.47E+00	0.3	0.38	1.07E+01	NA	5.96E-08	6.14E-08	5.96E-08
gamma-Chlordane	2.5E-04	2.5E-07	4.1E+02	0.7	5.5E+00	3.40E-02	-1.49E+00	2.65E-01	8.02E-06	8.02E-09	2.08E+01	0.5	0.53	4.99E+01	NA	2.12E-07	3.48E-07	2.12E-07
Heptachlor	1.1E-04	1.1E-07	3.7E+02	0.8	4.3E+00	8.60E-03	-2.07E+00	6.39E-02	1.28E-05	1.28E-08	1.30E+01	0.3	0.38	3.12E+01	NA	2.15E-08	2.68E-08	2.15E-08
Heptachlor epoxide	1.2E-04	1.2E-07	3.9E+02	1.0	5.0E+00	2.03E-02	-1.69E+00	1.54E-01	1.05E-05	1.05E-08	1.59E+01	0.4	0.44	3.82E+01	NA	7.58E-08	1.06E-07	7.58E-08
Methoxychlor	1.2E-04	1.2E-07	3.5E+02	1.0	5.1E+00	4.14E-02	-1.38E+00	2.96E-01	1.84E-05	1.84E-08	9.07E+00	0.5	0.55	2.18E+01	NA	1.17E-07	1.46E-07	1.17E-07
Aroclor-1260	9.6E-04	9.6E-07	4.0E+02	0.6	8.3E+00	7.50E-01	4.44E-01	5.74E+00	9.69E-06	9.69E-09	1.72E+01	23.1	5.78	7.60E+01	NA	1.40E-05	3.89E-05	1.40E-05
SVOCs/VOCs																		
1,4-Dioxane (p-dioxane)	7.8E-01	7.8E-04	8.8E+01	1.0	-2.7E-01	3.30E-04	-3.47E+00	1.19E-03	5.09E-04	5.09E-07	3.27E-01	0.3	0.33	7.86E-01	NA	1.15E-06	2.23E-06	2.23E-06
2,4,6-Trichlorophenol	7.1E-03	7.1E-06	2.0E+02	1.0	3.7E+00	3.50E-02	-1.47E+00	1.89E-01	1.24E-04	1.24E-07	1.34E+00	0.4	0.47	3.22E+00	NA	2.26E-06	2.47E-06	2.47E-06
2,4-Dimethylphenol	7.9E-02	7.9E-05	1.2E+02	1.0	2.3E+00	1.10E-02	-1.97E+00	4.68E-02	3.28E-04	3.28E-07	5.08E-01	0.3	0.37	1.22E+00	NA	4.82E-06	7.54E-06	7.54E-06
2-Chlorophenol	4.3E-03	4.3E-06	1.3E+02	1.0	2.2E+00	8.00E-03	-2.10E+00	3.49E-02	3.02E-04	3.02E-07	5.52E-01	0.3	0.36	1.33E+00	NA	2.00E-07	3.05E-07	3.05E-07
2-Methylnaphthalene	2.3E-01	2.3E-04	1.4E+02	1.0	3.9E+00	8.94E-02	-1.05E+00	4.10E-01	2.53E-04	2.53E-07	6.58E-01	0.6	0.65	1.58E+00	NA	1.28E-04	1.51E-04	1.51E-04
2-Methylphenol	1.2E-01	1.2E-04	1.1E+02	1.0	2.0E+00	7.70E-03	-2.12E+00	3.08E-02	3.93E-04	3.93E-07	4.24E-01	0.3	0.35	1.02E+00	NA	4.82E-06	8.17E-06	8.17E-06
2-Nitroaniline	1.0E-02	1.0E-05	1.4E+02	1.0	1.9E+00	4.44E-03	-2.35E+00	2.01E-02	2.67E-04	2.67E-07	6.24E-01	0.3	0.35	1.50E+00	NA	2.74E-07	4.05E-07	4.05E-07
3,4-methylphenol	8.4E-01	8.4E-04	1.1E+02	1.0	2.0E+00	7.70E-03	-2.12E+00	3.08E-02	3.93E-04	3.93E-07	4.24E-01	0.3	0.35	1.02E+00	NA	3.29E-05	5.58E-05	5.58E-05
4-Chloro-3-methylphenol	2.4E-02	2.4E-05	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	1.9E-01	1.9E-04	1.1E+02	1.0	2.0E+00	7.70E-03	-2.12E+00	3.08E-02	3.93E-04	3.93E-07	4.24E-01	0.3	0.35	1.02E+00	NA	7.59E-06	1.29E-05	1.29E-05
Acenaphthene	4.5E-03	4.5E-06	1.5E+02	1.0	3.9E+00	1.33E-01	-1.08E+00	6.35E-01	2.17E-04	2.17E-07	7.68E-01	0.9	0.84	3.04E+00	NA	4.10E-06	4.34E-06	4.34E-06
Acenaphthylene	9.5E-03	9.5E-06	1.5E+02	1.0	3.9E+00	1.41E-01	-1.05E+00	6.69E-01	2.23E-04	2.23E-07	7.48E-01	0.9	0.87	2.93E+00	NA	9.09E-06	9.59E-06	9.59E-06
Anthracene	3.2E-03	3.2E-06	1.8E+02	1.0	4.5E+00	2.25E-01	-8.61E-01	1.16E+00	1.59E-04	1.59E-07	1.05E+00	1.6	1.31	4.07E+00	NA	5.76E-06	5.42E-06	5.42E-06
Benzo(a)anthracene	9.0E-04	9.0E-07	2.3E+02	1.0	5.7E+00	4.70E-01	-3.43E-01	2.73E+00	8.35E-05	8.35E-08	2.00E+00	6.0	2.82	8.37E+00	NA	4.67E-06	4.74E-06	4.67E-06
Benzo(a)pyrene	5.0E-04	5.0E-07	2.5E+02	1.0	6.1E+00	7.00E-01	-1.74E-01	4.26E+00	6.31E-05	6.31E-08	2.64E+00	13.3	4.32	1.15E+01	NA	4.45E-06	5.09E-06	4.45E-06
Benzo(b)fluoranthene	7.6E-04	7.6E-07	2.5E+02	1.0	5.8E+00	6.99E-01	-3.98E-01	4.27E+00	6.12E-05	6.12E-08	2.72E+00	13.4	4.33	1.18E+01	NA	6.85E-06	7.94E-06	6.85E-06
Benzo(g,h,i)perylene	2.0E-04	2.0E-07	2.8E+02	1.0	6.6E+00	1.07E+00	2.83E-02	6.82E+00	4.49E-05	4.49E-08	3.71E+00	32.1	6.87	1.65E+01	NA	3.21E-06	4.39E-06	3.21E-06
Benzo(k)fluoranthene	4.6E-04	4.6E-07	2.5E+02	1.0	6.1E+00	6.60E-01	-1.80E-01	4.03E+00	6.12E-05	6.12E-08	2.72E+00	12.0	4.10	1.18E+01	NA	3.92E-06	4.52E-06	3.92E-06
Biphenyl (Diphenyl)	1.3E-03	1.3E-06	1.5E+02	1.0	4.0E+00	9.19E-02	-1.04E+00	4.39E-01	2.17E-04	2.17E-07	7.68E-01	0.6	0.67	1.84E+00	NA	8.18E-07	9.21E-07	9.21E-07
bis(2-Chloroethoxy)methane	2.0E-04	2.0E-07	1.7E+02	1.0	1.3E+00	1.23E-03	-2.91E+00	6.21E-03	1.70E-04	1.70E-07	9.79E-01	0.3	0.34	2.35E+00	NA	1.90E-09	2.44E-09	2.44E-09
bis(2-Ethylhexyl)phthalate	1.7E-02	1.7E-05	3.9E+02	1.0	5.1E+00	2.50E-02	-1.62E+00	1.90E-01	1.02E-05	1.02E-08	1.63E+01	0.4	0.47	3.91E+01	NA	1.33E-05	1.91E-05	1.33E-05
Bromoform	1.2E-02	1.2E-05	2.5E+02	1.0	2.4E+00	2.20E-03	-2.63E+00	1.35E-02	6.09E-05	6.09E-08	2.74E+00	0.3	0.34	6.56E+00	NA	3.41E-07	3.55E-07	3.55E-07
Caprolactam	2.4E-03	2.4E-06	1.1E+02	1.0	6.6E-01	1.00E-03	-3.00E+00	4.11E-03	3.68E-04	3.68E-07	4.52E-01	0.3	0.34	1.09E+00	NA	1.27E-08	2.14E-08	2.14E-08
Carbazole	1.3E-02	1.3E-05	1.7E+02	1.0	3.7E+00	5.23E-02	-1.28E+00	2.60E-01	1.83E-04	1.83E-07	9.08E-01	0.5	0.52	2.18E+00	NA	4.89E-06	5.65E-06	5.65E-06
Chrysene	1.1E-03	1.1E-06	2.3E+02	1.0	5.7E+00	4.70E-01	-3.43E-01	2.73E+00	8.35E-05	8.35E-08	2.00E+00	6.0	2.82	8.37E+00	NA	5.71E-06	5.79E-06	5.71E-06
Dibenz(a,h)anthracene	4.5E-05	4.5E-08	2.8E+02	0.6	6.5E+00	1.50E+00	-4.24E-02	9.63E+00	4.38E-05	4.38E-08	3.81E+00	62.2	9.66	1.72E+01	NA	6.18E-07	8.71E-07	6.18E-07
Diethylphthalate	1.0E-02	1.0E-05	2.2E+02	1.0	2.5E+00	3.90E-03	-2.41E+00	2.23E-02	9.05E-05	9.05E-08	1.84E+00	0.3	0.35	4.42E+00	NA	4.26E-07	4.66E-07	4.66E-07
Di-n-butyl phthalate	1.2E-02	1.2E-05	2.8E+02	0.9	4.1E+00	2.40E-02	-1.63E+00	1.54E-01	4.40E-05	4.40E-08	3.79E+00	0.4	0.44	9.10E+00	NA	3.83E-06	3.94E-06	3.83E-06

Constituent	Conc (mg/L)	Conc (mg/cm3)	MW	FA	Log Kow	Kp (cm/hr) Select	Log Kp	B	Dsc/Isc	Dsc (cm2/hr)	τ (hours)	b	c	t* (hours)	DA_inorg (mg/cm2-event)	DA_1 (mg/cm2-event)	DA_2 (mg/cm2-event)	Selected DA (mg/cm2-event)
Fluoranthene	2.4E-03	2.4E-06	2.0E+02	1.0	5.0E+00	2.20E-01	-6.66E-01	1.20E+00	1.17E-04	1.17E-07	1.43E+00	1.7	1.35	5.57E+00	NA	4.93E-06	4.70E-06	4.70E-06
Fluorene	2.6E-03	2.6E-06	1.7E+02	1.0	4.2E+00	1.71E-01	-9.72E-01	8.48E-01	1.86E-04	1.86E-07	8.97E-01	1.1	1.03	3.45E+00	NA	3.29E-06	3.26E-06	3.26E-06
Hexachloroethane	1.0E-03	1.0E-06	2.4E+02	1.0	3.9E+00	3.00E-02	-1.53E+00	1.78E-01	7.49E-05	7.49E-08	2.23E+00	0.4	0.46	5.34E+00	NA	3.50E-07	3.60E-07	3.60E-07
Indeno(1,2,3-c,d)pyrene	2.0E-04	2.0E-07	2.8E+02	0.6	6.6E+00	1.00E+00	-4.48E-03	6.39E+00	4.49E-05	4.49E-08	3.71E+00	28.4	6.44	1.65E+01	NA	1.81E-06	2.45E-06	1.81E-06
Naphthalene	1.4E-01	1.4E-04	1.3E+02	1.0	3.3E+00	4.70E-02	-1.34E+00	2.05E-01	3.03E-04	3.03E-07	5.49E-01	0.4	0.48	1.32E+00	NA	3.71E-05	5.10E-05	5.10E-05
Nitrobenzene	2.0E-03	2.0E-06	1.2E+02	1.0	1.9E+00	5.39E-03	-2.27E+00	2.30E-02	3.24E-04	3.24E-07	5.14E-01	0.3	0.35	1.23E+00	NA	6.04E-08	9.56E-08	9.56E-08
N-Nitrosodi-n-propylamine	2.0E-03	2.0E-06	1.3E+02	1.0	1.4E+00	2.34E-03	-2.63E+00	1.03E-02	2.96E-04	2.96E-07	5.64E-01	0.3	0.34	1.35E+00	NA	2.74E-08	4.23E-08	4.23E-08
N-Nitrosodiphenylamine	1.2E-03	1.2E-06	2.0E+02	1.0	3.1E+00	2.60E-02	-1.84E+00	1.41E-01	1.23E-04	1.23E-07	1.35E+00	0.4	0.43	3.25E+00	NA	2.84E-07	3.15E-07	3.15E-07
Pentachlorophenol	1.1E-02	1.1E-05	2.7E+02	0.9	5.9E+00	3.90E-01	-4.24E-01	2.45E+00	5.11E-05	5.11E-08	3.26E+00	5.0	2.54	1.36E+01	NA	5.59E-05	6.64E-05	5.59E-05
Phenanthrene	6.0E-03	6.0E-06	1.8E+02	1.0	4.5E+00	1.40E-01	-8.54E-01	7.19E-01	1.59E-04	1.59E-07	1.05E+00	1.0	0.91	4.05E+00	NA	6.72E-06	6.71E-06	6.71E-06
Pyrene	2.4E-03	2.4E-06	2.0E+02	1.0	4.9E+00	3.24E-01	-7.12E-01	1.77E+00	1.17E-04	1.17E-07	1.43E+00	3.0	1.89	5.76E+00	NA	7.26E-06	6.79E-06	6.79E-06
1,1-Dichloroethane	5.6E-01	5.6E-04	9.9E+01	1.0	1.8E+00	6.70E-03	-2.17E+00	2.56E-02	4.42E-04	4.42E-07	3.77E-01	0.3	0.35	9.05E-01	NA	1.79E-05	3.20E-05	3.20E-05
1,1-Dichloroethene	4.2E-02	4.2E-05	9.7E+01	1.0	2.1E+00	1.20E-02	-1.94E+00	4.54E-02	4.54E-04	4.54E-07	3.67E-01	0.3	0.36	8.80E-01	NA	2.36E-06	4.20E-06	4.20E-06
1,1,1-Trichloroethane	1.2E-01	1.2E-04	1.3E+02	1.0	2.5E+00	1.30E-02	-1.90E+00	5.77E-02	2.84E-04	2.84E-07	5.87E-01	0.3	0.37	1.41E+00	NA	9.19E-06	1.35E-05	1.35E-05
1,1,2-Trichloroethane	1.3E-02	1.3E-05	1.3E+02	1.0	2.1E+00	6.40E-03	-2.19E+00	2.84E-02	2.84E-04	2.84E-07	5.87E-01	0.3	0.35	1.41E+00	NA	5.11E-07	7.66E-07	7.66E-07
1,1,2,2-Tetrachloroethane	1.3E-02	1.3E-05	1.7E+02	1.0	2.4E+00	6.90E-03	-2.16E+00	3.44E-02	1.82E-04	1.82E-07	9.16E-01	0.3	0.36	2.20E+00	NA	6.67E-07	8.59E-07	8.59E-07
1,2,3-Trichlorobenzene	2.7E-03	2.7E-06	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	1.5E-02	1.5E-05	1.8E+02	1.0	4.0E+00	6.60E-02	-1.19E+00	3.42E-01	1.53E-04	1.53E-07	1.09E+00	0.6	0.59	2.62E+00	NA	8.14E-06	8.81E-06	8.81E-06
1,2,4-Trimethylbenzene	2.8E-01	2.8E-04	1.2E+02	1.0	3.6E+00	8.37E-02	-1.08E+00	3.53E-01	3.36E-04	3.36E-07	4.95E-01	0.6	0.60	1.19E+00	NA	1.28E-04	1.68E-04	1.68E-04
1,2-Dibromo-3-chloropropane	2.4E-03	2.4E-06	2.4E+02	1.0	3.0E+00	6.76E-03	-2.17E+00	4.00E-02	7.53E-05	7.53E-08	2.21E+00	0.3	0.36	5.32E+00	NA	1.89E-07	2.00E-07	2.00E-07
1,2-Dichlorobenzene	7.3E-01	7.3E-04	1.5E+02	1.0	3.4E+00	4.10E-02	-1.39E+00	1.91E-01	2.38E-04	2.38E-07	7.00E-01	0.4	0.47	1.68E+00	NA	1.97E-04	2.52E-04	2.52E-04
1,2-Dichloroethane	1.4E-02	1.4E-05	9.9E+01	1.0	1.5E+00	6.70E-03	-2.38E+00	2.56E-02	4.42E-04	4.42E-07	3.77E-01	0.3	0.35	9.05E-01	NA	4.62E-07	8.25E-07	8.25E-07
1,2-Dichloropropane	5.1E-03	5.1E-06	1.1E+02	1.0	2.0E+00	7.80E-03	-2.11E+00	3.19E-02	3.69E-04	3.69E-07	4.51E-01	0.3	0.35	1.08E+00	NA	2.09E-07	3.45E-07	3.45E-07
1,3-Dichlorobenzene	2.7E-02	2.7E-05	1.5E+02	1.0	3.6E+00	5.80E-02	-1.25E+00	2.70E-01	2.38E-04	2.38E-07	7.00E-01	0.5	0.53	1.68E+00	NA	1.03E-05	1.27E-05	1.27E-05
1,3,5-Trimethylbenzene	1.1E-01	1.1E-04	1.2E+02	1.0	3.4E+00	6.08E-02	-1.22E+00	2.56E-01	3.36E-04	3.36E-07	4.95E-01	0.5	0.52	1.19E+00	NA	3.69E-05	5.10E-05	5.10E-05
1,4-Dichlorobenzene	2.2E-01	2.2E-04	1.5E+02	1.0	3.4E+00	4.20E-02	-1.39E+00	1.96E-01	2.38E-04	2.38E-07	7.00E-01	0.4	0.47	1.68E+00	NA	5.98E-05	7.65E-05	7.65E-05
2-Chlorotoluene	2.9E-03	2.9E-06	1.3E+02	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	2.4E-02	2.4E-05	1.0E+02	1.0	1.4E+00	3.55E-03	-2.45E+00	1.37E-02	4.36E-04	4.36E-07	3.83E-01	0.3	0.34	9.18E-01	NA	4.04E-07	7.24E-07	7.24E-07
2,2-Dichloropropane	5.0E-04	5.0E-07	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	4.9E-01	4.9E-04	5.8E+01	1.0	-2.4E-01	5.20E-04	-3.28E+00	1.53E-03	7.49E-04	7.49E-07	2.22E-01	0.3	0.33	5.34E-01	NA	9.31E-07	2.13E-06	2.13E-06
Benzene	4.0E-01	4.0E-04	7.8E+01	1.0	2.1E+00	1.50E-02	-1.83E+00	5.10E-02	5.79E-04	5.79E-07	2.88E-01	0.3	0.37	6.91E-01	NA	2.52E-05	4.93E-05	4.93E-05
Carbon disulfide	3.1E-03	3.1E-06	8.0E+01	1.0	2.2E+00	1.70E-02	-1.77E+00	5.85E-02	5.65E-04	5.65E-07	2.95E-01	0.3	0.37	7.08E-01	NA	2.24E-07	4.31E-07	4.31E-07
Carbon tetrachloride	3.0E-04	3.0E-07	1.5E+02	1.0	2.8E+00	1.60E-02	-1.79E+00	7.63E-02	2.18E-04	2.18E-07	7.64E-01	0.4	0.39	1.83E+00	NA	3.28E-08	4.36E-08	4.36E-08
Chlorobenzene	6.7E-01	6.7E-04	1.1E+02	1.0	2.8E+00	2.80E-02	-1.56E+00	1.14E-01	3.71E-04	3.71E-07	4.49E-01	0.4	0.41	1.08E+00	NA	9.89E-05	1.54E-04	1.54E-04
Chloroethane	9.7E-02	9.7E-05	6.5E+01	1.0	1.4E+00	6.10E-03	-2.22E+00	1.88E-02	6.90E-04	6.90E-07	2.42E-01	0.3	0.35	5.80E-01	NA	2.28E-06	4.96E-06	4.96E-06
Chloroform	4.4E-03	4.4E-06	1.2E+02	1.0	2.0E+00	6.80E-03	-2.17E+00	2.86E-02	3.40E-04	3.40E-07	4.90E-01	0.3	0.35	1.18E+00	NA	1.64E-07	2.63E-07	2.63E-07
Chloromethane	7.4E-03	7.4E-06	5.1E+01	1.0	9.1E-01	3.30E-03	-2.48E+00	9.02E-03	8.26E-04	8.26E-07	2.02E-01	0.3	0.34	4.84E-01	NA	8.57E-08	2.04E-07	2.04E-07
cis-1,2-Dichloroethene	1.4E+01	1.4E-02	9.7E+01	1.0	2.1E+00	1.09E-02	-1.96E+00	4.12E-02	4.54E-04	4.54E-07	3.67E-01	0.3	0.36	8.81E-01	NA	7.07E-04	1.26E-03	1.26E-03
cis-1,3-Dichloropropene	4.2E-03	4.2E-06	1.1E+02	1.0	1.6E+00	4.30E-03	-2.37E+00	1.74E-02	3.79E-04	3.79E-07	4.40E-01	0.3	0.35	1.06E+00	NA	9.37E-08	1.58E-07	1.58E-07
Cyclohexane	1.8E-02	1.8E-05	8.4E+01	1.0	3.4E+00	9.98E-02	-1.00E+00	3.52E-01	5.35E-04	5.35E-07	3.11E-01	0.6	0.60	7.47E-01	NA	7.83E-06	1.21E-05	1.21E-05
Ethyl tert-butyl ether (ETBE)	1.2E-03	1.2E-06	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	4.5E-01	4.5E-04	1.1E+02	1.0	3.2E+00	4.90E-02	-1.32E+00	1.94E-01	4.03E-04	4.03E-07	4.14E-01	0.4	0.47	9.93E-01	NA	1.11E-04	1.69E-04	1.69E-04
Isopropyl ether	4.3E-01	4.3E-04	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene (cumene)	2.7E-02	2.7E-05	1.2E+02	1.0	3.7E+00	8.76E-02	-1.06E+00	3.69E-01	3.36E-04	3.36E-07	4.95E-01	0.6	0.61	1.19E+00	NA	1.30E-05	1.70E-05	1.70E-05
Methyl acetate	2.3E-02	2.3E-05	7.4E+01	1.0	1.8E-01	8.02E-04	-3.10E+00	2.65E-03	6.10E-04	6.10E-07	2.73E-01	0.3	0.34	6.56E-01	NA	7.38E-08	1.54E-07	1.54E-07
Methyl ethyl ketone	4.3E-01	4.3E-04	7.2E+01	1.0	2.9E-01	9.60E-04	-3.01E+00	3.13E-03	6.26E-04	6.26E-07	2.66E-01	0.3	0.34	6.39E-01	NA	1.66E-06	3.51E-06	3.51E-06
Methyl isobutyl ketone	4.9E+00	4.9E-03	1.0E+02	1.0	1.2E+00	2.66E-03	-2.57E+00	1.02E-02	4.37E-04	4.37E-07	3.82E-01	0.3	0.34	9.16E-01	NA	6.25E-05	1.12E-04	1.12E-04
Methyl tert-butyl ether	2.0E-02	2.0E-05	8.8E+01	1.0	9.4E-01	2.12E-03	-2.67E+00	7.66E-03	5.09E-04	5.09E-07	3.28E-01	0.3	0.34	7.87E-01	NA	1.91E-07	3.67E-07	3.67E-07
Methylcyclohexane	2.5E-02	2.5E-05	9.8E+01	1.0	3.6E+00	1.08E-01	-9.67E-01	4.11E-01	4.47E-04	4.47E-07	3.73E-01	0.6	0.65	8.95E-01	NA	1.26E-05	1.77E-05	1.77E-05
Methylene chloride	8.2E-03	8.2E-06	8.5E+01	1.0	1.3E+00	3.50E-03	-2.45E+00	1.24E-02	5.30E-04	5.30E-07	3.14E-01	0.3	0.34	7.54E-01	NA	1.26E-07	2.45E-07	2.45E-07
n-Butylbenzene	6.1E-03	6.1E-06	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Propylbenzene	5.6E-02	5.6E-05	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	4.8E-02	4.8E-05	9.4E+01	1.0	1.5E+00	4.30E-03	-2.36E+00	1.60E-02	4.71E-04	4.71E-07	3.54E-01	0.3	0.34	8.49E-01	NA	9.61E-07	1.77E-06	1.77E-06
p-Cymene (p-isopropyltoluene)	7.9E-02	7.9E-05	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	5.6E-03	5.6E-06	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	1.4E-02	1.4E-05	1.0E+02	1.0	3.0E+00	3.70E-02	-1.44E+00	1.45E-01	4.14E-04	4.14E-07	4.03E-01	0.4	0.44	9.66E-01	NA	2.56E-06	4.07E-06	4.07E-06
tert-Butylbenzene	2.1E-03	2.1E-06	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
tert-Butyl alcohol	1.2E-01	1.2E-04	NA	1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	1.2E-02	1.2E-05	1.7E+02	1.0	3.4E+00	3.30E-02	-1.48E+00	1.63E-01	1.87E-04	1.87E-07	8.92E-01	0.4	0.45	2.14E+00	NA	2.92E-06	3.54E-06	3.54E-06
Toluene	6.1E+00	6.1E-03	9.2E+01	1.0	2.7E+00	3.10E-02	-1.51E+00	1.14E-01	4.83E-04	4.83E-07	3.45E-01	0.4	0.41	8.28E-01	NA	8.70E-04	1.51E-03	1.51E-03
trans-1,2-Dichloroethene	4.0E-01	4.0E-04	9.7E+01	1.0	1.9E+00	7.70E-03	-2.12E+00	2.92E-02	4.54E-04	4.54E-07	3.67E-01	0.3	0.35	8.80E-01	NA	1.46E-05	2.64E-05	2.64E-05
trans-1,3-Dichloropropene	4.1E-03	4.1E-06	1.1E+02	1.0	1.6E+00	4.30E-03	-2.37E+00	1.74E-02	3.79E-04	3.79E-07	4.40E-01	0.3	0.35	1.06E+00	NA	9.14E-08	1.54E-07	1.54E-07
Trichloroethene	5.7E-02	5.7E-05	1.3E+02	1.0	2.4E+00	1.20E-02	-1.94E+00	5.29E-02	2.91E-04	2.91E-07	5.72E-01	0.3	0.37	1.37E+00	NA	4.04E-06	6.02E-06	6.02E-06
Vinyl chloride	1.6E+00	1.6E-03	6.3E+01	1.0	1.4E+00	5.60E-03	-2.25E+00	1.70E-02	7.08E-04	7.08E-07	2.35E-01	0.3	0.34	5.65E-01	NA	3.46E-05	7.60E-05	7.60E-05
m,p-Xylene	9.4E-01	9.4E-04	1.1E+02	1.0	NA	5.30E-02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Constituent	Conc (mg/L)	Conc (mg/cm3)	MW	FA	Log Kow	Kp (cm/hr) Select	Log Kp	B	Dsc/Isc	Dsc (cm2/hr)	τ (hours)	b	c	t* (hours)	DA_inorg (mg/cm2-event)	DA_1 (mg/cm2-event)	DA_2 (mg/cm2-event)	Selected DA (mg/cm2-event)
o-Xylene	4.4E-01	4.4E-04	1.1E+02	1.0	3.1E+00	7.04E-02	-1.34E+00	2.79E-01	4.03E-04	4.03E-07	4.13E-01	0.5	0.54	9.92E-01	NA	1.57E-04	2.29E-04	2.29E-04
Xylenes, total	1.6E+00	1.6E-03	1.1E+02	1.0	3.2E+00	5.30E-02	-1.28E+00	2.10E-01	4.03E-04	4.03E-07	4.14E-01	0.4	0.49	9.93E-01	NA	4.26E-04	6.45E-04	6.45E-04
Dioxans/Furans																		
1,2,3,4,6,7,8-HpCDD	4.6E-07	4.6E-10	4.3E+02	0.5	8.2E+00	8.10E-01	2.30E-01	6.42E+00	6.58E-06	6.58E-09	2.53E+01	28.6	6.47	1.13E+02	NA	7.40E-09	2.51E-08	7.40E-09
1,2,3,4,6,7,8-HpCDF	9.5E-08	9.5E-11	4.1E+02	0.5	7.9E+00	8.10E-01	1.35E-01	6.30E+00	8.09E-06	8.09E-09	2.06E+01	27.6	6.35	9.15E+01	NA	1.36E-09	4.17E-09	1.36E-09
1,2,3,4,7,8,9-HpCDF	9.8E-09	9.8E-12	4.1E+02	0.5	7.9E+00	8.10E-01	1.35E-01	6.30E+00	8.09E-06	8.09E-09	2.06E+01	27.6	6.35	9.15E+01	NA	1.41E-10	4.30E-10	1.41E-10
1,2,3,4,7,8-HxCDD	2.6E-09	2.6E-12	3.9E+02	0.5	8.2E+00	8.10E-01	4.30E-01	6.16E+00	1.03E-05	1.03E-08	1.62E+01	26.4	6.21	7.20E+01	NA	3.35E-11	9.10E-11	3.35E-11
1,2,3,4,7,8-HxCDF	8.5E-09	8.5E-12	3.7E+02	0.5	7.6E+00	8.10E-01	1.04E-01	6.03E+00	1.26E-05	1.26E-08	1.32E+01	25.4	6.08	5.85E+01	NA	9.78E-11	2.40E-10	9.78E-11
1,2,3,6,7,8-HxCDD	1.3E-08	1.3E-11	3.9E+02	0.5	8.2E+00	8.10E-01	4.30E-01	6.16E+00	1.03E-05	1.03E-08	1.62E+01	26.4	6.21	7.20E+01	NA	1.70E-10	4.61E-10	1.70E-10
1,2,3,6,7,8-HxCDF	1.6E-09	1.6E-12	3.7E+02	0.5	7.6E+00	8.10E-01	1.04E-01	6.03E+00	1.26E-05	1.26E-08	1.32E+01	25.4	6.08	5.85E+01	NA	1.86E-11	4.56E-11	1.86E-11
1,2,3,7,8,9-HxCDD	4.4E-09	4.4E-12	3.9E+02	0.5	8.2E+00	8.10E-01	4.30E-01	6.16E+00	1.03E-05	1.03E-08	1.62E+01	26.4	6.21	7.20E+01	NA	5.62E-11	1.53E-10	5.62E-11
1,2,3,7,8,9-HxCDF	3.9E-09	3.9E-12	3.7E+02	0.5	7.6E+00	8.10E-01	1.04E-01	6.03E+00	1.26E-05	1.26E-08	1.32E+01	25.4	6.08	5.85E+01	NA	4.45E-11	1.09E-10	4.45E-11
1,2,3,7,8-PeCDD	1.1E-09	1.1E-12	3.6E+02	0.5	6.3E+00	8.10E-01	-6.38E-01	5.88E+00	1.60E-05	1.60E-08	1.04E+01	24.2	5.93	4.61E+01	NA	1.10E-11	2.40E-11	1.10E-11
1,2,3,7,8-PeCDF	2.3E-09	2.3E-12	3.4E+02	0.5	6.8E+00	8.10E-01	-2.25E-01	5.75E+00	1.97E-05	1.97E-08	8.48E+00	23.2	5.80	3.74E+01	NA	2.10E-11	4.14E-11	2.10E-11
2,3,4,6,7,8-HxCDF	3.9E-09	3.9E-12	3.7E+02	0.5	7.6E+00	8.10E-01	1.04E-01	6.03E+00	1.26E-05	1.26E-08	1.32E+01	25.4	6.08	5.85E+01	NA	4.54E-11	1.11E-10	4.54E-11
2,3,4,7,8-PeCDF	2.6E-09	2.6E-12	3.4E+02	0.5	6.8E+00	8.10E-01	-2.25E-01	5.75E+00	1.97E-05	1.97E-08	8.48E+00	23.2	5.80	3.74E+01	NA	2.43E-11	4.79E-11	2.43E-11
2,3,7,8-TCDF	1.7E-09	1.7E-12	3.1E+02	0.5	6.5E+00	8.10E-01	-2.04E-01	5.45E+00	3.07E-05	3.07E-08	5.44E+00	21.0	5.50	2.39E+01	NA	1.24E-11	1.98E-11	1.24E-11
OCDD	2.2E-06	2.2E-09	4.6E+02	0.5	9.5E+00	8.10E-01	8.95E-01	6.68E+00	4.22E-06	4.22E-09	3.95E+01	30.8	6.72	1.76E+02	NA	4.34E-08	1.84E-07	4.34E-08
OCDF	7.4E-07	7.4E-10	4.4E+02	0.5	8.6E+00	8.10E-01	3.91E-01	6.56E+00	5.19E-06	5.19E-09	3.21E+01	29.8	6.61	1.43E+02	NA	1.33E-08	5.10E-08	1.33E-08

Table 2-19
Emissions to Air from Standing Water
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Source: CalEPA, DTSC, 2004.
Emissions equation:

$$E_i = K_i \times A_w \times C_w$$

E_i	Emissions from liquid surface (mg/s)
K_i	Overall mass transfer coefficient (cm/s)
C_w	Concentration in liquid phase (mg/cm^3)
A_w	Bottom area of the trench covered with contaminated water (cm^2)

Overall Mass Transfer Coefficient:

$$\frac{1}{K_i} = \frac{1}{k_{iL}} + \frac{RT}{k_{iG} H_i}$$

K_i	overall mass transfer coefficient (cm/s)
k_{iL}	liquid-phase mass transfer coefficient (cm/s)
k_{iG}	gas-phase mass transfer coefficient (cm/s)
R	gas constant, 8.25x10^{-5} (atm-m^3/mol-K)
T	average temperature (K)
H_i	Henry's Law constant (atm-m^3/mol)

Chemical	Concentration in Water (mg/L)	Concentration in Water (mg/cm^3)	Henry's Law Constant (atm-m^3/mol)	k_{iL}	k_{iG}	$1/K_i$	K_i (cm/s)	E (mg/s)
Metals								
Aluminum	9.40E+00	9.40E-03	NA	NA	NA	NA	NA	NA
Antimony	1.51E-03	1.51E-06	NA	NA	NA	NA	NA	NA
Arsenic	2.87E-01	2.87E-04	NA	NA	NA	NA	NA	NA
Barium	1.68E-01	1.68E-04	NA	NA	NA	NA	NA	NA
Beryllium	7.64E-04	7.64E-07	NA	NA	NA	NA	NA	NA
Boron	4.31E+00	4.31E-03	NA	NA	NA	NA	NA	NA
Cadmium	1.26E-03	1.26E-06	NA	NA	NA	NA	NA	NA
Chromium	3.57E-02	3.57E-05	NA	NA	NA	NA	NA	NA
Chromium (VI)	3.50E-04	3.50E-07	NA	NA	NA	NA	NA	NA
Cobalt	8.89E-03	8.89E-06	NA	NA	NA	NA	NA	NA
Copper	4.66E-02	4.66E-05	NA	NA	NA	NA	NA	NA
Iron	5.35E+01	5.35E-02	NA	NA	NA	NA	NA	NA
Lead	4.00E-02	4.00E-05	NA	NA	NA	NA	NA	NA
Manganese	4.33E+00	4.33E-03	NA	NA	NA	NA	NA	NA
Mercury	1.21E-04	1.21E-07	NA	NA	NA	NA	NA	NA
Molybdenum	5.64E-03	5.64E-06	NA	NA	NA	NA	NA	NA
Nickel	5.46E-02	5.46E-05	NA	NA	NA	NA	NA	NA
Selenium	1.89E-02	1.89E-05	NA	NA	NA	NA	NA	NA
Silver	1.20E-04	1.20E-07	NA	NA	NA	NA	NA	NA
Thallium	5.00E-05	5.00E-08	NA	NA	NA	NA	NA	NA
Vanadium	3.19E-02	3.19E-05	NA	NA	NA	NA	NA	NA
Zinc	3.03E-01	3.03E-04	NA	NA	NA	NA	NA	NA
Cyanide	6.29E-02	6.29E-05	NA	NA	NA	NA	NA	NA
Pesticides/PCBs								
4,4'-DDD	5.00E-03	5.00E-06	NA	NA	NA	NA	NA	NA
4,4'-DDE	7.76E-04	7.76E-07	NA	NA	NA	NA	NA	NA
4,4'-DDT	1.80E-04	1.80E-07	NA	NA	NA	NA	NA	NA
Aldrin	4.05E-04	4.05E-07	NA	NA	NA	NA	NA	NA
alpha-BHC	3.00E-04	3.00E-07	NA	NA	NA	NA	NA	NA
alpha-Chlordane	3.34E-04	3.34E-07	NA	NA	NA	NA	NA	NA
Atrazine	2.00E-03	2.00E-06	NA	NA	NA	NA	NA	NA
beta-BHC	3.69E-04	3.69E-07	NA	NA	NA	NA	NA	NA
delta-BHC	1.60E-04	1.60E-07	NA	NA	NA	NA	NA	NA
Diazinon	2.60E-04	2.60E-07	NA	NA	NA	NA	NA	NA
Dieldrin	9.24E-04	9.24E-07	NA	NA	NA	NA	NA	NA
Endosulfan I	3.31E-04	3.31E-07	NA	NA	NA	NA	NA	NA
Endosulfan II	2.30E-04	2.30E-07	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	9.20E-05	9.20E-08	NA	NA	NA	NA	NA	NA
Endrin	6.46E-04	6.46E-07	NA	NA	NA	NA	NA	NA
Endrin aldehyde	1.40E-04	1.40E-07	NA	NA	NA	NA	NA	NA
Endrin ketone	1.70E-04	1.70E-07	NA	NA	NA	NA	NA	NA
gamma-BHC	3.28E-04	3.28E-07	NA	NA	NA	NA	NA	NA
gamma-Chlordane	2.50E-04	2.50E-07	NA	NA	NA	NA	NA	NA
Heptachlor	1.11E-04	1.11E-07	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	1.20E-04	1.20E-07	NA	NA	NA	NA	NA	NA
Methoxychlor	1.20E-04	1.20E-07	NA	NA	NA	NA	NA	NA
Aroclor-1260	9.63E-04	9.63E-07	NA	NA	NA	NA	NA	NA
SVOCs/VOCs								
1,4-Dioxane (p-dioxane)	7.80E-01	7.80E-04	NA	NA	NA	NA	NA	NA

Chemical	Concentration in Water (mg/L)	Concentration in Water (mg/cm^3)	Henry's Law Constant (atm-m^3/mol)	k_{iL}	k_{iG}	$1/K_i$	K_i (cm/s)	E (mg/s)
2,4,6-Trichlorophenol	7.14E-03	7.14E-06	NA	NA	NA	NA	NA	NA
2,4-Dimethylphenol	7.87E-02	7.87E-05	NA	NA	NA	NA	NA	NA
2-Chlorophenol	4.30E-03	4.30E-06	3.91E-04	9.92E-04	4.30E-01	1.15E+03	0.00086642	2.42E-04
2-Methylnaphthalene	2.26E-01	2.26E-04	NA	9.49E-04	4.17E-01	NA	NA	NA
2-Methylphenol	1.23E-01	1.23E-04	NA	NA	NA	NA	NA	NA
2-Nitroaniline	1.00E-02	1.00E-05	NA	NA	NA	NA	NA	NA
3,4-methylphenol	8.40E-01	8.40E-04	NA	NA	NA	NA	NA	NA
4-Chloro-3-methylphenol	2.38E-02	2.38E-05	NA	NA	NA	NA	NA	NA
4-Methylphenol	1.94E-01	1.94E-04	NA	NA	NA	NA	NA	NA
Acenaphthene	4.50E-03	4.50E-06	1.55E-04	9.11E-04	4.06E-01	1.49E+03	0.00067176	1.97E-04
Acenaphthylene	9.54E-03	9.54E-06	1.13E-05	9.17E-04	4.07E-01	6.43E+03	0.00015551	9.64E-05
Anthracene	3.20E-03	3.20E-06	6.50E-05	8.48E-04	3.87E-01	2.16E+03	0.00046348	9.65E-05
Benzo(a)anthracene	9.00E-04	9.00E-07	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	5.00E-04	5.00E-07	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	7.60E-04	7.60E-07	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	2.00E-04	2.00E-07	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	4.60E-04	4.60E-07	NA	NA	NA	NA	NA	NA
Biphenyl (Diphenyl)	1.30E-03	1.30E-06	3.00E-04	NA	NA	NA	NA	NA
bis(2-Chloroethoxy)methane	2.00E-04	2.00E-07	NA	8.60E-04	3.90E-01	NA	NA	NA
bis(2-Ethylhexyl)phthalate	1.69E-02	1.69E-05	NA	NA	NA	NA	NA	NA
Bromoform	1.20E-02	1.20E-05	5.35E-04	7.12E-04	3.44E-01	1.54E+03	0.00064985	5.07E-04
Caprolactam	2.40E-03	2.40E-06	NA	NA	NA	NA	NA	NA
Carbazole	1.25E-02	1.25E-05	NA	NA	NA	NA	NA	NA
Chrysene	1.10E-03	1.10E-06	9.46E-05	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	4.50E-05	4.50E-08	NA	NA	NA	NA	NA	NA
Diethylphthalate	1.03E-02	1.03E-05	NA	NA	NA	NA	NA	NA
Di-n-butyl phthalate	1.17E-02	1.17E-05	NA	NA	NA	NA	NA	NA
Fluoranthene	2.40E-03	2.40E-06	NA	NA	NA	NA	NA	NA
Fluorene	2.60E-03	2.60E-06	7.70E-05	8.78E-04	3.96E-01	1.95E+03	0.0005137	8.69E-05
Hexachloroethane	1.00E-03	1.00E-06	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-c,d)pyrene	2.00E-04	2.00E-07	NA	NA	NA	NA	NA	NA
Naphthalene	1.36E-01	1.36E-04	4.83E-04	9.99E-04	4.32E-01	1.12E+03	0.000894	7.92E-03
Nitrobenzene	2.00E-03	2.00E-06	2.39E-05	1.03E-03	4.41E-01	3.30E+03	0.00030305	3.94E-05
N-Nitrosodi-n-propylamine	2.00E-03	2.00E-06	NA	NA	NA	NA	NA	NA
N-Nitrosodiphenylamine	1.20E-03	1.20E-06	NA	NA	NA	NA	NA	NA
Pentachlorophenol	1.13E-02	1.13E-05	NA	NA	NA	NA	NA	NA
Phenanthrene	6.00E-03	6.00E-06	NA	NA	NA	NA	NA	NA
Pyrene	2.40E-03	2.40E-06	1.10E-05	8.00E-04	3.72E-01	7.26E+03	0.00013772	2.15E-05
1,1-Dichloroethane	5.57E-01	5.57E-04	5.62E-03	1.14E-03	4.71E-01	8.89E+02	0.00112518	4.08E-02
1,1-Dichloroethene	4.16E-02	4.16E-05	2.61E-02	1.15E-03	4.74E-01	8.73E+02	0.00114612	3.10E-03
1,1,1-Trichloroethane	1.18E-01	1.18E-04	1.72E-02	9.81E-04	4.26E-01	1.02E+03	0.00097781	7.50E-03
1,1,2-Trichloroethane	1.33E-02	1.33E-05	9.13E-04	9.81E-04	4.26E-01	1.08E+03	0.00092377	8.01E-04
1,1,2,2-Tetrachloroethane	1.29E-02	1.29E-05	3.45E-04	8.73E-04	3.94E-01	1.33E+03	0.0007539	6.33E-04
1,2,3-Trichlorobenzene	2.72E-03	2.72E-06	1.42E-03	8.40E-04	3.84E-01	1.24E+03	0.00080926	1.43E-04
1,2,4-Trichlorobenzene	1.51E-02	1.51E-05	1.42E-03	8.41E-04	3.84E-01	1.23E+03	0.00081026	7.95E-04
1,2,4-Trimethylbenzene	2.78E-01	2.78E-04	5.70E-03	1.03E-03	4.41E-01	9.79E+02	0.00102167	1.84E-02
1,2-Dibromo-3-chloropropane	2.40E-03	2.40E-06	1.47E-04	7.36E-04	3.52E-01	1.83E+03	0.00054508	8.51E-05
1,2-Dichlorobenzene	7.34E-01	7.34E-04	1.90E-03	9.33E-04	4.12E-01	1.10E+03	0.00090658	4.33E-02
1,2-Dichloroethane	1.44E-02	1.44E-05	9.79E-04	1.14E-03	4.71E-01	9.33E+02	0.00107202	1.00E-03
1,2-Dichloropropane	5.10E-03	5.10E-06	2.80E-03	1.06E-03	4.50E-01	9.59E+02	0.00104266	3.46E-04
1,3-Dichlorobenzene	2.71E-02	2.71E-05	1.90E-03	9.33E-04	4.12E-01	1.10E+03	0.00090658	1.60E-03
1,3,5-Trimethylbenzene	1.10E-01	1.10E-04	7.71E-03	1.03E-03	4.41E-01	9.76E+02	0.00102433	7.34E-03
1,4-Dichlorobenzene	2.18E-01	2.18E-04	2.43E-03	9.33E-04	4.12E-01	1.10E+03	0.00091225	1.29E-02
2-Chlorotoluene	2.89E-03	2.89E-06	NA	1.01E-03	4.33E-01	NA	NA	NA
2-Hexanone	2.35E-02	2.35E-05	NA	1.13E-03	4.69E-01	NA	NA	NA
2,2-Dichloropropane	5.00E-04	5.00E-07	NA	1.06E-03	4.50E-01	NA	NA	NA
Acetone	4.85E-01	4.85E-04	3.88E-05	1.49E-03	5.63E-01	1.80E+03	0.00055591	1.75E-02
Benzene	4.00E-01	4.00E-04	5.55E-03	1.28E-03	5.09E-01	7.90E+02	0.00126611	3.29E-02
Carbon disulfide	3.10E-03	3.10E-06	3.03E-02	1.30E-03	5.14E-01	7.72E+02	0.00129512	2.61E-04
Carbon tetrachloride	3.00E-04	3.00E-07	3.04E-02	9.12E-04	4.06E-01	1.10E+03	0.00091003	1.78E-05
Chlorobenzene	6.74E-01	6.74E-04	3.70E-03	1.06E-03	4.50E-01	9.54E+02	0.00104784	4.59E-02
Chloroethane	9.74E-02	9.74E-05	1.10E-02	1.40E-03	5.42E-01	7.17E+02	0.00139522	8.84E-03
Chloroform	4.40E-03	4.40E-06	3.67E-03	1.04E-03	4.42E-01	9.79E+02	0.00102109	2.92E-04
Chloromethane	7.40E-03	7.40E-06	2.40E-02	1.58E-03	5.88E-01	6.33E+02	0.00157987	7.60E-04
cis-1,2-Dichloroethene	1.37E+01	1.37E-02	4.08E-03	1.15E-03	4.74E-01	8.83E+02	0.00113219	1.01E+00
cis-1,3-Dichloropropene	4.20E-03	4.20E-06	1.77E-02	1.07E-03	4.53E-01	9.34E+02	0.00107032	2.92E-04
Cyclohexane	1.80E-02	1.80E-05	2.00E-01	1.23E-03	4.97E-01	8.10E+02	0.00123405	1.44E-03
Ethyl tert-butyl ether (ETBE)	1.20E-03	1.20E-06	NA	1.12E-03	4.66E-01	NA	NA	NA
Ethylbenzene	4.49E-01	4.49E-04	7.88E-03	1.10E-03	4.60E-01	9.18E+02	0.00108973	3.18E-02
Isopropyl ether	4.30E-01	4.30E-04	NA	1.12E-03	4.66E-01	NA	NA	NA
Isopropylbenzene (cumene)	2.71E-02	2.71E-05	NA	1.03E-03	4.41E-01	NA	NA	NA
Methyl acetate	2.25E-02	2.25E-05	2.06E-05	1.31E-03	5.19E-01	3.06E+03	0.00032657	4.79E-04

Chemical	Concentration in Water (mg/L)	Concentration in Water (mg/cm^3)	Henry's Law Constant (atm-m^3/mol)	k_{iL}	k_{iG}	$1/K_i$	K_i (cm/s)	E (mg/s)
Methyl ethyl ketone	4.30E-01	4.30E-04	2.74E-05	1.33E-03	5.24E-01	2.46E+03	0.00040587	1.14E-02
Methyl isobutyl ketone	4.86E+00	4.86E-03	1.40E-04	1.13E-03	4.69E-01	1.26E+03	0.00079414	2.51E-01
Methyl tert-butyl ether	2.01E-02	2.01E-05	NA	1.21E-03	4.89E-01	NA	NA	NA
Methylcyclohexane	2.45E-02	2.45E-05	4.30E-01	1.14E-03	4.72E-01	8.76E+02	0.00114159	1.82E-03
Methylene chloride	8.19E-03	8.19E-06	2.19E-03	1.23E-03	4.95E-01	8.38E+02	0.00119393	6.36E-04
n-Butylbenzene	6.12E-03	6.12E-06	1.31E-02	9.77E-04	4.25E-01	1.03E+03	0.00097236	3.87E-04
n-Propylbenzene	5.61E-02	5.61E-05	1.31E-02	1.03E-03	4.41E-01	9.73E+02	0.00102747	3.75E-03
Phenol	4.80E-02	4.80E-05	NA	NA	NA	NA	NA	NA
p-Cymene (p-isopropyltoluene)	7.86E-02	7.86E-05	NA	9.77E-04	4.25E-01	NA	NA	NA
sec-Butylbenzene	5.64E-03	5.64E-06	1.87E-02	9.77E-04	4.25E-01	1.03E+03	0.00097361	3.57E-04
Styrene	1.39E-02	1.39E-05	2.75E-03	1.11E-03	4.63E-01	9.22E+02	0.00108509	9.83E-04
tert-Butylbenzene	2.10E-03	2.10E-06	1.26E-02	9.77E-04	4.25E-01	1.03E+03	0.0009722	1.33E-04
tert-Butyl alcohol	1.17E-01	1.17E-04	NA	1.31E-03	5.18E-01	NA	NA	NA
Tetrachloroethene	1.20E-02	1.20E-05	1.84E-02	8.79E-04	3.96E-01	1.14E+03	0.00087597	6.84E-04
Toluene	6.11E+00	6.11E-03	6.64E-03	1.18E-03	4.82E-01	8.55E+02	0.00116895	4.65E-01
trans-1,2-Dichloroethene	4.01E-01	4.01E-04	9.38E-03	1.15E-03	4.74E-01	8.76E+02	0.00114148	2.98E-02
trans-1,3-Dichloropropene	4.10E-03	4.10E-06	1.77E-02	1.07E-03	4.53E-01	9.34E+02	0.00107032	2.85E-04
Trichloroethene	5.70E-02	5.70E-05	1.03E-02	9.88E-04	4.28E-01	1.02E+03	0.00098307	3.64E-03
Vinyl chloride	1.63E+00	1.63E-03	2.70E-02	1.43E-03	5.47E-01	7.03E+02	0.00142202	1.50E-01
m,p-Xylene	9.44E-01	9.44E-04	7.34E-03	1.10E-03	4.60E-01	9.18E+02	0.00108914	6.69E-02
o-Xylene	4.45E-01	4.45E-04	5.19E-03	1.10E-03	4.60E-01	9.21E+02	0.00108557	3.14E-02
Xylenes, total	1.60E+00	1.60E-03	5.19E-03	1.10E-03	4.60E-01	9.21E+02	0.00108557	1.13E-01
Dioxans/Furans								
1,2,3,4,6,7,8-HpCDD	4.64E-07	4.64E-10	NA	NA	NA	NA	NA	NA
1,2,3,4,6,7,8-HpCDF	9.49E-08	9.49E-11	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8,9-HpCDF	9.79E-09	9.79E-12	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HxCDD	2.62E-09	2.62E-12	NA	NA	NA	NA	NA	NA
1,2,3,4,7,8-HxCDF	8.49E-09	8.49E-12	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HxCDD	1.33E-08	1.33E-11	NA	NA	NA	NA	NA	NA
1,2,3,6,7,8-HxCDF	1.62E-09	1.62E-12	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HxCDD	4.40E-09	4.40E-12	NA	NA	NA	NA	NA	NA
1,2,3,7,8,9-HxCDF	3.87E-09	3.87E-12	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PeCDD	1.08E-09	1.08E-12	NA	NA	NA	NA	NA	NA
1,2,3,7,8-PeCDF	2.28E-09	2.28E-12	NA	NA	NA	NA	NA	NA
2,3,4,6,7,8-HxCDF	3.94E-09	3.94E-12	NA	NA	NA	NA	NA	NA
2,3,4,7,8-PeCDF	2.64E-09	2.64E-12	NA	NA	NA	NA	NA	NA
2,3,7,8-TCDF	1.68E-09	1.68E-12	NA	NA	NA	NA	NA	NA
OCDD	2.18E-06	2.18E-09	NA	NA	NA	NA	NA	NA
OCDF	7.44E-07	7.44E-10	NA	NA	NA	NA	NA	NA

Notes:

[a] Trench dimensions are assumed to be 10 ft x 10 ft with 70% water coverage in the bottom of the trench

- The Henry's Law Constant value for 1,2,4-trichlorobenzene was used for 1,2,3-trichlorobenzene.
- The Henry's Law Constant value for m-xylene was used for m,p-xylenes.
- The Henry's Law Constant value for 1,3-dichloropropene was used for cis-1,3-dichloropropene and trans-1,3-dichloropropene.

Table 2-20
Mass Transfer Coefficient Calculations - Water to Air
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Source: CalEPA, DTSC, 2004.

Liquid-phase mass transfer coefficient

$$k_{iL} = \sqrt{\frac{MW_{O_2}}{MW_i}} \times \frac{T}{298} \times k_{L,O_2}$$

MW_{O2}	Molecular Weight of Oxygen, g/mol	3.20E+01
MW_i	Chemical specific molecular weight, g/mol	chemical specific
T^a	Average Temperature, K	298
$k_{L,O2}$	Liqiud-phase mass transfer coefficient for oxygen at 25°C, cm/s	0.002

[a] The average temperture is assumed to be 25°C.

Gas-phase mass transfer coefficient

$$k_{iG} = \left(\frac{MW_{H_2O}}{MW_i}\right)^{0.335} \times \left(\frac{T}{298}\right)^{1.005} \times k_{G,H_2O}$$

MW_{H2O}	Molecular weight of water, g/mol	18
MW_i	Chemical specific molecular weight, g/mol	chem specific
T^a	Average Temperature, K	298
$k_{G,H2O}$	Gas phase mass transfer coefficient for water vapor at 25°C, cm/s	8.33E-01

[a] The average temperture is assumed to be 25°C.

Chemical	Molecular Weight (g/mol)	k_{iL} (cm/s)	k_{iG} (cm/s)	V or NV
Metals				
Aluminum		NA	NA	NV
Antimony		NA	NA	NV
Arsenic		NA	NA	NV
Barium		NA	NA	NV
Beryllium		NA	NA	NV
Boron		NA	NA	NV
Cadmium		NA	NA	NV
Chromium		NA	NA	NV
Chromium (VI)		NA	NA	NV
Cobalt		NA	NA	NV
Copper		NA	NA	NV
Iron		NA	NA	NV
Lead		NA	NA	NV
Manganese		NA	NA	NV
Mercury		NA	NA	NV
Molybdenum		NA	NA	NV
Nickel		NA	NA	NV
Selenium		NA	NA	NV
Silver		NA	NA	NV
Thallium		NA	NA	NV
Vanadium		NA	NA	NV
Zinc		NA	NA	NV
Cyanide		NA	NA	NV
Pesticides/PCBs				
4,4'-DDD		NA	NA	NV

Chemical	Molecular Weight (g/mol)	k_{iL} (cm/s)	k_{iG} (cm/s)	V or NV
4,4'-DDE		NA	NA	NV
4,4'-DDT		NA	NA	NV
Aldrin		NA	NA	NV
alpha-BHC		NA	NA	NV
alpha-Chlordane		NA	NA	NV
Atrazine		NA	NA	NV
beta-BHC		NA	NA	NV
delta-BHC		NA	NA	NV
Diazinon		NA	NA	NV
Dieldrin		NA	NA	NV
Endosulfan I		NA	NA	NV
Endosulfan II		NA	NA	NV
Endosulfan sulfate		NA	NA	NV
Endrin		NA	NA	NV
Endrin aldehyde		NA	NA	NV
Endrin ketone		NA	NA	NV
gamma-BHC		NA	NA	NV
gamma-Chlordane		NA	NA	NV
Heptachlor		NA	NA	NV
Heptachlor epoxide		NA	NA	NV
Methoxychlor		NA	NA	NV
Aroclor-1260		NA	NA	NV
SVOCs/VOCs				
1,4-Dioxane (p-dioxane)		NA	NA	NV
2,4,6-Trichlorophenol		NA	NA	NV
2,4-Dimethylphenol		NA	NA	NV
2-Chlorophenol	130	9.92E-04	4.30E-01	V
2-Methylnaphthalene	142.2	9.49E-04	4.17E-01	V
2-Methylphenol		NA	NA	NV
2-Nitroaniline		NA	NA	NV
3,4-methylphenol		NA	NA	NV
4-Chloro-3-methylphenol		NA	NA	NV
4-Methylphenol		NA	NA	NV
Acenaphthene	154.21	9.11E-04	4.06E-01	V
Acenaphthylene	152.195	9.17E-04	4.07E-01	V
Anthracene	178	8.48E-04	3.87E-01	V
Benzo(a)anthracene		NA	NA	NV
Benzo(a)pyrene		NA	NA	NV
Benzo(b)fluoranthene		NA	NA	NV
Benzo(g,h,i)perylene		NA	NA	NV
Benzo(k)fluoranthene		NA	NA	NV
Biphenyl (Diphenyl)	150	NA	NA	NV
bis(2-Chloroethoxy)methane	173.0388	8.60E-04	3.90E-01	V
bis(2-Ethylhexyl)phthalate		NA	NA	NV
Bromoform	252.7309	7.12E-04	3.44E-01	V
Caprolactam		NA	NA	NV
Carbazole		NA	NA	NV
Chrysene	228.28	NA	NA	NV
Dibenz(a,h)anthracene		NA	NA	NV
Diethylphthalate		NA	NA	NV
Di-n-butyl phthalate		NA	NA	NV
Fluoranthene		NA	NA	NV
Fluorene	166.21	8.78E-04	3.96E-01	V
Hexachloroethane		NA	NA	NV
Indeno(1,2,3-c,d)pyrene		NA	NA	NV
Naphthalene	128.16	9.99E-04	4.32E-01	V
Nitrobenzene	120	1.03E-03	4.41E-01	V

Chemical	Molecular Weight (g/mol)	k_{iL} (cm/s)	k_{iG} (cm/s)	V or NV
N-Nitrosodi-n-propylamine		NA	NA	NV
N-Nitrosodiphenylamine		NA	NA	NV
Pentachlorophenol		NA	NA	NV
Phenanthrene		NA	NA	NV
Pyrene	200	8.00E-04	3.72E-01	0.00
1,1-Dichloroethane	99	1.14E-03	4.71E-01	V
1,1-Dichloroethene	97	1.15E-03	4.74E-01	V
1,1,1-Trichloroethane	133	9.81E-04	4.26E-01	V
1,1,2-Trichloroethane	133	9.81E-04	4.26E-01	V
1,1,2,2-Tetrachloroethane	168	8.73E-04	3.94E-01	V
1,2,3-Trichlorobenzene	181.45	8.40E-04	3.84E-01	V
1,2,4-Trichlorobenzene	181	8.41E-04	3.84E-01	V
1,2,4-Trimethylbenzene	120.19	1.03E-03	4.41E-01	V
1,2-Dibromo-3-chloropropane	236.36	7.36E-04	3.52E-01	V
1,2-Dichlorobenzene	147	9.33E-04	4.12E-01	V
1,2-Dichloroethane	99	1.14E-03	4.71E-01	V
1,2-Dichloropropane	113	1.06E-03	4.50E-01	V
1,3-Dichlorobenzene	147	9.33E-04	4.12E-01	V
1,3,5-Trimethylbenzene	120.19	1.03E-03	4.41E-01	V
1,4-Dichlorobenzene	147	9.33E-04	4.12E-01	V
2-Chlorotoluene	126.59	1.01E-03	4.33E-01	V
2-Hexanone	100.2	1.13E-03	4.69E-01	V
2,2-Dichloropropane	113	1.06E-03	4.50E-01	V
Acetone	58	1.49E-03	5.63E-01	V
Benzene	78.1	1.28E-03	5.09E-01	V
Carbon disulfide	76	1.30E-03	5.14E-01	V
Carbon tetrachloride	154	9.12E-04	4.06E-01	V
Chlorobenzene	113	1.06E-03	4.50E-01	V
Chloroethane	65	1.40E-03	5.42E-01	V
Chloroform	119	1.04E-03	4.42E-01	V
Chloromethane	51	1.58E-03	5.88E-01	V
cis-1,2-Dichloroethene	97	1.15E-03	4.74E-01	V
cis-1,3-Dichloropropene	111	1.07E-03	4.53E-01	V
Cyclohexane	84	1.23E-03	4.97E-01	V
Ethyl tert-butyl ether (ETBE)	102.18	1.12E-03	4.66E-01	V
Ethylbenzene	106.2	1.10E-03	4.60E-01	V
Isopropyl ether	102.18	1.12E-03	4.66E-01	V
Isopropylbenzene (cumene)	120.2	1.03E-03	4.41E-01	V
Methyl acetate	74.0792	1.31E-03	5.19E-01	V
Methyl ethyl ketone	72	1.33E-03	5.24E-01	V
Methyl isobutyl ketone	100.16	1.13E-03	4.69E-01	V
Methyl tert-butyl ether	88.15	1.21E-03	4.89E-01	V
Methylcyclohexane	98.19	1.14E-03	4.72E-01	V
Methylene chloride	85	1.23E-03	4.95E-01	V
n-Butylbenzene	134.22	9.77E-04	4.25E-01	V
n-Propylbenzene	120.19	1.03E-03	4.41E-01	V
Phenol		NA	NA	NV
p-Cymene (p-isopropyltoluene)	134.22	9.77E-04	4.25E-01	V
sec-Butylbenzene	134.22	9.77E-04	4.25E-01	V
Styrene	104.2	1.11E-03	4.63E-01	V
tert-Butylbenzene	134.22	9.77E-04	4.25E-01	V
tert-Butyl alcohol	74.12	1.31E-03	5.18E-01	V
Tetrachloroethene	165.83	8.79E-04	3.96E-01	V
Toluene	92	1.18E-03	4.82E-01	V
trans-1,2-Dichloroethene	97	1.15E-03	4.74E-01	V
trans-1,3-Dichloropropene	111	1.07E-03	4.53E-01	V
Trichloroethene	131	9.88E-04	4.28E-01	V

Chemical	Molecular Weight (g/mol)	k_{iL} (cm/s)	k_{iG} (cm/s)	V or NV
Vinyl chloride	63	1.43E-03	5.47E-01	V
m,p-Xylene	106.2	1.10E-03	4.60E-01	V
o-Xylene	106.2	1.10E-03	4.60E-01	V
Xylenes, total	106.2	1.10E-03	4.60E-01	V
Dioxans/Furans				
1,2,3,4,6,7,8-HpCDD		NA	NA	NV
1,2,3,4,6,7,8-HpCDF		NA	NA	NV
1,2,3,4,7,8,9-HpCDF		NA	NA	NV
1,2,3,4,7,8-HxCDD		NA	NA	NV
1,2,3,4,7,8-HxCDF		NA	NA	NV
1,2,3,6,7,8-HxCDD		NA	NA	NV
1,2,3,6,7,8-HxCDF		NA	NA	NV
1,2,3,7,8,9-HxCDD		NA	NA	NV
1,2,3,7,8,9-HxCDF		NA	NA	NV
1,2,3,7,8-PeCDD		NA	NA	NV
1,2,3,7,8-PeCDF		NA	NA	NV
2,3,4,6,7,8-HxCDF		NA	NA	NV
2,3,4,7,8-PeCDF		NA	NA	NV
2,3,7,8-TCDF		NA	NA	NV
OCDD		NA	NA	NV
OCDF		NA	NA	NV

Table 2-21
Calculation of Concentration in Air from Emissions from Water
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Source: CalEPA, DTSC, 2004.

Description	Symbol	Value	Units	Comments
Mixing Height (adult breating zone)	H	1.83	m	DTSC, 2006
Assumed velocity of air in the trench	u	0.152	m/s	DTSC, 2006
Width of trench perpendicular to wind direction	W	3.05	m	DTSC, 2006
Conversion factor	CF	1000	ug/mg	

$$C_{air} = \frac{E_i \times CF}{u \times H \times W}$$

Chemical	Total emission rate, Ei (mg/s)	Concentration of VOCs in breathing zone, C_{air} (ug/m^3)
Metals		
Aluminum	NA	NA
Antimony	NA	NA
Arsenic	NA	NA
Barium	NA	NA
Beryllium	NA	NA
Boron	NA	NA
Cadmium	NA	NA
Chromium	NA	NA
Chromium (VI)	NA	NA
Cobalt	NA	NA
Copper	NA	NA
Iron	NA	NA
Lead	NA	NA
Manganese	NA	NA
Mercury	NA	NA
Molybdenum	NA	NA
Nickel	NA	NA
Selenium	NA	NA
Silver	NA	NA
Thallium	NA	NA
Vanadium	NA	NA
Zinc	NA	NA
Cyanide	NA	NA
Pesticides/PCBs		
4,4'-DDD	NA	NA
4,4'-DDE	NA	NA
4,4'-DDT	NA	NA
Aldrin	NA	NA
alpha-BHC	NA	NA
alpha-Chlordane	NA	NA
Atrazine	NA	NA
beta-BHC	NA	NA
delta-BHC	NA	NA
Diazinon	NA	NA
Dieldrin	NA	NA

Chemical	Total emission rate, Ei (mg/s)	Concentration of VOCs in breathing zone, C_{air} (ug/m^3)
Endosulfan I	NA	NA
Endosulfan II	NA	NA
Endosulfan sulfate	NA	NA
Endrin	NA	NA
Endrin aldehyde	NA	NA
Endrin ketone	NA	NA
gamma-BHC	NA	NA
gamma-Chlordane	NA	NA
Heptachlor	NA	NA
Heptachlor epoxide	NA	NA
Methoxychlor	NA	NA
Aroclor-1260	NA	NA
SVOCs/VOCs		
1,4-Dioxane (p-dioxane)	NA	NA
2,4,6-Trichlorophenol	NA	NA
2,4-Dimethylphenol	NA	NA
2-Chlorophenol	2.42E-04	2.86E-01
2-Methylnaphthalene	NA	NA
2-Methylphenol	NA	NA
2-Nitroaniline	NA	NA
3,4-methylphenol	NA	NA
4-Chloro-3-methylphenol	NA	NA
4-Methylphenol	NA	NA
Acenaphthene	1.97E-04	2.32E-01
Acenaphthylene	9.64E-05	1.14E-01
Anthracene	9.65E-05	1.14E-01
Benzo(a)anthracene	NA	NA
Benzo(a)pyrene	NA	NA
Benzo(b)fluoranthene	NA	NA
Benzo(g,h,i)perylene	NA	NA
Benzo(k)fluoranthene	NA	NA
Biphenyl (Diphenyl)	NA	NA
bis(2-Chloroethoxy)methane	NA	NA
bis(2-Ethylhexyl)phthalate	NA	NA
Bromoform	5.07E-04	5.98E-01
Caprolactam	NA	NA
Carbazole	NA	NA
Chrysene	NA	NA
Dibenz(a,h)anthracene	NA	NA
Diethylphthalate	NA	NA
Di-n-butyl phthalate	NA	NA
Fluoranthene	NA	NA
Fluorene	8.69E-05	1.02E-01
Hexachloroethane	NA	NA
Indeno(1,2,3-c,d)pyrene	NA	NA
Naphthalene	7.92E-03	9.34E+00
Nitrobenzene	3.94E-05	4.65E-02
N-Nitrosodi-n-propylamine	NA	NA
N-Nitrosodiphenylamine	NA	NA
Pentachlorophenol	NA	NA
Phenanthrene	NA	NA
Pyrene	2.15E-05	2.53E-02
1,1-Dichloroethane	4.08E-02	4.80E+01
1,1-Dichloroethene	3.10E-03	3.65E+00
1,1,1-Trichloroethane	7.50E-03	8.85E+00
1,1,2-Trichloroethane	8.01E-04	9.44E-01

Chemical	Total emission rate, Ei (mg/s)	Concentration of VOCs in breathing zone, C_{air} (ug/m^3)
1,1,2,2-Tetrachloroethane	6.33E-04	7.47E-01
1,2,3-Trichlorobenzene	1.43E-04	1.69E-01
1,2,4-Trichlorobenzene	7.95E-04	9.37E-01
1,2,4-Trimethylbenzene	1.84E-02	2.17E+01
1,2-Dibromo-3-chloropropane	8.51E-05	1.00E-01
1,2-Dichlorobenzene	4.33E-02	5.10E+01
1,2-Dichloroethane	1.00E-03	1.18E+00
1,2-Dichloropropane	3.46E-04	4.08E-01
1,3-Dichlorobenzene	1.60E-03	1.88E+00
1,3,5-Trimethylbenzene	7.34E-03	8.65E+00
1,4-Dichlorobenzene	1.29E-02	1.52E+01
2-Chlorotoluene	NA	NA
2-Hexanone	NA	NA
2,2-Dichloropropane	NA	NA
Acetone	1.75E-02	2.07E+01
Benzene	3.29E-02	3.88E+01
Carbon disulfide	2.61E-04	3.08E-01
Carbon tetrachloride	1.78E-05	2.09E-02
Chlorobenzene	4.59E-02	5.41E+01
Chloroethane	8.84E-03	1.04E+01
Chloroform	2.92E-04	3.44E-01
Chloromethane	7.60E-04	8.96E-01
cis-1,2-Dichloroethene	1.01E+00	1.19E+03
cis-1,3-Dichloropropene	2.92E-04	3.45E-01
Cyclohexane	1.44E-03	1.70E+00
Ethyl tert-butyl ether (ETBE)	NA	NA
Ethylbenzene	3.18E-02	3.75E+01
Isopropyl ether	NA	NA
Isopropylbenzene (cumene)	NA	NA
Methyl acetate	4.79E-04	5.64E-01
Methyl ethyl ketone	1.14E-02	1.34E+01
Methyl isobutyl ketone	2.51E-01	2.96E+02
Methyl tert-butyl ether	NA	NA
Methylcyclohexane	1.82E-03	2.15E+00
Methylene chloride	6.36E-04	7.49E-01
n-Butylbenzene	3.87E-04	4.56E-01
n-Propylbenzene	3.75E-03	4.42E+00
Phenol	NA	NA
p-Cymene (p-isopropyltoluene)	NA	NA
sec-Butylbenzene	3.57E-04	4.21E-01
Styrene	9.83E-04	1.16E+00
tert-Butylbenzene	1.33E-04	1.56E-01
tert-Butyl alcohol	NA	NA
Tetrachloroethene	6.84E-04	8.06E-01
Toluene	4.65E-01	5.48E+02
trans-1,2-Dichloroethene	2.98E-02	3.51E+01
trans-1,3-Dichloropropene	2.85E-04	3.36E-01
Trichloroethene	3.64E-03	4.29E+00
Vinyl chloride	1.50E-01	1.77E+02
m,p-Xylene	6.69E-02	7.88E+01
o-Xylene	3.14E-02	3.70E+01
Xylenes, total	1.13E-01	1.33E+02
Dioxans/Furans		
1,2,3,4,6,7,8-HpCDD	NA	NA
1,2,3,4,6,7,8-HpCDF	NA	NA
1,2,3,4,7,8,9-HpCDF	NA	NA

Chemical	Total emission rate, Ei (mg/s)	Concentration of VOCs in breathing zone, C_{air} (ug/m^3)
1,2,3,4,7,8-HxCDD	NA	NA
1,2,3,4,7,8-HxCDF	NA	NA
1,2,3,6,7,8-HxCDD	NA	NA
1,2,3,6,7,8-HxCDF	NA	NA
1,2,3,7,8,9-HxCDD	NA	NA
1,2,3,7,8,9-HxCDF	NA	NA
1,2,3,7,8-PeCDD	NA	NA
1,2,3,7,8-PeCDF	NA	NA
2,3,4,6,7,8-HxCDF	NA	NA
2,3,4,7,8-PeCDF	NA	NA
2,3,7,8-TCDF	NA	NA
OCDD	NA	NA
OCDF	NA	NA

Table 2-22
Summary of Cancer Risks and Noncancer Hazards - Resident Receptors - Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario/ Receptor	Cancer	Noncancer
Trench Worker	1E-04	34
Future Resident		
Future Adult Resident (24 years)	8E-02	484
Future Child Resident (6 years)	5E-02	1153
Sum of Adult plus Child (30 years)	1E-01	

Table 2-23
Summary of Cancer Risks - Resident Receptors - Soil plus Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Exposure Scenario/ Receptor	Cancer Risk			
	Former AMCO Chemical Facility	Parking Lot	Large Vacant Lot	Small Vacant Lot
Future Resident				
Shallow Soil plus Groundwater				
Adult (Soil)	2E-04	1E-04	2E-04	1E-04
Child (Soil)	2E-04	3E-04	4E-04	2E-04
Groundwater (Adult plus Child)	1E-01	1E-01	1E-01	1E-01
Combined Cancer Risk	1E-01	1E-01	1E-01	1E-01
Deep Soil plus Groundwater				
Adult (Soil)	2E-04	2E-04	1E-04	
Child (Soil)	3E-04	4E-04	3E-04	
Groundwater (Adult plus Child)	1E-01	1E-01	1E-01	
Combined Cancer Risk	1E-01	1E-01	1E-01	

Table 2-24
Summary of Target Organ / Endpoint for Health Hazards
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Chemical	Target Organ / Endpoint	Source
1,2,4-Trimethylbenzene	Decreased body weight	PPRTV
1,3,5-Trimethylbenzene	Decreased body weight	PPRTV
2-Methylnaphthalene	Lungs	IRIS
Aroclor-1260*	Eyes	IRIS
Arsenic	Skin, Circulatory System	IRIS
Benzene	Immune system (decreased lymphocyte count)	IRIS
cis-1,2-Dichloroethene	Decreased hematocrit and hemoglobin (Blood)	PPRTV
Naphthalene	Decreased body weight	IRIS
Toluene	Kidney	IRIS
Trichloroethene	Nervous system	NCEA
Vinyl chloride	Liver	IRIS
Xylenes, total	Decreased body weight, increased mortality	IRIS

Notes
*Aroclor 1254 used as surrogate
PPRTV = Provisional Peer Reviewed Toxicity Value
IRIS = Integrated Risk Information System
NCEA = National Center for Environmental Assessment

Table 2-25
Noncancer Health Hazard - Target Organs/Endpoints for Future Adult Residents - Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
cis-1,2-Dichloroethene	229	47%	Decreased hematocrit and hemoglobin (Blood)
Aroclor-1260	48	10%	Eyes
Arsenic	26	5%	Skin, Circulatory System
Vinyl chloride	23	5%	Liver
1,2,4-Trimethylbenzene	23	5%	Decreased body weight
Naphthalene	22	5%	Decreased body weight
Toluene	11	2%	Kidney
Benzene	10	2%	Immune system (decreased lymphocyte count)
1,3,5-Trimethylbenzene	9	2%	Decreased body weight
Xylenes, total	8	2%	Decreased body weight, increased mortality
Total Hazard Index[1]	**484**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Blood	229
Decreased body weight	61
Eyes	48
Skin	26
Liver	23
Kidney	11
Immune System	10

Notes
NA = Target organ data not available
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Table 2-26
Noncancer Health Hazard - Target Organs/Endpoints for Future Child Residents - Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
cis-1,2-Dichloroethene	541	48%	Decreased hematocrit and hemoglobin (Blood)
Aroclor-1260	108	10%	Eyes
Arsenic	62	5%	Skin, Circulatory System
Vinyl chloride	55	5%	Liver
1,2,4-Trimethylbenzene	53	5%	Decreased body weight
Naphthalene	52	5%	Decreased body weight
Toluene	26	2%	Kidney
Benzene	22	2%	Immune system (decreased lymphocyte count)
1,3,5-Trimethylbenzene	21	2%	Decreased body weight
Xylenes, total	19	2%	Decreased body weight, increased mortality
Total Hazard Index[1]	**1133**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Blood	541
Decreased body weight	145
Eyes	108
Skin	62
Liver	55
Kidney	26
Immune System	22

Notes
NA = Target organ data not available
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Table 2-27
Noncancer Health Hazard - Target Organs/Endpoints for Trenchworkers - Groundwater
Baseline Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Primary Contributors	Hazard Quotient	% Contribution	Target Organ/Endpoint
Aroclor-1260	14	42%	Eyes
cis-1,2-Dichloroethene	11	32%	Decreased hematocrit and hemoglobin (Blood)
1,2,4-Trimethylbenzene	1	3%	Decreased body weight
Vinyl chloride	1	3%	Liver
Naphthalene	0.8	2%	Decreased body weight
2-Methylnaphthalene	0.8	2%	Lungs
Toluene	0.6	2%	Kidney
Benzene	0.6	2%	Immune system (decreased lymphocyte count)
Trichloroethene	0.4	1%	Nervous system
Xylenes, total	0.4	1%	Decreased body weight, increased mortality
Total Hazard Index[1]	**34**		

Target Organ/Endpoint[2]	Total Hazard per Target Organ/Endpoint
Eyes	14
Blood	11
Decreased body weight	2
Liver	1
Lungs	0.8
Kidney	0.6
Immune system	0.6
Nervous system	0.4

Notes
NA = Target organ data not available
1) Total Hazard Index includes all chemicals evaluated including those chemicals not shown. Only the top ten contributors are presented.
2) For chemicals having multiple target organ or system effects, only the first target organ/endpoint listed was used to calculate cumulative effects.

Attachment 3
Residential Neighborhood Screening Tables

Attachment 3
Table of Contents - Residential Neighborhood Screening Tables
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Attachment 3
Table of Contents - Residential Neighborhood Screening Tables
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

TABLE 3-1
Ambient and Crawlspace Air Screening Levels
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Screening Level	Units	Source	Notes
Volatile Organic Compounds				
1,1,1-Trichloroethane	2,300	µg/m³	EPA Region 9 Ambient Air PRG	
1,1,2,2-Tetrachloroethane	0.033	µg/m³	EPA Region 9 Ambient Air PRG	
1,1,2-Trichloroethane	0.12	µg/m³	EPA Region 9 Ambient Air PRG	
1,1-Dichloroethane	1.2	µg/m³	EPA Region 9 Ambient Air PRG	CAL-modified PRG
1,1-Dichloroethene	210	µg/m³	EPA Region 9 Ambient Air PRG	
1,2,4-Trichlorobenzene	3.7	µg/m³	EPA Region 9 Ambient Air PRG	
1,2,4-Trimethylbenzene	6.2	µg/m³	EPA Region 9 Ambient Air PRG	
1,2-Dibromoethane	0.0034	µg/m³	EPA Region 9 Ambient Air PRG	
1,2-Dichlorobenzene	210	µg/m³	EPA Region 9 Ambient Air PRG	
1,2-Dichloroethane	0.074	µg/m³	EPA Region 9 Ambient Air PRG	
1,2-Dichloropropane	0.099	µg/m³	EPA Region 9 Ambient Air PRG	
1,3,5-Trimethylbenzene	6.2	µg/m³	EPA Region 9 Ambient Air PRG	
1,3-Dichlorobenzene	110	µg/m³	EPA Region 9 Ambient Air PRG	
1,4-Dichlorobenzene	0.31	µg/m³	EPA Region 9 Ambient Air PRG	
1,4-Dioxane (p-dioxane)	0.61	µg/m³	EPA Region 9 Ambient Air PRG	
Benzene	0.25	µg/m³	EPA Region 9 Ambient Air PRG	
Bromomethane	5.2	µg/m³	EPA Region 9 Ambient Air PRG	
Carbon tetrachloride	0.13	µg/m³	EPA Region 9 Ambient Air PRG	
Chlorobenzene	62	µg/m³	EPA Region 9 Ambient Air PRG	
Chloroethane	2.3	µg/m³	EPA Region 9 Ambient Air PRG	
Chloroform	0.083	µg/m³	EPA Region 9 Ambient Air PRG	
Chloromethane	95	µg/m³	EPA Region 9 Ambient Air PRG	
cis-1,2-Dichloroethene	37	µg/m³	EPA Region 9 Ambient Air PRG	
cis-1,3-Dichloropropene	0.48	µg/m³	EPA Region 9 Ambient Air PRG	
Ethylbenzene	1,100	µg/m³	EPA Region 9 Ambient Air PRG	
Freon 11	730	µg/m³	EPA Region 9 Ambient Air PRG	
Freon 12	210	µg/m³	EPA Region 9 Ambient Air PRG	
Freon 113	31,000	µg/m³	EPA Region 9 Ambient Air PRG	
Freon 114	31,000	µg/m³	Surrogate	Freon 113 was used as the surrogate
Hexachlorobutadiene	0.086	µg/m³	EPA Region 9 Ambient Air PRG	
Methyl tert-butyl ether	7.4	µg/m³	EPA Region 9 Ambient Air PRG	
Methylene chloride	4.1	µg/m³	EPA Region 9 Ambient Air PRG	
Naphthalene	0.056	µg/m³	EPA Region 9 Ambient Air PRG	CAL-modified PRG
Styrene	1,100	µg/m³	EPA Region 9 Ambient Air PRG	
Tetrachloroethene	0.32	µg/m³	EPA Region 9 Ambient Air PRG	
Toluene	400	µg/m³	EPA Region 9 Ambient Air PRG	
trans-1,2-Dichloroethene	73	µg/m³	EPA Region 9 Ambient Air PRG	
trans-1,3-Dichloropropene	0.48	µg/m³	EPA Region 9 Ambient Air PRG	
Trichloroethene	0.017	µg/m³	EPA Region 9 Ambient Air PRG	
Vinyl chloride	0.11	µg/m³	EPA Region 9 Ambient Air PRG	
Xylenes, total	110	µg/m³	EPA Region 9 Ambient Air PRG	

Notes:
EPA Region 9 ambient air PRGs were last updated in October 2004 and are based on target cancer risk level of 10-6 or a noncancer hazard quotient of 1.

NA not applicable
NDRI not detected in ambient or crawlspace air during the Remedial Investigation phase
µg/m³ micrograms per cubic meter
PRG Preliminary Remediation Goal

TABLE 3-2
Residential Air Results Summary (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Backyard Air Levels	Crawlspace Air Levels	Neighborhood Background Air Levels[1]	West Oakland Background Air Levels[2]	Screening Levels[3]
1,2,4-Trimethylbenzene	µg/m³	0.29 - 23	0.3 - 31	0.17 - 0.84	NA	6.2
1,3,5-Trimethylbenzene	µg/m³	< 0.16 - 8	< 0.16 - 11	< 0.17 - 0.27	NA	6.2
1,4-Dichlorobenzene	µg/m³	< 0.19 - 3.5	< 0.22 - 6	< 0.21 - < 0.22	NA	0.31
Benzene	µg/m³	< 0.59 - 5.6	0.65 - 16	0.59 - 1.3	0.96	0.25
Carbon tetrachloride	µg/m³	0.46 - 0.53	0.43 - 0.54	0.45	0.69	0.13
Chloroform	µg/m³	0.16 - 0.3	< 0.16 - 0.47	< 0.17 - 0.19	<0.10	0.083
Tetrachloroethene	µg/m³	< 0.21 - 2.2	< 0.23 - 3.2	< 0.24 - 0.27	<0.47	0.32
Trichloroethene	µg/m³	< 0.028 - 0.13	< 0.027 - 0.36	< 0.029 - 0.11	<0.43	0.017
Vinyl chloride	µg/m³	< 0.04 - 0.058	< 0.043 - 0.13	< 0.045 - < 0.046	<0.77	0.11

Notes:

Only compounds detected above screening levels are shown

[1] From samples collected at 329 Lewis St (upwind of the AMCO site) in the morning and afternoon of the same day.

[2] From the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); levels shown are from December 2002, the latest date available.

[3] EPA Region 9 Preliminary Remediation Goals for ambient air, October 2004.

NA not available
µg/m³ micrograms per cubic meter

TABLE 3-3
1428 3rd Street Analytical Results - Air (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1428 3rd St			
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	329BA AM 9/21/2004	329BA PM 9/21/2004	1428AA 9/21/2004	1428AA (FD) 9/21/2004	1428CAa 9/21/2004	1428CAb 9/21/2004
Volatile Organic Compounds										
1,1,1-Trichloroethane	µg/m³	2,300	68,000	ND (0.27)	ND (0.2)	ND (0.19)	ND (0.19)	ND (0.18)	ND (0.2)	ND (0.2)
1,1,2,2-Tetrachloroethane	µg/m³	0.033	NE	NE	ND (0.25)	ND (0.24)	ND (0.24)	ND (0.23)	ND (0.26)	ND (0.26)
1,1,2-Trichloroethane	µg/m³	0.12	NE	NE	ND (0.2)	ND (0.19)	ND (0.19)	ND (0.18)	ND (0.2)	ND (0.2)
1,1-Dichloroethane	µg/m³	1.2	NE	NE	ND (0.15)	ND (0.14)	ND (0.14)	ND (0.13)	ND (0.15)	ND (0.15)
1,1-Dichloroethene	µg/m³	210	NE	NE	ND (0.072)	ND (0.07)	ND (0.07)	ND (0.066)	ND (0.074)	ND (0.074)
1,2,4-Trichlorobenzene	µg/m³	3.7	NE	NE	ND (1.4) J	ND (1.3) J	ND (1.3) J	ND (1.2) J	ND (1.4) J	ND (1.4) J
1,2,4-Trimethylbenzene	µg/m³	6.2	NE	NE	0.84	0.17 J	**23**	**23**	**14**	**13**
1,2-Dibromoethane	µg/m³	0.0034	NE	NE	ND (0.28)	ND (0.27)	ND (0.27)	ND (0.26)	ND (0.28)	ND (0.28)
1,2-Dichlorobenzene	µg/m³	210	NE	NE	ND (0.22) J	ND (0.21) J	ND (0.21) J	ND (0.2) J	ND (0.22) J	ND (0.22) J
1,2-Dichloroethane	µg/m³	0.074	NE	ND (0.40)	ND (0.15)	ND (0.14)	ND (0.14)	ND (0.13)	ND (0.15)	ND (0.15)
1,2-Dichloropropane	µg/m³	0.099	NE	NE	ND (0.17)	ND (0.16)	ND (0.16)	ND (0.15)	ND (0.17)	ND (0.17)
1,3,5-Trimethylbenzene	µg/m³	6.2	NE	NE	0.27	ND (0.17)	**8**	**8**	5.6	5.4
1,3-Dichlorobenzene	µg/m³	110	NE	NE	ND (0.22) J	ND (0.21) J	51 J	39 J	ND (0.22) J	ND (0.22) J
1,4-Dichlorobenzene	µg/m³	0.31	NE	NE	ND (0.22) J	ND (0.21) J	**3.5 J**	**2.5 J**	0.25 J	ND (0.22) J
1,4-Dioxane (p-dioxane)	µg/m³	0.61	**3,000**	NE	ND (0.66)	ND (0.64)	ND (0.64)	ND (0.6)	ND (0.67)	ND (0.67)
Benzene	µg/m³	0.25	**1,300**	**0.96**	**1.3 J**	**0.59 J**	**4.8 J**	**5.6 J**	**1.1 J**	**1.2 J**
Bromomethane	µg/m³	5.2	3,900	NE	0.42	ND (0.34)	ND (0.34)	0.35	ND (0.36)	ND (0.36)
Carbon tetrachloride	µg/m³	0.13	**1,900**	**0.69**	**0.45**	**0.45**	**0.47**	**0.46**	**0.43**	**0.45**
Chlorobenzene	µg/m³	62	NE	NE	ND (0.17)	ND (0.16)	0.3	0.24	ND (0.17)	ND (0.17)
Chloroethane	µg/m³	2.3	NE	NE	ND (0.24)	ND (0.23)	ND (0.23)	ND (0.22)	ND (0.24)	ND (0.24)
Chloroform	µg/m³	0.083	**150**	ND (0.10)	**0.19**	ND (0.17)	ND (0.17)	ND (0.16)	**0.35**	**0.47**
Chloromethane	µg/m³	95	NE	NE	1.2	1.1	1.5	1.5	0.87	1
cis-1,2-Dichloroethene	µg/m³	37	NE	NE	ND (0.14)	ND (0.14)	ND (0.14)	ND (0.13)	ND (0.15)	ND (0.15)
cis-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.15)	ND (0.17)	ND (0.17)
Ethylbenzene	µg/m³	1,100	NE	NE	0.9	0.23	12	11	1.9	1.8
Freon 11	µg/m³	730	NE	NE	3.2	1.1	1.1	1.1	1.7	1.8
Freon 12	µg/m³	210	NE	NE	3.1	2.5	2.4	2.4	2.4	2.5
Freon 113	µg/m³	31,000	NE	NE	0.61	0.58	0.59	0.57	0.56	0.59
Freon 114	µg/m³	31,000	NE	NE	ND (0.25)	ND (0.25)	ND (0.25)	ND (0.23)	ND (0.26)	ND (0.26)
Hexachlorobutadiene	µg/m³	0.086	NE	NE	ND (1.9)	ND (1.9)	ND (1.9)	ND (1.8)	ND (2)	ND (2)

TABLE 3-3
1428 3rd Street Analytical Results - Air (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1428 3rd St			
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	329BA AM 9/21/2004	329BA PM 9/21/2004	1428AA 9/21/2004	1428AA (FD) 9/21/2004	1428CAa 9/21/2004	1428CAb 9/21/2004
Volatile Organic Compounds										
Methyl tert-butyl ether	µg/m³	7.4	NE	ND (1.8)	ND (0.66)	ND (0.64)	ND (0.64)	ND (0.6)	ND (0.67)	ND (0.67)
Methylene chloride	µg/m³	4.1	**14,000**	ND (1.74)	ND (1.3)	ND (1.2)	ND (1.2)	ND (1.2)	ND (1.3)	ND (1.3)
Styrene	µg/m³	1,100	21,000	NE	0.31	ND (0.15)	6.8	6.5	0.58	0.52
Tetrachloroethene	µg/m³	0.32	**20,000**	ND (0.47)	0.27	ND (0.24)	**2.2**	**1.2**	**0.34**	**0.34**
Toluene	µg/m³	400	37,000	ND (3.0)	4.1	1.1	32	31	5.1	6.3
trans-1,2-Dichloroethene	µg/m³	73	NE	NE	ND (0.72)	ND (0.7)	ND (0.7)	ND (0.66)	ND (0.74)	ND (0.74)
trans-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.15)	ND (0.17)	ND (0.17)
Trichloroethene	µg/m³	0.017	NE	ND (0.43)	**0.11**	ND (0.029)	**0.13**	**0.1**	**0.16**	**0.12**
Vinyl chloride	µg/m³	0.11	**180,000**	ND (0.77)	ND (0.046)	ND (0.045)	0.058	ND (0.043)	ND (0.048)	ND (0.048)
Xylenes, total	µg/m³	110	22,000	NE	3.86	0.74	62	61	13.4	12.3

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-1 (Ambient and Crawlspace Air Screening Levels) for source of screening levels.

[2] Acute Reference Exposure Levels developed by Office of Environmental Health Hazard Assessment as of May 2000

[3] West Oakland background results are from the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); the result is from December 2002.

[4] Neighborhood background results are from samples collected at 329 Lewis Street (upwind of the AMCO site) in the morning and afternoon of the same day.

FD field duplicate
ND not detected above the laboratory's reporting limit shown in parentheses
NE not established
J estimated value
µg/m³ micrograms per cubic meter

TABLE 3-4
1432 3rd Street Analytical Results - Air (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1432 3rd St		
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	329BA AM 9/21/2004	329BA PM 9/21/2004	1432AA 9/21/2004	1432CA 9/21/2004	1432CA (FD) 9/21/2004
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/m³	2,300	68,000	ND (0.27)	ND (0.2)	ND (0.19)	ND (0.18)	ND (0.18)	ND (0.18)
1,1,2,2-Tetrachloroethane	µg/m³	0.033	NE	NE	ND (0.25)	ND (0.24)	ND (0.22)	ND (0.22)	ND (0.22)
1,1,2-Trichloroethane	µg/m³	0.12	NE	NE	ND (0.2)	ND (0.19)	ND (0.18)	ND (0.18)	ND (0.18)
1,1-Dichloroethane	µg/m³	1.2	NE	NE	ND (0.15)	ND (0.14)	ND (0.13)	ND (0.13)	ND (0.13)
1,1-Dichloroethene	µg/m³	210	NE	NE	ND (0.072)	ND (0.07)	ND (0.064)	ND (0.065)	ND (0.065)
1,2,4-Trichlorobenzene	µg/m³	3.7	NE	NE	ND (1.4) J	ND (1.3) J	ND (1.2) J	ND (1.2) J	ND (1.2) J
1,2,4-Trimethylbenzene	µg/m³	6.2	NE	NE	0.84	0.17 J	0.4	**20**	**31**
1,2-Dibromoethane	µg/m³	0.0034	NE	NE	ND (0.28)	ND (0.27)	ND (0.25)	ND (0.25)	ND (0.25)
1,2-Dichlorobenzene	µg/m³	210	NE	NE	ND (0.22) J	ND (0.21) J	ND (0.19) J	ND (0.2)	ND (0.2)
1,2-Dichloroethane	µg/m³	0.074	NE	ND (0.40)	ND (0.15)	ND (0.14)	ND (0.13)	ND (0.13)	ND (0.13)
1,2-Dichloropropane	µg/m³	0.099	NE	NE	ND (0.17)	ND (0.16)	ND (0.15)	ND (0.15)	ND (0.15)
1,3,5-Trimethylbenzene	µg/m³	6.2	NE	NE	0.27	ND (0.17)	ND (0.16)	6.2	**11**
1,3-Dichlorobenzene	µg/m³	110	NE	NE	ND (0.22) J	ND (0.21) J	ND (0.19) J	63	11
1,4-Dichlorobenzene	µg/m³	0.31	NE	NE	ND (0.22) J	ND (0.21) J	ND (0.19) J	**4.8**	**1**
1,4-Dioxane (p-dioxane)	µg/m³	0.61	**3,000**	NE	ND (0.66)	ND (0.64)	ND (0.58)	ND (0.59)	ND (0.59)
Benzene	µg/m³	0.25	**1,300**	**0.96**	**1.3 J**	**0.59 J**	**0.74 J**	**11 J**	**16 J**
Bromomethane	µg/m³	5.2	3,900	NE	0.42	ND (0.34)	0.35	0.42	0.39
Carbon tetrachloride	µg/m³	0.13	**1,900**	**0.69**	**0.45**	**0.45**	**0.53**	**0.54**	**0.5**
Chlorobenzene	µg/m³	62	NE	NE	ND (0.17)	ND (0.16)	ND (0.15)	0.4	0.16
Chloroethane	µg/m³	2.3	NE	NE	ND (0.24)	ND (0.23)	ND (0.21)	0.28	0.37
Chloroform	µg/m³	0.083	**150**	ND (0.10)	**0.19**	ND (0.17)	**0.3**	**0.44**	**0.42**
Chloromethane	µg/m³	95	NE	NE	1.2	1.1	0.96	1.2	1.5
cis-1,2-Dichloroethene	µg/m³	37	NE	NE	ND (0.14)	ND (0.14)	ND (0.13)	ND (0.13)	ND (0.13)
cis-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.16)	ND (0.14)	ND (0.15)	ND (0.15)
Ethylbenzene	µg/m³	1,100	NE	NE	0.9	0.23	0.4	13	20
Freon 11	µg/m³	730	NE	NE	3.2	1.1	1.4	1.5	1.5
Freon 12	µg/m³	210	NE	NE	3.1	2.5	2.5	2.6	2.6
Freon 113	µg/m³	31,000	NE	NE	0.61	0.58	0.58	0.63	0.61
Freon 114	µg/m³	31,000	NE	NE	ND (0.25)	ND (0.25)	ND (0.22)	ND (0.23)	ND (0.23)
Hexachlorobutadiene	µg/m³	0.086	NE	NE	ND (1.9)	ND (1.9)	ND (1.7)	ND (1.7) J	ND (1.7) J

TABLE 3-4
1432 3rd Street Analytical Results - Air (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1432 3rd St		
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	329BA AM 9/21/2004	329BA PM 9/21/2004	1432AA 9/21/2004	1432CA 9/21/2004	1432CA (FD) 9/21/2004
Volatile Organic Compounds									
Methyl tert-butyl ether	µg/m³	7.4	NE	ND (1.8)	ND (0.66)	ND (0.64)	ND (0.58)	ND (0.59)	ND (0.59)
Methylene chloride	µg/m³	4.1	**14,000**	ND (1.74)	ND (1.3)	ND (1.2)	ND (1.1)	ND (1.1)	ND (1.1)
Styrene	µg/m³	1,100	21,000	NE	0.31	ND (0.15)	ND (0.14)	7.8	11
Tetrachloroethene	µg/m³	0.32	**20,000**	ND (0.47)	0.27	ND (0.24)	**0.36**	**3.2**	**0.82**
Toluene	µg/m³	400	37,000	ND (3.0)	4.1	1.1	1.6	62	77
trans-1,2-Dichloroethene	µg/m³	73	NE	NE	ND (0.72)	ND (0.7)	ND (0.64)	ND (0.65)	ND (0.65)
trans-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.16)	ND (0.14)	ND (0.15)	ND (0.15)
Trichloroethene	µg/m³	0.017	NE	ND (0.43)	**0.11**	ND (0.029)	**0.046**	**0.36**	**0.16**
Vinyl chloride	µg/m³	0.11	**180,000**	ND (0.77)	ND (0.046)	ND (0.045)	ND (0.041)	**0.13**	0.11
Xylenes, total	µg/m³	110	22,000	NE	3.86	0.74	1.49	52	**127**

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-1 (Ambient and Crawlspace Air Screening Levels) for source of screening levels.

[2] Acute Reference Exposure Levels developed by Office of Environmental Health Hazard Assessment as of May 2000

[3] West Oakland background results are from the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); the result is from December 2002.

[4] Neighborhood background results are from samples collected at 329 Lewis Street (upwind of the AMCO site) in the morning and afternoon of the same day.

FD field duplicate
ND not detected above the laboratory's reporting limit shown in parentheses
NE not established
J estimated value
µg/m³ micrograms per cubic meter

TABLE 3-5
1436 3rd Street Analytical Results - Air (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1436 3rd St
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	329BA AM 9/21/2004	329BA PM 9/21/2004	1436AA 9/21/2004
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/m³	2,300	68,000	ND (0.27)	ND (0.2)	ND (0.19)	ND (0.17)
1,1,2,2-Tetrachloroethane	µg/m³	0.033	NE	NE	ND (0.25)	ND (0.24)	ND (0.22)
1,1,2-Trichloroethane	µg/m³	0.12	NE	NE	ND (0.2)	ND (0.19)	ND (0.17)
1,1-Dichloroethane	µg/m³	1.2	NE	NE	ND (0.15)	ND (0.14)	ND (0.13)
1,1-Dichloroethene	µg/m³	210	NE	NE	ND (0.072)	ND (0.07)	ND (0.062)
1,2,4-Trichlorobenzene	µg/m³	3.7	NE	NE	ND (1.4) J	ND (1.3) J	ND (1.2) J
1,2,4-Trimethylbenzene	µg/m³	6.2	NE	NE	0.84	0.17 J	0.89
1,2-Dibromoethane	µg/m³	0.0034	NE	NE	ND (0.28)	ND (0.27)	ND (0.24)
1,2-Dichlorobenzene	µg/m³	210	NE	NE	ND (0.22) J	ND (0.21) J	ND (0.19)
1,2-Dichloroethane	µg/m³	0.074	NE	ND (0.40)	ND (0.15)	ND (0.14)	ND (0.13)
1,2-Dichloropropane	µg/m³	0.099	NE	NE	ND (0.17)	ND (0.16)	ND (0.14)
1,3,5-Trimethylbenzene	µg/m³	6.2	NE	NE	0.27	ND (0.17)	0.26
1,3-Dichlorobenzene	µg/m³	110	NE	NE	ND (0.22) J	ND (0.21) J	ND (0.19)
1,4-Dichlorobenzene	µg/m³	0.31	NE	NE	ND (0.22) J	ND (0.21) J	ND (0.19)
1,4-Dioxane (p-dioxane)	µg/m³	0.61	**3,000**	NE	ND (0.66)	ND (0.64)	ND (0.57)
Benzene	µg/m³	0.25	**1,300**	**0.96**	**1.3 J**	**0.59 J**	**0.79 J**
Bromomethane	µg/m³	5.2	3,900	NE	0.42	ND (0.34)	0.34
Carbon tetrachloride	µg/m³	0.13	**1,900**	**0.69**	**0.45**	**0.45**	**0.48**
Chlorobenzene	µg/m³	62	NE	NE	ND (0.17)	ND (0.16)	ND (0.14)
Chloroethane	µg/m³	2.3	NE	NE	ND (0.24)	ND (0.23)	ND (0.21)
Chloroform	µg/m³	0.083	**150**	ND (0.10)	**0.19**	ND (0.17)	**0.16**
Chloromethane	µg/m³	95	NE	NE	1.2	1.1	1
cis-1,2-Dichloroethene	µg/m³	37	NE	NE	ND (0.14)	ND (0.14)	ND (0.12)
cis-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.16)	ND (0.14)
Ethylbenzene	µg/m³	1,100	NE	NE	0.9	0.23	0.57
Freon 11	µg/m³	730	NE	NE	3.2	1.1	1.3
Freon 12	µg/m³	210	NE	NE	3.1	2.5	2.8
Freon 113	µg/m³	31,000	NE	NE	0.61	0.58	0.63
Freon 114	µg/m³	31,000	NE	NE	ND (0.25)	ND (0.25)	ND (0.22)
Hexachlorobutadiene	µg/m³	0.086	NE	NE	ND (1.9)	ND (1.9)	ND (1.7) J

TABLE 3-5
1436 3rd Street Analytical Results - Air (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1436 3rd St
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	329BA AM 9/21/2004	329BA PM 9/21/2004	1436AA 9/21/2004
Volatile Organic Compounds							
Methyl tert-butyl ether	µg/m³	7.4	NE	ND (1.8)	ND (0.66)	ND (0.64)	ND (0.57)
Methylene chloride	µg/m³	4.1	**14,000**	ND (1.74)	ND (1.3)	ND (1.2)	ND (1.1)
Styrene	µg/m³	1,100	21,000	NE	0.31	ND (0.15)	ND (0.13)
Tetrachloroethene	µg/m³	0.32	**20,000**	ND (0.47)	0.27	ND (0.24)	ND (0.21)
Toluene	µg/m³	400	37,000	ND (3.0)	4.1	1.1	1.7
trans-1,2-Dichloroethene	µg/m³	73	NE	NE	ND (0.72)	ND (0.7)	ND (0.62)
trans-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.16)	ND (0.14)
Trichloroethene	µg/m³	0.017	NE	ND (0.43)	**0.11**	ND (0.029)	**0.058**
Vinyl chloride	µg/m³	0.11	**180,000**	ND (0.77)	ND (0.046)	ND (0.045)	ND (0.04)
Xylenes, total	µg/m³	110	22,000	NE	3.86	0.74	2.03

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-1 (Ambient and Crawlspace Air Screening Levels) for source of screening levels.

[2] Acute Reference Exposure Levels developed by Office of Environmental Health Hazard Assessment as of May 2000

[3] West Oakland background results are from the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); the result is from December 2002.

[4] Neighborhood background results are from samples collected at 329 Lewis Street (upwind of the AMCO site) in the morning and afternoon of the same day.

ND not detected above the laboratory's reporting limit shown in parentheses
NE not established
J estimated value
µg/m³ micrograms per cubic meter

TABLE 3-6
326 Center Street Analytical Results - Air (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		326 Center St	
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	329BA AM 9/21/2004	329BA PM 9/21/2004	326AA 9/21/2004	326CA 9/21/2004
Volatile Organic Compounds								
1,1,1-Trichloroethane	µg/m³	2,300	68,000	ND (0.27)	ND (0.2)	ND (0.19)	ND (0.19)	ND (0.18)
1,1,2,2-Tetrachloroethane	µg/m³	0.033	NE	NE	ND (0.25)	ND (0.24)	ND (0.24)	ND (0.23)
1,1,2-Trichloroethane	µg/m³	0.12	NE	NE	ND (0.2)	ND (0.19)	ND (0.19)	ND (0.18)
1,1-Dichloroethane	µg/m³	1.2	NE	NE	ND (0.15)	ND (0.14)	ND (0.14)	ND (0.13)
1,1-Dichloroethene	µg/m³	210	NE	NE	ND (0.072)	ND (0.07)	ND (0.069)	ND (0.066)
1,2,4-Trichlorobenzene	µg/m³	3.7	NE	NE	ND (1.4) J	ND (1.3) J	ND (1.3) J	ND (1.2) J
1,2,4-Trimethylbenzene	µg/m³	6.2	NE	NE	0.84	0.17 J	0.37	0.3
1,2-Dibromoethane	µg/m³	0.0034	NE	NE	ND (0.28)	ND (0.27)	ND (0.27)	ND (0.26)
1,2-Dichlorobenzene	µg/m³	210	NE	NE	ND (0.22) J	ND (0.21) J	ND (0.21)	ND (0.2)
1,2-Dichloroethane	µg/m³	0.074	NE	ND (0.40)	ND (0.15)	ND (0.14)	ND (0.14)	ND (0.13)
1,2-Dichloropropane	µg/m³	0.099	NE	NE	ND (0.17)	ND (0.16)	ND (0.16)	ND (0.15)
1,3,5-Trimethylbenzene	µg/m³	6.2	NE	NE	0.27	ND (0.17)	ND (0.17)	ND (0.16)
1,3-Dichlorobenzene	µg/m³	110	NE	NE	ND (0.22) J	ND (0.21) J	ND (0.21)	ND (0.2)
1,4-Dichlorobenzene	µg/m³	0.31	NE	NE	ND (0.22) J	ND (0.21) J	**0.85**	**6**
1,4-Dioxane (p-dioxane)	µg/m³	0.61	**3,000**	NE	ND (0.66)	ND (0.64)	ND (0.63)	ND (0.6)
Benzene	µg/m³	0.25	**1,300**	**0.96**	**1.3 J**	**0.59 J**	**0.66 J**	**0.65 J**
Bromomethane	µg/m³	5.2	3,900	NE	0.42	ND (0.34)	ND (0.34)	0.38
Carbon tetrachloride	µg/m³	0.13	**1,900**	**0.69**	**0.45**	**0.45**	**0.46**	**0.48**
Chlorobenzene	µg/m³	62	NE	NE	ND (0.17)	ND (0.16)	ND (0.16)	ND (0.15)
Chloroethane	µg/m³	2.3	NE	NE	ND (0.24)	ND (0.23)	ND (0.23)	ND (0.22)
Chloroform	µg/m³	0.083	**150**	ND (0.10)	**0.19**	ND (0.17)	ND (0.17)	ND (0.16)
Chloromethane	µg/m³	95	NE	NE	1.2	1.1	0.95	0.8
cis-1,2-Dichloroethene	µg/m³	37	NE	NE	ND (0.14)	ND (0.14)	ND (0.14)	ND (0.13)
cis-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.15)
Ethylbenzene	µg/m³	1,100	NE	NE	0.9	0.23	0.36	0.31
Freon 11	µg/m³	730	NE	NE	3.2	1.1	1.2	1.2
Freon 12	µg/m³	210	NE	NE	3.1	2.5	2.7	2.7
Freon 113	µg/m³	31,000	NE	NE	0.61	0.58	0.63	0.61
Freon 114	µg/m³	31,000	NE	NE	ND (0.25)	ND (0.25)	ND (0.24)	ND (0.23)
Hexachlorobutadiene	µg/m³	0.086	NE	NE	ND (1.9)	ND (1.9)	ND (1.8) J	ND (1.8) J

TABLE 3-6
326 Center Street Analytical Results - Air (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		326 Center St	
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	329BA AM 9/21/2004	329BA PM 9/21/2004	326AA 9/21/2004	326CA 9/21/2004
Volatile Organic Compounds								
Methyl tert-butyl ether	µg/m³	7.4	NE	ND (1.8)	ND (0.66)	ND (0.64)	ND (0.63)	ND (0.6)
Methylene chloride	µg/m³	4.1	**14,000**	ND (1.74)	ND (1.3)	ND (1.2)	ND (1.2)	ND (1.2)
Styrene	µg/m³	1,100	21,000	NE	0.31	ND (0.15)	ND (0.15)	ND (0.14)
Tetrachloroethene	µg/m³	0.32	**20,000**	ND (0.47)	0.27	ND (0.24)	ND (0.24)	ND (0.23)
Toluene	µg/m³	400	37,000	ND (3.0)	4.1	1.1	1.6	1.4
trans-1,2-Dichloroethene	µg/m³	73	NE	NE	ND (0.72)	ND (0.7)	ND (0.69)	ND (0.66)
trans-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.16)	ND (0.16)	ND (0.15)
Trichloroethene	µg/m³	0.017	NE	ND (0.43)	**0.11**	ND (0.029)	ND (0.028)	ND (0.027)
Vinyl chloride	µg/m³	0.11	**180,000**	ND (0.77)	ND (0.046)	ND (0.045)	ND (0.044)	ND (0.043)
Xylenes, total	µg/m³	110	22,000	NE	3.86	0.74	1.47	1.14

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-1 (Ambient and Crawlspace Air Screening Levels) for source of screening levels.

[2] Acute Reference Exposure Levels developed by Office of Environmental Health Hazard Assessment as of May 2000

[3] West Oakland background results are from the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); the result is from December 2002.

[4] Neighborhood background results are from samples collected at 329 Lewis Street (upwind of the AMCO site) in the morning and afternoon of the same day.

ND not detected above the laboratory's reporting limit shown in parentheses
NE not established
J estimated value
µg/m³ micrograms per cubic meter

TABLE 3-7
360 Center Street Analytical Results - Air (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		360 Center St
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	329BA AM 9/21/2004	329BA PM 9/21/2004	360AA 9/21/2004
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/m³	2,300	68,000	ND (0.27)	ND (0.2)	ND (0.19)	ND (0.2)
1,1,2,2-Tetrachloroethane	µg/m³	0.033	NE	NE	ND (0.25)	ND (0.24)	ND (0.26)
1,1,2-Trichloroethane	µg/m³	0.12	NE	NE	ND (0.2)	ND (0.19)	ND (0.2)
1,1-Dichloroethane	µg/m³	1.2	NE	NE	ND (0.15)	ND (0.14)	ND (0.15)
1,1-Dichloroethene	µg/m³	210	NE	NE	ND (0.072)	ND (0.07)	ND (0.074)
1,2,4-Trichlorobenzene	µg/m³	3.7	NE	NE	ND (1.4) J	ND (1.3) J	ND (1.4) J
1,2,4-Trimethylbenzene	µg/m³	6.2	NE	NE	0.84	0.17 J	0.29
1,2-Dibromoethane	µg/m³	0.0034	NE	NE	ND (0.28)	ND (0.27)	ND (0.28)
1,2-Dichlorobenzene	µg/m³	210	NE	NE	ND (0.22) J	ND (0.21) J	ND (0.22) J
1,2-Dichloroethane	µg/m³	0.074	NE	ND (0.40)	ND (0.15)	ND (0.14)	ND (0.15)
1,2-Dichloropropane	µg/m³	0.099	NE	NE	ND (0.17)	ND (0.16)	ND (0.17)
1,3,5-Trimethylbenzene	µg/m³	6.2	NE	NE	0.27	ND (0.17)	ND (0.18)
1,3-Dichlorobenzene	µg/m³	110	NE	NE	ND (0.22) J	ND (0.21) J	ND (0.22) J
1,4-Dichlorobenzene	µg/m³	0.31	NE	NE	ND (0.22) J	ND (0.21) J	0.28 J
1,4-Dioxane (p-dioxane)	µg/m³	0.61	**3,000**	NE	ND (0.66)	ND (0.64)	ND (0.67)
Benzene	µg/m³	0.25	**1,300**	**0.96**	**1.3 J**	**0.59 J**	ND (0.59) J
Bromomethane	µg/m³	5.2	3,900	NE	0.42	ND (0.34)	ND (0.36)
Carbon tetrachloride	µg/m³	0.13	**1,900**	**0.69**	**0.45**	**0.45**	**0.53**
Chlorobenzene	µg/m³	62	NE	NE	ND (0.17)	ND (0.16)	ND (0.17)
Chloroethane	µg/m³	2.3	NE	NE	ND (0.24)	ND (0.23)	ND (0.24)
Chloroform	µg/m³	0.083	**150**	ND (0.10)	**0.19**	ND (0.17)	ND (0.18)
Chloromethane	µg/m³	95	NE	NE	1.2	1.1	1.1
cis-1,2-Dichloroethene	µg/m³	37	NE	NE	ND (0.14)	ND (0.14)	ND (0.15)
cis-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.16)	ND (0.17)
Ethylbenzene	µg/m³	1,100	NE	NE	0.9	0.23	0.25
Freon 11	µg/m³	730	NE	NE	3.2	1.1	1.1
Freon 12	µg/m³	210	NE	NE	3.1	2.5	2.6
Freon 113	µg/m³	31,000	NE	NE	0.61	0.58	0.6
Freon 114	µg/m³	31,000	NE	NE	ND (0.25)	ND (0.25)	ND (0.26)
Hexachlorobutadiene	µg/m³	0.086	NE	NE	ND (1.9)	ND (1.9)	ND (2)

TABLE 3-7
360 Center Street Analytical Results - Air (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		360 Center St
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	329BA AM 9/21/2004	329BA PM 9/21/2004	360AA 9/21/2004
Volatile Organic Compounds							
Methyl tert-butyl ether	µg/m³	7.4	NE	ND (1.8)	ND (0.66)	ND (0.64)	ND (0.67)
Methylene chloride	µg/m³	4.1	**14,000**	ND (1.74)	ND (1.3)	ND (1.2)	ND (1.3)
Styrene	µg/m³	1,100	21,000	NE	0.31	ND (0.15)	ND (0.16)
Tetrachloroethene	µg/m³	0.32	**20,000**	ND (0.47)	0.27	ND (0.24)	ND (0.25)
Toluene	µg/m³	400	37,000	ND (3.0)	4.1	1.1	2.2
trans-1,2-Dichloroethene	µg/m³	73	NE	NE	ND (0.72)	ND (0.7)	ND (0.74)
trans-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.16)	ND (0.17)
Trichloroethene	µg/m³	0.017	NE	ND (0.43)	**0.11**	ND (0.029)	ND (0.03)
Vinyl chloride	µg/m³	0.11	**180,000**	ND (0.77)	ND (0.046)	ND (0.045)	ND (0.048)
Xylenes, total	µg/m³	110	22,000	NE	3.86	0.74	0.87

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-1 (Ambient and Crawlspace Air Screening Levels) for source of screening levels.

[2] Acute Reference Exposure Levels developed by Office of Environmental Health Hazard Assessment as of May 2000

[3] West Oakland background results are from the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); the result is from December 2002.

[4] Neighborhood background results are from samples collected at 329 Lewis Street (upwind of the AMCO site) in the morning and afternoon of the same day.

ND not detected above the laboratory's reporting limit shown in parentheses
NE not established
J estimated value
µg/m³ micrograms per cubic meter

TABLE 3-8
Residential Air Results Summary (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Backyard Air Levels	Crawlspace Air Levels	Neighborhood Background Air Levels[1]	West Oakland Background Air Levels[2]	Screening Levels[3]
1,1,2,2-Tetrachloroethane	µg/m³	0.15 - < 0.23	< 0.21 - < 0.22	< 0.22 - < 0.24	NA	0.033
1,4-Dichlorobenzene	µg/m³	0.077 - 0.25	0.088 - 0.4	0.069 - < 0.2	NA	0.31
Benzene	µg/m³	0.41 - 1.2	0.11 - 0.55	0.43 - 0.52	0.96	0.25
Carbon tetrachloride	µg/m³	0.51 - 0.83	0.49 - 0.63	0.52 - 0.58	0.69	0.13
Chloroform	µg/m³	0.093 - 0.18	0.099 - 0.25	0.095 - 0.13	<0.10	0.083
Hexachlorobutadiene	µg/m³	< 1.6 - < 1.8	0.68 - < 1.7	< 1.7 - < 1.9	NA	0.086
Methylene chloride	µg/m³	< 1.1 - 21	< 1.1 - 8.2	< 1.1 - < 1.2	<1.74	4.1
Naphthalene	µg/m³	0.036 - 0.27	-	0.043 - 0.09	NA	0.056
Trichloroethene	µg/m³	< 0.03 - < 0.057	< 0.036 - 0.16	< 0.042 - < 0.06	<0.43	0.017

Notes:

Only compounds detected above screening levels are shown

[1] From samples collected at 322 Lewis St (upwind of the AMCO site) in the morning and afternoon of the same day.

[2] From the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); levels shown are from December 2002, the latest date available.

[3] EPA Region 9 Preliminary Remediation Goals for ambient air, October 2004.

NA not available
µg/m³ micrograms per cubic meter

TABLE 3-9
1428 3rd Street Analytical Results - Air (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1428 3rd St			
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 5/12/2005	322BA PM 5/12/2005	1428AA 5/12/2005	1428AA (FD) 5/12/2005	1428CAa 5/12/2005	1428CAc 5/12/2005
Volatile Organic Compounds										
1,1,1-Trichloroethane	µg/m³	2,300	68,000	ND (0.27)	0.096 J	0.1 J	0.095 J	0.11 J	0.13 J	0.15 J
1,1,2,2-Tetrachloroethane	µg/m³	0.033	NE	NE	ND (0.24) J	ND (0.22) J	**0.15 J**	ND (0.21)	ND (0.21) J	ND (0.21) J
1,1,2-Trichloroethane	µg/m³	0.12	NE	NE	ND (0.19)	ND (0.18)	ND (0.17)	ND (0.17)	ND (0.17)	ND (0.17)
1,1-Dichloroethane	µg/m³	1.2	NE	NE	ND (0.14)	ND (0.13)	ND (0.12)	ND (0.12)	ND (0.12)	ND (0.13)
1,1-Dichloroethene	µg/m³	210	NE	NE	ND (0.069)	0.052 J	ND (0.061)	ND (0.061)	ND (0.061)	ND (0.062)
1,2,4-Trichlorobenzene	µg/m³	3.7	NE	NE	ND (1.3) J	ND (1.2) J	ND (1.2) J	ND (1.2) J	ND (1.2) J	ND (1.2) J
1,2,4-Trimethylbenzene	µg/m³	6.2	NE	NE	0.11 J	0.22	0.19	0.16	0.077 J	0.45
1,2-Dibromoethane	µg/m³	0.0034	NE	NE	ND (0.27)	ND (0.25)	ND (0.24)	ND (0.24)	ND (0.24)	ND (0.24)
1,2-Dichlorobenzene	µg/m³	210	NE	NE	ND (0.21) J	ND (0.2) J	ND (0.19) J	ND (0.19) J	ND (0.19) J	ND (0.19) J
1,2-Dichloroethane	µg/m³	0.074	NE	ND (0.40)	ND (0.14)	ND (0.13)	ND (0.12)	ND (0.12)	ND (0.12)	ND (0.13)
1,2-Dichloropropane	µg/m³	0.099	NE	NE	ND (0.16)	ND (0.15)	ND (0.14)	ND (0.14)	ND (0.14)	ND (0.14)
1,3,5-Trimethylbenzene	µg/m³	6.2	NE	NE	0.042 J	0.094 J	0.082 J	0.068 J	0.039 J	0.13 J
1,3-Dichlorobenzene	µg/m³	110	NE	NE	ND (0.21)	ND (0.2)	ND (0.19) J	0.052 J	ND (0.19) J	ND (0.19) J
1,4-Dichlorobenzene	µg/m³	0.31	NE	NE	0.069 J	ND (0.2) J	ND (0.2) J	ND (0.19) J	ND (0.19) J	**0.4 J**
1,4-Dioxane (p-dioxane)	µg/m³	0.61	**3,000**	NE	ND (0.63)	ND (0.59)	ND (0.56)	ND (0.56)	ND (0.56)	ND (0.56)
Benzene	µg/m³	0.25	**1,300**	**0.96**	**0.43**	**0.52**	**0.41**	**0.44**	0.19 J	**0.55**
Bromomethane	µg/m³	5.2	3,900	NE	ND (0.34) J	ND (0.32) J	ND (0.3) J	ND (0.3) J	ND (0.47) J	ND (0.45) J
Carbon tetrachloride	µg/m³	0.13	**1,900**	**0.69**	**0.52**	**0.58**	**0.51 J**	**0.54 J**	**0.49 J**	**0.63 J**
Chlorobenzene	µg/m³	62	NE	NE	ND (0.16)	ND (0.15)	ND (0.14)	ND (0.14)	ND (0.14)	0.029 J
Chloroethane	µg/m³	2.3	NE	NE	0.03 J	0.04 J	0.05 J	0.028 J	0.036 J	0.63
Chloroform	µg/m³	0.083	**150**	ND (0.10)	**0.13 J**	**0.095 J**	**0.1 J**	**0.11 J**	**0.19**	**0.25**
Chloromethane	µg/m³	95	NE	NE	1.1	1.2	1.1	1.2	3.1	2.7
cis-1,2-Dichloroethene	µg/m³	37	NE	NE	ND (0.14)	ND (0.13)	ND (0.12)	ND (0.12)	ND (0.12)	ND (0.12)
cis-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.15)	ND (0.14)	ND (0.14)	ND (0.14)	ND (0.14)
Ethylbenzene	µg/m³	1,100	NE	NE	0.19	0.22	0.21	0.21	0.11 J	0.4
Freon 11	µg/m³	730	NE	NE	1.6	1.6	1.6	1.7	1.9	2.4
Freon 12	µg/m³	210	NE	NE	2.7	2.6	2.6	2.9	2.4	3.1
Freon 113	µg/m³	31,000	NE	NE	0.64	0.66	0.65	0.69	0.63	0.8
Freon 114	µg/m³	31,000	NE	NE	0.12 J	0.12 J	0.12 J	0.13 J	ND (0.22)	ND (0.22)
Hexachlorobutadiene	µg/m³	0.086	NE	NE	ND (1.9) J	ND (1.7) J	ND (1.6)	ND (1.6)	ND (1.6)	ND (1.7)

TABLE 3-9
1428 3rd Street Analytical Results - Air (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1428 3rd St			
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 5/12/2005	322BA PM 5/12/2005	1428AA 5/12/2005	1428AA (FD) 5/12/2005	1428CAa 5/12/2005	1428CAc 5/12/2005
Volatile Organic Compounds										
Methyl tert-butyl ether	µg/m³	7.4	NE	ND (1.8)	ND (0.63)	ND (0.59)	ND (0.56)	ND (0.56)	ND (0.56)	ND (0.56)
Methylene chloride	µg/m³	4.1	**14,000**	ND (1.74)	ND (1.2) J	ND (1.1) J	**19**	**21**	4.1	**8.2**
Naphthalene	µg/m³	0.056	NE	NE	0.043	**0.09**	**0.12**	**0.1**	---	---
Styrene	µg/m³	1,100	21,000	NE	0.054 J	0.053 J	0.061 J	0.049 J	0.068 J	0.17
Tetrachloroethene	µg/m³	0.32	**20,000**	ND (0.47)	**0.4**	0.28	0.13 J	0.14 J	0.29	0.28
Toluene	µg/m³	400	37,000	ND (3.0)	1.1	1.3	1.2	1.2	0.46	1.7
trans-1,2-Dichloroethene	µg/m³	73	NE	NE	ND (0.69)	ND (0.65)	ND (0.61)	ND (0.61)	ND (0.61)	ND (0.62)
trans-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.15)	ND (0.14)	ND (0.14)	ND (0.14)	ND (0.14)
Trichloroethene	µg/m³	0.017	NE	ND (0.43)	ND (0.06) J	ND (0.042) J	ND (0.032) J	ND (0.034) J	**0.1**	**0.16**
Vinyl chloride	µg/m³	0.11	**180,000**	ND (0.77)	ND (0.045)	ND (0.042)	ND (0.04)	ND (0.04)	ND (0.04)	ND (0.04)
Xylenes, total	µg/m³	110	22,000	NE	0.63 J	0.87	0.77	0.74	0.218 J	1.2

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-1 (Ambient and Crawlspace Air Screening Levels) for source of screening levels.

[2] Acute Reference Exposure Levels developed by Office of Environmental Health Hazard Assessment as of May 2000

[3] West Oakland background results are from the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); the result is from December 2002.

[4] Neighborhood background results are from samples collected at 322 Lewis Street (upwind of the AMCO site) in the morning and afternoon of the same day.

FD	field duplicate
ND	not detected above the laboratory's reporting limit shown in parentheses
NE	not established
J	estimated value
µg/m³	micrograms per cubic meter

TABLE 3-10
1432 3rd Street Analytical Results - Air (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1432 3rd St		
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 5/12/2005	322BA PM 5/12/2005	1432AA 5/12/2005	1432CA 5/12/2005	1432CA (FD) 5/12/2005
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/m³	2,300	68,000	ND (0.27)	0.096 J	0.1 J	0.11 J	0.11 J	0.12 J
1,1,2,2-Tetrachloroethane	µg/m³	0.033	NE	NE	ND (0.24) J	ND (0.22) J	ND (0.23) J	ND (0.22)	ND (0.22) J
1,1,2-Trichloroethane	µg/m³	0.12	NE	NE	ND (0.19)	ND (0.18)	ND (0.18)	ND (0.17)	ND (0.17)
1,1-Dichloroethane	µg/m³	1.2	NE	NE	ND (0.14)	ND (0.13)	ND (0.14)	ND (0.13)	ND (0.13)
1,1-Dichloroethene	µg/m³	210	NE	NE	ND (0.069)	0.052 J	ND (0.067)	ND (0.063)	ND (0.063)
1,2,4-Trichlorobenzene	µg/m³	3.7	NE	NE	ND (1.3) J	ND (1.2) J	ND (1.2) J	ND (1.2) J	ND (1.2) J
1,2,4-Trimethylbenzene	µg/m³	6.2	NE	NE	0.11 J	0.22	0.25	ND (0.16)	0.066 J
1,2-Dibromoethane	µg/m³	0.0034	NE	NE	ND (0.27)	ND (0.25)	ND (0.26)	ND (0.24)	ND (0.24)
1,2-Dichlorobenzene	µg/m³	210	NE	NE	ND (0.21) J	ND (0.2) J	0.13 J	0.11 J	0.16 J
1,2-Dichloroethane	µg/m³	0.074	NE	ND (0.40)	ND (0.14)	ND (0.13)	0.047 J	ND (0.13)	0.044 J
1,2-Dichloropropane	µg/m³	0.099	NE	NE	ND (0.16)	ND (0.15)	ND (0.16)	ND (0.15)	ND (0.15)
1,3,5-Trimethylbenzene	µg/m³	6.2	NE	NE	0.042 J	0.094 J	0.098 J	ND (0.16)	0.047 J
1,3-Dichlorobenzene	µg/m³	110	NE	NE	ND (0.21)	ND (0.2)	0.092 J	0.077 J	0.12 J
1,4-Dichlorobenzene	µg/m³	0.31	NE	NE	0.069 J	ND (0.2) J	0.25 J	**0.32 J**	0.3 J
1,4-Dioxane (p-dioxane)	µg/m³	0.61	**3,000**	NE	ND (0.63)	ND (0.59)	ND (0.6)	ND (0.57)	ND (0.57)
Benzene	µg/m³	0.25	**1,300**	**0.96**	**0.43**	**0.52**	**0.55**	0.23 J	0.11 J
Bromomethane	µg/m³	5.2	3,900	NE	ND (0.34) J	ND (0.32) J	ND (0.33) J	ND (0.32) J	ND (0.31) J
Carbon tetrachloride	µg/m³	0.13	**1,900**	**0.69**	**0.52**	**0.58**	**0.6**	**0.53**	**0.58**
Chlorobenzene	µg/m³	62	NE	NE	ND (0.16)	ND (0.15)	ND (0.15)	0.029 J	ND (0.14)
Chloroethane	µg/m³	2.3	NE	NE	0.03 J	0.04 J	ND (0.22)	0.072 J	0.11 J
Chloroform	µg/m³	0.083	**150**	ND (0.10)	**0.13 J**	**0.095 J**	**0.18**	**0.19**	**0.16**
Chloromethane	µg/m³	95	NE	NE	1.1	1.2	1.2	0.48	0.45
cis-1,2-Dichloroethene	µg/m³	37	NE	NE	ND (0.14)	ND (0.13)	ND (0.13)	ND (0.12)	ND (0.12)
cis-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.15)	ND (0.15)	ND (0.14)	ND (0.14)
Ethylbenzene	µg/m³	1,100	NE	NE	0.19	0.22	0.24	0.046 J	0.043 J
Freon 11	µg/m³	730	NE	NE	1.6	1.6	1.8	1.7	1.8
Freon 12	µg/m³	210	NE	NE	2.7	2.6	2.9	2.7	2.8
Freon 113	µg/m³	31,000	NE	NE	0.64	0.66	0.71	0.68	0.73
Freon 114	µg/m³	31,000	NE	NE	0.12 J	0.12 J	0.13 J	0.23	0.23
Hexachlorobutadiene	µg/m³	0.086	NE	NE	ND (1.9) J	ND (1.7) J	ND (1.8) J	ND (1.7) J	ND (1.7) J

TABLE 3-10
1432 3rd Street Analytical Results - Air (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1432 3rd St		
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 5/12/2005	322BA PM 5/12/2005	1432AA 5/12/2005	1432CA 5/12/2005	1432CA (FD) 5/12/2005
Volatile Organic Compounds									
Methyl tert-butyl ether	µg/m³	7.4	NE	ND (1.8)	ND (0.63)	ND (0.59)	ND (0.6)	ND (0.57)	ND (0.57)
Methylene chloride	µg/m³	4.1	**14,000**	ND (1.74)	ND (1.2) J	ND (1.1) J	3.2	2.2	2.2
Naphthalene	µg/m³	0.056	NE	NE	0.043	**0.09**	**0.27**	---	---
Styrene	µg/m³	1,100	21,000	NE	0.054 J	0.053 J	0.073 J	ND (0.13)	0.05 J
Tetrachloroethene	µg/m³	0.32	**20,000**	ND (0.47)	**0.4**	0.28	0.22 J	0.15 J	0.17 J
Toluene	µg/m³	400	37,000	ND (3.0)	1.1	1.3	1.4	0.17	0.17
trans-1,2-Dichloroethene	µg/m³	73	NE	NE	ND (0.69)	ND (0.65)	ND (0.67)	ND (0.63)	ND (0.63)
trans-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.15)	ND (0.15)	ND (0.14)	ND (0.14)
Trichloroethene	µg/m³	0.017	NE	ND (0.43)	ND (0.06) J	ND (0.042) J	ND (0.057) J	ND (0.036) J	ND (0.05) J
Vinyl chloride	µg/m³	0.11	**180,000**	ND (0.77)	ND (0.045)	ND (0.042)	ND (0.043)	ND (0.04)	0.064
Xylenes, total	µg/m³	110	22,000	NE	0.63 J	0.87	0.94	0.107 J	0.159 J

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-1 (Ambient and Crawlspace Air Screening Levels) for source of screening levels.

[2] Acute Reference Exposure Levels developed by Office of Environmental Health Hazard Assessment as of May 2000

[3] West Oakland background results are from the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); the result is from December 2002.

[4] Neighborhood background results are from samples collected at 322 Lewis Street (upwind of the AMCO site) in the morning and afternoon of the same day.

FD	field duplicate
ND	not detected above the laboratory's reporting limit shown in parentheses
NE	not established
J	estimated value
µg/m³	micrograms per cubic meter

TABLE 3-11
1436 3rd Street Analytical Results - Air (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1436 3rd St
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 5/12/2005	322BA PM 5/12/2005	1436AA 5/12/2005
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/m³	2,300	68,000	ND (0.27)	0.096 J	0.1 J	0.11 J
1,1,2,2-Tetrachloroethane	µg/m³	0.033	NE	NE	ND (0.24) J	ND (0.22) J	ND (0.22) J
1,1,2-Trichloroethane	µg/m³	0.12	NE	NE	ND (0.19)	ND (0.18)	ND (0.17)
1,1-Dichloroethane	µg/m³	1.2	NE	NE	ND (0.14)	ND (0.13)	ND (0.13)
1,1-Dichloroethene	µg/m³	210	NE	NE	ND (0.069)	0.052 J	ND (0.063)
1,2,4-Trichlorobenzene	µg/m³	3.7	NE	NE	ND (1.3) J	ND (1.2) J	ND (1.2) J
1,2,4-Trimethylbenzene	µg/m³	6.2	NE	NE	0.11 J	0.22	0.18
1,2-Dibromoethane	µg/m³	0.0034	NE	NE	ND (0.27)	ND (0.25)	ND (0.24)
1,2-Dichlorobenzene	µg/m³	210	NE	NE	ND (0.21) J	ND (0.2) J	0.1 J
1,2-Dichloroethane	µg/m³	0.074	NE	ND (0.40)	ND (0.14)	ND (0.13)	0.049 J
1,2-Dichloropropane	µg/m³	0.099	NE	NE	ND (0.16)	ND (0.15)	ND (0.15)
1,3,5-Trimethylbenzene	µg/m³	6.2	NE	NE	0.042 J	0.094 J	0.072 J
1,3-Dichlorobenzene	µg/m³	110	NE	NE	ND (0.21)	ND (0.2)	0.074 J
1,4-Dichlorobenzene	µg/m³	0.31	NE	NE	0.069 J	ND (0.2) J	0.14 J
1,4-Dioxane (p-dioxane)	µg/m³	0.61	**3,000**	NE	ND (0.63)	ND (0.59)	ND (0.57)
Benzene	µg/m³	0.25	**1,300**	**0.96**	**0.43**	**0.52**	**0.48**
Bromomethane	µg/m³	5.2	3,900	NE	ND (0.34) J	ND (0.32) J	ND (0.31) J
Carbon tetrachloride	µg/m³	0.13	**1,900**	**0.69**	**0.52**	**0.58**	**0.63**
Chlorobenzene	µg/m³	62	NE	NE	ND (0.16)	ND (0.15)	0.028 J
Chloroethane	µg/m³	2.3	NE	NE	0.03 J	0.04 J	0.039 J
Chloroform	µg/m³	0.083	**150**	ND (0.10)	**0.13 J**	**0.095 J**	**0.11 J**
Chloromethane	µg/m³	95	NE	NE	1.1	1.2	1.3
cis-1,2-Dichloroethene	µg/m³	37	NE	NE	ND (0.14)	ND (0.13)	ND (0.12)
cis-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.15)	ND (0.14)
Ethylbenzene	µg/m³	1,100	NE	NE	0.19	0.22	0.22
Freon 11	µg/m³	730	NE	NE	1.6	1.6	1.8
Freon 12	µg/m³	210	NE	NE	2.7	2.6	3
Freon 113	µg/m³	31,000	NE	NE	0.64	0.66	0.74
Freon 114	µg/m³	31,000	NE	NE	0.12 J	0.12 J	0.14 J
Hexachlorobutadiene	µg/m³	0.086	NE	NE	ND (1.9) J	ND (1.7) J	ND (1.7) J

TABLE 3-11
1436 3rd Street Analytical Results - Air (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1436 3rd St
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 5/12/2005	322BA PM 5/12/2005	1436AA 5/12/2005
Volatile Organic Compounds							
Methyl tert-butyl ether	µg/m³	7.4	NE	ND (1.8)	ND (0.63)	ND (0.59)	ND (0.57)
Methylene chloride	µg/m³	4.1	**14,000**	ND (1.74)	ND (1.2) J	ND (1.1) J	**11**
Naphthalene	µg/m³	0.056	NE	NE	0.043	**0.09**	**0.069**
Styrene	µg/m³	1,100	21,000	NE	0.054 J	0.053 J	0.055 J
Tetrachloroethene	µg/m³	0.32	**20,000**	ND (0.47)	**0.4**	0.28	0.18 J
Toluene	µg/m³	400	37,000	ND (3.0)	1.1	1.3	1.3
trans-1,2-Dichloroethene	µg/m³	73	NE	NE	ND (0.69)	ND (0.65)	ND (0.63)
trans-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.15)	ND (0.14)
Trichloroethene	µg/m³	0.017	NE	ND (0.43)	ND (0.06) J	ND (0.042) J	ND (0.043) J
Vinyl chloride	µg/m³	0.11	**180,000**	ND (0.77)	ND (0.045)	ND (0.042)	ND (0.04)
Xylenes, total	µg/m³	110	22,000	NE	0.63 J	0.87	0.76

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-1 (Ambient and Crawlspace Air Screening Levels) for source of screening levels.

[2] Acute Reference Exposure Levels developed by Office of Environmental Health Hazard Assessment as of May 2000

[3] West Oakland background results are from the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); the result is from December 2002.

[4] Neighborhood background results are from samples collected at 322 Lewis Street (upwind of the AMCO site) in the morning and afternoon of the same day.

ND not detected above the laboratory's reporting limit shown in parentheses
NE not established
J estimated value
µg/m³ micrograms per cubic meter

TABLE 3-12
326 Center Street Analytical Results - Air (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		326 Center St	
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 5/12/2005	322BA PM 5/12/2005	326AA 5/12/2005	326CA 5/12/2005
Volatile Organic Compounds								
1,1,1-Trichloroethane	µg/m³	2,300	68,000	ND (0.27)	0.096 J	0.1 J	0.1 J	0.11 J
1,1,2,2-Tetrachloroethane	µg/m³	0.033	NE	NE	ND (0.24) J	ND (0.22) J	ND (0.22) J	ND (0.21) J
1,1,2-Trichloroethane	µg/m³	0.12	NE	NE	ND (0.19)	ND (0.18)	ND (0.17)	ND (0.17)
1,1-Dichloroethane	µg/m³	1.2	NE	NE	ND (0.14)	ND (0.13)	ND (0.13)	ND (0.12)
1,1-Dichloroethene	µg/m³	210	NE	NE	ND (0.069)	0.052 J	ND (0.063)	ND (0.061)
1,2,4-Trichlorobenzene	µg/m³	3.7	NE	NE	ND (1.3) J	ND (1.2) J	ND (1.2) J	ND (1.2) J
1,2,4-Trimethylbenzene	µg/m³	6.2	NE	NE	0.11 J	0.22	0.27	0.069 J
1,2-Dibromoethane	µg/m³	0.0034	NE	NE	ND (0.27)	ND (0.25)	ND (0.24)	ND (0.24)
1,2-Dichlorobenzene	µg/m³	210	NE	NE	ND (0.21) J	ND (0.2) J	ND (0.19) J	0.13 J
1,2-Dichloroethane	µg/m³	0.074	NE	ND (0.40)	ND (0.14)	ND (0.13)	0.047 J	0.049 J
1,2-Dichloropropane	µg/m³	0.099	NE	NE	ND (0.16)	ND (0.15)	ND (0.15)	ND (0.14)
1,3,5-Trimethylbenzene	µg/m³	6.2	NE	NE	0.042 J	0.094 J	0.11 J	0.048 J
1,3-Dichlorobenzene	µg/m³	110	NE	NE	ND (0.21)	ND (0.2)	0.047 J	0.096 J
1,4-Dichlorobenzene	µg/m³	0.31	NE	NE	0.069 J	ND (0.2) J	0.077 J	0.088 J
1,4-Dioxane (p-dioxane)	µg/m³	0.61	**3,000**	NE	ND (0.63)	ND (0.59)	ND (0.57)	ND (0.56)
Benzene	µg/m³	0.25	**1,300**	**0.96**	**0.43**	**0.52**	**0.42**	**0.51**
Bromomethane	µg/m³	5.2	3,900	NE	ND (0.34) J	ND (0.32) J	ND (0.31) J	ND (0.3) J
Carbon tetrachloride	µg/m³	0.13	**1,900**	**0.69**	**0.52**	**0.58**	**0.53**	**0.55**
Chlorobenzene	µg/m³	62	NE	NE	ND (0.16)	ND (0.15)	ND (0.14)	ND (0.14)
Chloroethane	µg/m³	2.3	NE	NE	0.03 J	0.04 J	0.064 J	0.074 J
Chloroform	µg/m³	0.083	**150**	ND (0.10)	**0.13 J**	**0.095 J**	**0.1 J**	**0.099 J**
Chloromethane	µg/m³	95	NE	NE	1.1	1.2	1.2	1.2
cis-1,2-Dichloroethene	µg/m³	37	NE	NE	ND (0.14)	ND (0.13)	ND (0.12)	ND (0.12)
cis-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.15)	ND (0.14)	ND (0.14)
Ethylbenzene	µg/m³	1,100	NE	NE	0.19	0.22	0.22	0.11 J
Freon 11	µg/m³	730	NE	NE	1.6	1.6	1.6	1.7
Freon 12	µg/m³	210	NE	NE	2.7	2.6	2.6	2.8
Freon 113	µg/m³	31,000	NE	NE	0.64	0.66	0.68	0.7
Freon 114	µg/m³	31,000	NE	NE	0.12 J	0.12 J	ND (0.22)	0.11 J
Hexachlorobutadiene	µg/m³	0.086	NE	NE	ND (1.9) J	ND (1.7) J	ND (1.7) J	**0.68 J**

TABLE 3-12
326 Center Street Analytical Results - Air (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		326 Center St	
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 5/12/2005	322BA PM 5/12/2005	326AA 5/12/2005	326CA 5/12/2005
Volatile Organic Compounds								
Methyl tert-butyl ether	µg/m³	7.4	NE	ND (1.8)	ND (0.63)	ND (0.59)	ND (0.57)	ND (0.56)
Methylene chloride	µg/m³	4.1	**14,000**	ND (1.74)	ND (1.2) J	ND (1.1) J	ND (1.1) J	ND (1.1) J
Naphthalene	µg/m³	0.056	NE	NE	0.043	**0.09**	0.036	---
Styrene	µg/m³	1,100	21,000	NE	0.054 J	0.053 J	0.051 J	ND (0.13)
Tetrachloroethene	µg/m³	0.32	**20,000**	ND (0.47)	**0.4**	0.28	0.18 J	0.2 J
Toluene	µg/m³	400	37,000	ND (3.0)	1.1	1.3	1.2	1
trans-1,2-Dichloroethene	µg/m³	73	NE	NE	ND (0.69)	ND (0.65)	ND (0.63)	ND (0.61)
trans-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.15)	ND (0.14)	ND (0.14)
Trichloroethene	µg/m³	0.017	NE	ND (0.43)	ND (0.06) J	ND (0.042) J	ND (0.03) J	ND (0.042) J
Vinyl chloride	µg/m³	0.11	**180,000**	ND (0.77)	ND (0.045)	ND (0.042)	ND (0.04)	ND (0.04)
Xylenes, total	µg/m³	110	22,000	NE	0.63 J	0.87	0.89	0.206 J

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-1 (Ambient and Crawlspace Air Screening Levels) for source of screening levels.

[2] Acute Reference Exposure Levels developed by Office of Environmental Health Hazard Assessment as of May 2000

[3] West Oakland background results are from the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); the result is from December 2002.

[4] Neighborhood background results are from samples collected at 322 Lewis Street (upwind of the AMCO site) in the morning and afternoon of the same day.

ND not detected above the laboratory's reporting limit shown in parentheses
NE not established
J estimated value
µg/m³ micrograms per cubic meter

TABLE 3-13
360 Center Street Analytical Results - Air (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		360 Center St
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 5/12/2005	322BA PM 5/12/2005	360AA 5/12/2005
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/m³	2,300	68,000	ND (0.27)	0.096 J	0.1 J	0.12 J
1,1,2,2-Tetrachloroethane	µg/m³	0.033	NE	NE	ND (0.24) J	ND (0.22) J	ND (0.21)
1,1,2-Trichloroethane	µg/m³	0.12	NE	NE	ND (0.19)	ND (0.18)	ND (0.16)
1,1-Dichloroethane	µg/m³	1.2	NE	NE	ND (0.14)	ND (0.13)	ND (0.12)
1,1-Dichloroethene	µg/m³	210	NE	NE	ND (0.069)	0.052 J	ND (0.06)
1,2,4-Trichlorobenzene	µg/m³	3.7	NE	NE	ND (1.3) J	ND (1.2) J	ND (1.1) J
1,2,4-Trimethylbenzene	µg/m³	6.2	NE	NE	0.11 J	0.22	0.2
1,2-Dibromoethane	µg/m³	0.0034	NE	NE	ND (0.27)	ND (0.25)	ND (0.23)
1,2-Dichlorobenzene	µg/m³	210	NE	NE	ND (0.21) J	ND (0.2) J	ND (0.18) J
1,2-Dichloroethane	µg/m³	0.074	NE	ND (0.40)	ND (0.14)	ND (0.13)	ND (0.12)
1,2-Dichloropropane	µg/m³	0.099	NE	NE	ND (0.16)	ND (0.15)	ND (0.14)
1,3,5-Trimethylbenzene	µg/m³	6.2	NE	NE	0.042 J	0.094 J	0.079 J
1,3-Dichlorobenzene	µg/m³	110	NE	NE	ND (0.21)	ND (0.2)	ND (0.18)
1,4-Dichlorobenzene	µg/m³	0.31	NE	NE	0.069 J	ND (0.2) J	0.2 J
1,4-Dioxane (p-dioxane)	µg/m³	0.61	**3,000**	NE	ND (0.63)	ND (0.59)	ND (0.55)
Benzene	µg/m³	0.25	**1,300**	**0.96**	**0.43**	**0.52**	**1.2**
Bromomethane	µg/m³	5.2	3,900	NE	ND (0.34) J	ND (0.32) J	ND (0.3) J
Carbon tetrachloride	µg/m³	0.13	**1,900**	**0.69**	**0.52**	**0.58**	**0.83**
Chlorobenzene	µg/m³	62	NE	NE	ND (0.16)	ND (0.15)	ND (0.14)
Chloroethane	µg/m³	2.3	NE	NE	0.03 J	0.04 J	0.075 J
Chloroform	µg/m³	0.083	**150**	ND (0.10)	**0.13 J**	**0.095 J**	**0.093 J**
Chloromethane	µg/m³	95	NE	NE	1.1	1.2	1.2
cis-1,2-Dichloroethene	µg/m³	37	NE	NE	ND (0.14)	ND (0.13)	ND (0.12)
cis-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.15)	ND (0.14)
Ethylbenzene	µg/m³	1,100	NE	NE	0.19	0.22	0.27
Freon 11	µg/m³	730	NE	NE	1.6	1.6	1.7
Freon 12	µg/m³	210	NE	NE	2.7	2.6	2.6
Freon 113	µg/m³	31,000	NE	NE	0.64	0.66	0.63
Freon 114	µg/m³	31,000	NE	NE	0.12 J	0.12 J	0.12 J
Hexachlorobutadiene	µg/m³	0.086	NE	NE	ND (1.9) J	ND (1.7) J	ND (1.6) J

TABLE 3-13
360 Center Street Analytical Results - Air (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		360 Center St
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 5/12/2005	322BA PM 5/12/2005	360AA 5/12/2005
Volatile Organic Compounds							
Methyl tert-butyl ether	µg/m³	7.4	NE	ND (1.8)	ND (0.63)	ND (0.59)	ND (0.55)
Methylene chloride	µg/m³	4.1	**14,000**	ND (1.74)	ND (1.2) J	ND (1.1) J	ND (1.1) J
Naphthalene	µg/m³	0.056	NE	NE	0.043	**0.09**	0.041
Styrene	µg/m³	1,100	21,000	NE	0.054 J	0.053 J	0.072 J
Tetrachloroethene	µg/m³	0.32	**20,000**	ND (0.47)	**0.4**	0.28	0.2 J
Toluene	µg/m³	400	37,000	ND (3.0)	1.1	1.3	2.7
trans-1,2-Dichloroethene	µg/m³	73	NE	NE	ND (0.69)	ND (0.65)	ND (0.6)
trans-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.15)	ND (0.14)
Trichloroethene	µg/m³	0.017	NE	ND (0.43)	ND (0.06) J	ND (0.042) J	ND (0.032) J
Vinyl chloride	µg/m³	0.11	**180,000**	ND (0.77)	ND (0.045)	ND (0.042)	ND (0.039)
Xylenes, total	µg/m³	110	22,000	NE	0.63 J	0.87	0.9

Notes:

Results greater than the screening level are bolded.

[1]Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-1 (Ambient and Crawlspace Air Screening Levels) for source of screening levels.

[2]Acute Reference Exposure Levels developed by Office of Environmental Health Hazard Assessment as of May 2000

[3]West Oakland background results are from the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); the result is from December 2002.

[4]Neighborhood background results are from samples collected at 322 Lewis Street (upwind of the AMCO site) in the morning and afternoon of the same day.

ND not detected above the laboratory's reporting limit shown in parentheses
NE not established
J estimated value
µg/m³ micrograms per cubic meter

TABLE 3-14
Prescott Park Analytical Results - Air (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		Prescott Park
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 5/12/2005	322BA PM 5/12/2005	PP-AA 5/12/2005
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/m³	2,300	68,000	ND (0.27)	0.096 J	0.1 J	0.11 J
1,1,2,2-Tetrachloroethane	µg/m³	0.033	NE	NE	ND (0.24) J	ND (0.22) J	ND (0.22)
1,1,2-Trichloroethane	µg/m³	0.12	NE	NE	ND (0.19)	ND (0.18)	ND (0.17)
1,1-Dichloroethane	µg/m³	1.2	NE	NE	ND (0.14)	ND (0.13)	ND (0.13)
1,1-Dichloroethene	µg/m³	210	NE	NE	ND (0.069)	0.052 J	ND (0.063)
1,2,4-Trichlorobenzene	µg/m³	3.7	NE	NE	ND (1.3) J	ND (1.2) J	ND (1.2) J
1,2,4-Trimethylbenzene	µg/m³	6.2	NE	NE	0.11 J	0.22	0.13 J
1,2-Dibromoethane	µg/m³	0.0034	NE	NE	ND (0.27)	ND (0.25)	ND (0.24)
1,2-Dichlorobenzene	µg/m³	210	NE	NE	ND (0.21) J	ND (0.2) J	ND (0.19) J
1,2-Dichloroethane	µg/m³	0.074	NE	ND (0.40)	ND (0.14)	ND (0.13)	ND (0.13)
1,2-Dichloropropane	µg/m³	0.099	NE	NE	ND (0.16)	ND (0.15)	ND (0.15)
1,3,5-Trimethylbenzene	µg/m³	6.2	NE	NE	0.042 J	0.094 J	0.05 J
1,3-Dichlorobenzene	µg/m³	110	NE	NE	ND (0.21)	ND (0.2)	ND (0.19) J
1,4-Dichlorobenzene	µg/m³	0.31	NE	NE	0.069 J	ND (0.2) J	ND (0.19) J
1,4-Dioxane (p-dioxane)	µg/m³	0.61	**3,000**	NE	ND (0.63)	ND (0.59)	**0.96**
Benzene	µg/m³	0.25	**1,300**	**0.96**	**0.43**	**0.52**	**0.46**
Bromomethane	µg/m³	5.2	3,900	NE	ND (0.34) J	ND (0.32) J	ND (0.31) J
Carbon tetrachloride	µg/m³	0.13	**1,900**	**0.69**	**0.52**	**0.58**	**0.55 J**
Chlorobenzene	µg/m³	62	NE	NE	ND (0.16)	ND (0.15)	ND (0.14)
Chloroethane	µg/m³	2.3	NE	NE	0.03 J	0.04 J	0.034 J
Chloroform	µg/m³	0.083	**150**	ND (0.10)	**0.13 J**	**0.095 J**	**0.093 J**
Chloromethane	µg/m³	95	NE	NE	1.1	1.2	1.2
cis-1,2-Dichloroethene	µg/m³	37	NE	NE	ND (0.14)	ND (0.13)	ND (0.12)
cis-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.15)	ND (0.14)
Ethylbenzene	µg/m³	1,100	NE	NE	0.19	0.22	0.2
Freon 11	µg/m³	730	NE	NE	1.6	1.6	1.7
Freon 12	µg/m³	210	NE	NE	2.7	2.6	2.9
Freon 113	µg/m³	31,000	NE	NE	0.64	0.66	0.7
Freon 114	µg/m³	31,000	NE	NE	0.12 J	0.12 J	ND (0.22)
Hexachlorobutadiene	µg/m³	0.086	NE	NE	ND (1.9) J	ND (1.7) J	ND (1.7)

TABLE 3-14
Prescott Park Analytical Results - Air (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		Prescott Park
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 5/12/2005	322BA PM 5/12/2005	PP-AA 5/12/2005
Volatile Organic Compounds							
Methyl tert-butyl ether	µg/m³	7.4	NE	ND (1.8)	ND (0.63)	ND (0.59)	ND (0.57)
Methylene chloride	µg/m³	4.1	**14,000**	ND (1.74)	ND (1.2) J	ND (1.1) J	ND (1.1) J
Naphthalene	µg/m³	0.056	NE	NE	0.043	**0.09**	---
Styrene	µg/m³	1,100	21,000	NE	0.054 J	0.053 J	0.048 J
Tetrachloroethene	µg/m³	0.32	**20,000**	ND (0.47)	**0.4**	0.28	0.14 J
Toluene	µg/m³	400	37,000	ND (3.0)	1.1	1.3	1.1
trans-1,2-Dichloroethene	µg/m³	73	NE	NE	ND (0.69)	ND (0.65)	ND (0.63)
trans-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.15)	ND (0.14)
Trichloroethene	µg/m³	0.017	NE	ND (0.43)	ND (0.06) J	ND (0.042) J	ND (0.03) J
Vinyl chloride	µg/m³	0.11	**180,000**	ND (0.77)	ND (0.045)	ND (0.042)	ND (0.04)
Xylenes, total	µg/m³	110	22,000	NE	0.63 J	0.87	0.67

Notes:

Results greater than the screening level are bolded.

[1]Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-1 (Ambient and Crawlspace Air Screening Levels) for source of screening levels.

[2]Acute Reference Exposure Levels developed by Office of Environmental Health Hazard Assessment as of May 2000

[3]West Oakland background results are from the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); the result is from December 2002.

[4]Neighborhood background results are from samples collected at 322 Lewis Street (upwind of the AMCO site) in the morning and afternoon of the same day.

ND not detected above the laboratory's reporting limit shown in parentheses
NE not established
J estimated value
µg/m³ micrograms per cubic meter

TABLE 3-15
Residential Air Results Summary (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Backyard Air Levels	Crawlspace Air Levels	Neighborhood Background Air Levels[1]	West Oakland Background Air Levels[2]	Screening Levels[3]
1,1-Dichloroethane	µg/m³	< 0.11 - < 0.14	0.026 - 28	< 0.14 - < 0.15	NA	1.2
1,4-Dichlorobenzene	µg/m³	0.16 - 0.23	< 0.19 - < 0.95	0.1 - 0.19	NA	0.31
Benzene	µg/m³	0.81 - 1.2	0.19 - 0.99	0.69 - 0.97	0.96	0.25
Carbon tetrachloride	µg/m³	0.45 - 0.48	0.38 - 0.48	0.45 - 0.48	0.69	0.13
Chloroform	µg/m³	0.12 - 0.16	0.21 - 0.66	0.091 - 0.1	<0.10	0.083
cis-1,2-Dichloroethene	µg/m³	< 0.11 - < 0.14	< 0.12 - 400	< 0.14 - < 0.15	NA	37
Naphthalene	µg/m³	0.46 - < 4.5	0.41 - < 4.4	< 4.5 - < 4.9	NA	0.056
Tetrachloroethene	µg/m³	0.3 - 0.4	0.37 - 19	0.31 - 0.42	<0.47	0.32
Trichloroethene	µg/m³	0.079 - 0.23	0.14 - 26	0.069 - 0.22	<0.43	0.017
Vinyl chloride	µg/m³	< 0.036 - 0.7	1.3 - 10	< 0.044 - < 0.048	<0.77	0.11

Notes:

Only compounds detected above screening levels are shown

[1] From samples collected at 322 Lewis St (upwind of the AMCO site) in the morning and afternoon of the same day.

[2] From the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); levels shown are from December 2002, the latest date available.

[3] EPA Region 9 Preliminary Remediation Goals for ambient air, October 2004.

NA not available
µg/m³ micrograms per cubic meter

TABLE 3-16
1414 3rd Street Analytical Results - Air (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1414 3rd St		
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 11/7/2006	322BA PM 11/7/2006	1414CAa 11/7/2006	1414CAa (FD) 11/7/2006	1414CAb 11/7/2006
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/m³	2,300	68,000	ND (0.27)	0.095 J	0.068 J	16	17	0.62
1,1,2,2-Tetrachloroethane	µg/m³	0.033	NE	NE	ND (0.23)	ND (0.26)	ND (0.74)	ND (1.1)	ND (0.22)
1,1,2-Trichloroethane	µg/m³	0.12	NE	NE	ND (0.093)	ND (0.1)	ND (0.29)	ND (0.43)	ND (0.088)
1,1-Dichloroethane	µg/m³	1.2	NE	NE	ND (0.14)	ND (0.15)	**28**	**28**	1.1
1,1-Dichloroethene	µg/m³	210	NE	NE	ND (0.068)	ND (0.074)	0.96	0.96	ND (0.064)
1,2,4-Trichlorobenzene	µg/m³	3.7	NE	NE	ND (1.3)	ND (1.4)	ND (4)	ND (5.9)	ND (1.2)
1,2,4-Trimethylbenzene	µg/m³	6.2	NE	NE	1.1	0.7	0.9	0.97	0.67
1,2-Dibromoethane	µg/m³	0.0034	NE	NE	ND (0.26)	ND (0.29)	ND (0.82)	ND (1.2)	ND (0.25)
1,2-Dichlorobenzene	µg/m³	210	NE	NE	ND (0.2)	ND (0.22)	ND (0.64)	ND (0.95)	ND (0.19)
1,2-Dichloroethane	µg/m³	0.074	NE	ND (0.40)	ND (0.14)	ND (0.15)	ND (0.43)	ND (0.64)	ND (0.13)
1,2-Dichloropropane	µg/m³	0.099	NE	NE	ND (0.079)	ND (0.086)	ND (0.25)	ND (0.36)	ND (0.074)
1,3,5-Trimethylbenzene	µg/m³	6.2	NE	NE	0.3	0.2	0.27 J	0.32 J	0.21
1,3-Dichlorobenzene	µg/m³	110	NE	NE	ND (0.2)	ND (0.22)	ND (0.64)	ND (0.95)	ND (0.19)
1,4-Dichlorobenzene	µg/m³	0.31	NE	NE	0.19 J	0.1 J	ND (0.64)	ND (0.95)	ND (0.19)
1,4-Dioxane (p-dioxane)	µg/m³	0.61	**3,000**	NE	0.46 J	ND (0.67)	ND (1.9)	**1.3 J**	ND (0.58)
Benzene	µg/m³	0.25	**1,300**	**0.96**	**0.97**	**0.69**	**0.95**	**0.99 J**	**0.55**
Bromomethane	µg/m³	5.2	3,900	NE	0.12 J	ND (0.36)	ND (1)	ND (1.5)	ND (0.31)
Carbon tetrachloride	µg/m³	0.13	**1,900**	**0.69**	**0.48**	**0.45**	**0.44**	**0.47 J**	**0.38**
Chlorobenzene	µg/m³	62	NE	NE	ND (0.16)	ND (0.17)	ND (0.49)	ND (0.73)	ND (0.15)
Chloroethane	µg/m³	2.3	NE	NE	0.035 J	ND (0.25)	0.2 J	0.3 J	0.074 J
Chloroform	µg/m³	0.083	**150**	ND (0.10)	**0.1 J**	**0.091 J**	**0.6**	**0.66 J**	**0.22**
Chloromethane	µg/m³	95	NE	NE	1.1	1.1	22	22	46
cis-1,2-Dichloroethene	µg/m³	37	NE	NE	ND (0.14)	ND (0.15)	**380**	**400**	7.7
cis-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.17)	ND (0.49)	ND (0.72)	ND (0.15)
Ethylbenzene	µg/m³	1,100	NE	NE	0.88	0.58	0.93	1.2	0.5
Freon 11	µg/m³	730	NE	NE	2.7	1.4	4.6	4.8	4.3
Freon 12	µg/m³	210	NE	NE	2.3 J	2 J	2.8 J	2.9	1.6
Freon 113	µg/m³	31,000	NE	NE	0.52	0.55	ND (0.82)	0.7 J	0.45
Hexachlorobutadiene	µg/m³	0.086	NE	NE	ND (1.8)	ND (2)	ND (5.7)	ND (8.4)	ND (1.7)
Methyl tert-butyl ether	µg/m³	7.4	NE	ND (1.8)	ND (0.62)	ND (0.67)	ND (1.9)	ND (2.8)	ND (0.58)

TABLE 3-16
1414 3rd Street Analytical Results - Air (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1414 3rd St		
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 11/7/2006	322BA PM 11/7/2006	1414CAa 11/7/2006	1414CAa (FD) 11/7/2006	1414CAb 11/7/2006
Volatile Organic Compounds									
Methylene chloride	µg/m³	4.1	**14,000**	ND (1.74)	ND (1.2)	ND (1.3)	ND (3.7)	ND (5.5)	ND (1.1)
Naphthalene	µg/m³	0.056	NE	NE	ND (4.5)	ND (4.9)	ND (4.2)	**0.41 J**	**0.53 J**
Styrene	µg/m³	1,100	21,000	NE	0.46	0.15 J	0.2 J	0.33 J	0.13 J
Tetrachloroethene	µg/m³	0.32	**20,000**	ND (0.47)	**0.42**	0.31	**19**	**18**	**3**
Toluene	µg/m³	400	37,000	ND (3.0)	5.1	2.7	9.5	9.3	4.7
trans-1,2-Dichloroethene	µg/m³	73	NE	NE	ND (0.68)	ND (0.74)	0.49 J	ND (3.1)	ND (0.64)
trans-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.17)	ND (0.49)	ND (0.72)	ND (0.15)
Trichloroethene	µg/m³	0.017	NE	ND (0.43)	**0.22**	**0.069**	**25**	**26**	**3.1**
Vinyl chloride	µg/m³	0.11	**180,000**	ND (0.77)	ND (0.044)	ND (0.048)	**1.3**	**1.8**	**7.6**
Xylenes, total	µg/m³	110	22,000	NE	3.8	2.16	4.4	4.5	2.33

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-1 (Ambient and Crawlspace Air Screening Levels) for source of screening levels.

[2] Acute Reference Exposure Levels developed by Office of Environmental Health Hazard Assessment as of May 2000

[3] West Oakland background results are from the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); the result is from December 2002.

[4] Neighborhood background results are from samples collected at 322 Lewis Street (upwind of the AMCO site) in the morning and afternoon of the same day.

FD field duplicate
ND not detected above the laboratory's reporting limit shown in parentheses
NE not established
J estimated value
µg/m³ micrograms per cubic meter

TABLE 3-17
1428 3rd Street Analytical Results - Air (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1428 3rd St		
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 11/7/2006	322BA PM 11/7/2006	1428AA 11/7/2006	1428CAa 11/7/2006	1428CAc 11/7/2006
Volatile Organic Compounds									
1,1,1-Trichloroethane	µg/m³	2,300	68,000	ND (0.27)	0.095 J	0.068 J	0.075 J	0.12 J	0.14 J
1,1,2,2-Tetrachloroethane	µg/m³	0.033	NE	NE	ND (0.23)	ND (0.26)	ND (0.22)	ND (0.22)	ND (0.2)
1,1,2-Trichloroethane	µg/m³	0.12	NE	NE	ND (0.093)	ND (0.1)	ND (0.088)	ND (0.088)	ND (0.081)
1,1-Dichloroethane	µg/m³	1.2	NE	NE	ND (0.14)	ND (0.15)	ND (0.13)	0.026 J	ND (0.12)
1,1-Dichloroethene	µg/m³	210	NE	NE	ND (0.068)	ND (0.074)	ND (0.064)	ND (0.064)	ND (0.059)
1,2,4-Trichlorobenzene	µg/m³	3.7	NE	NE	ND (1.3)	ND (1.4)	ND (1.2)	ND (1.2)	ND (1.1)
1,2,4-Trimethylbenzene	µg/m³	6.2	NE	NE	1.1	0.7	0.9	0.5	0.57
1,2-Dibromoethane	µg/m³	0.0034	NE	NE	ND (0.26)	ND (0.29)	ND (0.25)	ND (0.25)	ND (0.23)
1,2-Dichlorobenzene	µg/m³	210	NE	NE	ND (0.2)	ND (0.22)	ND (0.19)	ND (0.19)	ND (0.18)
1,2-Dichloroethane	µg/m³	0.074	NE	ND (0.40)	ND (0.14)	ND (0.15)	ND (0.13)	ND (0.13)	ND (0.12)
1,2-Dichloropropane	µg/m³	0.099	NE	NE	ND (0.079)	ND (0.086)	ND (0.074)	ND (0.074)	ND (0.069)
1,3,5-Trimethylbenzene	µg/m³	6.2	NE	NE	0.3	0.2	0.24	0.13 J	0.14 J
1,3-Dichlorobenzene	µg/m³	110	NE	NE	ND (0.2)	ND (0.22)	ND (0.19)	ND (0.19)	ND (0.18)
1,4-Dichlorobenzene	µg/m³	0.31	NE	NE	0.19 J	0.1 J	ND (0.19)	0.31	**0.38**
1,4-Dioxane (p-dioxane)	µg/m³	0.61	**3,000**	NE	0.46 J	ND (0.67)	ND (0.58)	ND (0.58)	ND (0.54)
Benzene	µg/m³	0.25	**1,300**	**0.96**	**0.97**	**0.69**	**0.85**	**0.49**	**0.51**
Bromomethane	µg/m³	5.2	3,900	NE	0.12 J	ND (0.36)	ND (0.31)	ND (0.31)	0.19 J
Carbon tetrachloride	µg/m³	0.13	**1,900**	**0.69**	**0.48**	**0.45**	**0.46**	**0.46**	**0.44**
Chlorobenzene	µg/m³	62	NE	NE	ND (0.16)	ND (0.17)	ND (0.15)	0.047 J	ND (0.14)
Chloroethane	µg/m³	2.3	NE	NE	0.035 J	ND (0.25)	ND (0.21)	ND (0.21) J	0.026 J
Chloroform	µg/m³	0.083	**150**	ND (0.10)	**0.1 J**	**0.091 J**	**0.14 J**	**0.23**	**0.21**
Chloromethane	µg/m³	95	NE	NE	1.1	1.1	0.99	12	19
cis-1,2-Dichloroethene	µg/m³	37	NE	NE	ND (0.14)	ND (0.15)	ND (0.13)	ND (0.13)	ND (0.12)
cis-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.17)	ND (0.15)	ND (0.15)	ND (0.14)
Ethylbenzene	µg/m³	1,100	NE	NE	0.88	0.58	0.72	0.41	0.39
Freon 11	µg/m³	730	NE	NE	2.7	1.4	1.5	2.1	4.7
Freon 12	µg/m³	210	NE	NE	2.3 J	2 J	2	1.7	2.3
Freon 113	µg/m³	31,000	NE	NE	0.52	0.55	0.55	0.6	0.59
Hexachlorobutadiene	µg/m³	0.086	NE	NE	ND (1.8)	ND (2)	ND (1.7)	ND (1.7)	ND (1.6)
Methyl tert-butyl ether	µg/m³	7.4	NE	ND (1.8)	ND (0.62)	ND (0.67)	ND (0.58)	ND (0.58)	ND (0.54)

TABLE 3-17
1428 3rd Street Analytical Results - Air (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1428 3rd St		
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 11/7/2006	322BA PM 11/7/2006	1428AA 11/7/2006	1428CAa 11/7/2006	1428CAc 11/7/2006
Volatile Organic Compounds									
Methylene chloride	µg/m³	4.1	**14,000**	ND (1.74)	ND (1.2)	ND (1.3)	ND (1.1)	2	2.5
Naphthalene	µg/m³	0.056	NE	NE	ND (4.5)	ND (4.9)	ND (4.2)	**0.58 J**	ND (3.9)
Styrene	µg/m³	1,100	21,000	NE	0.46	0.15 J	0.15	0.14	0.11 J
Tetrachloroethene	µg/m³	0.32	**20,000**	ND (0.47)	**0.42**	0.31	0.32	**0.58**	**4.8**
Toluene	µg/m³	400	37,000	ND (3.0)	5.1	2.7	3.7	2.2	2.7
trans-1,2-Dichloroethene	µg/m³	73	NE	NE	ND (0.68)	ND (0.74)	ND (0.64)	ND (0.64)	ND (0.59)
trans-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.17)	ND (0.15)	ND (0.15)	ND (0.14)
Trichloroethene	µg/m³	0.017	NE	ND (0.43)	**0.22**	**0.069**	**0.09**	**0.21**	**0.23**
Vinyl chloride	µg/m³	0.11	**180,000**	ND (0.77)	ND (0.044)	ND (0.048)	ND (0.041)	**1.5**	**10**
Xylenes, total	µg/m³	110	22,000	NE	3.8	2.16	3.1	1.76	1.93

Notes:

1428CAb was not sampled because it was no longer accessible.

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-1 (Ambient and Crawlspace Air Screening Levels) for source of screening levels.

[2] Acute Reference Exposure Levels developed by Office of Environmental Health Hazard Assessment as of May 2000

[3] West Oakland background results are from the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); the result is from December 2002.

[4] Neighborhood background results are from samples collected at 322 Lewis Street (upwind of the AMCO site) in the morning and afternoon of the same day.

ND not detected above the laboratory's reporting limit shown in parentheses
NE not established
J estimated value
µg/m³ micrograms per cubic meter

TABLE 3-18
1432 3rd Street Analytical Results - Air (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1432 3rd St	
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 11/7/2006	322BA PM 11/7/2006	1432AA 11/7/2006	1432CA 11/7/2006
Volatile Organic Compounds								
1,1,1-Trichloroethane	µg/m³	2,300	68,000	ND (0.27)	0.095 J	0.068 J	0.076 J	0.11 J
1,1,2,2-Tetrachloroethane	µg/m³	0.033	NE	NE	ND (0.23)	ND (0.26)	ND (0.24)	ND (0.23)
1,1,2-Trichloroethane	µg/m³	0.12	NE	NE	ND (0.093)	ND (0.1)	ND (0.098)	ND (0.092)
1,1-Dichloroethane	µg/m³	1.2	NE	NE	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.14)
1,1-Dichloroethene	µg/m³	210	NE	NE	ND (0.068)	ND (0.074)	ND (0.071)	ND (0.067)
1,2,4-Trichlorobenzene	µg/m³	3.7	NE	NE	ND (1.3)	ND (1.4)	ND (1.3)	ND (1.2)
1,2,4-Trimethylbenzene	µg/m³	6.2	NE	NE	1.1	0.7	0.74	0.092 J
1,2-Dibromoethane	µg/m³	0.0034	NE	NE	ND (0.26)	ND (0.29)	ND (0.28)	ND (0.26)
1,2-Dichlorobenzene	µg/m³	210	NE	NE	ND (0.2)	ND (0.22)	ND (0.22)	ND (0.2)
1,2-Dichloroethane	µg/m³	0.074	NE	ND (0.40)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.14)
1,2-Dichloropropane	µg/m³	0.099	NE	NE	ND (0.079)	ND (0.086)	ND (0.083)	ND (0.078)
1,3,5-Trimethylbenzene	µg/m³	6.2	NE	NE	0.3	0.2	0.18	ND (0.16)
1,3-Dichlorobenzene	µg/m³	110	NE	NE	ND (0.2)	ND (0.22)	ND (0.22)	ND (0.2)
1,4-Dichlorobenzene	µg/m³	0.31	NE	NE	0.19 J	0.1 J	ND (0.22)	ND (0.2)
1,4-Dioxane (p-dioxane)	µg/m³	0.61	**3,000**	NE	0.46 J	ND (0.67)	ND (0.64)	ND (0.6)
Benzene	µg/m³	0.25	**1,300**	**0.96**	**0.97**	**0.69**	**0.81**	0.19 J
Bromomethane	µg/m³	5.2	3,900	NE	0.12 J	ND (0.36)	ND (0.35)	0.3 J
Carbon tetrachloride	µg/m³	0.13	**1,900**	**0.69**	**0.48**	**0.45**	**0.45**	**0.48**
Chlorobenzene	µg/m³	62	NE	NE	ND (0.16)	ND (0.17)	ND (0.16)	ND (0.15)
Chloroethane	µg/m³	2.3	NE	NE	0.035 J	ND (0.25)	ND (0.24)	ND (0.22)
Chloroform	µg/m³	0.083	**150**	ND (0.10)	**0.1 J**	**0.091 J**	**0.15 J**	**0.33**
Chloromethane	µg/m³	95	NE	NE	1.1	1.1	0.98	7.2
cis-1,2-Dichloroethene	µg/m³	37	NE	NE	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.13)
cis-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.17)	ND (0.16)	ND (0.15)
Ethylbenzene	µg/m³	1,100	NE	NE	0.88	0.58	0.6	0.083 J
Freon 11	µg/m³	730	NE	NE	2.7	1.4	1.4	1.9
Freon 12	µg/m³	210	NE	NE	2.3 J	2 J	1.5	1.6
Freon 113	µg/m³	31,000	NE	NE	0.52	0.55	0.52	0.58
Hexachlorobutadiene	µg/m³	0.086	NE	NE	ND (1.8)	ND (2)	ND (1.9)	ND (1.8)
Methyl tert-butyl ether	µg/m³	7.4	NE	ND (1.8)	ND (0.62)	ND (0.67)	ND (0.64)	ND (0.6)

TABLE 3-18
1432 3rd Street Analytical Results - Air (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1432 3rd St	
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 11/7/2006	322BA PM 11/7/2006	1432AA 11/7/2006	1432CA 11/7/2006
Volatile Organic Compounds								
Methylene chloride	µg/m³	4.1	**14,000**	ND (1.74)	ND (1.2)	ND (1.3)	ND (1.2)	ND (1.2)
Naphthalene	µg/m³	0.056	NE	NE	ND (4.5)	ND (4.9)	**0.46 J**	ND (4.4)
Styrene	µg/m³	1,100	21,000	NE	0.46	0.15 J	0.14 J	ND (0.14)
Tetrachloroethene	µg/m³	0.32	**20,000**	ND (0.47)	**0.42**	0.31	0.3	**0.37**
Toluene	µg/m³	400	37,000	ND (3.0)	5.1	2.7	3.5	0.36
trans-1,2-Dichloroethene	µg/m³	73	NE	NE	ND (0.68)	ND (0.74)	ND (0.71)	ND (0.67)
trans-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.17)	ND (0.16)	ND (0.15)
Trichloroethene	µg/m³	0.017	NE	ND (0.43)	**0.22**	**0.069**	**0.079**	**0.14**
Vinyl chloride	µg/m³	0.11	**180,000**	ND (0.77)	ND (0.044)	ND (0.048)	ND (0.046)	**2.8**
Xylenes, total	µg/m³	110	22,000	NE	3.8	2.16	2.59	0.277 J

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-1 (Ambient and Crawlspace Air Screening Levels) for source of screening levels.

[2] Acute Reference Exposure Levels developed by Office of Environmental Health Hazard Assessment as of May 2000

[3] West Oakland background results are from the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); the result is from December 2002.

[4] Neighborhood background results are from samples collected at 322 Lewis Street (upwind of the AMCO site) in the morning and afternoon of the same day.

ND not detected above the laboratory's reporting limit shown in parentheses
NE not established
J estimated value
µg/m³ micrograms per cubic meter

TABLE 3-19
1436 3rd Street Analytical Results - Air (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1436 3rd St	
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 11/7/2006	322BA PM 11/7/2006	1436AA 11/7/2006	1436AA (FD) 11/7/2006
Volatile Organic Compounds								
1,1,1-Trichloroethane	µg/m³	2,300	68,000	ND (0.27)	0.095 J	0.068 J	0.078 J	0.084 J
1,1,2,2-Tetrachloroethane	µg/m³	0.033	NE	NE	ND (0.23)	ND (0.26)	ND (0.23)	ND (0.19)
1,1,2-Trichloroethane	µg/m³	0.12	NE	NE	ND (0.093)	ND (0.1)	ND (0.093)	ND (0.076)
1,1-Dichloroethane	µg/m³	1.2	NE	NE	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.11)
1,1-Dichloroethene	µg/m³	210	NE	NE	ND (0.068)	ND (0.074)	ND (0.068)	ND (0.055)
1,2,4-Trichlorobenzene	µg/m³	3.7	NE	NE	ND (1.3)	ND (1.4)	ND (1.3)	ND (1)
1,2,4-Trimethylbenzene	µg/m³	6.2	NE	NE	1.1	0.7	1.1	1.3
1,2-Dibromoethane	µg/m³	0.0034	NE	NE	ND (0.26)	ND (0.29)	ND (0.26)	ND (0.21)
1,2-Dichlorobenzene	µg/m³	210	NE	NE	ND (0.2)	ND (0.22)	ND (0.2)	ND (0.17)
1,2-Dichloroethane	µg/m³	0.074	NE	ND (0.40)	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.11)
1,2-Dichloropropane	µg/m³	0.099	NE	NE	ND (0.079)	ND (0.086)	ND (0.079)	ND (0.064)
1,3,5-Trimethylbenzene	µg/m³	6.2	NE	NE	0.3	0.2	0.31	0.36
1,3-Dichlorobenzene	µg/m³	110	NE	NE	ND (0.2)	ND (0.22)	ND (0.2)	ND (0.17)
1,4-Dichlorobenzene	µg/m³	0.31	NE	NE	0.19 J	0.1 J	0.23	0.16 J
1,4-Dioxane (p-dioxane)	µg/m³	0.61	**3,000**	NE	0.46 J	ND (0.67)	ND (0.62)	ND (0.5)
Benzene	µg/m³	0.25	**1,300**	**0.96**	**0.97**	**0.69**	**1.2**	**1.2**
Bromomethane	µg/m³	5.2	3,900	NE	0.12 J	ND (0.36)	0.11 J	0.33
Carbon tetrachloride	µg/m³	0.13	**1,900**	**0.69**	**0.48**	**0.45**	**0.48**	**0.47**
Chlorobenzene	µg/m³	62	NE	NE	ND (0.16)	ND (0.17)	0.045 J	0.048 J
Chloroethane	µg/m³	2.3	NE	NE	0.035 J	ND (0.25)	0.036 J	0.07 J
Chloroform	µg/m³	0.083	**150**	ND (0.10)	**0.1 J**	**0.091 J**	**0.12 J**	**0.14**
Chloromethane	µg/m³	95	NE	NE	1.1	1.1	8 J	1.5 J
cis-1,2-Dichloroethene	µg/m³	37	NE	NE	ND (0.14)	ND (0.15)	ND (0.14)	ND (0.11)
cis-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.17)	ND (0.16)	ND (0.13)
Ethylbenzene	µg/m³	1,100	NE	NE	0.88	0.58	1.6	1.7
Freon 11	µg/m³	730	NE	NE	2.7	1.4	1.6	1.6
Freon 12	µg/m³	210	NE	NE	2.3 J	2 J	1.8 J	2.3 J
Freon 113	µg/m³	31,000	NE	NE	0.52	0.55	0.55	0.58
Hexachlorobutadiene	µg/m³	0.086	NE	NE	ND (1.8)	ND (2)	ND (1.8)	ND (1.5)
Methyl tert-butyl ether	µg/m³	7.4	NE	ND (1.8)	ND (0.62)	ND (0.67)	ND (0.62)	ND (0.5)

TABLE 3-19
1436 3rd Street Analytical Results - Air (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		1436 3rd St	
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 11/7/2006	322BA PM 11/7/2006	1436AA 11/7/2006	1436AA (FD) 11/7/2006
Volatile Organic Compounds								
Methylene chloride	µg/m³	4.1	**14,000**	ND (1.74)	ND (1.2)	ND (1.3)	1.3 J	**4.5 J**
Naphthalene	µg/m³	0.056	NE	NE	ND (4.5)	ND (4.9)	ND (4.5)	ND (3.6)
Styrene	µg/m³	1,100	21,000	NE	0.46	0.15 J	0.33	0.34
Tetrachloroethene	µg/m³	0.32	**20,000**	ND (0.47)	**0.42**	0.31	0.31	0.3
Toluene	µg/m³	400	37,000	ND (3.0)	5.1	2.7	13	13
trans-1,2-Dichloroethene	µg/m³	73	NE	NE	ND (0.68)	ND (0.74)	ND (0.68)	ND (0.55)
trans-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.17)	ND (0.16)	ND (0.13)
Trichloroethene	µg/m³	0.017	NE	ND (0.43)	**0.22**	**0.069**	**0.14**	**0.17**
Vinyl chloride	µg/m³	0.11	**180,000**	ND (0.77)	ND (0.044)	ND (0.048)	**0.7 J**	ND (0.036) J
Xylenes, total	µg/m³	110	22,000	NE	3.8	2.16	6.7	7.5

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-1 (Ambient and Crawlspace Air Screening Levels) for source of screening levels.

[2] Acute Reference Exposure Levels developed by Office of Environmental Health Hazard Assessment as of May 2000

[3] West Oakland background results are from the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); the result is from December 2002.

[4] Neighborhood background results are from samples collected at 322 Lewis Street (upwind of the AMCO site) in the morning and afternoon of the same day.

FD field duplicate
ND not detected above the laboratory's reporting limit shown in parentheses
NE not established
J estimated value
µg/m³ micrograms per cubic meter

TABLE 3-20
360 Center Street Analytical Results - Air (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		360 Center St
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 11/7/2006	322BA PM 11/7/2006	360AA 11/7/2006
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/m³	2,300	68,000	ND (0.27)	0.095 J	0.068 J	0.088 J
1,1,2,2-Tetrachloroethane	µg/m³	0.033	NE	NE	ND (0.23)	ND (0.26)	ND (0.23)
1,1,2-Trichloroethane	µg/m³	0.12	NE	NE	ND (0.093)	ND (0.1)	ND (0.093)
1,1-Dichloroethane	µg/m³	1.2	NE	NE	ND (0.14)	ND (0.15)	ND (0.14)
1,1-Dichloroethene	µg/m³	210	NE	NE	ND (0.068)	ND (0.074)	ND (0.068)
1,2,4-Trichlorobenzene	µg/m³	3.7	NE	NE	ND (1.3)	ND (1.4)	ND (1.3)
1,2,4-Trimethylbenzene	µg/m³	6.2	NE	NE	1.1	0.7	2.2
1,2-Dibromoethane	µg/m³	0.0034	NE	NE	ND (0.26)	ND (0.29)	ND (0.26)
1,2-Dichlorobenzene	µg/m³	210	NE	NE	ND (0.2)	ND (0.22)	ND (0.2)
1,2-Dichloroethane	µg/m³	0.074	NE	ND (0.40)	ND (0.14)	ND (0.15)	ND (0.14)
1,2-Dichloropropane	µg/m³	0.099	NE	NE	ND (0.079)	ND (0.086)	ND (0.079)
1,3,5-Trimethylbenzene	µg/m³	6.2	NE	NE	0.3	0.2	0.73
1,3-Dichlorobenzene	µg/m³	110	NE	NE	ND (0.2)	ND (0.22)	ND (0.2)
1,4-Dichlorobenzene	µg/m³	0.31	NE	NE	0.19 J	0.1 J	0.16 J
1,4-Dioxane (p-dioxane)	µg/m³	0.61	**3,000**	NE	0.46 J	ND (0.67)	ND (0.62)
Benzene	µg/m³	0.25	**1,300**	**0.96**	**0.97**	**0.69**	**1.2**
Bromomethane	µg/m³	5.2	3,900	NE	0.12 J	ND (0.36)	ND (0.33)
Carbon tetrachloride	µg/m³	0.13	**1,900**	**0.69**	**0.48**	**0.45**	**0.46**
Chlorobenzene	µg/m³	62	NE	NE	ND (0.16)	ND (0.17)	0.052 J
Chloroethane	µg/m³	2.3	NE	NE	0.035 J	ND (0.25)	0.031 J
Chloroform	µg/m³	0.083	**150**	ND (0.10)	**0.1 J**	**0.091 J**	**0.16 J**
Chloromethane	µg/m³	95	NE	NE	1.1	1.1	1.1
cis-1,2-Dichloroethene	µg/m³	37	NE	NE	ND (0.14)	ND (0.15)	ND (0.14)
cis-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.17)	ND (0.16)
Ethylbenzene	µg/m³	1,100	NE	NE	0.88	0.58	3.5
Freon 11	µg/m³	730	NE	NE	2.7	1.4	1.5
Freon 12	µg/m³	210	NE	NE	2.3 J	2 J	1.7 J
Freon 113	µg/m³	31,000	NE	NE	0.52	0.55	0.58
Hexachlorobutadiene	µg/m³	0.086	NE	NE	ND (1.8)	ND (2)	ND (1.8)
Methyl tert-butyl ether	µg/m³	7.4	NE	ND (1.8)	ND (0.62)	ND (0.67)	ND (0.62)

TABLE 3-20
360 Center Street Analytical Results - Air (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		360 Center St
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 11/7/2006	322BA PM 11/7/2006	360AA 11/7/2006
Volatile Organic Compounds							
Methylene chloride	µg/m³	4.1	**14,000**	ND (1.74)	ND (1.2)	ND (1.3)	2.2
Naphthalene	µg/m³	0.056	NE	NE	ND (4.5)	ND (4.9)	ND (4.5)
Styrene	µg/m³	1,100	21,000	NE	0.46	0.15 J	0.55
Tetrachloroethene	µg/m³	0.32	**20,000**	ND (0.47)	**0.42**	0.31	**0.4**
Toluene	µg/m³	400	37,000	ND (3.0)	5.1	2.7	34
trans-1,2-Dichloroethene	µg/m³	73	NE	NE	ND (0.68)	ND (0.74)	ND (0.68)
trans-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.17)	ND (0.16)
Trichloroethene	µg/m³	0.017	NE	ND (0.43)	**0.22**	**0.069**	**0.23**
Vinyl chloride	µg/m³	0.11	**180,000**	ND (0.77)	ND (0.044)	ND (0.048)	ND (0.044)
Xylenes, total	µg/m³	110	22,000	NE	3.8	2.16	15.4

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-1 (Ambient and Crawlspace Air Screening Levels) for source of screening levels.

[2] Acute Reference Exposure Levels developed by Office of Environmental Health Hazard Assessment as of May 2000

[3] West Oakland background results are from the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); the result is from December 2002.

[4] Neighborhood background results are from samples collected at 322 Lewis Street (upwind of the AMCO site) in the morning and afternoon of the same day.

ND not detected above the laboratory's reporting limit shown in parentheses
NE not established
J estimated value
µg/m³ micrograms per cubic meter

TABLE 3-21
Prescott Park Analytical Results - Air (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		Prescott Park
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 11/7/2006	322BA PM 11/7/2006	PP-AA 11/7/2006
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/m³	2,300	68,000	ND (0.27)	0.095 J	0.068 J	0.08 J
1,1,2,2-Tetrachloroethane	µg/m³	0.033	NE	NE	ND (0.23)	ND (0.26)	ND (0.21)
1,1,2-Trichloroethane	µg/m³	0.12	NE	NE	ND (0.093)	ND (0.1)	ND (0.084)
1,1-Dichloroethane	µg/m³	1.2	NE	NE	ND (0.14)	ND (0.15)	ND (0.12)
1,1-Dichloroethene	µg/m³	210	NE	NE	ND (0.068)	ND (0.074)	ND (0.061)
1,2,4-Trichlorobenzene	µg/m³	3.7	NE	NE	ND (1.3)	ND (1.4)	ND (1.2)
1,2,4-Trimethylbenzene	µg/m³	6.2	NE	NE	1.1	0.7	0.86
1,2-Dibromoethane	µg/m³	0.0034	NE	NE	ND (0.26)	ND (0.29)	ND (0.24)
1,2-Dichlorobenzene	µg/m³	210	NE	NE	ND (0.2)	ND (0.22)	ND (0.19)
1,2-Dichloroethane	µg/m³	0.074	NE	ND (0.40)	ND (0.14)	ND (0.15)	ND (0.12)
1,2-Dichloropropane	µg/m³	0.099	NE	NE	ND (0.079)	ND (0.086)	ND (0.072)
1,3,5-Trimethylbenzene	µg/m³	6.2	NE	NE	0.3	0.2	0.24
1,3-Dichlorobenzene	µg/m³	110	NE	NE	ND (0.2)	ND (0.22)	ND (0.19)
1,4-Dichlorobenzene	µg/m³	0.31	NE	NE	0.19 J	0.1 J	ND (0.19)
1,4-Dioxane (p-dioxane)	µg/m³	0.61	**3,000**	NE	0.46 J	ND (0.67)	ND (0.56)
Benzene	µg/m³	0.25	**1,300**	**0.96**	**0.97**	**0.69**	**0.86**
Bromomethane	µg/m³	5.2	3,900	NE	0.12 J	ND (0.36)	ND (0.3)
Carbon tetrachloride	µg/m³	0.13	**1,900**	**0.69**	**0.48**	**0.45**	**0.48**
Chlorobenzene	µg/m³	62	NE	NE	ND (0.16)	ND (0.17)	ND (0.14)
Chloroethane	µg/m³	2.3	NE	NE	0.035 J	ND (0.25)	0.021 J
Chloroform	µg/m³	0.083	**150**	ND (0.10)	**0.1 J**	**0.091 J**	**0.51**
Chloromethane	µg/m³	95	NE	NE	1.1	1.1	1.2
cis-1,2-Dichloroethene	µg/m³	37	NE	NE	ND (0.14)	ND (0.15)	ND (0.12)
cis-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.17)	ND (0.14)
Ethylbenzene	µg/m³	1,100	NE	NE	0.88	0.58	0.67
Freon 11	µg/m³	730	NE	NE	2.7	1.4	1.8
Freon 12	µg/m³	210	NE	NE	2.3 J	2 J	2.4
Freon 113	µg/m³	31,000	NE	NE	0.52	0.55	0.6
Hexachlorobutadiene	µg/m³	0.086	NE	NE	ND (1.8)	ND (2)	ND (1.6)
Methyl tert-butyl ether	µg/m³	7.4	NE	ND (1.8)	ND (0.62)	ND (0.67)	ND (0.56)

TABLE 3-21
Prescott Park Analytical Results - Air (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

					Neighborhood Background Air Results[4]		Prescott Park
Analyte	Units	Screening Level [1]	Acute Reference Exposure Level[2]	West Oakland Background Air Results [3]	322BA AM 11/7/2006	322BA PM 11/7/2006	PP-AA 11/7/2006
Volatile Organic Compounds							
Methylene chloride	µg/m³	4.1	**14,000**	ND (1.74)	ND (1.2)	ND (1.3)	ND (1.1)
Naphthalene	µg/m³	0.056	NE	NE	ND (4.5)	ND (4.9)	ND (4.1)
Styrene	µg/m³	1,100	21,000	NE	0.46	0.15 J	0.15
Tetrachloroethene	µg/m³	0.32	**20,000**	ND (0.47)	**0.42**	0.31	**0.42**
Toluene	µg/m³	400	37,000	ND (3.0)	5.1	2.7	3.6
trans-1,2-Dichloroethene	µg/m³	73	NE	NE	ND (0.68)	ND (0.74)	ND (0.61)
trans-1,3-Dichloropropene	µg/m³	0.48	NE	NE	ND (0.16)	ND (0.17)	ND (0.14)
Trichloroethene	µg/m³	0.017	NE	ND (0.43)	**0.22**	**0.069**	**0.087**
Vinyl chloride	µg/m³	0.11	**180,000**	ND (0.77)	ND (0.044)	ND (0.048)	ND (0.04)
Xylenes, total	µg/m³	110	22,000	NE	3.8	2.16	2.72

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-1 (Ambient and Crawlspace Air Screening Levels) for source of screening levels.

[2] Acute Reference Exposure Levels developed by Office of Environmental Health Hazard Assessment as of May 2000

[3] West Oakland background results are from the Oakland-Filbert Street ambient air sampling station monitored by the Bay Area Air Quality Management District, located at 2419 Filbert Street (approximately one mile northeast, or crosswind, of the AMCO site); the result is from December 2002.

[4] Neighborhood background results are from samples collected at 322 Lewis Street (upwind of the AMCO site) in the morning and afternoon of the same day.

ND not detected above the laboratory's reporting limit shown in parentheses
NE not established
J estimated value
µg/m³ micrograms per cubic meter

TABLE 3-22
Soil Gas Screening Levels
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Screening Level	Units	Source	Notes
Volatile Organic Compounds				
1,1,1-Trichloroethane	23,000	µg/m³	10 x EPA Region 9 Ambient Air PRG	
1,1,2,2-Tetrachloroethane	0.33	µg/m³	10 x EPA Region 9 Ambient Air PRG	
1,1,2-Trichloroethane	1.2	µg/m³	10 x EPA Region 9 Ambient Air PRG	
1,1-Dichloroethane	12	µg/m³	10 x EPA Region 9 Ambient Air PRG	CAL-modified PRG
1,1-Dichloroethene	2,100	µg/m³	10 x EPA Region 9 Ambient Air PRG	
1,2,4-Trichlorobenzene	37	µg/m³	10 x EPA Region 9 Ambient Air PRG	
1,2,4-Trimethylbenzene	62	µg/m³	10 x EPA Region 9 Ambient Air PRG	
1,2-Dibromoethane	0.034	µg/m³	10 x EPA Region 9 Ambient Air PRG	
1,2-Dichlorobenzene	2,100	µg/m³	10 x EPA Region 9 Ambient Air PRG	
1,2-Dichloroethane	0.74	µg/m³	10 x EPA Region 9 Ambient Air PRG	
1,2-Dichloropropane	0.99	µg/m³	10 x EPA Region 9 Ambient Air PRG	
1,3,5-Trimethylbenzene	62	µg/m³	10 x EPA Region 9 Ambient Air PRG	
1,3-Butadiene	0.11	µg/m³	10 x EPA Region 9 Ambient Air PRG	CAL-modified PRG
1,3-Dichlorobenzene	1,100	µg/m³	10 x EPA Region 9 Ambient Air PRG	
1,4-Dichlorobenzene	3.1	µg/m³	10 x EPA Region 9 Ambient Air PRG	
1,4-Dioxane (p-dioxane)	6.1	µg/m³	10 x EPA Region 9 Ambient Air PRG	
2,2,4-Trimethylpentane	2,100	µg/m³	Surrogate	n-Hexane was used as the surrogate
2-Hexanone	NDRI			SL not required
3-Chloropropene	10	µg/m³	10 x EPA Region 9 Ambient Air PRG	
4-Ethyltoluene	1,100	µg/m³	Surrogate	Xylenes was used as the surrogate
Acetone	33,000	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Benzene	2.5	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Benzyl chloride	0.4	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Bromodichloromethane	1.1	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Bromoform	17	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Bromomethane	52	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Carbon disulfide	7,300	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Carbon tetrachloride	1.3	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Chlorobenzene	620	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Chloroethane	23	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Chloroform	0.83	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Chloromethane	950	µg/m³	10 x EPA Region 9 Ambient Air PRG	
cis-1,2-Dichloroethene	370	µg/m³	10 x EPA Region 9 Ambient Air PRG	
cis-1,3-Dichloropropene	4.8	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Cyclohexane	62,000	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Dibromochloromethane	0.8	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Ethanol	18,000	µg/m³	Surrogate	Methanol was used as the surrogate
Ethylbenzene	11,000	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Freon 11	7,300	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Freon 12	2,100	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Freon 113	310,000	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Freon 114	310,000	µg/m³	Surrogate	Freon 113 was used as the surrogate
Freon 134a	310,000	µg/m³	Surrogate	Freon 113 was used as the surrogate
Hexachlorobutadiene	0.86	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Isopropanol	11,000	µg/m³	Surrogate	Isobutanol was used as the surrogate
Isopropylbenzene (cumene)	4,000	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Methyl ethyl ketone	51,000	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Methyl isobutyl ketone	31,000	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Methyl tert-butyl ether	74	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Methylene chloride	41	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Naphthalene	0.56	µg/m³	10 x EPA Region 9 Ambient Air PRG	CAL-modified PRG

TABLE 3-22
Soil Gas Screening Levels
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Screening Level	Units	Source	Notes
Volatile Organic Compounds				
n-Heptane	2,100	µg/m³	Surrogate	n-Hexane was used as the surrogate
n-Propylbenzene	1,500	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Styrene	11,000	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Tetrachloroethene	3.2	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Tetrahydrofuran	9.9	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Toluene	4,000	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Total hexanes	2,100	µg/m³	Surrogate	n-Hexane was used as the surrogate
trans-1,2-Dichloroethene	730	µg/m³	10 x EPA Region 9 Ambient Air PRG	
trans-1,3-Dichloropropene	4.8	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Trichloroethene	0.17	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Vinyl acetate	2,100	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Vinyl chloride	1.1	µg/m³	10 x EPA Region 9 Ambient Air PRG	
Xylenes, total	1,100	µg/m³	10 x EPA Region 9 Ambient Air PRG	

Notes:

EPA Region 9 ambient air PRGs were last updated in October 2004 and are based on target cancer risk level of 10-6 or a noncancer hazard quotient of 1.

Screening levels for soil gas are calculated by multiplying ambient air PRGs by an attenuation factor of 10 (EPA 2002).

NDRI not detected in soil gas during the Remedial Investigation phase

PRG Preliminary Remediation Goal

µg/m³ micrograms per cubic meter

TABLE 3-23
Residential Soil Gas Results Summary (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Backyard Soil Gas Levels	Screening Levels [1]
1,1-Dichloroethane	µg/m³	< 2.8 - 17	12
Benzene	µg/m³	2.2 - 3.6	2.5
Chloroform	µg/m³	< 3.3 - 32	0.83
Tetrachloroethene	µg/m³	< 4.6 - 680	3.2
Trichloroethene	µg/m³	< 0.15 - 230	0.17

Notes:

Only compounds detected above screening levels are shown

[1] Screening levels for soil gas are calculated by multiplying ambient air PRGs by an attenuation factor of 10 (Attenuation factor for shallow soil gas is taken from EPA Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, November 2002, page 28).

µg/m³ micrograms per cubic meter

TABLE 3-24
1428 3rd Street Analytical Results - Soil Gas (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		1428SG	1428SG (FD)
	Sample Date		9/21/2004	9/21/2004
Analyte	**Screening Level [1]**	**Units**	**Analytical Results**	
Volatile Organic Compounds				
1,1,1-Trichloroethane	23,000	µg/m³	22	25
1,1,2,2-Tetrachloroethane	0.33	µg/m³	ND (0.37)	ND (0.37)
1,1,2-Trichloroethane	1.2	µg/m³	0.34	0.36
1,1-Dichloroethane	12	µg/m³	**14**	**17**
1,1-Dichloroethene	2,100	µg/m³	ND (2.7)	ND (2.7)
1,2,4-Trichlorobenzene	37	µg/m³	ND (20)	ND (20)
1,2,4-Trimethylbenzene	62	µg/m³	ND (3.3)	ND (3.3)
1,2-Dibromoethane	0.034	µg/m³	ND (0.42)	ND (0.42)
1,2-Dichlorobenzene	2,100	µg/m³	ND (4.1)	ND (4.1)
1,2-Dichloroethane	0.74	µg/m³	ND (0.22)	ND (0.22)
1,2-Dichloropropane	0.99	µg/m³	ND (0.25)	ND (0.25)
1,3,5-Trimethylbenzene	62	µg/m³	ND (3.3)	ND (3.3)
1,3-Butadiene	0.11	µg/m³	ND (1.5)	ND (1.5)
1,3-Dichlorobenzene	1,100	µg/m³	ND (4.1)	ND (4.1)
1,4-Dichlorobenzene	3.1	µg/m³	ND (4.1)	ND (4.1)
1,4-Dioxane (p-dioxane)	6.1	µg/m³	ND (9.8)	ND (9.8)
2,2,4-Trimethylpentane	2,100	µg/m³	ND (3.2)	ND (3.2)
2-Hexanone	NE	µg/m³	ND (11)	ND (11)
3-Chloropropene	10	µg/m³	ND (8.5)	ND (8.5)
4-Ethyltoluene	1,100	µg/m³	ND (3.3)	ND (3.3)
Acetone	33,000	µg/m³	8.8	7.2
Benzene	2.5	µg/m³	ND (2.2)	ND (2.2)
Benzyl chloride	0.4	µg/m³	ND (3.5)	ND (3.5)
Bromodichloromethane	1.1	µg/m³	ND (4.6)	ND (4.6)
Bromoform	17	µg/m³	ND (7)	ND (7)
Bromomethane	52	µg/m³	ND (2.6)	ND (2.6)
Carbon disulfide	7,300	µg/m³	ND (2.1)	ND (2.1)
Carbon tetrachloride	1.3	µg/m³	ND (0.34)	ND (0.34)
Chlorobenzene	620	µg/m³	ND (3.1)	ND (3.1)
Chloroethane	23	µg/m³	ND (1.8)	ND (1.8)
Chloroform	0.83	µg/m³	**22**	**20**
Chloromethane	950	µg/m³	ND (5.6)	ND (5.6)
cis-1,2-Dichloroethene	370	µg/m³	36	34
cis-1,3-Dichloropropene	4.8	µg/m³	ND (3.1)	ND (3.1)
Cyclohexane	62,000	µg/m³	ND (2.3)	ND (2.3)
Dibromochloromethane	0.8	µg/m³	ND (5.8)	ND (5.8)
Ethanol	18,000	µg/m³	ND (5.1)	ND (5.1)
Ethylbenzene	11,000	µg/m³	ND (3)	ND (3)
Freon 11	7,300	µg/m³	5.6	5.3
Freon 12	2,100	µg/m³	ND (3.4)	ND (3.4)
Freon 113	310,000	µg/m³	ND (5.2)	ND (5.2)
Freon 114	310,000	µg/m³	ND (4.8)	ND (4.8)
Hexachlorobutadiene	0.86	µg/m³	ND (2.9)	ND (2.9)
Isopropanol	11,000	µg/m³	ND (6.7)	ND (6.7)
Isopropylbenzene (cumene)	4,000	µg/m³	ND (3.3)	ND (3.3)
Methyl ethyl ketone	51,000	µg/m³	ND (2)	ND (2)
Methyl isobutyl ketone	31,000	µg/m³	ND (2.8)	ND (2.8)
Methyl tert-butyl ether	74	µg/m³	ND (2.4)	ND (2.4)

TABLE 3-24
1428 3rd Street Analytical Results - Soil Gas (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		1428SG	1428SG (FD)
	Sample Date		9/21/2004	9/21/2004
Analyte	**Screening Level [1]**	**Units**	**Analytical Results**	
Volatile Organic Compounds				
Methylene chloride	41	µg/m³	ND (2.4)	ND (2.4)
n-Heptane	2,100	µg/m³	17	15
n-Propylbenzene	1,500	µg/m³	ND (3.3)	ND (3.3)
Styrene	11,000	µg/m³	ND (2.9)	ND (2.9)
Tetrachloroethene	3.2	µg/m³	**81**	**100**
Tetrahydrofuran	9.9	µg/m³	ND (2)	ND (2)
Toluene	4,000	µg/m³	ND (2.6)	ND (2.6)
Total hexanes	2,100	µg/m³	46	35
trans-1,2-Dichloroethene	730	µg/m³	22	20
trans-1,3-Dichloropropene	4.8	µg/m³	ND (3.1)	ND (3.1)
Trichloroethene	0.17	µg/m³	**220**	**230**
Vinyl acetate	2,100	µg/m³	ND (9.6)	ND (9.6)
Vinyl chloride	1.1	µg/m³	ND (0.07)	ND (0.07)
Xylenes, total	1,100	µg/m³	ND (3)	ND (3)

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-22 (Soil Gas Screening Levels) for source of screening levels.

µg/m³ micrograms per cubic meter

FD field duplicate

ND not detected above the laboratory's reporting limit shown in parentheses

TABLE 3-25
1432 3rd Street Analytical Results - Soil Gas (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		1432SGa	1432SGb
	Sample Date		9/21/2004	9/21/2004
Analyte	**Screening Level** [1]	**Units**	**Analytical Results**	
Volatile Organic Compounds				
1,1,1-Trichloroethane	23,000	µg/m³	ND (3.7)	ND (3.7)
1,1,2,2-Tetrachloroethane	0.33	µg/m³	ND (0.22)	ND (0.19)
1,1,2-Trichloroethane	1.2	µg/m³	ND (0.18)	ND (0.15)
1,1-Dichloroethane	12	µg/m³	ND (2.8)	ND (2.8)
1,1-Dichloroethene	2,100	µg/m³	ND (2.7)	ND (2.7)
1,2,4-Trichlorobenzene	37	µg/m³	ND (20)	ND (20)
1,2,4-Trimethylbenzene	62	µg/m³	6.5	ND (3.3)
1,2-Dibromoethane	0.034	µg/m³	ND (0.25)	ND (0.21)
1,2-Dichlorobenzene	2,100	µg/m³	ND (4.1)	ND (4.1)
1,2-Dichloroethane	0.74	µg/m³	ND (0.13)	ND (0.11)
1,2-Dichloropropane	0.99	µg/m³	ND (0.15)	ND (0.12)
1,3,5-Trimethylbenzene	62	µg/m³	ND (3.3)	ND (3.3)
1,3-Butadiene	0.11	µg/m³	ND (1.5)	ND (1.5)
1,3-Dichlorobenzene	1,100	µg/m³	15	ND (4.1)
1,4-Dichlorobenzene	3.1	µg/m³	ND (4.1)	ND (4.1)
1,4-Dioxane (p-dioxane)	6.1	µg/m³	ND (9.8)	ND (9.8)
2,2,4-Trimethylpentane	2,100	µg/m³	ND (3.2)	ND (3.2)
2-Hexanone	NE	µg/m³	ND (11)	ND (11)
3-Chloropropene	10	µg/m³	ND (8.5)	ND (8.5)
4-Ethyltoluene	1,100	µg/m³	4.9	ND (3.3)
Acetone	33,000	µg/m³	18	12
Benzene	2.5	µg/m³	ND (2.2)	ND (2.2)
Benzyl chloride	0.4	µg/m³	ND (3.5)	ND (3.5)
Bromodichloromethane	1.1	µg/m³	ND (4.6)	ND (4.6)
Bromoform	17	µg/m³	ND (7)	ND (7)
Bromomethane	52	µg/m³	ND (2.6)	ND (2.6)
Carbon disulfide	7,300	µg/m³	ND (2.1)	ND (2.1)
Carbon tetrachloride	1.3	µg/m³	ND (0.2)	ND (0.17)
Chlorobenzene	620	µg/m³	ND (3.1)	ND (3.1)
Chloroethane	23	µg/m³	ND (1.8)	ND (1.8)
Chloroform	0.83	µg/m³	**6.3**	**6.3**
Chloromethane	950	µg/m³	ND (5.6)	ND (5.6)
cis-1,2-Dichloroethene	370	µg/m³	ND (2.7)	ND (2.7)
cis-1,3-Dichloropropene	4.8	µg/m³	ND (3.1)	ND (3.1)
Cyclohexane	62,000	µg/m³	ND (2.3)	ND (2.3)
Dibromochloromethane	0.8	µg/m³	ND (5.8)	ND (5.8)
Ethanol	18,000	µg/m³	20	ND (5.1)
Ethylbenzene	11,000	µg/m³	ND (3)	ND (3)
Freon 11	7,300	µg/m³	12	ND (3.8)
Freon 12	2,100	µg/m³	ND (3.4)	ND (3.4)
Freon 113	310,000	µg/m³	ND (5.2)	ND (5.2)
Freon 114	310,000	µg/m³	ND (4.8)	ND (4.8)
Hexachlorobutadiene	0.86	µg/m³	ND (1.7)	ND (1.4)
Isopropanol	11,000	µg/m³	88	ND (6.7)
Isopropylbenzene (cumene)	4,000	µg/m³	ND (3.3)	ND (3.3)
Methyl ethyl ketone	51,000	µg/m³	5.1	5.4
Methyl isobutyl ketone	31,000	µg/m³	ND (2.8)	ND (2.8)
Methyl tert-butyl ether	74	µg/m³	ND (2.4)	ND (2.4)

TABLE 3-25
1432 3rd Street Analytical Results - Soil Gas (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		1432SGa	1432SGb
	Sample Date		9/21/2004	9/21/2004
Analyte	**Screening Level** [1]	**Units**	**Analytical Results**	
Volatile Organic Compounds				
Methylene chloride	41	µg/m³	ND (2.4)	ND (2.4)
n-Heptane	2,100	µg/m³	ND (2.8)	ND (2.8)
n-Propylbenzene	1,500	µg/m³	ND (3.3)	ND (3.3)
Styrene	11,000	µg/m³	ND (2.9)	ND (2.9)
Tetrachloroethene	3.2	µg/m³	ND (4.6)	ND (4.6)
Tetrahydrofuran	9.9	µg/m³	3.5	2.8
Toluene	4,000	µg/m³	4.7	ND (2.6)
Total hexanes	2,100	µg/m³	ND (2.4)	ND (2.4)
trans-1,2-Dichloroethene	730	µg/m³	ND (2.7)	ND (2.7)
trans-1,3-Dichloropropene	4.8	µg/m³	ND (3.1)	ND (3.1)
Trichloroethene	0.17	µg/m³	ND (0.17)	ND (0.15)
Vinyl acetate	2,100	µg/m³	ND (9.6)	ND (9.6)
Vinyl chloride	1.1	µg/m³	ND (0.041)	ND (0.035)
Xylenes, total	1,100	µg/m³	11.6	ND (3)

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-22 (Soil Gas Screening Levels) for source of screening levels.

µg/m³ micrograms per cubic meter

ND not detected above the laboratory's reporting limit shown in parentheses

TABLE 3-26
1436 3rd Street Analytical Results - Soil Gas (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		1436SG
	Sample Date		9/21/2004
Analyte	**Screening Level** [1]	**Units**	**Analytical Results**
Volatile Organic Compounds			
1,1,1-Trichloroethane	23,000	µg/m³	ND (3.7)
1,1,2,2-Tetrachloroethane	0.33	µg/m³	ND (0.19)
1,1,2-Trichloroethane	1.2	µg/m³	ND (0.15)
1,1-Dichloroethane	12	µg/m³	ND (2.8)
1,1-Dichloroethene	2,100	µg/m³	ND (2.7)
1,2,4-Trichlorobenzene	37	µg/m³	ND (20)
1,2,4-Trimethylbenzene	62	µg/m³	ND (3.3)
1,2-Dibromoethane	0.034	µg/m³	ND (0.21)
1,2-Dichlorobenzene	2,100	µg/m³	ND (4.1)
1,2-Dichloroethane	0.74	µg/m³	ND (0.11)
1,2-Dichloropropane	0.99	µg/m³	ND (0.12)
1,3,5-Trimethylbenzene	62	µg/m³	ND (3.3)
1,3-Butadiene	0.11	µg/m³	ND (1.5)
1,3-Dichlorobenzene	1,100	µg/m³	ND (4.1)
1,4-Dichlorobenzene	3.1	µg/m³	ND (4.1)
1,4-Dioxane (p-dioxane)	6.1	µg/m³	ND (9.8)
2,2,4-Trimethylpentane	2,100	µg/m³	ND (3.2)
2-Hexanone	NE	µg/m³	ND (11)
3-Chloropropene	10	µg/m³	ND (8.5)
4-Ethyltoluene	1,100	µg/m³	ND (3.3)
Acetone	33,000	µg/m³	6.6
Benzene	2.5	µg/m³	ND (2.2)
Benzyl chloride	0.4	µg/m³	ND (3.5)
Bromodichloromethane	1.1	µg/m³	ND (4.6)
Bromoform	17	µg/m³	ND (7)
Bromomethane	52	µg/m³	ND (2.6)
Carbon disulfide	7,300	µg/m³	ND (2.1)
Carbon tetrachloride	1.3	µg/m³	ND (0.17)
Chlorobenzene	620	µg/m³	ND (3.1)
Chloroethane	23	µg/m³	ND (1.8)
Chloroform	0.83	µg/m³	ND (3.3)
Chloromethane	950	µg/m³	ND (5.6)
cis-1,2-Dichloroethene	370	µg/m³	ND (2.7)
cis-1,3-Dichloropropene	4.8	µg/m³	ND (3.1)
Cyclohexane	62,000	µg/m³	ND (2.3)
Dibromochloromethane	0.8	µg/m³	ND (5.8)
Ethanol	18,000	µg/m³	ND (5.1)
Ethylbenzene	11,000	µg/m³	ND (3)
Freon 11	7,300	µg/m³	16
Freon 12	2,100	µg/m³	ND (3.4)
Freon 113	310,000	µg/m³	ND (5.2)
Freon 114	310,000	µg/m³	ND (4.8)
Hexachlorobutadiene	0.86	µg/m³	ND (1.4)
Isopropanol	11,000	µg/m³	ND (6.7)
Isopropylbenzene (cumene)	4,000	µg/m³	ND (3.3)
Methyl ethyl ketone	51,000	µg/m³	4.1
Methyl isobutyl ketone	31,000	µg/m³	ND (2.8)
Methyl tert-butyl ether	74	µg/m³	ND (2.4)

TABLE 3-26
1436 3rd Street Analytical Results - Soil Gas (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		1436SG
	Sample Date		9/21/2004
Analyte	**Screening Level** [1]	**Units**	**Analytical Results**
Volatile Organic Compounds			
Methylene chloride	41	µg/m³	ND (2.4)
n-Heptane	2,100	µg/m³	ND (2.8)
n-Propylbenzene	1,500	µg/m³	ND (3.3)
Styrene	11,000	µg/m³	ND (2.9)
Tetrachloroethene	3.2	µg/m³	**5.2**
Tetrahydrofuran	9.9	µg/m³	3.3
Toluene	4,000	µg/m³	ND (2.6)
Total hexanes	2,100	µg/m³	ND (2.4)
trans-1,2-Dichloroethene	730	µg/m³	ND (2.7)
trans-1,3-Dichloropropene	4.8	µg/m³	ND (3.1)
Trichloroethene	0.17	µg/m³	ND (0.15)
Vinyl acetate	2,100	µg/m³	ND (9.6)
Vinyl chloride	1.1	µg/m³	ND (0.035)
Xylenes, total	1,100	µg/m³	ND (3)

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-22 (Soil Gas Screening Levels) for source of screening levels.

µg/m³ micrograms per cubic meter

ND not detected above the laboratory's reporting limit shown in parentheses

TABLE 3-27
360 Center Street Analytical Results - Soil Gas (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		326SG
	Sample Date		9/21/2004
Analyte	**Screening Level** [1]	**Units**	**Analytical Results**
Volatile Organic Compounds			
1,1,1-Trichloroethane	23,000	µg/m³	ND (3.7)
1,1,2,2-Tetrachloroethane	0.33	µg/m³	ND (0.31)
1,1,2-Trichloroethane	1.2	µg/m³	ND (0.25)
1,1-Dichloroethane	12	µg/m³	11
1,1-Dichloroethene	2,100	µg/m³	ND (2.7)
1,2,4-Trichlorobenzene	37	µg/m³	ND (20)
1,2,4-Trimethylbenzene	62	µg/m³	ND (3.3)
1,2-Dibromoethane	0.034	µg/m³	ND (0.35)
1,2-Dichlorobenzene	2,100	µg/m³	ND (4.1)
1,2-Dichloroethane	0.74	µg/m³	ND (0.18)
1,2-Dichloropropane	0.99	µg/m³	ND (0.21)
1,3,5-Trimethylbenzene	62	µg/m³	ND (3.3)
1,3-Butadiene	0.11	µg/m³	ND (1.5)
1,3-Dichlorobenzene	1,100	µg/m³	ND (4.1)
1,4-Dichlorobenzene	3.1	µg/m³	ND (4.1)
1,4-Dioxane (p-dioxane)	6.1	µg/m³	ND (9.8)
2,2,4-Trimethylpentane	2,100	µg/m³	ND (3.2)
2-Hexanone	NE	µg/m³	ND (11)
3-Chloropropene	10	µg/m³	ND (8.5)
4-Ethyltoluene	1,100	µg/m³	ND (3.3)
Acetone	33,000	µg/m³	8.9
Benzene	2.5	µg/m³	ND (2.2)
Benzyl chloride	0.4	µg/m³	ND (3.5)
Bromodichloromethane	1.1	µg/m³	ND (4.6)
Bromoform	17	µg/m³	ND (7)
Bromomethane	52	µg/m³	ND (2.6)
Carbon disulfide	7,300	µg/m³	3.2
Carbon tetrachloride	1.3	µg/m³	ND (0.28)
Chlorobenzene	620	µg/m³	ND (3.1)
Chloroethane	23	µg/m³	ND (1.8)
Chloroform	0.83	µg/m³	**32**
Chloromethane	950	µg/m³	ND (5.6)
cis-1,2-Dichloroethene	370	µg/m³	ND (2.7)
cis-1,3-Dichloropropene	4.8	µg/m³	ND (3.1)
Cyclohexane	62,000	µg/m³	ND (2.3)
Dibromochloromethane	0.8	µg/m³	ND (5.8)
Ethanol	18,000	µg/m³	ND (5.1)
Ethylbenzene	11,000	µg/m³	ND (3)
Freon 11	7,300	µg/m³	4.7
Freon 12	2,100	µg/m³	ND (3.4)
Freon 113	310,000	µg/m³	ND (5.2)
Freon 114	310,000	µg/m³	ND (4.8)
Hexachlorobutadiene	0.86	µg/m³	ND (2.4)
Isopropanol	11,000	µg/m³	ND (6.7)
Isopropylbenzene (cumene)	4,000	µg/m³	ND (3.3)
Methyl ethyl ketone	51,000	µg/m³	4.1
Methyl isobutyl ketone	31,000	µg/m³	ND (2.8)
Methyl tert-butyl ether	74	µg/m³	ND (2.4)

TABLE 3-27
360 Center Street Analytical Results - Soil Gas (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		326SG
	Sample Date		9/21/2004
Analyte	**Screening Level** [1]	**Units**	**Analytical Results**
Volatile Organic Compounds			
Methylene chloride	41	µg/m³	ND (2.4)
n-Heptane	2,100	µg/m³	ND (2.8)
n-Propylbenzene	1,500	µg/m³	ND (3.3)
Styrene	11,000	µg/m³	ND (2.9)
Tetrachloroethene	3.2	µg/m³	**680**
Tetrahydrofuran	9.9	µg/m³	3.2
Toluene	4,000	µg/m³	ND (2.6)
Total hexanes	2,100	µg/m³	ND (2.4)
trans-1,2-Dichloroethene	730	µg/m³	ND (2.7)
trans-1,3-Dichloropropene	4.8	µg/m³	ND (3.1)
Trichloroethene	0.17	µg/m³	**52**
Vinyl acetate	2,100	µg/m³	ND (9.6)
Vinyl chloride	1.1	µg/m³	ND (0.058)
Xylenes, total	1,100	µg/m³	ND (3)

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-22 (Soil Gas Screening Levels) for source of screening levels.

µg/m³ micrograms per cubic meter

ND not detected above the laboratory's reporting limit shown in parentheses

TABLE 3-28
326 Center Street Analytical Results - Soil Gas (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		356SG
	Sample Date		9/21/2004
Analyte	**Screening Level** [1]	**Units**	**Analytical Results**
Volatile Organic Compounds			
1,1,1-Trichloroethane	23,000	µg/m³	ND (3.7)
1,1,2,2-Tetrachloroethane	0.33	µg/m³	ND (0.19)
1,1,2-Trichloroethane	1.2	µg/m³	ND (0.15)
1,1-Dichloroethane	12	µg/m³	ND (2.8)
1,1-Dichloroethene	2,100	µg/m³	ND (2.7)
1,2,4-Trichlorobenzene	37	µg/m³	ND (20)
1,2,4-Trimethylbenzene	62	µg/m³	8
1,2-Dibromoethane	0.034	µg/m³	ND (0.21)
1,2-Dichlorobenzene	2,100	µg/m³	ND (4.1)
1,2-Dichloroethane	0.74	µg/m³	ND (0.11)
1,2-Dichloropropane	0.99	µg/m³	ND (0.12)
1,3,5-Trimethylbenzene	62	µg/m³	ND (3.3)
1,3-Butadiene	0.11	µg/m³	ND (1.5)
1,3-Dichlorobenzene	1,100	µg/m³	21
1,4-Dichlorobenzene	3.1	µg/m³	ND (4.1)
1,4-Dioxane (p-dioxane)	6.1	µg/m³	ND (9.8)
2,2,4-Trimethylpentane	2,100	µg/m³	ND (3.2)
2-Hexanone	NE	µg/m³	ND (11)
3-Chloropropene	10	µg/m³	ND (8.5)
4-Ethyltoluene	1,100	µg/m³	6.7
Acetone	33,000	µg/m³	22
Benzene	2.5	µg/m³	2.4
Benzyl chloride	0.4	µg/m³	ND (3.5)
Bromodichloromethane	1.1	µg/m³	ND (4.6)
Bromoform	17	µg/m³	ND (7)
Bromomethane	52	µg/m³	ND (2.6)
Carbon disulfide	7,300	µg/m³	ND (2.1)
Carbon tetrachloride	1.3	µg/m³	ND (0.17)
Chlorobenzene	620	µg/m³	ND (3.1)
Chloroethane	23	µg/m³	ND (1.8)
Chloroform	0.83	µg/m³	ND (3.3)
Chloromethane	950	µg/m³	ND (5.6)
cis-1,2-Dichloroethene	370	µg/m³	ND (2.7)
cis-1,3-Dichloropropene	4.8	µg/m³	ND (3.1)
Cyclohexane	62,000	µg/m³	ND (2.3)
Dibromochloromethane	0.8	µg/m³	ND (5.8)
Ethanol	18,000	µg/m³	25
Ethylbenzene	11,000	µg/m³	3.5
Freon 11	7,300	µg/m³	4.3
Freon 12	2,100	µg/m³	ND (3.4)
Freon 113	310,000	µg/m³	ND (5.2)
Freon 114	310,000	µg/m³	ND (4.8)
Hexachlorobutadiene	0.86	µg/m³	ND (1.4)
Isopropanol	11,000	µg/m³	87
Isopropylbenzene (cumene)	4,000	µg/m³	ND (3.3)
Methyl ethyl ketone	51,000	µg/m³	7.5
Methyl isobutyl ketone	31,000	µg/m³	ND (2.8)
Methyl tert-butyl ether	74	µg/m³	ND (2.4)

TABLE 3-28
326 Center Street Analytical Results - Soil Gas (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		356SG
	Sample Date		9/21/2004
Analyte	**Screening Level [1]**	**Units**	**Analytical Results**
Volatile Organic Compounds			
Methylene chloride	41	µg/m³	ND (2.4)
n-Heptane	2,100	µg/m³	ND (2.8)
n-Propylbenzene	1,500	µg/m³	ND (3.3)
Styrene	11,000	µg/m³	ND (2.9)
Tetrachloroethene	3.2	µg/m³	ND (4.6)
Tetrahydrofuran	9.9	µg/m³	3.4
Toluene	4,000	µg/m³	9.9
Total hexanes	2,100	µg/m³	ND (2.4)
trans-1,2-Dichloroethene	730	µg/m³	ND (2.7)
trans-1,3-Dichloropropene	4.8	µg/m³	ND (3.1)
Trichloroethene	0.17	µg/m³	ND (0.15)
Vinyl acetate	2,100	µg/m³	ND (9.6)
Vinyl chloride	1.1	µg/m³	ND (0.035)
Xylenes, total	1,100	µg/m³	17.8

Notes:

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-22 (Soil Gas Screening Levels) for source of screening levels.

µg/m³ micrograms per cubic meter

ND not detected above the laboratory's reporting limit shown in parentheses

TABLE 3-29
356 Center Street Analytical Results - Soil Gas (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		360SGa	360SGb	360SGc
	Sample Date		9/21/2004	9/21/2004	9/21/2004
Analyte	**Screening Level [1]**	**Units**	**Analytical Results**		
Volatile Organic Compounds					
1,1,1-Trichloroethane	23,000	µg/m³	ND (3.7)	ND (3.7)	ND (3.7)
1,1,2,2-Tetrachloroethane	0.33	µg/m³	ND (0.19)	ND (0.19)	ND (0.19)
1,1,2-Trichloroethane	1.2	µg/m³	ND (0.15)	ND (0.15)	ND (0.15)
1,1-Dichloroethane	12	µg/m³	ND (2.8)	ND (2.8)	ND (2.8)
1,1-Dichloroethene	2,100	µg/m³	ND (2.7)	ND (2.7)	ND (2.7)
1,2,4-Trichlorobenzene	37	µg/m³	ND (20)	ND (20)	ND (20)
1,2,4-Trimethylbenzene	62	µg/m³	5.7	ND (3.3)	ND (3.3)
1,2-Dibromoethane	0.034	µg/m³	ND (0.21)	ND (0.21)	ND (0.21)
1,2-Dichlorobenzene	2,100	µg/m³	ND (4.1)	ND (4.1)	ND (4.1)
1,2-Dichloroethane	0.74	µg/m³	ND (0.11)	ND (0.11)	ND (0.11)
1,2-Dichloropropane	0.99	µg/m³	ND (0.12)	ND (0.12)	ND (0.12)
1,3,5-Trimethylbenzene	62	µg/m³	ND (3.3)	ND (3.3)	ND (3.3)
1,3-Butadiene	0.11	µg/m³	ND (1.5)	ND (1.5)	ND (1.5)
1,3-Dichlorobenzene	1,100	µg/m³	26	ND (4.1)	ND (4.1)
1,4-Dichlorobenzene	3.1	µg/m³	ND (4.1)	ND (4.1)	ND (4.1)
1,4-Dioxane (p-dioxane)	6.1	µg/m³	ND (9.8)	ND (9.8)	ND (9.8)
2,2,4-Trimethylpentane	2,100	µg/m³	ND (3.2)	ND (3.2)	ND (3.2)
2-Hexanone	NE	µg/m³	ND (11)	ND (11)	ND (11)
3-Chloropropene	10	µg/m³	ND (8.5)	ND (8.5)	ND (8.5)
4-Ethyltoluene	1,100	µg/m³	4.9	ND (3.3)	ND (3.3)
Acetone	33,000	µg/m³	51	19	24
Benzene	2.5	µg/m³	**3.6**	2.2	ND (2.2)
Benzyl chloride	0.4	µg/m³	ND (3.5)	ND (3.5)	ND (3.5)
Bromodichloromethane	1.1	µg/m³	ND (4.6)	ND (4.6)	ND (4.6)
Bromoform	17	µg/m³	ND (7)	ND (7)	ND (7)
Bromomethane	52	µg/m³	ND (2.6)	ND (2.6)	ND (2.6)
Carbon disulfide	7,300	µg/m³	6.8	ND (2.1)	ND (2.1)
Carbon tetrachloride	1.3	µg/m³	ND (0.17)	ND (0.17)	ND (0.17)
Chlorobenzene	620	µg/m³	ND (3.1)	ND (3.1)	ND (3.1)
Chloroethane	23	µg/m³	ND (1.8)	ND (1.8)	ND (1.8)
Chloroform	0.83	µg/m³	ND (3.3)	ND (3.3)	ND (3.3)
Chloromethane	950	µg/m³	ND (5.6)	ND (5.6)	ND (5.6)
cis-1,2-Dichloroethene	370	µg/m³	ND (2.7)	ND (2.7)	ND (2.7)
cis-1,3-Dichloropropene	4.8	µg/m³	ND (3.1)	ND (3.1)	ND (3.1)
Cyclohexane	62,000	µg/m³	ND (2.3)	ND (2.3)	ND (2.3)
Dibromochloromethane	0.8	µg/m³	ND (5.8)	ND (5.8)	ND (5.8)
Ethanol	18,000	µg/m³	210	6	26
Ethylbenzene	11,000	µg/m³	ND (3)	ND (3)	ND (3)
Freon 11	7,300	µg/m³	ND (3.8)	ND (3.8)	4.5
Freon 12	2,100	µg/m³	ND (3.4)	ND (3.4)	ND (3.4)
Freon 113	310,000	µg/m³	ND (5.2)	ND (5.2)	ND (5.2)
Freon 114	310,000	µg/m³	ND (4.8)	ND (4.8)	ND (4.8)
Hexachlorobutadiene	0.86	µg/m³	ND (1.4)	ND (1.4)	ND (1.4)
Isopropanol	11,000	µg/m³	83	ND (6.7)	ND (6.7)
Isopropylbenzene (cumene)	4,000	µg/m³	ND (3.3)	ND (3.3)	ND (3.3)
Methyl ethyl ketone	51,000	µg/m³	10	7.6	8.4
Methyl isobutyl ketone	31,000	µg/m³	ND (2.8)	ND (2.8)	ND (2.8)
Methyl tert-butyl ether	74	µg/m³	ND (2.4)	ND (2.4)	ND (2.4)

TABLE 3-29
356 Center Street Analytical Results - Soil Gas (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		360SGa	360SGb	360SGc
	Sample Date		9/21/2004	9/21/2004	9/21/2004
Analyte	**Screening Level [1]**	**Units**	**Analytical Results**		
Volatile Organic Compounds					
Methylene chloride	41	µg/m³	ND (2.4)	ND (2.4)	ND (2.4)
n-Heptane	2,100	µg/m³	ND (2.8)	ND (2.8)	ND (2.8)
n-Propylbenzene	1,500	µg/m³	ND (3.3)	ND (3.3)	ND (3.3)
Styrene	11,000	µg/m³	ND (2.9)	ND (2.9)	ND (2.9)
Tetrachloroethene	3.2	µg/m³	ND (4.6)	ND (4.6)	ND (4.6)
Tetrahydrofuran	9.9	µg/m³	4	2.6	4.3
Toluene	4,000	µg/m³	10	2.7	ND (2.6)
Total hexanes	2,100	µg/m³	ND (2.4)	ND (2.4)	ND (2.4)
trans-1,2-Dichloroethene	730	µg/m³	ND (2.7)	ND (2.7)	ND (2.7)
trans-1,3-Dichloropropene	4.8	µg/m³	ND (3.1)	ND (3.1)	ND (3.1)
Trichloroethene	0.17	µg/m³	ND (0.15)	ND (0.15)	ND (0.15)
Vinyl acetate	2,100	µg/m³	ND (9.6)	ND (9.6)	ND (9.6)
Vinyl chloride	1.1	µg/m³	ND (0.035)	ND (0.035)	ND (0.035)
Xylenes, total	1,100	µg/m³	11.3	ND (3)	ND (3)

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-22 (Soil Gas Screening Levels) for source of screening levels.

µg/m³ micrograms per cubic meter

ND not detected above the laboratory's reporting limit shown in parentheses

TABLE 3-30
Prescott Park Analytical Results - Soil Gas (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		PP-E	PP-NW	PP-SW
	Sample Date		9/30/2004	9/30/2004	9/30/2004
Analyte	**Screening Level [1]**	**Units**	**Analytical Results**		
Volatile Organic Compounds					
1,1,1-Trichloroethane	23,000	µg/m³	ND (3.7)	ND (12)	ND (4)
1,1,2,2-Tetrachloroethane	0.33	µg/m³	ND (0.19)	ND (0.59)	ND (0.2)
1,1,2-Trichloroethane	1.2	µg/m³	ND (0.15)	ND (0.47)	ND (0.16)
1,1-Dichloroethane	12	µg/m³	ND (2.8)	ND (8.7)	ND (3)
1,1-Dichloroethene	2,100	µg/m³	ND (2.7)	ND (8.5)	ND (2.9)
1,2,4-Trichlorobenzene	37	µg/m³	ND (20)	ND (64)	ND (22)
1,2,4-Trimethylbenzene	62	µg/m³	ND (3.3)	ND (10)	ND (3.6)
1,2-Dibromoethane	0.034	µg/m³	ND (0.21)	ND (0.66)	ND (0.22)
1,2-Dichlorobenzene	2,100	µg/m³	ND (4.1)	ND (13)	ND (4.4)
1,2-Dichloroethane	0.74	µg/m³	ND (0.11)	ND (0.35)	ND (0.12)
1,2-Dichloropropane	0.99	µg/m³	ND (0.12)	ND (0.4)	ND (0.14)
1,3,5-Trimethylbenzene	62	µg/m³	ND (3.3)	ND (10)	ND (3.6)
1,3-Butadiene	0.11	µg/m³	ND (1.5)	ND (4.8)	ND (1.6)
1,3-Dichlorobenzene	1,100	µg/m³	ND (4.1)	ND (13)	ND (4.4)
1,4-Dichlorobenzene	3.1	µg/m³	ND (4.1)	ND (13)	ND (4.4)
1,4-Dioxane (p-dioxane)	6.1	µg/m³	ND (9.8)	ND (31)	ND (10)
2,2,4-Trimethylpentane	2,100	µg/m³	ND (3.2)	ND (10)	ND (3.4)
2-Hexanone	NE	µg/m³	ND (11)	ND (35)	ND (12)
3-Chloropropene	10	µg/m³	ND (8.5)	ND (27)	ND (9.2)
4-Ethyltoluene	1,100	µg/m³	ND (3.3)	ND (10)	ND (3.6)
Acetone	33,000	µg/m³	15	46	ND (7)
Benzene	2.5	µg/m³	ND (2.2)	ND (6.9)	ND (2.3)
Benzyl chloride	0.4	µg/m³	ND (3.5)	ND (11)	ND (3.8)
Bromodichloromethane	1.1	µg/m³	ND (4.6)	ND (14)	ND (4.9)
Bromoform	17	µg/m³	ND (7)	ND (22)	ND (7.6)
Bromomethane	52	µg/m³	ND (2.6)	ND (8.3)	ND (2.8)
Carbon disulfide	7,300	µg/m³	ND (2.1)	ND (6.7)	2.6
Carbon tetrachloride	1.3	µg/m³	ND (0.17)	ND (0.54)	ND (0.18)
Chlorobenzene	620	µg/m³	ND (3.1)	ND (9.9)	ND (3.4)
Chloroethane	23	µg/m³	ND (1.8)	ND (5.7)	ND (1.9)
Chloroform	0.83	µg/m³	**99**	ND (10)	**22**
Chloromethane	950	µg/m³	ND (5.6)	ND (18)	ND (6)
cis-1,2-Dichloroethene	370	µg/m³	ND (2.7)	ND (8.5)	ND (2.9)
cis-1,3-Dichloropropene	4.8	µg/m³	ND (3.1)	ND (9.8)	ND (3.3)
Cyclohexane	62,000	µg/m³	ND (2.3)	12	ND (2.5)
Dibromochloromethane	0.8	µg/m³	ND (5.8)	ND (18)	ND (6.2)
Ethanol	18,000	µg/m³	ND (5.1)	ND (16)	ND (5.5)
Ethylbenzene	11,000	µg/m³	ND (3)	ND (9.3)	ND (3.2)
Freon 11	7,300	µg/m³	11	ND (12)	ND (4.1)
Freon 12	2,100	µg/m³	ND (3.4)	ND (11) J	ND (3.6) J
Freon 113	310,000	µg/m³	ND (5.2)	ND (16)	ND (5.6)
Freon 114	310,000	µg/m³	ND (4.8) J	ND (15) J	ND (5.1) J
Hexachlorobutadiene	0.86	µg/m³	ND (1.4)	ND (4.6)	ND (1.6)
Isopropanol	11,000	µg/m³	ND (6.7)	ND (21)	ND (7.2)
Isopropylbenzene (cumene)	4,000	µg/m³	ND (3.3)	ND (10)	ND (3.6)
Methyl ethyl ketone	51,000	µg/m³	3.8	13	5.4
Methyl isobutyl ketone	31,000	µg/m³	ND (2.8)	ND (8.8)	ND (3)
Methyl tert-butyl ether	74	µg/m³	ND (2.4)	ND (7.8)	ND (2.6)

TABLE 3-30
Prescott Park Analytical Results - Soil Gas (September 2004)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		PP-E	PP-NW	PP-SW
	Sample Date		9/30/2004	9/30/2004	9/30/2004
Analyte	**Screening Level [1]**	**Units**	**Analytical Results**		
Volatile Organic Compounds					
Methylene chloride	41	µg/m³	ND (2.4)	ND (7.5)	ND (2.5)
n-Heptane	2,100	µg/m³	ND (2.8)	18	ND (3)
n-Propylbenzene	1,500	µg/m³	ND (3.3)	ND (10)	ND (3.6)
Styrene	11,000	µg/m³	ND (2.9)	ND (9.2)	ND (3.1)
Tetrachloroethene	3.2	µg/m³	**16**	**27**	ND (5)
Tetrahydrofuran	9.9	µg/m³	ND (2)	7.1	ND (2.2)
Toluene	4,000	µg/m³	2.9	9.1	2.8
Total hexanes	2,100	µg/m³	ND (2.4)	8.2	ND (2.6)
trans-1,2-Dichloroethene	730	µg/m³	ND (2.7)	ND (8.5)	ND (2.9)
trans-1,3-Dichloropropene	4.8	µg/m³	ND (3.1)	ND (9.8)	ND (3.3)
Trichloroethene	0.17	µg/m³	**1**	**1.4**	ND (0.16)
Vinyl acetate	2,100	µg/m³	ND (9.6)	ND (30)	ND (10)
Vinyl chloride	1.1	µg/m³	ND (0.035)	ND (0.11)	ND (0.037)
Xylenes, total	1,100	µg/m³	3.5	11	3.6

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-22 (Soil Gas Screening Levels) for source of screening levels.

µg/m³ micrograms per cubic meter

ND not detected above the laboratory's reporting limit shown in parentheses

TABLE 3-31
Residential Soil Gas Results Summary (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Backyard Soil Gas Levels	Screening Levels[(1)]
1,1,2,2-Tetrachloroethane	µg/m³	< 0.2 - < 0.52	0.33
Chloroform	µg/m³	1.1 - < 12	0.83
Tetrachloroethene	µg/m³	< 5 - 46	3.2

Notes:

Only compounds detected above screening levels are shown

[(1)] Screening levels for soil gas are calculated by multiplying ambient air PRGs by an attenuation factor of 10 (Attenuation factor for shallow soil gas is taken from EPA Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, November 2002, page 28).

µg/m³ micrograms per cubic meter

TABLE 3-32
326 Center Street Analytical Results - Soil Gas, Phase 2 (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		326SG
	Sample Date		5/12/2005
Analyte	**Screening Level** [1]	**Units**	**Analytical Results**
Volatile Organic Compounds			
1,1,1-Trichloroethane	23,000	µg/m³	ND (3.9)
1,1,2,2-Tetrachloroethane	0.33	µg/m³	ND (0.2)
1,1,2-Trichloroethane	1.2	µg/m³	ND (0.16)
1,1-Dichloroethane	12	µg/m³	ND (2.9)
1,1-Dichloroethene	2,100	µg/m³	ND (2.8)
1,2,4-Trichlorobenzene	37	µg/m³	ND (21)
1,2,4-Trimethylbenzene	62	µg/m³	ND (3.5)
1,2-Dibromoethane	0.034	µg/m³	ND (0.22)
1,2-Dichlorobenzene	2,100	µg/m³	ND (4.3)
1,2-Dichloroethane	0.74	µg/m³	ND (0.12)
1,2-Dichloropropane	0.99	µg/m³	ND (0.13)
1,3,5-Trimethylbenzene	62	µg/m³	ND (3.5)
1,3-Butadiene	0.11	µg/m³	ND (1.6)
1,3-Dichlorobenzene	1,100	µg/m³	ND (4.3)
1,4-Dichlorobenzene	3.1	µg/m³	ND (4.3)
1,4-Dioxane (p-dioxane)	6.1	µg/m³	ND (10)
2,2,4-Trimethylpentane	2,100	µg/m³	ND (3.4)
2-Hexanone	NE	µg/m³	ND (12)
3-Chloropropene	10	µg/m³	ND (9)
4-Ethyltoluene	1,100	µg/m³	ND (3.5)
Acetone	33,000	µg/m³	14
Benzene	2.5	µg/m³	ND (2.3) J
Benzyl chloride	0.4	µg/m³	ND (3.7)
Bromodichloromethane	1.1	µg/m³	ND (4.8)
Bromoform	17	µg/m³	ND (7.4)
Bromomethane	52	µg/m³	ND (2.8)
Carbon disulfide	7,300	µg/m³	3
Carbon tetrachloride	1.3	µg/m³	ND (0.18)
Chlorobenzene	620	µg/m³	ND (3.3)
Chloroethane	23	µg/m³	ND (1.9)
Chloroform	0.83	µg/m³	**1.8 J**
Chloromethane	950	µg/m³	ND (5.9)
cis-1,2-Dichloroethene	370	µg/m³	ND (2.8)
cis-1,3-Dichloropropene	4.8	µg/m³	ND (3.3)
Cyclohexane	62,000	µg/m³	ND (2.5)
Dibromochloromethane	0.8	µg/m³	ND (6.1)
Ethanol	18,000	µg/m³	ND (5.4)
Ethylbenzene	11,000	µg/m³	ND (3.1)
Freon 11	7,300	µg/m³	4.6
Freon 12	2,100	µg/m³	2.4 J
Freon 113	310,000	µg/m³	ND (5.5)
Freon 114	310,000	µg/m³	ND (5)
Hexachlorobutadiene	0.86	µg/m³	ND (1.5)
Isopropanol	11,000	µg/m³	6.4 J
Isopropylbenzene (cumene)	4,000	µg/m³	ND (3.5)
Methyl ethyl ketone	51,000	µg/m³	1.9 J
Methyl isobutyl ketone	31,000	µg/m³	ND (2.9)
Methyl tert-butyl ether	74	µg/m³	ND (2.6)

TABLE 3-32
326 Center Street Analytical Results - Soil Gas, Phase 2 (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		326SG
	Sample Date		5/12/2005
Analyte	**Screening Level** [1]	**Units**	**Analytical Results**
Volatile Organic Compounds			
Methylene chloride	41	µg/m³	ND (2.5)
Naphthalene	0.56	µg/m³	ND (5)
n-Heptane	2,100	µg/m³	ND (3)
n-Propylbenzene	1,500	µg/m³	ND (3.5)
Styrene	11,000	µg/m³	ND (3.1)
Tetrachloroethene	3.2	µg/m³	**46**
Tetrahydrofuran	9.9	µg/m³	1.5 J
Toluene	4,000	µg/m³	ND (2.7)
Total hexanes	2,100	µg/m³	ND (2.5)
trans-1,2-Dichloroethene	730	µg/m³	ND (2.8)
trans-1,3-Dichloropropene	4.8	µg/m³	ND (3.3)
Trichloroethene	0.17	µg/m³	ND (0.15)
Vinyl chloride	1.1	µg/m³	ND (0.037)
Xylenes, total	1,100	µg/m³	ND (3.1)

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-22 (Soil Gas Screening Levels) for source of screening levels.

µg/m³ micrograms per cubic meter

ND not detected above the laboratory's reporting limit shown in parentheses

J estimated value

TABLE 3-33
356 Center Street Analytical Results - Soil Gas, Phase 2 (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		356SG
	Sample Date		5/12/2005
Analyte	**Screening Level [1]**	**Units**	**Analytical Results**
Volatile Organic Compounds			
1,1,1-Trichloroethane	23,000	µg/m³	ND (14)
1,1,2,2-Tetrachloroethane	0.33	µg/m³	ND (0.52)
1,1,2-Trichloroethane	1.2	µg/m³	ND (0.42)
1,1-Dichloroethane	12	µg/m³	ND (10)
1,1-Dichloroethene	2,100	µg/m³	ND (9.9)
1,2,4-Trichlorobenzene	37	µg/m³	ND (74)
1,2,4-Trimethylbenzene	62	µg/m³	ND (12)
1,2-Dibromoethane	0.034	µg/m³	ND (0.59)
1,2-Dichlorobenzene	2,100	µg/m³	ND (15)
1,2-Dichloroethane	0.74	µg/m³	ND (0.31)
1,2-Dichloropropane	0.99	µg/m³	ND (0.35)
1,3,5-Trimethylbenzene	62	µg/m³	ND (12)
1,3-Butadiene	0.11	µg/m³	ND (5.5)
1,3-Dichlorobenzene	1,100	µg/m³	ND (15)
1,4-Dichlorobenzene	3.1	µg/m³	ND (15)
1,4-Dioxane (p-dioxane)	6.1	µg/m³	ND (36)
2,2,4-Trimethylpentane	2,100	µg/m³	ND (12)
2-Hexanone	NE	µg/m³	ND (41)
3-Chloropropene	10	µg/m³	ND (31)
4-Ethyltoluene	1,100	µg/m³	ND (12)
Acetone	33,000	µg/m³	74
Benzene	2.5	µg/m³	ND (8) J
Benzyl chloride	0.4	µg/m³	ND (13)
Bromodichloromethane	1.1	µg/m³	ND (17)
Bromoform	17	µg/m³	ND (26)
Bromomethane	52	µg/m³	ND (9.7)
Carbon disulfide	7,300	µg/m³	ND (7.8)
Carbon tetrachloride	1.3	µg/m³	0.51
Chlorobenzene	620	µg/m³	ND (11)
Chloroethane	23	µg/m³	ND (6.6)
Chloroform	0.83	µg/m³	ND (12)
Chloromethane	950	µg/m³	ND (20)
cis-1,2-Dichloroethene	370	µg/m³	ND (9.9)
cis-1,3-Dichloropropene	4.8	µg/m³	ND (11)
Cyclohexane	62,000	µg/m³	ND (8.6)
Dibromochloromethane	0.8	µg/m³	ND (21)
Ethanol	18,000	µg/m³	9.7 J
Ethylbenzene	11,000	µg/m³	ND (11)
Freon 11	7,300	µg/m³	ND (14)
Freon 12	2,100	µg/m³	ND (12)
Freon 113	310,000	µg/m³	ND (19)
Freon 114	310,000	µg/m³	ND (17)
Hexachlorobutadiene	0.86	µg/m³	ND (4.1)
Isopropanol	11,000	µg/m³	3.7 J
Isopropylbenzene (cumene)	4,000	µg/m³	ND (12)
Methyl ethyl ketone	51,000	µg/m³	14
Methyl isobutyl ketone	31,000	µg/m³	ND (10)
Methyl tert-butyl ether	74	µg/m³	ND (9)

TABLE 3-33
356 Center Street Analytical Results - Soil Gas, Phase 2 (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		356SG
	Sample Date		5/12/2005
Analyte	**Screening Level** [1]	**Units**	**Analytical Results**
Volatile Organic Compounds			
Methylene chloride	41	µg/m³	ND (8.6)
Naphthalene	0.56	µg/m³	ND (13)
n-Heptane	2,100	µg/m³	ND (10)
n-Propylbenzene	1,500	µg/m³	ND (12)
Styrene	11,000	µg/m³	ND (11)
Tetrachloroethene	3.2	µg/m³	ND (17)
Tetrahydrofuran	9.9	µg/m³	5 J
Toluene	4,000	µg/m³	ND (9.4)
Total hexanes	2,100	µg/m³	ND (8.8)
trans-1,2-Dichloroethene	730	µg/m³	ND (9.9)
trans-1,3-Dichloropropene	4.8	µg/m³	ND (11)
Trichloroethene	0.17	µg/m³	ND (0.41)
Vinyl chloride	1.1	µg/m³	ND (0.098)
Xylenes, total	1,100	µg/m³	ND (11)

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-22 (Soil Gas Screening Levels) for source of screening levels.

µg/m³ micrograms per cubic meter

ND not detected above the laboratory's reporting limit shown in parentheses

J estimated value

TABLE 3-34
360 Center Street Analytical Results - Soil Gas, Phase 2 (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		360SGa	360SGb	360SGc
	Sample Date		5/12/2005	5/12/2005	5/12/2005
Analyte	**Screening Level [1]**	**Units**	**Analytical Results**		
Volatile Organic Compounds					
1,1,1-Trichloroethane	23,000	µg/m³	ND (4.2)	ND (4.5)	ND (4.1)
1,1,2,2-Tetrachloroethane	0.33	µg/m³	**0.34**	ND (0.22)	ND (0.2)
1,1,2-Trichloroethane	1.2	µg/m³	ND (0.17)	ND (0.18)	ND (0.16)
1,1-Dichloroethane	12	µg/m³	ND (3.1)	ND (3.3)	ND (3)
1,1-Dichloroethene	2,100	µg/m³	ND (3.1)	ND (3.2)	ND (3)
1,2,4-Trichlorobenzene	37	µg/m³	ND (23)	ND (24)	ND (22)
1,2,4-Trimethylbenzene	62	µg/m³	ND (3.8)	ND (4)	ND (3.7)
1,2-Dibromoethane	0.034	µg/m³	ND (0.24)	ND (0.25)	ND (0.23)
1,2-Dichlorobenzene	2,100	µg/m³	ND (4.6)	ND (4.9)	ND (4.5)
1,2-Dichloroethane	0.74	µg/m³	ND (0.12)	ND (0.13)	ND (0.12)
1,2-Dichloropropane	0.99	µg/m³	ND (0.14)	ND (0.15)	ND (0.14)
1,3,5-Trimethylbenzene	62	µg/m³	ND (3.8)	ND (4)	ND (3.7)
1,3-Butadiene	0.11	µg/m³	ND (1.7)	ND (1.8)	ND (1.6)
1,3-Dichlorobenzene	1,100	µg/m³	ND (4.6)	ND (4.9)	ND (4.5)
1,4-Dichlorobenzene	3.1	µg/m³	ND (4.6)	ND (4.9)	ND (4.5)
1,4-Dioxane (p-dioxane)	6.1	µg/m³	ND (11)	ND (12)	ND (11)
2,2,4-Trimethylpentane	2,100	µg/m³	ND (3.6)	ND (3.8)	ND (3.5)
2-Hexanone	NE	µg/m³	ND (13)	ND (13)	ND (12)
3-Chloropropene	10	µg/m³	ND (9.7)	ND (10)	ND (9.3)
4-Ethyltoluene	1,100	µg/m³	ND (3.8)	ND (4)	ND (3.7)
Acetone	33,000	µg/m³	12	8.8	19
Benzene	2.5	µg/m³	1.6 J	ND (2.6) J	ND (2.4) J
Benzyl chloride	0.4	µg/m³	ND (4)	ND (4.2)	ND (3.8)
Bromodichloromethane	1.1	µg/m³	ND (5.2)	ND (5.5)	ND (5)
Bromoform	17	µg/m³	ND (8)	ND (8.5)	ND (7.7)
Bromomethane	52	µg/m³	ND (3)	ND (3.2)	ND (2.9)
Carbon disulfide	7,300	µg/m³	14	ND (2.6)	0.67 J
Carbon tetrachloride	1.3	µg/m³	0.22	ND (0.21)	ND (0.19)
Chlorobenzene	620	µg/m³	ND (3.6)	ND (3.8)	ND (3.4)
Chloroethane	23	µg/m³	ND (2)	ND (2.2)	ND (2)
Chloroform	0.83	µg/m³	**1.1 J**	**1.2 J**	**1.4 J**
Chloromethane	950	µg/m³	ND (6.4)	ND (6.8)	ND (6.2)
cis-1,2-Dichloroethene	370	µg/m³	ND (3.1)	ND (3.2)	ND (3)
cis-1,3-Dichloropropene	4.8	µg/m³	ND (3.5)	ND (3.7)	ND (3.4)
Cyclohexane	62,000	µg/m³	ND (2.7)	ND (2.8)	ND (2.6)
Dibromochloromethane	0.8	µg/m³	ND (6.6)	ND (7)	ND (6.3)
Ethanol	18,000	µg/m³	2.7 J	2 J	4.1 J
Ethylbenzene	11,000	µg/m³	ND (3.4)	ND (3.6)	ND (3.2)
Freon 11	7,300	µg/m³	1.8 J	2.5 J	2.4 J
Freon 12	2,100	µg/m³	2.5 J	2.3 J	2.3 J
Freon 113	310,000	µg/m³	ND (5.9)	ND (6.3)	ND (5.7)
Freon 114	310,000	µg/m³	ND (5.4)	ND (5.7)	ND (5.2)
Hexachlorobutadiene	0.86	µg/m³	ND (1.6)	ND (1.7)	ND (1.6)
Isopropanol	11,000	µg/m³	0.98 J	ND (8.1)	1.1 J
Isopropylbenzene (cumene)	4,000	µg/m³	ND (3.8)	ND (4)	ND (3.7)
Methyl ethyl ketone	51,000	µg/m³	3.8	ND (2.4)	4.1
Methyl isobutyl ketone	31,000	µg/m³	ND (3.2)	ND (3.4)	ND (3)
Methyl tert-butyl ether	74	µg/m³	ND (2.8)	ND (3)	ND (2.7)

TABLE 3-34
360 Center Street Analytical Results - Soil Gas, Phase 2 (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		360SGa	360SGb	360SGc
	Sample Date		5/12/2005	5/12/2005	5/12/2005
Analyte	**Screening Level** [1]	**Units**	**Analytical Results**		
Volatile Organic Compounds					
Methylene chloride	41	µg/m³	ND (2.7)	ND (2.8)	ND (2.6)
Naphthalene	0.56	µg/m³	ND (5.2)	ND (5.4)	ND (4.9)
n-Heptane	2,100	µg/m³	ND (3.2)	ND (3.4)	ND (3)
n-Propylbenzene	1,500	µg/m³	ND (3.8)	ND (4)	ND (3.7)
Styrene	11,000	µg/m³	ND (3.3)	ND (3.5)	ND (3.2)
Tetrachloroethene	3.2	µg/m³	ND (5.2)	ND (5.6)	ND (5)
Tetrahydrofuran	9.9	µg/m³	1.6 J	1.8 J	1.5 J
Toluene	4,000	µg/m³	ND (2.9)	ND (3.1)	3.2
Total hexanes	2,100	µg/m³	0.98 J	ND (2.9)	ND (2.6)
trans-1,2-Dichloroethene	730	µg/m³	ND (3.1)	ND (3.2)	ND (3)
trans-1,3-Dichloropropene	4.8	µg/m³	ND (3.5)	ND (3.7)	ND (3.4)
Trichloroethene	0.17	µg/m³	ND (0.17)	ND (0.18)	ND (0.16)
Vinyl chloride	1.1	µg/m³	ND (0.04)	ND (0.042)	ND (0.038)
Xylenes, total	1,100	µg/m³	ND (3.4)	ND (3.6)	ND (3.2)

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-22 (Soil Gas Screening Levels) for source of screening levels.

µg/m³ micrograms per cubic meter

ND not detected above the laboratory's reporting limit shown in parentheses

J estimated value

TABLE 3-35
Prescott Park Analytical Results - Soil Gas (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		PP-E	PP-E (FD)	PP-SW
	Sample Date		5/13/2005	5/13/2005	5/13/2005
Analyte	**Screening Level [1]**	**Units**	**Analytical Results**		
Volatile Organic Compounds					
1,1,1-Trichloroethane	23,000	µg/m³	ND (3.6)	ND (4.2)	ND (8.1)
1,1,2,2-Tetrachloroethane	0.33	µg/m³	ND (0.18) J	ND (0.31)	ND (0.41)
1,1,2-Trichloroethane	1.2	µg/m³	ND (0.15)	ND (0.24)	ND (0.32)
1,1-Dichloroethane	12	µg/m³	ND (2.7)	ND (3.1)	ND (6)
1,1-Dichloroethene	2,100	µg/m³	ND (2.6)	ND (3.1)	ND (5.9)
1,2,4-Trichlorobenzene	37	µg/m³	ND (20)	ND (23)	ND (44)
1,2,4-Trimethylbenzene	62	µg/m³	ND (3.3)	ND (3.8)	3.2 J
1,2-Dibromoethane	0.034	µg/m³	ND (0.2)	ND (0.34)	ND (0.46)
1,2-Dichlorobenzene	2,100	µg/m³	ND (4)	ND (4.6)	ND (9)
1,2-Dichloroethane	0.74	µg/m³	ND (0.11)	ND (0.18)	ND (0.24)
1,2-Dichloropropane	0.99	µg/m³	ND (0.12)	ND (0.21)	ND (0.28)
1,3,5-Trimethylbenzene	62	µg/m³	ND (3.3)	ND (3.8)	ND (7.3)
1,3-Butadiene	0.11	µg/m³	**1.7**	**1.2 J**	ND (3.3)
1,3-Dichlorobenzene	1,100	µg/m³	ND (4)	ND (4.6)	ND (9)
1,4-Dichlorobenzene	3.1	µg/m³	ND (4)	ND (4.6)	ND (9)
1,4-Dioxane (p-dioxane)	6.1	µg/m³	ND (9.6)	ND (11)	ND (21)
2,2,4-Trimethylpentane	2,100	µg/m³	ND (3.1)	ND (3.6)	4.3 J
2-Hexanone	NE	µg/m³	ND (11)	ND (13)	ND (24)
3-Chloropropene	10	µg/m³	ND (8.4)	ND (9.7)	ND (19)
4-Ethyltoluene	1,100	µg/m³	ND (3.3)	ND (3.8)	ND (7.3)
Acetone	33,000	µg/m³	ND (13) J	ND (9.1) J	53
Benzene	2.5	µg/m³	1.7 J	ND (2.5)	**14**
Benzyl chloride	0.4	µg/m³	ND (3.5)	ND (4)	ND (7.7)
Bromodichloromethane	1.1	µg/m³	ND (4.5)	ND (5.2)	ND (10)
Bromoform	17	µg/m³	ND (6.9)	ND (8)	ND (15)
Bromomethane	52	µg/m³	ND (2.6)	ND (3)	ND (5.8)
Carbon disulfide	7,300	µg/m³	4.1	2.2 J	32
Carbon tetrachloride	1.3	µg/m³	0.056 J	0.064 J	ND (0.38) J
Chlorobenzene	620	µg/m³	ND (3.1)	ND (3.6)	ND (6.8)
Chloroethane	23	µg/m³	ND (1.8)	ND (2)	ND (3.9)
Chloroform	0.83	µg/m³	**23**	**22**	ND (7.3)
Chloromethane	950	µg/m³	ND (5.5)	ND (6.4)	ND (12)
cis-1,2-Dichloroethene	370	µg/m³	ND (2.6)	ND (3.1)	20
cis-1,3-Dichloropropene	4.8	µg/m³	ND (3)	ND (3.5)	ND (6.8)
Cyclohexane	62,000	µg/m³	ND (2.3)	ND (2.7)	52
Dibromochloromethane	0.8	µg/m³	ND (5.7)	ND (6.6)	ND (13)
Ethanol	18,000	µg/m³	ND (5)	ND (5.8)	6.1 J
Ethylbenzene	11,000	µg/m³	ND (2.9)	ND (3.4)	ND (6.5)
Freon 11	7,300	µg/m³	6	5.9	ND (8.4)
Freon 12	2,100	µg/m³	2.2 J	2.3 J	ND (7.4)
Freon 113	310,000	µg/m³	ND (5.1)	ND (5.9)	ND (11)
Freon 114	310,000	µg/m³	ND (4.7)	ND (5.4)	ND (10)
Hexachlorobutadiene	0.86	µg/m³	ND (1.4) J	ND (2.4) J	ND (3.2) J
Isopropanol	11,000	µg/m³	1.2 J	2.2 J	3.8 J
Isopropylbenzene (cumene)	4,000	µg/m³	ND (3.3)	ND (3.8)	ND (7.3)
Methyl ethyl ketone	51,000	µg/m³	4.2	2.9	14
Methyl isobutyl ketone	31,000	µg/m³	ND (2.7)	ND (3.2)	ND (6.1)
Methyl tert-butyl ether	74	µg/m³	ND (2.4)	ND (2.8)	ND (5.4)

TABLE 3-35
Prescott Park Analytical Results - Soil Gas (May 2005)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		PP-E	PP-E (FD)	PP-SW
	Sample Date		5/13/2005	5/13/2005	5/13/2005
Analyte	**Screening Level** [1]	**Units**	**Analytical Results**		
Volatile Organic Compounds					
Methylene chloride	41	µg/m³	ND (2.3)	ND (2.7)	ND (5.2)
Naphthalene	0.56	µg/m³	ND (3.5)	ND (4.1)	ND (12) J
n-Heptane	2,100	µg/m³	ND (2.7)	ND (3.2)	20
n-Propylbenzene	1,500	µg/m³	ND (3.3)	ND (3.8)	ND (7.3)
Styrene	11,000	µg/m³	ND (2.8)	ND (3.3)	ND (6.3)
Tetrachloroethene	3.2	µg/m³	**12**	**11**	ND (10)
Tetrahydrofuran	9.9	µg/m³	1.4 J	1.4 J	3.4 J
Toluene	4,000	µg/m³	1.4 J	1.5 J	5.6
Total hexanes	2,100	µg/m³	0.88 J	0.83 J	25
trans-1,2-Dichloroethene	730	µg/m³	ND (2.6)	ND (3.1)	ND (5.9)
trans-1,3-Dichloropropene	4.8	µg/m³	ND (3)	ND (3.5)	ND (6.8)
Trichloroethene	0.17	µg/m³	**0.32**	**0.47**	ND (0.32) J
Vinyl chloride	1.1	µg/m³	ND (0.034)	ND (0.057)	0.52
Xylenes, total	1,100	µg/m³	ND (2.9)	ND (3.4)	ND (6.5)

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-22 (Soil Gas Screening Levels) for source of screening levels.

µg/m³ micrograms per cubic meter
FD field duplicate
ND not detected above the laboratory's reporting limit shown in parentheses
J estimated value

TABLE 3-36
Residential Soil Gas Results Summary (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Backyard Soil Gas Levels	Screening Levels[(1)]
Chloroform	µg/m³	< 0.64 - 9	0.83
Tetrachloroethene	µg/m³	0.84 - 42	3.2
Trichloroethene	µg/m³	0.041 - 98	0.17

Notes:

Only compounds detected above screening levels are shown

(1) Screening levels for soil gas are calculated by multiplying ambient air PRGs by an attenuation factor of 10 (Attenuation factor for shallow soil gas is taken from EPA Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils, November 2002, page 28).

µg/m³ micrograms per cubic meter

TABLE 3-37
1428 3rd Street Analytical Results - Soil Gas (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		1428SG
	Sample Date		11/7/2006
Analyte	**Screening Level [1]**	**Units**	**Analytical Results**
Volatile Organic Compounds			
1,1,1-Trichloroethane	23,000	µg/m³	12
1,1,2,2-Tetrachloroethane	0.33	µg/m³	ND (0.22)
1,1,2-Trichloroethane	1.2	µg/m³	ND (0.18)
1,1-Dichloroethane	12	µg/m³	4.9
1,1-Dichloroethene	2,100	µg/m³	ND (0.64)
1,2,4-Trichlorobenzene	37	µg/m³	ND (6)
1,2,4-Trimethylbenzene	62	µg/m³	ND (0.79)
1,2-Dibromoethane	0.034	µg/m³	ND (1.2)
1,2-Dichlorobenzene	2,100	µg/m³	ND (0.97)
1,2-Dichloroethane	0.74	µg/m³	ND (0.13)
1,2-Dichloropropane	0.99	µg/m³	ND (0.74)
1,3,5-Trimethylbenzene	62	µg/m³	ND (0.79)
1,3-Dichlorobenzene	1,100	µg/m³	ND (0.97)
1,4-Dichlorobenzene	3.1	µg/m³	ND (0.97)
1,4-Dioxane (p-dioxane)	6.1	µg/m³	ND (0.58)
Benzene	2.5	µg/m³	0.46 J
Bromomethane	52	µg/m³	ND (0.62)
Carbon tetrachloride	1.3	µg/m³	ND (1)
Chlorobenzene	620	µg/m³	ND (0.74)
Chloroethane	23	µg/m³	ND (0.42)
Chloroform	0.83	µg/m³	**9**
Chloromethane	950	µg/m³	ND (0.33)
cis-1,2-Dichloroethene	370	µg/m³	4.4
cis-1,3-Dichloropropene	4.8	µg/m³	ND (0.73)
Ethylbenzene	11,000	µg/m³	ND (0.14)
Freon 11	7,300	µg/m³	3.3
Freon 12	2,100	µg/m³	1.5
Freon 113	310,000	µg/m³	ND (1.2)
Freon 134a	310,000	µg/m³	29
Hexachlorobutadiene	0.86	µg/m³	ND (8.6)
Methyl tert-butyl ether	74	µg/m³	ND (0.58)
Methylene chloride	41	µg/m³	ND (1.1)
Naphthalene	0.56	µg/m³	ND (4.2)
Styrene	11,000	µg/m³	ND (0.68)
Tetrachloroethene	3.2	µg/m³	**42**
Toluene	4,000	µg/m³	0.39 J
trans-1,2-Dichloroethene	730	µg/m³	3.1
trans-1,3-Dichloropropene	4.8	µg/m³	ND (0.73)
Trichloroethene	0.17	µg/m³	**98**
Vinyl chloride	1.1	µg/m³	ND (0.041)
Xylenes, total	1,100	µg/m³	ND (0.7)

Notes:
Results greater than the screening level are bolded.
[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-22 (Soil Gas Screening Levels) for source of screening levels.
µg/m³ micrograms per cubic meter
ND not detected above the laboratory's reporting limit shown in parentheses
J estimated value

TABLE 3-38
1432 3rd Street Analytical Results - Soil Gas (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		1432SGa	1432SGb
	Sample Date		11/7/2006	11/7/2006
Analyte	**Screening Level [1]**	**Units**	**Analytical Results**	
Volatile Organic Compounds				
1,1,1-Trichloroethane	23,000	µg/m³	0.26 J	0.49 J
1,1,2,2-Tetrachloroethane	0.33	µg/m³	ND (0.18)	ND (0.18)
1,1,2-Trichloroethane	1.2	µg/m³	ND (0.14)	ND (0.15)
1,1-Dichloroethane	12	µg/m³	ND (0.11)	ND (0.11)
1,1-Dichloroethene	2,100	µg/m³	ND (0.52)	ND (0.53)
1,2,4-Trichlorobenzene	37	µg/m³	ND (4.9)	ND (5)
1,2,4-Trimethylbenzene	62	µg/m³	ND (0.65)	ND (0.66)
1,2-Dibromoethane	0.034	µg/m³	ND (1)	ND (1)
1,2-Dichlorobenzene	2,100	µg/m³	ND (0.79)	ND (0.8)
1,2-Dichloroethane	0.74	µg/m³	ND (0.11)	ND (0.11)
1,2-Dichloropropane	0.99	µg/m³	ND (0.61)	ND (0.62)
1,3,5-Trimethylbenzene	62	µg/m³	ND (0.65)	ND (0.66)
1,3-Dichlorobenzene	1,100	µg/m³	ND (0.79)	ND (0.8)
1,4-Dichlorobenzene	3.1	µg/m³	ND (0.79)	ND (0.8)
1,4-Dioxane (p-dioxane)	6.1	µg/m³	ND (0.48)	ND (0.48)
Benzene	2.5	µg/m³	0.6 J	0.59 J
Bromomethane	52	µg/m³	ND (0.51)	ND (0.52) J
Carbon tetrachloride	1.3	µg/m³	ND (0.83)	ND (0.84)
Chlorobenzene	620	µg/m³	ND (0.61)	ND (0.62)
Chloroethane	23	µg/m³	ND (0.35)	ND (0.35)
Chloroform	0.83	µg/m³	**1.4**	**1.6**
Chloromethane	950	µg/m³	0.8	ND (0.28)
cis-1,2-Dichloroethene	370	µg/m³	ND (0.1)	ND (0.11)
cis-1,3-Dichloropropene	4.8	µg/m³	ND (0.6)	ND (0.61)
Ethylbenzene	11,000	µg/m³	0.27	0.12
Freon 11	7,300	µg/m³	3.6	3.6
Freon 12	2,100	µg/m³	2.2	2
Freon 113	310,000	µg/m³	ND (1)	0.88 J
Freon 134a	310,000	µg/m³	6.9	23
Hexachlorobutadiene	0.86	µg/m³	ND (7)	ND (7.1)
Methyl tert-butyl ether	74	µg/m³	ND (0.48)	ND (0.48)
Methylene chloride	41	µg/m³	ND (0.92)	ND (0.93)
Naphthalene	0.56	µg/m³	ND (3.4)	ND (3.5)
Styrene	11,000	µg/m³	ND (0.56)	ND (0.57)
Tetrachloroethene	3.2	µg/m³	2.9	**11**
Toluene	4,000	µg/m³	1.9	0.8
trans-1,2-Dichloroethene	730	µg/m³	ND (0.52)	ND (0.53)
trans-1,3-Dichloropropene	4.8	µg/m³	ND (0.6)	ND (0.61)
Trichloroethene	0.17	µg/m³	ND (0.14)	ND (0.14)
Vinyl chloride	1.1	µg/m³	0.014 J	ND (0.034)
Xylenes, total	1,100	µg/m³	1.16 J	0.3 J

Notes:
Results greater than the screening level are bolded.
[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-22 (Soil Gas Screening Levels) for source of screening levels.
µg/m³ micrograms per cubic meter
ND not detected above the laboratory's reporting limit shown in parentheses
J estimated value

TABLE 3-39
1436 3rd Street Analytical Results - Soil Gas (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		1436SG
	Sample Date		11/7/2006
Analyte	**Screening Level [1]**	**Units**	**Analytical Results**
Volatile Organic Compounds			
1,1,1-Trichloroethane	23,000	µg/m³	ND (0.92)
1,1,2,2-Tetrachloroethane	0.33	µg/m³	ND (0.23)
1,1,2-Trichloroethane	1.2	µg/m³	ND (0.18)
1,1-Dichloroethane	12	µg/m³	ND (0.14)
1,1-Dichloroethene	2,100	µg/m³	ND (0.67)
1,2,4-Trichlorobenzene	37	µg/m³	ND (6.2)
1,2,4-Trimethylbenzene	62	µg/m³	ND (0.82)
1,2-Dibromoethane	0.034	µg/m³	ND (1.3)
1,2-Dichlorobenzene	2,100	µg/m³	ND (1)
1,2-Dichloroethane	0.74	µg/m³	ND (0.14)
1,2-Dichloropropane	0.99	µg/m³	ND (0.78)
1,3,5-Trimethylbenzene	62	µg/m³	ND (0.82)
1,3-Dichlorobenzene	1,100	µg/m³	ND (1)
1,4-Dichlorobenzene	3.1	µg/m³	ND (1)
1,4-Dioxane (p-dioxane)	6.1	µg/m³	ND (0.6)
Benzene	2.5	µg/m³	1.1 J
Bromomethane	52	µg/m³	ND (0.65) J
Carbon tetrachloride	1.3	µg/m³	ND (1)
Chlorobenzene	620	µg/m³	ND (0.77)
Chloroethane	23	µg/m³	ND (0.44)
Chloroform	0.83	µg/m³	**1.6**
Chloromethane	950	µg/m³	ND (0.35)
cis-1,2-Dichloroethene	370	µg/m³	ND (0.13)
cis-1,3-Dichloropropene	4.8	µg/m³	ND (0.76)
Ethylbenzene	11,000	µg/m³	0.17
Freon 11	7,300	µg/m³	3.5
Freon 12	2,100	µg/m³	3.2
Freon 113	310,000	µg/m³	ND (1.3)
Freon 134a	310,000	µg/m³	350 J
Hexachlorobutadiene	0.86	µg/m³	ND (9)
Methyl tert-butyl ether	74	µg/m³	ND (0.6)
Methylene chloride	41	µg/m³	ND (1.2)
Naphthalene	0.56	µg/m³	ND (4.4)
Styrene	11,000	µg/m³	ND (0.72)
Tetrachloroethene	3.2	µg/m³	1.4
Toluene	4,000	µg/m³	1.1
trans-1,2-Dichloroethene	730	µg/m³	ND (0.67)
trans-1,3-Dichloropropene	4.8	µg/m³	ND (0.76)
Trichloroethene	0.17	µg/m³	ND (0.18)
Vinyl chloride	1.1	µg/m³	ND (0.043)
Xylenes, total	1,100	µg/m³	0.22 J

Notes:
Results greater than the screening level are bolded.
[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-22 (Soil Gas Screening Levels) for source of screening levels.

µg/m³	micrograms per cubic meter
ND	not detected above the laboratory's reporting limit shown in parentheses
J	estimated value

TABLE 3-40
356 Center Street Analytical Results - Soil Gas (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		356SG
	Sample Date		11/7/2006
Analyte	**Screening Level [1]**	**Units**	**Analytical Results**
Volatile Organic Compounds			
1,1,1-Trichloroethane	23,000	µg/m³	ND (0.83)
1,1,2,2-Tetrachloroethane	0.33	µg/m³	ND (0.21)
1,1,2-Trichloroethane	1.2	µg/m³	ND (0.16)
1,1-Dichloroethane	12	µg/m³	0.018 J
1,1-Dichloroethene	2,100	µg/m³	ND (0.6)
1,2,4-Trichlorobenzene	37	µg/m³	ND (5.6)
1,2,4-Trimethylbenzene	62	µg/m³	ND (0.75)
1,2-Dibromoethane	0.034	µg/m³	ND (1.2)
1,2-Dichlorobenzene	2,100	µg/m³	ND (0.91)
1,2-Dichloroethane	0.74	µg/m³	ND (0.12)
1,2-Dichloropropane	0.99	µg/m³	ND (0.7)
1,3,5-Trimethylbenzene	62	µg/m³	ND (0.75)
1,3-Dichlorobenzene	1,100	µg/m³	ND (0.91)
1,4-Dichlorobenzene	3.1	µg/m³	ND (0.91)
1,4-Dioxane (p-dioxane)	6.1	µg/m³	ND (0.55)
Benzene	2.5	µg/m³	0.95
Bromomethane	52	µg/m³	ND (0.59)
Carbon tetrachloride	1.3	µg/m³	ND (0.96)
Chlorobenzene	620	µg/m³	ND (0.7)
Chloroethane	23	µg/m³	ND (0.4)
Chloroform	0.83	µg/m³	**1.2**
Chloromethane	950	µg/m³	ND (0.31)
cis-1,2-Dichloroethene	370	µg/m³	ND (0.12)
cis-1,3-Dichloropropene	4.8	µg/m³	ND (0.69)
Ethylbenzene	11,000	µg/m³	ND (0.13)
Freon 11	7,300	µg/m³	4.8
Freon 12	2,100	µg/m³	1.7
Freon 113	310,000	µg/m³	ND (1.2)
Freon 134a	310,000	µg/m³	7.5
Hexachlorobutadiene	0.86	µg/m³	ND (8.1)
Methyl tert-butyl ether	74	µg/m³	ND (0.55)
Methylene chloride	41	µg/m³	ND (1)
Naphthalene	0.56	µg/m³	ND (4)
Styrene	11,000	µg/m³	ND (0.65)
Tetrachloroethene	3.2	µg/m³	**3.3**
Toluene	4,000	µg/m³	0.8
trans-1,2-Dichloroethene	730	µg/m³	ND (0.6)
trans-1,3-Dichloropropene	4.8	µg/m³	ND (0.69)
Trichloroethene	0.17	µg/m³	ND (0.16)
Vinyl chloride	1.1	µg/m³	ND (0.039)
Xylenes, total	1,100	µg/m³	ND (0.66)

Notes:
Results greater than the screening level are bolded.
[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-22 (Soil Gas Screening Levels) for source of screening levels.

µg/m³	micrograms per cubic meter
ND	not detected above the laboratory's reporting limit shown in parentheses
J	estimated value

TABLE 3-41
360 Center Street Analytical Results - Soil Gas (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		360SGa	360SGb	360SGb (FD)	360SGc
	Sample Date		11/7/2006	11/7/2006	11/7/2006	11/7/2006
Analyte	**Screening Level [1]**	**Units**	**Analytical Results**			
Volatile Organic Compounds						
1,1,1-Trichloroethane	23,000	µg/m³	ND (1.8)	ND (0.74)	ND (0.86)	ND (0.72)
1,1,2,2-Tetrachloroethane	0.33	µg/m³	ND (0.46)	ND (0.19)	ND (0.22)	ND (0.18)
1,1,2-Trichloroethane	1.2	µg/m³	ND (0.37)	ND (0.15)	ND (0.17)	ND (0.14)
1,1-Dichloroethane	12	µg/m³	ND (0.27)	ND (0.11)	ND (0.13)	ND (0.11)
1,1-Dichloroethene	2,100	µg/m³	ND (1.3)	ND (0.54)	ND (0.63)	ND (0.52)
1,2,4-Trichlorobenzene	37	µg/m³	ND (12)	ND (5)	ND (5.9)	ND (4.9)
1,2,4-Trimethylbenzene	62	µg/m³	ND (1.7)	ND (0.67)	ND (0.78)	0.77
1,2-Dibromoethane	0.034	µg/m³	ND (2.6)	ND (1)	ND (1.2)	ND (1)
1,2-Dichlorobenzene	2,100	µg/m³	0.71 J	ND (0.82)	ND (0.95)	ND (0.79)
1,2-Dichloroethane	0.74	µg/m³	ND (0.27)	ND (0.11)	ND (0.13)	0.06 J
1,2-Dichloropropane	0.99	µg/m³	ND (1.6)	ND (0.63)	ND (0.73)	ND (0.61)
1,3,5-Trimethylbenzene	62	µg/m³	ND (1.7)	ND (0.67)	ND (0.78)	0.32 J
1,3-Dichlorobenzene	1,100	µg/m³	ND (2)	ND (0.82)	ND (0.95)	ND (0.79)
1,4-Dichlorobenzene	3.1	µg/m³	ND (2)	ND (0.82)	ND (0.95)	0.32 J
1,4-Dioxane (p-dioxane)	6.1	µg/m³	ND (1.2)	ND (0.49)	ND (0.57)	ND (0.48)
Benzene	2.5	µg/m³	1.9 J	0.56 J	0.61 J	1.5 J
Bromomethane	52	µg/m³	ND (1.3)	ND (0.53)	ND (0.61)	ND (0.51)
Carbon tetrachloride	1.3	µg/m³	ND (2.1)	ND (0.86)	ND (0.99)	0.27 J
Chlorobenzene	620	µg/m³	ND (1.6)	ND (0.63)	ND (0.73)	ND (0.61)
Chloroethane	23	µg/m³	ND (0.89)	ND (0.36)	ND (0.42)	ND (0.35)
Chloroform	0.83	µg/m³	**2**	**3.6**	**3.9**	ND (0.64)
Chloromethane	950	µg/m³	ND (0.7)	ND (0.28)	ND (0.33)	0.48
cis-1,2-Dichloroethene	370	µg/m³	ND (0.27)	ND (0.11)	ND (0.12)	ND (0.1)
cis-1,3-Dichloropropene	4.8	µg/m³	ND (1.5) J	ND (0.62) J	ND (0.72) J	ND (0.6) J
Ethylbenzene	11,000	µg/m³	0.43	ND (0.12)	ND (0.14)	1.1
Freon 11	7,300	µg/m³	4.3	3.1	3.2	2.5
Freon 12	2,100	µg/m³	3.2 J	1.4 J	1.5 J	2
Freon 113	310,000	µg/m³	ND (2.6)	ND (1)	ND (1.2)	ND (1)
Freon 134a	310,000	µg/m³	4,400 J	1,100 J	1,300 J	15 J
Hexachlorobutadiene	0.86	µg/m³	ND (18)	ND (7.2)	ND (8.4)	ND (7)
Methyl tert-butyl ether	74	µg/m³	ND (1.2)	ND (0.49)	ND (0.57)	ND (0.48)
Methylene chloride	41	µg/m³	ND (2.3)	ND (0.94)	ND (1.1)	ND (0.92)
Naphthalene	0.56	µg/m³	ND (8.8)	ND (3.6)	ND (4.1)	ND (3.4)
Styrene	11,000	µg/m³	ND (1.4)	0.77	ND (0.67)	ND (0.56)
Tetrachloroethene	3.2	µg/m³	1.3	1.7	1.7	0.84
Toluene	4,000	µg/m³	2.6	0.58	0.63	3.2
trans-1,2-Dichloroethene	730	µg/m³	ND (1.3)	ND (0.54)	ND (0.63)	0.09 J
trans-1,3-Dichloropropene	4.8	µg/m³	ND (1.5)	ND (0.62)	ND (0.72)	ND (0.6)
Trichloroethene	0.17	µg/m³	ND (0.36)	ND (0.15)	ND (0.17)	0.041 J
Vinyl chloride	1.1	µg/m³	ND (0.086)	ND (0.035)	ND (0.04)	ND (0.034)
Xylenes, total	1,100	µg/m³	0.95 J	ND (0.59)	ND (0.69)	2.69

TABLE 3-41
360 Center Street Analytical Results - Soil Gas (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-22 (Soil Gas Screening Levels) for source of screening levels.

µg/m³	micrograms per cubic meter
FD	field duplicate
ND	not detected above the laboratory's reporting limit shown in parentheses
J	estimated value

TABLE 3-42
Prescott Park Analytical Results - Soil Gas, (November 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Sample Location		PP-E	PP-NW
	Sample Date		11/7/2006	11/7/2006
Analyte	**Screening Level [1]**	**Units**	**Analytical Results**	
Volatile Organic Compounds				
1,1,1-Trichloroethane	23,000	µg/m³	ND (1.9)	ND (0.54)
1,1,2,2-Tetrachloroethane	0.33	µg/m³	ND (0.48)	ND (0.14)
1,1,2-Trichloroethane	1.2	µg/m³	ND (0.38)	ND (0.11)
1,1-Dichloroethane	12	µg/m³	0.076 J	0.032 J
1,1-Dichloroethene	2,100	µg/m³	ND (1.4)	ND (0.4)
1,2,4-Trichlorobenzene	37	µg/m³	ND (13)	ND (3.7)
1,2,4-Trimethylbenzene	62	µg/m³	ND (1.7)	ND (0.49)
1,2-Dibromoethane	0.034	µg/m³	ND (2.7)	ND (0.77)
1,2-Dichlorobenzene	2,100	µg/m³	ND (2.1)	ND (0.6)
1,2-Dichloroethane	0.74	µg/m³	ND (0.28)	0.017 J
1,2-Dichloropropane	0.99	µg/m³	ND (1.6)	ND (0.46)
1,3,5-Trimethylbenzene	62	µg/m³	0.27 J	0.11 J
1,3-Dichlorobenzene	1,100	µg/m³	ND (2.1)	ND (0.6)
1,4-Dichlorobenzene	3.1	µg/m³	ND (2.1)	ND (0.6)
1,4-Dioxane (p-dioxane)	6.1	µg/m³	ND (1.3)	ND (0.36)
Benzene	2.5	µg/m³	1.4 J	1.7 J
Bromomethane	52	µg/m³	ND (1.4)	ND (0.39)
Carbon tetrachloride	1.3	µg/m³	ND (2.2)	ND (0.63)
Chlorobenzene	620	µg/m³	ND (1.6)	ND (0.46)
Chloroethane	23	µg/m³	ND (0.92)	ND (0.26)
Chloroform	0.83	µg/m³	**61**	ND (0.49)
Chloromethane	950	µg/m³	0.79	ND (0.21)
cis-1,2-Dichloroethene	370	µg/m³	ND (0.28)	ND (0.079)
cis-1,3-Dichloropropene	4.8	µg/m³	ND (1.6) J	ND (0.45) J
Ethylbenzene	11,000	µg/m³	0.58	0.31
Freon 11	7,300	µg/m³	4.4	ND (0.56)
Freon 12	2,100	µg/m³	2.2	ND (0.49)
Freon 113	310,000	µg/m³	ND (2.7)	ND (0.77)
Freon 134a	310,000	µg/m³	61 J	460 J
Hexachlorobutadiene	0.86	µg/m³	ND (19)	ND (5.3)
Methyl tert-butyl ether	74	µg/m³	ND (1.3)	ND (0.36)
Methylene chloride	41	µg/m³	5.8	ND (0.69)
Naphthalene	0.56	µg/m³	ND (9.2)	ND (2.6)
Styrene	11,000	µg/m³	ND (1.5)	0.14 J
Tetrachloroethene	3.2	µg/m³	**7.6**	ND (0.14)
Toluene	4,000	µg/m³	4.5	38
trans-1,2-Dichloroethene	730	µg/m³	ND (1.4)	ND (0.4)
trans-1,3-Dichloropropene	4.8	µg/m³	ND (1.6)	ND (0.45)
Trichloroethene	0.17	µg/m³	**0.42**	ND (0.11)
Vinyl chloride	1.1	µg/m³	ND (0.089)	ND (0.026)
Xylenes, total	1,100	µg/m³	2.88 J	0.58 J

Notes:
Results greater than the screening level are bolded.
[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 3-22 (Soil Gas Screening Levels) for source of screening levels.
µg/m³ micrograms per cubic meter
ND not detected above the laboratory's reporting limit shown in parentheses
J estimated value

TABLE 3-43
Soil Screening Levels
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Screening Level	Units	Source	Notes
Volatile Organic Compounds				
1,1,1-Trichloroethane	1,200,000	mg/kg	EPA Region 9 Residential Soil PRG	
1,1,2,2-Tetrachloroethane	410	mg/kg	EPA Region 9 Residential Soil PRG	
1,1,2-Trichloroethane	730	mg/kg	EPA Region 9 Residential Soil PRG	
1,1-Dichloroethane	2,800	mg/kg	EPA Region 9 Residential Soil PRG	CAL-modified PRG
1,1-Dichloroethene	120,000	mg/kg	EPA Region 9 Residential Soil PRG	
1,1-Dichloropropene	NDRI	mg/kg		SL not required
1,2,3-Trichlorobenzene	62,000	mg/kg	Surrogate	1,2,4-Trichlorobenzene was used as the surrogate
1,2,3-Trichloropropane	NDRI	mg/kg		SL not required
1,2,4-Trichlorobenzene	62,000	mg/kg	EPA Region 9 Residential Soil PRG	
1,2,4-Trimethylbenzene	NDRI	mg/kg		SL not required
1,2-Dibromo-3-chloropropane	30	mg/kg	EPA Region 9 Residential Soil PRG	CAL-modified PRG
1,2-Dibromoethane	32	mg/kg	EPA Region 9 Residential Soil PRG	
1,2-Dichlorobenzene	600,000	mg/kg	EPA Region 9 Residential Soil PRG	
1,2-Dichloroethane	280	mg/kg	EPA Region 9 Residential Soil PRG	
1,2-Dichloropropane	340	mg/kg	EPA Region 9 Residential Soil PRG	
1,3-Dichlorobenzene	530,000	mg/kg	EPA Region 9 Residential Soil PRG	
1,3-Dichloropropane	NDRI	mg/kg		SL not required
1,4-Dichlorobenzene	3,400	mg/kg	EPA Region 9 Residential Soil PRG	
1,4-Dioxane (p-dioxane)	44,000	mg/kg	EPA Region 9 Residential Soil PRG	
2-Hexanone	NDRI	mg/kg		SL not required
Acetone	14,000,000	mg/kg	EPA Region 9 Residential Soil PRG	
Benzene	640	mg/kg	EPA Region 9 Residential Soil PRG	
Bromochloromethane	NDRI	mg/kg		SL not required
Bromodichloromethane	820	mg/kg	EPA Region 9 Residential Soil PRG	
Bromoform	62,000	mg/kg	EPA Region 9 Residential Soil PRG	
Bromomethane	3,900	mg/kg	EPA Region 9 Residential Soil PRG	
Carbon disulfide	360,000	mg/kg	EPA Region 9 Residential Soil PRG	
Carbon tetrachloride	250	mg/kg	EPA Region 9 Residential Soil PRG	
Chlorobenzene	150,000	mg/kg	EPA Region 9 Residential Soil PRG	
Chloroethane	3,000	mg/kg	EPA Region 9 Residential Soil PRG	
Chloroform	940	mg/kg	EPA Region 9 Residential Soil PRG	CAL-modified PRG
Chloromethane	47,000	mg/kg	EPA Region 9 Residential Soil PRG	
cis-1,2-Dichloroethene	43,000	mg/kg	EPA Region 9 Residential Soil PRG	
cis-1,3-Dichloropropene	780	mg/kg	EPA Region 9 Residential Soil PRG	
Cyclohexane	140,000	mg/kg	EPA Region 9 Residential Soil PRG	
Dibromochloromethane	1,100	mg/kg	EPA Region 9 Residential Soil PRG	
Ethyl tert-butyl ether	32,000	mg/kg	Surrogate	Methyl tertbutyl ether (MTBE) was used as the surrogate
Ethylbenzene	400,000	mg/kg	EPA Region 9 Residential Soil PRG	
Freon 11	390,000	mg/kg	EPA Region 9 Residential Soil PRG	
Freon 12	94,000	mg/kg	EPA Region 9 Residential Soil PRG	
Freon 113	5,600,000	mg/kg	EPA Region 9 Residential Soil PRG	
Isopropyl ether	NDRI	mg/kg		SL not required
Isopropylbenzene (cumene)	570,000	mg/kg	EPA Region 9 Residential Soil PRG	
Methyl acetate	22,000,000	mg/kg	EPA Region 9 Residential Soil PRG	
Methyl ethyl ketone	22,000,000	mg/kg	EPA Region 9 Residential Soil PRG	
Methyl isobutyl ketone	5,300,000	mg/kg	EPA Region 9 Residential Soil PRG	
Methyl tert-butyl ether	32,000	mg/kg	EPA Region 9 Residential Soil PRG	
Methylcyclohexane	2,600,000	mg/kg	EPA Region 9 Residential Soil PRG	
Methylene chloride	9,100	mg/kg	EPA Region 9 Residential Soil PRG	
Styrene	1,700,000	mg/kg	EPA Region 9 Residential Soil PRG	

TABLE 3-43
Soil Screening Levels
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Screening Level	Units	Source	Notes
Volatile Organic Compounds				
tert-Amyl methyl ether	32,000	mg/kg	Surrogate	Methyl tertbutyl ether (MTBE) was used as the surrogate
tert-Butyl alcohol	13,000,000	mg/kg	Surrogate	Isobutanol was used as the surrogate
Tetrachloroethene	480	mg/kg	EPA Region 9 Residential Soil PRG	
Toluene	520,000	mg/kg	EPA Region 9 Residential Soil PRG	
trans-1,2-Dichloroethene	69,000	mg/kg	EPA Region 9 Residential Soil PRG	
trans-1,3-Dichloropropene	780	mg/kg	EPA Region 9 Residential Soil PRG	
Trichloroethene	53	mg/kg	EPA Region 9 Residential Soil PRG	
Vinyl chloride	79	mg/kg	EPA Region 9 Residential Soil PRG	
Xylenes, total	270,000	mg/kg	EPA Region 9 Residential Soil PRG	
Semivolatile Organic Compounds				
1,1'-Biphenyl	3,000,000	mg/kg	EPA Region 9 Residential Soil PRG	
1,2,4,5-Tetrachlorobenzene	3,200	mg/kg	EPA Region 9 Residential Soil PRG	
1,4-Dioxane (p-dioxane)	44,000	mg/kg	EPA Region 9 Residential Soil PRG	
2,2'-Oxybis(1-Chloropropane)	220	mg/kg	Surrogate	bis(2-Chloroethyl)ether was used as the surrogate
2,3,4,6-Tetrachlorophenol	NDRI	mg/kg		SL not required
2,4,5-Trichlorophenol	6,100,000	mg/kg	EPA Region 9 Residential Soil PRG	
2,4,6-Trichlorophenol	6,100	mg/kg	EPA Region 9 Residential Soil PRG	
2,4-Dichlorophenol	180,000	mg/kg	EPA Region 9 Residential Soil PRG	
2,4-Dimethylphenol	1,200,000	mg/kg	EPA Region 9 Residential Soil PRG	
2,4-Dinitrophenol	120,000	mg/kg	EPA Region 9 Residential Soil PRG	
2,4-Dinitrotoluene	120,000	mg/kg	EPA Region 9 Residential Soil PRG	
2,6-Dinitrotoluene	61,000	mg/kg	EPA Region 9 Residential Soil PRG	
2-Chloronaphthalene	4,900,000	mg/kg	EPA Region 9 Residential Soil PRG	
2-Chlorophenol	63,000	mg/kg	EPA Region 9 Residential Soil PRG	
2-Methylnaphthalene	150,000	mg/kg	Calculated PRG	Based on surrogate toxic information
2-Methylphenol	3,100,000	mg/kg	EPA Region 9 Residential Soil PRG	
2-Nitroaniline	180,000	mg/kg	EPA Region 9 Residential Soil PRG	
2-Nitrophenol	NDRI	mg/kg		SL not required
3,3'-Dichlorobenzidine	1,100	mg/kg	EPA Region 9 Residential Soil PRG	
3-Nitroaniline	18,000	mg/kg	EPA Region 9 Residential Soil PRG	
4,6-Dinitro-2-methylphenol	NDRI	mg/kg		SL not required
4-Bromophenylphenyl ether	NDRI	mg/kg		SL not required
4-Chloro-3-methylphenol	3,100,000	mg/kg	Surrogate	3-methylphenol was used as the surrogate
4-Chloroaniline	240,000	mg/kg	EPA Region 9 Residential Soil PRG	
4-Chlorophenylphenyl ether	NDRI	mg/kg		SL not required
4-Methylphenol	310,000	mg/kg	EPA Region 9 Residential Soil PRG	
4-Nitroaniline	23,000	mg/kg	EPA Region 9 Residential Soil PRG	
4-Nitrophenol	120,000	mg/kg	Surrogate	2,4-Dinitrophenol was used as the surrogate
Acenaphthene	3,700,000	mg/kg	EPA Region 9 Residential Soil PRG	
Acenaphthylene	2,300,000	mg/kg	Surrogate	Pyrene was used as the surrogate
Acetophenone	100,000,000	mg/kg	Surrogate	Benzoic acid was used as the surrogate
Anthracene	22,000,000	mg/kg	EPA Region 9 Residential Soil PRG	
Atrazine	2,200	mg/kg	EPA Region 9 Residential Soil PRG	
Benzaldehyde	6,100,000	mg/kg	EPA Region 9 Residential Soil PRG	
Benzo(a)anthracene	620	mg/kg	EPA Region 9 Residential Soil PRG	
Benzo(a)pyrene	62	mg/kg	EPA Region 9 Residential Soil PRG	
Benzo(b)fluoranthene	620	mg/kg	EPA Region 9 Residential Soil PRG	
Benzo(g,h,i)perylene	2,300,000	mg/kg	Surrogate	Pyrene was used as the surrogate
Benzo(k)fluoranthene	380	mg/kg	EPA Region 9 Residential Soil PRG	CAL-modified PRG
Benzyl butyl phthalate	12,000,000	mg/kg	EPA Region 9 Residential Soil PRG	
bis(2-Chloroethoxy)methane	220	mg/kg	Surrogate	bis(2-Chloroethyl)ether was used as the surrogate

TABLE 3-43
Soil Screening Levels
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Screening Level	Units	Source	Notes
Semivolatile Organic Compounds				
bis(2-Chloroethyl)ether	220	mg/kg	EPA Region 9 Residential Soil PRG	
bis(2-Ethylhexyl)phthalate	35,000	mg/kg	EPA Region 9 Residential Soil PRG	
Caprolactam	31,000,000	mg/kg	EPA Region 9 Residential Soil PRG	
Carbazole	24,000	mg/kg	EPA Region 9 Residential Soil PRG	
Chrysene	3,800	mg/kg	EPA Region 9 Residential Soil PRG	CAL-modified PRG
Dibenz(a,h)anthracene	62	mg/kg	EPA Region 9 Residential Soil PRG	
Dibenzofuran	150,000	mg/kg	EPA Region 9 Residential Soil PRG	
Diethylphthalate	49,000,000	mg/kg	EPA Region 9 Residential Soil PRG	
Dimethylphthalate	100,000,000	mg/kg	EPA Region 9 Residential Soil PRG	
Di-n-butyl phthalate	6,100,000	mg/kg	EPA Region 9 Residential Soil PRG	
Di-n-octyl phthalate	2,400,000	mg/kg	EPA Region 9 Residential Soil PRG	
Fluoranthene	2,300,000	mg/kg	EPA Region 9 Residential Soil PRG	
Fluorene	2,700,000	mg/kg	EPA Region 9 Residential Soil PRG	
Hexachlorobenzene	300	mg/kg	EPA Region 9 Residential Soil PRG	
Hexachlorobutadiene	6,200	mg/kg	EPA Region 9 Residential Soil PRG	
Hexachlorocyclopentadiene	370,000	mg/kg	EPA Region 9 Residential Soil PRG	
Hexachloroethane	35,000	mg/kg	EPA Region 9 Residential Soil PRG	
Indeno(1,2,3-c,d)pyrene	620	mg/kg	EPA Region 9 Residential Soil PRG	
Isophorone	510,000	mg/kg	EPA Region 9 Residential Soil PRG	
Naphthalene	1,700	mg/kg	EPA Region 9 Residential Soil PRG	CAL-modified PRG
Nitrobenzene	20,000	mg/kg	EPA Region 9 Residential Soil PRG	
N-Nitrosodi-n-propylamine	69	mg/kg	EPA Region 9 Residential Soil PRG	
N-Nitrosodiphenylamine	99,000	mg/kg	EPA Region 9 Residential Soil PRG	
Pentachlorophenol	3,000	mg/kg	EPA Region 9 Residential Soil PRG	
Phenanthrene	2,300,000	mg/kg	Surrogate	Pyrene was used as the surrogate
Phenol	18,000,000	mg/kg	EPA Region 9 Residential Soil PRG	
Pyrene	2,300,000	mg/kg	EPA Region 9 Residential Soil PRG	
Metals				
Aluminum	76,000	mg/kg	EPA Region 9 Residential Soil PRG	
Antimony	31	mg/kg	EPA Region 9 Residential Soil PRG	
Arsenic	0.062 / 22	mg/kg	EPA Region 9 Residential Soil PRG	0.062 mg/kg is the cancer endpoint; 22 mg/kg is the noncancer endpoint.
Barium	5,400	mg/kg	EPA Region 9 Residential Soil PRG	
Beryllium	150	mg/kg	EPA Region 9 Residential Soil PRG	
Cadmium	37	mg/kg	EPA Region 9 Residential Soil PRG	
Chromium	210	mg/kg	EPA Region 9 Residential Soil PRG	
Cobalt	900	mg/kg	EPA Region 9 Residential Soil PRG	
Copper	3,100	mg/kg	EPA Region 9 Residential Soil PRG	
Lead	194 / 340	mg/kg	DTSC's Lead Risk Assessment Spreadsheet Version 7	194 mg/kg: including homegrown produce pathway; 340 mg/kg: excluding homegrown produce pathway.
Manganese	1,800	mg/kg	EPA Region 9 Residential Soil PRG	
Mercury	23	mg/kg	EPA Region 9 Residential Soil PRG	
Nickel	1,600	mg/kg	EPA Region 9 Residential Soil PRG	
Selenium	390	mg/kg	EPA Region 9 Residential Soil PRG	
Silver	390	mg/kg	EPA Region 9 Residential Soil PRG	
Thallium	5.2	mg/kg	EPA Region 9 Residential Soil PRG	
Vanadium	78	mg/kg	EPA Region 9 Residential Soil PRG	
Zinc	23,000	mg/kg	EPA Region 9 Residential Soil PRG	
Calcium	NA	mg/kg		Essential nutrient; SL not required
Iron	23,000	mg/kg	EPA Region 9 Residential Soil PRG	

TABLE 3-43
Soil Screening Levels
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Screening Level	Units	Source	Notes
Metals				
Magnesium	NA	mg/kg		Essential nutrient; SL not required
Potassium	NA	mg/kg		Essential nutrient; SL not required
Sodium	NA	mg/kg		Essential nutrient; SL not required
Organochlorine Pesticides/PCBs				
4,4'-DDD	2,400	mg/kg	EPA Region 9 Residential Soil PRG	
4,4'-DDE	1,700	mg/kg	EPA Region 9 Residential Soil PRG	
4,4'-DDT	1,700	mg/kg	EPA Region 9 Residential Soil PRG	
Aldrin	29	mg/kg	EPA Region 9 Residential Soil PRG	
alpha-BHC	90	mg/kg	EPA Region 9 Residential Soil PRG	
alpha-Chlordane	1,600	mg/kg	EPA Region 9 Residential Soil PRG	
Aroclor-1016	3,900	mg/kg	EPA Region 9 Residential Soil PRG	
Aroclor-1221	220	mg/kg	EPA Region 9 Residential Soil PRG	
Aroclor-1232	220	mg/kg	EPA Region 9 Residential Soil PRG	
Aroclor-1242	220	mg/kg	EPA Region 9 Residential Soil PRG	
Aroclor-1248	220	mg/kg	EPA Region 9 Residential Soil PRG	
Aroclor-1254	220	mg/kg	EPA Region 9 Residential Soil PRG	
Aroclor-1260	220	mg/kg	EPA Region 9 Residential Soil PRG	
beta-BHC	320	mg/kg	EPA Region 9 Residential Soil PRG	
delta-BHC	90	mg/kg	Surrogate	alpha-BHC was used as the surrogate
Dieldrin	30	mg/kg	EPA Region 9 Residential Soil PRG	
Endosulfan I	370,000	mg/kg	EPA Region 9 Residential Soil PRG	
Endosulfan II	370,000	mg/kg	EPA Region 9 Residential Soil PRG	
Endosulfan sulfate	370,000	mg/kg	Surrogate	Endosulfan was used as the surrogate
Endrin	18,000	mg/kg	EPA Region 9 Residential Soil PRG	
Endrin aldehyde	18,000	mg/kg	Surrogate	Endrin was used as the surrogate
Endrin ketone	18,000	mg/kg	Surrogate	Endrin was used as the surrogate
gamma-BHC	440	mg/kg	EPA Region 9 Residential Soil PRG	
gamma-Chlordane	1,600	mg/kg	EPA Region 9 Residential Soil PRG	
Heptachlor	110	mg/kg	EPA Region 9 Residential Soil PRG	
Heptachlor epoxide	53	mg/kg	EPA Region 9 Residential Soil PRG	
Methoxychlor	310,000	mg/kg	EPA Region 9 Residential Soil PRG	
PCB-1262 (Aroclor 1262)	NDRI	mg/kg		SL not required
PCB-1268 (Aroclor 1268)	NDRI	mg/kg		SL not required
Toxaphene	440	mg/kg	EPA Region 9 Residential Soil PRG	
Dioxins/Furans (1)				
1,2,3,4,6,7,8-HpCDD	390	ng/kg	TEF Calculation	
1,2,3,4,6,7,8-HpCDF	390	ng/kg	TEF Calculation	
1,2,3,4,7,8,9-HpCDF	390	ng/kg	TEF Calculation	
1,2,3,4,7,8-HxCDD	39	ng/kg	TEF Calculation	
1,2,3,4,7,8-HxCDF	39	ng/kg	TEF Calculation	
1,2,3,6,7,8-HxCDD	39	ng/kg	TEF Calculation	
1,2,3,6,7,8-HxCDF	39	ng/kg	TEF Calculation	
1,2,3,7,8,9-HxCDD	39	ng/kg	TEF Calculation	
1,2,3,7,8,9-HxCDF	39	ng/kg	TEF Calculation	
1,2,3,7,8-PeCDD	3.9	ng/kg	TEF Calculation	
1,2,3,7,8-PeCDF	78	ng/kg	TEF Calculation	
2,3,4,6,7,8-HxCDF	39	ng/kg	TEF Calculation	
2,3,4,7,8-PeCDF	7.8	ng/kg	TEF Calculation	
2,3,7,8-TCDD	3.9	ng/kg	EPA Region 9 Residential Soil PRG	Listed in EPA Region 9 Residential Soil PRG list as Dioxin
2,3,7,8-TCDF	39	ng/kg	TEF Calculation	
OCDD	39,000	ng/kg	TEF Calculation	

TABLE 3-43
Soil Screening Levels
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Screening Level	Units	Source	Notes
Dioxins/Furans (1)				
OCDF	39,000	ng/kg	TEF Calculation	

Notes:
(1) Dioxin/Furan screening levels calculated using Toxicity Equivalency Factors (EPA 2000)
EPA Region 9 PRGs were last updated in October 2004.
DTSC Department of Toxic Substances Control
NA not applicable
NDRI not detected in soil during the Remedial Investigation phase
PRG Preliminary Remediation Goal
TEF Toxicity Equivalence Factor
mg/kg milligrams per kilogram
ng/kg nanograms per kilogram

TABLE 3-44
1428 3rd Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening[1] Level	Oakland[2] Background Levels	1428SSa 1 ft bgs[3] 10/18/2006	1428SSa 3 ft bgs[4] 10/18/2006	1428SSb 1 ft bgs 10/18/2006	1428SSb 1 ft bgs (FD) 10/18/2006	1428SSb 3 ft bgs 10/18/2006	1428SSc 1 ft bgs 10/18/2006	1428SSc 3 ft bgs 10/18/2006	1428SSd 1 ft bgs 10/18/2006	1428SSd 3 ft bgs 10/18/2006	1428SSe 1 ft bgs 10/18/2006	1428SSe 3 ft bgs 10/18/2006
Volatile Organic Compounds														
1,1,1-Trichloroethane	µg/kg	1,200,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
1,1,2,2-Tetrachloroethane	µg/kg	410	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
1,1,2-Trichloroethane	µg/kg	730	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
1,1-Dichloroethane	µg/kg	2,800	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
1,1-Dichloroethene	µg/kg	120,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
1,1-Dichloropropene	µg/kg	NDRI	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
1,2,3-Trichlorobenzene	µg/kg	62,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
1,2,3-Trichloropropane	µg/kg	NDRI	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
1,2,4-Trichlorobenzene	µg/kg	62,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
1,2,4-Trimethylbenzene	µg/kg	NDRI	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
1,2-Dibromo-3-chloroprop	µg/kg	30	NE	ND (5.3)	ND (5)	ND (6.8)	ND (16)	ND (4.7)	ND (5.6)	ND (7.5)	ND (5.6)	ND (5.2)	ND (6)	ND (5.6)
1,2-Dibromoethane	µg/kg	32	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
1,2-Dichlorobenzene	µg/kg	600,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
1,2-Dichloroethane	µg/kg	280	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
1,2-Dichloropropane	µg/kg	340	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
1,3-Dichlorobenzene	µg/kg	530,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
1,3-Dichloropropane	µg/kg	NDRI	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
1,4-Dichlorobenzene	µg/kg	3,400	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
2-Hexanone	µg/kg	NDRI	NE	ND (21)	ND (20)	ND (27)	ND (32)	ND (19)	ND (22)	ND (30)	ND (22)	ND (21)	ND (24)	ND (22)
Acetone	µg/kg	14,000,000	NE	ND (21)	ND (20)	19 J	ND (32)	ND (19)	23	17 J	ND (22)	ND (21)	54	ND (22)
Benzene	µg/kg	640	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Bromochloromethane	µg/kg	NDRI	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Bromodichloromethane	µg/kg	820	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Bromoform	µg/kg	62,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Bromomethane	µg/kg	3,900	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Carbon disulfide	µg/kg	360,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Carbon tetrachloride	µg/kg	250	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Chlorobenzene	µg/kg	150,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Chloroethane	µg/kg	3,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Chloroform	µg/kg	940	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Chloromethane	µg/kg	47,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)

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Human Health Risk Assessment
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Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	1428SSa 1 ft bgs[3] 10/18/2006	1428SSa 3 ft bgs[4] 10/18/2006	1428SSb 1 ft bgs 10/18/2006	1428SSb 1 ft bgs (FD) 10/18/2006	1428SSb 3 ft bgs 10/18/2006	1428SSc 1 ft bgs 10/18/2006	1428SSc 3 ft bgs 10/18/2006	1428SSd 1 ft bgs 10/18/2006	1428SSd 3 ft bgs 10/18/2006	1428SSe 1 ft bgs 10/18/2006	1428SSe 3 ft bgs 10/18/2006
Volatile Organic Compounds														
cis-1,2-Dichloroethene	µg/kg	43,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
cis-1,3-Dichloropropene	µg/kg	780	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Dibromochloromethane	µg/kg	1,100	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Ethyl tert-butyl ether	µg/kg	32,000	NE	ND (11)	ND (10)	ND (14)	ND (16)	ND (9.4)	ND (11)	ND (15)	ND (11)	ND (10)	ND (12)	ND (11)
Ethylbenzene	µg/kg	400,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Freon 11	µg/kg	390,000	NE	3.4	3.5	8.8	11	2 J	2.2 J	5	4.1	ND (2.6)	3.2	5.9
Freon 113	µg/kg	5,600,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Freon 12	µg/kg	94,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Isopropyl ether	µg/kg	NDRI	NE	ND (11)	ND (10)	ND (14)	ND (16)	ND (9.4)	ND (11)	ND (15)	ND (11)	ND (10)	ND (12)	ND (11)
Isopropylbenzene (cumen	µg/kg	570,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Methyl ethyl ketone	µg/kg	22,000,000	NE	ND (21)	ND (20)	ND (27)	ND (32)	ND (19)	ND (22)	ND (30)	ND (22)	ND (21)	ND (24)	ND (22)
Methyl isobutyl ketone	µg/kg	5,300,000	NE	ND (21)	ND (20)	ND (27)	ND (32)	ND (19)	ND (22)	ND (30)	ND (22)	ND (21)	ND (24)	ND (22)
Methyl tert-butyl ether	µg/kg	32,000	NE	ND (11)	ND (10)	ND (14)	ND (16)	ND (9.4)	ND (11)	ND (15)	ND (11)	ND (10)	ND (12)	ND (11)
Methylene chloride	µg/kg	9,100	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Styrene	µg/kg	1,700,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
tert-Amyl methyl ether	µg/kg	32,000	NE	ND (11)	ND (10)	ND (14)	ND (16)	ND (9.4)	ND (11)	ND (15)	ND (11)	ND (10)	ND (12)	ND (11)
tert-Butyl alcohol	µg/kg	13,000,000	NE	ND (53)	ND (50)	ND (68)	ND (79)	ND (47)	ND (56)	ND (75)	ND (56)	ND (52)	ND (60)	ND (56)
Tetrachloroethene	µg/kg	480	NE	ND (2.6)	ND (2.5)	ND (3.4)	2.5 J	20	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	17	ND (2.8)
Toluene	µg/kg	520,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
trans-1,2-Dichloroethene	µg/kg	69,000	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
trans-1,3-Dichloropropene	µg/kg	780	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Trichloroethene	µg/kg	53	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	20	ND (2.8)
Vinyl chloride	µg/kg	79	NE	ND (2.6)	ND (2.5)	ND (3.4)	ND (4)	ND (2.4)	ND (2.8)	ND (3.7)	ND (2.8)	ND (2.6)	ND (3)	ND (2.8)
Xylenes, total	µg/kg	270,000	NE	ND (5.3)	ND (5)	ND (6.8)	ND (7.9)	ND (4.7)	ND (5.6)	ND (7.5)	ND (5.6)	ND (5.2)	ND (6)	ND (5.6)
Semivolatile Organic Compounds														
1,1'-Biphenyl	µg/kg	3,000,000	NE	ND (910)	ND (320)	290 J	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
1,2,4,5-Tetrachlorobenzen	µg/kg	3,200	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
1,4-Dioxane (p-dioxane)	µg/kg	44,000	NE	ND (360) J	ND (130) J	ND (390) J	ND (75) R	ND (80) J	ND (390) J	ND (95) R	ND (83) R	ND (410) R	ND (530) J	6.6 J
2,2'-Oxybis(1-Chloropropa	µg/kg	220	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
2,3,4,6-Tetrachlorophenol	µg/kg	NDRI	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
2,4,5-Trichlorophenol	µg/kg	6,100,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)

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Semivolatile Organic Compounds														
2,4,6-Trichlorophenol	µg/kg	6,100	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
2,4-Dichlorophenol	µg/kg	180,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
2,4-Dimethylphenol	µg/kg	1,200,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
2,4-Dinitrophenol	µg/kg	120,000	NE	ND (1,800)	ND (620)	ND (1,900)	ND (1,900)	ND (390)	ND (1,900)	ND (470)	ND (2,000)	ND (2,000)	ND (2,600)	ND (2,200)
2,4-Dinitrotoluene	µg/kg	120,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
2,6-Dinitrotoluene	µg/kg	61,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	1,800	ND (1,100)	ND (1,300)	ND (1,100)
2-Chloronaphthalene	µg/kg	4,900,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
2-Chlorophenol	µg/kg	63,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
2-Methylnaphthalene	µg/kg	150,000	NE	ND (910)	ND (320)	180 J	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
2-Methylphenol	µg/kg	3,100,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
2-Nitroaniline	µg/kg	180,000	NE	ND (1,800)	ND (620)	ND (1,900)	ND (1,900)	ND (390)	ND (1,900)	ND (470)	ND (2,000)	ND (2,000)	ND (2,600)	ND (2,200)
2-Nitrophenol	µg/kg	NDRI	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
3,3'-Dichlorobenzidine	µg/kg	1,100	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
3-Nitroaniline	µg/kg	18,000	NE	ND (1,800)	ND (620)	ND (1,900)	370	ND (390)	ND (1,900)	ND (470)	ND (2,000)	ND (2,000)	ND (2,600)	ND (2,200)
4,6-Dinitro-2-methylphenol	µg/kg	NDRI	NE	ND (1,800)	ND (620)	ND (1,900)	ND (1,900)	ND (390)	ND (1,900)	ND (470)	ND (2,000)	ND (2,000)	ND (2,600)	ND (2,200)
4-Bromophenylphenyl eth	µg/kg	NDRI	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
4-Chloro-3-methylphenol	µg/kg	3,100,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
4-Chloroaniline	µg/kg	240,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
4-Chlorophenylphenyl eth	µg/kg	NDRI	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
4-Methylphenol	µg/kg	310,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
4-Nitroaniline	µg/kg	23,000	NE	ND (1,800)	ND (620)	ND (1,900)	ND (1,900)	ND (390)	ND (1,900)	ND (470)	ND (2,000)	ND (2,000)	ND (2,600)	ND (2,200)
4-Nitrophenol	µg/kg	120,000	NE	ND (1,800)	ND (620)	ND (1,900)	100	ND (390)	ND (1,900)	ND (470)	ND (2,000)	ND (2,000)	ND (2,600)	ND (2,200)
Acenaphthene	µg/kg	3,700,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
Acenaphthylene	µg/kg	2,300,000	NE	330	72 J	2,300 J	400 J	24 J	ND (990)	ND (240)	150 J	ND (1,100)	900 J	170
Acetophenone	µg/kg	100,000,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
Anthracene	µg/kg	22,000,000	NE	320	110 J	3,000 J	270 J	28 J	ND (990)	ND (240)	130 J	ND (1,100)	1,100 J	250
Atrazine	µg/kg	2,200	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
Benzaldehyde	µg/kg	6,100,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
Benzo(a)anthracene	µg/kg	620	NE	**1,600**	340	**8,300 J**	**970 J**	96 J	380	41 J	500 J	260	**4,700**	**1,200**
Benzo(a)pyrene	µg/kg	62	NE	**1,800**	**410**	**9,200 J**	**1,500 J**	**150 J**	**690**	**68 J**	**770 J**	**390**	**6,200**	**1,600**
Benzo(b)fluoranthene	µg/kg	620	NE	**2,000**	380	**9,800 J**	**1,500 J**	180 J	**630**	79 J	**940 J**	420	**6,000**	**1,400**

TABLE 3-44
1428 3rd Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	1428SSa 1 ft bgs[3] 10/18/2006	1428SSa 3 ft bgs[4] 10/18/2006	1428SSb 1 ft bgs 10/18/2006	1428SSb 1 ft bgs (FD) 10/18/2006	1428SSb 3 ft bgs 10/18/2006	1428SSc 1 ft bgs 10/18/2006	1428SSc 3 ft bgs 10/18/2006	1428SSd 1 ft bgs 10/18/2006	1428SSd 3 ft bgs 10/18/2006	1428SSe 1 ft bgs 10/18/2006	1428SSe 3 ft bgs 10/18/2006
Semivolatile Organic Compounds														
Benzo(g,h,i)perylene	µg/kg	2,300,000	NE	670	160 J	4,400 J	810 J	ND (200)	360	64 J	570 J	ND (1,100)	4,000	610
Benzo(k)fluoranthene	µg/kg	380	NE	**860**	180 J	**3,600 J**	**720 J**	67 J	260	29 J	300 J	150	**2,900**	**810**
Benzyl butyl phthalate	µg/kg	12,000,000	NE	ND (910)	ND (320)	ND (1,000)	100	ND (200)	240	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
bis(2-Chloroethoxy)metha	µg/kg	220	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
bis(2-Chloroethyl)ether	µg/kg	220	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
bis(2-Ethylhexyl)phthalate	µg/kg	35,000	NE	ND (910)	ND (320)	120 J	120	36 J	150	39 J	560 J	ND (1,100)	190 J	200
Caprolactam	µg/kg	31,000,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
Carbazole	µg/kg	24,000	NE	190	ND (320)	630 J	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	240 J	ND (1,100)
Chrysene	µg/kg	3,800	NE	2,200	420	**10,000 J**	1,400 J	140 J	560	70 J	830 J	450	**6,100**	1,500
Dibenz(a,h)anthracene	µg/kg	62	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
Dibenzofuran	µg/kg	150,000	NE	ND (910)	ND (320)	130 J	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
Diethylphthalate	µg/kg	49,000,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
Dimethylphthalate	µg/kg	100,000,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
Di-n-butyl phthalate	µg/kg	6,100,000	NE	ND (910)	ND (320)	230 J	ND (960)	ND (200)	ND (990)	180 J	190 J	ND (1,100)	440 J	ND (1,100)
Di-n-octyl phthalate	µg/kg	2,400,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
Fluoranthene	µg/kg	2,300,000	NE	3,800	840	19,000 J	2,600 J	270	980	83 J	1,300	670	9,800	2,600
Fluorene	µg/kg	2,700,000	NE	120	ND (320)	1,600 J	110 J	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	490 J	ND (1,100)
Hexachlorobenzene	µg/kg	300	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
Hexachlorobutadiene	µg/kg	6,200	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
Hexachlorocyclopentadien	µg/kg	370,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
Hexachloroethane	µg/kg	35,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
Indeno(1,2,3-c,d)pyrene	µg/kg	620	NE	**950**	220 J	**4,600 J**	**970 J**	100 J	460	57 J	500 J	220	**3,600**	**870**
Isophorone	µg/kg	510,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
Naphthalene	µg/kg	1,700	NE	210	ND (320)	1,000 J	330 J	37 J	ND (990)	ND (240)	ND (1,100)	ND (1,100)	180 J	ND (1,100)
Nitrobenzene	µg/kg	20,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
N-Nitrosodi-n-propylamine	µg/kg	69	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
N-Nitrosodiphenylamine	µg/kg	99,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
Pentachlorophenol	µg/kg	3,000	NE	ND (1,800)	ND (620)	ND (1,900)	ND (1,900)	ND (390)	ND (1,900)	ND (470)	ND (2,000)	ND (2,000)	ND (2,600)	ND (2,200)
Phenanthrene	µg/kg	2,300,000	NE	2,500	680	20,000 J	2,200 J	220	530	51 J	1,000 J	400 J	6,800	1,600
Phenol	µg/kg	18,000,000	NE	ND (910)	ND (320)	ND (1,000)	ND (960)	ND (200)	ND (990)	ND (240)	ND (1,100)	ND (1,100)	ND (1,300)	ND (1,100)
Pyrene	µg/kg	2,300,000	NE	3,800	820	20,000 J	2,900 J	260	1,000	97 J	1,400	680	11,000	2,800

TABLE 3-44
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Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	1428SSa 1 ft bgs[3] 10/18/2006	1428SSa 3 ft bgs[4] 10/18/2006	1428SSb 1 ft bgs 10/18/2006	1428SSb 1 ft bgs (FD) 10/18/2006	1428SSb 3 ft bgs 10/18/2006	1428SSc 1 ft bgs 10/18/2006	1428SSc 3 ft bgs 10/18/2006	1428SSd 1 ft bgs 10/18/2006	1428SSd 3 ft bgs 10/18/2006	1428SSe 1 ft bgs 10/18/2006	1428SSe 3 ft bgs 10/18/2006
Metals														
Aluminum	mg/kg	76,000	NE	2,160	4,610	7,910	6,920	3,940	2,140	11,900	5,640	1,910	7,060	5,570
Antimony	mg/kg	31	5.9	0.75 J	ND (6.8)	**37.7**	**36.5**	6 J	0.87 J	ND (8.7)	ND (7.1)	1.3 J	**77.4**	18.4
Arsenic[5]	mg/kg	0.062 / 22	***14***	***4.9***	***3.1***	***14.8***	***13.5***	***6.2***	***5.2***	***13.5***	***15.7***	***4.7***	**35.1**	***10.8***
Barium	mg/kg	5,400	NE	150	125	1,490	1,220	231	126	3,210	1,160	123	711	374
Beryllium	mg/kg	150	0.9	0.08 J	0.09 J	0.27 J	0.22 J	0.12 J	0.09 J	0.47 J	0.16 J	0.05 J	0.29 J	0.15 J
Cadmium	mg/kg	37	1.5	0.76	0.15 J	4	4.3	0.78	0.94	17.9	5.6	1.6	3.4	2.1
Calcium	mg/kg	NA	NE	**2,210**	**2,650**	**18,700**	**21,900**	**3,910**	**2,540**	**31,900**	**12,400**	**2,400**	**9,160**	**4,490**
Chromium	mg/kg	210	91.4	12.5	24.8	41.7	39	21.8	10.9	81.1	112	17.8	38.8	37.3
Cobalt	mg/kg	900	NE	2.3 J	5 J	9.4	8.6	4.5 J	2.6 J	14.4	11.4	3.2 J	7.1	6.6
Copper	mg/kg	3,100	59.6	64.3	23.9	427	347	55.6	72.6	267	439	76.1	440	257
Iron	mg/kg	23,000	NE	9,130	9,140	**26,100**	**23,700**	10,500	8,670	**51,500**	**44,100**	15,000	22,200	16,600
Lead[6]	mg/kg	194 / 340	14.7	**443**	72.1 J+	**2,320**	**1,590 J+**	***224***	**429**	**4,170 J+**	**2,920**	***318 J+***	**2,660 J+**	**1,050 J+**
Magnesium	mg/kg	NA	NE	**686**	**1,440**	**2,410**	**2,230**	**1,190**	**766**	**2,650**	**3,180**	**695**	**2,310**	**1,730**
Manganese	mg/kg	1,800	NE	102	220	493	478	193	123	492	485	239	313	260
Mercury	mg/kg	23	0.3	0.73	0.18	0.76	0.69	0.26	0.52	1.5	0.71	0.34	1.4	0.81
Nickel	mg/kg	1,600	120.2	10.3	17.4	38.8	38	18	10.6	44.3	59.4	18.9	33.6	27
Potassium	mg/kg	NA	NE	**362 J**	**645**	**1,880**	**1,490**	**744**	**425 J**	**1,260**	**1,050**	**327 J**	**1,280**	**834**
Selenium	mg/kg	390	5.6	ND (3.8)	0.55 J	ND (4.1)	ND (3.8)	ND (4)	ND (3.9)	ND (5.1)	ND (4.2)	ND (4.2)	ND (4.4)	0.66 J
Silver	mg/kg	390	1.7	0.88 J	0.58 J	6.4	4.9	0.74 J	0.95 J	4.1	6.4	0.83 J	3.2	2.6
Sodium	mg/kg	NA	NE	ND (536)	**383 J**	**5,370**	**6,030**	ND (567)	ND (562)	**12,400**	**5,860**	ND (602)	**2,970**	**1,950**
Thallium	mg/kg	5.2	**42.5**	0.53 J	ND (2.8)	ND (2.9)	ND (2.7)	0.71 J	0.68 J	ND (3.6)	0.61 J	1 J	ND (3.2)	ND (3.1)
Vanadium	mg/kg	78	NE	8	19.8	27.7	25.6	15.9	9	43.9	38.4	10.6	27	23.3
Zinc	mg/kg	23,000	91.5	267	77.2	2,040	2,340	277	361	4,730	2,320	495	1,130	722
Organochlorine Pesticides/PCBs														
4,4'-DDD	µg/kg	2,400	NE	160 J	4.7 J	30 J	180 J	13 J	14 J	0.53 J	13 J	4.3 J	ND (5.2)	4.7 J
4,4'-DDE	µg/kg	1,700	NE	240 J	18	6.1 J	260 J	180 J	58	3.1 J	9 J	14	7.7 J	20 J
4,4'-DDT	µg/kg	1,700	NE	360 J	38 J	270 J	**1,800 J**	450 J	340 J	8.4	1,000 J	110	0.34 J	200 J
Aldrin	µg/kg	29	NE	0.15 J	ND (3.2) J	ND (2) J	0.18 J	0.16 J	0.64 J	ND (2.4) J	0.68 J	0.59 J	ND (2.7) J	ND (2.3) J
alpha-BHC	µg/kg	90	NE	0.082 J	ND (3.2)	1.5 J	2.5 J	0.3 J	0.042 J	ND (2.4)	0.55 J	ND (2.1)	ND (2.7)	0.18 J
alpha-Chlordane	µg/kg	1,600	NE	0.44 J	0.18 J	1.7 J	4.3	0.64 J	3.9	ND (2.4)	10 J	0.21 J	0.54 J	2.5 J
Aroclor-1016	µg/kg	3,900	NE	ND (36)	ND (62)	ND (39)	ND (37)	ND (39)	ND (38)	ND (47)	ND (41)	ND (41)	ND (52)	ND (44)

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Human Health Risk Assessment
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Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	1428SSa 1 ft bgs[3] 10/18/2006	1428SSa 3 ft bgs[4] 10/18/2006	1428SSb 1 ft bgs 10/18/2006	1428SSb 1 ft bgs (FD) 10/18/2006	1428SSb 3 ft bgs 10/18/2006	1428SSc 1 ft bgs 10/18/2006	1428SSc 3 ft bgs 10/18/2006	1428SSd 1 ft bgs 10/18/2006	1428SSd 3 ft bgs 10/18/2006	1428SSe 1 ft bgs 10/18/2006	1428SSe 3 ft bgs 10/18/2006
Organochlorine Pesticides/PCBs														
Aroclor-1221	µg/kg	220	NE	ND (36)	ND (62)	ND (39)	ND (37)	ND (39)	ND (38)	ND (47)	ND (41)	ND (41)	ND (52)	ND (44)
Aroclor-1232	µg/kg	220	NE	ND (36)	ND (62)	ND (39)	ND (37)	ND (39)	ND (38)	ND (47)	ND (41)	ND (41)	ND (52)	ND (44)
Aroclor-1242	µg/kg	220	NE	ND (36)	ND (62)	ND (39)	ND (37)	ND (39)	ND (38)	ND (47)	ND (41)	ND (41)	ND (52)	ND (44)
Aroclor-1248	µg/kg	220	NE	ND (36)	ND (62)	ND (39)	ND (37)	ND (39)	ND (38)	ND (47)	ND (41)	ND (41)	ND (52)	ND (44)
Aroclor-1254	µg/kg	220	NE	ND (36)	ND (62)	ND (39)	ND (37)	ND (39)	ND (38)	ND (47)	ND (41)	ND (41)	ND (52)	ND (44)
Aroclor-1260	µg/kg	220	NE	ND (36)	ND (62)	ND (39)	ND (37)	ND (39)	ND (38)	ND (47)	ND (41)	ND (41)	ND (52)	ND (44)
beta-BHC	µg/kg	320	NE	0.45 J	0.25 J	ND (2) J	2.3 J	0.36 J	1.2 J	ND (2.4)	ND (2.1) J	ND (2.1)	ND (2.7) J	0.7 J
delta-BHC	µg/kg	90	NE	0.43 J	ND (3.2)	0.92 J	0.23 J	0.14 J	0.1 J	ND (2.4)	0.25 J	ND (2.1)	0.68 J	0.26 J
Dieldrin	µg/kg	30	NE	ND (3.3) J	ND (6.2)	0.2 J	15 J	18 J	8.1 J	ND (4.7)	2 J	ND (4.1)	0.77 J	5.8 J
Endosulfan I	µg/kg	370,000	NE	0.38 J	ND (3.2)	ND (2)	0.4 J	0.069 J	0.067 J	ND (2.4)	1.9 J	ND (2.1)	ND (2.7)	0.095 J
Endosulfan II	µg/kg	370,000	NE	0.53 J	0.66 J	0.31 J	0.83 J	0.4 J	0.31 J	ND (4.7)	2.2 J	0.62 J	0.31 J	0.24 J
Endosulfan sulfate	µg/kg	370,000	NE	0.57 J	0.54 J	0.58 J	2.7 J	0.16 J	2.1 J	0.52 J	0.92 J	0.26 J	2.1 J	2.6 J
Endrin	µg/kg	18,000	NE	11 J	0.44 J	0.57 J	0.75 J	0.73 J	0.32 J	1.4 J	2 J	0.58 J	7.5 J	3.9 J
Endrin aldehyde	µg/kg	18,000	NE	ND (3.3) J	ND (3.3)	1 J	ND (3.3) J	ND (3.3) J	ND (3.3) J	ND (4.7)	5.4 J	0.42 J	3.3 J	ND (3.3) J
Endrin ketone	µg/kg	18,000	NE	0.19 J	0.68 J	4.9 J	7 J	0.16 J	0.21 J	ND (2.4)	1.4 J	ND (2.1)	0.41 J	4 J
gamma-BHC	µg/kg	440	NE	0.28 J	ND (3.2) J	0.32 J	0.48 J	ND (2) J	0.21 J	ND (2.4) J	ND (2.1) J	ND (2.1)	ND (2.7) J	ND (2.3) J
gamma-Chlordane	µg/kg	1,600	NE	ND (1.7) J	ND (1.7) J	4.4 J	1.9 J	ND (1.7) J	2 J	0.29 J	4.4 J	1.3 J	1.5 J	3.7
Heptachlor	µg/kg	110	NE	0.11 J	ND (3.2) J	0.29 J	0.69 J	0.16 J	0.25 J	ND (2.4) J	0.84 J	ND (2.1)	0.32 J	0.036 J
Heptachlor epoxide	µg/kg	53	NE	0.28 J	0.14 J	1.9 J	6.1 J	0.44 J	2.9	ND (2.4)	26	0.48 J	0.38 J	0.66 J
Methoxychlor	µg/kg	310,000	NE	18 J	ND (17) J	1.1 J	17 J	ND (17)	ND (17) J	ND (24)	0.71 J	0.5 J	12 J	ND (17) J
Toxaphene	µg/kg	440	NE	ND (180)	ND (320)	ND (200)	ND (190)	ND (200)	ND (200)	ND (240)	ND (210)	ND (210)	ND (270)	ND (230)

TABLE 3-44
1428 3rd Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 16b (Soil Screening Levels) for source of screening levels.

[2] Oakland background results are from background metal concentration studies conducted by the Lawrence Berkeley National Laboratory Environmental Restoration Program, 1995. Samples were taken from locations representing the Colluvian and Fill geologic unit.

[3] 1ft bgs samples were collected between 0.5 and 1ft bgs

[4] 3ft bgs samples were collected between 2.5 and 3 ft bgs

[5] For Arsenic, 0.062 mg/kg is the cancer endpoint; 22 mg/kg is the noncancer endpoint.

FD	field duplicate
ft bgs	feet below ground surface
mg/kg	milligrams per kilogram
ND	not detected above the laboratory's reporting limit shown in parentheses
J	estimated value
J+	estimated value, possible high bias
R	rejected for failure to meet quality control requirements

TABLE 3-45
1432 3rd Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	1432SSa 1 ft bgs[3] 10/18/2006	1432SSa 3 ft bgs[4] 10/18/2006	1432SSb 1 ft bgs 10/18/2006	1432SSb 1 ft bgs (FD) 10/18/2006	1432SSb 3 ft bgs 10/18/2006	1432SSc 1 ft bgs 11/7/2006	1432SSc 3 ft bgs 11/7/2006
Volatile Organic Compounds										
1,1,1-Trichloroethane	µg/kg	1,200,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
1,1,2,2-Tetrachloroethane	µg/kg	410	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
1,1,2-Trichloroethane	µg/kg	730	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
1,1-Dichloroethane	µg/kg	2,800	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
1,1-Dichloroethene	µg/kg	120,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
1,1-Dichloropropene	µg/kg	NDRI	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
1,2,3-Trichlorobenzene	µg/kg	62,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
1,2,3-Trichloropropane	µg/kg	NDRI	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
1,2,4-Trichlorobenzene	µg/kg	62,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
1,2,4-Trimethylbenzene	µg/kg	NDRI	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
1,2-Dibromo-3-chloroprop	µg/kg	30	NE	ND (6.5)	ND (6.2)	ND (7.3)	ND (6.5)	ND (7.3)	ND (15)	ND (13)
1,2-Dibromoethane	µg/kg	32	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
1,2-Dichlorobenzene	µg/kg	600,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
1,2-Dichloroethane	µg/kg	280	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
1,2-Dichloropropane	µg/kg	340	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
1,3-Dichlorobenzene	µg/kg	530,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
1,3-Dichloropropane	µg/kg	NDRI	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
1,4-Dichlorobenzene	µg/kg	3,400	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
2-Hexanone	µg/kg	NDRI	NE	ND (26)	ND (25)	ND (29)	ND (26)	ND (29)	ND (29)	ND (25)
Acetone	µg/kg	14,000,000	NE	ND (13)	ND (12)	ND (29)	ND (13)	ND (29)	ND (29) J	ND (25) J
Benzene	µg/kg	640	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Bromochloromethane	µg/kg	NDRI	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Bromodichloromethane	µg/kg	820	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Bromoform	µg/kg	62,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6) J	ND (3.2) J
Bromomethane	µg/kg	3,900	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Carbon disulfide	µg/kg	360,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Carbon tetrachloride	µg/kg	250	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Chlorobenzene	µg/kg	150,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Chloroethane	µg/kg	3,000	NE	ND (1.6)	ND (1.6)	ND (3.6)	ND (1.6)	ND (3.6)	ND (3.6)	ND (3.2)
Chloroform	µg/kg	940	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Chloromethane	µg/kg	47,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)

TABLE 3-45
1432 3rd Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	1432SSa 1 ft bgs[3] 10/18/2006	1432SSa 3 ft bgs[4] 10/18/2006	1432SSb 1 ft bgs 10/18/2006	1432SSb 1 ft bgs (FD) 10/18/2006	1432SSb 3 ft bgs 10/18/2006	1432SSc 1 ft bgs 11/7/2006	1432SSc 3 ft bgs 11/7/2006
Volatile Organic Compounds										
cis-1,2-Dichloroethene	µg/kg	43,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
cis-1,3-Dichloropropene	µg/kg	780	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Dibromochloromethane	µg/kg	1,100	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6) J	ND (3.2) J
Ethyl tert-butyl ether	µg/kg	32,000	NE	ND (13)	ND (12)	ND (15)	ND (13)	ND (15)	ND (15)	ND (13)
Ethylbenzene	µg/kg	400,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Freon 11	µg/kg	390,000	NE	4.5	5.2	9.2	5.8	12	17	3 J
Freon 113	µg/kg	5,600,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Freon 12	µg/kg	94,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Isopropyl ether	µg/kg	NDRI	NE	ND (13)	ND (12)	ND (15)	ND (13)	ND (15)	ND (15)	ND (13)
Isopropylbenzene (cumen	µg/kg	570,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Methyl ethyl ketone	µg/kg	22,000,000	NE	ND (26)	ND (25)	ND (29)	ND (26)	ND (29)	ND (29)	ND (25)
Methyl isobutyl ketone	µg/kg	5,300,000	NE	ND (26)	ND (25)	ND (29)	ND (26)	ND (29)	ND (29)	ND (25)
Methyl tert-butyl ether	µg/kg	32,000	NE	ND (13)	ND (12)	ND (15)	ND (13)	ND (15)	ND (15)	ND (13)
Methylene chloride	µg/kg	9,100	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Styrene	µg/kg	1,700,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
tert-Amyl methyl ether	µg/kg	32,000	NE	ND (13)	ND (12)	ND (15)	ND (13)	ND (15)	ND (15)	ND (13)
tert-Butyl alcohol	µg/kg	13,000,000	NE	ND (65)	ND (62)	ND (73)	ND (65)	ND (73)	ND (73)	ND (63)
Tetrachloroethene	µg/kg	480	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Toluene	µg/kg	520,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
trans-1,2-Dichloroethene	µg/kg	69,000	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
trans-1,3-Dichloropropene	µg/kg	780	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Trichloroethene	µg/kg	53	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Vinyl chloride	µg/kg	79	NE	ND (3.3)	ND (3.1)	ND (3.6)	ND (3.2)	ND (3.6)	ND (3.6)	ND (3.2)
Xylenes, total	µg/kg	270,000	NE	ND (6.5)	ND (6.2)	ND (7.3)	ND (6.5)	ND (7.3)	ND (7.3)	ND (6.3)
Semivolatile Organic Compounds										
1,1'-Biphenyl	µg/kg	3,000,000	NE	220	ND (1,000)	490 J	ND (1,200)	ND (1,000)	ND (230)	ND (200)
1,2,4,5-Tetrachlorobenzen	µg/kg	3,200	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
1,4-Dioxane (p-dioxane)	µg/kg	44,000	NE	ND (81) R	ND (400) J	ND (400) J	ND (490) J	ND (410) J	---	---
2,2'-Oxybis(1-Chloropropa	µg/kg	220	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
2,3,4,6-Tetrachlorophenol	µg/kg	NDRI	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
2,4,5-Trichlorophenol	µg/kg	6,100,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)

TABLE 3-45
1432 3rd Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening[1] Level	Oakland[2] Background Levels	1432SSa 1 ft bgs[3] 10/18/2006	1432SSa 3 ft bgs[4] 10/18/2006	1432SSb 1 ft bgs 10/18/2006	1432SSb 1 ft bgs (FD) 10/18/2006	1432SSb 3 ft bgs 10/18/2006	1432SSc 1 ft bgs 11/7/2006	1432SSc 3 ft bgs 11/7/2006
Semivolatile Organic Compounds										
2,4,6-Trichlorophenol	µg/kg	6,100	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
2,4-Dichlorophenol	µg/kg	180,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
2,4-Dimethylphenol	µg/kg	1,200,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
2,4-Dinitrophenol	µg/kg	120,000	NE	ND (2,000)	ND (2,000)	ND (2,000)	ND (2,400)	ND (2,000)	ND (440)	ND (390)
2,4-Dinitrotoluene	µg/kg	120,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
2,6-Dinitrotoluene	µg/kg	61,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	1,800	ND (230)	ND (200)
2-Chloronaphthalene	µg/kg	4,900,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
2-Chlorophenol	µg/kg	63,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
2-Methylnaphthalene	µg/kg	150,000	NE	130	ND (1,000)	150 J	ND (1,200)	ND (1,000)	ND (230)	ND (200)
2-Methylphenol	µg/kg	3,100,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
2-Nitroaniline	µg/kg	180,000	NE	ND (2,000)	ND (2,000)	ND (2,000)	ND (2,400)	ND (2,000)	ND (440)	ND (390)
2-Nitrophenol	µg/kg	NDRI	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
3,3'-Dichlorobenzidine	µg/kg	1,100	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
3-Nitroaniline	µg/kg	18,000	NE	ND (2,000)	ND (2,000)	ND (2,000)	ND (2,400)	ND (2,000)	ND (440)	ND (390)
4,6-Dinitro-2-methylphenol	µg/kg	NDRI	NE	ND (2,000)	ND (2,000)	ND (2,000)	ND (2,400)	ND (2,000)	ND (440)	ND (390)
4-Bromophenylphenyl eth	µg/kg	NDRI	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
4-Chloro-3-methylphenol	µg/kg	3,100,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
4-Chloroaniline	µg/kg	240,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
4-Chlorophenylphenyl eth	µg/kg	NDRI	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
4-Methylphenol	µg/kg	310,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
4-Nitroaniline	µg/kg	23,000	NE	ND (2,000)	ND (2,000)	ND (2,000)	ND (2,400)	ND (2,000)	ND (440)	ND (390)
4-Nitrophenol	µg/kg	120,000	NE	ND (2,000)	ND (2,000)	ND (2,000)	ND (2,400)	ND (2,000)	ND (440)	ND (390)
Acenaphthene	µg/kg	3,700,000	NE	120	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
Acenaphthylene	µg/kg	2,300,000	NE	870	ND (1,000)	1,200 J	180 J	110 J	120 J	ND (200)
Acetophenone	µg/kg	100,000,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
Anthracene	µg/kg	22,000,000	NE	610	ND (1,000)	570 J	160	120 J	90 J	ND (200)
Atrazine	µg/kg	2,200	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
Benzaldehyde	µg/kg	6,100,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
Benzo(a)anthracene	µg/kg	620	NE	**1,300**	290 J	**1,600 J**	480 J	390 J	340	66 J
Benzo(a)pyrene	µg/kg	62	NE	**1,900**	**380 J**	**2,800 J**	**790 J**	**600 J**	**410**	52 J
Benzo(b)fluoranthene	µg/kg	620	NE	**2,000**	400 J	**3,000 J**	**820 J**	**770 J**	600	110 J

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Human Health Risk Assessment
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Analyte	Units	Screening[1] Level	Oakland[2] Background Levels	1432SSa 1 ft bgs[3] 10/18/2006	1432SSa 3 ft bgs[4] 10/18/2006	1432SSb 1 ft bgs 10/18/2006	1432SSb 1 ft bgs (FD) 10/18/2006	1432SSb 3 ft bgs 10/18/2006	1432SSc 1 ft bgs 11/7/2006	1432SSc 3 ft bgs 11/7/2006
Semivolatile Organic Compounds										
Benzo(g,h,i)perylene	µg/kg	2,300,000	NE	810	190 J	1,400 J	390 J	390 J	270	37 J
Benzo(k)fluoranthene	µg/kg	380	NE	**970**	160 J	**880 J**	**420**	360 J	220 J	39 J
Benzyl butyl phthalate	µg/kg	12,000,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
bis(2-Chloroethoxy)metha	µg/kg	220	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
bis(2-Chloroethyl)ether	µg/kg	220	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
bis(2-Ethylhexyl)phthalate	µg/kg	35,000	NE	130	110 J	ND (1,000)	ND (1,200)	160 J	60 J	ND (200)
Caprolactam	µg/kg	31,000,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
Carbazole	µg/kg	24,000	NE	190	ND (1,000)	160 J	ND (1,200)	ND (1,000)	28 J	ND (200)
Chrysene	µg/kg	3,800	NE	1,800	410 J	2,300 J	750 J	780 J	460	75 J
Dibenz(a,h)anthracene	µg/kg	62	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
Dibenzofuran	µg/kg	150,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
Diethylphthalate	µg/kg	49,000,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
Dimethylphthalate	µg/kg	100,000,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
Di-n-butyl phthalate	µg/kg	6,100,000	NE	ND (1,000)	ND (1,000)	210 J	ND (1,200)	240 J	51 J	50 J
Di-n-octyl phthalate	µg/kg	2,400,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
Fluoranthene	µg/kg	2,300,000	NE	4,300	620 J	5,200 J	1,500 J	1,100	900	110 J
Fluorene	µg/kg	2,700,000	NE	320	ND (1,000)	330 J	ND (1,200)	ND (1,000)	ND (230)	ND (200)
Hexachlorobenzene	µg/kg	300	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
Hexachlorobutadiene	µg/kg	6,200	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
Hexachlorocyclopentadien	µg/kg	370,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230) J	ND (200) J
Hexachloroethane	µg/kg	35,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
Indeno(1,2,3-c,d)pyrene	µg/kg	620	NE	**1,200**	270 J	**1,800 J**	490 J	410 J	370	56 J
Isophorone	µg/kg	510,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
Naphthalene	µg/kg	1,700	NE	1,200	ND (1,000)	**2,800 J**	140 J	ND (1,000)	ND (230)	ND (200)
Nitrobenzene	µg/kg	20,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
N-Nitrosodi-n-propylamine	µg/kg	69	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
N-Nitrosodiphenylamine	µg/kg	99,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
Pentachlorophenol	µg/kg	3,000	NE	ND (2,000)	ND (2,000)	ND (2,000)	ND (2,400)	ND (2,000)	ND (440)	ND (390)
Phenanthrene	µg/kg	2,300,000	NE	5,100	500 J	6,000	1,200	920 J	590	88 J
Phenol	µg/kg	18,000,000	NE	ND (1,000)	ND (1,000)	ND (1,000)	ND (1,200)	ND (1,000)	ND (230)	ND (200)
Pyrene	µg/kg	2,300,000	NE	4,300	720 J	5,800 J	1,500 J	1,200	940	110 J

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Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening[1] Level	Oakland[2] Background Levels	1432SSa 1 ft bgs[3] 10/18/2006	1432SSa 3 ft bgs[4] 10/18/2006	1432SSb 1 ft bgs 10/18/2006	1432SSb 1 ft bgs (FD) 10/18/2006	1432SSb 3 ft bgs 10/18/2006	1432SSc 1 ft bgs 11/7/2006	1432SSc 3 ft bgs 11/7/2006
Metals										
Aluminum	mg/kg	76,000	NE	1,870	4,760	6,870 J	3,610 J	6,730	6,760 J	6,470
Antimony	mg/kg	31	5.9	1.1 J	1.4 J	ND (7.2)	2 J	ND (7.6)	5.7 J	2.6 J
Arsenic[5]	mg/kg	0.062 / 22	***14***	***7.8***	***8.1***	***11.7***	***9.9***	***11.1***	***13.8***	***7.6***
Barium	mg/kg	5,400	NE	396	493	1,180 J	660 J	1,290	1,170 J	502
Beryllium	mg/kg	150	0.9	0.07 J	0.24 J	0.26 J	0.13 J	0.26 J	0.25 J	0.25 J
Cadmium	mg/kg	37	1.5	1.9	1.5	5.7 J	3.4 J	3.6	5.3	3.6
Calcium	mg/kg	NA	NE	**3,080**	**9,200**	**13,500 J**	**5,630 J**	**15,200**	**10,500 J**	**12,600**
Chromium	mg/kg	210	91.4	13.2	19.8	47.7 J	24.1 J	47.6	62.6 J	53
Cobalt	mg/kg	900	NE	2.2 J	4.1 J	9	4.1 J	7.6	9.1	7
Copper	mg/kg	3,100	59.6	101	168	544 J	235 J	316	458 J	505
Iron	mg/kg	23,000	NE	15,700	9,680	**28,200**	22,600	22,900	21,700 J	15,000
Lead[6]	mg/kg	194 / 340	14.7	**1,060**	**524 J+**	**1,830**	**1,610**	**1,500 J+**	**2,280 J**	**983**
Magnesium	mg/kg	NA	NE	**571 J**	**1,160**	**2,200 J**	**1,050 J**	**1,990**	**2,030 J**	**1,860**
Manganese	mg/kg	1,800	NE	104	338	436 J	237 J	323	369 J	359
Mercury	mg/kg	23	0.3	1.5	1.7	1.5	1.6	2.3	1.8	2.3
Nickel	mg/kg	1,600	120.2	10.2	15.2	43.6 J	20.8 J	36.5	39 J	31.6
Potassium	mg/kg	NA	NE	**514 J**	**759 J**	**1,360 J**	**663 J**	**1,270**	**1,490**	**1,240**
Selenium	mg/kg	390	5.6	0.59 J	ND (5.4)	ND (4.2)	0.48 J	0.51 J	ND (4.6)	ND (4.5)
Silver	mg/kg	390	1.7	1.1 J	1.2 J	7.1 J	3 J	4.3	6.6 J+	3.6
Sodium	mg/kg	NA	NE	ND (747)	ND (770)	**5,810 J**	ND (704) J	**3,910**	**4,570 J+**	**3,810 J+**
Thallium	mg/kg	5.2	**42.5**	0.61 J	0.6 J	ND (3)	1 J	ND (3.2)	ND (3.3)	ND (3.2)
Vanadium	mg/kg	78	NE	8.4	16.4	29.6 J	15 J	30.8	28.2 J	21.3
Zinc	mg/kg	23,000	91.5	565	601	2,290 J	973 J	1,490	1,880 J	1,550
Organochlorine Pesticides/PCBs										
4,4'-DDD	µg/kg	2,400	NE	17 J	0.82 J	21 J	14 J	13 J	8.3 J	3.1 J
4,4'-DDE	µg/kg	1,700	NE	230 J	0.5 J	220 J	870 J	4.7 J	62 J	17
4,4'-DDT	µg/kg	1,700	NE	980 J	140	610 J	**3,100 J**	510 J	220 J	55
Aldrin	µg/kg	29	NE	0.098 J	ND (2) J	0.21 J	0.2 J	0.53 J	2.7 J	0.15 J
alpha-BHC	µg/kg	90	NE	1.5 J	ND (2)	10 J	1.5 J	0.56 J	0.67 J	0.18 J
alpha-Chlordane	µg/kg	1,600	NE	28 J	7.6 J	73 J	23 J	0.3 J	14	6.6
Aroclor-1016	µg/kg	3,900	NE	ND (40)	ND (39)	ND (40)	ND (48)	ND (41)	ND (44)	ND (39)

TABLE 3-45
1432 3rd Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	1432SSa 1 ft bgs[3] 10/18/2006	1432SSa 3 ft bgs[4] 10/18/2006	1432SSb 1 ft bgs 10/18/2006	1432SSb 1 ft bgs (FD) 10/18/2006	1432SSb 3 ft bgs 10/18/2006	1432SSc 1 ft bgs 11/7/2006	1432SSc 3 ft bgs 11/7/2006
Organochlorine Pesticides/PCBs										
Aroclor-1221	µg/kg	220	NE	ND (40)	ND (39)	ND (40)	ND (48)	ND (41)	ND (44)	ND (39)
Aroclor-1232	µg/kg	220	NE	ND (40)	ND (39)	ND (40)	ND (48)	ND (41)	ND (44)	ND (39)
Aroclor-1242	µg/kg	220	NE	ND (40)	ND (39)	ND (40)	ND (48)	ND (41)	ND (44)	ND (39)
Aroclor-1248	µg/kg	220	NE	ND (40)	ND (39)	ND (40)	ND (48)	ND (41)	ND (44)	ND (39)
Aroclor-1254	µg/kg	220	NE	ND (40)	ND (39)	ND (40)	ND (48)	ND (41)	ND (44)	ND (39)
Aroclor-1260	µg/kg	220	NE	ND (40)	ND (39)	ND (40)	ND (48)	ND (41)	ND (44)	ND (39)
beta-BHC	µg/kg	320	NE	2.9 J	ND (2) J	2.3 J	0.52 J	ND (2.1) J	0.85 J	ND (2)
delta-BHC	µg/kg	90	NE	0.037 J	0.33 J	1.4 J	0.72 J	0.27 J	0.34 J	ND (2)
Dieldrin	µg/kg	30	NE	19	4.8	17 J	10 J	3.5 J	12 J	3.5 J
Endosulfan I	µg/kg	370,000	NE	0.62 J	0.25 J	0.44 J	0.21 J	0.53 J	0.3 J	0.14 J
Endosulfan II	µg/kg	370,000	NE	0.54 J	0.62 J	0.82 J	0.28 J	0.55 J	1.1 J	0.29 J
Endosulfan sulfate	µg/kg	370,000	NE	2.7 J	0.31 J	16 J	0.83 J	2.7 J	3.5 J	1.5 J
Endrin	µg/kg	18,000	NE	19 J	6.7 J	150 J	15 J	0.22 J	9.2 J	ND (3.3) J
Endrin aldehyde	µg/kg	18,000	NE	ND (3.3) J	0.24 J	24 J	ND (3.3) J	ND (4.1)	2.5 J	1.5 J
Endrin ketone	µg/kg	18,000	NE	0.36 J	ND (2)	0.29 J	0.46 J	2.5 J	5.5 J	2.6 J
gamma-BHC	µg/kg	440	NE	0.36 J	ND (2) J	0.51 J	0.28 J	ND (2.1) J	0.16 J	0.26 J
gamma-Chlordane	µg/kg	1,600	NE	27 J	8.3 J	68 J	23	7.8 J	19 J	9.8
Heptachlor	µg/kg	110	NE	0.34 J	ND (2) J	0.36 J	0.04 J	ND (2.1) J	ND (1.7) J	ND (1.7)
Heptachlor epoxide	µg/kg	53	NE	1.6 J	ND (2)	1.1 J	1.4 J	ND (2.1)	0.73 J	0.46 J
Methoxychlor	µg/kg	310,000	NE	27 J	4.4 J	8.5 J	ND (17) J	0.22 J	0.63 J	2.7 J
Toxaphene	µg/kg	440	NE	ND (200)	ND (200)	ND (200)	ND (250)	ND (210)	ND (230)	ND (200)

TABLE 3-45
1432 3rd Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 16b (Soil Screening Levels) for source of screening levels.

[2] Oakland background results are from background metal concentration studies conducted by the Lawrence Berkeley National Laboratory Environmental Restoration Program, 1995. Samples were taken from locations representing the Colluvian and Fill geologic unit.

[3] 1ft bgs samples were collected between 0.5 and 1ft bgs

[4] 3ft bgs samples were collected between 2.5 and 3 ft bgs

[5] For Arsenic, 0.062 mg/kg is the cancer endpoint; 22 mg/kg is the noncancer endpoint.

FD	field duplicate
ft bgs	feet below ground surface
mg/kg	milligrams per kilogram
ND	not detected above the laboratory's reporting limit shown in parentheses
J	estimated value
J+	estimated value, possible high bias
R	rejected for failure to meet quality control requirements

TABLE 3-46
1436 3rd Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening[1] Level	Oakland[2] Background Levels	1436SSa 1 ft bgs[3] 10/18/2006	1436SSa 3 ft bgs[4] 10/18/2006	1436SSb 1 ft bgs 10/18/2006	1436SSb 3 ft bgs 10/18/2006
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	1,200,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
1,1,2,2-Tetrachloroethane	µg/kg	410	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
1,1,2-Trichloroethane	µg/kg	730	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
1,1-Dichloroethane	µg/kg	2,800	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
1,1-Dichloroethene	µg/kg	120,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
1,1-Dichloropropene	µg/kg	NDRI	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
1,2,3-Trichlorobenzene	µg/kg	62,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
1,2,3-Trichloropropane	µg/kg	NDRI	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
1,2,4-Trichlorobenzene	µg/kg	62,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
1,2,4-Trimethylbenzene	µg/kg	NDRI	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
1,2-Dibromo-3-chloroprop	µg/kg	30	NE	ND (6.6)	ND (5.8)	ND (6.8)	ND (6)
1,2-Dibromoethane	µg/kg	32	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
1,2-Dichlorobenzene	µg/kg	600,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
1,2-Dichloroethane	µg/kg	280	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
1,2-Dichloropropane	µg/kg	340	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
1,3-Dichlorobenzene	µg/kg	530,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
1,3-Dichloropropane	µg/kg	NDRI	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
1,4-Dichlorobenzene	µg/kg	3,400	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
2-Hexanone	µg/kg	NDRI	NE	ND (27)	ND (23)	ND (27)	ND (24)
Acetone	µg/kg	14,000,000	NE	ND (27)	ND (23)	ND (27)	ND (12)
Benzene	µg/kg	640	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Bromochloromethane	µg/kg	NDRI	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Bromodichloromethane	µg/kg	820	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Bromoform	µg/kg	62,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Bromomethane	µg/kg	3,900	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Carbon disulfide	µg/kg	360,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Carbon tetrachloride	µg/kg	250	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Chlorobenzene	µg/kg	150,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Chloroethane	µg/kg	3,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (1.5)
Chloroform	µg/kg	940	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Chloromethane	µg/kg	47,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)

TABLE 3-46
1436 3rd Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	1436SSa 1 ft bgs[3] 10/18/2006	1436SSa 3 ft bgs[4] 10/18/2006	1436SSb 1 ft bgs 10/18/2006	1436SSb 3 ft bgs 10/18/2006
Volatile Organic Compounds							
cis-1,2-Dichloroethene	µg/kg	43,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
cis-1,3-Dichloropropene	µg/kg	780	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Dibromochloromethane	µg/kg	1,100	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Ethyl tert-butyl ether	µg/kg	32,000	NE	ND (13)	ND (12)	ND (14)	ND (12)
Ethylbenzene	µg/kg	400,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Freon 11	µg/kg	390,000	NE	ND (3.3)	4.1	15	5.8
Freon 113	µg/kg	5,600,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Freon 12	µg/kg	94,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (1.5)
Isopropyl ether	µg/kg	NDRI	NE	ND (13)	ND (12)	ND (14)	ND (12)
Isopropylbenzene (cumen	µg/kg	570,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Methyl ethyl ketone	µg/kg	22,000,000	NE	ND (27)	ND (23)	ND (27)	ND (24)
Methyl isobutyl ketone	µg/kg	5,300,000	NE	ND (27)	ND (23)	ND (27)	ND (24)
Methyl tert-butyl ether	µg/kg	32,000	NE	ND (13)	ND (12)	ND (14)	ND (12)
Methylene chloride	µg/kg	9,100	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Styrene	µg/kg	1,700,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
tert-Amyl methyl ether	µg/kg	32,000	NE	ND (13)	ND (12)	ND (14)	ND (12)
tert-Butyl alcohol	µg/kg	13,000,000	NE	ND (66)	ND (58)	ND (68)	ND (60)
Tetrachloroethene	µg/kg	480	NE	4.9	5.6	ND (3.4)	ND (3)
Toluene	µg/kg	520,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
trans-1,2-Dichloroethene	µg/kg	69,000	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
trans-1,3-Dichloropropene	µg/kg	780	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Trichloroethene	µg/kg	53	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Vinyl chloride	µg/kg	79	NE	ND (3.3)	ND (2.9)	ND (3.4)	ND (3)
Xylenes, total	µg/kg	270,000	NE	ND (6.6)	ND (5.8)	ND (6.8)	ND (6)
Semivolatile Organic Compounds							
1,1'-Biphenyl	µg/kg	3,000,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
1,2,4,5-Tetrachlorobenzen	µg/kg	3,200	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
1,4-Dioxane (p-dioxane)	µg/kg	44,000	NE	ND (440) J	ND (81) J	ND (400) J	ND (77) J
2,2'-Oxybis(1-Chloropropa	µg/kg	220	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
2,3,4,6-Tetrachlorophenol	µg/kg	NDRI	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
2,4,5-Trichlorophenol	µg/kg	6,100,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)

TABLE 3-46
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Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening[1] Level	Oakland[2] Background Levels	1436SSa 1 ft bgs[3] 10/18/2006	1436SSa 3 ft bgs[4] 10/18/2006	1436SSb 1 ft bgs 10/18/2006	1436SSb 3 ft bgs 10/18/2006
Semivolatile Organic Compounds							
2,4,6-Trichlorophenol	µg/kg	6,100	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
2,4-Dichlorophenol	µg/kg	180,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
2,4-Dimethylphenol	µg/kg	1,200,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
2,4-Dinitrophenol	µg/kg	120,000	NE	ND (2,200)	ND (400)	ND (2,000)	ND (380)
2,4-Dinitrotoluene	µg/kg	120,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
2,6-Dinitrotoluene	µg/kg	61,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
2-Chloronaphthalene	µg/kg	4,900,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
2-Chlorophenol	µg/kg	63,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
2-Methylnaphthalene	µg/kg	150,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
2-Methylphenol	µg/kg	3,100,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
2-Nitroaniline	µg/kg	180,000	NE	ND (2,200)	ND (400)	ND (2,000)	ND (380)
2-Nitrophenol	µg/kg	NDRI	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
3,3'-Dichlorobenzidine	µg/kg	1,100	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
3-Nitroaniline	µg/kg	18,000	NE	ND (2,200)	ND (400)	ND (2,000)	ND (380)
4,6-Dinitro-2-methylphenol	µg/kg	NDRI	NE	ND (2,200)	ND (400)	ND (2,000)	ND (380)
4-Bromophenylphenyl eth	µg/kg	NDRI	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
4-Chloro-3-methylphenol	µg/kg	3,100,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
4-Chloroaniline	µg/kg	240,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
4-Chlorophenylphenyl eth	µg/kg	NDRI	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
4-Methylphenol	µg/kg	310,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
4-Nitroaniline	µg/kg	23,000	NE	ND (2,200)	ND (400)	ND (2,000)	ND (380)
4-Nitrophenol	µg/kg	120,000	NE	ND (2,200)	ND (400)	ND (2,000)	ND (380)
Acenaphthene	µg/kg	3,700,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
Acenaphthylene	µg/kg	2,300,000	NE	500	ND (210)	ND (1,000)	ND (190)
Acetophenone	µg/kg	100,000,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
Anthracene	µg/kg	22,000,000	NE	820	ND (210)	130 J	ND (190)
Atrazine	µg/kg	2,200	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
Benzaldehyde	µg/kg	6,100,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
Benzo(a)anthracene	µg/kg	620	NE	**1,800**	66 J	**840 J**	46 J
Benzo(a)pyrene	µg/kg	62	NE	**2,400**	**82 J**	**1,200**	**74 J**
Benzo(b)fluoranthene	µg/kg	620	NE	**2,300**	100 J	**1,800**	95 J

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1436 3rd Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening[1] Level	Oakland[2] Background Levels	1436SSa 1 ft bgs[3] 10/18/2006	1436SSa 3 ft bgs[4] 10/18/2006	1436SSb 1 ft bgs 10/18/2006	1436SSb 3 ft bgs 10/18/2006
Semivolatile Organic Compounds							
Benzo(g,h,i)perylene	µg/kg	2,300,000	NE	960	45 J	1,300	63 J
Benzo(k)fluoranthene	µg/kg	380	NE	**980**	43 J	**610 J**	32 J
Benzyl butyl phthalate	µg/kg	12,000,000	NE	130	ND (210)	ND (1,000)	ND (190)
bis(2-Chloroethoxy)metha	µg/kg	220	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
bis(2-Chloroethyl)ether	µg/kg	220	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
bis(2-Ethylhexyl)phthalate	µg/kg	35,000	NE	570	51 J	8,900	60 J
Caprolactam	µg/kg	31,000,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
Carbazole	µg/kg	24,000	NE	120	ND (210)	ND (1,000)	ND (190)
Chrysene	µg/kg	3,800	NE	2,400	86 J	1,400	69 J
Dibenz(a,h)anthracene	µg/kg	62	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
Dibenzofuran	µg/kg	150,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
Diethylphthalate	µg/kg	49,000,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
Dimethylphthalate	µg/kg	100,000,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
Di-n-butyl phthalate	µg/kg	6,100,000	NE	ND (1,100)	28 J	380 J	140 J
Di-n-octyl phthalate	µg/kg	2,400,000	NE	ND (1,100)	ND (210)	240 J	ND (190)
Fluoranthene	µg/kg	2,300,000	NE	5,200	120 J	2,600	150 J
Fluorene	µg/kg	2,700,000	NE	390	ND (210)	ND (1,000)	ND (190)
Hexachlorobenzene	µg/kg	300	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
Hexachlorobutadiene	µg/kg	6,200	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
Hexachlorocyclopentadien	µg/kg	370,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
Hexachloroethane	µg/kg	35,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
Indeno(1,2,3-c,d)pyrene	µg/kg	620	NE	**1,300**	69 J	**1,100**	64 J
Isophorone	µg/kg	510,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
Naphthalene	µg/kg	1,700	NE	110	ND (210)	ND (1,000)	ND (190)
Nitrobenzene	µg/kg	20,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
N-Nitrosodi-n-propylamine	µg/kg	69	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
N-Nitrosodiphenylamine	µg/kg	99,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
Pentachlorophenol	µg/kg	3,000	NE	ND (2,200)	ND (400)	ND (2,000)	ND (380)
Phenanthrene	µg/kg	2,300,000	NE	5,000	70 J	1,100	76 J
Phenol	µg/kg	18,000,000	NE	ND (1,100)	ND (210)	ND (1,000)	ND (190)
Pyrene	µg/kg	2,300,000	NE	5,600 J	130 J	2,900	150 J

TABLE 3-46
1436 3rd Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening[1] Level	Oakland[2] Background Levels	1436SSa 1 ft bgs[3] 10/18/2006	1436SSa 3 ft bgs[4] 10/18/2006	1436SSb 1 ft bgs 10/18/2006	1436SSb 3 ft bgs 10/18/2006
Metals							
Aluminum	mg/kg	76,000	NE	4,210 J	5,650	8,910	4,690
Antimony	mg/kg	31	5.9	1.7 J	ND (7.3)	ND (7.3)	ND (6.8)
Arsenic[5]	mg/kg	0.062 / 22	***14***	***7.6 J***	***7.7***	***15.6***	***3.3***
Barium	mg/kg	5,400	NE	333 J	217	1,450	154
Beryllium	mg/kg	150	0.9	0.12 J	0.21 J	0.23 J	0.11 J
Cadmium	mg/kg	37	1.5	3 J	1.2	13	0.59
Calcium	mg/kg	NA	NE	**4,370 J**	**3,700**	**15,000**	**3,180**
Chromium	mg/kg	210	91.4	26.1 J	144	69.7	35.3
Cobalt	mg/kg	900	NE	4.2 J	6.3	10.2	5.3 J
Copper	mg/kg	3,100	59.6	234 J	147	927	51.3
Iron	mg/kg	23,000	NE	**23,500**	13,900	**27,700**	9,290
Lead[6]	mg/kg	194 / 340	14.7	**2,910**	**829**	**3,630**	***216 J+***
Magnesium	mg/kg	NA	NE	**1,230 J**	**1,630**	**4,060**	**1,580**
Manganese	mg/kg	1,800	NE	304 J	120	447	183
Mercury	mg/kg	23	0.3	1.7	1.9	1.9	0.49
Nickel	mg/kg	1,600	120.2	14.3 J	22.7	60	18.4
Potassium	mg/kg	NA	NE	**705 J**	**700**	**1,530**	**852**
Selenium	mg/kg	390	5.6	ND (4.2) J	0.69 J	ND (4.2)	0.52 J
Silver	mg/kg	390	1.7	2.8 J	2.7	6.2	0.7 J
Sodium	mg/kg	NA	NE	ND (595)	**2,460**	**8,190**	**739**
Thallium	mg/kg	5.2	**42.5**	1.1 J	ND (3)	ND (3)	ND (2.8)
Vanadium	mg/kg	78	NE	12.5 J	25.3	32.9	19.5
Zinc	mg/kg	23,000	91.5	1,580 J	977	3,200	231
Organochlorine Pesticides/PCBs							
4,4'-DDD	µg/kg	2,400	NE	9.9 J	0.81 J	12 J	ND (3.8)
4,4'-DDE	µg/kg	1,700	NE	300 J	ND (4)	93	3.1 J
4,4'-DDT	µg/kg	1,700	NE	1,600	17 J	320 J	12 J
Aldrin	µg/kg	29	NE	0.17 J	ND (2.1) J	0.57 J	ND (1.9) J
alpha-BHC	µg/kg	90	NE	0.9 J	ND (2.1)	0.71 J	ND (1.9)
alpha-Chlordane	µg/kg	1,600	NE	100 J	2.8 J	120 J	0.41 J
Aroclor-1016	µg/kg	3,900	NE	ND (43)	ND (40)	ND (40)	ND (38)

TABLE 3-46
1436 3rd Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	1436SSa 1 ft bgs[3] 10/18/2006	1436SSa 3 ft bgs[4] 10/18/2006	1436SSb 1 ft bgs 10/18/2006	1436SSb 3 ft bgs 10/18/2006
Organochlorine Pesticides/PCBs							
Aroclor-1221	µg/kg	220	NE	ND (43)	ND (40)	ND (40)	ND (38)
Aroclor-1232	µg/kg	220	NE	ND (43)	ND (40)	ND (40)	ND (38)
Aroclor-1242	µg/kg	220	NE	ND (43)	ND (40)	ND (40)	ND (38)
Aroclor-1248	µg/kg	220	NE	ND (43)	ND (40)	ND (40)	ND (38)
Aroclor-1254	µg/kg	220	NE	ND (43)	ND (40)	ND (40)	ND (38)
Aroclor-1260	µg/kg	220	NE	ND (43)	ND (40)	ND (40)	ND (38)
beta-BHC	µg/kg	320	NE	0.57 J	ND (2.1) J	2.7 J	ND (1.9) J
delta-BHC	µg/kg	90	NE	1.4 J	ND (2.1)	ND (2)	ND (1.9)
Dieldrin	µg/kg	30	NE	**1,000**	4.4 J	**36**	0.2 J
Endosulfan I	µg/kg	370,000	NE	0.79 J	ND (2.1)	1.5 J	ND (1.9)
Endosulfan II	µg/kg	370,000	NE	0.51 J	0.43 J	2.4 J	ND (3.8)
Endosulfan sulfate	µg/kg	370,000	NE	4.7 J	0.82 J	0.97 J	1.9 J
Endrin	µg/kg	18,000	NE	1.2 J	1.4 J	13 J	1.3 J
Endrin aldehyde	µg/kg	18,000	NE	ND (3.3) J	0.5 J	0.56 J	ND (3.8)
Endrin ketone	µg/kg	18,000	NE	8.7 J	0.65 J	1.7 J	0.59 J
gamma-BHC	µg/kg	440	NE	0.36 J	ND (2.1) J	ND (2) J	ND (1.9) J
gamma-Chlordane	µg/kg	1,600	NE	110 J	1.4 J	1.5 J	1 J
Heptachlor	µg/kg	110	NE	0.34 J	ND (2.1) J	1.3 J	ND (1.9) J
Heptachlor epoxide	µg/kg	53	NE	2.3 J	ND (2.1)	0.74 J	ND (1.9)
Methoxychlor	µg/kg	310,000	NE	45 J	2.5 J	29	0.42 J
Toxaphene	µg/kg	440	NE	ND (220)	ND (210)	ND (200)	ND (190)

TABLE 3-46
1436 3rd Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 16b (Soil Screening Levels) for source of screening levels.

[2] Oakland background results are from background metal concentration studies conducted by the Lawrence Berkeley National Laboratory Environmental Restoration Program, 1995. Samples were taken from locations representing the Colluvian and Fill geologic unit.

[3] 1ft bgs samples were collected between 0.5 and 1ft bgs

[4] 3ft bgs samples were collected between 2.5 and 3 ft bgs

[5] For Arsenic, 0.062 mg/kg is the cancer endpoint; 22 mg/kg is the noncancer endpoint.

ft bgs	feet below ground surface
mg/kg	milligrams per kilogram
ND	not detected above the laboratory's reporting limit shown in parentheses
J	estimated value
J+	estimated value, possible high bias

TABLE 3-47
326 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	326SSa 1 ft bgs[3] 10/18/2006	326SSa 3 ft bgs[4] 10/18/2006	326SSb 1 ft bgs 10/18/2006	326SSb 3 ft bgs 10/18/2006	326SSc 1 ft bgs 10/18/2006	326SSc 1 ft bgs (FD) 10/18/2006	326SSc 3 ft bgs 10/18/2006	326SSd 1 ft bgs 10/18/2006	326SSd 2.5 ft bgs 10/18/2006	326SSe 1 ft bgs 10/18/2006	326SSe 3 ft bgs 10/18/2006
Volatile Organic Compounds														
1,1,1-Trichloroethane	µg/kg	1,200,000	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (1.4)	ND (2.8)	ND (2.7)	ND (3.8)
1,1,2,2-Tetrachloroethane	µg/kg	410	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
1,1,2-Trichloroethane	µg/kg	730	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
1,1-Dichloroethane	µg/kg	2,800	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (2.7)	ND (4.4)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
1,1-Dichloroethene	µg/kg	120,000	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (2.7)	ND (4.4)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
1,1-Dichloropropene	µg/kg	NDRI	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (1.4)	ND (2.8)	ND (2.7)	ND (3.8)
1,2,3-Trichlorobenzene	µg/kg	62,000	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
1,2,3-Trichloropropane	µg/kg	NDRI	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
1,2,4-Trichlorobenzene	µg/kg	62,000	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
1,2,4-Trimethylbenzene	µg/kg	NDRI	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
1,2-Dibromo-3-chloroprop	µg/kg	30	NE	ND (5.9)	ND (4.8)	ND (5)	ND (5)	ND (5.4)	ND (8.8)	ND (15)	ND (5.5)	ND (5.6)	ND (11)	ND (15)
1,2-Dibromoethane	µg/kg	32	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
1,2-Dichlorobenzene	µg/kg	600,000	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
1,2-Dichloroethane	µg/kg	280	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (1.4)	ND (2.8)	ND (2.7)	ND (3.8)
1,2-Dichloropropane	µg/kg	340	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (1.4)	ND (2.8)	ND (2.7)	ND (3.8)
1,3-Dichlorobenzene	µg/kg	530,000	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
1,3-Dichloropropane	µg/kg	NDRI	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
1,4-Dichlorobenzene	µg/kg	3,400	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
2-Hexanone	µg/kg	NDRI	NE	ND (24)	ND (19)	ND (20)	ND (20)	ND (11)	ND (18)	ND (29)	ND (22)	ND (22)	ND (21)	ND (30)
Acetone	µg/kg	14,000,000	NE	16 J	12 J	ND (20)	ND (20)	ND (11)	64	ND (29)	20 J	ND (11)	ND (21)	ND (30)
Benzene	µg/kg	640	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (1.4)	ND (2.8)	ND (2.7)	ND (3.8)
Bromochloromethane	µg/kg	NDRI	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (2.7)	ND (4.4)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
Bromodichloromethane	µg/kg	820	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (1.4)	ND (2.8)	ND (2.7)	ND (3.8)
Bromoform	µg/kg	62,000	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
Bromomethane	µg/kg	3,900	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (2.7)	ND (4.4)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
Carbon disulfide	µg/kg	360,000	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (2.7)	ND (4.4)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
Carbon tetrachloride	µg/kg	250	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (1.4)	ND (2.8)	ND (2.7)	ND (3.8)
Chlorobenzene	µg/kg	150,000	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
Chloroethane	µg/kg	3,000	NE	ND (1.5)	ND (1.2)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (1.4)	ND (1.4)	ND (2.7)	ND (3.8)
Chloroform	µg/kg	940	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (2.7)	ND (4.4)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
Chloromethane	µg/kg	47,000	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (2.7)	ND (4.4)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)

TABLE 3-47
326 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	326SSa 1 ft bgs[3] 10/18/2006	326SSa 3 ft bgs[4] 10/18/2006	326SSb 1 ft bgs 10/18/2006	326SSb 3 ft bgs 10/18/2006	326SSc 1 ft bgs 10/18/2006	326SSc 1 ft bgs (FD) 10/18/2006	326SSc 3 ft bgs 10/18/2006	326SSd 1 ft bgs 10/18/2006	326SSd 2.5 ft bgs 10/18/2006	326SSe 1 ft bgs 10/18/2006	326SSe 3 ft bgs 10/18/2006
Volatile Organic Compounds														
cis-1,2-Dichloroethene	µg/kg	43,000	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (2.7)	ND (4.4)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
cis-1,3-Dichloropropene	µg/kg	780	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (1.4)	ND (2.8)	ND (2.7)	ND (3.8)
Dibromochloromethane	µg/kg	1,100	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
Ethyl tert-butyl ether	µg/kg	32,000	NE	ND (12)	ND (9.6)	ND (10)	ND (10)	ND (11)	ND (18)	ND (15)	ND (11)	ND (11)	ND (11)	ND (15)
Ethylbenzene	µg/kg	400,000	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
Freon 11	µg/kg	390,000	NE	4.9	2.7	2.2 J	3.8	8.2	14	11	5.3	8.5	9.2	11
Freon 113	µg/kg	5,600,000	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (2.7)	ND (4.4)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
Freon 12	µg/kg	94,000	NE	ND (1.5)	ND (1.2)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (1.4)	ND (1.4)	ND (2.7)	ND (3.8)
Isopropyl ether	µg/kg	NDRI	NE	ND (12)	ND (9.6)	ND (10)	ND (10)	ND (11)	ND (18)	ND (15)	ND (11)	ND (11)	ND (11)	ND (15)
Isopropylbenzene (cumen	µg/kg	570,000	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
Methyl ethyl ketone	µg/kg	22,000,000	NE	ND (24)	ND (19)	ND (20)	ND (20)	ND (11)	ND (35)	ND (29)	ND (22)	ND (22)	ND (21)	ND (30)
Methyl isobutyl ketone	µg/kg	5,300,000	NE	ND (24)	ND (19)	ND (20)	ND (20)	ND (11)	ND (18)	ND (29)	ND (11)	ND (11)	ND (21)	ND (30)
Methyl tert-butyl ether	µg/kg	32,000	NE	ND (12)	ND (9.6)	ND (10)	ND (10)	ND (5.4)	ND (18)	ND (15)	ND (11)	ND (11)	ND (11)	ND (15)
Methylene chloride	µg/kg	9,100	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (2.7)	ND (4.4)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
Styrene	µg/kg	1,700,000	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
tert-Amyl methyl ether	µg/kg	32,000	NE	ND (12)	ND (9.6)	ND (10)	ND (10)	ND (5.4)	ND (8.8)	ND (15)	ND (5.5)	ND (11)	ND (11)	ND (15)
tert-Butyl alcohol	µg/kg	13,000,000	NE	ND (59)	ND (48)	ND (50)	ND (50)	ND (27)	ND (44)	ND (73)	ND (27)	ND (28)	ND (53)	ND (76)
Tetrachloroethene	µg/kg	480	NE	ND (3)	ND (2.4)	2.9	9.7	ND (1.3)	ND (2.2)	ND (3.6)	4.4	11	ND (2.7)	ND (3.8)
Toluene	µg/kg	520,000	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
trans-1,2-Dichloroethene	µg/kg	69,000	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (2.7)	ND (4.4)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
trans-1,3-Dichloropropene	µg/kg	780	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
Trichloroethene	µg/kg	53	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (1.3)	ND (2.2)	ND (3.6)	ND (1.4)	ND (2.8)	ND (2.7)	ND (3.8)
Vinyl chloride	µg/kg	79	NE	ND (3)	ND (2.4)	ND (2.5)	ND (2.5)	ND (2.7)	ND (4.4)	ND (3.6)	ND (2.7)	ND (2.8)	ND (2.7)	ND (3.8)
Xylenes, total	µg/kg	270,000	NE	ND (5.9)	ND (4.8)	ND (5)	ND (5)	ND (2.7)	ND (4.4)	ND (7.3)	ND (5.5)	ND (5.6)	ND (5.3)	ND (7.6)
Semivolatile Organic Compounds														
1,1'-Biphenyl	µg/kg	3,000,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
1,2,4,5-Tetrachlorobenzen	µg/kg	3,200	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
1,4-Dioxane (p-dioxane)	µg/kg	44,000	NE	ND (75) J	ND (80) J	ND (76) J	ND (86) J	ND (77) J	ND (75) J	ND (83) J	ND (86) J	ND (86) J	ND (73) J	ND (87) J
2,2'-Oxybis(1-Chloropropa	µg/kg	220	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
2,3,4,6-Tetrachlorophenol	µg/kg	NDRI	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
2,4,5-Trichlorophenol	µg/kg	6,100,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)

TABLE 3-47
326 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	326SSa 1 ft bgs[3] 10/18/2006	326SSa 3 ft bgs[4] 10/18/2006	326SSb 1 ft bgs 10/18/2006	326SSb 3 ft bgs 10/18/2006	326SSc 1 ft bgs 10/18/2006	326SSc 1 ft bgs (FD) 10/18/2006	326SSc 3 ft bgs 10/18/2006	326SSd 1 ft bgs 10/18/2006	326SSd 2.5 ft bgs 10/18/2006	326SSe 1 ft bgs 10/18/2006	326SSe 3 ft bgs 10/18/2006
Semivolatile Organic Compounds														
2,4,6-Trichlorophenol	µg/kg	6,100	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
2,4-Dichlorophenol	µg/kg	180,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
2,4-Dimethylphenol	µg/kg	1,200,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
2,4-Dinitrophenol	µg/kg	120,000	NE	ND (370)	ND (400)	ND (370)	ND (420)	ND (380)	ND (370)	ND (410)	ND (430)	ND (420)	ND (360)	ND (430)
2,4-Dinitrotoluene	µg/kg	120,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
2,6-Dinitrotoluene	µg/kg	61,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
2-Chloronaphthalene	µg/kg	4,900,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
2-Chlorophenol	µg/kg	63,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
2-Methylnaphthalene	µg/kg	150,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	35 J	ND (210)	ND (220)	30 J	ND (190)	ND (220)
2-Methylphenol	µg/kg	3,100,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
2-Nitroaniline	µg/kg	180,000	NE	ND (370)	ND (400)	ND (370)	ND (420)	ND (380)	ND (370)	ND (410)	ND (430)	ND (420)	ND (360)	ND (430)
2-Nitrophenol	µg/kg	NDRI	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
3,3'-Dichlorobenzidine	µg/kg	1,100	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
3-Nitroaniline	µg/kg	18,000	NE	ND (370)	ND (400)	ND (370)	ND (420)	ND (380)	ND (370)	ND (410)	ND (430)	ND (420)	ND (360)	ND (430)
4,6-Dinitro-2-methylphenol	µg/kg	NDRI	NE	ND (370)	ND (400)	ND (370)	ND (420)	ND (380)	ND (370)	ND (410)	ND (430)	ND (420)	ND (360)	ND (430)
4-Bromophenylphenyl eth	µg/kg	NDRI	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
4-Chloro-3-methylphenol	µg/kg	3,100,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
4-Chloroaniline	µg/kg	240,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
4-Chlorophenylphenyl eth	µg/kg	NDRI	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
4-Methylphenol	µg/kg	310,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
4-Nitroaniline	µg/kg	23,000	NE	ND (370)	ND (400)	ND (370)	ND (420)	ND (380)	ND (370)	ND (410)	ND (430)	ND (420)	ND (360)	ND (430)
4-Nitrophenol	µg/kg	120,000	NE	ND (370)	ND (400)	ND (370)	ND (420)	ND (380)	ND (370)	ND (410)	ND (430)	ND (420)	ND (360)	ND (430)
Acenaphthene	µg/kg	3,700,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
Acenaphthylene	µg/kg	2,300,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
Acetophenone	µg/kg	100,000,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
Anthracene	µg/kg	22,000,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	20 J	ND (190)	ND (210)	40 J	100 J	29 J	ND (220)
Atrazine	µg/kg	2,200	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
Benzaldehyde	µg/kg	6,100,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
Benzo(a)anthracene	µg/kg	620	NE	54 J	ND (200)	38 J	ND (220)	66 J	41 J	29 J	170 J	280	94 J	46 J
Benzo(a)pyrene	µg/kg	62	NE	**75 J**	ND (200)	45 J	ND (220)	**100 J**	56 J	39 J	**220**	**270**	**140 J**	62 J
Benzo(b)fluoranthene	µg/kg	620	NE	96 J	ND (200)	51 J	22 J	110 J	90 J	50 J	260	280	170 J	83 J

TABLE 3-47
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Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	326SSa 1 ft bgs[3] 10/18/2006	326SSa 3 ft bgs[4] 10/18/2006	326SSb 1 ft bgs 10/18/2006	326SSb 3 ft bgs 10/18/2006	326SSc 1 ft bgs 10/18/2006	326SSc 1 ft bgs (FD) 10/18/2006	326SSc 3 ft bgs 10/18/2006	326SSd 1 ft bgs 10/18/2006	326SSd 2.5 ft bgs 10/18/2006	326SSe 1 ft bgs 10/18/2006	326SSe 3 ft bgs 10/18/2006
Semivolatile Organic Compounds														
Benzo(g,h,i)perylene	µg/kg	2,300,000	NE	47 J	ND (200)	ND (190)	ND (220)	22 J	53 J	22 J	180 J	34 J	42 J	ND (220)
Benzo(k)fluoranthene	µg/kg	380	NE	42 J	ND (200)	23 J	ND (220)	56 J	35 J	26 J	110 J	140 J	86 J	35 J
Benzyl butyl phthalate	µg/kg	12,000,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	85 J	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
bis(2-Chloroethoxy)metha	µg/kg	220	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
bis(2-Chloroethyl)ether	µg/kg	220	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
bis(2-Ethylhexyl)phthalate	µg/kg	35,000	NE	200	38 J	59 J	ND (220)	ND (200)	3,600	110 J	55 J	ND (220)	ND (190)	ND (220)
Caprolactam	µg/kg	31,000,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
Carbazole	µg/kg	24,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	31 J	ND (190)	ND (220)
Chrysene	µg/kg	3,800	NE	85 J	ND (200)	44 J	ND (220)	99 J	71 J	46 J	210 J	340	140 J	66 J
Dibenz(a,h)anthracene	µg/kg	62	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
Dibenzofuran	µg/kg	150,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	22 J	ND (190)	ND (220)
Diethylphthalate	µg/kg	49,000,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
Dimethylphthalate	µg/kg	100,000,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
Di-n-butyl phthalate	µg/kg	6,100,000	NE	42 J	90 J	37 J	ND (220)	ND (200)	170 J	ND (210)	150 J	ND (220)	ND (190)	ND (220)
Di-n-octyl phthalate	µg/kg	2,400,000	NE	24 J	ND (200)	21 J	ND (220)	ND (200)	91 J	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
Fluoranthene	µg/kg	2,300,000	NE	120 J	ND (200)	68 J	26 J	160 J	89 J	67 J	360	590	240	100 J
Fluorene	µg/kg	2,700,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	40 J	ND (190)	ND (220)
Hexachlorobenzene	µg/kg	300	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
Hexachlorobutadiene	µg/kg	6,200	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
Hexachlorocyclopentadien	µg/kg	370,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
Hexachloroethane	µg/kg	35,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
Indeno(1,2,3-c,d)pyrene	µg/kg	620	NE	56 J	ND (200)	39 J	ND (220)	70 J	62 J	28 J	170 J	140 J	110 J	44 J
Isophorone	µg/kg	510,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
Naphthalene	µg/kg	1,700	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	23 J	ND (210)	ND (220)	22 J	ND (190)	ND (220)
Nitrobenzene	µg/kg	20,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
N-Nitrosodi-n-propylamine	µg/kg	69	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
N-Nitrosodiphenylamine	µg/kg	99,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
Pentachlorophenol	µg/kg	3,000	NE	ND (370)	ND (400)	ND (370)	ND (420)	ND (380)	ND (370)	ND (410)	ND (430)	ND (420)	ND (360)	ND (430)
Phenanthrene	µg/kg	2,300,000	NE	73 J	ND (200)	52 J	ND (220)	89 J	78 J	61 J	150 J	440	120 J	50 J
Phenol	µg/kg	18,000,000	NE	ND (190)	ND (200)	ND (190)	ND (220)	ND (200)	ND (190)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)
Pyrene	µg/kg	2,300,000	NE	110 J	ND (200)	72 J	23 J	150 J	110 J	67 J	320	500	220	94 J

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Metals														
Aluminum	mg/kg	76,000	NE	5,030	4,540	3,000	2,210	2,460 J	4,280 J	2,200	7,250	2,890	3,120	9,120
Antimony	mg/kg	31	5.9	ND (6.4)	ND (7.1)	ND (7.3)	ND (7.6)	ND (7.7)	0.81 J	ND (7.8)	ND (6.9)	0.6 J	1.2 J	13
Arsenic[5]	mg/kg	0.062 / 22	***14***	***6***	***2.8***	***5.5***	***3.5***	***10.4***	***9.6***	***8.5***	**451**	**125**	***7.5***	***15.5***
Barium	mg/kg	5,400	NE	161	99.4	114	48.3	173 J	483 J	112	907	195	379	487
Beryllium	mg/kg	150	0.9	0.11 J	0.07 J	0.13 J	0.07 J	0.08 J	0.14 J	0.07 J	0.31 J	0.12 J	0.13 J	0.48 J
Cadmium	mg/kg	37	1.5	0.89	0.11 J	0.33 J	0.19 J	0.53 J	2.6	0.53 J	4.1	0.68	2.1	1.7
Calcium	mg/kg	NA	NE	**2,650**	**2,600**	**2,250**	**1,730**	**1,660 J**	**4,250 J**	**1,960**	**10,900**	**5,470**	**4,360**	**19,400**
Chromium	mg/kg	210	91.4	33.8	28.9	13.8	12.5	14.7 J	42.5 J	12.2	77.5	31.2	25.6	19.2
Cobalt	mg/kg	900	NE	5.1 J	4.4 J	2.5 J	2 J	2.2 J	5.7 J	2 J	7.2	2.2 J	3.6 J	4.7 J
Copper	mg/kg	3,100	59.6	44.6	16.9	46.7	8.7	40.5 J	120 J	48.7	173	45.5	109	110
Iron	mg/kg	23,000	NE	9,630	8,510	5,090	6,000	5,270 J	17,400 J	8,370	**25,400**	5,530	13,600	9,050
Lead[6]	mg/kg	194 / 340	14.7	***274***	35.9	***261 J+***	179	167 J+	**389 J+**	***284***	**28,600**	**631 J+**	**1,270 J+**	**53,000 J**
Magnesium	mg/kg	NA	NE	**1,780**	**1,410**	**1,010**	**701**	**784 J**	**1,660 J**	**612 J**	**2,190**	**982**	**1,160**	**2,080**
Manganese	mg/kg	1,800	NE	187	251	202	53	175 J	465 J	78.2	352	278	309	305
Mercury	mg/kg	23	0.3	0.41	0.1 J	0.22	0.36	0.55	1	4.4	0.62	0.82	0.69	0.61
Nickel	mg/kg	1,600	120.2	20.2	17.6	8.6	10.6	9.5 J	34.1 J	7.7	27.9	8.4	15.4	14.5
Potassium	mg/kg	NA	NE	**905**	**666**	**561 J**	**356 J**	**409 J**	**671**	**310 J**	**1,360**	**643**	**762**	**1,320**
Selenium	mg/kg	390	5.6	0.55 J	0.52 J	ND (4.3)	ND (4.4)	ND (4.5)	ND (4.1)	ND (4.6)	0.57 J	ND (4.1)	ND (3.8)	ND (4.7)
Silver	mg/kg	390	1.7	0.68 J	0.47 J	0.18 J	ND (1.3)	0.2 J	0.8 J	0.35 J	2.6	0.21 J	0.8 J	5.3
Sodium	mg/kg	NA	NE	**833**	**303 J**	ND (607)	ND (635)	ND (642)	ND (585)	ND (652)	**5,940**	ND (587)	ND (545)	**1,540**
Thallium	mg/kg	5.2	**42.5**	ND (2.7)	ND (2.9)	ND (3)	ND (3.2)	0.7 J	1.3 J	ND (3.3)	ND (2.9)	0.58 J	0.95 J	ND (3.4)
Vanadium	mg/kg	78	NE	21.9	19.4	10.2	8.1	8.5 J	16.9 J	8.2	24.5	8	13	21.3
Zinc	mg/kg	23,000	91.5	298	63.2	139	72.4	175 J	555 J	206	2,380	251	732	344
Organochlorine Pesticides/PCBs														
4,4'-DDD	µg/kg	2,400	NE	13 J	0.36 J	0.39 J	0.48 J	490 J	1,000 J	45 J	400	780	15 J	3.5 J
4,4'-DDE	µg/kg	1,700	NE	180	8.1 J	1.1 J	ND (3.3) J	**2,100 J**	**11,000 J**	590 J	740 J	810 J	150	33
4,4'-DDT	µg/kg	1,700	NE	14 J	25 J	47	2.4 J	9 J	**3,100 J**	**4,400 J**	**2,200**	**3,000**	400 J	73
Aldrin	µg/kg	29	NE	ND (1.9) J	ND (2) R	ND (3.8) J	ND (2.2) J	1.7 J	ND (190) J	ND (2.1) J	1.6 J	ND (2.2)	ND (1.9)	ND (2.2)
alpha-BHC	µg/kg	90	NE	ND (1.9)	ND (2) R	ND (3.8)	0.24 J	ND (2)	ND (190)	ND (2.1)	ND (2.2)	ND (2.2)	ND (1.9)	0.24 J
alpha-Chlordane	µg/kg	1,600	NE	2.3 J	ND (2) R	ND (3.8)	0.29 J	7.9 J	ND (190)	0.59 J	0.55 J	0.5 J	3.3 J	0.65 J
Aroclor-1016	µg/kg	3,900	NE	ND (37)	ND (40)	ND (37)	ND (42)	ND (38)	ND (37)	ND (41)	ND (43)	ND (42)	ND (36)	ND (43)

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Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	326SSa 1 ft bgs[3] 10/18/2006	326SSa 3 ft bgs[4] 10/18/2006	326SSb 1 ft bgs 10/18/2006	326SSb 3 ft bgs 10/18/2006	326SSc 1 ft bgs 10/18/2006	326SSc 1 ft bgs (FD) 10/18/2006	326SSc 3 ft bgs 10/18/2006	326SSd 1 ft bgs 10/18/2006	326SSd 2.5 ft bgs 10/18/2006	326SSe 1 ft bgs 10/18/2006	326SSe 3 ft bgs 10/18/2006
Organochlorine Pesticides/PCBs														
Aroclor-1221	µg/kg	220	NE	ND (37)	ND (40)	ND (37)	ND (42)	ND (38)	ND (37)	ND (41)	ND (43)	ND (42)	ND (36)	ND (43)
Aroclor-1232	µg/kg	220	NE	ND (37)	ND (40)	ND (37)	ND (42)	ND (38)	ND (37)	ND (41)	ND (43)	ND (42)	ND (36)	ND (43)
Aroclor-1242	µg/kg	220	NE	ND (37)	ND (40)	ND (37)	ND (42)	ND (38)	ND (37)	ND (41)	ND (43)	ND (42)	ND (36)	ND (43)
Aroclor-1248	µg/kg	220	NE	ND (37)	ND (40)	ND (37)	ND (42)	ND (38)	ND (37)	ND (41)	ND (43)	ND (42)	ND (36)	ND (43)
Aroclor-1254	µg/kg	220	NE	ND (37)	ND (40)	ND (37)	ND (42)	ND (38)	ND (37)	ND (41)	ND (43)	ND (42)	ND (36)	ND (43)
Aroclor-1260	µg/kg	220	NE	ND (37)	ND (40)	ND (37)	ND (42)	ND (38)	ND (37)	ND (41)	ND (43)	ND (42)	ND (36)	ND (43)
beta-BHC	µg/kg	320	NE	ND (1.9) J	ND (2) J	ND (3.8) J	0.054 J	1.4 J	ND (190)	0.2 J	ND (2.2)	0.57 J	0.86 J	2.4
delta-BHC	µg/kg	90	NE	0.28 J	ND (2) R	ND (3.8)	ND (2.2)	ND (2)	ND (190)	0.24 J	0.25 J	0.62 J	ND (1.9)	ND (2.2)
Dieldrin	µg/kg	30	NE	0.34 J	ND (4) R	ND (7.4)	ND (3.3) J	**160 J**	23 J	13	1.4 J	9.8 J	ND (3.6)	0.47 J
Endosulfan I	µg/kg	370,000	NE	1.6 J	ND (2) R	ND (3.8)	ND (2.2)	5.7 J	ND (190)	0.67 J	0.6 J	0.34 J	ND (1.9)	ND (2.2)
Endosulfan II	µg/kg	370,000	NE	0.35 J	ND (4) R	ND (7.4)	ND (4.2)	5.9 J	32 J	3 J	2.5 J	0.77 J	1.5 J	0.42 J
Endosulfan sulfate	µg/kg	370,000	NE	3 J	ND (4) R	ND (7.4)	0.37 J	6.8 J	ND (370)	1.6 J	0.78 J	1.2 J	0.35 J	ND (4.3)
Endrin	µg/kg	18,000	NE	0.44 J	0.21 J	ND (7.4)	3.5 J	0.78 J	ND (370)	0.26 J	340 J	0.28 J	0.82 J	0.44 J
Endrin aldehyde	µg/kg	18,000	NE	ND (3.7)	0.47 J	ND (7.4)	ND (3.3) J	0.75 J	24 J	ND (3.3) J	0.33 J	ND (4.2)	1.3 J	0.28 J
Endrin ketone	µg/kg	18,000	NE	0.34 J	1.5 J	0.53 J	0.41 J	5.2 J	ND (190)	0.95 J	0.44 J	1.6 J	0.21 J	0.33 J
gamma-BHC	µg/kg	440	NE	5 J	ND (2) R	ND (3.8) J	0.2 J	3.7 J	ND (190) J	0.27 J	220 J	26 J	ND (1.9)	1 J
gamma-Chlordane	µg/kg	1,600	NE	0.23 J	0.57 J	ND (3.8)	ND (1.7) J	4	110 J	1.7 J	22	23 J	3.1 J	0.73 J
Heptachlor	µg/kg	110	NE	ND (1.9) J	ND (2) R	ND (3.8) J	ND (2.2) J	0.66 J	ND (190) J	ND (2.1) J	ND (2.2) J	ND (2.2)	ND (1.9)	ND (2.2)
Heptachlor epoxide	µg/kg	53	NE	0.47 J	ND (2) R	ND (3.8)	ND (2.2)	4.3 J	ND (190)	0.49 J	ND (2.2)	0.34 J	ND (1.9)	ND (2.2)
Methoxychlor	µg/kg	310,000	NE	31	0.79 J	1.8 J	ND (17) J	12 J	82 J	26	5.9 J	6.2 J	9.5 J	3.4 J
Toxaphene	µg/kg	440	NE	ND (190)	ND (200) R	ND (380)	ND (220)	ND (200)	ND (19,000)	ND (210)	ND (220)	ND (220)	ND (190)	ND (220)

TABLE 3-47
326 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 16b (Soil Screening Levels) for source of screening levels.

[2] Oakland background results are from background metal concentration studies conducted by the Lawrence Berkeley National Laboratory Environmental Restoration Program, 1995. Samples were taken from locations representing the Colluvian and Fill geologic unit.

[3] 1ft bgs samples were collected between 0.5 and 1ft bgs

[4] 3ft bgs samples were collected between 2.5 and 3 ft bgs

[5] For Arsenic, 0.062 mg/kg is the cancer endpoint; 22 mg/kg is the noncancer endpoint.

FD	field duplicate
ft bgs	feet below ground surface
mg/kg	milligrams per kilogram
ND	not detected above the laboratory's reporting limit shown in parentheses
J	estimated value
J+	estimated value, possible high bias
R	rejected for failure to meet quality control requirements

TABLE 3-48
356 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening[1] Level	Oakland[2] Background Levels	356SSa 1 ft bgs[3] 10/18/2006	356SSa 1 ft bgs (FD) 10/18/2006	356SSa 3 ft bgs[4] 10/18/2006	356SSb 1 ft bgs 10/18/2006	356SSb 3 ft bgs 10/18/2006	356SSc 1 ft bgs 10/18/2006	356SSc 3 ft bgs 10/18/2006
Volatile Organic Compounds										
1,1,1-Trichloroethane	µg/kg	1,200,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
1,1,2,2-Tetrachloroethane	µg/kg	410	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
1,1,2-Trichloroethane	µg/kg	730	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
1,1-Dichloroethane	µg/kg	2,800	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (3.3)	ND (2.4)
1,1-Dichloroethene	µg/kg	120,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
1,1-Dichloropropene	µg/kg	NDRI	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
1,2,3-Trichlorobenzene	µg/kg	62,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (3.3)	ND (2.4)
1,2,3-Trichloropropane	µg/kg	NDRI	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
1,2,4-Trichlorobenzene	µg/kg	62,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (3.3)	ND (2.4)
1,2,4-Trimethylbenzene	µg/kg	NDRI	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (3.3)	ND (2.4)
1,2-Dibromo-3-chloroprop	µg/kg	30	NE	ND (12)	ND (12)	ND (12)	ND (15)	ND (10)	ND (6.7)	ND (9.4)
1,2-Dibromoethane	µg/kg	32	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
1,2-Dichlorobenzene	µg/kg	600,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
1,2-Dichloroethane	µg/kg	280	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (3.3)	ND (2.4)
1,2-Dichloropropane	µg/kg	340	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
1,3-Dichlorobenzene	µg/kg	530,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
1,3-Dichloropropane	µg/kg	NDRI	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
1,4-Dichlorobenzene	µg/kg	3,400	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
2-Hexanone	µg/kg	NDRI	NE	ND (24)	ND (24)	ND (25)	ND (30)	ND (20)	ND (13)	ND (19)
Acetone	µg/kg	14,000,000	NE	ND (24)	ND (24)	ND (25)	ND (30)	ND (20)	ND (13)	ND (19)
Benzene	µg/kg	640	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
Bromochloromethane	µg/kg	NDRI	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (3.3)	ND (2.4)
Bromodichloromethane	µg/kg	820	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
Bromoform	µg/kg	62,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
Bromomethane	µg/kg	3,900	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
Carbon disulfide	µg/kg	360,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (3.3)	ND (2.4)
Carbon tetrachloride	µg/kg	250	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
Chlorobenzene	µg/kg	150,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
Chloroethane	µg/kg	3,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
Chloroform	µg/kg	940	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
Chloromethane	µg/kg	47,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (3.3)	ND (2.4)

TABLE 3-48
356 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	356SSa 1 ft bgs[3] 10/18/2006	356SSa 1 ft bgs (FD) 10/18/2006	356SSa 3 ft bgs[4] 10/18/2006	356SSb 1 ft bgs 10/18/2006	356SSb 3 ft bgs 10/18/2006	356SSc 1 ft bgs 10/18/2006	356SSc 3 ft bgs 10/18/2006
Volatile Organic Compounds										
cis-1,2-Dichloroethene	µg/kg	43,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
cis-1,3-Dichloropropene	µg/kg	780	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
Dibromochloromethane	µg/kg	1,100	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
Ethyl tert-butyl ether	µg/kg	32,000	NE	ND (12)	ND (12)	ND (12)	ND (15)	ND (10)	ND (13)	ND (9.4)
Ethylbenzene	µg/kg	400,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
Freon 11	µg/kg	390,000	NE	11	7.4	5.3	7	7.8	ND (3.3)	6.1
Freon 113	µg/kg	5,600,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
Freon 12	µg/kg	94,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
Isopropyl ether	µg/kg	NDRI	NE	ND (12)	ND (12)	ND (12)	ND (15)	ND (10)	ND (13)	ND (9.4)
Isopropylbenzene (cumen	µg/kg	570,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (3.3)	ND (2.4)
Methyl ethyl ketone	µg/kg	22,000,000	NE	ND (24)	ND (24)	ND (25)	ND (30)	ND (20)	ND (13)	ND (19)
Methyl isobutyl ketone	µg/kg	5,300,000	NE	ND (24)	ND (24)	ND (25)	ND (30)	ND (20)	ND (27)	ND (19)
Methyl tert-butyl ether	µg/kg	32,000	NE	ND (12)	ND (12)	ND (12)	ND (15)	ND (10)	ND (13)	ND (9.4)
Methylene chloride	µg/kg	9,100	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (3.3)	ND (2.4)
Styrene	µg/kg	1,700,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
tert-Amyl methyl ether	µg/kg	32,000	NE	ND (12)	ND (12)	ND (12)	ND (15)	ND (10)	ND (13)	ND (9.4)
tert-Butyl alcohol	µg/kg	13,000,000	NE	ND (60)	ND (61)	ND (61)	ND (75)	ND (51)	ND (67)	ND (47)
Tetrachloroethene	µg/kg	480	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
Toluene	µg/kg	520,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
trans-1,2-Dichloroethene	µg/kg	69,000	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
trans-1,3-Dichloropropene	µg/kg	780	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
Trichloroethene	µg/kg	53	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
Vinyl chloride	µg/kg	79	NE	ND (3)	ND (3.1)	ND (3.1)	ND (3.8)	ND (2.6)	ND (1.7)	ND (2.4)
Xylenes, total	µg/kg	270,000	NE	ND (6)	ND (6.1)	ND (6.1)	ND (7.5)	ND (5.1)	ND (3.3)	ND (4.7)
Semivolatile Organic Compounds										
1,1'-Biphenyl	µg/kg	3,000,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
1,2,4,5-Tetrachlorobenzen	µg/kg	3,200	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
1,4-Dioxane (p-dioxane)	µg/kg	44,000	NE	ND (370) J	ND (73) J	ND (79) J	ND (89) J	ND (83) J	ND (73) J	ND (76) J
2,2'-Oxybis(1-Chloropropa	µg/kg	220	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210) R	ND (190)	ND (190)
2,3,4,6-Tetrachlorophenol	µg/kg	NDRI	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
2,4,5-Trichlorophenol	µg/kg	6,100,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)

TABLE 3-48
356 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	356SSa 1 ft bgs[3] 10/18/2006	356SSa 1 ft bgs (FD) 10/18/2006	356SSa 3 ft bgs[4] 10/18/2006	356SSb 1 ft bgs 10/18/2006	356SSb 3 ft bgs 10/18/2006	356SSc 1 ft bgs 10/18/2006	356SSc 3 ft bgs 10/18/2006
Semivolatile Organic Compounds										
2,4,6-Trichlorophenol	µg/kg	6,100	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
2,4-Dichlorophenol	µg/kg	180,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
2,4-Dimethylphenol	µg/kg	1,200,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
2,4-Dinitrophenol	µg/kg	120,000	NE	ND (1,800)	ND (1,800)	ND (390)	ND (440)	ND (410)	ND (360)	ND (380)
2,4-Dinitrotoluene	µg/kg	120,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210) R	ND (190)	ND (190)
2,6-Dinitrotoluene	µg/kg	61,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210) R	ND (190)	ND (190)
2-Chloronaphthalene	µg/kg	4,900,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
2-Chlorophenol	µg/kg	63,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210) R	ND (190)	ND (190)
2-Methylnaphthalene	µg/kg	150,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
2-Methylphenol	µg/kg	3,100,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
2-Nitroaniline	µg/kg	180,000	NE	ND (1,800)	ND (1,800)	ND (390)	ND (440)	ND (410)	ND (360)	ND (380)
2-Nitrophenol	µg/kg	NDRI	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210) R	ND (190)	ND (190)
3,3'-Dichlorobenzidine	µg/kg	1,100	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
3-Nitroaniline	µg/kg	18,000	NE	ND (1,800)	ND (1,800)	ND (390)	ND (440)	ND (410)	ND (360)	ND (380)
4,6-Dinitro-2-methylphenol	µg/kg	NDRI	NE	ND (1,800)	ND (1,800)	ND (390)	ND (440)	ND (410)	ND (360)	ND (380)
4-Bromophenylphenyl eth	µg/kg	NDRI	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
4-Chloro-3-methylphenol	µg/kg	3,100,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
4-Chloroaniline	µg/kg	240,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
4-Chlorophenylphenyl eth	µg/kg	NDRI	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
4-Methylphenol	µg/kg	310,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
4-Nitroaniline	µg/kg	23,000	NE	ND (1,800)	ND (1,800)	ND (390)	ND (440)	ND (410)	ND (360)	ND (380)
4-Nitrophenol	µg/kg	120,000	NE	ND (1,800)	ND (1,800)	ND (390)	ND (440)	ND (410)	ND (360)	ND (380)
Acenaphthene	µg/kg	3,700,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
Acenaphthylene	µg/kg	2,300,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
Acetophenone	µg/kg	100,000,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210) R	ND (190)	ND (190)
Anthracene	µg/kg	22,000,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
Atrazine	µg/kg	2,200	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
Benzaldehyde	µg/kg	6,100,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210) J	ND (190)	ND (190)
Benzo(a)anthracene	µg/kg	620	NE	210	130 J	20 J	93 J	38 J	37 J	ND (190)
Benzo(a)pyrene	µg/kg	62	NE	**430**	**280 J**	27 J	**190 J**	51 J	49 J	ND (190)
Benzo(b)fluoranthene	µg/kg	620	NE	520	310 J	36 J	240	66 J	58 J	24 J

TABLE 3-48
356 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	356SSa 1 ft bgs[3] 10/18/2006	356SSa 1 ft bgs (FD) 10/18/2006	356SSa 3 ft bgs[4] 10/18/2006	356SSb 1 ft bgs 10/18/2006	356SSb 3 ft bgs 10/18/2006	356SSc 1 ft bgs 10/18/2006	356SSc 3 ft bgs 10/18/2006
Semivolatile Organic Compounds										
Benzo(g,h,i)perylene	µg/kg	2,300,000	NE	210	270 J	ND (200)	140 J	27 J	41 J	ND (190)
Benzo(k)fluoranthene	µg/kg	380	NE	200	130 J	ND (200)	90 J	23 J	ND (190)	ND (190)
Benzyl butyl phthalate	µg/kg	12,000,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
bis(2-Chloroethoxy)metha	µg/kg	220	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210) R	ND (190)	ND (190)
bis(2-Chloroethyl)ether	µg/kg	220	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210) R	ND (190)	ND (190)
bis(2-Ethylhexyl)phthalate	µg/kg	35,000	NE	440	210 J	23 J	170 J	21 J	33 J	ND (190)
Caprolactam	µg/kg	31,000,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
Carbazole	µg/kg	24,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
Chrysene	µg/kg	3,800	NE	350	230 J	21 J	150 J	52 J	52 J	ND (190)
Dibenz(a,h)anthracene	µg/kg	62	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
Dibenzofuran	µg/kg	150,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
Diethylphthalate	µg/kg	49,000,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
Dimethylphthalate	µg/kg	100,000,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
Di-n-butyl phthalate	µg/kg	6,100,000	NE	ND (930)	190 J	96 J	ND (230)	ND (210)	100 J	ND (190)
Di-n-octyl phthalate	µg/kg	2,400,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
Fluoranthene	µg/kg	2,300,000	NE	520	270 J	26 J	160 J	77 J	74 J	26 J
Fluorene	µg/kg	2,700,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
Hexachlorobenzene	µg/kg	300	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
Hexachlorobutadiene	µg/kg	6,200	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
Hexachlorocyclopentadien	µg/kg	370,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
Hexachloroethane	µg/kg	35,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210) R	ND (190)	ND (190)
Indeno(1,2,3-c,d)pyrene	µg/kg	620	NE	310	270 J	26 J	180 J	36 J	46 J	ND (190)
Isophorone	µg/kg	510,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210) R	ND (190)	ND (190)
Naphthalene	µg/kg	1,700	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)
Nitrobenzene	µg/kg	20,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210) R	ND (190)	ND (190)
N-Nitrosodi-n-propylamine	µg/kg	69	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210) R	ND (190)	ND (190)
N-Nitrosodiphenylamine	µg/kg	99,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210) R	ND (190)	ND (190)
Pentachlorophenol	µg/kg	3,000	NE	ND (1,800)	ND (1,800)	ND (390)	ND (440)	ND (410)	ND (360) J	ND (380)
Phenanthrene	µg/kg	2,300,000	NE	210 J	100 J	ND (200)	67 J	58 J	52 J	ND (190)
Phenol	µg/kg	18,000,000	NE	ND (930)	ND (920)	ND (200)	ND (230)	ND (210) J	ND (190)	ND (190)
Pyrene	µg/kg	2,300,000	NE	520	310 J	29 J	160 J	73 J	81 J	22 J

TABLE 3-48
356 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	356SSa 1 ft bgs[3] 10/18/2006	356SSa 1 ft bgs (FD) 10/18/2006	356SSa 3 ft bgs[4] 10/18/2006	356SSb 1 ft bgs 10/18/2006	356SSb 3 ft bgs 10/18/2006	356SSc 1 ft bgs 10/18/2006	356SSc 3 ft bgs 10/18/2006
Metals										
Aluminum	mg/kg	76,000	NE	2,680 J	5,670 J	5,510	5,580	5,570	6,380 J	1,660
Antimony	mg/kg	31	5.9	ND (6.7)	ND (6.6)	ND (7)	ND (6.8)	ND (7.3)	ND (6.5) J	ND (6.8)
Arsenic[5]	mg/kg	0.062 / 22	***14***	***4.3 J***	***7.8 J***	***3.9***	***6.6***	***4.5***	***7.5 J***	***3.7***
Barium	mg/kg	5,400	NE	174 J	360 J	821	292	240	190 J	31
Beryllium	mg/kg	150	0.9	0.09 J	0.19 J	0.16 J	0.27 J	0.23 J	0.27 J	0.05 J
Cadmium	mg/kg	37	1.5	0.9	2	ND (0.59)	1.7	0.41 J	1.1 J	0.11 J
Calcium	mg/kg	NA	NE	**3,190 J**	**5,490 J**	**5,510**	**5,760**	**8,500**	**8,310 J**	**1,490**
Chromium	mg/kg	210	91.4	10.3 J	30.6 J	32.4	27.3	18.7	19.1 J	8.8
Cobalt	mg/kg	900	NE	2.3 J	5.7	5.3 J	5.4 J	4.2 J	5.7 J	1.5 J
Copper	mg/kg	3,100	59.6	28 J	80 J	27	63.7	40.4	48.3 J	5.2
Iron	mg/kg	23,000	NE	12,200	14,400	10,500	14,500	9,900	13,700 J	2,690
Lead[6]	mg/kg	194 / 340	14.7	**574**	**822 J+**	***223***	**563 J+**	**432**	**354 J+**	26.2 J+
Magnesium	mg/kg	NA	NE	**879 J**	**2,100 J**	**1,820**	**2,410**	**2,440**	**3,610 J**	**612**
Manganese	mg/kg	1,800	NE	99.7 J	271 J	181	261	200	285	124
Mercury	mg/kg	23	0.3	0.5	0.58	0.33	0.56	0.46	0.53	0.19
Nickel	mg/kg	1,600	120.2	11.8 J	28.4 J	18.1	25.8	13.9	21.3 J	5.8
Potassium	mg/kg	NA	NE	**624 J**	**1,520 J**	**1,170**	**1,510**	**1,150**	**1,660 J**	**407 J**
Selenium	mg/kg	390	5.6	ND (3.9)	0.52 J	0.47 J	0.56 J	ND (4.2)	ND (3.8) J	ND (4)
Silver	mg/kg	390	1.7	0.4 J	1.4	0.75 J	1.2	0.5 J	0.61 J-	ND (1.1)
Sodium	mg/kg	NA	NE	ND (556) J	**1,920 J**	**554 J**	**1,760**	ND (605)	ND (542)	ND (566)
Thallium	mg/kg	5.2	**42.5**	0.39 J	ND (2.7)	ND (2.9)	ND (2.9)	ND (3)	0.56 J	ND (2.8)
Vanadium	mg/kg	78	NE	9 J	22.4 J	23.9	23.3	21.5	18.5 J	6.3
Zinc	mg/kg	23,000	91.5	254 J	724 J	68.9	648	71.7	260 J	25
Organochlorine Pesticides/PCBs										
4,4'-DDD	µg/kg	2,400	NE	9.2 J	5.9 J	0.44 J	5.8 J	2.3 J	0.89 J	1.5 J
4,4'-DDE	µg/kg	1,700	NE	110 J	0.67 J	1.1 J	12	ND (3.3) J	1.2 J	0.37 J
4,4'-DDT	µg/kg	1,700	NE	480 J	210 J	ND (3.9)	33 J	9.9 J	4.9	7.4
Aldrin	µg/kg	29	NE	0.77 J	0.51 J	ND (2) J	0.094 J	0.11 J	ND (1.9) J	ND (1.9)
alpha-BHC	µg/kg	90	NE	0.14 J	ND (1.8)	ND (2)	0.35 J	ND (2.1)	ND (1.9)	ND (1.9)
alpha-Chlordane	µg/kg	1,600	NE	370 J	2.5 J	1.7 J	19 J	0.1 J	2.1 J	0.25 J
Aroclor-1016	µg/kg	3,900	NE	ND (36)	ND (36)	ND (39)	ND (44)	ND (41)	ND (36)	ND (38)

TABLE 3-48
356 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	356SSa 1 ft bgs[3] 10/18/2006	356SSa 1 ft bgs (FD) 10/18/2006	356SSa 3 ft bgs[4] 10/18/2006	356SSb 1 ft bgs 10/18/2006	356SSb 3 ft bgs 10/18/2006	356SSc 1 ft bgs 10/18/2006	356SSc 3 ft bgs 10/18/2006
Organochlorine Pesticides/PCBs										
Aroclor-1221	µg/kg	220	NE	ND (36)	ND (36)	ND (39)	ND (44)	ND (41)	ND (36)	ND (38)
Aroclor-1232	µg/kg	220	NE	ND (36)	ND (36)	ND (39)	ND (44)	ND (41)	ND (36)	ND (38)
Aroclor-1242	µg/kg	220	NE	ND (36)	ND (36)	ND (39)	ND (44)	ND (41)	ND (36)	ND (38)
Aroclor-1248	µg/kg	220	NE	ND (36)	ND (36)	ND (39)	ND (44)	ND (41)	ND (36)	ND (38)
Aroclor-1254	µg/kg	220	NE	ND (36)	ND (36)	ND (39)	ND (44)	ND (41)	ND (36)	ND (38)
Aroclor-1260	µg/kg	220	NE	ND (36)	ND (36)	ND (39)	ND (44)	ND (41)	ND (36)	ND (38)
beta-BHC	µg/kg	320	NE	0.07 J	ND (1.8) J	ND (2) J	0.17 J	0.089 J	ND (1.9) J	ND (1.9)
delta-BHC	µg/kg	90	NE	0.41 J	ND (1.8)	ND (2)	0.56 J	ND (2.1)	ND (1.9)	ND (1.9)
Dieldrin	µg/kg	30	NE	5.1 J	2.3 J	ND (3.9)	2.3 J	ND (3.3) J	ND (3.6)	ND (3.8)
Endosulfan I	µg/kg	370,000	NE	3.5 J	3.3 J	ND (2)	0.97 J	0.15 J	ND (1.9)	ND (1.9)
Endosulfan II	µg/kg	370,000	NE	1.8 J	1.4 J	ND (3.9)	0.29 J	0.2 J	ND (3.6)	ND (3.8)
Endosulfan sulfate	µg/kg	370,000	NE	0.3 J	0.71 J	ND (3.9)	1.2 J	0.3 J	ND (3.6)	ND (3.8)
Endrin	µg/kg	18,000	NE	37 J	0.25 J	ND (3.9)	0.3 J	0.67 J	ND (3.6)	ND (3.8)
Endrin aldehyde	µg/kg	18,000	NE	ND (3.3)	0.19 J	0.55 J	ND (3.3) J	ND (3.3) J	ND (3.6)	ND (3.8)
Endrin ketone	µg/kg	18,000	NE	0.73 J	0.75 J	19 J	0.93 J	1.6 J	ND (3.6)	ND (1.9)
gamma-BHC	µg/kg	440	NE	ND (1.9) J	0.22 J	ND (2) J	ND (2.3) J	0.17 J	ND (1.9) J	ND (1.9)
gamma-Chlordane	µg/kg	1,600	NE	390	2.8 J	0.48 J	16	ND (1.7) J	1.8 J	ND (1.9)
Heptachlor	µg/kg	110	NE	3.4 J	1.4 J	ND (2) J	0.042 J	ND (2.1) J	ND (1.9) J	ND (1.9)
Heptachlor epoxide	µg/kg	53	NE	11 J	0.97 J	ND (2)	2.2 J	0.057 J	ND (1.9)	ND (1.9)
Methoxychlor	µg/kg	310,000	NE	ND (17) J	0.68 J	1.8 J	ND (17) J	ND (17) J	2.4 J	ND (0.22) R
Toxaphene	µg/kg	440	NE	ND (190)	ND (180)	ND (200)	ND (230)	ND (210)	ND (190)	ND (190)

TABLE 3-48
356 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 16b (Soil Screening Levels) for source of screening levels.

[2] Oakland background results are from background metal concentration studies conducted by the Lawrence Berkeley National Laboratory Environmental Restoration Program, 1995. Samples were taken from locations representing the Colluvian and Fill geologic unit.

[3] 1ft bgs samples were collected between 0.5 and 1ft bgs

[4] 3ft bgs samples were collected between 2.5 and 3 ft bgs

[5] For Arsenic, 0.062 mg/kg is the cancer endpoint; 22 mg/kg is the noncancer endpoint.

FD	field duplicate
ft bgs	feet below ground surface
mg/kg	milligrams per kilogram
ND	not detected above the laboratory's reporting limit shown in parentheses
J	estimated value
J-	estimated value, low bias
J+	estimated value, possible high bias
R	rejected for failure to meet quality control requirements

TABLE 3-49
360 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	360SSa 1 ft bgs[3] 10/18/2006	360SSa 3 ft bgs[4] 10/18/2006	360SSb 1 ft bgs 10/18/2006	360SSb 3 ft bgs 10/18/2006
Volatile Organic Compounds							
1,1,1-Trichloroethane	µg/kg	1,200,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
1,1,2,2-Tetrachloroethane	µg/kg	410	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
1,1,2-Trichloroethane	µg/kg	730	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
1,1-Dichloroethane	µg/kg	2,800	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
1,1-Dichloroethene	µg/kg	120,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
1,1-Dichloropropene	µg/kg	NDRI	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
1,2,3-Trichlorobenzene	µg/kg	62,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
1,2,3-Trichloropropane	µg/kg	NDRI	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
1,2,4-Trichlorobenzene	µg/kg	62,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
1,2,4-Trimethylbenzene	µg/kg	NDRI	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
1,2-Dibromo-3-chloroprop	µg/kg	30	NE	ND (13)	ND (11)	ND (12)	ND (9.8)
1,2-Dibromoethane	µg/kg	32	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
1,2-Dichlorobenzene	µg/kg	600,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
1,2-Dichloroethane	µg/kg	280	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
1,2-Dichloropropane	µg/kg	340	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
1,3-Dichlorobenzene	µg/kg	530,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
1,3-Dichloropropane	µg/kg	NDRI	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
1,4-Dichlorobenzene	µg/kg	3,400	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
2-Hexanone	µg/kg	NDRI	NE	ND (26)	ND (22)	ND (25)	ND (20)
Acetone	µg/kg	14,000,000	NE	ND (26)	ND (22)	ND (25)	ND (20)
Benzene	µg/kg	640	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Bromochloromethane	µg/kg	NDRI	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Bromodichloromethane	µg/kg	820	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Bromoform	µg/kg	62,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Bromomethane	µg/kg	3,900	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Carbon disulfide	µg/kg	360,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Carbon tetrachloride	µg/kg	250	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Chlorobenzene	µg/kg	150,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Chloroethane	µg/kg	3,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Chloroform	µg/kg	940	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Chloromethane	µg/kg	47,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)

TABLE 3-49
360 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

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Volatile Organic Compounds							
cis-1,2-Dichloroethene	µg/kg	43,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
cis-1,3-Dichloropropene	µg/kg	780	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Dibromochloromethane	µg/kg	1,100	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Ethyl tert-butyl ether	µg/kg	32,000	NE	ND (13)	ND (11)	ND (12)	ND (9.8)
Ethylbenzene	µg/kg	400,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Freon 11	µg/kg	390,000	NE	3.2	3.6	2.2 J	1.8 J
Freon 113	µg/kg	5,600,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Freon 12	µg/kg	94,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Isopropyl ether	µg/kg	NDRI	NE	ND (13)	ND (11)	ND (12)	ND (9.8)
Isopropylbenzene (cumen	µg/kg	570,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Methyl ethyl ketone	µg/kg	22,000,000	NE	ND (26)	ND (22)	ND (25)	ND (20)
Methyl isobutyl ketone	µg/kg	5,300,000	NE	ND (26)	ND (22)	ND (25)	ND (20)
Methyl tert-butyl ether	µg/kg	32,000	NE	ND (13)	ND (11)	ND (12)	ND (9.8)
Methylene chloride	µg/kg	9,100	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Styrene	µg/kg	1,700,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
tert-Amyl methyl ether	µg/kg	32,000	NE	ND (13)	ND (11)	ND (12)	ND (9.8)
tert-Butyl alcohol	µg/kg	13,000,000	NE	ND (65)	ND (56)	ND (61)	ND (49)
Tetrachloroethene	µg/kg	480	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Toluene	µg/kg	520,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
trans-1,2-Dichloroethene	µg/kg	69,000	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
trans-1,3-Dichloropropene	µg/kg	780	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Trichloroethene	µg/kg	53	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Vinyl chloride	µg/kg	79	NE	ND (3.2)	ND (2.8)	ND (3.1)	ND (2.5)
Xylenes, total	µg/kg	270,000	NE	ND (6.5)	ND (5.6)	ND (6.1)	ND (4.9)
Semivolatile Organic Compounds							
1,1'-Biphenyl	µg/kg	3,000,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
1,2,4,5-Tetrachlorobenzen	µg/kg	3,200	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
1,4-Dioxane (p-dioxane)	µg/kg	44,000	NE	ND (73) J	ND (76) J	ND (410) J	ND (76) J
2,2'-Oxybis(1-Chloropropa	µg/kg	220	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
2,3,4,6-Tetrachlorophenol	µg/kg	NDRI	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
2,4,5-Trichlorophenol	µg/kg	6,100,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)

TABLE 3-49
360 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	360SSa 1 ft bgs[3] 10/18/2006	360SSa 3 ft bgs[4] 10/18/2006	360SSb 1 ft bgs 10/18/2006	360SSb 3 ft bgs 10/18/2006
Semivolatile Organic Compounds							
2,4,6-Trichlorophenol	µg/kg	6,100	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
2,4-Dichlorophenol	µg/kg	180,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
2,4-Dimethylphenol	µg/kg	1,200,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
2,4-Dinitrophenol	µg/kg	120,000	NE	ND (360)	ND (370)	ND (2,000)	ND (370)
2,4-Dinitrotoluene	µg/kg	120,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
2,6-Dinitrotoluene	µg/kg	61,000	NE	62 J	ND (190)	ND (1,000)	ND (190)
2-Chloronaphthalene	µg/kg	4,900,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
2-Chlorophenol	µg/kg	63,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
2-Methylnaphthalene	µg/kg	150,000	NE	ND (180)	28 J	ND (1,000)	46 J
2-Methylphenol	µg/kg	3,100,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
2-Nitroaniline	µg/kg	180,000	NE	ND (360)	ND (370)	ND (2,000)	ND (370)
2-Nitrophenol	µg/kg	NDRI	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
3,3'-Dichlorobenzidine	µg/kg	1,100	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
3-Nitroaniline	µg/kg	18,000	NE	24 J	ND (370)	ND (2,000)	ND (370)
4,6-Dinitro-2-methylphenol	µg/kg	NDRI	NE	ND (360)	ND (370)	ND (2,000)	ND (370)
4-Bromophenylphenyl eth	µg/kg	NDRI	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
4-Chloro-3-methylphenol	µg/kg	3,100,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
4-Chloroaniline	µg/kg	240,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
4-Chlorophenylphenyl eth	µg/kg	NDRI	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
4-Methylphenol	µg/kg	310,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
4-Nitroaniline	µg/kg	23,000	NE	ND (360)	ND (370)	ND (2,000)	ND (370)
4-Nitrophenol	µg/kg	120,000	NE	ND (360)	ND (370)	ND (2,000)	ND (370)
Acenaphthene	µg/kg	3,700,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Acenaphthylene	µg/kg	2,300,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Acetophenone	µg/kg	100,000,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Anthracene	µg/kg	22,000,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Atrazine	µg/kg	2,200	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Benzaldehyde	µg/kg	6,100,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Benzo(a)anthracene	µg/kg	620	NE	47 J	44 J	160	44 J
Benzo(a)pyrene	µg/kg	62	NE	**90 J**	**67 J**	**320**	59 J
Benzo(b)fluoranthene	µg/kg	620	NE	120 J	91 J	400	84 J

TABLE 3-49
360 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	360SSa 1 ft bgs[3] 10/18/2006	360SSa 3 ft bgs[4] 10/18/2006	360SSb 1 ft bgs 10/18/2006	360SSb 3 ft bgs 10/18/2006
Semivolatile Organic Compounds							
Benzo(g,h,i)perylene	µg/kg	2,300,000	NE	91 J	37 J	150	29 J
Benzo(k)fluoranthene	µg/kg	380	NE	60 J	33 J	200	32 J
Benzyl butyl phthalate	µg/kg	12,000,000	NE	24 J	ND (190)	ND (1,000)	ND (190)
bis(2-Chloroethoxy)metha	µg/kg	220	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
bis(2-Chloroethyl)ether	µg/kg	220	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
bis(2-Ethylhexyl)phthalate	µg/kg	35,000	NE	55 J	59 J	150 J	33 J
Caprolactam	µg/kg	31,000,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Carbazole	µg/kg	24,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Chrysene	µg/kg	3,800	NE	110 J	74 J	420	76 J
Dibenz(a,h)anthracene	µg/kg	62	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Dibenzofuran	µg/kg	150,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Diethylphthalate	µg/kg	49,000,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Dimethylphthalate	µg/kg	100,000,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Di-n-butyl phthalate	µg/kg	6,100,000	NE	140 J	ND (190)	ND (1,000)	46 J
Di-n-octyl phthalate	µg/kg	2,400,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Fluoranthene	µg/kg	2,300,000	NE	160 J	110 J	830	110 J
Fluorene	µg/kg	2,700,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Hexachlorobenzene	µg/kg	300	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Hexachlorobutadiene	µg/kg	6,200	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Hexachlorocyclopentadien	µg/kg	370,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Hexachloroethane	µg/kg	35,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Indeno(1,2,3-c,d)pyrene	µg/kg	620	NE	75 J	45 J	240	42 J
Isophorone	µg/kg	510,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Naphthalene	µg/kg	1,700	NE	23 J	21 J	ND (1,000)	31 J
Nitrobenzene	µg/kg	20,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
N-Nitrosodi-n-propylamine	µg/kg	69	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
N-Nitrosodiphenylamine	µg/kg	99,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Pentachlorophenol	µg/kg	3,000	NE	ND (360)	ND (370)	ND (2,000)	ND (370)
Phenanthrene	µg/kg	2,300,000	NE	90 J	85 J	770 J	100 J
Phenol	µg/kg	18,000,000	NE	ND (180)	ND (190)	ND (1,000)	ND (190)
Pyrene	µg/kg	2,300,000	NE	130 J	98 J	710	98 J

TABLE 3-49
360 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	360SSa 1 ft bgs[3] 10/18/2006	360SSa 3 ft bgs[4] 10/18/2006	360SSb 1 ft bgs 10/18/2006	360SSb 3 ft bgs 10/18/2006
Metals							
Aluminum	mg/kg	76,000	NE	7,190	2,420	3,570	6,640 J
Antimony	mg/kg	31	5.9	ND (9.2)	ND (6.8)	ND (6.9)	ND (6.8) J
Arsenic[5]	mg/kg	0.062 / 22	***14***	***11.1***	***4***	***6.4***	***5.3***
Barium	mg/kg	5,400	NE	610	75.3	188	168 J
Beryllium	mg/kg	150	0.9	0.23 J	0.1 J	0.15 J	0.21 J
Cadmium	mg/kg	37	1.5	1.8	0.41 J	1.5	0.21 J
Calcium	mg/kg	NA	NE	**7,850**	**3,640**	**3,780**	**8,450 J**
Chromium	mg/kg	210	91.4	31.2	9.5	14	22.9 J
Cobalt	mg/kg	900	NE	6.9 J	2.3 J	3.7 J	5.9
Copper	mg/kg	3,100	59.6	152	19.6	75.6	105 J
Iron	mg/kg	23,000	NE	19,900	8,680	17,500	14,800 J
Lead[6]	mg/kg	194 / 340	14.7	**2,230 J+**	193	**600**	**478 J**
Magnesium	mg/kg	NA	NE	**2,800**	**1,060**	**1,320**	**3,090 J**
Manganese	mg/kg	1,800	NE	322	108	161	245 J
Mercury	mg/kg	23	0.3	0.21	0.61	2.8	1.7 J
Nickel	mg/kg	1,600	120.2	32.2	8.2	14.9	20.9 J
Potassium	mg/kg	NA	NE	**1,920**	**748**	**743**	**1,510 J**
Selenium	mg/kg	390	5.6	ND (5.4)	ND (4)	ND (4)	ND (4)
Silver	mg/kg	390	1.7	1.6	0.28 J	0.68 J	1.3
Sodium	mg/kg	NA	NE	**2,410**	ND (569)	ND (571)	**674**
Thallium	mg/kg	5.2	**42.5**	ND (3.9)	0.45 J	0.91 J	ND (2.8)
Vanadium	mg/kg	78	NE	25.8	8.4	13.2	22.3 J
Zinc	mg/kg	23,000	91.5	897	81.6	356	178 J
Organochlorine Pesticides/PCBs							
4,4'-DDD	µg/kg	2,400	NE	1.6 J	1.8 J	7.5 J	0.39 J
4,4'-DDE	µg/kg	1,700	NE	130 J	50 J	54 J	5.2 J
4,4'-DDT	µg/kg	1,700	NE	9 J	380 J	800 J	38 J
Aldrin	µg/kg	29	NE	0.48 J	1.2 J	0.11 J	ND (1.9) J
alpha-BHC	µg/kg	90	NE	0.34 J	0.28 J	0.26 J	ND (1.9)
alpha-Chlordane	µg/kg	1,600	NE	7.3 J	1.3 J	3 J	ND (1.9)
Aroclor-1016	µg/kg	3,900	NE	ND (180)	ND (37)	ND (40)	ND (37)

TABLE 3-49
360 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Screening Level[1]	Oakland Background Levels[2]	360SSa 1 ft bgs[3] 10/18/2006	360SSa 3 ft bgs[4] 10/18/2006	360SSb 1 ft bgs 10/18/2006	360SSb 3 ft bgs 10/18/2006
Organochlorine Pesticides/PCBs							
Aroclor-1221	µg/kg	220	NE	ND (180)	ND (37)	ND (40)	ND (37)
Aroclor-1232	µg/kg	220	NE	ND (180)	ND (37)	ND (40)	ND (37)
Aroclor-1242	µg/kg	220	NE	ND (180)	ND (37)	ND (40)	ND (37)
Aroclor-1248	µg/kg	220	NE	ND (180)	ND (37)	ND (40)	ND (37)
Aroclor-1254	µg/kg	220	NE	**11,000**	**2,400 J**	ND (40)	ND (37)
Aroclor-1260	µg/kg	220	NE	ND (180)	ND (37)	ND (40)	ND (37)
beta-BHC	µg/kg	320	NE	ND (1.8) J	1.2 J	0.057 J	ND (1.9) J
delta-BHC	µg/kg	90	NE	0.23 J	0.18 J	0.032 J	ND (1.9)
Dieldrin	µg/kg	30	NE	14 J	12 J	3.9 J	ND (3.7)
Endosulfan I	µg/kg	370,000	NE	20 J	4 J	0.35 J	ND (1.9)
Endosulfan II	µg/kg	370,000	NE	53 J	8.6 J	0.87 J	ND (3.7)
Endosulfan sulfate	µg/kg	370,000	NE	0.42 J	0.32 J	0.16 J	0.4 J
Endrin	µg/kg	18,000	NE	530	5.3 J	0.64 J	0.57 J
Endrin aldehyde	µg/kg	18,000	NE	8.2 J	6.8	ND (3.3) J	ND (3.7)
Endrin ketone	µg/kg	18,000	NE	1.5 J	0.15 J	0.27 J	ND (1.9)
gamma-BHC	µg/kg	440	NE	ND (1.8) J	ND (1.9) J	0.2 J	ND (1.9) J
gamma-Chlordane	µg/kg	1,600	NE	3.9 J	29 J	2.9 J	0.51 J
Heptachlor	µg/kg	110	NE	ND (1.8) J	0.47 J	0.33 J	ND (1.9) J
Heptachlor epoxide	µg/kg	53	NE	**310 J**	9.9 J	2.5 J	ND (1.9)
Methoxychlor	µg/kg	310,000	NE	9.6 J	ND (17) J	220 J	2 J
Toxaphene	µg/kg	440	NE	ND (180)	ND (190)	ND (210)	ND (190)

TABLE 3-49
360 Center Street Analytical Results - Soil (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Notes:

Results greater than the screening level are bolded.

[1] Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Table 16b (Soil Screening Levels) for source of screening levels.

[2] Oakland background results are from background metal concentration studies conducted by the Lawrence Berkeley National Laboratory Environmental Restoration Program, 1995. Samples were taken from locations representing the Colluvian and Fill geologic unit.

[3] 1ft bgs samples were collected between 0.5 and 1ft bgs

[4] 3ft bgs samples were collected between 2.5 and 3 ft bgs

[5] For Arsenic, 0.062 mg/kg is the cancer endpoint; 22 mg/kg is the noncancer endpoint.

ft bgs	feet below ground surface
mg/kg	milligrams per kilogram
ND	not detected above the laboratory's reporting limit shown in parentheses
J	estimated value
J+	estimated value, possible high bias

TABLE 3-50
Residential Soil Results Summary (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Residential Soil Levels	Screening Levels[(1)]
4,4'-DDE	mg/kg	0.00037 - 11	1.7
4,4'-DDT	mg/kg	0.00034 - 4.4	1.7
Antimony	mg/kg	0.6 - 77.4	31
Aroclor-1254	mg/kg	< 0.036 - 11	0.22
Arsenic *	mg/kg	2.8 - 451	0.062 / 22
Benzo(a)anthracene	mg/kg	0.02 - 8.3	0.62
Benzo(a)pyrene	mg/kg	0.027 - 9.2	0.062
Benzo(b)fluoranthene	mg/kg	0.022 - 9.8	0.62
Benzo(k)fluoranthene	mg/kg	0.023 - 3.6	0.38
Chrysene	mg/kg	0.021 - 10	3.8
Dieldrin	mg/kg	0.0002 - 1	0.03
Heptachlor epoxide	mg/kg	0.000057 - 0.31	0.053
Indeno(1,2,3-c,d)pyrene	mg/kg	0.026 - 4.6	0.62
Iron	mg/kg	2690 - 51500	23000
Lead **	mg/kg	26.2 - 53000	194 / 340
Naphthalene	mg/kg	0.021 - 2.8	1.7

Notes:

Only compounds detected above screening levels are shown

(1) EPA Region 9 Preliminary Remediation Goals for soil, October 2004.

* For Arsenic, 0.062 mg/kg is the cancer endpoint; 22 mg/kg is the noncancer endpoint.

** For Lead: Lead screening level in soil was evaluated using Department Toxic Substance Control's Lead Risk Assessment Spreadsheet Version 7(Lead Spread 7, Cal/EPA 1999). Screening level including homegrown produce pathway: 194 mg/kg. Screening level excluding homegrown produce pathway: 340 mg/kg.

mg/kg milligrams per kilogram

Table 3-51: LEAD RISK ASSESSMENT SPREADSHEET

CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

USER'S GUIDE to version 7

INPUT	
MEDIUM	LEVEL
Lead in Air (ug/m^3)	0.055
Lead in Soil/Dust (ug/g)	194.0
Lead in Water (ug/l)	5
% Home-grown Produce	7%
Respirable Dust (ug/m^3)	1.5

OUTPUT	Percentile Estimate of Blood Pb (ug/dl)					PRG-99	PRG-95
	50th	90th	95th	98th	99th	(ug/g)	(ug/g)
BLOOD Pb, ADULT	1.2	2.2	2.7	3.2	3.7	832	1219
BLOOD Pb, CHILD	3.3	6.1	7.2	8.8	10.0	194	295
BLOOD Pb, PICA CHILD	4.7	8.6	10.2	12.4	14.1	125	190
BLOOD Pb, OCCUPATIONAL	0.7	1.3	1.5	1.8	2.1	4295	6284

EXPOSURE PARAMETERS			
	units	adults	children
Days per week	days/wk	7	
Days per week, occupational		5	
Geometric Standard Deviation		1.6	
Blood lead level of concern (ug/dl)		10	
Skin area, residential	cm^2	5700	2900
Skin area occupational	cm^2	2900	
Soil adherence	ug/cm^2	70	200
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001	
Soil ingestion	mg/day	50	100
Soil ingestion, pica	mg/day		200
Ingestion constant	(ug/dl)/(ug/day)	0.04	0.16
Bioavailability	unitless	0.44	
Breathing rate	m^3/day	20	6.8
Inhalation constant	(ug/dl)/(ug/day)	0.08	0.192
Water ingestion	l/day	1.4	0.4
Food ingestion	kg/day	1.9	1.1
Lead in market basket	ug/kg	3.1	
Lead in home-grown produce	ug/kg	87.3	

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PATHWAYS						
ADULTS	Residential			Occupational		
	Pathway contribution			Pathway contribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	3.8E-5	0.01	1%	1.4E-5	0.00	0%
Soil Ingestion	8.8E-4	0.17	14%	6.3E-4	0.12	17%
Inhalation, bkgrnd		0.09	7%		0.06	9%
Inhalation	2.5E-6	0.00	0%	1.8E-6	0.00	0%
Water Ingestion		0.28	23%		0.28	40%
Food Ingestion, bkgrnd		0.22	18%		0.23	33%
Food Ingestion	2.4E-3	0.46	38%			0%

CHILDREN	typical			with pica		
	Pathway contribution			Pathway contribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	5.6E-5	0.01	0%		0.01	0%
Soil Ingestion	7.0E-3	1.37	41%	1.4E-2	2.73	58%
Inhalation	2.0E-6	0.00	0%		0.00	0%
Inhalation, bkgrnd		0.07	2%		0.07	2%
Water Ingestion		0.32	10%		0.32	7%
Food Ingestion, bkgrnd		0.50	15%		0.50	11%
Food Ingestion	5.5E-3	1.08	32%		1.08	23%

Excludes Homegrown Produce

LEAD RISK ASSESSMENT SPREADSHEET

CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL

USER'S GUIDE to version 7

INPUT	
MEDIUM	LEVEL
Lead in Air (ug/m^3)	0.055
Lead in Soil/Dust (ug/g)	340.0
Lead in Water (ug/l)	5
% Home-grown Produce	0%
Respirable Dust (ug/m^3)	1.5

OUTPUT							
	Percentile Estimate of Blood Pb (ug/dl)					PRG-99	PRG-95
	50th	90th	95th	98th	99th	(ug/g)	(ug/g)
BLOOD Pb, ADULT	0.9	1.7	2.0	2.4	2.7	2977	4369
BLOOD Pb, CHILD	3.3	6.1	7.2	8.8	10.0	340	520
BLOOD Pb, PICA CHILD	5.7	10.5	12.4	15.1	17.2	171	261
BLOOD Pb, OCCUPATIONAL	0.8	1.5	1.7	2.1	2.4	4295	6284

EXPOSURE PARAMETERS			
	units	adults	children
Days per week	days/wk	7	
Days per week, occupational		5	
Geometric Standard Deviation		1.6	
Blood lead level of concern (ug/dl)		10	
Skin area, residential	cm^2	5700	2900
Skin area occupational	cm^2	2900	
Soil adherence	ug/cm^2	70	200
Dermal uptake constant	(ug/dl)/(ug/day)	0.0001	
Soil ingestion	mg/day	50	100
Soil ingestion, pica	mg/day		200
Ingestion constant	(ug/dl)/(ug/day)	0.04	0.16
Bioavailability	unitless	0.44	
Breathing rate	m^3/day	20	6.8
Inhalation constant	(ug/dl)/(ug/day)	0.08	0.192
Water ingestion	l/day	1.4	0.4
Food ingestion	kg/day	1.9	1.1
Lead in market basket	ug/kg	3.1	
Lead in home-grown produce	ug/kg	153.0	

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PATHWAYS						
ADULTS	Residential			Occupational		
	Pathway contribution			Pathway contribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	3.8E-5	0.01	1%	1.4E-5	0.00	1%
Soil Ingestion	8.8E-4	0.30	33%	6.3E-4	0.21	27%
Inhalation, bkgrnd		0.09	10%		0.06	8%
Inhalation	2.5E-6	0.00	0%	1.8E-6	0.00	0%
Water Ingestion		0.28	31%		0.28	35%
Food Ingestion, bkgrnd		0.23	25%		0.23	29%
Food Ingestion	0.0E+0	0.00	0%			0%

CHILDREN	typical			with pica		
	Pathway contribution			Pathway contribution		
Pathway	PEF	ug/dl	percent	PEF	ug/dl	percent
Soil Contact	5.6E-5	0.02	1%		0.02	0%
Soil Ingestion	7.0E-3	2.39	72%	1.4E-2	4.79	83%
Inhalation	2.0E-6	0.00	0%		0.00	0%
Inhalation, bkgrnd		0.07	2%		0.07	1%
Water Ingestion		0.32	10%		0.32	6%
Food Ingestion, bkgrnd		0.54	16%		0.54	9%
Food Ingestion	0.0E+0	0.00	0%		0.00	0%

Includes Homegrown Produce

Table 3-52: Annual Toxics Summary

San Francisco-Arkansas Street

Lead

nanograms per cubic meter

Year	Months Present	Minimum	Median	Mean	90th Percentile	Maximum	Standard Deviation	Number of Observations	Detection Limit	Estimated Risk
2003	----------	6	*	*	*	13	2.5	6	3	*
2002	----------	1.5	7	8.3	16	23	5.7	30	3	0.1
2001	----------	2	7	8.4	17	19	5.4	31	4	0.1
2000	----------	2	15	*	28	55	12.4	19	4	*
1999	----------	2	8	*	13	18	4.3	20	4	*
1998	----------	2	8	8.6	16	20	4.6	26	4	0.1
1997	----------	2	11	11.8	23	30	7.7	28	4	0.1
1996	----------	2	9	12.1	21	30	7.5	26	4	0.1
1995	----------	2	12	15.9	31	100	18.6	30	4	0.2
1994	----------	2	10	12.2	22	43	8.8	30	4	0.1
1993	----------	2	14	16.4	29	32	8.8	27	4	0.2
1992	----------	2	9	*	17	25	6.3	16	4	*
1991	----------	6	24	*	58	63	17.8	25	4	*
1990	----------	3	17	27.5	56	100	23.0	29	1	0.3
1989	----------	4	21	34.1	65	118	25.0	56	1	0.4

Graph It!

Toxics Statistics Home

Notes: Values below the Limit of Detection (LoD) assumed to be ½ LoD.
Means and risks shown only for years with data in all 12 months.
"*" means there was insufficient or no data available to determine the value.

Data Descriptions Page

Table 3-53: Annual Toxics Summary

Richmond-13th Street

Lead

nanograms per cubic meter

Year	Months Present	Minimum	Median	Mean	90th Percentile	Maximum	Standard Deviation	Number of Observations	Detection Limit	Estimated Risk
2003	----------	*	*	*	*	*	*	0	*	*
2002	----------	*	*	*	*	*	*	0	*	*
2001	----------	*	*	*	*	*	*	0	*	*
2000	----------	*	*	*	*	*	*	0	*	*
1999	----------	*	*	*	*	*	*	0	*	*
1998	----------	*	*	*	*	*	*	0	*	*
1997	----------	7	*	*	*	21	4.8	9	4	*
1996	----------	2	8	10.2	19	24	6.1	27	4	0.1
1995	----------	2	8	8.5	16	27	5.9	29	4	0.1
1994	----------	2	11	11.7	21	27	5.7	28	4	0.1
1993	----------	2	13	*	23	27	7.4	28	4	*
1992	----------	2	16	14.6	24	35	7.8	30	4	0.2
1991	----------	5	22	29.8	67	96	23.9	30	4	0.4
1990	----------	2	17	25.7	58	130	28.4	27	1	0.3
1989	----------	0.5	25	*	44	62	14.3	50	1	*

Graph It!

Toxics Statistics Home

Notes: Values below the Limit of Detection (LoD) assumed to be ½ LoD.
Means and risks shown only for years with data in all 12 months.
"*" means there was insufficient or no data available to determine the value.

Data Descriptions Page

Table 3-54 Annual Toxics Summary

San Pablo-El Portal

Lead

nanograms per cubic meter

Year	Months Present	Minimum	Median	Mean	90th Percentile	Maximum	Standard Deviation	Number of Observations	Detection Limit	Estimated Risk
2003	----------	*	*	*	*	*	*	0	*	*
2002	----------	*	*	*	*	*	*	0	*	*
2001	----------	*	*	*	*	*	*	0	*	*
2000	----------	2	*	*	*	12	4.3	5	4	*
1999	----------	2	5	5.1	10	16	3.8	26	4	0.06
1998	----------	2	2	*	8	11	2.9	27	4	*
1997	----------	2	4	*	8	11	3.0	19	4	*
1996	----------	*	*	*	*	*	*	0	*	*
1995	----------	*	*	*	*	*	*	0	*	*
1994	----------	*	*	*	*	*	*	0	*	*
1993	----------	*	*	*	*	*	*	0	*	*
1992	----------	*	*	*	*	*	*	0	*	*
1991	----------	*	*	*	*	*	*	0	*	*
1990	----------	*	*	*	*	*	*	0	*	*
1989	----------	*	*	*	*	*	*	0	*	*

Graph It!

Toxics Statistics Home

Notes: Values below the Limit of Detection (LoD) assumed to be ½ LoD.
Means and risks shown only for years with data in all 12 months.
"*" means there was insufficient or no data available to determine the value.

Data Descriptions Page

TABLE 3-55
Residential Produce and Adjacent Soil Results Summary (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Units	Residential Produce Levels	Screening Levels[(1)]
Arsenic *	mg/kg	0.06 - 0.08	0.062 / 22
Chromium	mg/kg	0.39 - 1.07	210
Lead **	mg/kg	0.15 - 8.47	194 / 340

Notes:

(1) EPA Region 9 Preliminary Remediation Goals for residential soil, October 2004.

* For Arsenic, 0.062 mg/kg is the cancer endpoint; 22 mg/kg is the noncancer endpoint.

** For Lead: Lead screening level in soil was evaluated using Department Toxic Substance Control's Lead Risk Assessment Spreadsheet Version 7(Lead Spread 7, Cal/EPA 1999). Screening level including homegrown produce pathway: 194 mg/kg. Screening level excluding homegrown produce pathway: 340 mg/kg.

mg/kg milligrams per kilogram

TABLE 3-56
1432 3rd Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
	Fig		none		
Metals					
Arsenic *	ND (0.06)	NC	NC	0.062 / 22	mg/kg
Chromium	0.79	NC	NC	210	mg/kg
Lead **	0.28	NC	NC	194 / 340	mg/kg
VOCs					
1,1,1-Trichloroethane	ND (0.02)	NC	NC	1,200	mg/kg
1,1,2,2-Tetrachloroethane	ND (0.025)	NC	NC	0.41	mg/kg
1,1,2-Trichloroethane	ND (0.018)	NC	NC	0.73	mg/kg
1,1-Dichloroethane	ND (0.017)	NC	NC	2.8	mg/kg
1,1-Dichloroethene	ND (0.022)	NC	NC	120	mg/kg
1,2,4-Trichlorobenzene	ND (0.039)	NC	NC	62	mg/kg
1,2,4-Trimethylbenzene	ND (0.026)	NC	NC	NE	mg/kg
1,2-Dibromo-3-chloropropane	ND (0.18)	NC	NC	0.03	mg/kg
1,2-Dibromoethane	ND (0.013)	NC	NC	0.032	mg/kg
1,2-Dichlorobenzene	ND (0.016)	NC	NC	600	mg/kg
1,2-Dichloroethane	ND (0.021)	NC	NC	0.28	mg/kg
1,2-Dichloropropane	ND (0.034)	NC	NC	0.34	mg/kg
1,3-Dichlorobenzene	ND (0.019)	NC	NC	530	mg/kg
1,4-Dichlorobenzene	ND (0.016)	NC	NC	3.4	mg/kg
2-Hexanone	ND (0.71)	NC	NC	NE	mg/kg
Acetone	ND (0.41)	NC	NC	14,000	mg/kg
Benzene	ND (0.019)	NC	NC	0.64	mg/kg
Bromochloromethane	ND (0.023)	NC	NC	NE	mg/kg
Bromodichloromethane	ND (0.016)	NC	NC	0.82	mg/kg
Bromoform	ND (0.05)	NC	NC	62	mg/kg
Bromomethane	ND (0.039)	NC	NC	3.9	mg/kg
Carbon disulfide	ND (0.029)	NC	NC	360	mg/kg
Carbon tetrachloride	ND (0.022)	NC	NC	0.25	mg/kg
Chlorobenzene	ND (0.017)	NC	NC	150	mg/kg
Chloroethane	ND (0.031)	NC	NC	3	mg/kg
Chloroform	ND (0.018)	NC	NC	0.94	mg/kg
Chloromethane	ND (0.025)	NC	NC	47	mg/kg
cis-1,2-Dichloroethene	ND (0.021)	NC	NC	43	mg/kg
cis-1,3-Dichloropropene	ND (0.015)	NC	NC	0.78	mg/kg
Cyclohexane	ND (0.018)	NC	NC	140	mg/kg
Dibromochloromethane	ND (0.015)	NC	NC	1.1	mg/kg
Ethylbenzene	ND (0.018)	NC	NC	400	mg/kg
Freon 11	ND (0.024)	NC	NC	390	mg/kg
Freon 113	ND (0.022)	NC	NC	5,600	mg/kg
Freon 12	ND (0.03)	NC	NC	94	mg/kg
Isopropylbenzene (cumene)	ND (0.013)	NC	NC	570	mg/kg
Methyl acetate	0.053 J	NC	NC	22,000	mg/kg
Methyl ethyl ketone	ND (0.58)	NC	NC	22,000	mg/kg
Methyl isobutyl ketone	ND (0.5)	NC	NC	5,300	mg/kg
Methyl tert-butyl ether	ND (0.014)	NC	NC	32	mg/kg
Methylcyclohexane	ND (0.011)	NC	NC	2,600	mg/kg
Methylene chloride	ND (0.035)	NC	NC	9.1	mg/kg
Styrene	ND (0.017)	NC	NC	1,700	mg/kg
tert-Butyl alcohol	ND (0.19) R	NC	NC	13,000	mg/kg
Tetrachloroethene	ND (0.02)	NC	NC	0.48	mg/kg
Toluene	ND (0.018)	NC	NC	520	mg/kg
trans-1,2-Dichloroethene	ND (0.025)	NC	NC	69	mg/kg
trans-1,3-Dichloropropene	ND (0.016)	NC	NC	0.78	mg/kg
Trichloroethene	ND (0.034)	NC	NC	0.053	mg/kg
Vinyl chloride	ND (0.038)	NC	NC	0.079	mg/kg
Xylenes, total	ND (0.034)	NC	NC	270	mg/kg

TABLE 3-56
1432 3rd Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
	Grape	1432SSc			
Metals					
Arsenic *	ND (0.06)	**13.8**	**7.6**	0.062 / 22	mg/kg
Chromium	0.44	62.6 J	53	210	mg/kg
Lead **	0.86	**2,280 J**	**983**	194 / 340	mg/kg
VOCs					
1,1,1-Trichloroethane	ND (0.02)	ND (0.0036)	ND (0.0032)	1,200	mg/kg
1,1,2,2-Tetrachloroethane	ND (0.025)	ND (0.0036)	ND (0.0032)	0.41	mg/kg
1,1,2-Trichloroethane	ND (0.018)	ND (0.0036)	ND (0.0032)	0.73	mg/kg
1,1-Dichloroethane	ND (0.017)	ND (0.0036)	ND (0.0032)	2.8	mg/kg
1,1-Dichloroethene	ND (0.022)	ND (0.0036)	ND (0.0032)	120	mg/kg
1,2,4-Trichlorobenzene	ND (0.04)	ND (0.0036)	ND (0.0032)	62	mg/kg
1,2,4-Trimethylbenzene	ND (0.026)	ND (0.0036)	ND (0.0032)	NE	mg/kg
1,2-Dibromo-3-chloropropane	ND (0.18)	ND (0.015)	ND (0.013)	0.03	mg/kg
1,2-Dibromoethane	ND (0.014)	ND (0.0036)	ND (0.0032)	0.032	mg/kg
1,2-Dichlorobenzene	ND (0.016)	ND (0.0036)	ND (0.0032)	600	mg/kg
1,2-Dichloroethane	ND (0.021)	ND (0.0036)	ND (0.0032)	0.28	mg/kg
1,2-Dichloropropane	ND (0.035)	ND (0.0036)	ND (0.0032)	0.34	mg/kg
1,3-Dichlorobenzene	ND (0.019)	ND (0.0036)	ND (0.0032)	530	mg/kg
1,4-Dichlorobenzene	ND (0.016)	ND (0.0036)	ND (0.0032)	3.4	mg/kg
2-Hexanone	ND (0.72)	ND (0.029)	ND (0.025)	NE	mg/kg
Acetone	ND (0.42)	ND (0.029) J	ND (0.025) J	14,000	mg/kg
Benzene	ND (0.019)	ND (0.0036)	ND (0.0032)	0.64	mg/kg
Bromochloromethane	ND (0.023)	ND (0.0036)	ND (0.0032)	NE	mg/kg
Bromodichloromethane	ND (0.016)	ND (0.0036)	ND (0.0032)	0.82	mg/kg
Bromoform	ND (0.051)	ND (0.0036) J	ND (0.0032) J	62	mg/kg
Bromomethane	ND (0.04)	ND (0.0036)	ND (0.0032)	3.9	mg/kg
Carbon disulfide	ND (0.029)	ND (0.0036)	ND (0.0032)	360	mg/kg
Carbon tetrachloride	ND (0.023)	ND (0.0036)	ND (0.0032)	0.25	mg/kg
Chlorobenzene	ND (0.017)	ND (0.0036)	ND (0.0032)	150	mg/kg
Chloroethane	ND (0.032)	ND (0.0036)	ND (0.0032)	3	mg/kg
Chloroform	ND (0.018)	ND (0.0036)	ND (0.0032)	0.94	mg/kg
Chloromethane	ND (0.025)	ND (0.0036)	ND (0.0032)	47	mg/kg
cis-1,2-Dichloroethene	ND (0.021)	ND (0.0036)	ND (0.0032)	43	mg/kg
cis-1,3-Dichloropropene	ND (0.015)	ND (0.0036)	ND (0.0032)	0.78	mg/kg
Cyclohexane	ND (0.018)	NA	NA	140	mg/kg
Dibromochloromethane	ND (0.015)	ND (0.0036) J	ND (0.0032) J	1.1	mg/kg
Ethylbenzene	ND (0.018)	ND (0.0036)	ND (0.0032)	400	mg/kg
Freon 11	ND (0.024)	0.017	0.003 J	390	mg/kg
Freon 113	ND (0.022)	ND (0.0036)	ND (0.0032)	5,600	mg/kg
Freon 12	ND (0.03)	ND (0.0036)	ND (0.0032)	94	mg/kg
Isopropylbenzene (cumene)	ND (0.013)	ND (0.0036)	ND (0.0032)	570	mg/kg
Methyl acetate	ND (0.017)	NA	NA	22,000	mg/kg
Methyl ethyl ketone	ND (0.58)	ND (0.029)	ND (0.025)	22,000	mg/kg
Methyl isobutyl ketone	ND (0.51)	ND (0.029)	ND (0.025)	5,300	mg/kg
Methyl tert-butyl ether	ND (0.014)	ND (0.015)	ND (0.013)	32	mg/kg
Methylcyclohexane	ND (0.011)	NA	NA	2,600	mg/kg
Methylene chloride	ND (0.035)	ND (0.0036)	ND (0.0032)	9.1	mg/kg
Styrene	ND (0.017)	ND (0.0036)	ND (0.0032)	1,700	mg/kg
tert-Butyl alcohol	ND (0.19) R	ND (0.073)	ND (0.063)	13,000	mg/kg
Tetrachloroethene	ND (0.02)	ND (0.0036)	ND (0.0032)	0.48	mg/kg
Toluene	ND (0.018)	ND (0.0036)	ND (0.0032)	520	mg/kg
trans-1,2-Dichloroethene	ND (0.025)	ND (0.0036)	ND (0.0032)	69	mg/kg
trans-1,3-Dichloropropene	ND (0.016)	ND (0.0036)	ND (0.0032)	0.78	mg/kg
Trichloroethene	ND (0.034)	ND (0.0036)	ND (0.0032)	0.053	mg/kg
Vinyl chloride	ND (0.038)	ND (0.0036)	ND (0.0032)	0.079	mg/kg
Xylenes, total	ND (0.034)	ND (0.0073)	ND (0.0063)	270	mg/kg

TABLE 3-56
1432 3rd Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
		Pomegranate	1432SSa			
Metals						
	Arsenic *	**0.08**	**7.8**	**8.1**	0.062 / 22	mg/kg
	Chromium	0.49	13.2	19.8	210	mg/kg
	Lead **	0.16	**1,060**	**524 J+**	194 / 340	mg/kg
VOCs						
	1,1,1-Trichloroethane	ND (0.02)	ND (0.0033)	ND (0.0031)	1,200	mg/kg
	1,1,2,2-Tetrachloroethane	ND (0.025)	ND (0.0033)	ND (0.0031)	0.41	mg/kg
	1,1,2-Trichloroethane	ND (0.018)	ND (0.0033)	ND (0.0031)	0.73	mg/kg
	1,1-Dichloroethane	ND (0.016)	ND (0.0033)	ND (0.0031)	2.8	mg/kg
	1,1-Dichloroethene	ND (0.021)	ND (0.0033)	ND (0.0031)	120	mg/kg
	1,2,4-Trichlorobenzene	ND (0.039)	ND (0.0033)	ND (0.0031)	62	mg/kg
	1,2,4-Trimethylbenzene	ND (0.025)	ND (0.0033)	ND (0.0031)	NE	mg/kg
	1,2-Dibromo-3-chloropropane	ND (0.18)	ND (0.0065)	ND (0.0062)	0.03	mg/kg
	1,2-Dibromoethane	ND (0.013)	ND (0.0033)	ND (0.0031)	0.032	mg/kg
	1,2-Dichlorobenzene	ND (0.015)	ND (0.0033)	ND (0.0031)	600	mg/kg
	1,2-Dichloroethane	ND (0.021)	ND (0.0033)	ND (0.0031)	0.28	mg/kg
	1,2-Dichloropropane	ND (0.034)	ND (0.0033)	ND (0.0031)	0.34	mg/kg
	1,3-Dichlorobenzene	ND (0.018)	ND (0.0033)	ND (0.0031)	530	mg/kg
	1,4-Dichlorobenzene	ND (0.016)	ND (0.0033)	ND (0.0031)	3.4	mg/kg
	2-Hexanone	ND (0.7)	ND (0.026)	ND (0.025)	NE	mg/kg
	Acetone	ND (0.41)	ND (0.013)	ND (0.012)	14,000	mg/kg
	Benzene	ND (0.019)	ND (0.0033)	ND (0.0031)	0.64	mg/kg
	Bromochloromethane	ND (0.023)	ND (0.0033)	ND (0.0031)	NE	mg/kg
	Bromodichloromethane	ND (0.015)	ND (0.0033)	ND (0.0031)	0.82	mg/kg
	Bromoform	ND (0.05)	ND (0.0033)	ND (0.0031)	62	mg/kg
	Bromomethane	ND (0.039)	ND (0.0033)	ND (0.0031)	3.9	mg/kg
	Carbon disulfide	ND (0.029)	ND (0.0033)	ND (0.0031)	360	mg/kg
	Carbon tetrachloride	ND (0.022)	ND (0.0033)	ND (0.0031)	0.25	mg/kg
	Chlorobenzene	ND (0.017)	ND (0.0033)	ND (0.0031)	150	mg/kg
	Chloroethane	ND (0.031)	ND (0.0016)	ND (0.0016)	3	mg/kg
	Chloroform	ND (0.017)	ND (0.0033)	ND (0.0031)	0.94	mg/kg
	Chloromethane	ND (0.024)	ND (0.0033)	ND (0.0031)	47	mg/kg
	cis-1,2-Dichloroethene	ND (0.021)	ND (0.0033)	ND (0.0031)	43	mg/kg
	cis-1,3-Dichloropropene	ND (0.015)	ND (0.0033)	ND (0.0031)	0.78	mg/kg
	Cyclohexane	ND (0.018)	NA	NA	140	mg/kg
	Dibromochloromethane	ND (0.015)	ND (0.0033)	ND (0.0031)	1.1	mg/kg
	Ethylbenzene	ND (0.018)	ND (0.0033)	ND (0.0031)	400	mg/kg
	Freon 11	ND (0.024)	0.0045	0.0052	390	mg/kg
	Freon 113	ND (0.022)	ND (0.0033)	ND (0.0031)	5,600	mg/kg
	Freon 12	ND (0.03)	ND (0.0033)	ND (0.0031)	94	mg/kg
	Isopropylbenzene (cumene)	ND (0.012)	ND (0.0033)	ND (0.0031)	570	mg/kg
	Methyl acetate	ND (0.017)	NA	NA	22,000	mg/kg
	Methyl ethyl ketone	ND (0.57)	ND (0.026)	ND (0.025)	22,000	mg/kg
	Methyl isobutyl ketone	ND (0.5)	ND (0.026)	ND (0.025)	5,300	mg/kg
	Methyl tert-butyl ether	ND (0.013)	ND (0.013)	ND (0.012)	32	mg/kg
	Methylcyclohexane	ND (0.011)	NA	NA	2,600	mg/kg
	Methylene chloride	ND (0.035)	ND (0.0033)	ND (0.0031)	9.1	mg/kg
	Styrene	ND (0.017)	ND (0.0033)	ND (0.0031)	1,700	mg/kg
	tert-Butyl alcohol	ND (0.19) R	ND (0.065)	ND (0.062)	13,000	mg/kg
	Tetrachloroethene	ND (0.02)	ND (0.0033)	ND (0.0031)	0.48	mg/kg
	Toluene	ND (0.018)	ND (0.0033)	ND (0.0031)	520	mg/kg
	trans-1,2-Dichloroethene	ND (0.025)	ND (0.0033)	ND (0.0031)	69	mg/kg
	trans-1,3-Dichloropropene	ND (0.016)	ND (0.0033)	ND (0.0031)	0.78	mg/kg
	Trichloroethene	ND (0.034)	ND (0.0033)	ND (0.0031)	0.053	mg/kg
	Vinyl chloride	ND (0.038)	ND (0.0033)	ND (0.0031)	0.079	mg/kg
	Xylenes, total	ND (0.033)	ND (0.0065)	ND (0.0062)	270	mg/kg

TABLE 3-56
1432 3rd Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
	Tomato	1432SSc			
Metals					
Arsenic *	ND (0.06)	**13.8**	**7.6**	0.062 / 22	mg/kg
Chromium	0.88	62.6 J	53	210	mg/kg
Lead **	0.75	**2,280 J**	**983**	194 / 340	mg/kg
VOCs					
1,1,1-Trichloroethane	ND (0.022)	ND (0.0036)	ND (0.0032)	1,200	mg/kg
1,1,2,2-Tetrachloroethane	ND (0.028)	ND (0.0036)	ND (0.0032)	0.41	mg/kg
1,1,2-Trichloroethane	ND (0.02)	ND (0.0036)	ND (0.0032)	0.73	mg/kg
1,1-Dichloroethane	ND (0.018)	ND (0.0036)	ND (0.0032)	2.8	mg/kg
1,1-Dichloroethene	ND (0.024)	ND (0.0036)	ND (0.0032)	120	mg/kg
1,2,4-Trichlorobenzene	ND (0.043)	ND (0.0036)	ND (0.0032)	62	mg/kg
1,2,4-Trimethylbenzene	ND (0.028)	ND (0.0036)	ND (0.0032)	NE	mg/kg
1,2-Dibromo-3-chloropropane	ND (0.2)	ND (0.015)	ND (0.013)	0.03	mg/kg
1,2-Dibromoethane	ND (0.015)	ND (0.0036)	ND (0.0032)	0.032	mg/kg
1,2-Dichlorobenzene	ND (0.017)	ND (0.0036)	ND (0.0032)	600	mg/kg
1,2-Dichloroethane	ND (0.023)	ND (0.0036)	ND (0.0032)	0.28	mg/kg
1,2-Dichloropropane	ND (0.038)	ND (0.0036)	ND (0.0032)	0.34	mg/kg
1,3-Dichlorobenzene	ND (0.02)	ND (0.0036)	ND (0.0032)	530	mg/kg
1,4-Dichlorobenzene	ND (0.018)	ND (0.0036)	ND (0.0032)	3.4	mg/kg
2-Hexanone	ND (0.78)	ND (0.029)	ND (0.025)	NE	mg/kg
Acetone	ND (0.45)	ND (0.029) J	ND (0.025) J	14,000	mg/kg
Benzene	ND (0.021)	ND (0.0036)	ND (0.0032)	0.64	mg/kg
Bromochloromethane	ND (0.025)	ND (0.0036)	ND (0.0032)	NE	mg/kg
Bromodichloromethane	ND (0.017)	ND (0.0036)	ND (0.0032)	0.82	mg/kg
Bromoform	ND (0.055)	ND (0.0036) J	ND (0.0032) J	62	mg/kg
Bromomethane	ND (0.043)	ND (0.0036)	ND (0.0032)	3.9	mg/kg
Carbon disulfide	ND (0.032)	ND (0.0036)	ND (0.0032)	360	mg/kg
Carbon tetrachloride	ND (0.025)	ND (0.0036)	ND (0.0032)	0.25	mg/kg
Chlorobenzene	ND (0.019)	ND (0.0036)	ND (0.0032)	150	mg/kg
Chloroethane	ND (0.034)	ND (0.0036)	ND (0.0032)	3	mg/kg
Chloroform	ND (0.019)	ND (0.0036)	ND (0.0032)	0.94	mg/kg
Chloromethane	ND (0.027)	ND (0.0036)	ND (0.0032)	47	mg/kg
cis-1,2-Dichloroethene	ND (0.023)	ND (0.0036)	ND (0.0032)	43	mg/kg
cis-1,3-Dichloropropene	ND (0.016)	ND (0.0036)	ND (0.0032)	0.78	mg/kg
Cyclohexane	ND (0.02)	NA	NA	140	mg/kg
Dibromochloromethane	ND (0.017)	ND (0.0036) J	ND (0.0032) J	1.1	mg/kg
Ethylbenzene	ND (0.02)	ND (0.0036)	ND (0.0032)	400	mg/kg
Freon 11	ND (0.026)	0.017	0.003 J	390	mg/kg
Freon 113	ND (0.024)	ND (0.0036)	ND (0.0032)	5,600	mg/kg
Freon 12	ND (0.033)	ND (0.0036)	ND (0.0032)	94	mg/kg
Isopropylbenzene (cumene)	ND (0.014)	ND (0.0036)	ND (0.0032)	570	mg/kg
Methyl acetate	ND (0.019)	NA	NA	22,000	mg/kg
Methyl ethyl ketone	ND (0.64)	ND (0.029)	ND (0.025)	22,000	mg/kg
Methyl isobutyl ketone	ND (0.55)	ND (0.029)	ND (0.025)	5,300	mg/kg
Methyl tert-butyl ether	ND (0.015)	ND (0.015)	ND (0.013)	32	mg/kg
Methylcyclohexane	ND (0.012)	NA	NA	2,600	mg/kg
Methylene chloride	ND (0.038)	ND (0.0036)	ND (0.0032)	9.1	mg/kg
Styrene	ND (0.019)	ND (0.0036)	ND (0.0032)	1,700	mg/kg
tert-Butyl alcohol	ND (0.21) R	ND (0.073)	ND (0.063)	13,000	mg/kg
Tetrachloroethene	ND (0.022)	ND (0.0036)	ND (0.0032)	0.48	mg/kg
Toluene	ND (0.02)	ND (0.0036)	ND (0.0032)	520	mg/kg
trans-1,2-Dichloroethene	ND (0.028)	ND (0.0036)	ND (0.0032)	69	mg/kg
trans-1,3-Dichloropropene	ND (0.017)	ND (0.0036)	ND (0.0032)	0.78	mg/kg
Trichloroethene	ND (0.037)	ND (0.0036)	ND (0.0032)	0.053	mg/kg
Vinyl chloride	ND (0.042)	ND (0.0036)	ND (0.0032)	0.079	mg/kg
Xylenes, total	ND (0.037)	ND (0.0073)	ND (0.0063)	270	mg/kg

TABLE 3-56
1432 3rd Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Notes:

Deep samples were collected between 2.5 and 3 ft below ground surface.

* For Arsenic, 0.062 mg/kg is the cancer endpoint; 22 mg/kg is the noncancer endpoint.

** For Lead: Lead screening level in soil was evaluated using Department Toxic Substance Control's Lead Risk Assessment Spreadsheet Version 7 (Lead Spread 7, Cal/EPA 1999). Screening level including homegrown produce pathway: 194 mg/kg. Screening level excluding homegrown produce pathway: 340 mg/kg.

Produce results were compared to Soil Screening Levels.

Results greater than the screening level are bolded.

Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Soil Screening Level table for source of screening levels.

Shallow samples 1ft bgs samples were collected between 0.5 and 1ft below ground surface.

mg/kg	milligrams per kilogram
NA	not analyzed
NC	not collected
ND	not detected above the laboratory's reporting limit shown in parentheses
J	estimated value
J+	estimated value, possible high bias
R	rejected for failure to meet quality control requirements

TABLE 3-57
1436 3rd Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
	Bell Pepper		**none**		
Metals					
Arsenic *	ND (0.06)	NC	NC	0.062 / 22	mg/kg
Chromium	0.58	NC	NC	210	mg/kg
Lead **	0.13	NC	NC	194 / 340	mg/kg
VOCs					
1,1,1-Trichloroethane	ND (0.019)	NC	NC	1,200	mg/kg
1,1,2,2-Tetrachloroethane	ND (0.024)	NC	NC	0.41	mg/kg
1,1,2-Trichloroethane	ND (0.017)	NC	NC	0.73	mg/kg
1,1-Dichloroethane	ND (0.016)	NC	NC	2.8	mg/kg
1,1-Dichloroethene	ND (0.021)	NC	NC	120	mg/kg
1,2,4-Trichlorobenzene	ND (0.037)	NC	NC	62	mg/kg
1,2,4-Trimethylbenzene	ND (0.024)	NC	NC	NE	mg/kg
1,2-Dibromo-3-chloropropane	ND (0.17)	NC	NC	0.03	mg/kg
1,2-Dibromoethane	ND (0.013)	NC	NC	0.032	mg/kg
1,2-Dichlorobenzene	ND (0.015)	NC	NC	600	mg/kg
1,2-Dichloroethane	ND (0.02)	NC	NC	0.28	mg/kg
1,2-Dichloropropane	ND (0.032)	NC	NC	0.34	mg/kg
1,3-Dichlorobenzene	ND (0.018)	NC	NC	530	mg/kg
1,4-Dichlorobenzene	ND (0.015)	NC	NC	3.4	mg/kg
2-Hexanone	ND (0.67)	NC	NC	NE	mg/kg
Acetone	ND (0.39)	NC	NC	14,000	mg/kg
Benzene	ND (0.018)	NC	NC	0.64	mg/kg
Bromochloromethane	ND (0.022)	NC	NC	NE	mg/kg
Bromodichloromethane	ND (0.015)	NC	NC	0.82	mg/kg
Bromoform	ND (0.047)	NC	NC	62	mg/kg
Bromomethane	ND (0.037)	NC	NC	3.9	mg/kg
Carbon disulfide	ND (0.027)	NC	NC	360	mg/kg
Carbon tetrachloride	ND (0.021)	NC	NC	0.25	mg/kg
Chlorobenzene	ND (0.016)	NC	NC	150	mg/kg
Chloroethane	ND (0.03)	NC	NC	3	mg/kg
Chloroform	ND (0.017)	NC	NC	0.94	mg/kg
Chloromethane	ND (0.023)	NC	NC	47	mg/kg
cis-1,2-Dichloroethene	ND (0.02)	NC	NC	43	mg/kg
cis-1,3-Dichloropropene	ND (0.014)	NC	NC	0.78	mg/kg
Cyclohexane	ND (0.017)	NC	NC	140	mg/kg
Dibromochloromethane	ND (0.014)	NC	NC	1.1	mg/kg
Ethylbenzene	ND (0.017)	NC	NC	400	mg/kg
Freon 11	ND (0.023)	NC	NC	390	mg/kg
Freon 113	ND (0.021)	NC	NC	5,600	mg/kg
Freon 12	ND (0.028)	NC	NC	94	mg/kg
Isopropylbenzene (cumene)	ND (0.012)	NC	NC	570	mg/kg
Methyl acetate	ND (0.016)	NC	NC	22,000	mg/kg
Methyl ethyl ketone	ND (0.55)	NC	NC	22,000	mg/kg
Methyl isobutyl ketone	ND (0.48)	NC	NC	5,300	mg/kg
Methyl tert-butyl ether	ND (0.013)	NC	NC	32	mg/kg
Methylcyclohexane	ND (0.01)	NC	NC	2,600	mg/kg
Methylene chloride	ND (0.033)	NC	NC	9.1	mg/kg
Styrene	ND (0.016)	NC	NC	1,700	mg/kg
tert-Butyl alcohol	ND (0.18) R	NC	NC	13,000	mg/kg
Tetrachloroethene	ND (0.019)	NC	NC	0.48	mg/kg
Toluene	ND (0.017)	NC	NC	520	mg/kg
trans-1,2-Dichloroethene	ND (0.024)	NC	NC	69	mg/kg
trans-1,3-Dichloropropene	ND (0.015)	NC	NC	0.78	mg/kg
Trichloroethene	ND (0.032)	NC	NC	0.053	mg/kg
Vinyl chloride	ND (0.036)	NC	NC	0.079	mg/kg
Xylenes, total	ND (0.032)	NC	NC	270	mg/kg

TABLE 3-57
1436 3rd Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
		Green Chili	1436SSa			
Metals						
	Arsenic *	ND (0.06)	**7.6 J**	**7.7**	0.062 / 22	mg/kg
	Chromium	0.68	26.1 J	144	210	mg/kg
	Lead **	0.15	**2,910**	**829**	194 / 340	mg/kg
VOCs						
	1,1,1-Trichloroethane	ND (0.016)	ND (0.0033)	ND (0.0029)	1,200	mg/kg
	1,1,2,2-Tetrachloroethane	ND (0.02)	ND (0.0033)	ND (0.0029)	0.41	mg/kg
	1,1,2-Trichloroethane	ND (0.015)	ND (0.0033)	ND (0.0029)	0.73	mg/kg
	1,1-Dichloroethane	ND (0.013)	ND (0.0033)	ND (0.0029)	2.8	mg/kg
	1,1-Dichloroethene	ND (0.017)	ND (0.0033)	ND (0.0029)	120	mg/kg
	1,2,4-Trichlorobenzene	ND (0.031)	ND (0.0033)	ND (0.0029)	62	mg/kg
	1,2,4-Trimethylbenzene	ND (0.02)	ND (0.0033)	ND (0.0029)	NE	mg/kg
	1,2-Dibromo-3-chloropropane	ND (0.14)	ND (0.0066)	ND (0.0058)	0.03	mg/kg
	1,2-Dibromoethane	ND (0.011)	ND (0.0033)	ND (0.0029)	0.032	mg/kg
	1,2-Dichlorobenzene	ND (0.012)	ND (0.0033)	ND (0.0029)	600	mg/kg
	1,2-Dichloroethane	ND (0.017)	ND (0.0033)	ND (0.0029)	0.28	mg/kg
	1,2-Dichloropropane	ND (0.027)	ND (0.0033)	ND (0.0029)	0.34	mg/kg
	1,3-Dichlorobenzene	ND (0.015)	ND (0.0033)	ND (0.0029)	530	mg/kg
	1,4-Dichlorobenzene	ND (0.013)	ND (0.0033)	ND (0.0029)	3.4	mg/kg
	2-Hexanone	ND (0.56)	ND (0.027)	ND (0.023)	NE	mg/kg
	Acetone	ND (0.33)	ND (0.027)	ND (0.023)	14,000	mg/kg
	Benzene	ND (0.015)	ND (0.0033)	ND (0.0029)	0.64	mg/kg
	Bromochloromethane	ND (0.018)	ND (0.0033)	ND (0.0029)	NE	mg/kg
	Bromodichloromethane	ND (0.012)	ND (0.0033)	ND (0.0029)	0.82	mg/kg
	Bromoform	ND (0.04)	ND (0.0033)	ND (0.0029)	62	mg/kg
	Bromomethane	ND (0.031)	ND (0.0033)	ND (0.0029)	3.9	mg/kg
	Carbon disulfide	ND (0.023)	ND (0.0033)	ND (0.0029)	360	mg/kg
	Carbon tetrachloride	ND (0.018)	ND (0.0033)	ND (0.0029)	0.25	mg/kg
	Chlorobenzene	ND (0.014)	ND (0.0033)	ND (0.0029)	150	mg/kg
	Chloroethane	ND (0.025)	ND (0.0033)	ND (0.0029)	3	mg/kg
	Chloroform	ND (0.014)	ND (0.0033)	ND (0.0029)	0.94	mg/kg
	Chloromethane	ND (0.02)	ND (0.0033)	ND (0.0029)	47	mg/kg
	cis-1,2-Dichloroethene	ND (0.017)	ND (0.0033)	ND (0.0029)	43	mg/kg
	cis-1,3-Dichloropropene	ND (0.012)	ND (0.0033)	ND (0.0029)	0.78	mg/kg
	Cyclohexane	ND (0.015)	NA	NA	140	mg/kg
	Dibromochloromethane	ND (0.012)	ND (0.0033)	ND (0.0029)	1.1	mg/kg
	Ethylbenzene	ND (0.014)	ND (0.0033)	ND (0.0029)	400	mg/kg
	Freon 11	ND (0.019)	ND (0.0033)	0.0041	390	mg/kg
	Freon 113	ND (0.018)	ND (0.0033)	ND (0.0029)	5,600	mg/kg
	Freon 12	ND (0.024)	ND (0.0033)	ND (0.0029)	94	mg/kg
	Isopropylbenzene (cumene)	ND (0.0096)	ND (0.0033)	ND (0.0029)	570	mg/kg
	Methyl acetate	ND (0.014)	NA	NA	22,000	mg/kg
	Methyl ethyl ketone	ND (0.46)	ND (0.027)	ND (0.023)	22,000	mg/kg
	Methyl isobutyl ketone	ND (0.4)	ND (0.027)	ND (0.023)	5,300	mg/kg
	Methyl tert-butyl ether	ND (0.011)	ND (0.013)	ND (0.012)	32	mg/kg
	Methylcyclohexane	ND (0.0084)	NA	NA	2,600	mg/kg
	Methylene chloride	ND (0.028)	ND (0.0033)	ND (0.0029)	9.1	mg/kg
	Styrene	ND (0.014)	ND (0.0033)	ND (0.0029)	1,700	mg/kg
	tert-Butyl alcohol	ND (0.15) R	ND (0.066)	ND (0.058)	13,000	mg/kg
	Tetrachloroethene	ND (0.016)	0.0049	0.0056	0.48	mg/kg
	Toluene	ND (0.014)	ND (0.0033)	ND (0.0029)	520	mg/kg
	trans-1,2-Dichloroethene	ND (0.02)	ND (0.0033)	ND (0.0029)	69	mg/kg
	trans-1,3-Dichloropropene	ND (0.013)	ND (0.0033)	ND (0.0029)	0.78	mg/kg
	Trichloroethene	ND (0.027)	ND (0.0033)	ND (0.0029)	0.053	mg/kg
	Vinyl chloride	ND (0.03)	ND (0.0033)	ND (0.0029)	0.079	mg/kg
	Xylenes, total	ND (0.027)	ND (0.0066)	ND (0.0058)	270	mg/kg

TABLE 3-57
1436 3rd Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
	Lemon	1436SSb			
Metals					
Arsenic *	ND (0.06)	**15.6**	**3.3**	0.062 / 22	mg/kg
Chromium	0.7	69.7	35.3	210	mg/kg
Lead **	0.19	**3,630**	**216 J+**	194 / 340	mg/kg
VOCs					
1,1,1-Trichloroethane	ND (0.017)	ND (0.0034)	ND (0.003)	1,200	mg/kg
1,1,2,2-Tetrachloroethane	ND (0.021)	ND (0.0034)	ND (0.003)	0.41	mg/kg
1,1,2-Trichloroethane	ND (0.015)	ND (0.0034)	ND (0.003)	0.73	mg/kg
1,1-Dichloroethane	ND (0.014)	ND (0.0034)	ND (0.003)	2.8	mg/kg
1,1-Dichloroethene	ND (0.018)	ND (0.0034)	ND (0.003)	120	mg/kg
1,2,4-Trichlorobenzene	ND (0.033)	ND (0.0034)	ND (0.003)	62	mg/kg
1,2,4-Trimethylbenzene	ND (0.021)	ND (0.0034)	ND (0.003)	NE	mg/kg
1,2-Dibromo-3-chloropropane	ND (0.15)	ND (0.0068)	ND (0.006)	0.03	mg/kg
1,2-Dibromoethane	ND (0.011)	ND (0.0034)	ND (0.003)	0.032	mg/kg
1,2-Dichlorobenzene	ND (0.013)	ND (0.0034)	ND (0.003)	600	mg/kg
1,2-Dichloroethane	ND (0.017)	ND (0.0034)	ND (0.003)	0.28	mg/kg
1,2-Dichloropropane	ND (0.029)	ND (0.0034)	ND (0.003)	0.34	mg/kg
1,3-Dichlorobenzene	ND (0.016)	ND (0.0034)	ND (0.003)	530	mg/kg
1,4-Dichlorobenzene	ND (0.013)	ND (0.0034)	ND (0.003)	3.4	mg/kg
2-Hexanone	ND (0.59)	ND (0.027)	ND (0.024)	NE	mg/kg
Acetone	ND (0.34)	ND (0.027)	ND (0.012)	14,000	mg/kg
Benzene	ND (0.016)	ND (0.0034)	ND (0.003)	0.64	mg/kg
Bromochloromethane	ND (0.019)	ND (0.0034)	ND (0.003)	NE	mg/kg
Bromodichloromethane	ND (0.013)	ND (0.0034)	ND (0.003)	0.82	mg/kg
Bromoform	ND (0.042)	ND (0.0034)	ND (0.003)	62	mg/kg
Bromomethane	ND (0.033)	ND (0.0034)	ND (0.003)	3.9	mg/kg
Carbon disulfide	ND (0.024)	ND (0.0034)	ND (0.003)	360	mg/kg
Carbon tetrachloride	ND (0.019)	ND (0.0034)	ND (0.003)	0.25	mg/kg
Chlorobenzene	ND (0.014)	ND (0.0034)	ND (0.003)	150	mg/kg
Chloroethane	ND (0.026)	ND (0.0034)	ND (0.0015)	3	mg/kg
Chloroform	ND (0.015)	ND (0.0034)	ND (0.003)	0.94	mg/kg
Chloromethane	ND (0.021)	ND (0.0034)	ND (0.003)	47	mg/kg
cis-1,2-Dichloroethene	ND (0.018)	ND (0.0034)	ND (0.003)	43	mg/kg
cis-1,3-Dichloropropene	ND (0.012)	ND (0.0034)	ND (0.003)	0.78	mg/kg
Cyclohexane	ND (0.015)	NA	NA	140	mg/kg
Dibromochloromethane	ND (0.013)	ND (0.0034)	ND (0.003)	1.1	mg/kg
Ethylbenzene	ND (0.015)	ND (0.0034)	ND (0.003)	400	mg/kg
Freon 11	ND (0.02)	0.015	0.0058	390	mg/kg
Freon 113	ND (0.018)	ND (0.0034)	ND (0.003)	5,600	mg/kg
Freon 12	ND (0.025)	ND (0.0034)	ND (0.0015)	94	mg/kg
Isopropylbenzene (cumene)	ND (0.011)	ND (0.0034)	ND (0.003)	570	mg/kg
Methyl acetate	ND (0.014)	NA	NA	22,000	mg/kg
Methyl ethyl ketone	ND (0.48)	ND (0.027)	ND (0.024)	22,000	mg/kg
Methyl isobutyl ketone	ND (0.42)	ND (0.027)	ND (0.024)	5,300	mg/kg
Methyl tert-butyl ether	ND (0.011)	ND (0.014)	ND (0.012)	32	mg/kg
Methylcyclohexane	ND (0.0088)	NA	NA	2,600	mg/kg
Methylene chloride	ND (0.029)	ND (0.0034)	ND (0.003)	9.1	mg/kg
Styrene	ND (0.014)	ND (0.0034)	ND (0.003)	1,700	mg/kg
tert-Butyl alcohol	ND (0.16) R	ND (0.068)	ND (0.06)	13,000	mg/kg
Tetrachloroethene	ND (0.017)	ND (0.0034)	ND (0.003)	0.48	mg/kg
Toluene	ND (0.015)	ND (0.0034)	ND (0.003)	520	mg/kg
trans-1,2-Dichloroethene	ND (0.021)	ND (0.0034)	ND (0.003)	69	mg/kg
trans-1,3-Dichloropropene	ND (0.013)	ND (0.0034)	ND (0.003)	0.78	mg/kg
Trichloroethene	ND (0.028)	ND (0.0034)	ND (0.003)	0.053	mg/kg
Vinyl chloride	ND (0.032)	ND (0.0034)	ND (0.003)	0.079	mg/kg
Xylenes, total	ND (0.028)	ND (0.0068)	ND (0.006)	270	mg/kg

TABLE 3-57
1436 3rd Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
	Lemon (FD)	1436SSb			
Metals					
Arsenic *	ND (0.06)	**15.6**	**3.3**	0.062 / 22	mg/kg
Chromium	0.59	69.7	35.3	210	mg/kg
Lead **	0.16	**3,630**	**216 J+**	194 / 340	mg/kg
VOCs					
1,1,1-Trichloroethane	ND (0.022)	ND (0.0034)	ND (0.003)	1,200	mg/kg
1,1,2,2-Tetrachloroethane	ND (0.028)	ND (0.0034)	ND (0.003)	0.41	mg/kg
1,1,2-Trichloroethane	ND (0.02)	ND (0.0034)	ND (0.003)	0.73	mg/kg
1,1-Dichloroethane	ND (0.018)	ND (0.0034)	ND (0.003)	2.8	mg/kg
1,1-Dichloroethene	ND (0.024)	ND (0.0034)	ND (0.003)	120	mg/kg
1,2,4-Trichlorobenzene	ND (0.043)	ND (0.0034)	ND (0.003)	62	mg/kg
1,2,4-Trimethylbenzene	ND (0.028)	ND (0.0034)	ND (0.003)	NE	mg/kg
1,2-Dibromo-3-chloropropane	ND (0.2)	ND (0.0068)	ND (0.006)	0.03	mg/kg
1,2-Dibromoethane	ND (0.015)	ND (0.0034)	ND (0.003)	0.032	mg/kg
1,2-Dichlorobenzene	ND (0.017)	ND (0.0034)	ND (0.003)	600	mg/kg
1,2-Dichloroethane	ND (0.023)	ND (0.0034)	ND (0.003)	0.28	mg/kg
1,2-Dichloropropane	ND (0.038)	ND (0.0034)	ND (0.003)	0.34	mg/kg
1,3-Dichlorobenzene	ND (0.02)	ND (0.0034)	ND (0.003)	530	mg/kg
1,4-Dichlorobenzene	ND (0.018)	ND (0.0034)	ND (0.003)	3.4	mg/kg
2-Hexanone	ND (0.78)	ND (0.027)	ND (0.024)	NE	mg/kg
Acetone	ND (0.45)	ND (0.027)	ND (0.012)	14,000	mg/kg
Benzene	ND (0.021)	ND (0.0034)	ND (0.003)	0.64	mg/kg
Bromochloromethane	ND (0.025)	ND (0.0034)	ND (0.003)	NE	mg/kg
Bromodichloromethane	ND (0.017)	ND (0.0034)	ND (0.003)	0.82	mg/kg
Bromoform	ND (0.055)	ND (0.0034)	ND (0.003)	62	mg/kg
Bromomethane	ND (0.043)	ND (0.0034)	ND (0.003)	3.9	mg/kg
Carbon disulfide	ND (0.032)	ND (0.0034)	ND (0.003)	360	mg/kg
Carbon tetrachloride	ND (0.025)	ND (0.0034)	ND (0.003)	0.25	mg/kg
Chlorobenzene	ND (0.019)	ND (0.0034)	ND (0.003)	150	mg/kg
Chloroethane	ND (0.034)	ND (0.0034)	ND (0.0015)	3	mg/kg
Chloroform	ND (0.019)	ND (0.0034)	ND (0.003)	0.94	mg/kg
Chloromethane	ND (0.027)	ND (0.0034)	ND (0.003)	47	mg/kg
cis-1,2-Dichloroethene	ND (0.023)	ND (0.0034)	ND (0.003)	43	mg/kg
cis-1,3-Dichloropropene	ND (0.016)	ND (0.0034)	ND (0.003)	0.78	mg/kg
Cyclohexane	ND (0.02)	NA	NA	140	mg/kg
Dibromochloromethane	ND (0.017)	ND (0.0034)	ND (0.003)	1.1	mg/kg
Ethylbenzene	ND (0.02)	ND (0.0034)	ND (0.003)	400	mg/kg
Freon 11	ND (0.026)	0.015	0.0058	390	mg/kg
Freon 113	ND (0.024)	ND (0.0034)	ND (0.003)	5,600	mg/kg
Freon 12	ND (0.033)	ND (0.0034)	ND (0.0015)	94	mg/kg
Isopropylbenzene (cumene)	ND (0.014)	ND (0.0034)	ND (0.003)	570	mg/kg
Methyl acetate	ND (0.019)	NA	NA	22,000	mg/kg
Methyl ethyl ketone	ND (0.64)	ND (0.027)	ND (0.024)	22,000	mg/kg
Methyl isobutyl ketone	ND (0.55)	ND (0.027)	ND (0.024)	5,300	mg/kg
Methyl tert-butyl ether	ND (0.015)	ND (0.014)	ND (0.012)	32	mg/kg
Methylcyclohexane	ND (0.012)	NA	NA	2,600	mg/kg
Methylene chloride	ND (0.038)	ND (0.0034)	ND (0.003)	9.1	mg/kg
Styrene	ND (0.019)	ND (0.0034)	ND (0.003)	1,700	mg/kg
tert-Butyl alcohol	ND (0.21) R	ND (0.068)	ND (0.06)	13,000	mg/kg
Tetrachloroethene	ND (0.022)	ND (0.0034)	ND (0.003)	0.48	mg/kg
Toluene	ND (0.02)	ND (0.0034)	ND (0.003)	520	mg/kg
trans-1,2-Dichloroethene	ND (0.028)	ND (0.0034)	ND (0.003)	69	mg/kg
trans-1,3-Dichloropropene	ND (0.017)	ND (0.0034)	ND (0.003)	0.78	mg/kg
Trichloroethene	ND (0.037)	ND (0.0034)	ND (0.003)	0.053	mg/kg
Vinyl chloride	ND (0.042)	ND (0.0034)	ND (0.003)	0.079	mg/kg
Xylenes, total	ND (0.037)	ND (0.0068)	ND (0.006)	270	mg/kg

TABLE 3-57
1436 3rd Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

	Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
		Mint	1436SSa			
Metals						
	Arsenic *	ND (0.06)	**7.6 J**	**7.7**	0.062 / 22	mg/kg
	Chromium	1.07	26.1 J	144	210	mg/kg
	Lead **	8.47	**2,910**	**829**	194 / 340	mg/kg
VOCs						
	1,1,1-Trichloroethane	ND (0.019)	ND (0.0033)	ND (0.0029)	1,200	mg/kg
	1,1,2,2-Tetrachloroethane	ND (0.024)	ND (0.0033)	ND (0.0029)	0.41	mg/kg
	1,1,2-Trichloroethane	ND (0.017)	ND (0.0033)	ND (0.0029)	0.73	mg/kg
	1,1-Dichloroethane	ND (0.016)	ND (0.0033)	ND (0.0029)	2.8	mg/kg
	1,1-Dichloroethene	ND (0.021)	ND (0.0033)	ND (0.0029)	120	mg/kg
	1,2,4-Trichlorobenzene	ND (0.037)	ND (0.0033)	ND (0.0029)	62	mg/kg
	1,2,4-Trimethylbenzene	ND (0.024)	ND (0.0033)	ND (0.0029)	NE	mg/kg
	1,2-Dibromo-3-chloropropane	ND (0.17)	ND (0.0066)	ND (0.0058)	0.03	mg/kg
	1,2-Dibromoethane	ND (0.013)	ND (0.0033)	ND (0.0029)	0.032	mg/kg
	1,2-Dichlorobenzene	ND (0.015)	ND (0.0033)	ND (0.0029)	600	mg/kg
	1,2-Dichloroethane	ND (0.02)	ND (0.0033)	ND (0.0029)	0.28	mg/kg
	1,2-Dichloropropane	ND (0.033)	ND (0.0033)	ND (0.0029)	0.34	mg/kg
	1,3-Dichlorobenzene	ND (0.018)	ND (0.0033)	ND (0.0029)	530	mg/kg
	1,4-Dichlorobenzene	ND (0.015)	ND (0.0033)	ND (0.0029)	3.4	mg/kg
	2-Hexanone	ND (0.67)	ND (0.027)	ND (0.023)	NE	mg/kg
	Acetone	ND (0.39)	ND (0.027)	ND (0.023)	14,000	mg/kg
	Benzene	ND (0.018)	ND (0.0033)	ND (0.0029)	0.64	mg/kg
	Bromochloromethane	ND (0.022)	ND (0.0033)	ND (0.0029)	NE	mg/kg
	Bromodichloromethane	ND (0.015)	ND (0.0033)	ND (0.0029)	0.82	mg/kg
	Bromoform	ND (0.048)	ND (0.0033)	ND (0.0029)	62	mg/kg
	Bromomethane	ND (0.037)	ND (0.0033)	ND (0.0029)	3.9	mg/kg
	Carbon disulfide	ND (0.027)	ND (0.0033)	ND (0.0029)	360	mg/kg
	Carbon tetrachloride	ND (0.021)	ND (0.0033)	ND (0.0029)	0.25	mg/kg
	Chlorobenzene	ND (0.016)	ND (0.0033)	ND (0.0029)	150	mg/kg
	Chloroethane	ND (0.03)	ND (0.0033)	ND (0.0029)	3	mg/kg
	Chloroform	ND (0.017)	ND (0.0033)	ND (0.0029)	0.94	mg/kg
	Chloromethane	ND (0.023)	ND (0.0033)	ND (0.0029)	47	mg/kg
	cis-1,2-Dichloroethene	ND (0.02)	ND (0.0033)	ND (0.0029)	43	mg/kg
	cis-1,3-Dichloropropene	ND (0.014)	ND (0.0033)	ND (0.0029)	0.78	mg/kg
	Cyclohexane	ND (0.017)	NA	NA	140	mg/kg
	Dibromochloromethane	ND (0.014)	ND (0.0033)	ND (0.0029)	1.1	mg/kg
	Ethylbenzene	ND (0.017)	ND (0.0033)	ND (0.0029)	400	mg/kg
	Freon 11	ND (0.023)	ND (0.0033)	0.0041	390	mg/kg
	Freon 113	ND (0.021)	ND (0.0033)	ND (0.0029)	5,600	mg/kg
	Freon 12	ND (0.028)	ND (0.0033)	ND (0.0029)	94	mg/kg
	Isopropylbenzene (cumene)	ND (0.012)	ND (0.0033)	ND (0.0029)	570	mg/kg
	Methyl acetate	0.19	NA	NA	22,000	mg/kg
	Methyl ethyl ketone	ND (0.55)	ND (0.027)	ND (0.023)	22,000	mg/kg
	Methyl isobutyl ketone	ND (0.48)	ND (0.027)	ND (0.023)	5,300	mg/kg
	Methyl tert-butyl ether	ND (0.013)	ND (0.013)	ND (0.012)	32	mg/kg
	Methylcyclohexane	ND (0.01)	NA	NA	2,600	mg/kg
	Methylene chloride	ND (0.033)	ND (0.0033)	ND (0.0029)	9.1	mg/kg
	Styrene	ND (0.016)	ND (0.0033)	ND (0.0029)	1,700	mg/kg
	tert-Butyl alcohol	ND (0.18) R	ND (0.066)	ND (0.058)	13,000	mg/kg
	Tetrachloroethene	ND (0.019)	0.0049	0.0056	0.48	mg/kg
	Toluene	ND (0.017)	ND (0.0033)	ND (0.0029)	520	mg/kg
	trans-1,2-Dichloroethene	ND (0.024)	ND (0.0033)	ND (0.0029)	69	mg/kg
	trans-1,3-Dichloropropene	ND (0.015)	ND (0.0033)	ND (0.0029)	0.78	mg/kg
	Trichloroethene	ND (0.032)	ND (0.0033)	ND (0.0029)	0.053	mg/kg
	Vinyl chloride	ND (0.036)	ND (0.0033)	ND (0.0029)	0.079	mg/kg
	Xylenes, total	ND (0.032)	ND (0.0066)	ND (0.0058)	270	mg/kg

TABLE 3-57
1436 3rd Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
	Red Chili	1436SSa			
Metals					
Arsenic *	**0.07**	**7.6 J**	**7.7**	0.062 / 22	mg/kg
Chromium	0.39	26.1 J	144	210	mg/kg
Lead **	0.77	**2,910**	**829**	194 / 340	mg/kg
VOCs					
1,1,1-Trichloroethane	ND (0.019)	ND (0.0033)	ND (0.0029)	1,200	mg/kg
1,1,2,2-Tetrachloroethane	ND (0.023)	ND (0.0033)	ND (0.0029)	0.41	mg/kg
1,1,2-Trichloroethane	ND (0.017)	ND (0.0033)	ND (0.0029)	0.73	mg/kg
1,1-Dichloroethane	ND (0.015)	ND (0.0033)	ND (0.0029)	2.8	mg/kg
1,1-Dichloroethene	ND (0.02)	ND (0.0033)	ND (0.0029)	120	mg/kg
1,2,4-Trichlorobenzene	ND (0.036)	ND (0.0033)	ND (0.0029)	62	mg/kg
1,2,4-Trimethylbenzene	ND (0.023)	ND (0.0033)	ND (0.0029)	NE	mg/kg
1,2-Dibromo-3-chloropropane	ND (0.17)	ND (0.0066)	ND (0.0058)	0.03	mg/kg
1,2-Dibromoethane	ND (0.012)	ND (0.0033)	ND (0.0029)	0.032	mg/kg
1,2-Dichlorobenzene	ND (0.014)	ND (0.0033)	ND (0.0029)	600	mg/kg
1,2-Dichloroethane	ND (0.019)	ND (0.0033)	ND (0.0029)	0.28	mg/kg
1,2-Dichloropropane	ND (0.031)	ND (0.0033)	ND (0.0029)	0.34	mg/kg
1,3-Dichlorobenzene	ND (0.017)	ND (0.0033)	ND (0.0029)	530	mg/kg
1,4-Dichlorobenzene	ND (0.015)	ND (0.0033)	ND (0.0029)	3.4	mg/kg
2-Hexanone	ND (0.65)	ND (0.027)	ND (0.023)	NE	mg/kg
Acetone	ND (0.38)	ND (0.027)	ND (0.023)	14,000	mg/kg
Benzene	ND (0.018)	ND (0.0033)	ND (0.0029)	0.64	mg/kg
Bromochloromethane	ND (0.021)	ND (0.0033)	ND (0.0029)	NE	mg/kg
Bromodichloromethane	ND (0.014)	ND (0.0033)	ND (0.0029)	0.82	mg/kg
Bromoform	ND (0.046)	ND (0.0033)	ND (0.0029)	62	mg/kg
Bromomethane	ND (0.036)	ND (0.0033)	ND (0.0029)	3.9	mg/kg
Carbon disulfide	ND (0.026)	ND (0.0033)	ND (0.0029)	360	mg/kg
Carbon tetrachloride	ND (0.02)	ND (0.0033)	ND (0.0029)	0.25	mg/kg
Chlorobenzene	ND (0.016)	ND (0.0033)	ND (0.0029)	150	mg/kg
Chloroethane	ND (0.029)	ND (0.0033)	ND (0.0029)	3	mg/kg
Chloroform	ND (0.016)	ND (0.0033)	ND (0.0029)	0.94	mg/kg
Chloromethane	ND (0.023)	ND (0.0033)	ND (0.0029)	47	mg/kg
cis-1,2-Dichloroethene	ND (0.019)	ND (0.0033)	ND (0.0029)	43	mg/kg
cis-1,3-Dichloropropene	ND (0.014)	ND (0.0033)	ND (0.0029)	0.78	mg/kg
Cyclohexane	ND (0.017)	NA	NA	140	mg/kg
Dibromochloromethane	ND (0.014)	ND (0.0033)	ND (0.0029)	1.1	mg/kg
Ethylbenzene	ND (0.016)	ND (0.0033)	ND (0.0029)	400	mg/kg
Freon 11	ND (0.022)	ND (0.0033)	0.0041	390	mg/kg
Freon 113	ND (0.02)	ND (0.0033)	ND (0.0029)	5,600	mg/kg
Freon 12	ND (0.027)	ND (0.0033)	ND (0.0029)	94	mg/kg
Isopropylbenzene (cumene)	ND (0.012)	ND (0.0033)	ND (0.0029)	570	mg/kg
Methyl acetate	0.13 J	NA	NA	22,000	mg/kg
Methyl ethyl ketone	ND (0.53)	ND (0.027)	ND (0.023)	22,000	mg/kg
Methyl isobutyl ketone	ND (0.46)	ND (0.027)	ND (0.023)	5,300	mg/kg
Methyl tert-butyl ether	ND (0.012)	ND (0.013)	ND (0.012)	32	mg/kg
Methylcyclohexane	ND (0.0096)	NA	NA	2,600	mg/kg
Methylene chloride	ND (0.032)	ND (0.0033)	ND (0.0029)	9.1	mg/kg
Styrene	ND (0.016)	ND (0.0033)	ND (0.0029)	1,700	mg/kg
tert-Butyl alcohol	ND (0.17) R	ND (0.066)	ND (0.058)	13,000	mg/kg
Tetrachloroethene	ND (0.018)	0.0049	0.0056	0.48	mg/kg
Toluene	ND (0.016)	ND (0.0033)	ND (0.0029)	520	mg/kg
trans-1,2-Dichloroethene	ND (0.023)	ND (0.0033)	ND (0.0029)	69	mg/kg
trans-1,3-Dichloropropene	ND (0.015)	ND (0.0033)	ND (0.0029)	0.78	mg/kg
Trichloroethene	ND (0.031)	ND (0.0033)	ND (0.0029)	0.053	mg/kg
Vinyl chloride	ND (0.035)	ND (0.0033)	ND (0.0029)	0.079	mg/kg
Xylenes, total	ND (0.031)	ND (0.0066)	ND (0.0058)	270	mg/kg

TABLE 3-57
1436 3rd Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
	Tomatillo	1436SSa			
Metals					
Arsenic *	ND (0.06)	**7.6 J**	**7.7**	0.062 / 22	mg/kg
Chromium	0.68	26.1 J	144	210	mg/kg
Lead **	0.65	**2,910**	**829**	194 / 340	mg/kg
VOCs					
1,1,1-Trichloroethane	ND (0.02)	ND (0.0033)	ND (0.0029)	1,200	mg/kg
1,1,2,2-Tetrachloroethane	ND (0.024)	ND (0.0033)	ND (0.0029)	0.41	mg/kg
1,1,2-Trichloroethane	ND (0.018)	ND (0.0033)	ND (0.0029)	0.73	mg/kg
1,1-Dichloroethane	ND (0.016)	ND (0.0033)	ND (0.0029)	2.8	mg/kg
1,1-Dichloroethene	ND (0.021)	ND (0.0033)	ND (0.0029)	120	mg/kg
1,2,4-Trichlorobenzene	ND (0.038)	ND (0.0033)	ND (0.0029)	62	mg/kg
1,2,4-Trimethylbenzene	ND (0.025)	ND (0.0033)	ND (0.0029)	NE	mg/kg
1,2-Dibromo-3-chloropropane	ND (0.18)	ND (0.0066)	ND (0.0058)	0.03	mg/kg
1,2-Dibromoethane	ND (0.013)	ND (0.0033)	ND (0.0029)	0.032	mg/kg
1,2-Dichlorobenzene	ND (0.015)	ND (0.0033)	ND (0.0029)	600	mg/kg
1,2-Dichloroethane	ND (0.02)	ND (0.0033)	ND (0.0029)	0.28	mg/kg
1,2-Dichloropropane	ND (0.033)	ND (0.0033)	ND (0.0029)	0.34	mg/kg
1,3-Dichlorobenzene	ND (0.018)	ND (0.0033)	ND (0.0029)	530	mg/kg
1,4-Dichlorobenzene	ND (0.016)	ND (0.0033)	ND (0.0029)	3.4	mg/kg
2-Hexanone	ND (0.69)	ND (0.027)	ND (0.023)	NE	mg/kg
Acetone	ND (0.4)	ND (0.027)	ND (0.023)	14,000	mg/kg
Benzene	ND (0.019)	ND (0.0033)	ND (0.0029)	0.64	mg/kg
Bromochloromethane	ND (0.022)	ND (0.0033)	ND (0.0029)	NE	mg/kg
Bromodichloromethane	ND (0.015)	ND (0.0033)	ND (0.0029)	0.82	mg/kg
Bromoform	ND (0.049)	ND (0.0033)	ND (0.0029)	62	mg/kg
Bromomethane	ND (0.038)	ND (0.0033)	ND (0.0029)	3.9	mg/kg
Carbon disulfide	ND (0.028)	ND (0.0033)	ND (0.0029)	360	mg/kg
Carbon tetrachloride	ND (0.022)	ND (0.0033)	ND (0.0029)	0.25	mg/kg
Chlorobenzene	ND (0.017)	ND (0.0033)	ND (0.0029)	150	mg/kg
Chloroethane	ND (0.031)	ND (0.0033)	ND (0.0029)	3	mg/kg
Chloroform	ND (0.017)	ND (0.0033)	ND (0.0029)	0.94	mg/kg
Chloromethane	ND (0.024)	ND (0.0033)	ND (0.0029)	47	mg/kg
cis-1,2-Dichloroethene	ND (0.021)	ND (0.0033)	ND (0.0029)	43	mg/kg
cis-1,3-Dichloropropene	ND (0.015)	ND (0.0033)	ND (0.0029)	0.78	mg/kg
Cyclohexane	ND (0.018)	NA	NA	140	mg/kg
Dibromochloromethane	ND (0.015)	ND (0.0033)	ND (0.0029)	1.1	mg/kg
Ethylbenzene	ND (0.017)	ND (0.0033)	ND (0.0029)	400	mg/kg
Freon 11	ND (0.023)	ND (0.0033)	0.0041	390	mg/kg
Freon 113	ND (0.021)	ND (0.0033)	ND (0.0029)	5,600	mg/kg
Freon 12	ND (0.029)	ND (0.0033)	ND (0.0029)	94	mg/kg
Isopropylbenzene (cumene)	ND (0.012)	ND (0.0033)	ND (0.0029)	570	mg/kg
Methyl acetate	ND (0.017)	NA	NA	22,000	mg/kg
Methyl ethyl ketone	ND (0.56)	ND (0.027)	ND (0.023)	22,000	mg/kg
Methyl isobutyl ketone	ND (0.49)	ND (0.027)	ND (0.023)	5,300	mg/kg
Methyl tert-butyl ether	ND (0.013)	ND (0.013)	ND (0.012)	32	mg/kg
Methylcyclohexane	ND (0.011)	NA	NA	2,600	mg/kg
Methylene chloride	ND (0.034)	ND (0.0033)	ND (0.0029)	9.1	mg/kg
Styrene	ND (0.017)	ND (0.0033)	ND (0.0029)	1,700	mg/kg
tert-Butyl alcohol	ND (0.18) R	ND (0.066)	ND (0.058)	13,000	mg/kg
Tetrachloroethene	ND (0.019)	0.0049	0.0056	0.48	mg/kg
Toluene	ND (0.017)	ND (0.0033)	ND (0.0029)	520	mg/kg
trans-1,2-Dichloroethene	ND (0.025)	ND (0.0033)	ND (0.0029)	69	mg/kg
trans-1,3-Dichloropropene	ND (0.015)	ND (0.0033)	ND (0.0029)	0.78	mg/kg
Trichloroethene	ND (0.033)	ND (0.0033)	ND (0.0029)	0.053	mg/kg
Vinyl chloride	ND (0.037)	ND (0.0033)	ND (0.0029)	0.079	mg/kg
Xylenes, total	ND (0.033)	ND (0.0066)	ND (0.0058)	270	mg/kg

TABLE 3-57
1436 3rd Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
	Tomato	1436SSa			
Metals					
Arsenic *	0.06	**7.6 J**	**7.7**	0.062 / 22	mg/kg
Chromium	0.73	26.1 J	144	210	mg/kg
Lead **	1	**2,910**	**829**	194 / 340	mg/kg
VOCs					
1,1,1-Trichloroethane	ND (0.018)	ND (0.0033)	ND (0.0029)	1,200	mg/kg
1,1,2,2-Tetrachloroethane	ND (0.023)	ND (0.0033)	ND (0.0029)	0.41	mg/kg
1,1,2-Trichloroethane	ND (0.016)	ND (0.0033)	ND (0.0029)	0.73	mg/kg
1,1-Dichloroethane	ND (0.015)	ND (0.0033)	ND (0.0029)	2.8	mg/kg
1,1-Dichloroethene	ND (0.02)	ND (0.0033)	ND (0.0029)	120	mg/kg
1,2,4-Trichlorobenzene	ND (0.036)	ND (0.0033)	ND (0.0029)	62	mg/kg
1,2,4-Trimethylbenzene	ND (0.023)	ND (0.0033)	ND (0.0029)	NE	mg/kg
1,2-Dibromo-3-chloropropane	ND (0.16)	ND (0.0066)	ND (0.0058)	0.03	mg/kg
1,2-Dibromoethane	ND (0.012)	ND (0.0033)	ND (0.0029)	0.032	mg/kg
1,2-Dichlorobenzene	ND (0.014)	ND (0.0033)	ND (0.0029)	600	mg/kg
1,2-Dichloroethane	ND (0.019)	ND (0.0033)	ND (0.0029)	0.28	mg/kg
1,2-Dichloropropane	ND (0.031)	ND (0.0033)	ND (0.0029)	0.34	mg/kg
1,3-Dichlorobenzene	ND (0.017)	ND (0.0033)	ND (0.0029)	530	mg/kg
1,4-Dichlorobenzene	ND (0.015)	ND (0.0033)	ND (0.0029)	3.4	mg/kg
2-Hexanone	ND (0.64)	ND (0.027)	ND (0.023)	NE	mg/kg
Acetone	ND (0.37)	ND (0.027)	ND (0.023)	14,000	mg/kg
Benzene	ND (0.017)	ND (0.0033)	ND (0.0029)	0.64	mg/kg
Bromochloromethane	ND (0.021)	ND (0.0033)	ND (0.0029)	NE	mg/kg
Bromodichloromethane	ND (0.014)	ND (0.0033)	ND (0.0029)	0.82	mg/kg
Bromoform	ND (0.045)	ND (0.0033)	ND (0.0029)	62	mg/kg
Bromomethane	ND (0.035)	ND (0.0033)	ND (0.0029)	3.9	mg/kg
Carbon disulfide	ND (0.026)	ND (0.0033)	ND (0.0029)	360	mg/kg
Carbon tetrachloride	ND (0.02)	ND (0.0033)	ND (0.0029)	0.25	mg/kg
Chlorobenzene	ND (0.016)	ND (0.0033)	ND (0.0029)	150	mg/kg
Chloroethane	ND (0.028)	ND (0.0033)	ND (0.0029)	3	mg/kg
Chloroform	ND (0.016)	ND (0.0033)	ND (0.0029)	0.94	mg/kg
Chloromethane	ND (0.022)	ND (0.0033)	ND (0.0029)	47	mg/kg
cis-1,2-Dichloroethene	ND (0.019)	ND (0.0033)	ND (0.0029)	43	mg/kg
cis-1,3-Dichloropropene	ND (0.014)	ND (0.0033)	ND (0.0029)	0.78	mg/kg
Cyclohexane	ND (0.017)	NA	NA	140	mg/kg
Dibromochloromethane	ND (0.014)	ND (0.0033)	ND (0.0029)	1.1	mg/kg
Ethylbenzene	ND (0.016)	ND (0.0033)	ND (0.0029)	400	mg/kg
Freon 11	ND (0.022)	ND (0.0033)	0.0041	390	mg/kg
Freon 113	ND (0.02)	ND (0.0033)	ND (0.0029)	5,600	mg/kg
Freon 12	ND (0.027)	ND (0.0033)	ND (0.0029)	94	mg/kg
Isopropylbenzene (cumene)	ND (0.011)	ND (0.0033)	ND (0.0029)	570	mg/kg
Methyl acetate	ND (0.016)	NA	NA	22,000	mg/kg
Methyl ethyl ketone	ND (0.52)	ND (0.027)	ND (0.023)	22,000	mg/kg
Methyl isobutyl ketone	ND (0.46)	ND (0.027)	ND (0.023)	5,300	mg/kg
Methyl tert-butyl ether	ND (0.012)	ND (0.013)	ND (0.012)	32	mg/kg
Methylcyclohexane	ND (0.0096)	NA	NA	2,600	mg/kg
Methylene chloride	ND (0.032)	ND (0.0033)	ND (0.0029)	9.1	mg/kg
Styrene	ND (0.016)	ND (0.0033)	ND (0.0029)	1,700	mg/kg
tert-Butyl alcohol	ND (0.17) R	ND (0.066)	ND (0.058)	13,000	mg/kg
Tetrachloroethene	ND (0.018)	0.0049	0.0056	0.48	mg/kg
Toluene	ND (0.016)	ND (0.0033)	ND (0.0029)	520	mg/kg
trans-1,2-Dichloroethene	ND (0.023)	ND (0.0033)	ND (0.0029)	69	mg/kg
trans-1,3-Dichloropropene	ND (0.014)	ND (0.0033)	ND (0.0029)	0.78	mg/kg
Trichloroethene	ND (0.031)	ND (0.0033)	ND (0.0029)	0.053	mg/kg
Vinyl chloride	ND (0.035)	ND (0.0033)	ND (0.0029)	0.079	mg/kg
Xylenes, total	ND (0.03)	ND (0.0066)	ND (0.0058)	270	mg/kg

TABLE 3-57
1436 3rd Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Notes:

Deep samples were collected between 2.5 and 3 ft below ground surface.

* For Arsenic, 0.062 mg/kg is the cancer endpoint; 22 mg/kg is the noncancer endpoint.

** For Lead: Lead screening level in soil was evaluated using Department Toxic Substance Control's Lead Risk Assessment Spreadsheet Version 7 (Lead Spread 7, Cal/EPA 1999). Screening level including homegrown produce pathway: 194 mg/kg. Screening level excluding homegrown produce pathway: 340 mg/kg.

Produce results were compared to Soil Screening Levels.

Results greater than the screening level are bolded.

Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Soil Screening Level table for source of screening levels.

Shallow samples 1ft bgs samples were collected between 0.5 and 1ft below ground surface.

FD	field duplicate
mg/kg	milligrams per kilogram
NA	not analyzed
NC	not collected
ND	not detected above the laboratory's reporting limit shown in parentheses
J	estimated value
R	rejected for failure to meet quality control requirements
J+	estimated value, possible high bias

TABLE 3-58
356 Center Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
	Apple		none		
Metals					
Arsenic *	ND (0.06)	NC	NC	0.062 / 22	mg/kg
Chromium	0.3	NC	NC	210	mg/kg
Lead **	0.3	NC	NC	194 / 340	mg/kg
VOCs					
1,1,1-Trichloroethane	ND (0.017) J	NC	NC	1,200	mg/kg
1,1,2,2-Tetrachloroethane	ND (0.021) J	NC	NC	0.41	mg/kg
1,1,2-Trichloroethane	ND (0.015) J	NC	NC	0.73	mg/kg
1,1-Dichloroethane	ND (0.014) J	NC	NC	2.8	mg/kg
1,1-Dichloroethene	ND (0.018) J	NC	NC	120	mg/kg
1,2,4-Trichlorobenzene	ND (0.033) J	NC	NC	62	mg/kg
1,2,4-Trimethylbenzene	ND (0.021) J	NC	NC	NE	mg/kg
1,2-Dibromo-3-chloropropane	ND (0.15) J	NC	NC	0.03	mg/kg
1,2-Dibromoethane	ND (0.011) J	NC	NC	0.032	mg/kg
1,2-Dichlorobenzene	ND (0.013) J	NC	NC	600	mg/kg
1,2-Dichloroethane	ND (0.017) J	NC	NC	0.28	mg/kg
1,2-Dichloropropane	ND (0.028) J	NC	NC	0.34	mg/kg
1,3-Dichlorobenzene	ND (0.016) J	NC	NC	530	mg/kg
1,4-Dichlorobenzene	ND (0.013) J	NC	NC	3.4	mg/kg
2-Hexanone	ND (0.59) J	NC	NC	NE	mg/kg
Acetone	ND (0.34) J	NC	NC	14,000	mg/kg
Benzene	ND (0.016) J	NC	NC	0.64	mg/kg
Bromochloromethane	ND (0.019) J	NC	NC	NE	mg/kg
Bromodichloromethane	ND (0.013) J	NC	NC	0.82	mg/kg
Bromoform	ND (0.042) J	NC	NC	62	mg/kg
Bromomethane	ND (0.032) J	NC	NC	3.9	mg/kg
Carbon disulfide	ND (0.024) J	NC	NC	360	mg/kg
Carbon tetrachloride	ND (0.019) J	NC	NC	0.25	mg/kg
Chlorobenzene	ND (0.014) J	NC	NC	150	mg/kg
Chloroethane	ND (0.026) J	NC	NC	3	mg/kg
Chloroform	ND (0.015) J	NC	NC	0.94	mg/kg
Chloromethane	ND (0.021) J	NC	NC	47	mg/kg
cis-1,2-Dichloroethene	ND (0.018) J	NC	NC	43	mg/kg
cis-1,3-Dichloropropene	ND (0.012) J	NC	NC	0.78	mg/kg
Cyclohexane	ND (0.015) J	NC	NC	140	mg/kg
Dibromochloromethane	ND (0.013) J	NC	NC	1.1	mg/kg
Ethylbenzene	ND (0.015) J	NC	NC	400	mg/kg
Freon 11	ND (0.02) J	NC	NC	390	mg/kg
Freon 113	ND (0.018) J	NC	NC	5,600	mg/kg
Freon 12	ND (0.025) J	NC	NC	94	mg/kg
Isopropylbenzene (cumene)	ND (0.011) J	NC	NC	570	mg/kg
Methyl acetate	ND (0.014) J	NC	NC	22,000	mg/kg
Methyl ethyl ketone	ND (0.48) J	NC	NC	22,000	mg/kg
Methyl isobutyl ketone	ND (0.42) J	NC	NC	5,300	mg/kg
Methyl tert-butyl ether	ND (0.011) J	NC	NC	32	mg/kg
Methylcyclohexane	ND (0.0087) J	NC	NC	2,600	mg/kg
Methylene chloride	ND (0.029) J	NC	NC	9.1	mg/kg
Styrene	ND (0.014) J	NC	NC	1,700	mg/kg
tert-Butyl alcohol	ND (0.16) R	NC	NC	13,000	mg/kg
Tetrachloroethene	ND (0.017) J	NC	NC	0.48	mg/kg
Toluene	ND (0.015) J	NC	NC	520	mg/kg
trans-1,2-Dichloroethene	ND (0.021) J	NC	NC	69	mg/kg
trans-1,3-Dichloropropene	ND (0.013) J	NC	NC	0.78	mg/kg
Trichloroethene	ND (0.028) J	NC	NC	0.053	mg/kg
Vinyl chloride	ND (0.032) J	NC	NC	0.079	mg/kg
Xylenes, total	ND (0.028) J	NC	NC	270	mg/kg

TABLE 3-58
356 Center Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Notes:

Deep samples were collected between 2.5 and 3 ft below ground surface.

* For Arsenic, 0.062 mg/kg is the cancer endpoint; 22 mg/kg is the noncancer endpoint.

** For Lead: Lead screening level in soil was evaluated using Department Toxic Substance Control's Lead Risk Assessment Spreadsheet Version 7 (Lead Spread 7, Cal/EPA 1999). Screening level including homegrown produce pathway: 194 mg/kg. Screening level excluding homegrown produce pathway: 340 mg/kg.

Produce results were compared to Soil Screening Levels.

Results greater than the screening level are bolded.

Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Soil Screening Level table for source of screening levels.

Shallow samples 1ft bgs samples were collected between 0.5 and 1ft below ground surface.

mg/kg	milligrams per kilogram
NA	not analyzed
NC	not collected
ND	not detected above the laboratory's reporting limit shown in parentheses
J	estimated value
R	rejected for failure to meet quality control requirements

TABLE 3-59
360 Center Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
	Apple		none		
Metals					
Arsenic *	**0.07**	NC	NC	0.062 / 22	mg/kg
Chromium	0.46	NC	NC	210	mg/kg
Lead **	0.23	NC	NC	194 / 340	mg/kg
VOCs					
1,1,1-Trichloroethane	ND (0.017)	NC	NC	1,200	mg/kg
1,1,2,2-Tetrachloroethane	ND (0.021)	NC	NC	0.41	mg/kg
1,1,2-Trichloroethane	ND (0.015)	NC	NC	0.73	mg/kg
1,1-Dichloroethane	ND (0.014)	NC	NC	2.8	mg/kg
1,1-Dichloroethene	ND (0.018)	NC	NC	120	mg/kg
1,2,4-Trichlorobenzene	ND (0.032)	NC	NC	62	mg/kg
1,2,4-Trimethylbenzene	ND (0.021)	NC	NC	NE	mg/kg
1,2-Dibromo-3-chloropropane	ND (0.15)	NC	NC	0.03	mg/kg
1,2-Dibromoethane	ND (0.011)	NC	NC	0.032	mg/kg
1,2-Dichlorobenzene	ND (0.013)	NC	NC	600	mg/kg
1,2-Dichloroethane	ND (0.017)	NC	NC	0.28	mg/kg
1,2-Dichloropropane	ND (0.028)	NC	NC	0.34	mg/kg
1,3-Dichlorobenzene	ND (0.015)	NC	NC	530	mg/kg
1,4-Dichlorobenzene	ND (0.013)	NC	NC	3.4	mg/kg
2-Hexanone	ND (0.58)	NC	NC	NE	mg/kg
Acetone	ND (0.34)	NC	NC	14,000	mg/kg
Benzene	ND (0.016)	NC	NC	0.64	mg/kg
Bromochloromethane	ND (0.019)	NC	NC	NE	mg/kg
Bromodichloromethane	ND (0.013)	NC	NC	0.82	mg/kg
Bromoform	ND (0.041)	NC	NC	62	mg/kg
Bromomethane	ND (0.032)	NC	NC	3.9	mg/kg
Carbon disulfide	ND (0.024)	NC	NC	360	mg/kg
Carbon tetrachloride	ND (0.018)	NC	NC	0.25	mg/kg
Chlorobenzene	ND (0.014)	NC	NC	150	mg/kg
Chloroethane	ND (0.026)	NC	NC	3	mg/kg
Chloroform	ND (0.014)	NC	NC	0.94	mg/kg
Chloromethane	ND (0.02)	NC	NC	47	mg/kg
cis-1,2-Dichloroethene	ND (0.017)	NC	NC	43	mg/kg
cis-1,3-Dichloropropene	ND (0.012)	NC	NC	0.78	mg/kg
Cyclohexane	ND (0.015)	NC	NC	140	mg/kg
Dibromochloromethane	ND (0.012)	NC	NC	1.1	mg/kg
Ethylbenzene	ND (0.015)	NC	NC	400	mg/kg
Freon 11	ND (0.02)	NC	NC	390	mg/kg
Freon 113	ND (0.018)	NC	NC	5,600	mg/kg
Freon 12	ND (0.025)	NC	NC	94	mg/kg
Isopropylbenzene (cumene)	ND (0.01)	NC	NC	570	mg/kg
Methyl acetate	ND (0.014)	NC	NC	22,000	mg/kg
Methyl ethyl ketone	ND (0.47)	NC	NC	22,000	mg/kg
Methyl isobutyl ketone	ND (0.41)	NC	NC	5,300	mg/kg
Methyl tert-butyl ether	ND (0.011)	NC	NC	32	mg/kg
Methylcyclohexane	ND (0.0086)	NC	NC	2,600	mg/kg
Methylene chloride	ND (0.029)	NC	NC	9.1	mg/kg
Styrene	ND (0.014)	NC	NC	1,700	mg/kg
tert-Butyl alcohol	ND (0.16) R	NC	NC	13,000	mg/kg
Tetrachloroethene	ND (0.016)	NC	NC	0.48	mg/kg
Toluene	ND (0.015)	NC	NC	520	mg/kg
trans-1,2-Dichloroethene	ND (0.021)	NC	NC	69	mg/kg
trans-1,3-Dichloropropene	ND (0.013)	NC	NC	0.78	mg/kg
Trichloroethene	ND (0.028)	NC	NC	0.053	mg/kg
Vinyl chloride	ND (0.031)	NC	NC	0.079	mg/kg
Xylenes, total	ND (0.028)	NC	NC	270	mg/kg

TABLE 3-59
360 Center Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
	Blackberry (CS)	**360SSa**			
Metals					
Arsenic *	ND (0.06)	**11.1**	**4**	0.062 / 22	mg/kg
Chromium	0.66	31.2	9.5	210	mg/kg
Lead **	3.27	**2,230 J+**	193	194 / 340	mg/kg
VOCs					
1,1,1-Trichloroethane	ND (0.018)	ND (0.0032)	ND (0.0028)	1,200	mg/kg
1,1,2,2-Tetrachloroethane	ND (0.022)	ND (0.0032)	ND (0.0028)	0.41	mg/kg
1,1,2-Trichloroethane	ND (0.016)	ND (0.0032)	ND (0.0028)	0.73	mg/kg
1,1-Dichloroethane	ND (0.015)	ND (0.0032)	ND (0.0028)	2.8	mg/kg
1,1-Dichloroethene	ND (0.019)	ND (0.0032)	ND (0.0028)	120	mg/kg
1,2,4-Trichlorobenzene	ND (0.034)	ND (0.0032)	ND (0.0028)	62	mg/kg
1,2,4-Trimethylbenzene	ND (0.022)	ND (0.0032)	ND (0.0028)	NE	mg/kg
1,2-Dibromo-3-chloropropane	ND (0.16)	ND (0.013)	ND (0.011)	0.03	mg/kg
1,2-Dibromoethane	ND (0.012)	ND (0.0032)	ND (0.0028)	0.032	mg/kg
1,2-Dichlorobenzene	ND (0.014)	ND (0.0032)	ND (0.0028)	600	mg/kg
1,2-Dichloroethane	ND (0.018)	ND (0.0032)	ND (0.0028)	0.28	mg/kg
1,2-Dichloropropane	ND (0.03)	ND (0.0032)	ND (0.0028)	0.34	mg/kg
1,3-Dichlorobenzene	ND (0.016)	ND (0.0032)	ND (0.0028)	530	mg/kg
1,4-Dichlorobenzene	ND (0.014)	ND (0.0032)	ND (0.0028)	3.4	mg/kg
2-Hexanone	ND (0.62)	ND (0.026)	ND (0.022)	NE	mg/kg
Acetone	ND (0.36)	ND (0.026)	ND (0.022)	14,000	mg/kg
Benzene	ND (0.017)	ND (0.0032)	ND (0.0028)	0.64	mg/kg
Bromochloromethane	ND (0.02)	ND (0.0032)	ND (0.0028)	NE	mg/kg
Bromodichloromethane	ND (0.014)	ND (0.0032)	ND (0.0028)	0.82	mg/kg
Bromoform	ND (0.044)	ND (0.0032)	ND (0.0028)	62	mg/kg
Bromomethane	ND (0.034)	ND (0.0032)	ND (0.0028)	3.9	mg/kg
Carbon disulfide	ND (0.025)	ND (0.0032)	ND (0.0028)	360	mg/kg
Carbon tetrachloride	ND (0.02)	ND (0.0032)	ND (0.0028)	0.25	mg/kg
Chlorobenzene	ND (0.015)	ND (0.0032)	ND (0.0028)	150	mg/kg
Chloroethane	ND (0.027)	ND (0.0032)	ND (0.0028)	3	mg/kg
Chloroform	ND (0.015)	ND (0.0032)	ND (0.0028)	0.94	mg/kg
Chloromethane	ND (0.022)	ND (0.0032)	ND (0.0028)	47	mg/kg
cis-1,2-Dichloroethene	ND (0.018)	ND (0.0032)	ND (0.0028)	43	mg/kg
cis-1,3-Dichloropropene	ND (0.013)	ND (0.0032)	ND (0.0028)	0.78	mg/kg
Cyclohexane	ND (0.016)	NA	NA	140	mg/kg
Dibromochloromethane	ND (0.013)	ND (0.0032)	ND (0.0028)	1.1	mg/kg
Ethylbenzene	ND (0.016)	ND (0.0032)	ND (0.0028)	400	mg/kg
Freon 11	ND (0.021)	0.0032	0.0036	390	mg/kg
Freon 113	ND (0.019)	ND (0.0032)	ND (0.0028)	5,600	mg/kg
Freon 12	ND (0.026)	ND (0.0032)	ND (0.0028)	94	mg/kg
Isopropylbenzene (cumene)	ND (0.011)	ND (0.0032)	ND (0.0028)	570	mg/kg
Methyl acetate	ND (0.015)	NA	NA	22,000	mg/kg
Methyl ethyl ketone	ND (0.5)	ND (0.026)	ND (0.022)	22,000	mg/kg
Methyl isobutyl ketone	ND (0.44)	ND (0.026)	ND (0.022)	5,300	mg/kg
Methyl tert-butyl ether	ND (0.012)	ND (0.013)	ND (0.011)	32	mg/kg
Methylcyclohexane	ND (0.0092)	NA	NA	2,600	mg/kg
Methylene chloride	ND (0.03)	ND (0.0032)	ND (0.0028)	9.1	mg/kg
Styrene	ND (0.015)	ND (0.0032)	ND (0.0028)	1,700	mg/kg
tert-Butyl alcohol	ND (0.16) R	ND (0.065)	ND (0.056)	13,000	mg/kg
Tetrachloroethene	ND (0.017)	ND (0.0032)	ND (0.0028)	0.48	mg/kg
Toluene	ND (0.016)	ND (0.0032)	ND (0.0028)	520	mg/kg
trans-1,2-Dichloroethene	ND (0.022)	ND (0.0032)	ND (0.0028)	69	mg/kg
trans-1,3-Dichloropropene	ND (0.014)	ND (0.0032)	ND (0.0028)	0.78	mg/kg
Trichloroethene	ND (0.03)	ND (0.0032)	ND (0.0028)	0.053	mg/kg
Vinyl chloride	ND (0.033)	ND (0.0032)	ND (0.0028)	0.079	mg/kg
Xylenes, total	ND (0.029)	ND (0.0065)	ND (0.0056)	270	mg/kg

TABLE 3-59
360 Center Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
	Blackberry (CS)	360SSb			
Metals					
Arsenic *	ND (0.06)	**6.4**	**5.3**	0.062 / 22	mg/kg
Chromium	0.66	14	22.9 J	210	mg/kg
Lead **	3.27	**600**	**478 J**	194 / 340	mg/kg
VOCs					
1,1,1-Trichloroethane	ND (0.018)	ND (0.0031)	ND (0.0025)	1,200	mg/kg
1,1,2,2-Tetrachloroethane	ND (0.022)	ND (0.0031)	ND (0.0025)	0.41	mg/kg
1,1,2-Trichloroethane	ND (0.016)	ND (0.0031)	ND (0.0025)	0.73	mg/kg
1,1-Dichloroethane	ND (0.015)	ND (0.0031)	ND (0.0025)	2.8	mg/kg
1,1-Dichloroethene	ND (0.019)	ND (0.0031)	ND (0.0025)	120	mg/kg
1,2,4-Trichlorobenzene	ND (0.034)	ND (0.0031)	ND (0.0025)	62	mg/kg
1,2,4-Trimethylbenzene	ND (0.022)	ND (0.0031)	ND (0.0025)	NE	mg/kg
1,2-Dibromo-3-chloropropane	ND (0.16)	ND (0.012)	ND (0.0098)	0.03	mg/kg
1,2-Dibromoethane	ND (0.012)	ND (0.0031)	ND (0.0025)	0.032	mg/kg
1,2-Dichlorobenzene	ND (0.014)	ND (0.0031)	ND (0.0025)	600	mg/kg
1,2-Dichloroethane	ND (0.018)	ND (0.0031)	ND (0.0025)	0.28	mg/kg
1,2-Dichloropropane	ND (0.03)	ND (0.0031)	ND (0.0025)	0.34	mg/kg
1,3-Dichlorobenzene	ND (0.016)	ND (0.0031)	ND (0.0025)	530	mg/kg
1,4-Dichlorobenzene	ND (0.014)	ND (0.0031)	ND (0.0025)	3.4	mg/kg
2-Hexanone	ND (0.62)	ND (0.025)	ND (0.02)	NE	mg/kg
Acetone	ND (0.36)	ND (0.025)	ND (0.02)	14,000	mg/kg
Benzene	ND (0.017)	ND (0.0031)	ND (0.0025)	0.64	mg/kg
Bromochloromethane	ND (0.02)	ND (0.0031)	ND (0.0025)	NE	mg/kg
Bromodichloromethane	ND (0.014)	ND (0.0031)	ND (0.0025)	0.82	mg/kg
Bromoform	ND (0.044)	ND (0.0031)	ND (0.0025)	62	mg/kg
Bromomethane	ND (0.034)	ND (0.0031)	ND (0.0025)	3.9	mg/kg
Carbon disulfide	ND (0.025)	ND (0.0031)	ND (0.0025)	360	mg/kg
Carbon tetrachloride	ND (0.02)	ND (0.0031)	ND (0.0025)	0.25	mg/kg
Chlorobenzene	ND (0.015)	ND (0.0031)	ND (0.0025)	150	mg/kg
Chloroethane	ND (0.027)	ND (0.0031)	ND (0.0025)	3	mg/kg
Chloroform	ND (0.015)	ND (0.0031)	ND (0.0025)	0.94	mg/kg
Chloromethane	ND (0.022)	ND (0.0031)	ND (0.0025)	47	mg/kg
cis-1,2-Dichloroethene	ND (0.018)	ND (0.0031)	ND (0.0025)	43	mg/kg
cis-1,3-Dichloropropene	ND (0.013)	ND (0.0031)	ND (0.0025)	0.78	mg/kg
Cyclohexane	ND (0.016)	NA	NA	140	mg/kg
Dibromochloromethane	ND (0.013)	ND (0.0031)	ND (0.0025)	1.1	mg/kg
Ethylbenzene	ND (0.016)	ND (0.0031)	ND (0.0025)	400	mg/kg
Freon 11	ND (0.021)	0.0022 J	0.0018 J	390	mg/kg
Freon 113	ND (0.019)	ND (0.0031)	ND (0.0025)	5,600	mg/kg
Freon 12	ND (0.026)	ND (0.0031)	ND (0.0025)	94	mg/kg
Isopropylbenzene (cumene)	ND (0.011)	ND (0.0031)	ND (0.0025)	570	mg/kg
Methyl acetate	ND (0.015)	NA	NA	22,000	mg/kg
Methyl ethyl ketone	ND (0.5)	ND (0.025)	ND (0.02)	22,000	mg/kg
Methyl isobutyl ketone	ND (0.44)	ND (0.025)	ND (0.02)	5,300	mg/kg
Methyl tert-butyl ether	ND (0.012)	ND (0.012)	ND (0.0098)	32	mg/kg
Methylcyclohexane	ND (0.0092)	NA	NA	2,600	mg/kg
Methylene chloride	ND (0.03)	ND (0.0031)	ND (0.0025)	9.1	mg/kg
Styrene	ND (0.015)	ND (0.0031)	ND (0.0025)	1,700	mg/kg
tert-Butyl alcohol	ND (0.16) R	ND (0.061)	ND (0.049)	13,000	mg/kg
Tetrachloroethene	ND (0.017)	ND (0.0031)	ND (0.0025)	0.48	mg/kg
Toluene	ND (0.016)	ND (0.0031)	ND (0.0025)	520	mg/kg
trans-1,2-Dichloroethene	ND (0.022)	ND (0.0031)	ND (0.0025)	69	mg/kg
trans-1,3-Dichloropropene	ND (0.014)	ND (0.0031)	ND (0.0025)	0.78	mg/kg
Trichloroethene	ND (0.03)	ND (0.0031)	ND (0.0025)	0.053	mg/kg
Vinyl chloride	ND (0.033)	ND (0.0031)	ND (0.0025)	0.079	mg/kg
Xylenes, total	ND (0.029)	ND (0.0061)	ND (0.0049)	270	mg/kg

TABLE 3-59
360 Center Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
	Cactus	360SSa			
Metals					
Arsenic *	ND (0.06)	**11.1**	**4**	0.062 / 22	mg/kg
Chromium	0.75	31.2	9.5	210	mg/kg
Lead **	2.7 J	**2,230 J+**	193	194 / 340	mg/kg
VOCs					
1,1,1-Trichloroethane	ND (0.016)	ND (0.0032)	ND (0.0028)	1,200	mg/kg
1,1,2,2-Tetrachloroethane	ND (0.019)	ND (0.0032)	ND (0.0028)	0.41	mg/kg
1,1,2-Trichloroethane	ND (0.014)	ND (0.0032)	ND (0.0028)	0.73	mg/kg
1,1-Dichloroethane	ND (0.013)	ND (0.0032)	ND (0.0028)	2.8	mg/kg
1,1-Dichloroethene	ND (0.017)	ND (0.0032)	ND (0.0028)	120	mg/kg
1,2,4-Trichlorobenzene	ND (0.03)	ND (0.0032)	ND (0.0028)	62	mg/kg
1,2,4-Trimethylbenzene	ND (0.02)	ND (0.0032)	ND (0.0028)	NE	mg/kg
1,2-Dibromo-3-chloropropane	ND (0.14)	ND (0.013)	ND (0.011)	0.03	mg/kg
1,2-Dibromoethane	ND (0.01)	ND (0.0032)	ND (0.0028)	0.032	mg/kg
1,2-Dichlorobenzene	ND (0.012)	ND (0.0032)	ND (0.0028)	600	mg/kg
1,2-Dichloroethane	ND (0.016)	ND (0.0032)	ND (0.0028)	0.28	mg/kg
1,2-Dichloropropane	ND (0.026)	ND (0.0032)	ND (0.0028)	0.34	mg/kg
1,3-Dichlorobenzene	ND (0.014)	ND (0.0032)	ND (0.0028)	530	mg/kg
1,4-Dichlorobenzene	ND (0.012)	ND (0.0032)	ND (0.0028)	3.4	mg/kg
2-Hexanone	ND (0.55)	ND (0.026)	ND (0.022)	NE	mg/kg
Acetone	ND (0.32)	ND (0.026)	ND (0.022)	14,000	mg/kg
Benzene	ND (0.015)	ND (0.0032)	ND (0.0028)	0.64	mg/kg
Bromochloromethane	ND (0.018)	ND (0.0032)	ND (0.0028)	NE	mg/kg
Bromodichloromethane	ND (0.012)	ND (0.0032)	ND (0.0028)	0.82	mg/kg
Bromoform	ND (0.039)	ND (0.0032)	ND (0.0028)	62	mg/kg
Bromomethane	ND (0.03)	ND (0.0032)	ND (0.0028)	3.9	mg/kg
Carbon disulfide	ND (0.022)	ND (0.0032)	ND (0.0028)	360	mg/kg
Carbon tetrachloride	ND (0.017)	ND (0.0032)	ND (0.0028)	0.25	mg/kg
Chlorobenzene	ND (0.013)	ND (0.0032)	ND (0.0028)	150	mg/kg
Chloroethane	ND (0.024)	ND (0.0032)	ND (0.0028)	3	mg/kg
Chloroform	ND (0.014)	ND (0.0032)	ND (0.0028)	0.94	mg/kg
Chloromethane	ND (0.019)	ND (0.0032)	ND (0.0028)	47	mg/kg
cis-1,2-Dichloroethene	ND (0.016)	ND (0.0032)	ND (0.0028)	43	mg/kg
cis-1,3-Dichloropropene	ND (0.012)	ND (0.0032)	ND (0.0028)	0.78	mg/kg
Cyclohexane	ND (0.014)	NA	NA	140	mg/kg
Dibromochloromethane	ND (0.012)	ND (0.0032)	ND (0.0028)	1.1	mg/kg
Ethylbenzene	ND (0.014)	ND (0.0032)	ND (0.0028)	400	mg/kg
Freon 11	ND (0.018)	0.0032	0.0036	390	mg/kg
Freon 113	ND (0.017)	ND (0.0032)	ND (0.0028)	5,600	mg/kg
Freon 12	ND (0.023)	ND (0.0032)	ND (0.0028)	94	mg/kg
Isopropylbenzene (cumene)	ND (0.0093)	ND (0.0032)	ND (0.0028)	570	mg/kg
Methyl acetate	ND (0.013)	NA	NA	22,000	mg/kg
Methyl ethyl ketone	ND (0.44)	ND (0.026)	ND (0.022)	22,000	mg/kg
Methyl isobutyl ketone	ND (0.39)	ND (0.026)	ND (0.022)	5,300	mg/kg
Methyl tert-butyl ether	ND (0.011)	ND (0.013)	ND (0.011)	32	mg/kg
Methylcyclohexane	ND (0.0081)	NA	NA	2,600	mg/kg
Methylene chloride	ND (0.027)	ND (0.0032)	ND (0.0028)	9.1	mg/kg
Styrene	0.022 J	ND (0.0032)	ND (0.0028)	1,700	mg/kg
tert-Butyl alcohol	ND (0.15) R	ND (0.065)	ND (0.056)	13,000	mg/kg
Tetrachloroethene	ND (0.015)	ND (0.0032)	ND (0.0028)	0.48	mg/kg
Toluene	ND (0.014)	ND (0.0032)	ND (0.0028)	520	mg/kg
trans-1,2-Dichloroethene	ND (0.019)	ND (0.0032)	ND (0.0028)	69	mg/kg
trans-1,3-Dichloropropene	ND (0.012)	ND (0.0032)	ND (0.0028)	0.78	mg/kg
Trichloroethene	ND (0.026)	ND (0.0032)	ND (0.0028)	0.053	mg/kg
Vinyl chloride	ND (0.029)	ND (0.0032)	ND (0.0028)	0.079	mg/kg
Xylenes, total	ND (0.026)	ND (0.0065)	ND (0.0056)	270	mg/kg

TABLE 3-59
360 Center Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Analyte	Produce Result	Soil Result (Shallow)	Soil Result (Deep)	Soil Screening Level	Units
	Cactus (FD)	360SSa			
Metals					
Arsenic *	ND (0.06)	**11.1**	**4**	0.062 / 22	mg/kg
Chromium	0.66	31.2	9.5	210	mg/kg
Lead **	1.21 J	**2,230 J+**	193	194 / 340	mg/kg
VOCs					
1,1,1-Trichloroethane	ND (0.023)	ND (0.0032)	ND (0.0028)	1,200	mg/kg
1,1,2,2-Tetrachloroethane	ND (0.029)	ND (0.0032)	ND (0.0028)	0.41	mg/kg
1,1,2-Trichloroethane	ND (0.021)	ND (0.0032)	ND (0.0028)	0.73	mg/kg
1,1-Dichloroethane	ND (0.019)	ND (0.0032)	ND (0.0028)	2.8	mg/kg
1,1-Dichloroethene	ND (0.025)	ND (0.0032)	ND (0.0028)	120	mg/kg
1,2,4-Trichlorobenzene	ND (0.045)	ND (0.0032)	ND (0.0028)	62	mg/kg
1,2,4-Trimethylbenzene	ND (0.029)	ND (0.0032)	ND (0.0028)	NE	mg/kg
1,2-Dibromo-3-chloropropane	ND (0.21)	ND (0.013)	ND (0.011)	0.03	mg/kg
1,2-Dibromoethane	ND (0.015)	ND (0.0032)	ND (0.0028)	0.032	mg/kg
1,2-Dichlorobenzene	ND (0.018)	ND (0.0032)	ND (0.0028)	600	mg/kg
1,2-Dichloroethane	ND (0.024)	ND (0.0032)	ND (0.0028)	0.28	mg/kg
1,2-Dichloropropane	ND (0.039)	ND (0.0032)	ND (0.0028)	0.34	mg/kg
1,3-Dichlorobenzene	ND (0.021)	ND (0.0032)	ND (0.0028)	530	mg/kg
1,4-Dichlorobenzene	ND (0.018)	ND (0.0032)	ND (0.0028)	3.4	mg/kg
2-Hexanone	ND (0.81)	ND (0.026)	ND (0.022)	NE	mg/kg
Acetone	ND (0.47)	ND (0.026)	ND (0.022)	14,000	mg/kg
Benzene	ND (0.022)	ND (0.0032)	ND (0.0028)	0.64	mg/kg
Bromochloromethane	ND (0.026)	ND (0.0032)	ND (0.0028)	NE	mg/kg
Bromodichloromethane	ND (0.018)	ND (0.0032)	ND (0.0028)	0.82	mg/kg
Bromoform	ND (0.057)	ND (0.0032)	ND (0.0028)	62	mg/kg
Bromomethane	ND (0.045)	ND (0.0032)	ND (0.0028)	3.9	mg/kg
Carbon disulfide	ND (0.033)	ND (0.0032)	ND (0.0028)	360	mg/kg
Carbon tetrachloride	ND (0.025)	ND (0.0032)	ND (0.0028)	0.25	mg/kg
Chlorobenzene	ND (0.019)	ND (0.0032)	ND (0.0028)	150	mg/kg
Chloroethane	ND (0.036)	ND (0.0032)	ND (0.0028)	3	mg/kg
Chloroform	ND (0.02)	ND (0.0032)	ND (0.0028)	0.94	mg/kg
Chloromethane	ND (0.028)	ND (0.0032)	ND (0.0028)	47	mg/kg
cis-1,2-Dichloroethene	ND (0.024)	ND (0.0032)	ND (0.0028)	43	mg/kg
cis-1,3-Dichloropropene	ND (0.017)	ND (0.0032)	ND (0.0028)	0.78	mg/kg
Cyclohexane	ND (0.021)	NA	NA	140	mg/kg
Dibromochloromethane	ND (0.017)	ND (0.0032)	ND (0.0028)	1.1	mg/kg
Ethylbenzene	ND (0.02)	ND (0.0032)	ND (0.0028)	400	mg/kg
Freon 11	ND (0.027)	0.0032	0.0036	390	mg/kg
Freon 113	ND (0.025)	ND (0.0032)	ND (0.0028)	5,600	mg/kg
Freon 12	ND (0.034)	ND (0.0032)	ND (0.0028)	94	mg/kg
Isopropylbenzene (cumene)	ND (0.014)	ND (0.0032)	ND (0.0028)	570	mg/kg
Methyl acetate	ND (0.02)	NA	NA	22,000	mg/kg
Methyl ethyl ketone	ND (0.66)	ND (0.026)	ND (0.022)	22,000	mg/kg
Methyl isobutyl ketone	ND (0.57)	ND (0.026)	ND (0.022)	5,300	mg/kg
Methyl tert-butyl ether	ND (0.015)	ND (0.013)	ND (0.011)	32	mg/kg
Methylcyclohexane	ND (0.012)	NA	NA	2,600	mg/kg
Methylene chloride	ND (0.04)	ND (0.0032)	ND (0.0028)	9.1	mg/kg
Styrene	ND (0.02)	ND (0.0032)	ND (0.0028)	1,700	mg/kg
tert-Butyl alcohol	ND (0.21) R	ND (0.065)	ND (0.056)	13,000	mg/kg
Tetrachloroethene	ND (0.023)	ND (0.0032)	ND (0.0028)	0.48	mg/kg
Toluene	ND (0.02)	ND (0.0032)	ND (0.0028)	520	mg/kg
trans-1,2-Dichloroethene	ND (0.029)	ND (0.0032)	ND (0.0028)	69	mg/kg
trans-1,3-Dichloropropene	ND (0.018)	ND (0.0032)	ND (0.0028)	0.78	mg/kg
Trichloroethene	ND (0.039)	ND (0.0032)	ND (0.0028)	0.053	mg/kg
Vinyl chloride	ND (0.043)	ND (0.0032)	ND (0.0028)	0.079	mg/kg
Xylenes, total	ND (0.038)	ND (0.0065)	ND (0.0056)	270	mg/kg

TABLE 3-59
360 Center Street Analytical Results - Produce and Adjacent Soil Samples (October 2006)
Human Health Risk Assessment
AMCO Chemical Superfund Site, Oakland, California

Notes:

Deep samples were collected between 2.5 and 3 ft below ground surface.

* For Arsenic, 0.062 mg/kg is the cancer endpoint; 22 mg/kg is the noncancer endpoint.

** For Lead: Lead screening level in soil was evaluated using Department Toxic Substance Control's Lead Risk Assessment Spreadsheet Version 7 (Lead Spread 7, Cal/EPA 1999). Screening level including homegrown produce pathway: 194 mg/kg. Screening level excluding homegrown produce pathway: 340 mg/kg.

Produce results were compared to Soil Screening Levels.

Results greater than the screening level are bolded.

Screening levels are specific concentrations of chemicals that are considered health protective for human populations (including sensitive populations). See Soil Screening Level table for source of screening levels.

Shallow samples 1ft bgs samples were collected between 0.5 and 1ft below ground surface.

CS	composite
FD	field duplicate
mg/kg	milligrams per kilogram
NA	not analyzed
NC	not collected
ND	not detected above the laboratory's reporting limit shown in parentheses
J	estimated value
J+	estimated value, possible high bias
R	rejected for failure to meet quality control requirements

Attachment 4
ATSDR ToxFaqs (on CD)

Attachment 5
proUCL Outputs (on CD)