Basewide Remedial Investigation/Feasibility Study Fort Ord, California

Volume III - Baseline Human Health Risk Assessment

Prepared for

Department of the Army
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Draft: July 7, 1994
Draft Final: November 22, 1994
Final: October 19, 1995

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Fort Ord, California

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Baseline Human Health Risk Assessment

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Summary of Text Changes

This final version of the Baseline Human Health Risk Assessment addresses comments received on the Draft Final version of the report dated December 1994. Responses to agency comments on the Draft Final report are included in Volume VI of this report. Text changes have been made to the following pages in response to agency comments. Replacement pages are indicated with an R.

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ACRONYMS AND ABBREVIATIONS

1,1-DCA	1,1-Dichloroethane
1,1-DCE	1,1-Dichloroethene
1,1,1-TCA	1,1,1-Trichloroethane
1,1,2-TCA	1,1,2-Trichloroethane
1,1,2,2-PCA	1,1,2,2-Tetrachloroethane
1,2-DCA	1,2-Dichloroethane
1,2-DCE	1,2-Dichloroethene (total)
1,2-DCP	1,2-Dichloropropane
1,2,3,4,6,7,8-HpCDF	1,2,3,4,6,7,8-Heptachlorodibenzofuran
1,2,3,4,6,7,8-HpCDD	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin
1,2,3,4,7,8,9-HpCDF	1,2,3,4,7,8,9-Heptachlorodibenzofuran
1,2,3,4,7,8-HxCDD	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin
1,2,3,4,7,8-HxCDF	1,2,3,4,7,8-Hexachlorodibenzofuran
2,3,4,7,8-PeCDF	2,3,4,7,8-Pentachlorodibenzofuran
1,2,3,7,8-PeCDD	1,2,3,7,8-Pentachlorodibenzo-p-dioxin
1,2,3,7,8-PeCDF	1,2,3,7,8-Pentachlorodibenzofuran
1,2,3,7,8,9-HxCDD	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin
1,2,3,7,8,9-HxCDF	1,2,3,7,8,9-Hexachlorodibenzofuran
1,3,5-TNB	1,3,5-Trinitrobenzene
2-Amino-DNT	2-Amino-dinitrotoluene
2-Methnaphthalene	2-Methylnaphthalene
2-Methylphenol	2-Methylphenol
2,3,4,6,7,8-HxCDF	2,3,4,6,7,8-Hexachlorodibenzofuran
2,3,7,8-TCDD	2,3,7,8-Tetrachlorodibenzo-p-dioxin
2,3,7,8-TCDF	2,3,7,8-Tetrachlorodibenzofuran
2,4,6-TNT	2,4,6-Trinitrotoluene
4-Amino-DNT	4-Amino-dinitrotoluene
AA	Atomic adsorption
AAFES	Army and Air Force Exchange Service
AAL	Applied action level
ACM	Asbestos-containing materials
ADD	Average daily dose
AEC	Army Environmental Center
AEHA	U.S. Army Environmental Hygiene Agency
AF	Absorption factor
AF	Adherence factor (soil to skin)
Ag	Silver
AL	Action level
Alkalinity, Hydrox	Alkalinity, Hydrox. (as HCO_3)
Alkalinity, Bicarb	Alkalinity, Bicarb. (as $CaCO_3$)
Alkalinity, Total	Alkalinity, Total (as $CaCO_3$)
AMBAG	Association of Monterey Bay Area Governments
AP	Armor piercing
APC	Armored personnel carrier
AR200-1	Army Regulation 200-1
ARAR	Applicable or relevant and appropriate requirement
ARB	Air Resources Board
Army	Department of the Army
As	Arsenic
ASP	Ammunition supply point

ASR	Archives search report
AST	Aboveground storage tank
ASTM	American Society for Testing and Materials
AT	Averaging time
atm-m^3/mol	Atmospheres per cubic meter per mole
ATSDR	Agency for Toxic Substances and Disease Registry
B	Below quantitation limits (inorganic) or detected in blank as well as in sample (organic)
B(a)P	Benzo(a)pyrene
B(a)P-TE	Benzo(a)pyrene toxic equivalent
BAM	Behavior assessment model
BbC	Baywood (USDA soil type)
BCP	BRAC Cleanup Plan
BCT	BRAC Cleanup Team
BDC	Below detection limit
Be	Beryllium
BEC	Base Environmental Coordinator
BEHP	bis(2-Ethylhexyl)phthalate
Benzo(b)fluoranthe	Benzo(b)fluoranthene
BEP	bis(2-Ethylhexyl)phthalate
bgs	Below ground surface
BHC	Benzohexachloride
Bis(2ethlhex)phlat	bis(2-Ethylhexyl)phthalate
BNA	Base/neutral/acid extractable compound
BOD	Biological oxygen demand
BRA	Baseline Human Health Risk Assessment
BRAC	Base Realignment and Closure
BS/BSD	Blank spike/blank spike duplicate
BTC	Base Transition Coordinator
BTEX	Benzene, toluene, ethylbenzene, xylenes
BW	Body weight
C-4	A type of plastic explosive
C	Chemical concentration in environmental medium
Ca	Calcium
CAIS	Chemical agent identification set
Cal/EPA	California Environmental Protection Agency
Cal/OSHA	California Occupational Safety and Health Act/Administration
Cal-Am	California-American Water Company
CAMU	Corrective action management unit
Carbon Tet	Carbon tetrachloride
CAS	Chemical Abstracts Service
Cat Ex Capacity	Cation Exchange Capacity as Na (sodium)
CBR	Chemical, biological, and radioactive
CCC	California Conservation Corps
CCR	California Code of Regulations
Cd	Cadmium
CDD	Chlorinated dibenzodioxin
CDF	Chlorinated dibenzofuran
CDFG	California Department of Fish and Game
CDI	Chronic daily intake
CDP	Common depth point
CEQA	California Environmental Quality Act

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
CERFA	Community Environmental Response Facilitation Act
CF	Conversion factor
CFR	Code of Federal Regulations
CGI	Combustible gas indicator
cis-1,2-DCE	cis-1,2-Dichloroethene
CLP	Contract Laboratory Program (EPA)
CNCC	California Natural Coordinating Council
COC	Chemical of concern
COE	U.S. Army Corps of Engineers
COPC	Chemical of potential concern
cPAH	Carcinogenic polycyclic aromatic hydrocarbon
Cr	Chromium
cRfD	Chronic reference dose
CRL	Certified reporting limit
CSL	Chemical Systems Laboratory
Cu	Copper
CV	Coefficient of variation
CVAA	Cold vapor atomic absorption
CWM	Chemical warfare material
1,3-DNB	1,3-Dinitrobenzene
2,6-DNT	2,6-Dinitrotoluene
2,4-DNT	2,4-Dinitrotoluene
%D	Percent difference
DAF	Dermal absorption factor
DBCM	Dibromochloromethane
DBMS	Database management system
DCE	Dichloroethene
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethene
DDNP	Diazodinitrophenol
DDT	Dichlorodiphenyltrichloroethane
DEH	Directorate of Engineering and Housing
DHS	California Department of Health Services (before 7/1/91)
DI	Deionized
Di-n-butyl phlat	Di-n-butylphthalate
Dibenzo(ah)anthrac	Dibenzo(a,h)anthracene
Dinoctylphthalate	Di-n-octylphthalate
DMA	U.S. Defense Mapping Agency
DnB	Di-n-butylphthalate
DNB	Dinitrobenzene
DNT	Dinitrotoluene
DOD	Department of Defense
DOL	Directorate of Logistics
DOT	Department of Transportation
DPR	Department of Pesticide Regulation
DQO	Data quality objective
DRMO	Defense Reutilization and Marketing Office
DTSC	Department of Toxic Substances Control (after 7/1/91)
DWR	California Department of Water Resources
E	Serial dilution analysis not within control limits
EA	EA Engineering, Science and Technology, Inc.

EBS/EBST	Environmental Baseline Survey/Environmental Baseline Survey for Transfer
EC	Effective concentration
ED	Exposure duration
ED1	Exposure in years (to a toxic chemical)
ED2	Exposure in days per year
EDD	Expected daily dose
EF	Exposure frequency
EGSTP	East Garrison Sewage Treatment Plant
EIR	Environmental impact report
EIS	Environmental impact statement
EM	Electromagnetic
EOD	Explosive ordnance disposal
EPA	U.S. Environmental Protection Agency
EPC	Exposure point concentration
ET	Exposure time
F	Fahrenheit
F	Fischer distribution
FAAF	Fritzsche Army Airfield
FAASTP	Fritzsche Army Airfield Sewage Treatment Plant
Fe	Iron
FFA	Federal Facilities Agreement
FFE	Flame field expedient
FI	Fraction of intake
FO-SVA	Fort Ord-Salinas Valley Aquiclude
FOD	Frequency of detection
FORG	Fort Ord Reuse Group
FOSL	Findings of suitability for lease
FOST	Findings of suitability for transfer
FOSTA	Fort Ord Soil Treatment Area
FOSTS	Fort Ord Soil Treatment System
FP	Firing point
FS	Feasibility study
FSP	Field sampling plan
FUDS	Formerly used defense site
FWS	U.S. Fish and Wildlife Service
GC	Gas chromatograph
GC/MS	Gas chromatography/mass spectrometry
GF	Graphite furnace
GFAA	Graphite furnace atomic absorption
GP	General purpose (bomb)
gpd	Gallons per day
GPR	Ground penetrating radar
GPS	Global Positioning System
GRA	General response action
GTC	Geotechnical Consultants, Inc.
H	Henry's Law constant
HBL	Health-based level
HBPHC	High boiling point hydrocarbon
HBSL	Health-based screening level
HCRS	Heritage Conservation and Recreation Service
HE	High explosive
Hg	Mercury
HHAG	Human Health Assessment Group

HHRA	Human Health Risk Assessment
HI	Hazard index
HIA	High impact area
HLA	Harding Lawson Associates
HMX	Cyclotetramethylene tetranitramine (explosive compound)
HpCDDs (total)	Heptachlorodibenzo-p-dioxins (total)
HpCDFs (total)	Heptachlorodibenzofurans (total)
HPLC	High-pressure liquid chromatography
HQ	Hazard quotient
HxCDDs (total)	Hexachlorodibenzo-p-dioxins (total)
HxCDFs (total)	Hexachlorodibenzofurans (total)
IA	Interim action
IAFS	Interim action feasibility study
IAROD	Interim action record of decision
ICP	Inductively coupled plasma
ICS	Interference check sample
IF	Intake factors
IFR	Interim final report
IR	Ingestion rate (of soil)
IR	Intake rate/inhalation rate
IRIS	Integrated Risk Information System
IWMB	Integrated Waste Management Board
J	Estimated concentration
J&S	Jones and Stokes Associates
JMM	James M. Montgomery Consulting Engineers
K	Potassium
Kd	Distribution coefficient
Kh	Henry's Law constant
Koc	Distribution coefficient divided by soil fraction of organic carbon
Know	Octanol/water partition coefficient
LADD	Lifetime average daily dose
LAW	Light antitank weapon
LBP	Lead-based paint
LCP	Local coastal program
LCS	Laboratory control samples
LDR	Land disposal restriction
LOAEL	Lowest observed adverse effect level
LRTC	Leadership Reaction Training Compound
LRTS	Leadership Reaction Training Structure
LUFT	Leaking underground fuel tank
MBA	Mine and booby trap area
MBAS	Methylene blue active substances
MBUAPCD	Monterey Bay Unified Air Pollution Control District
MCDH	Monterey County Department of Health
MCL	Maximum contaminant level
MCPD	Monterey County Planning Department
MCPHD	Monterey County Public Health Department
MCX	Mandatory center of expertise
Methylethyl ketone	Methyl ethyl ketone
MG	Machine gun
μg/kg	Micrograms per kilogram
μg/l	Micrograms per liter
mg/kg	Milligrams per kilogram

mg/l	Milligrams per liter
Mg	Magnesium
mgd	Million gallons per day
MGSTP	Main Garrison Sewage Treatment Plant
MIBK	4-Methyl-2-pentanone
Mn	Manganese
MPN	Most probable number
MPWMD	Monterey Peninsula Water Management District
MRTP	Monterey Regional Treatment Plant
MS/MSD	Matrix spike/matrix spike duplicate
MSL	mean sea level
MW	Monitoring well
2-NT	2-Nitrotoluene
3-NT	3-Nitrotoluene
4-NT	4-Nitrotoluene
N	Nitrogen
Na	Sodium
NA	Not analyzed, not applicable, or not available
NAAQS	National Ambient Air Quality Standard
Nap	Naphthalene
NAS	National Academy of Sciences
NBC	Nuclear, biological, and chemical
NCP	National Contingency Plan (40 CFR 300)
ND	Not detected
NDDB	Natural Diversity Database
NEPA	National Environmental Policy Act
NESHAP	National Emissive Standards for Hazardous Air Pollutants
Ni	Nickel
NIOSH	National Institute of Occupational Safety and Health
Nitrate	Nitrate as nitrogen
NOAA	U.S. National Oceanic and Atmospheric Administration
NOAEL	No observed adverse effect level
NoFA	No further action
NoFAROD	No Further Action Record of Decision
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NPV	Net present value
NQTP	non-QTP (not from Paso Robles Formation [QTp])
NRC	National Research Council
O&M	Operation and maintenance
OaD	Oceano (USDA soil type)
OAF	Oral absorption factor
OB/OD	Open burn/open detonation
OCDD	Octachlorodibenzo-p-dioxin
OCDF	Octachlorodibenzofuran
OEHHA	Office of Environmental Health Hazard Assessment
OEW	Ordnance and explosive waste
Orthophosphate	Orthophosphate as phosphorus
OSHA	Occupational Safety and Health Act/Administration
OU	Operable unit
OVA	Organic vapor analyzer
OVM	Organic vapor monitor
OVSTP	Ord Village Sewage Treatment Plant

PA/ST	Preliminary Assessment/Site Investigation
PAH	Polycyclic aromatic hydrocarbon
PARCC	Precision, accuracy, representativeness, completeness, and comparability
Pb	Lead
PCB	Polychlorinated biphenyl
PCDD	Polychlorinated dibenzodioxin
PCDF	Polychlorinated dibenzofuran
PCE	Tetrachloroethene
PCP	Pentachlorophenol
PD	Percent difference
PEA	Preliminary exposure analysis
PeCDDs (total)	Pentachlorodibenzo-p-dioxins (total)
PeCDFs (total)	Pentachlorodibenzofurans (total)
PEL	Permissible exposure limit
%D	Percent difference
PETN	Pentaerythritol tetranitrate
PM_{10}	Particulates with mean diameter of less than 10 microns
PNA	Polynuclear aromatic hydrocarbon
POL	Petroleum, oil, lubricants
POTW	Publicly owned treatment works
PP	Priority pollutants
ppb	Parts per billion
PPE	Personal protective equipment
ppm	Parts per million
PQL	Practical quantitation limit
PRG	Preliminary remediation goal
PS	Protection standards
PVC	Polyvinyl chloride
QA	Quality assurance
QAPP	Quality assurance project plan
QASAS	Quality Assurance Specialist Ammunition Surveillance
QC	Quality control
QTp	Paso Robles Formation
R	Rejected
RAB	Restoration Advisory Board
RAO	Remedial action objectives
RAP	Remedial action plan
RCRA	Resource Conservation and Recovery Act
RD/RA	Remedial design/remedial action
RDA	Recommended daily allowance
RDX	Cyclotrimethylenetrinitramine (explosive compound)
RfC	Reference concentration
RfD	Reference dose
RI/FS	Remedial investigation/feasibility study
RI	Remedial investigation
RME	Reasonable maximum exposure
ROC	Record of concurrence
ROD	Record of decision
RP	Respirable particulate rate
RPD	Relative percent difference
RSCL	Recommended soil cleanup level
RTS	Remedial technologies screening
RU	Remedial unit

RWQCB	California Regional Water Quality Control Board
SA	Surface area (of exposed skin)
SAAQS	State Ambient Air Quality Standard
SAP	Sampling and analysis plan
Sb	Antimony
SDG	Sample delivery group
SDI	Subchronic daily intake
Se	Selenium
SF	Slope factor
SGD	Staal, Gardner & Dunne, Inc.
ShE	Santa Inez Soil Series
SMAW	Shoulder-fired medium assault weapon
Sn	Tin
SOC	Statement of conditions
SOC	Semivolatile organic compound
SOP	Standard operating procedure
Spec Cond	Specific conductance
Specific Conduct.	Specific conductance at 25°C
SQL	Sample quantitation limit
SRE	Screening risk evaluation
sRfD	Subchronic reference dose
STLC	Soluble threshold limit concentration
SVA	Salinas Valley Aquiclude
SVE	Soil vapor extraction
SWMU	Solid waste management unit
SWRCB	State Water Resources Control Board
TBC	To-be-considered requirements
TCDD	2,3,7,8-Tetrachlorodibenzo-p-dioxin
TCDD-TE	2,3,7,8-Tetrachlorodibenzo-p dioxin toxic equivalent
TCDDS (total)	Tetrachlorodibenzo-p-dioxins (total)
TCDFs (total)	Tetrachlorodibenzofurans (total)
TCE	Trichloroethene
TCL	Target cleanup level
TCLP	Toxicity characteristic leaching procedure
TCP	Tricresyl phosphate
TDS	Total dissolved solids
TE	Toxic equivalent
TEF	Toxicity equivalent factor
TFH	Total fuel hydrocarbons
TIC	Tentatively identified compound
Tl	Thallium
TL	Target (cleanup) level
TNB	Trinitrobenzene
TNT	Trinitrotoluene
TOC	Total organic carbon
TOG	Total oil and grease
Tot. Susp. Part.	Total suspended particulates
TPH	Total petroleum hydrocarbons
TPH-D Unknown	TPH-extractable unknown hydrocarbon
TPH-D	TPH as diesel
TPH-G Unknown	TPH-purgeable unknown hydrocarbon
TPH-G	TPH as gasoline
TPHmo	TPH as motor oil

TPH-Motor Oil	TPH as motor oil
TPHd	Total petroleum hydrocarbons as diesel
TPHg	Total petroleum hydrocarbons as gasoline
TPHh	Total petroleum hydrocarbons of heavy molecular weight (diesel or heavier)
TRA	Thomas Reid Associates
trans-1,2-DCE	trans-1,2-Dichloroethene
TRGs	Target remedial goals
TRPH	Total recoverable petroleum hydrocarbons
TSCA	Toxic Substances Control Act
TSS	Total suspended solids
TTLC	Total threshold limit concentration
U	Not detected
UBK	Uptake Biokinetic Model (computer program)
UCL	Upper concentration limit
UF	Uncertainty factor
USA	Underground Service Alert
USAEDH	United States Army Engineer Division, Huntsville
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
USCS	Unified Soil Classification System
USGS	United States Geological Survey
UST	Underground storage tank
UXO	Unexploded ordnance
VES	Vertical electrical soundings
VF	Volatilization factor
VOC	Volatile organic compound
Weston	Roy F. Weston, Inc.
WOE	Weight of evidence
WP	White phosphorous (or "Willie Pete")
WP	Work plan
WTP	Water treatment plant
XRF	X-ray fluorescence
Zn	Zinc

1.0 INTRODUCTION

This volume of the Basewide RI/FS presents the Baseline Human Health Risk Assessments (BRAs) for the five RI/FS sites. During the basewide studies conducted for Fort Ord, sites of potential concern were identified and screening risk evaluations (SREs) were carried out for each of these sites. The results of the SREs, together with information on the history of each site, were used to classify each site into one of three categories: (1) sites requiring no further action (NoFA sites), (2) sites requiring some interim action (IA sites), and (3) sites requiring a complete RI/FS evaluation (RI sites).

The five RI sites identified during this process, and their areas of investigation for which BRAs were conducted, are listed below:

- Sites 2 and 12: the Main Garrison, the Sewage Treatment Plant, the Lower Meadow, the Directorate of Logistics (DOL) Automotive Yard, and the Cannibalization Yard
- Sites 16 and 17: the DOL Maintenance Yard, Pete's Pond, Pete's Pond Extension, and the 1400 Block Motor Pool
- Site 3: The Beach Trainfire Range
- Site 31: the Former Dump Site
- Site 39: the Inland Ranges.

A complete site history, a summary of the sampling and analysis performed, and conclusions about the potential chemical source areas for each of these sites were presented in Volume II. This volume presents the results of the BRAs performed on these sites. Each BRA evaluates possible adverse effects on human health from each discrete site area and also considers the potential for chemicals to migrate from each area to offsite locations. Volume IV presents the potential environmental (ecological) effects from exposure to these sites. Volume V evaluates potential remedial alternatives for each of the sites, based on the human health and ecological risk assessments.

1.1 Strategy of the Baseline Human Health Risk Assessment

Presented below is the strategy for risk assessment of NoFA, IA, and RI sites.

1.1.1 Assessment of NoFA and IA Sites

The SREs prepared for Fort Ord established whether unacceptable health risks or offsite migration of chemicals were associated with NoFA or IA sites. They indicated that no unacceptable health risks are associated with direct contact with site soils or onsite inhalation of vapors and dust from either NoFA or IA sites. At NoFA sites, no substantial offsite migration of chemicals will occur, even without further action. At IA sites, no substantial offsite migration of chemicals will occur after the planned interim actions.

If a receptor were exposed to chemicals at or from more than one NoFA or IA site, health risks are expected to be no greater than exposure to one site because all sites are geographically distinct (see Figure 1.1), and exposure to and health risks from chemicals at one site would decrease in proportion to exposure at additional sites.

1.1.2 Risk Assessment Framework for RI Sites

The risk assessment methods used for the BRAs at RI sites were based on EPA guidance. The methodology was presented to EPA Region IX, the California Department of Toxic Substances Control (DTSC), and the California Regional Water Quality Control Board, Central Coast Region (RWQCB) before preparing the BRAs. Any deviations from these methods are identified in the text sections corresponding to each RI site.

The methods used follow the basic framework for conducting risk assessments developed by the National Research Council (NRC) under the guidance of the National Academy of Sciences (NAS) (NRC, 1983). This framework consists of four basic steps: (1) hazard identification, (2) exposure assessment, (3) toxicity assessment, and (4) risk characterization, which are described below.

- Hazard identification: reviewing and evaluating available site sampling data and identifying chemicals of potential concern (COPCs) in various site media

- Exposure assessment: evaluating potential exposure pathways to the COPCs and the potential human populations that could be exposed to them, either now or in the future

- Toxicity assessment: evaluating potential adverse health effects of exposure to the COPCs, based primarily on animal laboratory data. The results of these high-dose experiments are then extrapolated to low-dose environmental exposures

- Risk characterization: combining the results of the previous three steps to estimate the potential human risks from exposure to COPCs at the site under investigation. Both potential carcinogenic risks and noncarcinogenic adverse health effects are evaluated.

In addition to these four steps, BRAs involve evaluation of the uncertainties inherent in the risk assessment process. Reviewing the uncertainties helps in the interpretation of BRA results.

Diagrams summarizing conceptual site models for each of the five RI sites are presented as Tables 1.1 through 1.5. The diagrams provide an overview of how people might be exposed to chemicals at each of the RI sites. The diagrams summarize site characterization and chemical fate and transport information presented in Volume II, and the exposure assessments presented in Sections 3.0 through 7.0 of the baseline human health risk assessment (RI/FS Volume III).

The BRAs were performed in accordance with the U.S. Environmental Protection Agency's (EPA's) Risk Assessment Guidance for Superfund (EPA, 1989b, 1991d).

1.1.3 Concurrent Exposure

Possible exposure to chemicals at or from more than one RI site or operable unit at Fort Ord is not expected to contribute substantially to the health risks described in the BRAs for individual sites. The areas at RI sites at which chemicals have been detected in soil are geographically distinct (see Figure 1.1), so exposure to and health risks from chemicals at one site would decrease in proportion to increases in exposure at additional sites.

Possible exposure to vapors and airborne dust is expected to be very small compared to possible direct exposure to soil; offsite inhalation exposures are not expected to contribute substantially to overall exposure. Site 12 is the only site at which chemicals from one RI site have migrated offsite in groundwater to another RI site (Site 3). The chemicals in groundwater from Site 12, however, are not expected to contribute substantially to exposure at Site 3 because no exposure to groundwater is expected in that location (see Section 5.0). No other concurrent exposure to chemicals from more than one RI site was identified.

Two operable units, OU 1 and OU 2, also represent sources of chemicals that might contribute to overall health risks at the site. The risk assessment for OU 1 presented in Appendix E of the Draft Final OU 1 Remediation Confirmation Study (*HLA, 1994n*) indicates that no unacceptable health risks are associated with residual chemical concentrations. OU 1 is separated geographically from OU 2 and the five RI sites, and exposure to and risks from chemicals from OU 1 are not expected to coincide with exposure to chemicals from OU 2 or the RI sites.

Chemicals in groundwater that may be associated with OU 2 are present in the area of Sites 16 and 17, and those chemicals detected in groundwater are evaluated in this BRA. The BRA does not identify any other mechanisms by which exposure to chemicals from operable units and/or RI sites might occur concurrently.

1.2 Objectives and Scope

The objectives of this assessment are to evaluate the need to take action to remove chemicals from environmental media at the Fort Ord RI sites to prevent adverse human health effects and to develop chemical clean-up levels, if necessary. In addition to the Remedial Investigation work (Volume II), the BRAs for each RI site reflect the findings of two other reports: the Installation-Wide Multispecies Habitat Management Plan prepared by the Sacramento COE (1994), and the Base Reuse Plan prepared by the Fort Ord Reuse Group (FORG, 1994).

Each BRA addresses the potential effects of exposure to the chemical concentrations measured at each RI site. The assessment evaluates measured chemical concentrations and, in addition, evaluates the effects of predicted or modeled concentrations of some chemicals in some environmental media to fully characterize the potential impact of the chemicals found at each site.

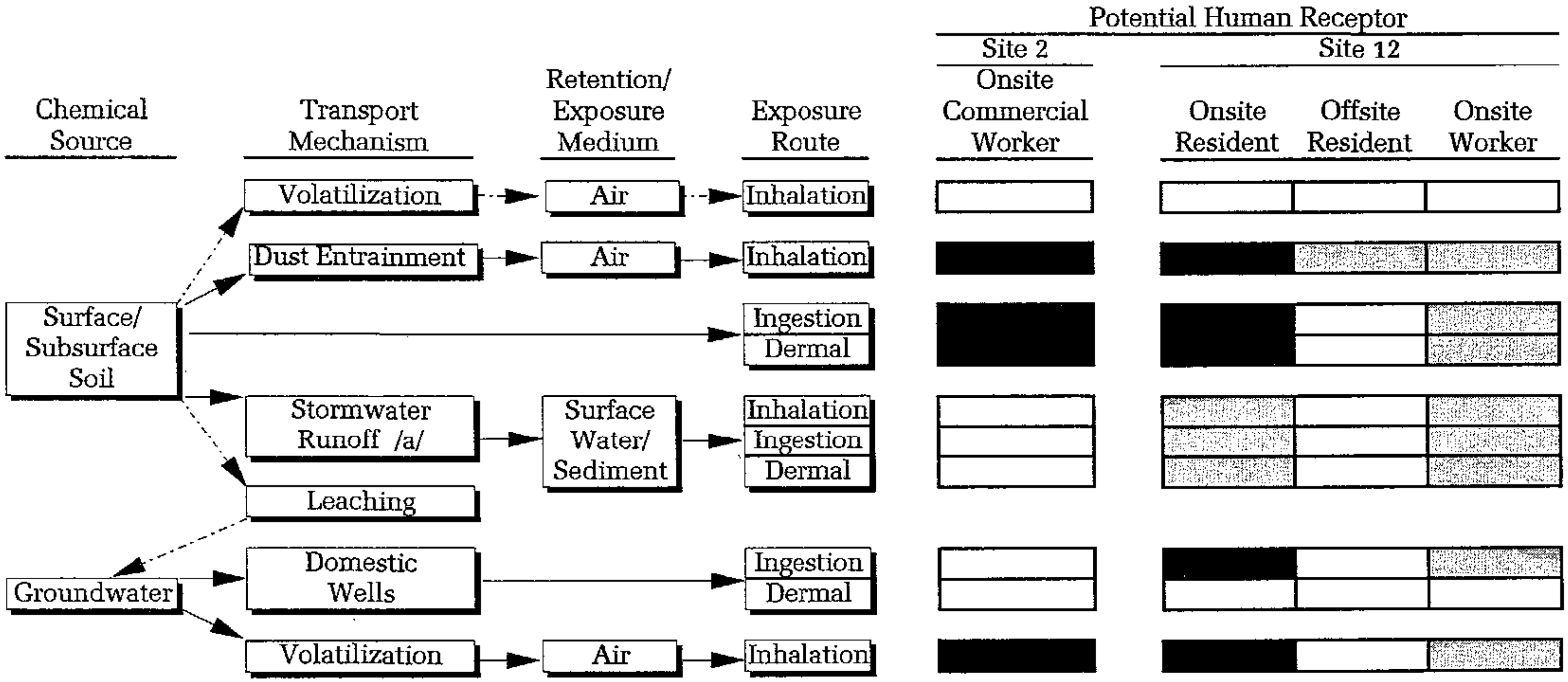
1.3 Organization of the Assessment

Section 2.0 of this volume describes the methodology used to assess each of the RI sites. This methodology includes guidelines for evaluation of sample data, selection of COPCs, derivation of exposure point concentrations (EPCs), estimation of potential receptors and intake doses, selection of toxicity values, and risk characterization. Section 2.0 also summarizes the uncertainties of the BRA methods.

Sections 3.0 through 7.0 describe the separate BRAs performed for each of the five sites: Sites 2 and 12 in Section 3.0, Sites 16 and 17 in Section 4.0, Site 3 in Section 5.0, Site 31 in Section 6.0, and Site 39 in Section 7.0. Section 8.0 contains the uncertainty analysis, and Section 9.0 summarizes each BRA and draws conclusions for each site. Tables, plates, and figures follow the text for each section. The Fort Ord RI/FS master reference list, which includes the references cited in this volume, appears after Section 9.0. Appendices supporting the text follow the RI/FS master reference list.

SECTION 1.0
TABLES AND PLATES

Table 1.1. Conceptual Site Model of Potential Chemical Migration Routes and Exposure Pathways
Sites 2 and 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California



Explanation

Assumed to occur at the site.

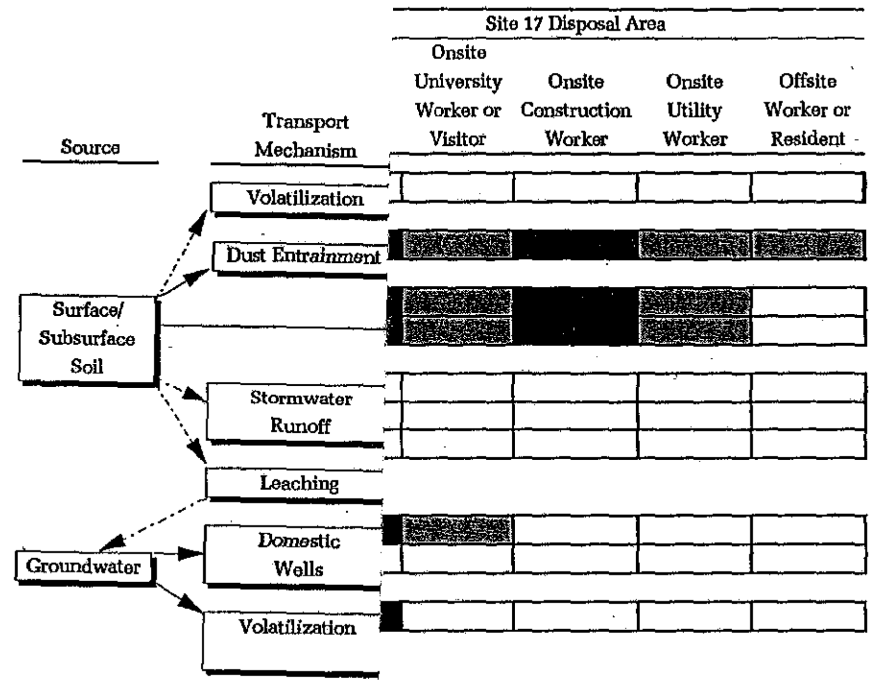
Unlikely to occur at the site.

Receptor likely to be exposed via this route, so pathway considered complete and was quantitatively evaluated.

Receptor may be exposed via this route, so pathway considered potentially complete; however, pathway is considered minor. Qualitative evaluation only.

Receptor unlikely to be exposed via this route; no further evaluation required.

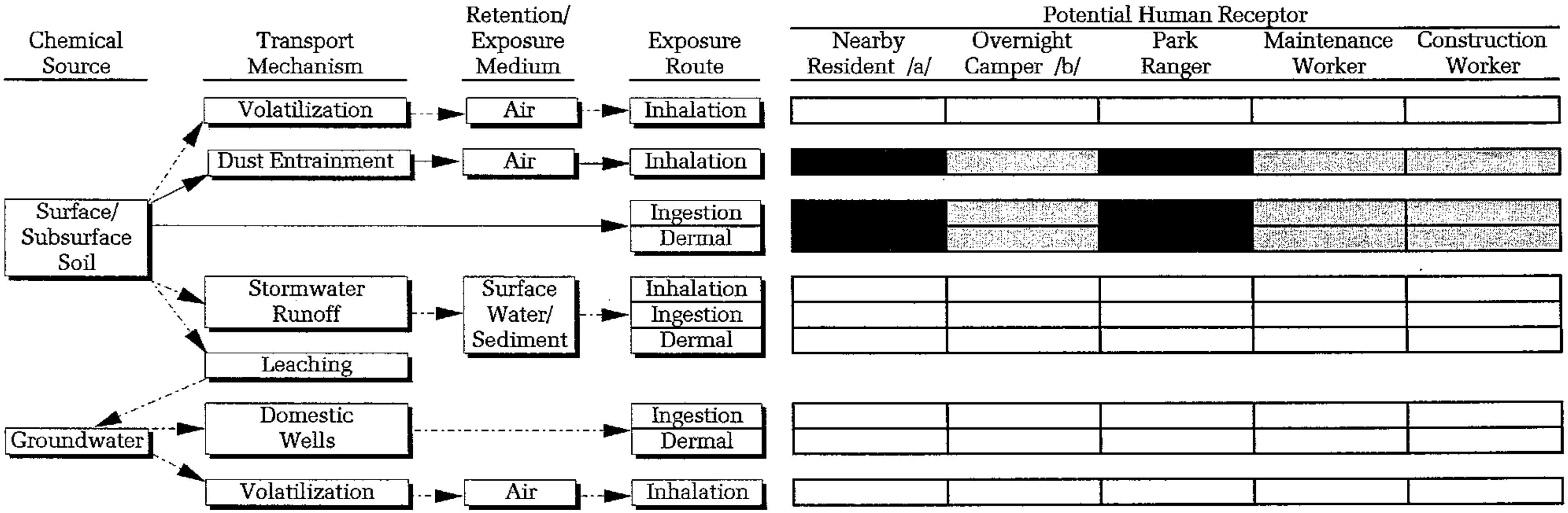
/a/ Potential stormwater runoff pertinent to Site 12 only; evaluated at Site 12 as part of soil exposure pathways (Section 3.4.1).



Explanation

DOL Directorate of Logist
Assumed to occur a
Unlikely to occur at
Receptor likely to b
Receptor may be ex
minor. Qualitative
Receptor unlikely t

Table 1.3. Conceptual Site Model of Potential Chemical Migration Routes and Exposure Pathways
Site 3
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California



Explanation

Assumed to occur at the site.
Unlikely to occur at the site.

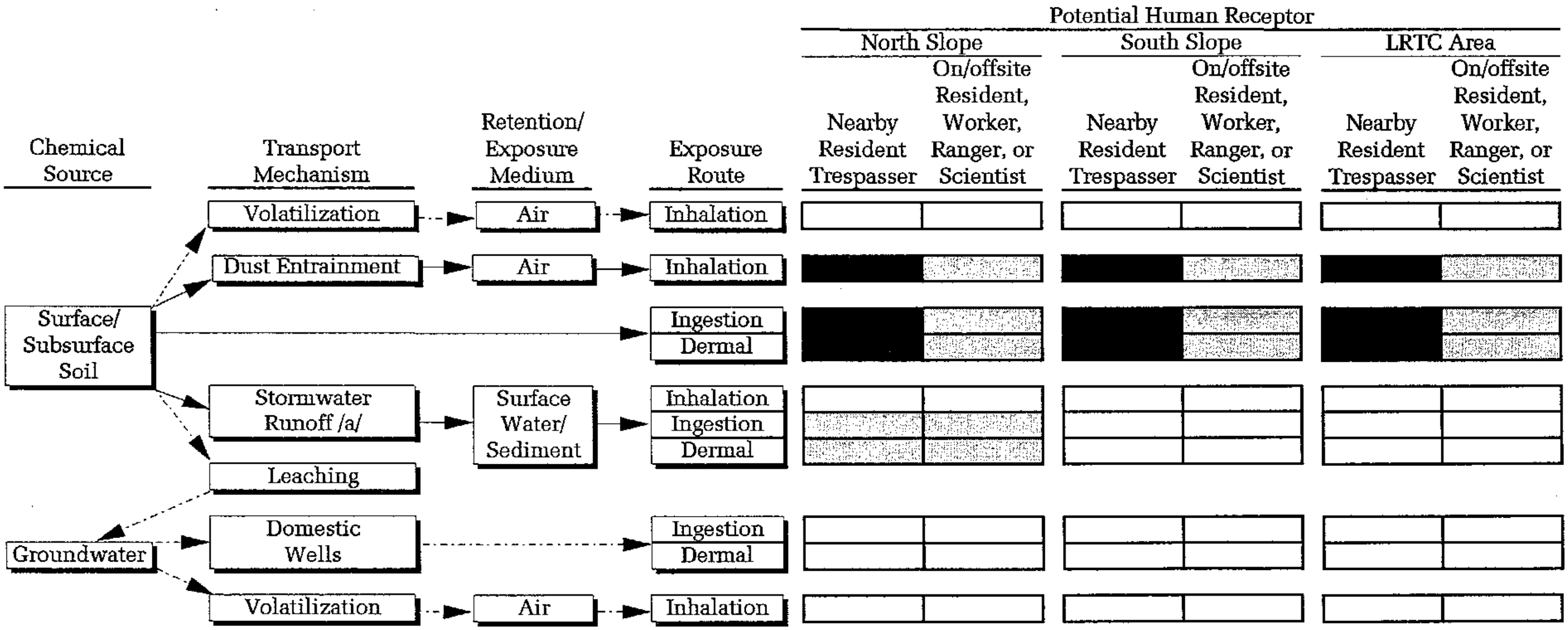
Receptor likely to be exposed via this route, so pathway considered complete and was quantitatively evaluated.

Receptor may be exposed via this route, so pathway considered potentially complete; however, pathway is considered minor. Qualitative evaluation only.

Receptor unlikely to be exposed via this route; no further evaluation required.

/a/ For the average scenario for this receptor, only the dust inhalation pathway was evaluated (Section 5.4.2).
/b/ Overnight camper is a nearby resident trespasser or visitor.

Table 1.4. Conceptual Site Model of Potential Chemical Migration Routes and Exposure Pathways
Site 31
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California



Explanation

LRTC Leadership Reaction Training Compound.

Asssumed to occur at the site.

Unlikely to occur at the site.

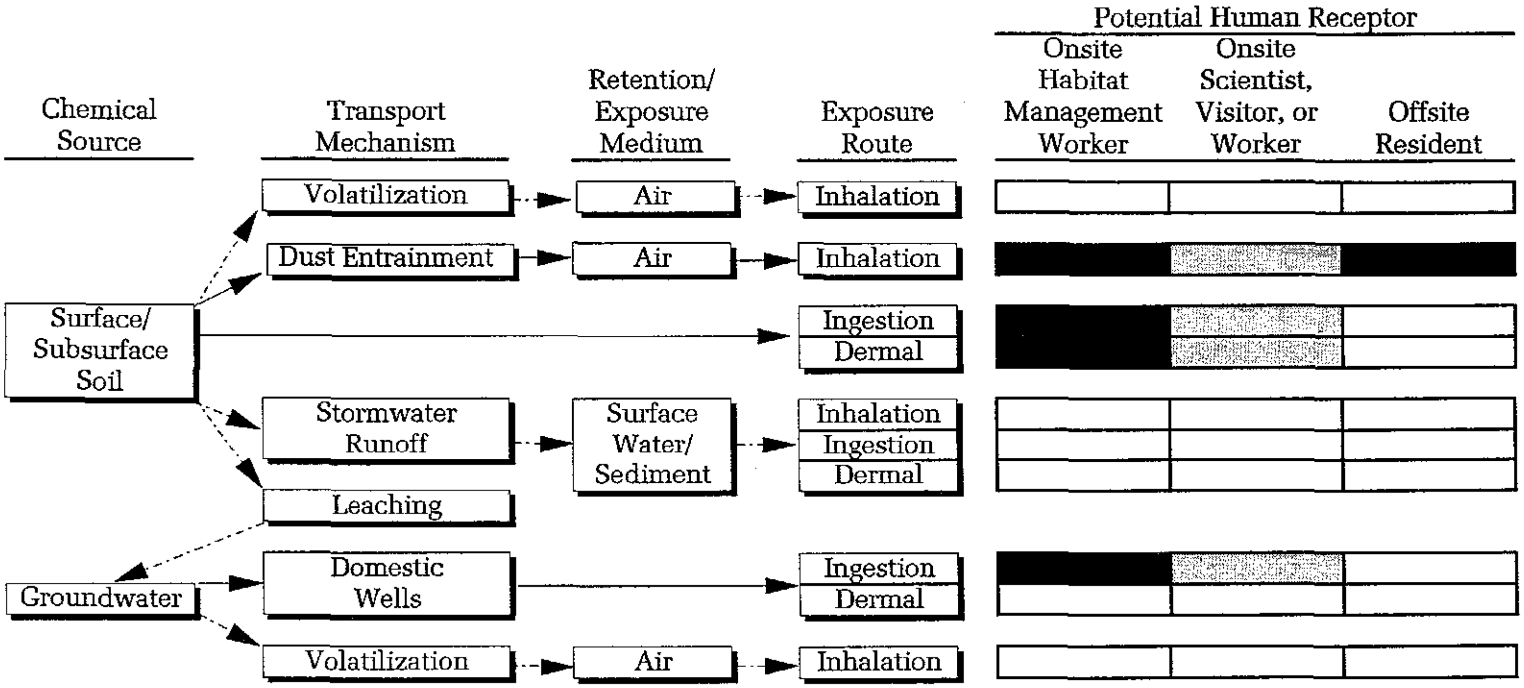
Receptor likely to be exposed via this route, so pathway considered complete and was quantitatively evaluated.

Receptor may be exposed via this route, so pathway considered potentially complete; however, pathway is considered minor. Qualitative evaluation only.

Receptor unlikely to be exposed via this route; no further evaluation required.

/a/ Stormwater runoff may occur at the North Slope and is evaluated with the soil exposure pathways (Section 6.4.2).

Table 1.5. Conceptual Site Model of Potential Chemical Migration Routes and Exposure Pathways
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California



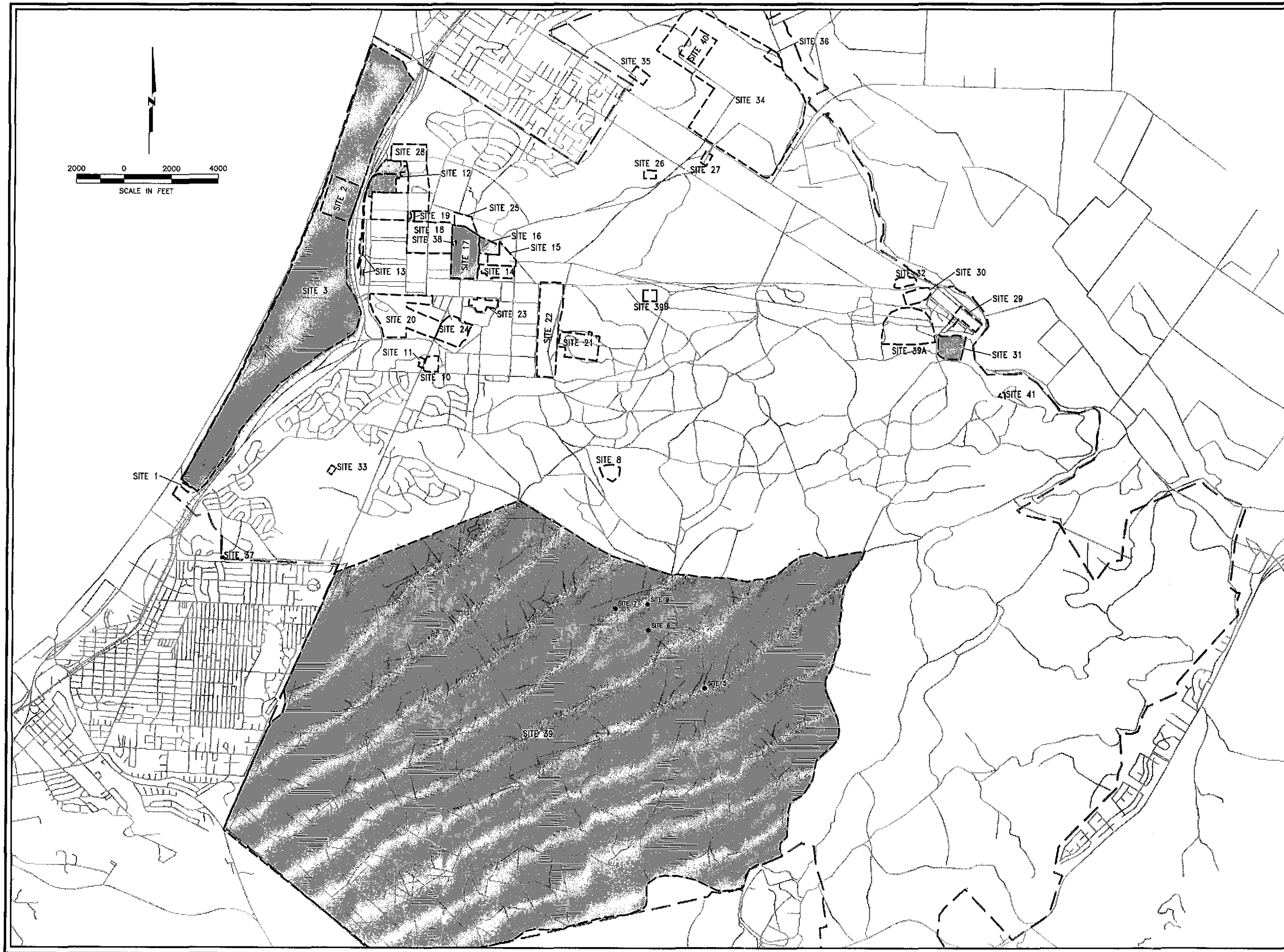
Explanation

Asssumed to occur at the site.
Unlikely to occur at the site.

Receptor likely to be exposed via this route, so pathway considered complete and was quantitatively evaluated.

Receptor may be exposed via this route, so pathway considered potentially complete; however, pathway is considered minor. Qualitative evaluation only.

Receptor unlikely to be exposed via this route; no further evaluation required.



EXPLANATION

RI SITES

NPL SITE BOUNDARY

FORT ORD SITE BOUNDARY

NO.	DATE	REVISIONS	HLA FILE NO.	PROJECT NO.	APPROVED	APPROVAL DATE	DRAWN BY
1	7/94	DRAFT	23366263	23366 04161			MEK
2	12/94	DRAFT FINAL	23366263	23366 041723	MEC	11/22/94	MEK

Harding Lawson Associates
Engineering and Environmental Services

Volume III – Baseline Risk Assessment
Basewide RI/FS
Fort Ord, California

Location of the Five RI Sites Assessed
Sites 2 and 12, Sites 16 and 17,
Site 3, Site 31, and Site 39

PLATE: 1.1

2.0 METHODOLOGY OF THE BASELINE RISK ASSESSMENT

This section presents the methodology used to derive exposure and risk estimates for the sites assessed. Sections 3.0 through 7.0 present the details of the BRAs for each site. Any deviations from the methodology presented in this section are identified in the detailed discussion for each site. The methods presented here follow EPA and DTSC guidance.

The steps used to perform the data evaluation and selection of chemicals of potential concern (COPCs) for each site are discussed in Section 2.1. The methods for the exposure assessment for each of the RI sites are presented in Section 2.2, which includes a description of the exposure setting, of the receptors, and of potential exposure pathways for each site. The methods used to derive the exposure point concentrations (EPCs) for each COPC in the relevant media are also presented in Section 2.2.

Section 2.3 presents a summary of the toxicity information for all of the COPCs evaluated at the four RI sites. Section 2.4 presents the methods for the risk characterization for each of the BRAs, including the methods used to evaluate possible noncancer health effects, possible cancer risks, and blood lead levels. The uncertainties of the methods used are summarized in Section 2.5.

2.1 Data Evaluation and Selection of Chemicals of Potential Concern (COPCs)

This section presents the methods used to evaluate the sample data and the methods used to select the chemicals of potential concern (COPCs) to be included in the quantitative risk evaluation for each RI site. Summaries of the sample data for each site and the site-specific COPCs are presented in the detailed discussions for each BRA in Sections 3.0 through 7.0.

The data considered for the human health BRAs include validated data from the RI, select data from surface water outfall points, and select data from the basewide investigations that are reviewed in the RIs for Sites 2 and 12, Sites 16 and 17, and Site 39 in Volume II of this basewide RI/FS. These data are presented in summary form in the Appendixes for each RI site in Volume II. Diskettes containing all of the raw data for each site were submitted to the reviewing agencies under separate cover. This risk assessment considers chemicals that were detected in each site area. Current onsite source areas of chemicals detected at each site are identified in the RI and are summarized in the detailed site-specific BRAs in Sections 3.0 through 7.0; potential releases from onsite and offsite sources are considered.

Section 2.1.1 describes the parameters used to evaluate the data used in the BRAs. This discussion includes a review of the analytical methods, of the data validation procedures, and of the procedures used to evaluate tentatively identified compounds (TICs) in each data set. Section 2.1.2 presents the steps used to select COPCs for each RI site.

2.1.1 Identification of Usable Data

Much data have been collected at the four RI sites, but only a subset of these data were used in the BRA evaluations. The screening steps recommended by EPA guidance were used to select the dataset for the quantitative BRAs (*EPA, 1989b*). The dataset selected for each BRA is defined in Section 2.1.1.5.

2.1.1.1 Analytical Methods

The analytical methods used to evaluate sample data from Fort Ord were presented in the Sampling and Analysis Plan and the RI/FS Work Plan for Fort Ord (*HLA, 1991b, 1991c*). Additional information about the analytical methods is presented in Volume II of this Basewide RI/FS. EPA-approved analytical test methods were used to analyze samples from various media, including soil and groundwater. Screening test results, such as soil gas and total petroleum hydrocarbon (TPH) analyses, are not considered appropriate for use in risk assessment and therefore, were not included in the data considered for the BRAs (*EPA, 1989b*). The methods used for collection and analysis of soil gas samples were not designed to support risk assessment needs. Soil gas data were collected to identify areas of potential contamination for additional soil investigation. No patterns indicative of source areas were identified.

2.1.1.2 Data Validation

To verify that consistent QA/QC methods were used when evaluating RI/FS data for the RI sites, all data considered for use in the BRAs underwent independent validation. Analytical results from the RI sites were validated according to procedures specified in the Fort Ord QAPP (Part 2 of *HLA, 1991b*). The validation included an evaluation of the quality of the data with respect to quality control (QC) criteria including precision, accuracy, and completeness. The QC samples used to assess data quality consisted of laboratory duplicate samples, matrix spike/matrix spike duplicates (MS/MSD), blank spike/blank spike duplicate (BS/BSD, also known as laboratory control samples [LCSs]), method blanks, source water blanks, trip blanks, equipment rinsate blanks, and field duplicate samples. Holding times and laboratory surrogate spike recoveries were also evaluated. In addition, 10 percent of all sample delivery groups were subjected to detailed data validation, including review of initial and continuing calibrations, and sample results calculations. The details of the data validation are presented in the Appendixes to the RI (Volume II).

2.1.1.3 Evaluation of Detection Limits, Quantitation Limits, and Data Qualifiers

The detection limits, quantitation limits, and data qualifiers for all of the chemicals analyzed for at the RI sites were reviewed. In general, detection limits indicate the concentration at which a small amount of chemical in a sample can be detected, whereas quantitation limits indicate the concentration at which measurements can be trusted. The quantitation limit of interest in the evaluation of RI data for the BRAs is the reporting limit, or sample quantitation limit (SQL). Compounds reported by the laboratory as "below detection limit" or "not detected" (ND) were analyzed for but were not detected above the reporting limit. These compounds are reported in the laboratory data as the reporting limit value followed by ND or by a U qualifier.

Data qualifiers are coded information about a particular piece of sample data. Data qualifiers can be added to a data set either in the laboratory or during validation. Laboratory qualifiers used in the Fort Ord data set are presented and defined in the site characterization reports and in the appendixes to the RI (Volume II). Some common laboratory qualifiers are: "U," "B," and "J." For inorganic chemical data, "B" qualifier indicates that the reported concentration is below the level of accurate quantitation, whereas for organic chemical data, a "B" qualifier indicates that the analyte was found in the associated blank as well as in the sample. A J qualifier indicates that the compound was detected in the sample but that the value reported is estimated. These and other laboratory qualifiers are reviewed as part of the data validation process. Additional qualifiers are added to the dataset during data validation. These qualifiers are presented in the Appendix to the RI (Volume II). An example of a qualifier that could be added during data validation is an "R." An R means that this piece of data is "rejected," or not considered to merit further evaluation.

For the evaluation of RI site data, all compounds reported with U, B, or J qualifiers after validation were retained in the dataset; and all compounds reported with R qualifiers were omitted from the data set, as recommended by EPA guidance (*EPA, 1989b*). Because of the uncertainty of the concentration of a compound in samples reported as ND, as "below detection limit" (BDL), or as U qualified samples, EPA guidance recommends that one half the reporting limit be used as a proxy concentration when calculating chemical concentration terms for the BRA. This was done in the calculation of exposure point concentrations (EPCs) for the BRAs.

2.1.1.4 Tentatively Identified Compounds (TICs)

Each laboratory analysis is limited to a subset of chemicals that can be reported accurately. This subset of chemicals may not represent all of the chemicals actually present at a site. Although the identity and reported concentration of TICs are questionable, the laboratory may prepare a list of TICs to accompany a particular dataset.

Any TIC data available for the Fort Ord RI were reviewed according to EPA guidelines as part of the data evaluation for the BRAs (*EPA, 1989b*). These reviews are presented in the data evaluation section for each site.

2.1.1.5 Data Used in the Baseline Risk Assessment Methodology

The data considered for the BRAs are summarized in Table 2.1. For each RI site, the following information is summarized in Table 2.1: the area of the site from which the samples were collected, the sampling medium, the number of samples collected, and the analyses run on those samples. The raw data for each RI site are summarized in the Appendixes of the RI (Volume II). Summaries of concentrations of all compounds detected in each area are presented in the RI text. The data from each site were segregated into several different groups by depth for the BRAs. Sample analyses for screening tests, such as TPH and soil gas samples, were not used in the BRAs (*EPA, 1989b*). Summary tables presenting concentrations of all detected compounds in the area-depth groupings for consideration in the BRAs are presented in the data evaluation section for each site (Sections 3.2, 4.2, 5.2, and 6.2).

In general, soil data were separated into three separate depth groupings for each area: samples from 0 to 2 feet below ground surface (bgs); samples from 2 to 10 feet bgs, and samples from below 10 feet bgs. Soil data were separated in this way for evaluation of the different potential for human exposures at different depths. Groundwater data were segregated into separate aquifers, where appropriate. Groundwater data from 1993 to May 1994 were used in this evaluation. Groundwater data collected before 1993 were not included due to the potential for migration and degradation of chemicals in groundwater.

Because some samples were analyzed by two test methods for the same compounds, two data points were sometimes available in the data set for the same compounds at one sampling location. This was true for samples analyzed for benzene, toluene, ethylbenzene, and xylene (BTEX) by EPA Test Method 8020 and for volatile organic compounds (VOCs) by EPA Test Method 8240. For this evaluation, when two data points were available for one compound at one sampling location, both data points were used to derive summary statistics for the BRAs.

2.1.2 Selection of Chemicals of Potential Concern

The COPCs were selected so that the most prevalent, persistent, and potentially toxic compounds detected at each site were quantitatively evaluated in the BRAs. Criteria for establishing COPCs included consideration of the toxicity, physical properties, and concentration of each of the detected chemicals. Only chemicals reported at concentrations above the laboratory reporting limit (i.e., detected compounds) were considered for evaluation in each discrete study area.

The EPA recommends the use of alternate exposure and toxicity methods to estimate the potential risk from exposure to lead. Therefore, the COPC screening steps reviewed in this section were not applied to the evaluation of lead as a COPC. Lead was retained as a COPC in soil if it was detected at concentrations above a health-based screening level (HBSL). The HBSL used in this assessment is the preliminary remediation goal (PRG) for soil estimated for a child (240 mg/kg [*HLA, 1993e*]). Lead was not detected in groundwater samples considered for the BRAs.

The following sections describe the methodology used to select COPCs for each of the BRAs for the Fort Ord RI sites. The COPCs selected for each site are presented in Sections 3.3, 4.3, 5.3, and 6.3.

2.1.2.1 Background Chemical Concentrations

As recommended in EPA guidance, chemicals associated with background soil conditions need not be included in the quantitative risk assessment (*EPA, 1989b*). To evaluate the potential contribution of background chemicals in soil, site-specific background soil data were collected and reported in the Draft Final Basewide Background Soil Investigation report for Fort Ord (*HLA, 1993e*). Background soil concentrations for organochlorine pesticides and 13 priority pollutant metals were investigated in this report. The infrequent detection of pesticides in onbase soil samples and the significantly higher frequency of detection of pesticides in offbase samples as compared with onbase samples precluded estimating background thresholds or maximum values for pesticides in Fort Ord soil. Site-specific background soil concentrations were determined for 13 priority pollutant metals in the background soil report: antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc (*HLA, 1993e*).

Background metal concentrations were identified for four geochemically significant conditions in Fort Ord soil: (1) shallow QTP (derived from the Paso Robles Formation), (2) deep QTP, (3) shallow NQTP (non-QTP soil, i.e., derived from the alluvium, older and recent dune sand, Aromas Sand, and Santa Margarita Formation), and (4) deep NQTP. Shallow soil was defined as soil less than 2 feet bgs; deep soil was defined as soil deeper than 2 feet bgs. Background concentrations of metals in the NQTP subsets adjusted for data outliers are shown in Table 2.2. The background dataset for all soil types is presented in Appendix G.

For the BRAs, priority pollutant metals detected at concentrations below maximum site-specific background concentrations were not considered as COPCs. Background concentrations selected for this evaluation were those for the soil type at the site considered; the soil type for the five RI sites evaluated here is NQTP.

As discussed in the background soil report, arsenic, beryllium, and chromium were present at background concentrations that exceeded the lowest, most conservative, preliminary remediation goals (PRGs) estimated for those metals (*HLA, 1993e*). This indicates that adverse health effects may occur as a result of exposure to background concentrations of these metals. EPA guidance recommends calculating the potential risks of background concentrations at a site separately from potentially site-related risks if there is reason to believe that the background risks for the site are of concern (*EPA, 1989b*). Because some metals have been detected at elevated background concentrations in soil, a detailed analysis of potential background risks from metals in soil is provided in Appendix A.

2.1.2.2 Further Limitations on the Number of Chemicals

Before the final selection of COPCs for each BRA, several additional points were considered as recommended in EPA guidance (*EPA, 1989b*):

- Chemicals known to be of high toxicity and known from historical data to be associated with past site activities are to be retained as COPCs

- Chemicals known either to be highly mobile or persistent or known to have a high bioaccumulation potential are to be retained as COPCs

- Chemicals known to be essential human nutrients, present at low concentrations, and known to be toxic only at high doses are not to be considered as COPCs. The details of the essential nutrient evaluation are presented in Appendix B.

- Chemicals that can be identified as laboratory contaminants or artifacts of laboratory analysis are to be eliminated as COPCs by EPA recommendations (*1989b*). As stated in the Quality Assurance Project Plan (Part 2 of *HLA, 1991b*), EPA recognizes acetone, methylene chloride, toluene, and phthalate esters as common laboratory contaminants. In areas where these chemicals were detected at low concentrations (i.e., less than 10 times the method blank concentration), they were eliminated as COPCs.

- Compounds detected in groundwater are to be eliminated if historical data shows decreasing concentrations in wells over time and if the current groundwater concentrations for the compounds do not exceed Maximum Contaminant Levels (MCLs)

- Chemicals most likely to contribute significantly to risk are to be retained as COPCs. These chemicals are identified through the use of a toxicity screen. This screening technique involves the calculation of a screening risk value to evaluate potential carcinogenic risks and a screening hazard index (HI) value to evaluate potential noncarcinogenic health effects. Potentially carcinogenic chemicals with carcinogenic screening risks of less than one in one hundred million (1×10^{-8}) are eliminated as COPCs. Chemicals not assumed to be carcinogenic with screening HI less than 0.01 are eliminated as COPCs. A summary of the results of the toxicity screen for each BRA is presented in Sections 3.3, 4.3, 5.3, 6.3, and 7.3. The details of the toxicity screens for all BRAs are presented in Appendix C.

2.2 Exposure Assessment

The exposure assessment section of each BRA identifies the populations assumed to be exposed to COPCs at each site. The exposure scenarios developed describe the potentially exposed populations, the potential pathways of human exposure to the COPCs at each site, and reasonable estimates of the frequency and duration of contact with COPCs in each of the site areas. The methods used to define these factors are presented in Sections 2.2.1, 2.2.2, and 2.2.3. The exposure scenarios for each site are described in detail in Sections 3.4.3, 4.4.3, 5.4.3, 6.4.3, and 7.4.4.

Section 2.2.4 defines the general approach for estimating potential human exposure doses for each scenario and presents the equations used to estimate pathway-specific doses for all chemicals except lead. Section 2.2.5 presents the exposure assumptions used to estimate dose via each pathway; both receptor-specific and pathway-specific assumptions are presented. Most of the exposure assumptions used in the BRAs are taken directly from current EPA risk assessment guidance; other assumptions are taken from the available scientific literature. As recommended by EPA, two separate exposure conditions for each scenario were evaluated: (1) a reasonable maximum exposure (RME), and (2) an average exposure. As suggested by current California Environmental Protection Agency (Cal/EPA) and EPA guidance, an appropriate mix of 50th and 95th percentile exposure assumptions were used to estimate both RME and average potential risks.

Section 2.2.6 presents the chemical-specific absorption factors used to estimate potential exposure dose. Section 2.2.7 presents the methods used to estimate exposure point concentrations (EPCs) for each chemical in each environmental medium selected for quantitative evaluation. Section 2.2.8 presents the methods used to perform fate and transport modeling for certain chemicals in select media. Fate and transport modeling is required when exposure is anticipated to occur at a point for which no measured data are available. The specific scenarios and site areas for which fate and transport modeling was conducted are identified in Section 2.2.8. The details of these evaluations are presented in the site-specific discussions. The methodology used to evaluate potential exposures to lead is presented in Section 2.2.9.

2.2.1 Exposure Setting

The Fort Ord facility has been used as a military training facility since 1917, and was undeveloped prior to that time. Previous uses of the sites addressed in the RI/FS include:

- Site 2 - sewage treatment plant with sludge drying beds and unlined pond areas

- Site 12 - automotive storage, maintenance, repair, and dismantling; fuel and solvent storage; refuse disposal; and railroad right of way

- Site 16 - corporation yard, stormwater runoff percolation area, and open space

- Site 17 - motor vehicle storage and maintenance; storage of petroleum products, solvents, and other chemicals; incinerator site; refuse disposal, including incinerated and unincinerated medical waste and other materials; and baseball field

- Site 31 - obstacle course used for training, incinerator building, disposal of refuse which included ashes apparently from an incinerator at the site, and open space
- Site 3 - small arms fire training ranges and open space.
- Site 39 - Ordnance training ranges, including those for naval gunfire from offshore; antitank rocket (bazooka) range; and open space.

The decision-making process to identify the reuse of these and other areas of Fort Ord is described in Volume 1 of this RI/FS. The exposure assessment developed land use scenarios based on the projected future land uses identified in the planning documents available at the time of preparation: the Fort Ord Reuse Group *Summary of Base Reuse Plan* (*FORG, 1994*), the *Installation-Wide Multispecies Habitat Management Plan for Fort Ord, California* (*COE, 1994*), and the *Final Environmental Impact Statement Fort Ord Disposal and Reuse* (*COE, 1993*). The general land uses upon which the exposure scenarios were based are:

- Sites 2 and 12 - Aquaculture and oceanographic research facilities, commercial and industrial development, a transit center, medium- to high-density residential development, and a school
- Sites 16 and 17 - Part of a university campus, and a corporation yard for public agencies
- Site 31 - Open space for wildlife habitat and an agricultural center with production, processing, distribution facilities, and worker housing
- Site 3 - A limited-access state park.
- Site 39 - Habitat reserve: a limited-access natural resource management area (NRMA) managed by the Bureau of Land Management (BLM).

The scenarios used to evaluate exposure for individual sites considered the projected land use at individual areas in which chemicals have been detected in soil or groundwater. Additional specific assumptions about land uses are presented in the site-specific discussions.

2.2.2 Potential Exposure Pathways

For this assessment, the exposure scenarios evaluated in the BRAs for the five RI sites represent complete exposure pathways that meet the following criteria:

- A source and mechanism for chemical release
- An environmental transport medium (e.g., air, water, soil)
- A point of potential human contact with the medium
- A route of exposure (e.g., inhalation, ingestion, dermal contact).

As defined in the site-specific discussions presented in Sections 3.4.2, 4.4.2, 5.4.2, 6.4.2, and 7.4.3, the primary pathways of potential exposure to the site areas of interest include incidental ingestion of soil, dermal contact with soil, inhalation of particulate dust, inhalation of vapors, and ingestion of groundwater.

2.2.3 Exposure Scenarios

Exposure scenarios describe the way in which potential human receptors could be exposed to COPCs at a site. As recommended by EPA, two separate exposure scenarios were evaluated for each receptor: an average exposure scenario and a reasonable maximum exposure (RME) scenario. It is important to note that although attempts are made to represent true average and RME exposures, all exposure scenarios presented here likely overestimate potential risk at these sites because of the uncertainty inherent in the assumptions used.

The exposure scenarios used in each BRA were based on the predicted future use of each site area. Table 2.3 summarizes the receptors selected for quantitative evaluation in the BRAs for the four RI sites. The detailed discussion for each site includes a thorough review of all potential human receptors. Only the most sensitive potential receptors were selected for quantitative evaluation to estimate the baseline risks for each RI site.

2.2.4 Estimation of Exposure (Dose)

This section describes the methods used to estimate the chemical intake (dose) for the exposure scenarios described in Section 2.2.3. Dose is defined as the amount of chemical absorbed by the body over a given period of time. For noncarcinogenic effects, the dose is averaged over the period of exposure and is referred to as the average daily dose (ADD). For carcinogenic effects, the dose was averaged over a lifetime and is referred to as the lifetime average daily dose (LADD). Consistent with current EPA guidance (*1989b*), the following general equation was used to assess the dose for each exposure pathway considered in this assessment:

$$\text{Dose} = \frac{C \times IR \times EF \times ED \times FI \times AF}{BW \times AT}$$

Where:

Dose	=	ADD or LADD in milligrams per kilogram per day (mg/kg-day)
C	=	Chemical concentration in environmental medium (mg/kg)
IR	=	Intake rate in milligrams per day (mg/day)
EF	=	Exposure frequency in days per year (days/year)
ED	=	Exposure duration (years)
FI	=	Fraction of intake (unitless)
AF	=	Absorption factor (unitless)
BW	=	Body weight in kilograms (kg)
AT	=	Averaging time (days): for noncarcinogenic effects, AT = Exposure duration x 365 days/year; for carcinogenic effects, AT = Lifetime (70 years) x 365 days/year

To evaluate the relative sensitivity of each exposure pathway, receptor- and pathway-specific intake factors (IFs) were estimated using the general dose equation presented. An IF is a nonchemical-specific term that incorporates information on medium contact rate (e.g., milligrams of soil ingested per day), exposure times, and other receptor- and pathway-specific assumptions. Receptor- and pathway-specific ADDs and LADDs were then estimated for each chemical, receptor, and exposure pathway by multiplying the IF for each receptor and pathway by the chemical concentration term (C x AF). The chemical concentration term was the measured or modeled concentration of the chemical in the appropriate medium multiplied by a chemical-specific absorption factor (AF) for some pathways of exposure as shown in this equation:

$$\text{Dose} = IF \times (C \times AF)$$

Where:

Dose	=	ADD or LADD (mg/kg-day)
IF	=	Intake factor
C	=	Chemical concentration in environmental medium
AF	=	Absorption factor

The format of the IFs used in the BRAs for the Fort Ord RI sites are consistent with the standard dose equations recommended by EPA (*1989b*). The pathway-specific equations used to estimate IFs are presented in the following sections. The exposure assumptions used to estimate IFs are presented in Section 2.2.5.

2.2.4.1 Incidental Ingestion of Soil

Incidental ingestion of soil was evaluated using the exposure point concentration (EPC) of the chemical in soil, a chemical-specific absorption factor, and the soil ingestion IF. The EPCs and absorption factors for compounds in soil are presented in subsequent sections. The equation for the IF for ingestion of soil is estimated as follows:

$$IF_{ing\text{-}s} = \frac{IR \times CF \times EF \times ED \times FI}{BW \times AT}$$

Where:

$IF_{ing\text{-}s}$	=	Intake factor for incidental ingestion of soil in kilograms of soil per kilogram of body weight per day ($kg_{soil}/kg_{body\ weight}$-day)
IR	=	Soil ingestion rate (mg/day)
CF	=	Conversion factor of one millionth of a kilogram per milligram (10^{-6} kg/mg)
EF	=	Exposure frequency (days/year)
ED	=	Exposure duration (years)
FI	=	Fraction of intake (unitless)
BW	=	Body weight (kg)
AT	=	Averaging time (period over which exposure is averaged in days)

2.2.4.2 Dermal Contact with Soil

Dermal exposure to chemicals present in soil was evaluated using the EPC of the chemical in soil, chemical-specific absorption factors, and the dermal IF. The EPCs and dermal absorption factors for COPCs in soil are presented in subsequent sections. The equation for the IF for dermal contact with soil is as follows:

$$IF_{der\text{-}s} = \frac{SA \times AF \times CF \times EF \times ED \times FI}{BW \times AT}$$

Where:

$IF_{der\text{-}s}$	=	Intake factor for dermal contact with soil ($kg_{soil}/kg_{body\ weight}$-day)
SA	=	Surface area of exposed skin in square centimeters (cm^2)
AF	=	Soil to skin adherence factor in milligrams per square centimeter per day (mg/cm^2-day)
CF	=	Conversion factor (10^{-6} kg/mg)
EF	=	Exposure frequency (days/year)
ED	=	Exposure duration (years)
FI	=	Fraction of intake (unitless)
BW	=	Body weight (kg)
AT	=	Averaging time (period over which exposure is averaged in days)

2.2.4.3 Inhalation of Dust Entrained in Air

Exposures to chemicals via inhalation of particulates, or dust, in air were evaluated using an EPC for dust and the particulate IF. Airborne dust EPCs are presented in Section 2.2.7. The equation for the IF for inhalation of particulates is as follows:

$$IF_{inh\text{-}p} = \frac{IR \times ET \times EF \times ED}{BW \times AT}$$

Where:

$IF_{inh\text{-}p}$	=	Intake factor for the inhalation of particulates in cubic meters per kilogram per day (m^3/kg-day)
IR	=	Inhalation rate in cubic meters per hour (m^3/hr)
ET	=	Exposure time in hours per day (hr/day)

EF = Exposure frequency (days/year)

ED = Exposure duration (years)

BW = Body weight (kg)

AT = Averaging time (period over which exposure is averaged in days)

2.2.4.4 Inhalation of Vapors from Groundwater

Inhalation exposure resulting from the volatilization of chemicals in groundwater and subsequent release to air at the soil surface was evaluated using airborne chemical concentrations (EPCs) predicted by vapor flux modeling (Section 2.2.8), and the vapor inhalation IF. The equation for the IF for inhalation of vapors is as follows:

$$IF_{inh\text{-}v} = \frac{IR \times ET \times EF \times ED}{BW \times AT}$$

Where:

$IF_{inh\text{-}v}$ = Intake factor for the inhalation of volatile chemicals (m^3/kg-day)

IR = Inhalation rate (m^3/hr)

ET = Exposure time (hr/day)

EF = Exposure frequency (days/year)

ED = Exposure duration (years)

BW = Body weight (kg)

AT = Averaging time (period over which exposure is averaged in days)

Inhalation exposure resulting from the volatilization of chemicals in groundwater during domestic use of groundwater (i.e., showering) was evaluated using a generic model from EPA guidance which assumes that the dose from inhalation of VOCs while showering is approximately equivalent to the dose from ingestion of 2 liters per day of the same water (*EPA, 1989o*). Inhalation-specific toxicity values were used to characterize potential risks and noncancer health effects from inhalation exposures (Section 2.4).

2.2.4.5 Ingestion of Water

Ingestion of groundwater as drinking water was evaluated using the EPC for the chemical in groundwater and the IF for the ingestion of water. The EPCs for groundwater are presented in subsequent sections. The IF for water ingestion was calculated using the following equation:

$$IF_{ing\text{-}w} = \frac{IR \times EF \times ED}{BW \times AT}$$

Where:

$IF_{ing\text{-}w}$ = Intake factor for ingestion of water in liters per kilogram per day (l/kg-day)

IR = Ingestion rate in liters per day (l/day)

EF = Exposure frequency (days/year)

ED = Exposure duration (years)

BW = Body weight (kg)

AT = Averaging time (period over which exposure is averaged in days)

2.2.5 Exposure Assumptions Used to Estimate Intake Factors (IFs)

Some of the exposure assumptions used to estimate IFs via the potential exposure pathways presented in Section 2.2.4, are described below and summarized in Tables 2.4 and 2.5. The remaining assumptions used to estimate IFs are presented in the discussions of exposure scenarios for each site.

2.2.5.1 Soil Ingestion Rate

A soil ingestion rate of 50 mg/day was used to estimate potential doses and risks in the average case scenarios for all receptors. Numerous investigations have provided data for incidental soil ingestion rates, the most accurate of which are those using tracer elements. The results suggest that soil ingestion rates range from 9 to 40 mg/day for young children (*Calabrese, Barnes et al., 1989*). Later work by some of the same investigators confirmed this range and concluded that the data were normally distributed with a geometric mean of 20.5 mg/day and a standard deviation of 87 mg/day (*Calabrese and Stanek, 1991a, b*). This range has been used in published risk assessments as the basis for characterizing a probability distribution for soil ingestion (*Copeland et al., 1993; Finley and Paustenbach, 1994*). Estimates of soil ingestion rates for older children and adults, based on studies in adults (*Calabrese, Gilbert et al., 1990*), range from 1 to 10 mg/day (*Paustenbach, Jernigan et al., 1992; Paustenbach, Wenning et al., 1992*). The upper-bound value for the probability distribution developed from the Calabrese and Stanek data (*1991a, b*) of 50 mg/day was selected as the average exposure value for the BRAs. This value is also suggested as the appropriate upper-bound value for a commercial/industrial worker (*EPA, 1991b*).

For the RME scenarios, EPA-recommended age-specific soil ingestion rates were used in the estimation of potential doses and risks via incidental ingestion of soil. For onsite resident and nearby resident receptors aged 0 to less than 6 years, a soil ingestion rate of 200 mg/day was used (*EPA 1989b, 1991b*). EPA's default soil ingestion rate for ages 6 and above, 100 mg/day (*EPA, 1989b, 1991b*), was used for the onsite resident (6 to less than 30 years), student resident, nearby resident (6 to less than 30 years), park ranger, habitat management worker, and nearby resident trespasser receptors. EPA's default onsite commercial worker soil ingestion rate of 50 mg/day (*EPA, 1991b*) was used for the evaluation of potential doses and risks via incidental ingestion of soil for the commercial worker receptor. EPA's default soil ingestion rate of 480 mg/day for construction/excavation scenarios was used for the construction worker and utility worker receptors (*EPA, 1991b*).

2.2.5.2 Surface Area of Exposed Skin

The skin surface areas used in the estimation of potential doses and risks via dermal contact with soil represent the average surface area values for certain body parts in the particular age category being evaluated. Fiftieth percentile data points for both males and females in the appropriate age category were taken from EPA's *Exposure Factors Handbook* (*EPA, 1990b*). For average exposure scenarios, the skin surface area for face, neck, and both hands was calculated for each receptor assumed to contact soil. Skin surface areas of 1,420 cm^2 and 1,635 cm^2 were calculated for receptors aged 0 to less than 6 years (onsite resident) and receptors aged 6 to less than 9 years (onsite resident and nearby resident trespasser), respectively. A skin surface area of 2,109 cm^2 was calculated for adult receptors evaluated in the average scenarios: commercial worker, utility worker, student resident, construction worker, and park ranger.

For RME scenarios, the skin surface area for face, neck, both arms, and both hands were calculated for each receptor assumed to contact soil. Skin surface areas of 2,348 cm^2 and 3,764 cm^2 were calculated for receptors aged 0 to less than 6 years (onsite resident and nearby resident) and receptors aged 6 to less than 18 years (onsite resident, nearby resident, and nearby resident trespasser), respectively. A skin surface area of 4,714 cm^2 was calculated for adult receptors evaluated in the RME scenarios: commercial worker, onsite resident, utility worker, student resident, construction worker, park ranger, and nearby resident.

2.2.5.3 Soil to Skin Adherence Factor

In the estimation of potential doses and risks via dermal contact with soil, a soil to skin adherence factor (AF) was used to estimate the volume of soil that adheres to each square centimeter of exposed skin during the assumed exposure period. This value was assumed to be 0.2 mg/cm^2-day for the average exposure scenarios, as recommended in EPA's dermal absorption guidance (*EPA, 1992m*).

An AF of 0.4 mg/cm²-day was used to evaluate RME scenarios. EPA's 1.0 mg/cm²-day default value for estimating upper-bound exposure was not used because not all exposed skin was assumed to be exposed at upper-bound levels. The RME AF was developed by assuming that the heaviest soiling would occur on the palms of the hands and inner forearms, and that the balance of the arms, and the face and neck would be less exposed. EPA's upper-bound AF of 1.0 mg/cm² was used to estimate exposure at the most heavily soiled skin areas, and the EPA's default average AF of 0.2 mg/cm²-day was used to estimate exposure to other skin areas. These AFs were used with 50th percentile values for the areas of the surfaces considered to develop an area-weighted AF of 0.4 mg/cm²-day (See Table below).

Description	Adherence Factor (AF) (mg/cm²)	Area (A) (cm²)	Adhered Soil (AS) (mg)
hands	1	420	420
hands (back(0	0.2	420	84
forearms (front)	1	570	570
forearms (back)	0.2	570	114
upper arms	0.2	1430	286
face and neck (head)	0.2	1180	236
Sum		4590	1710

Area-weighted AF = 0.37

Area values obtained from *Exposure Factors Handbook* (*EPA 1990b*) Table 4-1

AS = AF x A

Area-weighted AF = Sum of areas divided by the sum of adhered soil

This approach provides a conservative AF for RME because day-to-day exposure generally involves a variety of different activities; activities resulting in heavy soiling are unlikely to occur at every exposure opportunity.

2.2.5.4 Inhalation Rate

The inhalation rates used in the estimation of potential doses and risks via inhalation of particulate dust in air and of vapors from groundwater were derived from age-specific and activity level-specific data presented in EPA's *Exposure Factors Handbook (EPA, 1990b)*. Inhalation rates were estimated for each receptor age group based on outdoor activity data presented in EPA's *Exposure Factors Handbook*. The inhalation rate calculated for child receptors aged 0 to less than 6 for both average and RME scenarios was based on the inhalation rate for a child, age 6 (1.24 m³/hour). The inhalation rate calculated for receptors aged 6 to less than 9 years for the average scenarios was based on the average reported inhalation rate for a child of age 6 and a child of age 10 (1.56 m³/hour). The inhalation rate calculated for receptors aged 6 to less than 18 years for the RME scenarios was based on the reported inhalation rate for child, age 10 (1.87 m³/hour).

Inhalation rates for adult receptors were also taken from data presented in *Exposure Factors Handbook*. The inhalation rate used in the average exposure scenario for commercial worker, utility worker, student resident, park ranger, and habitat management worker receptors was 0.83 m³/hour, and that for construction worker receptors was 1.4 m³/hour. These average exposure rates were based on the average inhalation rates for adults. The inhalation rate used in the RME scenario for commercial worker, onsite resident, utility worker, student resident, nearby resident adult, park ranger, and habitat management worker receptors was 1.25 m³/hour, and that for construction worker receptors 3.0 m³/hour . These RME values were based on upper-bound inhalation rates for adults.

2.2.5.5 Water Ingestion Rate

The drinking water ingestion rates used in this assessment were age-specific ingestion rates based on data presented in EPA's *Exposure Factors Handbook*. Weighted ingestion rates were calculated for onsite resident receptors aged 0 to less than 6 years, 6 to less than 9 years, and 6 to less than 18 years. The drinking water ingestion rates used for both average exposure and RME are 0.4 l/day for receptors aged 0 to less than 6 years, 0.5 l/day for receptors aged 6 to less than 9 years, and 0.6 l/day for receptors aged 6 to less than 18 years.

Drinking water ingestion rates for onsite resident and student resident receptors were also taken from EPA's *Exposure Factors Handbook*, which presents an upper-bound adult tap water ingestion rate of 1.5 l/day. This water ingestion rate was selected for the average exposure. EPA's default ingestion rate of 2 l/day, which represents an upper-bound volume of beverages consumed per day, was selected as the water ingestion rate for the RME scenario.

2.2.5.6 Body Weight

The body weights used in the estimation of potential doses and risks for all pathways represent the average body weights of males and females in the particular age category being evaluated. Fiftieth percentile data for both males and females in the appropriate age category were taken from EPA's *Exposure Factors Handbook*. The same body weight data was used to evaluate both average and RME scenarios.

The average body weight of adults was reported to be 70 kg. This weight was used in the evaluation of adult commercial worker, resident, utility worker, student resident, construction worker, nearby resident, park ranger, and habitat management worker receptors.

The average body weight of male and female children ages 0 to less than 6 years was reported to be 14 kg. This weight was used in the evaluation of onsite, nearby, and offsite resident receptors. The average body weight of children ages 6 to less than 9 years was reported to be 24.2 kg and was used to evaluate average exposures of onsite, nearby, and offsite resident, and nearby resident trespasser receptors. The average body weight for 6 to less than 18 year old males and females was reported to be 41.6 kg and was used to evaluate potential RME exposures of onsite, nearby, and offsite resident, and nearby resident trespasser receptors.

2.2.5.7 Exposure Time

Exposure time is the number of hours that a receptor is assumed to inhale air containing COPCs each day that they are on the site. The values used for exposure time are described in detail in the exposure scenarios for each site presented in Sections 3.4.3, 4.4.3, 5.4.3, 6.4.3, and 7.4.4.

2.2.5.8 Fraction of Intake

The *Risk Assessment Guidance for Superfund* (*EPA, 1989b*) describes a fraction of intake term (FI) that accounts for the fact that only some of the soil that a receptor potentially contacts in 1 day comes from the site. The EPA recommends that the FI term should reflect chemical location and population activity patterns. This evaluation assumed that most receptors are likely to ingest and contact soils at both onsite and offsite locations on the days they are exposed to chemicals in soil at the Fort Ord sites. In the equations to estimate intake via incidental ingestion and dermal contact with soil, the FI factor represents the proportion of soil ingested and contacted that come from the site on a given day of exposure.

Although only a fraction of the total soil ingested or contacted on a given day is likely to come from the site, the RME scenarios conservatively assumed that 100 percent of the soil ingested and contacted on a given day came from the Fort Ord site being evaluated. Because many receptors are assumed to be on the site for only a portion of the given days of exposure, this assumption overestimates overall risks from ingestion and dermal contact exposures to soil.

The average exposure scenarios for all receptors, except the onsite resident evaluated at Sites 2 and 12, assumed that 50 percent of the total soil ingested and contacted on a given day came from the site being evaluated (i.e., FI equals 50 percent). Because it was also assumed that onsite residents spend the majority of their time on the site, an FI of 75 percent was assumed for the average scenario for this receptor (evaluated for Sites 2 and 12). These values likely overestimate average exposure.

FIs selected for receptors assumed to be exposed to more than one discrete area on a site (e.g., the student resident evaluated for Sites 16 and 17 who was assumed to be exposed to soils in three discrete areas), are described in detail in the site-specific discussions about exposure scenarios.

2.2.5.9 Exposure Frequency

Exposure frequency is the number of days in a year an individual may contact chemicals at the site. The receptor-specific exposure frequencies used in this assessment are described in the exposure scenarios for each site in Sections 3.4.3, 4.4.3, 5.4.3, 6.4.3, and 7.4.4.

2.2.5.10 Exposure Duration

Exposure duration is the length of time in years an individual may contact the media of interest at a site. The values used for exposure duration are described in detail in the exposure scenarios for each site in Sections 3.4.3, 4.4.3, 5.4.3, 6.4.3, and 7.4.4.

2.2.6 Chemical-Specific Absorption Factors

As described in Section 2.2.4, ADDs and LADDs were estimated by multiplying the receptor- and pathway-specific intake factors by the EPC and by a chemical-specific absorption factor for certain pathways of exposure. This assessment used only one oral absorption factor (OAF) to estimate doses and risks. An OAF of 43 percent for chlorinated dibenzodioxins and dibenzofurans (CDDs and CDFs) was used to evaluate incidental ingestion of soil. This value, used in many published risk assessments, is based on the study conducted by *Shu, Paustenbach et al. (1988)*, who reported a range of 39 to 49 percent and mean of 43 percent for tetrachlorodibenzo-p-dioxin (TCDD). This range is consistent with data reported by other investigators (*Lucier et al., 1986; Umbreit et al., 1986; Birnbaum and Couture, 1988*). The mean value was selected as representative for all 2,3,7,8 congeners of CDDs and CDFs because the penta- through octa-congeners exhibit reduced absorption due to higher chlorination (*Couture et al., 1988*).

Chemical-specific dermal absorption factors (DAFs) were derived for all COPCs in soil for the evaluation of dermal contact exposures following guidelines presented in Cal/EPA's *Preliminary Endangerment Assessment Guidance Manual* (*Cal/EPA, 1994*) and verbal recommendations from the California Department of Toxic Substances Control. The DAFs used in this assessment are presented in Table 2.6. DAFs for inorganic metals given to HLA by Dr. John Christopher from DTSC include 0.1 percent for cadmium, 3 percent for arsenic, and 1 percent for all other metals (meeting among U.S. EPA, DTSC, RWQCB, COE, Army, and HLA representatives, March 26, 1993). For all organic except explosives and CDDs and CDFs, chemical- or class-specific DAFs were derived using the recommendations presented in Cal/EPA's guidance.

In the absence of chemical- or class-specific DAFs for explosives, a DAF of 100 percent was used to conservatively estimate the uptake of explosive compounds from soils.

A DAF of 1 percent was used to conservatively estimate uptake of CDDs and CDFs from soils, based on information presented in *Dermal Exposure Assessment: Principles and Applications* (*EPA, 1992m*). The EPA's (*1992m*) document presents four DAF estimates based on the findings of three separate studies evaluating dermal uptake of dioxins from soil:

Value (percent)	Basis
2.5	A 1991 EPA rat study using *in vivo* administration, corrected to reflect differences between dermal absorption *in vivo* in rats and humans observed in the same study
0.2	A 1988 rat study by Shu, et al., using *in vivo* administration, corrected to reflect differences between dermal absorption *in vivo* in rats and humans observed in the 1991 EPA study. EPA's (*1992m*) discussion of the correction calculation indicates that the this value should be 0.33 percent
1	A 1980 rat study by Poiger and Schlatter using *in vivo* administration, corrected to reflect differences between dermal absorption *in vivo* in rats and humans observed in the 1991 EPA study
0.45	A 1991 EPA study which used *in vitro* administration to (human) cadaver skin, corrected to reflect differences between dermal absorption *in vitro* in rats and humans observed in the same study

The four experimentally-derived DAF values presented above were all based on soil with low organic carbon content, consistent with the conditions at Fort Ord, and were based on conservative interpretations of the experimental data. The DAF value of 1 percent used to estimate exposure represents the average of the four values above (computed using either 0.2 or 0.33 percent for the data from Shu et al.).

The 1 percent DAF value is based on soils representative of conditions at Fort Ord, is within the 0.1 to 3 percent range recommended by EPA (*1992m*), is consistent with a 0.5 percent value predicted by McCone (*1990*) using a dermal fugacity model for TCDD, and is in the range described by the probability distribution developed by Copeland, et al. (*1993*).

2.2.7 Exposure Point Concentrations (EPCs)

The concentrations of COPCs at the assumed points of human exposure (i.e., EPCs) were estimated under two separate exposure conditions for each receptor. For the RME scenario, the lower of the maximum detected concentration and the upper 95th confidence level of the arithmetic mean concentration for a chemical was selected as the EPC for each area. For the average exposure the arithmetic average concentration of a chemical in each area was selected as the EPC. As recommended in EPA guidance, one half the reporting limit value was used as a proxy concentration for each nondetected (ND) sample.

The EPCs for direct exposure to soil and water were based on the measured site sample data discussed in Section 2.1. The EPCs for exposure to airborne dust were estimated as described in Section 2.2.8 Fate and Transport Modeling. The EPCs for volatile compounds in air from groundwater were modeled using a compartment fate and transport model as described in Section 2.2.8.

The potential toxicity of certain groups of compounds is characterized by extensive toxicological information available for only one or a few compounds in the group. This is the case with the potential carcinogenic toxicity of CDDs and CDFs and polynuclear aromatic hydrocarbons (PAH). For each of these groups, EPA has developed toxicity equivalent factors (TEFs) for many of the compounds within these groups. TEFs are used to rank the relative toxicity of the compounds for which little toxicity information is available using one or a few compounds for which extensive toxicity information is available.

Samples analyzed for CDDs and CDFs were converted to 2,3,7,8-tetrachlorodibenzo-p-dioxin toxic equivalents (TCDD-TEs) using TEFs. EPA TEFs (*EPA, 1989b*) are shown in Table 2.7 and were used as follows: The concentration of each detected CDD and CDF congener was multiplied by its respective TEF; then these factors were summed for each sample in an area of interest. Summary statistics were then calculated for the TCDD-TE samples in each area of interest to yield one EPC concentration for CDDs and CDFs in each area where either dioxins or furans were detected.

The EPA-recommended TEFs used to evaluate the potential carcinogenic effects of PAH are based on benzo(a)pyrene (B[a]P ([*EPA, 1993f*]). Table 2.8 presents the B(a)P TEFs used to evaluate PAH in this assessment. The EPCs used for the evaluation of the potential carcinogenic effects of PAH in the BRAs were estimated for each area as follows. One half the reporting limit was used as a surrogate value for all samples for compounds with at least one detect in the area of interest; compounds not detected in the area of interest were omitted from the analysis.

TEFs for B(a)P were then multiplied by the measured or surrogate value for each compound. These products were then summed to yield a single concentration of B(a)P toxic equivalents (B[a]P-TEs) for each sample. Summary statistics were then calculated for each group of samples in an area of interest as for all other detected compounds.

B(a)P-TE concentrations are appropriate for the evaluation of potential carcinogenic health effects, but these adjusted concentrations of potentially carcinogenic PAH are not appropriate for the evaluation of the potentially noncarcinogenic effects of these compounds. As discussed in Section 2.3.1, no noncarcinogenic toxicity criteria are available for any of the individual carcinogenic PAH. Therefore, the potential noncarcinogenic effects of carcinogenic PAH were evaluated in this assessment as pyrene, on the basis of structural similarities. Because it was assumed that all potentially carcinogenic PAH act similarly, (i.e., benz(a)anthracene, benzo[a]pyrene, benzo[b] fluoranthene, benzo[k]fluoranthene, chrysene, dibenzo[a,h]anthracene, and indeno (1,2,3-cd) pyrene; *EPA, 1993f; 1994*), their potential noncarcinogenic effects are evaluated using total carcinogenic PAH (cPAH) concentrations. Total cPAH concentrations were derived by taking one half the reporting limit for all ND samples for compounds with at least one detect in the area of interest and then summing the measured and surrogate concentrations to yield a total cPAH concentration for each sample in the area of interest. Summary statistics were then calculated for each group of samples in an area of interest as for all other detected compounds.

The EPCs and other summary statistics for all chemicals in all media and areas evaluated in the BRAs are presented in the site-specific discussions.

2.2.8 Fate and Transport Modeling

Fate and transport modeling is required when exposure is anticipated to occur at a point for which no measured data are available. Measured data are available for soil and groundwater. Measured data are not available for either vapors or particulate dust in air. This section describes the methods used to estimate EPCs in air.

EPCs for compounds in air volatilizing from groundwater were estimated using a vapor flux model developed by the U.S. Department of the Army (Army model) and reviewed by W.A. Jury, W.W. Nazaroff, and V.C. Rogers (*Army, 1991*) and a box dispersion model (*Wadden and Sheaff, 1983*). The Army model was based on publications by Jury et al. that describe the behavior of volatile chemicals in soil and groundwater (*Jury et al., 1983; 1984a, b, c; Jury, Russo et al., 1990*). The Army model was selected because it was specifically designed to evaluate possible vapor emissions from groundwater. The Army model is described in detail in Appendix D.

EPCs for airborne dust concentrations were derived by multiplying the EPCs in soil in milligrams of chemical per kilogram of soil ($mg_{chemical}/kg_{soil}$) by the concentration of respirable particles with a mean diameter of less than or equal to 10 microns (PM_{10}) for the Monterey County area in micrograms of soil per cubic meter of air (11.5 $\mu g_{soil}/m^3{}_{air}$), and a units conversion factor in kilograms per micrograms (kg/μg). The Monterey County PM_{10} value was obtained from Monterey Bay Unified Air

Pollution Control District (MBUAPCD) representative Mr. John Fear on April 6, 1994 via fax to Mr. Craig Nichols of HLA. This approach will result in conservative estimates of potential particulate inhalation exposures because much of the site is covered with vegetation, buildings, or pavement and there is little potential for dust generation in such areas.

2.2.9 Evaluation of Lead

Due to the complex toxicokinetics of lead in the body, standard exposure assessment methods used in risk assessment are not appropriate for the evaluation of exposures to lead. Both EPA and Cal/EPA use pharmacokinetic models to evaluate lead exposure; both of these models estimate doses as blood-lead concentrations related to specific chemical doses. EPA's Uptake Biokinetic Model (UBK) Version 0.6 (*EPA, 1990e*), and Cal/EPA's LEADSPREAD (*Cal/EPA, 1992a*) exposure models (computer programs) were developed separately to estimate blood-lead levels in children ages 0 to 6 and adults, respectively.

The UBK model was used in this evaluation to evaluate lead exposures in children (0 to 6 years old) because it incorporates current toxicokinetic (chemical uptake and distribution) data for lead in a child's body over time. Because the UBK model is limited to children 6 years old or younger, the LEADSPREAD model was used to evaluate lead exposures in all receptors over 6 years old.

2.2.9.1 Methods for the Uptake Biokinetic Model

The UBK model was used to estimate a blood-lead level for the possible exposures of children to soil containing lead. The UBK model addresses possible exposure to lead via inhalation of airborne dust, ingestion of drinking water, incidental ingestion of soil and dust, incidental ingestion of paint containing lead, and maternal contribution to infant body burdens. The UBK model considers background exposures (i.e., exposures that occur due to our daily activities), site media concentrations, default exposure assumptions, and empirically derived toxicokinetic relationships to estimate the blood-lead concentrations from all sources for children at 1 year intervals from 6 months through 6 years of age. EPA has established some default lead contributions from each of the background sources and has preprogrammed these into the model. Default contributions were replaced with site-specific soil concentrations and site-specific dust in air concentrations where appropriate. Because a target blood-lead level has been established by EPA and the model considers contributions to blood-lead concentrations from background sources (i.e., lead in drinking water, mother's milk, etc.), the higher the background contributions of lead, the lower are the permissible lead exposures from any of the Fort Ord sites.

The EPA's default UBK model exposure assumptions and estimated blood-lead concentrations for child (0 to 6 years) receptors for both the average and RME scenarios are presented in Appendix F. As a conservative health-protective measure, the highest estimated blood-lead level predicted for any age group (0.5 to 1, 1 to 2, 2 to 3, 3 to 4, 4 to 5, or 5 to 6 years) was selected to represent blood-lead levels in child receptors.

2.2.9.2 Methods for the LEADSPREAD Model

The UBK model does not address lead exposures for receptors over 6 years old. Cal/EPA's LEADSPREAD model was used in this evaluation to estimate blood-lead concentrations of all receptors over 6 years old. As does the UBK model, the LEADSPREAD model incorporates background exposures, user-defined media concentrations, default and user-defined assumptions, and empirically derived toxicokinetic relationships to estimate blood-lead concentrations. The LEADSPREAD model addresses possible exposure to lead via inhalation of airborne dust, incidental ingestion of soil, direct dermal contact with soil, ingestion of drinking water, and ingestion of food.

The EPCs for average and RME scenarios used in the LEADSPREAD exposure analysis are presented in the exposure assessment section for each site. All receptors were assumed to be exposed to lead at background levels of home-grown or purchased produce. In addition, all receptors were assumed to be exposed to background lead concentrations in drinking water of 15 microliters of lead per liter of water as estimated by Cal/EPA.

Exposure to lead via ingestion of site-grown produce was evaluated for longer-term onsite resident receptors (i.e., at Site 12).

The intake assumptions for the LEADSPREAD model and the blood-lead levels estimated for each receptor are presented in Appendix F.

2.3 Toxicity Assessment

The purpose of the toxicity assessment is to identify the types of adverse health effects a COPC may potentially cause and to define the relationship between the dose of a chemical and the likelihood of an adverse effect (response). Adverse effects are characterized by EPA as carcinogenic or noncarcinogenic. Dose-response relationships are defined by EPA for oral exposure and for exposure by inhalation. Oral dose-response values were used to evaluate dermal exposures because EPA has not yet developed values for dermal exposure. Oral dose-response values were also used to evaluate inhalation exposures for some compounds lacking inhalation dose-response values. Combining the results of the dose-response assessment with information on the magnitude of potential human exposure provides an estimate--usually very conservative--of potential risk.

The majority of information available about the dose-response relationship for a given chemical is based on data collected from animal studies (usually rodents) and theoretical predictions about what might occur in humans. When available, human exposure data are also considered and given more weight. When animal data are considered, mathematical models are used to estimate the possible response in humans at exposure levels far below those tested in animals. These models contain conservative assumptions that should be considered when the resulting risk estimates are evaluated. Conservatism arises in animal models because of the uncertainty in extrapolating results obtained in animal research to humans and extrapolating responses obtained from high-dose studies to estimate responses at very low doses. For example, humans are typically exposed to chemicals in the environment at levels that are less than one thousandth of the lowest dose tested in animals. Such doses may be easily handled by the myriad of biological protective mechanisms in humans (*Ames et al., 1987*). This means that while the results of standard recent bioassays may be used to understand the human biological hazard or cancer risk posed by typical exposure levels, this understanding is considered to be very limited (*Crump et al., 1976; Sielkin, 1985*).

The EPA and Cal/EPA have used dose-response data to establish "maximally acceptable" levels of daily human exposure for noncarcinogenic chemicals. For carcinogenic chemicals, regulatory policy assumes a potential carcinogenic response at any dose. Carcinogenic potency is a measure of the relationship between dose and tumor incidence.

EPA's Integrated Risk Information System (IRIS), an on-line database, contains dose-response criteria currently approved by EPA; and EPA's Health Effects Assessment Summary Tables (HEAST), an annual report, tabulates EPA-approved dose-response information. For the Fort Ord BRAs, dose-response values were taken from IRIS (*EPA, 1994*) when available. HEAST (*EPA, 1993e, 1992b*) was used as a secondary source if dose-response values were not available on IRIS. Dose-response values from Cal/EPA (*1992e*) were used in place of EPA values if Cal/EPA values were more conservative. The following sections discuss the noncarcinogenic and carcinogenic risk dose-response values selected for the COPCs at Fort Ord RI sites; noncarcinogenic and carcinogenic risk dose-response values are presented in Table 2.9.

2.3.1 Possible Noncancer Health Effects

It is widely accepted that noncarcinogenic effects from chemical substances occur after a threshold dose is reached. To establish health risk criteria for noncarcinogenic effects, the threshold dose is usually estimated from the no-observed adverse effect level (NOAEL) or the lowest observed adverse effect level (LOAEL) determined in chronic animal exposure studies. The NOAEL is defined as the highest dose at which no adverse effects appear. The LOAEL is defined as the lowest dose at which adverse effects begin to appear.

NOAELs and LOAELs derived from human or animal studies are used by the EPA to establish oral and inhalation reference doses (RfDs). An RfD is a maximal daily dose that is not expected to cause adverse health effects. Uncertainty factors are used to establish RfDs in an attempt to account for limitations in the quality or quantity of available data. If the estimated dose for a given set of conditions is less than the chemical-specific RfD, then it is appropriate to conclude that no significant health hazard exists under the defined set of conditions.

As summarized in Table 2.9, either an oral or an inhalation RfD, or a surrogate value, exists for all of the COPCs at Fort Ord except 1,2-dichloroethane, B[a]P, 4,4'-DDE, 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD), and lead. 1,2-Dichloroethane, 4,4'-DDE, and 2,3,7,8-TCDD are considered carcinogenic and no applicable RfD is available to evaluate the potential noncarcinogenic effects of these compounds. The potential adverse health effects associated with lead are evaluated as described in Section 2.2.9.

Surrogate values are selected on the basis of structural similarities to other chemicals when chemical-specific RfDs are not available. The RfD for pyrene is used as a surrogate value for B(a)P to evaluate the potential noncarcinogenic effects of potentially carcinogenic PAH (Total cPAH). The RfD for trinitrotoluene is used as a surrogate value for 2-amino-dinitrotoluene and 4-amino-dinitrotoluene.

For this assessment, the oral RfD was used to represent the inhalation RfD for any chemical lacking an inhalation RfD (i.e., oral-to-inhalation route-to-route extrapolation was performed). Although chemical toxicity may vary substantially with route of uptake, this extrapolation was performed to reduce possible underestimation of health risks due to the absence of toxicity values.

2.3.2 Possible Cancer Effects

Regulatory agencies have generally assumed that carcinogenic agents should be treated as if they do not have thresholds. In other words, the dose-response curve for carcinogens used for regulatory purposes allows for zero risk only at zero dose (i.e., for any dose, some risk is assumed to be present). To estimate a theoretically plausible response at low environmental doses, various mathematical models are used to extrapolate response at low-dose levels from high-dose data. The EPA generally uses the linearized multistage model for extrapolation to low doses. This model assumes that the effect of the carcinogenic agent on tumor formation is linear. The cancer slope factor (SF) quantitatively defines the relationship between dose and response. The chemical-specific SF represents the upper-bound estimate of the probability of a carcinogenic response per unit intake of a chemical over a 70-year lifetime.

The EPA classifies chemicals into Groups A through E: Group A is designated "human carcinogen" and Group E is designated "noncarcinogen" (with "probable," "possible," and "not classifiable" as Groups B, C, and D, respectively). Quantitative carcinogenic risk assessments are performed for chemicals in Groups A and B and may be performed for those in Group C on a case-by-case basis (*EPA, 1989b*).

Of the COPCs considered in this assessment, the following have been determined by the EPA and/or Cal/EPA to possess carcinogenic potential (i.e., group A, B1, or B2): carbon tetrachloride, chlordane, 1,2-dichloroethane, methylene chloride, B(a)P, bis(2-ethylhexyl) phthalate, 4,4'-DDE, 4,4'-DDT, 2,3,7,8-TCDD, arsenic, beryllium, cadmium, lead, and nickel.

The cancer slope factor for B(a)P was used to evaluate the potential carcinogenic effects of B(a)P-TE. The cancer slope factor for 2,3,7,8-TCDD was used to evaluate the potential carcinogenic effects of TCDD-TE. The cancer slope factors used in this assessment are summarized in Table 2.9.

2.3.3 Possible Effects of Lead

EPA (*1994*) assigns lead to weight of evidence group B2, but neither EPA nor Cal/EPA has published RfDs or SFs for lead. The BRA therefore used different methods to evaluate possible effects of exposure to lead. As discussed in Section 2.2.9, the exposure assessment used the UBK and LEADSPREAD models to estimate receptor blood-lead concentrations. A target blood-lead concentration of 10 micrograms of lead per deciliter of blood (μg/dl) was used to evaluate possible exposures to lead. This target blood-lead concentration reflects the findings of the Agency for Toxic Substances and Disease Registry (ATSDR) that 10 μg/dl represents a lowest observed adverse effect level (LOAEL) associated with lead exposure, based on hypertension as the toxic effect (*ATSDR, 1990b*).

2.4 Risk Characterization

This section presents the methods used to quantify potential human health risks for each BRA. Subsections 2.4.1 and 2.4.2 describe the noncancer and cancer health risk estimates for all COPCs except lead. Section 2.4.3 describes the methods used to evaluate the potential risks associated with exposures to lead.

2.4.1 Possible Noncancer Health Effects

The estimates of receptor-specific noncancer health effects are represented by a hazard index (HI). The HI is determined for each receptor by summing the hazard quotient (HQ), for each chemical in each exposure pathway. The HQ is the fraction of the RfD represented by the average daily dose (ADD). This approach to estimating noncancer health effects is conservative and was used where the HIs were less than one. For receptors with HIs exceeding one, separate HIs were developed for chemicals that act on the same target organs (i.e., respiratory tract, liver, etc.). HIs were calculated separately for each receptor age-group for each BRA. If the HI is greater than 1, there may be potential adverse noncancer health effects associated with the pathway being evaluated according to EPA's definition (*1989b*).

2.4.2 Possible Cancer Risk

The estimates of potential upper-bound cancer risks are estimated for each receptor by summing the age-specific cancer risks for all pathways for that receptor. The potential cancer risk estimates are represented by the product of the lifetime average daily dose (LADD) and the cancer slope factor (SF). EPA has defined a target range of cancer risk estimates for Superfund sites as one in one million (1×10^{-6}), to one in ten thousand (1×10^{-4}). Cancer risk estimates falling below this target range do not typically trigger remedial action to reduce the estimated risks. Cancer risk estimates falling within this target range may trigger remedial action at some sites, and estimates above this range typically require some remedial action to reduce potential risk to within or below this range.

2.4.3 Evaluation of Blood Lead

Possible effects of exposure to lead were evaluated by comparing the receptor blood-lead levels estimated using the UBK and LEADSPREAD models described in Section 2.2.9 with the target blood-lead concentration of 10 μg/dl identified in Section 2.3.3. Estimated blood-lead levels less than the target blood-lead concentration were considered acceptable.

SECTION 2.0
TABLES

Table 2.1. Data Considered for the Baseline Risk Assessments - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Site	Medium	Area	Number of Samples	Sample Date	Analyses
2	Soil		6	Dec-91	VOCs, SOCs, pestic./PCBs, metals,
			11	Mar/Apr 92	VOCs, metals
			4	Sep-93	metals, Cr VI
			5	May-94	pestic./PCBs, metals
	Groundwater	Upper 180-	7	Aug-93	VOCs, metals
		Foot Aquifer	4	Dec-93	SOCs
			10	Jan-94	VOCs, metals
			10	Feb-94	VOCs, metals
3	Soil	Area 1	10	Nov/Dec-93	metals, Cr VI
		Area 2	10	Nov/Dec-93	metals, Cr VI
	Leachate	Area 2	4	Nov/Dec-93	metals
			4	Nov/Dec-93	metals
12	Soil	Lower Meadow	18	Jan-92	VOCs, SOCs, metals
			1	Oct-93	VOCs, metals, Cr VI
			5	Oct-93	VOCs, SOCs, pestic./PCBs, metals
			30	Feb-94	VOCs, SOCs, metals
	Soil	DOL	39	Dec-91	VOCs, metals
		Automotive	3	Dec-91	VOCs, metals
		Yard and	6	Dec-92	VOCs, metals
		Cannibalization	3	Apr-92	VOCs, metals
		Yard	20	Sep/Oct 93	VOCs, metals
			4	Oct-93	VOCs, metals, Cr VI
			5	Nov-93	VOCs, SOCs, metals
			1	Nov-93	VOCs, SOCs
			16	Dec-93	VOCs, SOCs, metals
			10	Mar-94	VOCs, SOCs, metals, Cr VI
			4	May-94	pestic./PCBs, PAHs, metals
	Groundwater	Upper 180-	6	Aug-93	VOCs, metals
		Foot Aquifer	1	Dec-93	metals
			9	Jan-94	VOCs, metals
			10	Feb-94	VOCs, metals
16	Soil	DOL	21	Jan-92	metals, VOCs, BTEX
		Maintenance	4	Aug-93	SOCs
		Yard	5	Oct-93	SOCs
			3	May-94	pestic., SOCs, CDDs/CDFs, metals
16	Soil	Pete's Pond	36	Jan/Feb-92	metals, VOCs
			11	Mar-92	VOCs, SOCs, PCBs, metals
			6	Feb-94	VOCs, SOCs, PCBs, metals, Cr VI

Table 2.1. Data Considered for the Baseline Risk Assessments - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Site	Medium	Area	Number of Samples	Sample Date	Analyses
16	Soil	Pete's Pond cont.	1	Feb-94	CDDs/CDFs
			4	Feb-94	SOCs
			4	May-94	pestic., SOCs, CDDs/CDFs, metals
		Pete's Pond	5	Aug-93	VOCs, SOCs, metals, Cr VI
		Extension	23	Aug-93	VOCs, metals, Cr VI
			3	Mar-94	VOCs
			6	Mar-94	VOCs, SOCs, metals, Cr VI, CDDs/CDFs
			5	Mar-94	VOCs, SOCs, metals, Cr VI
			3	May-94	pestic., SOCs, CDDs/CDFs, metals
	Groundwater	MW-16-01-A	1	Dec-93	halogenated VOCs, SOCs, BTEX
			1	Feb-94	halogenated VOCs, SOCs, BTEX
17	Soil	Site 17	12	Jan-92	VOCs, metals
			10	Aug-93	VOCs, metals, Cr VI
			3	Aug-93	VOCs, SOCs, metals, Cr VI
			31	Mar-94	VOCs, SOCs, metals, Cr VI
			13	Mar-94	CDDs/CDFs
			18	Mar-94	PCBs
	Groundwater	MW-17-01-A	1	Sep-93	halogenated VOCs, BTEX
			1	Dec-93	halogenated VOCs, BTEX
			1	Feb-94	halogenated VOCs, BTEX
	Groundwater	MW-17-02-180	1	Sep-93	halogenated VOCs, BTEX
			1	Feb-94	halogenated VOCs, BTEX
31	Soil	North Slope	12	Feb-92	VOCs, metals
			11	Aug-93	metals, Cr VI
			18	Sep-93	metals, Cr VI
			2	Mar-94	metals, Cr VI
			3	Aug-93	pestic./PCBs, CDDs/CDFs, metals, Cr VI
			3	Sep-93	pestic./PCBs, CDDs/CDFs, metals, Cr VI
			1	Feb-94	CDDs/CDFs, metals, Cr VI
			10	Mar-94	CDDs/CDFs, metals, Cr VI
			1	Feb-94	CDDs/CDFs
			1	Mar-94	CDDs/CDFs
31	Soil	North Slope	1	Feb-94	pesticides
			1	Mar-94	pesticides
			6	Mar-94	CDDs/CDFs, SOCs, metals, Cr VI
			2	Mar-94	pesticides, metals, Cr VI
			3	Mar-94	pesticides, CDDs/CDFs, metals, Cr VI
			1	Feb-94	pesticides, CDDs/CDFs

Table 2.1. Data Considered for the Baseline Risk Assessments - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Site	Medium	Area	Number of Samples	Sample Date	Analyses
31	Soil	South Slope	6	Feb-92	VOCs, metals
			8	Aug-93	metals, Cr VI
			2	Feb-94	CDDs/CDFs, metals, Cr VI
			1	Mar-94	CDDs/CDFs, metals, Cr VI
			2	Feb-94	CDDs/CDFs
			2	Mar-94	CDDs/CDFs
		LRTC Area	2	Aug-93	metals, Cr VI
			4	Sep-93	metals, Cr VI
			1	Aug-93	pestic./PCBs, CDDs/CDFs, metals, Cr VI
			5	Feb-94	CDDs/CDFs, metals, Cr VI
			7	Feb-94	copper
			1	Mar-94	copper
39	Soil	36A	69	Apr-93	metals, explosives
		BWMW	58	Feb/Apr-92	metals
		40A	14	Feb-92	BTEX, SOCs, lead
			60	Apr-94	metals, BTEX
			10	Apr-94	SOCs
		33	64	Apr-94	metals, BTEX
			7	Apr-94	explosives
			6	Apr-94	SOCs
		Target Areas	285	Apr-94	explosives, metals

VOCs Volatile organic compounds.
SOCs Semivolatile organic compounds.
pestic. Pesticides.
PCBs Polychlorinated biphenyls.
Cr VI Hexavalent chromium.
DOL Department of Logistics.
CDDs Chlorinated dibenzodioxins.
CDFs Chlorinated dibenzofurans.
BTEX Benzene, toluene, ethylbenzene, xylenes.
MW Monitoring well.
LRTC Leadership Reaction Training Compound.
BWMW Basewide Monitoring Wells.

Table 2.2 Background Concentrations of Metal in Soil - All Sites /a/
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals	Shallow NQTP /b/ Soil Conditions Depth <2.0 feet Maximum Concentration (mg/kg)	Deep NQTP /b/ Soil Conditions Depth >2.0 feet Maximum Concentration (mg/kg)
Antimony	ND	8.2
Arsenic	3.4	4.5
Beryllium	0.35	0.48
Cadmium	ND	1.9
Chromium	46.1	22.7
Copper	18.2	8.2
Lead	51.8	3.7
Mercury	0.12	ND
Nickel	58	19.5
Selenium	ND	ND
Silver	0.36	0.49
Thallium	0.45	0.39
Zinc	75.8	13.9

mg/kg Milligrams per kilogram.
NQTP Non-QTP, i.e., not from the Paso Robles Formation.
ND Not detected.

/a/ From HLA, 1993a. See Appendix G for additional information.
/b/ See Section 5.23, Volume II Basewide Background Soils Investigation for an explanation of soil type.

Table 2.3. Potential Receptors and Exposure Pathways - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Site	Potential Receptor	Area	Potential Exposure Pathway
Sites 2 and 12	Onsite Resident	Site 12[a]	1. Inhalation of volatile compounds from groundwater through soil 2. Incidental ingestion of surface soil (0-2 feet bgs) 3. Dermal contact with surface soil (0-2 feet bgs) 4. Inhalation of surface dust (0-2 feet bgs)
	Commercial Worker	Site 2	1. Incidental ingestion of surface soil (0-2 feet bgs) 2. Dermal contact with surface soil (0-2 feet bgs) 3. Inhalation of surface dust (0-2 feet bgs)
Sites 16 and 17	Utility Worker	Pete's Pond	1. Incidental ingestion of soil (0-10 feet bgs) 2. Dermal contact with soil (0-10 feet bgs) 3. Inhalation of dust (0-10 feet bgs)
	Utility Worker	Pete's Pond Extension	1. Incidental ingestion of soil (0-10 feet bgs) 2. Dermal contact with soil (0-10 feet bgs) 3. Inhalation of dust (0-10 feet bgs)
	Student Resident	Pete's Pond	1. Incidental ingestion of surface soil (0-2 feet bgs) 2. Dermal contact with surface soil (0-2 feet bgs) 3. Inhalation of surface dust (0-2 feet bgs)
		Pete's Pond Extension	1. Incidental ingestion of surface soil (0-2 feet bgs) 2. Dermal contact with surface soil (0-2 feet bgs) 3. Inhalation of surface dust (0-2 feet bgs)
		Site 17	1. Incidental ingestion of surface soil (0-2 feet bgs) 2. Dermal contact with surface soil (0-2 feet bgs) 3. Inhalation of surface dust (0-2 feet bgs)
		Sites 16 and 17	1. Ingestion of groundwater as drinking water

Site	Potential Receptor	Area	Potential Exposure Pathway
			2. Inhalation of volatile compounds from groundwater during showering
	Construction Worker	Site 17	1. Incidental ingestion of soil (0-10 feet bgs) 2. Dermal contact with soil (0-10 feet bgs) 3. Inhalation of dust (0-10 feet bgs)
	Construction Worker	DOL Maintenance Yard	1. Incidental ingestion of soil (0-10 feet bgs) 2. Dermal contact with soil (0-10 feet bgs) 3. Inhalation of subsurface dust (0-10 feet bgs)
	Commercial Worker	DOL Maintenance Yard	1. Incidental ingestion of surface soil (0-2 feet bgs) 2. Dermal contact with surface soil (0-2 feet bgs) 3. Inhalation of surface dust (0-2 feet bgs)
Site 3	Nearby Resident	Site 3[b]	1. Incidental ingestion of surface soil (0-2 feet bgs) (RME scenario only) 2. Dermal contact with surface soil (0-2 feet bgs) (RME scenario only) 3. Inhalation of surface dust (0-2 feet bgs)
	Park Ranger	Site 3	1. Incidental ingestion of surface soil (0-2 feet bgs) 2. Dermal contact with surface soil (0-2 feet bgs) 3. Inhalation of surface dust (0-2 feet bgs)
Site 31	Nearby Resident Trespasser	North Slope	1. Incidental ingestion of surface soil (0-2 feet bgs) 2. Dermal contact with surface soil (0-2 feet bgs) 3. Inhalation of surface dust (0-2 feet bgs)
		South Slope	1. Incidental ingestion of surface soil (0 feet bgs) 2. Dermal contact with surface soil (0 feet bgs) 3. Inhalation of surface dust (0 feet bgs)

Table 2.3. Potential Receptors and Exposure Pathways - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Site	Potential Receptor	Area	Potential Exposure Pathway
		LRTC Area	1. Incidental ingestion of surface soil (0 feet bgs) 2. Dermal contact with surface soil (0 feet bgs) 3. Inhalation of surface dust (0 feet bgs)
Site 39	Habitat Management Worker	Site 39	1. Incidental ingestion of surface soil (0-2 feet bgs) 2. Dermal contact with surface soil (0-2 feet bgs) 3. Inhalation of surface dust (0-2 feet bgs)
	Offsite Resident	Site 39	1. Inhalation of surface dust (0-2 feet bgs)

Feet bgs Feet below ground surface.
DOL Directorate of Logistics.
RME Reasonable maximum exposure.
LRTC Leadership reaction training compound.

/a/ The average exposure scenario will be based on all data from Site 12. The RME scenario will be based on data from the area of highest groundwater concentrations.

/b/ For all receptors selected for evaluation at Site 3, weighted exposure point concentrations will be determined based on the relative ammunition cover in the study areas. In addition, each bullet cover area (i.e., <1%, 1-10%, >10%) will be assessed separately.

Table 2.4 Inhalation Rates, Ingestion Rates, Skin Surface Areas, and Body Weights
Average Exposure Scenario - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Receptor (Age)	Inhalation Rate[a] (m^3/hr)	Ingestion Rate, Soil[b] (mg/day)	Ingestion Rate, Water[a] (l/day)	Skin Surface Area[a] (cm^2)	Body Weight[a] (kg)
Commercial Worker	0.83	50	NA	2109	70
Onsite Resident					
(0 to 6 years)	1.24	50	0.4	1420	14
(6 to 9 years)	1.56	50	0.5	1635	24.2
Utility Worker	0.83	50	NA	2109	70
Student Resident	0.83	50	1.5	2109	70
Construction Worker	1.4	50	NA	2109	70
Nearby Resident					
(0 to 6 years)	1.24	NA	NA	NA	14
(6 to 9 years)	1.56	NA	NA	NA	24.2
Park Ranger/Habitat Management Worker	0.83	50	0.5[c]	2109	70
Nearby Resident Trespasser (6 to 9 years)	1.56	50	NA	1635	24.2
Offsite Resident					
(0 to 6 years)	1.24	NA	NA	NA	14
(6 to 9 years)	1.56	NA	NA	NA	24.2

m^3/hr Cubic meters per hour.
mg/day Milligrams per day.
l/day Liters per day.
cm^2 Square centimeters.
kg Kilograms.
NA Not applicable.

/a/ *EPA, 1990b.*
/b/ *Finley and Paustenbach, 1994.*
/c/ Ingestion of groundwater evaluated for habitat management worker at Site 39.

Table 2.5 Inhalation Rates, Ingestion Rates, Skin Surface Areas, and Body Weights
RME Scenario - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Receptor (Age)	Inhalation Rate[a] (m^3/hr)	Ingestion Rate, Soil[b] (mg/day)	Ingestion Rate, Water[a] (l/day)	Skin Surface Area[a] (cm^2)	Body Weight[a] (kg)
Commercial Worker	1.25	50	NA	4714	70
Onsite Resident (0 to 6 years)	1.24	200	0.4	2348	14
Onsite Resident (6 to 18 years)	1.87	100	0.6	3764	41.6
Onsite Resident (>18 years)	1.25	100	2	4714	70
Utility Worker	1.25	100	NA	4714	70
Student Resident	1.25	100	2	4714	70
Construction Worker	3	480	NA	4714	70
Nearby Resident (0 to 6 years)	1.24	200	NA	2348	14
Nearby Resident (6 to 18 years)	1.87	NA	NA	NA	41.6
Nearby Resident (>18 years)	1.25	100	NA	4714	70
Park Ranger/Habitat Management Worker	1.25	100	1 /c/	4714	70
Nearby Resident Trespasser (6 to 18 years)	1.87	100	NA	3764	41.6
Offsite Resident					
(0 to 6 years)	1.24	NA	NA	NA	14
(6 to 18 years)	1.87	NA	NA	NA	41.6
(18 to 30 years)	1.25	NA	NA	NA	70

Table 2.5 Inhalation Rates, Ingestion Rates, Skin Surface Areas, and Body Weights
RME Scenario - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Receptor (Age)	Inhalation Rate[a] (m^3/hr)	Ingestion Rate, Soil[b] (mg/day)	Ingestion Rate, Water[a] (l/day)	Skin Surface Area[a] (cm^2)	Body Weight[a] (kg)

m^3/hr Cubic meters per hour.
mg/day Milligrams per day.
l/day Liters per day.
cm^2 Square centimeters.
kg Kilograms.
NA Not applicable.

/a/ *EPA, 1990b.*
/b/ *EPA, 1989b.*
/c/ Ingestion of groundwater evaluated for habitat management worker at Site 39.

Table 2.6. Absorption Factors - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Pathway	Absorption Factor /a/ (percent)
SOCs		
B(a)P-TE	Dermal	15
Bis(2-ethylhexyl)phthalate	Dermal	10
Total cPAH	Dermal	15
CDDs and CDFs		
TCDD-TE	Oral	43
	Dermal	1
Metals		
Antimony	Dermal	1
Arsenic	Dermal	3
Cadmium	Dermal	0.1
Copper	Dermal	1
Mercury	Dermal	1
Nickel	Dermal	1
Silver	Dermal	1
Thallium	Dermal	1
Pesticides		
4,4'-DDE	Dermal	5
4,4'-DDT	Dermal	5
Chlordane	Dermal	5

Table 2.6. Absorption Factors - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Pathway	Absorption Factor /a/ (percent)
Explosives		
2-Amino-dinitrotoluene	Dermal	100
4-Amino-dinitrotoluene	Dermal	100
HMX	Dermal	100
RDX	Dermal	100
2,4,6-Trinitrotoluene	Dermal	100

VOCs	Volatile organic compounds.
SOCs	Semivolatile organic compounds.
B(a)P-TE	Benzo(a)pyrene toxic equivalents.
cPAH	Carcinogenic polycyclic aromatic hydrocarbons.
CDDs	Chlorinated dibenzodioxins.
CDFs	Chlorinated dibenzofurans.
TCDD-TE	2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
HMX	Cyclotetramethylene tetranitramine.
RDX	Cyclotrimethylene trinitramine.

/a/ Methods and sources for defining absorption factors are presented in Section 2.2.6.

Table 2.7. TCDD Toxic Equivalent Factors - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	TEF /a/
Tetrachlorodibenzofurans (total)	0
2,3,7,8-Tetrachlorodibenzofuran	0.1
Pentachlorodibenzofurans (total)	0
1,2,3,7,8-Pentachlorodibenzofuran	0.05
2,3,4,7,8-Pentachlorodibenzofuran	0.5
Hexachlorodibenzofurans (total)	0
1,2,3,4,7,8-Hexachlorodibenzofuran	0.1
1,2,3,6,7,8-Hexachlorodibenzofuran	0.1
1,2,3,7,8,9-Hexachlorodibenzofuran	0.1
1,2,4,6,7,8-Hexachlorodibenzofuran	0
2,3,4,6,7,8-Hexachlorodibenzofuran	0.1
Heptachlorodibenzofurans (total)	0
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.01
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.01
Octachlorodibenzofuran	0.001
Tetrachlorodibenzo-p-dioxins (total)	0
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1
Pentachlorodibenzo-p-dioxins (total)	0
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	0.5
Hexachlorodibenzo-p-dioxins (total)	0
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	0.1
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	0.1
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	0.1
Heptachlorodibenzo-p-dioxins (total)	0
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	0.01
Octachlorodibenzo-p-dioxin	0.001

TCDD 2,3,7,8-Tetrachlorodibenzo-p-dioxin.
TEF Toxic equivalent factor.

/a/ Source: EPA, 1989n.

Table 2.8. Benzo(a)pyrene Toxic Equivalent Factors - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	TEF /a/
Benz(a)anthracene	0.1
Benzo(a)pyrene	1.0
Benzo(b)fluoranthene	0.1
Benzo(k)fluoranthene	0.01
Chrysene	0.001
Dibenz(a,h)anthracene	1.0
Indeno(1,2,3-cd)pyrene	0.1

TEF Toxic Equivalent Factor.

/a/ From: EPA, 1993f.

Table 2.9. Reference Doses and Slope Factors for Chemicals of Potential Concern - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Reference Doses: Oral RfD Subchronic (mg/kg/day)	Oral RfD Chronic (mg/kg/day)	Source /b/	Inhalation RfD Subchronic (mg/kg/day)	Inhalation RfD Chronic (mg/kg/day)	Source /b/	Slope Factors: Oral SF (mg/kg/day)^-1	Source /b/	Weight /a/ of Evidence	Inhalation SF (mg/kg/day)^-1	Source /b/	Weight /a/ of Evidence
VOCs												
Carbon tetrachloride	7.0E-03	7.0E-04	I94;HA92	7.0E-03	7.0E-04	oral	1.5E-01	Cal-EPA92	B2	1.5E-01	Cal-EPA92	B2
1,2-Dichloroethane	NA	NA	I94	NA	NA	I94	9.1E-02	I94	B2	9.1E-02	I94;HA93	B2
1,1-Dichloroethene	9.0E-03	9.0E-03	I94;HA93	9.0E-03	9.0E-03	oral	6.0E-01	I93	C	1.8E-01	I94	C
1,2-Dichloroethene (total)	9.0E-03	9.0E-03	HA93	9.0E-03	9.0E-03	oral	NA	HA93	NA	NA	HA93	NA
Methylene chloride	6.0E-02	6.0E-02	I94;HA93	9.0E-01	9.0E-01	HA93	1.4E-02	Cal-EPA92	B2	3.5E-03	Cal-EPA92	B2
Tetrachloroethene	1.0E-01	1.0E-02	I94;HA93	1.0E-01	1.0E-02	oral	5.1E-02	Cal-EPA92	NA	5.1E-01	Cal-EPA92	NA
Trichloroethene	NA	6.0E-03	I93	NA	6.0E-03	oral;	1.5E-02	Cal-EPA92	NA	1.0E-02	Cal-EPA92	NA
SOCs												
B(a)P-TE /c/	NA	NA		NA	NA		1.2E+01	Cal-EPA92	B2	1.2E+01	Cal-EPA92	B2
Bis(2-ethylhexyl)phthalate	2.0E-02	2.0E-02	I94	2.0E-02	2.0E-02	oral	1.4E-02	I94	B2	8.4E-03	Cal-EPA92	B2
Pyrene /d/	3.0E-01	3.0E-02	I94;HA93	3.0E-01	3.0E-02	oral	DI	I94	D	DI	I94	D
Total Carcinogenic PAHs /d/	3.0E-01	3.0E-02	I94;HA93	3.0E-01	3.0E-02	oral	DI	I94	D	DI	I94	D
Pesticides												
Chlordane	6.0E-05	6.0E-05	I94;HA93	6.0E-05	6.0E-05	oral	1.3E+00	I94	B2	1.3E+00	I94;HA93	B2
4,4'-DDE	NA	NA	I94	NA	NA	I94	3.4E-01	I94	B2	3.4E-01	Cal-EPA92	B2
4,4'-DDT	5.0E-04	5.0E-04	I94;HA93	5.0E-04	5.0E-04	oral	3.4E-01	I94	B2	3.4E-01	I94;HA93	B2
Inorganics												
Nitrate	1.6E+00	1.6E+00	I94	1.6E+00	1.6E+00	oral	NA	I94	NA	NA	I94	NA
Nitrite	1.0E-01	1.0E-01	I94;HA93	1.0E-01	1.0E-01	oral	NA	I94	NA	NA	I94	NA

Table 2.9. Reference Doses and Slope Factors for Chemicals of Potential Concern - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

	Reference Doses						Slope Factors					
Chemical	Oral RfD Subchronic (mg/kg/day)	Oral RfD Chronic (mg/kg/day)	Source /b/	Inhalation RfD Subchronic (mg/kg/day)	Inhalation RfD Chronic (mg/kg/day)	Source /b/	Oral SF (mg/kg/day)^-1	Source /b/	Weight /a/ of Evidence	Inhalation SF (mg/kg/day)^-1	Source /b/	Weight /a/ of Evidence
<u>CDDs and CDFs</u>												
TCDD-TE	NA	NA	HA92	NA	NA	HA92	1.5E+05	HA93	B2	1.5E+05	HA93	B2
<u>Metals</u>												
Antimony	4.0E-04	4.0E-04	I94;HA93	4.0E-04	4.0E-04	oral	NA	I94	NA	NA	I94	NA
Arsenic	3.0E-04	3.0E-04	I94;HA93	3.0E-04	3.0E-04	oral	1.8E+00	EPA88	A	1.5E+01	I94;HA93	A
Beryllium	5.0E-03	5.0E-03	I94;HA93	5.0E-03	5.0E-03	oral	7.0E+00	Cal-EPA93	B2	8.4E+00	I94;HA93	B2
Cadmium	5.0E-04	5.0E-04	I94	5.0E-04	5.0E-04	oral	NA	I94	B1	1.5E+01	Cal-EPA92	B1
Copper	3.7E-02	3.7E-02	HA93	3.7E-02	3.7E-02	oral	NA	I94	D	NA	I94	D
Lead	NA	NA	I94	NA	NA	I94	NA	I94	B2	NA	I94	B2
Manganese	1.4E-01	1.4E-01	I94;HA93	1.0E-04	1.0E-05	I94;HA93	DI	I94	D	DI	I94	D
Mercury	3.0E-04	3.0E-04	HA93	9.0E-05	9.0E-05	HA93	DI	I94	D	DI	I94	D
Nickel	2.0E-02	2.0E-02	I94;HA93	2.0E-02	2.0E-02	oral	NA	Cal-EPA93	A	9.1E-01	Cal-EPA92	A
Silver	5.0E-03	5.0E-03	I94;HA93	5.0E-03	5.0E-03	oral	NA	I94	D	NA	I94	D
Thallium (as Thallic oxide)	7.0E-04	7.0E-05	HA93	7.0E-04	7.0E-05	oral	DI	I94	D	DI	I94	D
<u>Explosives</u>												
Cyclonite (RDX)	3.0E-03	3.0E-03	I94;HA92	3.0E-03	3.0E-03	oral	1.1E-01	I94	C	1.1E-01	oral	C
2-amino-Dinitrotoluene	5.0E-04	5.0E-04	TNT	5.0E-04	5.0E-04	TNT	3.0E-02	TNT	NA	3.0E-02	TNT	NA
4-amino-Dinitrotoluene	5.0E-04	5.0E-04	TNT	5.0E-04	5.0E-04	TNT	3.0E-02	TNT	NA	3.0E-02	TNT	NA
HMX	5.0E-01	5.0E-02	I94	5.0E-01	5.0E-02	oral	NA	I94	D	NA	I94	D
Trinitrotoluene	5.0E-04	5.0E-04	I94;HA92	5.0E-04	5.0E-04	oral	3.0E-02	I94	C	3.0E-02	I94	C

RfD Reference dose.
SF Slope factor.

Table 2.9. Reference Doses and Slope Factors for Chemicals of Potential Concern - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

	Reference Doses						Slope Factors					
Chemical	Oral RfD Subchronic (mg/kg/day)	Oral RfD Chronic (mg/kg/day)	Source /b/	Inhalation RfD Subchronic (mg/kg/day)	Inhalation RfD Chronic (mg/kg/day)	Source /b/	Oral SF (mg/kg/day)^-1	Source /b/	Weight /a/ of Evidence	Inhalation SF (mg/kg/day)^-1	Source /b/	Weight /a/ of Evidence

mg/kg/day	Milligrams per kilogram per day.
VOCs	Volatile organic compounds.
1.0E-01	1 x 10^-1
I94	Integrated Risk Information System (IRIS; EPA, 1994).
HA93	Health Effects Assessment Summary Tables (HEAST; EPA, 1993e).
NA	Not available.
HA92	HEAST, 1992 (EPA, 1992b).
Cal/EPA92	California Environmental Protection Agency, 1992b.
SOCs	Semivolatile organic compounds.
DI	Data inadequate for quantitative risk assessment.
cPAHs	Carcinogenic polycyclic aromatic hydrocarbons.
ND	No data.
CDDs	Chlorinated dibenzodioxins.
CDFs	Chlorinated dibenzofurans.
TCDD	Tetrachlorodibenzo-p-dioxin.
N	Nitrogen.
HMX	Cyclotetramethylene tetranitramine.
RDX	Cyclotrimethylene trinitramine.

/a/ Weight of Evidence: A = known human carcinogen; B = probable human carcinogen (B1 = limited evidence of carcinogenicity in humans; B2 = sufficient evidence in animals and inadequate or lack of evidence in humans); C = possible human carcinogen; D = not classifiable as to human carcinogenicity (EPA, 1993y).

/b/ "Oral" in the "Source" column indicates that the inhalation RfD was derived from the oral RfD by route-to-route extrapolation or that the inhalation SF was derived from the oral SF.

/c/ The SFs for benzo(a)pyrene were used to evaluate the carcinogenic effects of B(a)P-TE (see text).

/d/ Potential noncarcinogenic health effects of carcinogenic polycyclic aromatic hydrocarbons were evaluated using the RfD for pyrene.

/e/ The SFs for 2,3,7,8-TCDD were used to evaluate TCDD-toxic equivalents.

/f/ Values for nickel are for nickel and compounds.

/g/ Nickel was not evaluated as an oral carcinogen on the basis of Cal/EPA Department of Toxic Substances Control guidance (22 California Code of Regulations, Article 7, Paragraph 12707, 1993).

/h/ Values for thallium are those for thallic oxide, which has the most conservative RfDs (i.e., lowest) of the thallium salts (EPA, 1993y).

3.0 BASELINE RISK ASSESSMENT FOR SITES 2 AND 12

The BRA for Sites 2 and 12 is presented in this section. Site 2 is the former Main Garrison Sewage Treatment Plant (MGSTP). Site 12 comprises four areas: the Lower Meadow, the former Directorate of Logistics (DOL) Automotive Yard, the former Cannibalization Yard and the associated industrial area, and a portion of the Southern Pacific Railroad (SPRR) spur. This BRA follows the methodology presented in Section 2.0. Any deviations from the methods described in Section 2.0 are noted.

3.1 Site Background

This section describes the physical settings, past and planned land uses, and local demographics for the sites.

3.1.1 Physical Setting

Both sites are in the northwest portion of Fort Ord. Site 2 is west of Highway 1; Site 12 is in the Main Garrison east of Highway 1 (Plate 3.1).

3.1.1.1 Site 2

Site 2 encompasses approximately 50 acres bounded by Indian Head Beach to the west, Range Road to the east, Trainfire Range No. 9 to the north, and Stilwell Hall to the south. The site is at an approximate elevation of 80 feet MSL. Much of Site 2 is covered with stabilized dune sand vegetated primarily with ice plant.

3.1.1.2 Site 12

The four areas of investigation at Site 12 are described below.

The Lower Meadow

This area is a grass field comprising less than 1 acre east of Highway 1, west of the DOL Automotive Yard, and south of the Twelfth Street Gate. The site is lined on two sides by Monterey cypress. The elevation of the Lower Meadow is approximately 65 feet MSL, about 5 feet lower than the DOL Automotive Yard, from which it historically received runoff. Several drain pipes extend from the DOL Yard into the Lower Meadow.

The DOL Automotive Yard

This 8-acre paved area northeast of the SPRR spur and south of Twelfth Street houses several buildings formerly used for automotive repair. Wooden barracks are located north and east of the yard. This area is approximately 70 feet above sea level and slopes gently to the west, toward the Lower Meadow.

The Cannibalization Yard

This approximately 1/2-acre paved area is located within an 18-1/2 acre industrial area separated from the DOL Automotive Yard to the north by the SPRR spur. A former baseball field lies to the east, and Tenth Street and wooden barracks are to the south. This area is approximately 80 feet above sea level.

The SPRR Spur

This area of less than 1 acre consists of the right of way along a portion of the railroad spur that curves east from the SPRR track through an industrial complex and between the DOL Automotive Yard and the Cannibalization Yard. The area is mostly unpaved except for areas adjacent to the former loading docks.

3.1.1.3 Geology

At Sites 2 and 12, older dune deposits consisting of predominately well-sorted to silty sand extend from the surface to approximately 120 to 150 feet bgs, where a sandy silt to sandy clay is encountered. Well-sorted sand to silty sand of the Valley Fill deposits is present beneath the silt to at least 300 feet bgs, the maximum depth investigated in the RI. The Salinas Valley Aquiclude, present through much of Fort Ord, is absent at both sites.

3.1.1.4 Hydrogeology

Sites 2 and 12 are located in the Salinas Basin. Two aquifer units were investigated as part of the RI, the Upper 180-foot aquifer and the Lower 180-foot aquifer. The sandy silt present at approximately 70 to 80 feet below MSL acts as a confining unit between the two aquifer units. Depth to water ranges from approximately 40 to 60 feet at Site 2 to about 70 feet at Site 12. Localized groundwater flow in the Upper 180-foot aquifer is generally from Site 12 westward toward Site 2 and Monterey Bay. Flow in the Lower 180-foot aquifer is primarily inland toward the Salinas Valley.

Groundwater quality at Sites 2 and 12 is characterized by total dissolved solids (TDS) content ranging from 295 to 998 mg/l for wells screened in the upper part of the Upper 180-foot aquifer at Site 2, and from 227 to 713 mg/l (with a mean of 375 mg/l) through the entire Upper 180-foot aquifer at Site 12. Saltwater intrusion has occurred in the lower part of the Upper 180-foot aquifer at Site 2 as far inland as the Sewage Treatment Plant, as evidenced by TDS values of up to 26,900 mg/l in Monitoring Well MW-02-07-180, which is screened in the bottom 20 feet of the Upper 180-foot aquifer. Groundwater underlying Site 12 is considered potable, but groundwater at Site 2 that has been subject to saltwater intrusion and is therefore generally not potable.

3.1.2 Land Use

This section discusses both past and planned future land uses for Sites 2 and 12.

3.1.2.1 Site 2

Site 2 is the former Main Garrison Sewage Treatment Plant (MGSTP) site. The MGSTP was the primary sewage treatment facility for Fort Ord from the late 1930s until May 1990. Five buildings, two large trickling filter facilities, three inactive unlined sewage ponding areas, and 10 inactive asphalt-lined sludge drying beds associated with the MGSTP remain on the southern portion of the parcel. The northwest edge of the site was used as a firing range (*HLA, 1993*). Effluent from the plant was discharged under a National Pollutant Discharge Elimination System (NPDES) permit to a storm drain that emptied into Indian Head Beach during low tide and into Monterey Bay at high tide.

The proposed development for Site 2 (Polygon 13) includes outdoor and indoor aquaculture facilities for raising fish and shellfish, with additional research facilities proposed to support oceanographic studies (*FORG, 1994*).

3.1.2.2 Site 12

Past land uses in the four Site 12 areas are described below.

Lower Meadow

This area was used as a waste disposal site. Suspected wastes include scrap metal, oil, and batteries. Construction waste, scrap metal, and evidence of hydrocarbon staining have been identified in fill at depths of up to 21 feet in areas of the Lower Meadow. The Lower Meadow has historically received runoff from the Automotive Yard via drain pipes.

DOL Automotive Yard

This area includes several buildings previously used for automobile repair, degreasing, engine testing, auto steam cleaning/washing, petroleum and oil storage, and auto painting. A formerly buried muffler near Building 2719 was used to store liquid waste (e.g., solvents and petroleum products). Underground storage tanks (USTs), primarily for gasoline storage, were present throughout the area, but all have been removed. Chemical releases from this area may have occurred as a result of accidental discharge of waste solvents, paints, and battery acid directly into soil, drains, or sewers.

Cannibalization Yard

The Cannibalization Yard was used from 1964 until the present to dismantle decommissioned military vehicles and other old equipment. Several buildings remain, including a former machine shop and a former furniture shop.

USTs that held diesel, kerosene, Stoddard solvent, and waste oil have been removed. Ten USTs containing motor vehicle fuel remain southeast of the MGSTP at Building 2042. One oil/water separator is located on the eastern border of the yard.

SPRR Spur

The portion of the SPRR spur described in Section 3.1.1.2 is considered as part of Site 12 because oil or fuel may have been sprayed in this area for dust control. The remainder of the SPRR spur is included in Site 13.

Future Use

Development planned for Site 12 includes a central business district, light industrial areas, a high-tech business park, a transit center, retail businesses, medium- to high-density residential areas, and a school (*FORG, 1994*).

3.1.3 Nearby Populations

The current and potential future residential population is nearest Site 2 approximately 1 mile north of the site in the city of Marina. It is not anticipated that these populations would have contact with chemicals detected at Site 2.

For Site 12, the nearest current residential and occupational receptors are individuals living and/or working at Fort Ord approximately 1 mile north to northeast of Site 12.

3.2 Data Evaluated

Data considered in the BRA were derived from soil and groundwater sampling conducted by HLA from 1991 to 1994 as part of the RI. Data obtained from site investigation(s) conducted by EA (*1990*) were also considered.

The sampling activities and the methods used to evaluate analytical data are discussed in Section 2.1.1.5 and summarized here. Soil data were segregated by depth as follows: surface soil (0 to 2 feet bgs), subsurface soil (2 to 10.5 feet bgs), and deep soil (greater than 10.5 feet gs). Statistical summaries for chemicals detected at Sites 2 and 12 are presented in Tables 3.1a, b, and c and 3.2a, b, and c (soil) and Tables 3.3 and 3.4 (groundwater). The frequency of detection, minimum and maximum concentrations, arithmetic mean concentration, and standard deviation and the 95 percent upper confidence limit (UCL) of the arithmetic mean are presented for each detected chemical.

Hexavalent chromium was not detected at either Site 2 or 12. A total of 31 soil samples were analyzed for hexavalent chromium at Site 2(4) and Site 12(27); detection limits for these samples ranged from 0.10 to 5.00 mg/kg for Sites 2 and 12. Detected concentrations of total chromium are therefore assumed to represent trivalent chromium.

3.2.1 Site 2

Twenty-seven soil samples were collected from eight soil borings and analyzed for one or more of the following: VOCs, SOCs, pesticides/PCBs, and priority pollutant metals (Tables 3.1a, b, and c).

The following 13 metals were detected in at least one surface soil sample (0 2 feet bgs): antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc. No organic compounds were detected in surface samples (Table 3.1a). Six metals were detected in at least one subsurface soil sample (2 to 10.5 feet bgs): arsenic, chromium, copper, lead, nickel, and zinc. No organic compounds were detected in subsurface soil (Table 3.1b). Chemicals detected in at least one deep soil sample (>10.5 feet bgs) were: acetone, bis (2-ethylhexyl)phthalate, antimony, arsenic, beryllium, chromium, copper, lead, nickel, and zinc (Table 3.1c).

Ten monitoring wells were installed at Site 2 between 1990 and 1994. Groundwater samples from these wells have been analyzed for VOCs, SOCs, and priority pollutant metals (Table 3.3). Results of analyses conducted since September 1993 indicate the presence of the following chemicals in groundwater from at least one of the 10 monitoring wells: bromodichloromethane, chloroform, dibromochloromethane, 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethene (1,1-DCE), 1,2-dichloroethene (total) (total 1,2-DCE), tetrachloroethene (PCE), 1,1,1-trichloroethane (1,1,1-TCA), trichloroethene (TCE), vinyl chloride, bis(2-ethylhexyl)phthalate, pentachlorophenol, antimony, arsenic, chromium, copper, iron, magnesium, manganese, mercury, nickel, potassium, thallium, zinc, calcium, chloride, nitrate as N, orthophosphate as P, sodium, and sulfate.

3.2.2 Site 12

Soil samples were collected in all four areas of Site 12 to characterize potential source areas. These areas were first investigated as potential source areas for the solvents identified in groundwater during an initial characterization of the Cannibalization Yard (*EA, 1990*). This investigation included drilling of four soil borings and installation and sampling of three monitoring wells. HLA conducted a remedial investigation at Site 12 between 1991 and 1994. This consisted of two phases and included the following activities: geophysical surveys; soil gas surveys for screening purposes; drilling of 38 soil borings and 4 pilot borings; collection of hydropunch samples to evaluate the extent of potential groundwater contamination and select monitoring well locations; installation of 7, and sampling of 10, monitoring wells; tidal influence monitoring; and aquifer testing. The results of soil sampling activities are summarized below followed by a summary of the groundwater sampling results. Soil sampling summaries are presented for Site 12 as a whole, consistent with how the data were employed in the exposure assessment (Table 3.2).

A total of 147 soil samples were collected from 42 soil borings, 6 test pits, and 5 surface locations at Site 12 and analyzed for one or more of the following: VOCs, SOCs, pesticides/PCBs, PAHs, and priority pollutant metals. The following chemicals were detected in at least one soil sample at Site 12 at depths of 0 to 2 feet bgs: acetone, PCE, toluene, TCE, 4,4'-DDT, di-n-butylphthalate, diethyl phthalate, bis(2-ethylhexyl)phthalate, total carcinogenic PAH, benzo(a)pyrene toxic equivalents (B(a)P-TE), pyrene, antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, and zinc (Table 3.2a). Most of these chemicals and the following chemicals were also detected at depths below 2 feet: carbon disulfide, 1,1-DCA, 1,2-DCA, total 1,2-DCE, 1,2-dichloropropane, methyl ethyl ketone (MEK), methylene chloride, 1,1,2-trichloroethane (1,1,2-TCA), 2-methylnaphthalene, pentachlorophenol, and xylenes (Tables 3.2b and 3.2c).

Groundwater samples from the 10 monitoring wells at Site 12 (seven installed by HLA and three by EA) have been analyzed for VOCs, SOCs, and metals on a regular basis from 1992 to 1994. Results of analyses conducted since September 1993 indicate the presence of the following chemicals in groundwater from at least one of the monitoring wells: 1,2-DCA, 1,1-DCE, total 1,2-DCE, methylene chloride, PCE, toluene, 1,1,1-TCA, TCE, antimony, chromium, copper, iron, magnesium, manganese, mercury, nickel, potassium, zinc, calcium, chloride, nitrate as N, orthophosphate as P, sodium, and sulfate (Table 3.4).

Results of physical testing of soil samples from Sites 2 and 12 are summarized Appendix C, RI Volume II, Sites 2 and 12.

3.3 Selection of Chemicals of Potential Concern (COPCs)

This section describes the selection of COPCs for soil and groundwater at Sites 2 and 12. All chemicals positively identified in at least one sample were subjected to the COPC selection screening described in Section 2.1.2.

3.3.1 Soil

For direct contact pathways, COPCs were identified based on soil analytical data at 0 to 2 feet bgs. The maximum concentration of each metal was first compared to the depth-specific Fort Ord NQTP soil background concentration for that metal. Metals whose concentrations did not exceed background concentrations were eliminated as COPCs. A toxicity screen, described in Section 2.1.2.4 and Appendix C, was performed for the remainder of the detected chemicals. Chemicals with a screening cancer risk of less than 1×10^{-8} or a screening hazard quotient less than 0.01 were eliminated.

Maximum lead concentrations were compared against a Health Based Screening Level (HBSL) of 240 mg/kg. Essential nutrients were considered and eliminated as appropriate, as discussed in Appendix B.

3.3.1.1 Site 2

Based on the exposure pathways identified for Site 2 (Section 3.4.3), only surface soil was evaluated for COPCs. Beryllium and nickel were eliminated because detected concentrations did not exceed background. Based on the essential nutrient evaluation (Appendix B), the estimated expected daily dose (EDD) of zinc is 0.31 mg/kg. This value is well below the Food and Drug Administration's (FDA's) recommended daily allowance (RDA) of 5 to 10 mg/day (*NRC, 1989*). For this reason, zinc was eliminated as a COPC. Chromium and selenium were eliminated based on results of the toxicity screen. The results of the toxicity screen are presented in Table C1 of Appendix C. Lead was eliminated because its maximum concentration was less than the HBSL.

The chemicals retained as COPCs in soil for Site 2 were: antimony, arsenic, cadmium, copper, mercury, silver, and thallium. The results of the selection process are presented in Table 3.5.

3.3.1.2 Site 12

Based on the exposure pathways identified for Site 12 (Section 3.4.3), only surface soil was evaluated for COPCs. Nickel was eliminated because the maximum concentration did not exceed background. Zinc was eliminated as an essential nutrient because its EDD of 0.10 mg/day was well below the FDA's RDA of 5 to 10 mg/day (*NRC, 1989*).

Acetone, beryllium, chromium, copper, 4,4'-DDT, di-n-butylphthalate, diethyl phthalate, mercury, pyrene, selenium, PCE, TCE, and toluene, were eliminated based on the results of the toxicity screen. The results of the toxicity screen are presented in Table C2 of Appendix C.

The chemicals that were retained as COPCs in soil for Site 12 were: antimony, arsenic, B(a)P-TE, beryllium, bis (2-ethylhexyl)phthalate, cadmium, lead, and Total carcinogenic PAH. Summaries of these COPCs and results of the selection process are presented in Table 3.6.

3.3.2 Groundwater

COPCs in groundwater were identified for Site 12 using a toxicity screen similar to that applied in the determination of COPCs in soil. COPCs were not selected for groundwater at Site 2, because ingestion of groundwater underlying Site 2 is not a complete pathway as residential land use is not planned for this site. In addition, groundwater below Site 2 has been subject to salt water intrusion, and is therefore generally not potable.

The toxicity screen evaluation was performed using a groundwater ingestion rate of 1 l/day, the maximum groundwater concentration within the last year, and the appropriate cancer slope factor or reference dose. Chemicals with a screening cancer risk of less than 1×10^{-8} or a screening hazard quotient less than 0.01 were eliminated on the basis of insignificant contribution. The results of the COPC screening analysis for groundwater are presented in Tables 3.7.

For groundwater at Site 12, the EDDs of calcium, iron, magnesium, and zinc were below their respective RDAs: for calcium 56.5 vs. 400 to 800 mg/day, for iron 0.14 vs. 6 to 10 mg/day, for magnesium 29.5 mg/day vs. 40 to 120 mg/day, and for zinc 0.10 vs. 5 to 10 mg/day. These chemicals were therefore, eliminated as COPCs.

The following chemicals were eliminated on the basis of the toxicity screen: chromium, toluene, and 1,1,1-TCA. The results of the toxicity screen are presented in Table C3 of Appendix C. EPA and Cal/EPA have not developed toxicity values for chloride, potassium, sodium, or sulfate. As a result, these chemicals could not be quantitatively evaluated in this BRA and were eliminated as COPCs.

The following chemicals were, therefore, retained as COPCs: antimony, copper, 1,1-DCE, 1,2-DCA, total 1,2-DCE, manganese, mercury, methylene chloride, nickel, nitrate (as N), PCE, and TCE (Table 3.7).

3.4 Exposure Assessment

The general methods used to identify potential exposure scenarios for Sites 2 and 12 are described in detail in Section 2.2. The following section provides a discussion of the nature and degree of the potential exposure to the COPCs that may occur at Sites 2 and 12. The sources and potential chemical migration routes for the COPCs, potential hypothetical receptors and the pathways by which exposure to COPCs may occur, exposure point concentrations, and the dose estimation for each chemical are presented in the following sections.

3.4.1 Chemical Source and Migration Analysis

Section 3.0 of the Introduction to the RI (Volume II) presents a general discussion of chemical fate and transport. Section 3.0 of the Introduction to the RI also includes a table of physical and chemical properties pertaining to environmental fate and transport of chemicals detected at the Fort Ord RI sites, and a discussion of potential chemical migration pathways. Section 5.0 of the Sites 2 and 12 RI presents a site-specific discussion of chemical fate and transport, and identifies potential chemical migration pathways at Sites 2 and 12. The potential migration pathways identified in Section 5.0 of the Sites 2 and 12 RI are discussed in the following sections.

The potential source of chemical release to soil and groundwater at Site 2 is the former sewage treatment plant. Metals are often found in sewage sludge and other sewage treatment byproducts. Metals have been detected in soil at elevated concentrations near the drying ponds at Site 2.

The potential sources of chemical release into soils and groundwater at Site 12 include:

The Lower Meadow

- Waste materials such as scrap metal, oil, batteries, and road construction waste, used as fill

- Runoff from the DOL Automotive Yard.

DOL Automotive Yard

- Former activities associated with automobile repair, degreasing, engine testing, auto steam cleaning/washing, petroleum and oil storage, and auto painting

- USTs used primarily for gasoline storage

- Discharge of waste solvents, paints, and battery acid directly into soil, drains, or sewers.

Cannibalization Yard

- Activities conducted at the former machine and furniture shops

- USTs that held diesel, kerosene, Stoddard solvent, and waste oil, and the oil/water separators on the eastern border of the yard.

SSRR Spur

- Oil or fuel that may have been sprayed in this area for dust control.

Chemicals may be released from soil through volatilization, wind or mechanical erosion, leaching to groundwater, or stormwater runoff. These potential release mechanisms are discussed below for the COPCs identified at Sites 2 and 12.

3.4.1.1 Chemical Vapors

The volatilization of certain chemicals from soil or groundwater can result in the release of chemicals from soil in a vapor phase. Metals were the only chemicals identified as COPCs in soil at Site 2. Metals, PAH and bis(2-ethylhexyl)phthalate were identified as COPCs in soil at Site 12. On the basis of the low vapor pressure of these chemicals, inhalation of vapors from chemicals present in soil at the sites was not assessed. However, as discussed below, volatilization of chemicals identified in groundwater was considered and evaluated as a complete exposure pathway for Site 12.

3.4.1.2 Fugitive Dust

Wind or mechanical erosion can result in the release of chemicals in soil by generation of dust from surface soil. Metals and SOCs, the only chemical classes identified as COPCs in soil at Sites 2 and 12, have been found in the environment adsorbed to suspended particulate matter and are subject to release from contaminated soils via this mechanism. Accordingly, this chemical migration route was included for metals and SOCs at Sites 2 and 12.

3.4.1.3 Stormwater Runoff

Chemicals released from the Automotive Yard may have been transported to adjacent areas within Site 12 (e.g., the Lower Meadow) via runoff through drainage pipes. Soil samples were collected in areas potentially receiving runoff to determine if runoff had occurred. Therefore, it was not necessary to conduct a quantitative migration analysis.

3.4.1.4 Leaching

The potential for chemicals to leach from soil to groundwater depends upon the physical and chemical properties of the chemical, the chemical concentration, soil type, pH, and other site-specific conditions (e.g., surface cover and annual rainfall). The chemicals identified as COPCs in soil at Sites 2 and 12 have limited water solubilities and high soil sorption tendencies. Chemical properties pertaining to chemical fate and transport are presented in Section 3.0 of Volume II of the RI/FS report. The detected concentrations and chemical properties of the organic chemicals detected at Site 12 indicate that the organic COPCs are unlikely to migrate to groundwater. The low detected metal concentrations and generally low mobility of metal cations in soil indicate that the metals detected in soil at Site 12 are unlikely to migrate to groundwater.

The pH of soil at Sites 2 and 12 ranges from 4.2 to 7.8, indicating that there is little potential for metals to leach to groundwater. Further, depth to groundwater is approximately 180 feet at Site 2, and 50 to 70 feet at Site 12. Although elevated concentrations of metals have been detected in at least one monitoring well at Site 2, "clean" soil in subsurface zones and saltwater intrusion at Site 2 indicate that leaching has not been the mechanism. Based on this information, chemical migration of the COPCs in soil to groundwater at Sites 2 and 12 is considered unlikely and was not quantitatively evaluated in the BRA.

3.4.2 Potential Receptors and Exposure Pathways

This section identifies the hypothetical receptors evaluated for Sites 2 and 12, and defines the potential exposure pathways through which the receptors could contact COPCs. Methods used to identify receptors are described in Section 2.2. Site-specific information presented in Section 3.1 was used to develop the exposure assessment.

3.4.2.1 Site 2

There are no current receptors at or within approximately 1 mile of Site 2. Potential future onsite receptors for Site 2 are adult workers employed at the proposed marine aquaculture and oceanographic research facilities. These receptors may be exposed to chemicals in surface soil as a result of outdoor activities associated with aquaculture and research. Residential receptors were not evaluated because proposed development at Site 2 includes only these facilities (*FORG, 1994*).

Three complete soil exposure pathways at Site 2 were identified: incidental ingestion of soil, dermal contact with soil, and inhalation of fugitive dust. Ingestion of groundwater underlying Site 2 was not considered a complete exposure pathway as residential land use is not planned for this site.

3.4.2.2 Site 12

There are no current receptors at Site 12. The nearest populations live and/or work approximately 1 mile east of the site. Exposure of these individuals to chemicals present at Site 12 is assumed to be negligible based on results of the future onsite scenario and the distance of these individuals from the site.

The potential future onsite receptors for Site 12 are adult workers and child and adult residents (*FORG, 1994*) who may be exposed to chemicals in surface soil as a result of normal activities. Because exposure of future workers would be much less than that of future residents, quantitative risk evaluations were conducted for residential receptors only.

The complete soil exposure pathways at Site 12 are incidental ingestion of soil, dermal contact with soil, and inhalation of fugitive dust. Inhalation of volatile chemicals migrating from groundwater into air was also evaluated for Site 12, although the results of an initial screening evaluation (Appendix D) indicated that this exposure pathway does not contribute significantly to the total exposure. Additionally, ingestion of groundwater underlying Site 12 was evaluated.

3.4.3 Exposure Scenarios

This section presents a discussion of the site-specific information considered in the exposure assessment. To provide a conservative range of potential risks, both average and RME exposure scenarios (defined in Section 2.2.3) were evaluated. The average exposure scenario was evaluated using average (or mean) values for key exposure parameters; the RME scenario was evaluated using upperbound values (e.g., 95th UCL) for key exposure parameters. The pathway-specific assumptions used to evaluate potential exposures of each of the receptors for Sites 2 and 12 are presented in Section 2.2.5.

It was assumed that exposures for future adult workers at Site 2 would occur 8 hours per day, 250 days per year (5 days per week, 50 weeks per year) for 10 years (average exposure) or 25 years (RME). The fraction of intake (FI) was assumed to be 0.5 (average) and 1.0 (RME).

For the future residential scenario at Site 12, it was assumed that exposure would occur 20 hours per day (average exposure) or 24 hours per day (RME), 350 days per year for 9 years (average exposure) or 30 years (RME). The fraction of intake was assumed to be 0.75 (average exposure) or 1.0 (RME).

These assumptions are summarized in Table 3.8.

3.4.4 Exposure Point Concentrations (EPCs)

The methods used to evaluate EPCs are discussed in Section 2.2.7. Site-specific average exposure and RME EPCs were developed for soil and groundwater using the arithmetic mean concentration and the 95 percent upper confidence limit on the mean (95th UCL), respectively. EPCs were developed for particulate-bound chemicals in air by assuming that 100 percent of the airborne, site-specific PM_{10} originated from site soil. Accordingly, the PM_{10} dust concentration was multiplied by the mean and 95th UCL soil concentrations to characterize EPCs in air, as described in Section 2.2.7.

EPCs for volatile chemicals were estimated using the Army/Jury Behavior Assessment Model, discussed in Appendix D. This model estimates vapor flux rates at the soil surface resulting from volatile chemicals present in the dissolved phase in groundwater.

Because no areas of contamination at Site 12 were identified as hot spots, it was not considered necessary to analyze soil data on an area-specific basis for the exposure assessment.

EPCs for soil, air, and groundwater are summarized in Tables 3.9 through 3.11.

3.4.5 Estimation of Exposure (Dose)

The pathway-specific equations and exposure parameters used to estimate average daily doses (noncarcinogens) and lifetime average daily doses (carcinogens) are presented in Sections 2.2.4 and 2.2.5. This approach was applied to all COPCs except lead. For lead, blood lead concentrations were conservatively estimated using the DTSC LEADSPREAD (adults and children from age 6 years) and the EPA UBK (children 0 to 6 years) models. These models are described Section 2.2.9.

3.5 Toxicity Assessment

The toxicity assessment presents the chemical-specific cancer slope factors (SFs) and noncancer reference doses (RfDs) used in the BRA. Where EPA and DTSC have derived different slope factors for a chemical, the more conservative value was used. The EPA RfD, or an appropriate surrogate RfD, was used for all noncarcinogenic endpoints other than lead toxicity. The chemical-specific SFs and RfDs used in the BRA are provided in Table 2.9.

3.6 Risk Characterization

The risk characterization integrates the dose estimates and the toxicity assessment to characterize the incremental cancer risks and the noncancer health hazards. Risk characterization methods are discussed in Section 2.4. Estimated incremental cancer risks and noncancer health hazards are presented in Appendix E. The following sections summarize the results of the risk characterization for receptors at Sites 2 and 12. Results are presented with and without corrections for background arsenic levels in surface soil.

3.6.1 Possible Noncancer Health Effects

Noncancer health effects were characterized for future onsite workers at Site 2 and future child and adult residents at Site 12 (Tables 3.12 and 3.13). Hazard quotients were summed to arrive at total hazard indexes (HI) for the average and RME scenarios. This method is considered conservative in that it is more accurate to only sum the hazard quotients of chemicals affecting common target organs ("toxicological endpoints").

3.6.1.1 Site 2

The total multipathway noncarcinogenic HIs for the average exposure and RME scenarios for future onsite workers at Site 2 are 0.01 and 0.1, respectively. These results indicate that noncarcinogenic adverse health effects are not expected for future populations at Site 2.

3.6.1.2 Site 12

Quantitative noncancer hazard evaluations for future residential receptors at Site 12 are discussed below.

Total multipathway HIs for a resident child 0 to 6 years old are 0.4 and 2 for the average exposure and RME scenarios, respectively.

The HI for a child resident 6 to 9 years old (average exposure scenario) is 0.3, and the HI for a child 6 to 18 years old (RME scenario) is 0.7.

The future adult resident noncancer health hazard was evaluated only for the RME scenario, as the average scenario of a 9 year residential tenure was conservatively applied to the childhood years. The HI for the future adult resident, ages 18 to 30, is 1.

The groundwater ingestion pathway accounts for approximately 63 percent (HI = 1.2) and 92 (HI = 1.2) percent of the HI for the child and the adult respectively. The remainder of the HI (0.3 and 0.1 for the child and adult residents, respectively) results from exposure to concentrations of metals, BEHP, and total carcinogenic PAHs in soil.

3.6.2 Possible Cancer Risk

Estimated incremental lifetime cancer risks were characterized for future onsite workers at Site 2 and residents at Site 12. The results are summarized in Tables 3.14 and 3.15 for the worker and resident receptors, respectively.

3.6.2.1 Site 2

Estimated lifetime cancer risks for the future worker at Site 2 are 2×10^{-7} and 3×10^{-6}, for the average and the RME scenarios, respectively. The estimated background RME cancer risk at Site 2 is 2×10^{-6} (Table A1 in Appendix A), which accounts for approximately 89 percent of the site specific RME risk of 3×10^{-6}. When the background related risk is subtracted from the RME site risk, the residual risk is 3×10^{-7}.

3.6.2.2 Site 12

Total cancer risks estimated for the future onsite resident receptor at Site 12 were 5 x 10^{-6} and 6 x 10^{-5}, for the average and RME scenarios, respectively. Nearly all of the cancer risk estimated at Site 12 is due to the presence of 2 metals in soil (arsenic and beryllium) at background concentrations and 5 VOCs in groundwater (1,2 DCA; 1,1 DCE; methylene chloride, PCE; and TCE). Background concentrations of arsenic and beryllium account for approximately 53 percent and 32 percent of the total average and RME cancer risk, respectively. Exposure to VOCs in groundwater accounts for approximately 69 percent (average) and 57 percent (RME) of the total risk estimated at the site. These results are discussed further below.

Total cancer risk estimates associated with exposure to all carcinogenic COPCs in soil (arsenic, beryllium, cadmium, B(a)P-TE, and BEHP) were 2 x 10^{-6} (average) and 2 x 10^{-5} (RME scenario). B(a)P-TE and BEHP account for only 7 percent (1.0 x 10^{-7}; average) and 9 percent (2.0 x 10^{-6}; RME) of this soil-related cancer risk; of this amount B(a)P-TE represents the majority of the risk for both the average (9.6 x 10^{-8}) and the RME scenarios (1.8 x 10^{-6}). B(a)P-TE was detected in only 1 out of 18 soil samples; detection limits ranged from 0.330 to 1.7 mg/kg.

With only one exception, cancer risks due to background levels of arsenic and beryllium (values for cadmium are not available) in soil are greater than the total cancer risk estimate associated with exposure to arsenic, beryllium and cadmium in soil. The total and background cancer risk due to RME concentrations of arsenic was 2 x 10^{-5} and 1 x 10^{-5}, respectively. These results suggest that in general, site-related concentrations of arsenic and beryllium are below naturally occurring background levels. The exceedance of RME arsenic concentrations over background levels may reflect the presence of a hotspot(s) - not extensive contamination throughout the site.

Subtracting out the background contribution from the total cancer risk results in a residual risk of 3 x 10^{-6} and 4 x 10^{-5} (rounded to one significant figure) for the average and RME scenarios, respectively. This information is summarized in Table 3.17.

3.6.3 Results of Lead Exposure Evaluation

Lead exposure evaluation was conducted only for Site 12, because lead was not selected as a COPC at Site 2. The UBK model was used to evaluate blood lead levels for children 0 to 6 years old. The highest blood lead levels for this age range were 3.15 μg/dl (average exposure) and 7.29 μg/dl (RME). UBK model output for the child resident receptor is presented in Tables F1 and F2 in Appendix F.

The LEADSPREAD model was used to evaluate resident children 6 to 18 years old and resident adults. The 99th percentile values predicted by the model were 4.46 μg/dl and 7.64 μg/dl, for the average exposure (age 6 to 9) and RME (age 6 to 18), respectively. LEADSPREAD model output for the resident children from age 6 to 18 and adult resident receptors is presented in Tables F3 and F4 in Appendix F.

The average exposure and RME blood lead levels estimated for all future receptors at Site 12 are well below the target 99th percentile blood lead level of 10 μg/dl (Table 3.16).

3.7 Uncertainty Analysis

Section 8.0 presents the uncertainties associated with the BRA that are common to all sites evaluated. Uncertainties associated with the driving component of the cancer risk characterization for Sites 2 and 12 (i.e., ingestion of groundwater) are discussed below.

Factors contributing to the uncertainty in the risks associated with groundwater ingestion include the lack of consideration of the low probability of a home being constructed above the maximally contaminated monitoring well, and lack of consideration of the oral bioavailability (absorption fraction) of ingested chemicals.

3.8 Summary of Baseline Risk Assessment for Sites 2 and 12

This BRA was conducted as part of the Basewide RI/FS for Fort Ord. Sites 2 and 12 were evaluated separately. COPCs for each site were identified for soil and groundwater. The COPCs selected for surface soil at Site 2 were antimony, arsenic, cadmium, copper, mercury, silver, and thallium. The COPCs selected for surface soil at Site 12 were antimony, arsenic, B(a)P-TE, bis(2-ethylhexyl)phthalate, cadmium, lead, and Total cPAH. The following chemicals were selected as COPCs for groundwater at Site 12: antimony, copper, 1,1-DCE, 1,2-DCA, total 1,2-DCE, manganese, mercury, methylene chloride, nickel, nitrate, PCE, and TCE.

There are no current receptors within a 1 mile of either site. The hypothetical future receptors for Site 2 are employees working at the proposed future aquaculture/marine research facility. The hypothetical future receptors at Site 12 are child and adult residents and commercial workers; residents were selected as representative receptors in the quantitative BRA for Site 12.

The results of the BRA for Site 2 indicate that there would be no noncarcinogenic health hazards associated with chemicals present at Site 2 when consideration is given to background levels of arsenic in site soil. Potential average exposure and RME cancer risk for Site 2 were conservatively estimated to be 2×10^{-7} and 3×10^{-6}, respectively. When the RME cancer risk is adjusted to account for local background arsenic levels in soil, the risk is 3×10^{-7}.

The BRA for Site 12 estimated multipathway HIs below 1 for all receptors except for the RME 0 - 6 year old child (HI = 2) and the 18 - 30 year old adult resident (HI = 1). As indicated previously, however, in Section 3.6.1, HIs estimated herein do not account for chemical-specific "toxicological endpoints" (i.e., not all the COPCs will have the identical toxic effect). The groundwater ingestion pathway accounts for approximately 63 percent (HI = 1.2) and 92 (HI = 1.2) percent of the HI for the child and the adult, respectively. The remainder of HI (0.74 and 0.09 for the child and adult, respectively) results from exposure to concentrations of metals, BEHP, and total carcinogenic PAHs in soil.

Potential average exposure and RME cancer risks for Site 12 were conservatively estimated to be 5×10^{-6} and 6×10^{-5}, respectively. The estimated lifetime incremental cancer risks for the future onsite resident (after consideration of local background arsenic and beryllium levels in soil) are 3×10^{-6} and 4×10^{-5} for the average and RME scenarios, respectively.

Of the RME risks, 3×10^{-5} was due to VOCs in groundwater, 2×10^{-5} was due to background metals in soil, and 4×10^{-6} can be attributed to potentially Fort Ord-related compounds in soil.

SECTION 3.0
TABLES AND PLATES

Table 3.1a. Statistical Data Summary of Chemicals Detected in Surface Soil (0 to 2 feet bgs), Site 2
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Antimony	2	8	25.0	1.30E+00	- -	2.31E+01	- -	3.56E+00	7.96E+00	1.92E+01	1.92E+01
Arsenic	7	8	87.5	1.40E+00	- -	3.70E+00	- -	2.30E+00	8.10E-01	3.89E+00	3.70E+00
Beryllium	1	8	12.5	2.30E-01	- -	2.30E-01	- -	1.10E-01	5.00E-02	2.10E-01	2.10E-01
Cadmium	2	8	25.0	9.00E-01	- -	1.75E+01	- -	2.61E+00	6.02E+00	1.44E+01	1.44E+01
Chromium /a/	8	8	100.0	9.60E+00	- -	9.08E+01	- -	2.59E+01	2.67E+01	7.82E+01	7.82E+01
Copper	4	8	50.0	3.70E+00	1.50	1.16E+03	- -	1.56E+02	4.06E+02	9.53E+02	9.53E+02
Lead	7	8	87.5	5.70E+00	- -	1.81E+02	- -	3.12E+01	6.11E+01	1.51E+02	1.51E+02
Mercury	6	8	75.0	1.90E-01	- -	5.30E+00	- -	1.07E+00	1.77E+00	4.53E+00	4.53E+00
Nickel	6	8	75.0	6.00E+00	- -	3.13E+01	- -	1.01E+01	9.10E+00	2.79E+01	2.79E+01
Selenium	1	8	12.5	8.40E+00	- -	8.40E+00	- -	1.38E+00	2.84E+00	6.94E+00	6.94E+00
Silver	4	8	50.0	5.00E-01	- -	5.86E+01	- -	8.90E+00	2.03E+01	4.87E+01	4.87E+01
Thallium	1	8	12.5	6.00E-01	- -	6.00E-01	- -	2.60E-01	1.40E-01	5.30E-01	5.30E-01
Zinc	4	8	50.0	8.50E+00	- -	1.55E+03	- -	2.30E+02	5.36E+02	1.28E+03	1.28E+03

bgs Below ground surface.
mg/kg Milligrams per kilogram.
- - Not applicable.

/a/ Two samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 5.0 mg/kg.

Table 3.1b. Statistical Data Summary of Chemicals Detected in Subsurface Soil (2 to 10 feet bgs), Site 2
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Arsenic	2	4	50.0	1.80E+00	5.50	4.00E+00	5.50	2.11E+00	1.29E+00	4.63E+00	4.00E+00
Chromium /a/	4	4	100.0	1.89E+01	5.50	3.02E+01	5.50	2.45E+01	5.72E+00	3.57E+01	3.02E+01
Copper	4	4	100.0	3.50E+00	5.50	4.60E+00	5.50	4.13E+00	5.60E-01	5.23E+00	4.60E+00
Lead	2	4	50.0	1.40E+00	5.50	1.40E+00	5.50	9.30E-01	6.00E-01	2.10E+00	1.40E+00
Nickel	4	4	100.0	8.90E+00	5.50	1.90E+01	5.50	1.44E+01	4.79E+00	2.38E+01	1.90E+01
Zinc	4	4	100.0	1.67E+01	5.50	3.16E+01	5.50	2.10E+01	7.10E+00	3.49E+01	3.16E+01

bgs Below ground surface.
mg/kg Milligrams per kilogram.

/a/ Two samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 1 mg/kg.

Table 3.1c. Statistical Data Summary of Chemicals Detected in Deep Soil (> 10 feet bgs), Site 2
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Acetone	5	14	35.7	7.50E-03	90.50	4.50E-02	10.50	4.38E+02	1.46E+03	3.30E+03	4.50E+01
Antimony	1	14	7.1	6.30E+00	50.50	6.30E+00	50.50	3.00E+00	9.50E-01	4.87E+00	4.87E+00
Arsenic	13	14	92.9	6.80E-01	40.50	2.60E+00	10.50	1.32E+00	6.10E-01	2.51E+00	2.51E+00
Beryllium	3	14	21.4	1.80E-01	30.50	3.10E-01	20.50	1.20E-01	8.00E-02	2.80E-01	2.80E-01
Bis(2-ethylhexyl)phthalate	1	4	25.0	2.00E-01	10.50	2.00E-01	10.50	1.79E-01	1.44E-02	2.07E-01	2.00E-01
Chromium /a/	14	14	100.0	4.60E+00	40.50	1.51E+01	15.50	8.95E+00	3.00E+00	1.48E+01	1.48E+01
Copper	10	14	71.4	2.10E+00	15.50	4.60E+00	20.50	2.61E+00	1.26E+00	5.07E+00	4.60E+00
Lead	12	14	85.7	5.90E-01	40.50	2.30E+00	10.50	1.16E+00	6.00E-01	2.33E+00	2.30E+00
Nickel	12	14	85.7	6.80E+00	100.50	1.14E+01	40.50	8.21E+00	2.78E+00	1.37E+01	1.14E+01
Zinc	9	14	64.3	4.50E+00	80.50	1.17E+01	20.50	6.09E+00	3.60E+00	1.31E+01	1.17E+01

bgs Below ground surface.
mg/kg Milligrams per kilogram.

/a/ No samples were analyzed for hexavalent chromium.

Table 3.2a. Statistical Data Summary of Chemicals Detected in Surface Soil (0 to 2 feet bgs), Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Acetone	4	30	13.3	4.00E-03	1.00	1.60E-02	1.50	5.04E-03	4.82E-03	1.45E-02	1.45E-02
Antimony	10	35	28.6	3.70E-01	2.00	8.70E+00	1.50	1.36E+00	1.89E+00	5.06E+00	5.06E+00
Arsenic	33	35	94.3	9.00E-01	1.00	6.80E+00	0.50	1.87E+00	1.33E+00	4.48E+00	4.48E+00
B(a)P-TE	1	18	5.6	4.58E-02	- -	4.58E-02	- -	1.49E-02	1.03E-02	3.52E-02	3.52E-02
Beryllium	17	34	50.0	1.30E-01	0.50	3.60E-01	2.00	1.50E-01	7.00E-02	2.90E-01	2.90E-01
Bis(2-ethylhexyl)phthalate	7	13	53.9	6.50E-02	0.50	9.90E+00	0.50	9.58E-01	2.70E+00	6.25E+00	6.25E+00
Cadmium	7	35	20.0	8.90E-01	0.35	1.86E+01	0.35	1.77E+00	4.18E+00	9.96E+00	9.96E+00
Chromium /a/	35	35	100.0	8.20E+00	1.00	1.84E+02	0.35	1.96E+01	2.99E+01	7.82E+01	7.82E+01
Copper	24	35	68.6	1.70E+00	1.00	1.25E+02	0.35	2.11E+01	3.43E+01	8.83E+01	8.83E+01
4,4'-DDT	1	12	8.3	1.50E-02	0.25	1.50E-02	0.25	1.20E-02	8.23E-03	2.82E-02	1.50E-02
Di-n-butylphthalate	2	13	15.4	4.00E-02	0.50	1.10E-01	2.00	3.45E-01	6.79E-01	1.68E+00	1.10E-01
Diethyl phthalate	1	13	7.7	4.10E-02	2.00	4.10E-02	2.00	3.50E-01	6.77E-01	1.68E+00	4.10E-02
Lead	32	35	91.4	5.70E-01	1.00	1.14E+03	0.35	9.64E+01	2.39E+02	5.65E+02	5.65E+02
Mercury	7	35	20.0	5.00E-02	0.50	5.60E-01	0.50	6.00E-02	1.00E-01	2.70E-01	2.70E-01
Nickel	32	35	91.4	6.90E+00	2.00	1.70E+01	0.50	9.78E+00	2.79E+00	1.53E+01	1.53E+01
Pyrene	1	19	5.3	9.50E-01	0.25	9.50E-01	0.25	3.08E-01	5.88E-01	1.46E+00	9.50E-01
Selenium	1	34	2.9	7.70E-01	2.00	7.70E-01	2.00	3.80E-01	9.00E-02	5.60E-01	5.60E-01
Tetrachloroethene	5	30	16.7	1.30E-03	2.00	2.90E-01	2.00	1.40E-02	5.27E-02	1.17E-01	1.17E-01
Toluene	1	30	3.3	2.10E-03	0.35	2.10E-03	0.35	2.94E-03	1.90E-03	6.67E-03	2.10E-03

Table 3.2a. Statistical Data Summary of Chemicals Detected in Surface Soil (0 to 2 feet bgs), Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Total Carcinogenic PAHs	1	18	5.6	1.25E+00	- -	1.25E+00	- -	3.17E-01	2.68E-01	8.42E-01	8.42E-01
Trichloroethene	1	30	3.3	2.40E-03	0.50	2.40E-03	0.50	2.95E-03	1.90E-03	6.67E-03	2.40E-03
Zinc	31	35	88.6	4.40E+00	1.50	4.99E+02	0.35	7.48E+01	1.26E+02	3.22E+02	3.22E+02

bgs Below ground surface.
mg/kg Milligrams per kilogram.
B(a)P-TE Benzo(a)pyrene toxic equivalents.
- - Not applicable.
cPAH Carcinogenic polycyclic aromatic hydrocarbons.

/a/ Ten samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 5 mg/kg.

Table 3.2b. Statistical Data Summary of Chemicals Detected in Subsurface Soil (2 to 10 feet bgs), Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Acetone	10	59	17.0	6.00E-03	5.50	3.70E-02	5.50	7.15E-03	5.58E-03	1.81E-02	1.81E-02
Antimony	3	58	5.2	3.80E-01	10.00	1.90E+00	10.00	1.82E+00	1.27E+00	4.32E+00	1.90E+00
Arsenic	40	58	69.0	9.30E-01	5.50	4.70E+00	5.50	1.26E+00	6.20E-01	2.48E+00	2.48E+00
B(a)P-TE	1	38	2.6	1.36E-02	4.25	1.36E-02	4.25	4.08E-01	3.53E-01	1.10E+00	1.36E-02
Beryllium	16	56	28.6	1.30E-01	5.00	4.60E-01	9.25	1.30E-01	8.00E-02	2.90E-01	2.90E-01
Bis(2-ethylhexyl)phthalate	9	35	25.7	4.80E-02	10.00	3.60E+00	9.50	2.90E-01	5.87E-01	1.44E+00	1.44E+00
Cadmium	5	58	8.6	7.00E-01	8.50	2.00E+00	9.50	4.30E-01	3.20E-01	1.06E+00	1.06E+00
Chromium /a/	55	58	94.8	2.80E+00	10.00	9.16E+01	9.50	1.46E+01	1.66E+01	4.72E+01	4.72E+01
Copper	44	58	75.9	1.50E+00	5.50	2.80E+01	9.50	4.67E+00	5.21E+00	1.49E+01	1.49E+01
Di-n-butylphthalate	2	35	5.7	4.60E-02	5.50	1.80E-01	9.50	1.97E-01	1.59E-01	5.08E-01	1.80E-01
Diethyl phthalate	3	35	8.6	1.90E-01	8.50	3.20E-01	9.50	2.05E-01	1.58E-01	5.14E-01	3.20E-01
Lead	55	58	94.8	4.30E-01	5.50	7.77E+02	9.50	5.42E+01	1.64E+02	3.76E+02	3.76E+02
Mercury	2	58	3.5	1.80E-01	9.50	2.90E-01	5.50	5.00E-02	4.00E-02	1.30E-01	1.30E-01
Methyl ethyl ketone	2	59	3.4	4.30E-03	10.00	7.10E-03	5.50	5.72E-03	2.84E-03	1.13E-02	7.10E-03
Methylene chloride	4	59	6.8	2.80E-03	9.50	5.00E-03	5.50	2.79E-03	2.20E-03	7.11E-03	5.00E-03
2-Methylnaphthalene	1	35	2.9	2.30E-01	10.00	2.30E-01	10.00	1.75E-01	1.08E-02	1.96E-01	1.96E-01
Nickel	49	58	84.5	4.20E+00	10.00	1.46E+01	5.50	8.22E+00	3.09E+00	1.43E+01	1.43E+01
Pyrene	1	38	2.6	3.60E-01	4.25	3.60E-01	4.25	1.95E-01	1.57E-01	5.04E-01	3.60E-01
Selenium	3	58	5.2	5.70E-01	5.50	7.40E-01	5.50	3.40E-01	1.00E-01	5.30E-01	5.30E-01

Table 3.2b. Statistical Data Summary of Chemicals Detected in Subsurface Soil (2 to 10 feet bgs), Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Tetrachloroethene	6	59	10.2	1.30E-03	5.00	1.70E-02	5.50	3.02E-03	2.35E-03	7.62E-03	7.62E-03
Total Carcinogenic PAHs	1	38	2.6	6.80E-01	4.25	6.80E-01	4.25	1.12E+00	9.42E-01	2.97E+00	6.80E-01
Xylenes	3	59	5.1	1.10E-03	5.50	2.80E-02	10.00	3.03E-03	3.31/1000	9.53E-03	9.53E-03
Zinc	52	58	89.7	5.60E+00	5.50	2.23E+02	9.50	2.68E+01	4.61E+01	1.17E+02	1.17E+02

bgs Below ground surface.
mg/kg Milligrams per kilogram.
B(a)P-TE Benzo(a)pyrene toxic equivalents.
cPAH Carcinogenic polycyclic aromatic hydrocarbons.

/a/ Six samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 1 mg/kg.

Table 3.2c. Statistical Data Summary of Chemicals Detected in Deep Soil (> 10 feet bgs), Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Acetone	20	69	29.0	2.40E-03	30.00	3.40E-01	22.00	1.41E-02	4.18E-02	9.60E-02	9.60E-02
Antimony	1	71	1.4	4.10E-01	15.00	4.10E-01	15.00	1.20E+00	1.33E+00	3.81E+00	4.10E-01
Arsenic	61	71	85.9	4.50E-01	70.50	1.80E+00	20.50	1.01E+00	3.70E-01	1.73E+00	1.73E+00
Beryllium	9	71	12.7	1.10E-01	70.50	3.60E-01	30.00	1.00E-01	6.00E-02	2.30E-01	2.30E-01
Bis(2-ethylhexyl)phthalate	16	22	72.7	3.30E-02	15.00	4.30E-01	15.00	1.66E-01	1.76E-01	5.12E-01	4.30E-01
Cadmium	1	71	1.4	6.10E-01	60.75	6.10E-01	60.75	3.80E-01	9.00E-02	5.60E-01	5.60E-01
Carbon disulfide	2	69	2.9	5.70E-03	15.50	2.00E-02	10.50	2.88E-03	2.13E-03	7.05E-03	7.05E-03
Chromium /a/	65	71	91.6	3.10E+00	20.50	2.12E+01	15.00	8.85E+00	4.48E+00	1.76E+01	1.76E+01
Copper	38	71	53.5	9.50E-01	40.50	1.22E+01	15.00	1.62E+00	1.68E+00	4.91E+00	4.91E+00
1,1-Dichloroethane	1	69	1.5	3.00E-03	20.50	3.00E-03	20.50	2.59E-03	1.30E-04	2.85E-03	2.85E-03
1,2-Dichloroethane	1	69	1.5	3.00E-03	20.50	3.00E-03	20.50	2.59E-03	1.30E-04	2.85E-03	2.85E-03
1,2-Dichloroethene (total)	1	69	1.5	4.00E-03	20.50	4.00E-03	20.50	2.60E-03	2.10E-04	3.02E-03	3.02E-03
1,2-Dichloropropane	1	69	1.5	3.00E-03	20.50	3.00E-03	20.50	2.59E-03	1.30E-04	2.85E-03	2.85E-03
Diethylphthalate	3	22	13.6	4.40E-02	15.00	9.40E-02	30.00	1.79E-01	1.57E-01	4.88E-01	9.40E-02
Lead	56	69	81.2	3.90E-01	40.50	6.32E+01	15.00	2.08E+00	7.55E+00	1.69E+01	1.69E+01
Methyl ethyl ketone	3	69	4.4	4.80E-03	20.00	8.00E-03	15.50	5.15E-03	4.60E-04	6.05E-03	6.05E-03
Methylene chloride	5	69	7.2	2.80E-03	10.50	6.90E-03	40.75	2.30E-03	1.12E-03	4.49E-03	4.49E-03
Nickel	53	71	74.7	4.10E+00	20.50	1.72E+01	60.50	7.63E+00	3.76E+00	1.50E+01	1.50E+01
Pentachlorophenol	2	22	9.1	3.50E-02	41.00	3.60E-02	11.00	9.06E-01	7.51E-01	2.34E+00	3.60E-02
Selenium	1	69	1.5	5.70E-01	16.00	5.70E-01	16.00	3.40E-01	7.00E-02	4.70E-01	4.70E-01
Toluene	10	69	14.5	1.00E-03	40.50	3.00E-03	20.50	2.41E-03	4.90E-04	3.37E-03	3.00E-03
1,1,2-Trichloroethane	1	69	1.5	3.00E-03	20.50	3.00E-03	20.50	2.59E-03	1.30E-04	2.85E-03	2.85E-03
Xylenes	1	69	1.5	6.00E-03	20.50	6.00E-03	20.50	2.63E-03	4.30E-04	3.47E-03	3.47E-03
Zinc	57	71	80.3	3.90E+00	20.50	4.65E+01	15.00	7.86E+00	6.17E+00	2.00E+01	2.00E+01

bgs Below ground surface.
mg/kg Milligrams per kilogram.

/a/ Ten samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 0.5 mg/kg.

Table 3.3. Statistical Data Summary of Chemicals Detected in Groundwater, Site 2
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/l)	Maximum Detection Value (mg/l)	Arithmetic Mean (mg/l)	Standard Deviation of the Arithmetic Mean (mg/l)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/l)	Lesser of 95% UCL and Maximum Concentrations (mg/l)
Antimony	14	27	51.9	2.50E-03	1.01E-02	4.00E-03	3.23E-03	1.06E-02	1.01E-02
Arsenic	5	27	18.5	2.70E-03	5.30E-03	1.71E-03	1.08E-03	3.82E-03	3.82E-03
Bis(2-ethylhexyl)phthalate	3	4	75.0	2.80E-03	6.50E-03	4.00E-03	1.76E-03	7.77E-03	6.50E-03
Bromodichloromethane	1	27	3.7	1.30E-03	1.30E-03	1.27E-03	9.70E-04	3.18E-03	1.30E-03
Calcium	11	11	100.0	1.57E+01	7.56E+02	1.51E+02	2.69E+02	6.78E+02	6.78E+02
Chloride	11	11	100.0	6.46E+01	1.38E+04	2.45E+03	5.18E+03	1.26E+04	1.26E+04
Chloroform	7	27	25.9	2.90E-04	7.30E-03	1.54E-03	1.65E-03	4.78E-03	4.78E-03
Chromium	3	27	11.1	4.50E-03	8.20E-03	2.61E-03	1.69E-03	5.92E-03	5.92E-03
Copper	2	27	7.4	4.90E-03	2.11E-02	3.94E-03	4.52E-03	1.28E-02	1.28E-02
Dibromochloromethane	2	27	7.4	5.80E-04	1.40E-03	1.28E-03	9.70E-04	3.18E-03	1.40E-03
1,1-Dichloroethane	1	27	3.7	6.30E-04	6.30E-04	1.10E-03	1.10E-03	3.25E-03	6.30E-04
1,1-Dichloroethene	2	27	7.4	5.80E-03	6.20E-03	1.43E-03	1.69E-03	4.74E-03	4.74E-03
1,2-Dichloroethene (total)	15	27	55.6	3.30E-04	4.40E-02	8.60E-03	9.89E-03	2.80E-02	2.80E-02
Iron	6	10	60.0	1.56E-02	2.34E+00	2.54E-01	7.33E-01	1.69E+00	1.69E+00
Magnesium	11	11	100.0	1.28E+01	1.20E+03	2.16E+02	4.23E+02	1.05E+03	1.05E+03
Manganese	10	10	100.0	5.40E-03	5.68E-01	1.53E-01	1.93E-01	5.32E-01	5.32E-01
Mercury	3	27	11.1	3.50E-04	7.10E-04	1.50E-04	1.50E-04	4.40E-04	4.40E-04
Nickel	3	27	11.1	2.58E-02	4.11E-02	1.56E-02	8.21E-03	3.17E-02	3.17E-02
Nitrate as N	24	28	85.7	2.80E+00	6.31E+01	1.28E+01	1.53E+01	4.27E+01	4.27E+01
Orthophosphate as P	3	27	11.1	1.00E+00	1.10E+00	1.31E+00	3.15E+00	7.48E+00	1.10E+00

Table 3.3. Statistical Data Summary of Chemicals Detected in Groundwater, Site 2
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/l)	Maximum Detection Value (mg/l)	Arithmetic Mean (mg/l)	Standard Deviation of the Arithmetic Mean (mg/l)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/l)	Lesser of 95% UCL and Maximum Concentrations (mg/l)
Pentachlorophenol	1	4	25.0	2.00E-03	2.00E-03	1.93E-02	1.15E-02	4.18E-02	2.00E-03
Potassium	11	11	100.0	1.40E+00	4.70E+01	9.69E+00	1.51E+01	3.92E+01	3.92E+01
Sodium	11	11	100.0	6.10E+01	7.08E+03	1.34E+03	2.78E+03	6.78E+03	6.78E+03
Sulfate	11	11	100.0	2.42E+01	2.08E+03	3.96E+02	7.66E+02	1.90E+03	1.90E+03
Tetrachloroethene	16	27	59.3	3.60E-04	1.50E-02	3.94E-03	4.39E-03	1.26E-02	1.26E-02
Thallium	1	27	3.7	1.06E-02	1.06E-02	2.52E-03	2.84E-03	8.10E-03	8.10E-03
1,1,1-Trichloroethane	4	27	14.8	3.00E-04	7.10E-02	6.27E-03	1.64E-02	3.84E-02	3.84E-02
Trichloroethene	17	27	63.0	5.20E-04	9.30E-02	2.42E-02	2.88E-02	8.06E-02	8.06E-02
Vinyl chloride	1	27	3.7	6.00E-04	6.00E-04	2.17E-03	2.21E-03	6.51E-03	6.00E-04
Zinc	15	27	55.6	1.30E-02	3.31E-01	4.78E-02	8.24E-02	2.09E-01	2.09E-01

mg/l Milligrams per liter.

Table 3.4. Statistical Data Summary of Chemicals Detected in Groundwater, Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/l)	Maximum Detection Value (mg/l)	Arithmetic Mean (mg/l)	Standard Deviation of the Arithmetic Mean (mg/l)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/l)	Lesser of 95% UCL and Maximum Concentrations (mg/l)
Antimony	9	25	36.0	2.10E-03	1.01E-02	3.38E-03	2.31E-03	7.90E-03	7.90E-03
Calcium	10	10	100.0	1.23E+01	5.65E+01	3.11E+01	1.49E+01	6.02E+01	5.65E+01
Chloride	10	10	100.0	3.78E+01	1.34E+02	8.43E+01	3.12E+01	1.46E+02	1.34E+02
Chromium	6	25	24.0	4.80E-03	1.62E-02	3.27E-03	3.12E-03	9.39E-03	9.39E-03
Copper	4	25	16.0	5.40E-03	1.37E-02	4.82E-03	3.80E-03	1.23E-02	1.23E-02
1,2-Dichloroethane	2	26	7.7	5.20E-04	1.50E-03	1.23E-03	9.60E-04	3.12E-03	1.50E-03
1,1-Dichloroethene	3	26	11.5	3.20E-04	1.30E-03	1.10E-03	1.07E-03	3.19E-03	1.30E-03
1,2-Dichloroethene (total)	15	26	57.7	1.60E-03	5.00E-02	9.80E-03	1.33E-02	3.58E-02	3.58E-02
Iron	3	10	30.0	3.91E-02	1.38E-01	2.98E-02	4.03E-02	1.09E-01	1.09E-01
Magnesium	10	10	100.0	7.10E+00	2.95E+01	1.82E+01	7.94E+00	3.38E+01	2.95E+01
Manganese	10	10	100.0	2.80E-03	5.03E-01	7.66E-02	1.52E-01	3.74E-01	3.74E-01
Mercury	1	25	4.0	3.00E-04	3.00E-04	1.10E-04	4.00E-05	1.90E-04	1.90E-04
Methylene chloride	3	26	11.5	1.90E-03	2.90E-03	2.49E-03	1.40E-04	2.77E-03	2.77E-03
Nickel	3	25	12.0	2.55E-02	3.56E-02	1.50E-02	6.27E-03	2.73E-02	2.73E-02
Nitrate as N	26	26	100.0	2.00E+00	1.55E+01	7.09E+00	3.64E+00	1.42E+01	1.42E+01
Orthophosphate as P	7	25	28.0	2.00E-01	4.00E-01	1.50E-01	9.00E-02	3.30E-01	3.30E-01
Potassium	10	10	100.0	1.69E+00	3.68E+00	2.63E+00	6.42E-01	3.89E+00	3.68E+00
Sodium	10	10	100.0	4.27E+01	8.51E+01	6.37E+01	1.20E+01	8.72E+01	8.51E+01
Sulfate	10	10	100.0	1.95E+01	6.16E+01	4.08E+01	1.37E+01	6.76E+01	6.16E+01

Table 3.4. Statistical Data Summary of Chemicals Detected in Groundwater, Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/l)	Maximum Detection Value (mg/l)	Arithmetic Mean (mg/l)	Standard Deviation of the Arithmetic Mean (mg/l)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/l)	Lesser of 95% UCL and Maximum Concentrations (mg/l)
Tetrachloroethene	19	26	73.1	5.40E-04	3.10E-02	9.28E-03	1.01E-02	2.90E-02	2.90E-02
Toluene	2	26	7.7	1.00E-03	1.60E-03	1.11E-03	1.07E-03	3.21E-03	1.60E-03
1,1,1-Trichloroethane	9	26	34.6	3.00E-04	2.20E-03	1.21E-03	1.01E-03	3.19E-03	2.20E-03
Trichloroethene	19	26	73.1	2.80E-04	1.20E-01	1.76E-02	2.83E-02	7.31E-02	7.31E-02
Zinc	8	25	32.0	2.01E-02	9.81E-02	2.66E-02	2.54E-02	7.63E-02	7.63E-02

mg/l Milligrams per liter.

Table 3.5. Selection of COPCs for Chemicals Detected in Surface Soil (0 to 2 feet bgs), Site 2 /a/
Volume III - Baseline Risk Assessment, Basewide RI/FS
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Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Antimony	23.10	--	--	--	0.08	--	YES
Arsenic	3.70	3.4	--	--	0.02	8E-05	YES
Beryllium	0.23	0.35	--	--	--	--	NO
Cadmium	17.50	--	--	--	0.05	4E-04	YES
Chromium (total) /f/	90.80	46.1	--	--	0.0001	--	NO
Copper	1160.00	18.2	--	--	0.04	--	YES
Lead	181.00	51.8	--	240	--	--	NO
Mercury	5.30	0.12	--	--	0.03	--	YES
Nickel	31.30	58	--	--	--	--	NO
Selenium	8.40	--	--	--	0.002	--	NO
Silver	58.60	0.36	--	--	0.02	--	YES

Table 3.5. Selection of COPCs for Chemicals Detected in Surface Soil (0 to 2 feet bgs), Site 2 /a/
Volume III - Baseline Risk Assessment, Basewide RI/FS
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Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Thallium	0.60	0.45	--	--	0.01	--	YES
Zinc (total)	1550.00	75.8	0.31	--	--	--	NO

COPCs Chemicals of potential concern.
bgs Below ground surface.
mg/kg Milligrams per kilogram.
-- Not applicable or not available.
4.08E-06 4.08 x 10^-6.

/a/ See Section 3.3 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 3.1a.
/c/ Estimated daily dose (see Appendix B for explanation). This was compared to the Recommended Daily Allowance of 5 to 10 mg/day for zinc (National Research Council, 1989).
/d/ Health based screening level for a child receptor (Harding Lawson Associates, Draft Technical Memorandum, Preliminar Remediation Goals, Fort Ord, California, June 14, 1993).
/e/ See Table C1, Appendix C for development of screening values.
/f/ Evaluated as chromium III. Chromium VI was not detected.

Table 3.6. Selection of COPCs for Chemical Detected in Surface Soil (0 to 2 feet bgs), Site 12 /a/
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Acetone	0.016	--	--	--	<0.000001	--	NO
Antimony	8.70	--	--	--	0.03	--	YES
Arsenic	6.80	3.4	--	--	0.03	2E-04	YES
B(a)P-TE	0.0458	--	--	--	--	3E-07	YES
Beryllium	0.36	0.35	--	--	0.0001	6E-06	YES
Bis(2-ethylhexyl)phthalate	9.9	--	--	--	0.0007	8E-08	YES
Cadmium	18.60	--	--	--	0.05	4E-04	YES
Chromium (total) /f/	184.00	46.1	--	--	0.0003	--	NO
Copper	125.00	18.2	--	--	0.005	--	NO
4,4'-DDT	0.015	--	--	--	0.00004	3E-09	NO
Di-n-butylphthalate	0.11	--	--	--	0.000002	--	NO
Diethylphthalate	0.041	--	--	--	<0.000001	--	NO
Lead	1140.00	51.8	--	240	--	--	YES
Mercury	0.56	0.12	--	--	0.003	--	NO
Nickel	17.00	58	--	--	- -	--	NO
Pyrene	0.95	--	--	--	0.00005	--	NO
Selenium	0.77	--	--	--	0.0002	--	NO
Tetrachloroethene	0.29	--	--	--	0.00004	9E-09	NO
Toluene	0.0021	--	--	--	<0.000001	--	NO
Total cPAH	1.25	--	--	--	0.000006	--	YES /g/

Table 3.6. Selection of COPCs for Chemical Detected in Surface Soil (0 to 2 feet bgs), Site 12 /a/
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Trichloroethene	0.0024	--	--	--	<0.000001	2E-11	NO
Zinc (total)	499.00	75.8	0.10	--	--	--	NO

COPCs Chemicals of potential concern.
bgs Below ground surface.
mg/kg Milligrams per kilogram.
-- Not applicable or not available.
7.49E-06 7.49 x 10^-6.
B(a)P-TE Benzo(a)pyrene toxic equivalents.
cPAH Carcinogenic polycyclic aromatic hydrocarbons.

/a/ See Section 3.3 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information provided in this table for that chemical.
/b/ From: Table 3.2a.
/c/ Estimated daily dose (see Appendix B for explanation). This was compared to the Recommended Daily Allowance of 5 to 10 mg/day for zinc (National Research Council, 1989).
/d/ Health Based Screening Level for a child receptor (Harding Lawson Associates, Draft Technical Memorandum, Preliminary Remediation Goals, Fort Ord, California, June 14, 1993).
/e/ See Table C2 of Appendix C for development of screening values.
/f/ Evaluated as chromium III. Chromium VI was not detected.
/g/ BaP-TE was selected as a COPC for the evaluation of the potential carcinogenic effects of carcinogenic PAH. Total cPAH used to evaluate the potential noncarcinogenic effects of these compounds.

Table 3.7. Selection of COPCs for Chemicals Detected in Groundwater, Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/l)	Essential Nutrient EDD /c/ (mg/day)	Screening Results /d/ Hazard Quotient	Screening Results /d/ Cancer Risk	COPC (Yes/No)
Antimony	0.0101	--	0.7	--	YES
Calcium	56.51	56.5	--	--	NO
Chloride	134	--	--	--	NO
Chromium (total) /e/	0.0162	--	0.0005	--	NO
Copper	0.0137	--	0.01	--	YES
1,1-Dichloroethene	0.0013	--	0.004	9.55E-06	YES
1,2-Dichloroethane	0.0015	--	--	1.67E-06	YES
1,2-Dichloroethene (total)	0.05	--	0.2	--	YES
Iron	0.138	0.14	--	--	NO
Magnesium	29.5	29.5	--	--	NO
Manganese	0.503	--	0.1	--	YES
Mercury	0.0003	--	0.03	--	YES
Methylene chloride	0.0029	--	0.001	4.97E-07	YES
Nickel	0.0356	--	0.05	--	YES
Nitrate as N	15.5	--	0.3	--	YES
Potassium	3.68	--	--	--	NO
Sodium	85.1	--	--	--	NO
Sulfate	61.6	--	--	--	NO

Table 3.7. Selection of COPCs for Chemicals Detected in Groundwater, Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/l)	Essential Nutrient EDD /c/ (mg/day)	Screening Results /d/ Hazard Quotient	Screening Results /d/ Cancer Risk	COPC (Yes/No)
Tetrachloroethene	0.031	--	0.09	1.94E-05	YES
Toluene	0.0016	--	0.0002	--	NO
1,1,1-Trichloroethane	0.0022	--	0.0007	--	NO
Trichloroethene	0.12	--	--	2.20E-05	YES
Zinc	0.0981	0.10	--	--	NO

COPCs Chemicals of potential concern.
mg/kg Milligrams per kilogram.
-- Not applicable or not available.
9.55E-06 9.55 x 10^-6.
N Nitrogen.

/a/ See Section 3.3 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 3.4.
/c/ Estimated daily dose (see Appendix B for explanation). EDD was compared to the Recommended Daily Allowance (RDA) of 400 to 800 mg/day for calcium, an RDA of 6 to 10 mg/day for iron, and an RDA of 5 to 10 mg/day for zinc (National Research Council, 1989).
/d/ See Table C3, Appendix C for development of screening values.
/e/ Evaluated as chromium III. Chromium VI was not detected.

Table 3.8. Site-Specific Intake Assumptions, Sites 2 and 12 /a/
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Site Scenario Receptor	Intake Assumptions Exposure Time ET (hours/day)	Fraction of Intake FI (unitless)	Exposure Frequency EF (days/year)	Exposure Duration ED (years)
Site 2				
Average Scenario				
Commercial Worker	8	0.5	250	10
RME Scenario				
Commercial Worker	8	1	250	25
Site 12				
Average Scenario				
Resident (0 - 6 years)	20	0.75	350	6
Resident (6 - 9 years)	20	0.75	350	3
RME Scenario				
Resident (0 - 6 years)	24	1	350	6
Resident (6 - 18 years)	24	1	350	12
Resident (18 - 30 years)	24	1	350	12

RME Reasonable maximum exposure.

/a/ See Section 3.4.3 for explanation.

Table 3.9. Exposure Point Concentrations (EPCs) for Soil and Air, Site 2
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

	Average Exposure Scenario		RME Scenario	
Chemicals of Potential Concern	Soil Concentration /a/ (mg/kg)	Air Concentration /b/ (mg/m³)	Soil Concentration /c/ (mg/kg)	Air Concentration /b/ (mg/m³)
Surface Soil (0 to 2 feet bgs)				
Antimony	3.56E+00	4.09E-08	1.92E+01	2.20E-07
Arsenic	2.30E+00	2.65E-08	3.70E+00	4.26E-08
Cadmium	2.61E+00	3.00E-08	1.44E+01	1.66E-07
Copper	1.56E+02	1.80E-06	9.53E+02	1.10E-05
Mercury	1.07E+00	1.23E-08	4.53E+00	5.21E-08
Silver	8.90E+00	1.02E-07	4.87E+01	5.60E-07
Thallium	2.60E-01	2.99E-09	5.30E-01	6.10E-09

RME Reasonable maximum exposure.
mg/kg Milligrams per kilogram.
mg/m^3 Milligrams per cubic meter.
bgs Below ground surface.
8.75E+00 8.75 x 10^0.
PM10 Particles with a diameter less than or equal to 10 microns.

/a/ Arithmetic mean.
/b/ Air concentration (mg/m^3) = soil concentration (mg/kg) x site-specific PM10 (1.15E-2 mg/m^3) x conversion factor (1E-6 kg/mg).
/c/ Lesser of the maximum concentration and 95 percent upper confidence limit of the arithmetic mean.

Table 3.11. Exposure Point Concentrations (EPCs) for Groundwater, Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals of Potential Concern	Average Scenario Groundwater Concentration /a/ (mg/l)	RME Scenario Groundwater Concentration /b/ (mg/l)
Antimony	3.38E-03	7.90E-03
Copper	4.32E-03	1.23E-02
1,1-Dichloroethene	1.10E-03	1.30E-03
1,2-Dichloroethane	1.23E-03	1.50E-03
1,2-Dichloroethene (total)	9.80E-03	3.58E-02
Manganese	7.66E-02	3.40E+00
Mercury	1.10E-04	1.90E-04
Methylene chloride	2.49E-03	2.77E-03
Nickel	1.50E-02	2.73E-02
Nitrate as N	7.09E-03	1.42E-02
Tetrachloroethene	9.28E-03	2.90E-02
Trichloroethene	1.76E-02	7.31E-02

RME Reasonable maximum exposure.
mg/l Milligrams per liter.
3.38E-03 3.38 x 10^-3.
N Nitrogen.

/a/ Arithmetic mean.
/b/ Lesser of the maximum concentration and 95 percent upper confidence limit of the arithmetic mean.

Table 3.12. Total Hazard Index for the Commercial Worker Receptor, Site 2 /a/
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario Receptor	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Total HI
Average Exposure Scenario				
Commercial Worker	0.01	0.001	0.00003	0.01
RME Scenario				
Commercial Worker	0.07	0.03	0.00021	0.1

HI Hazard index.
RME Reasonable maximum exposure.

/a/ Chemical specific risks are presented in Tables E1 and E2 in Appendix E.

Table 3.13. Total Hazard Index for the Resident Receptor, Site 12 /a/
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario Receptor	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Ingestion of Groundwater	Total HI
Average Exposure Scenario					
Resident (0 - 6 years)	0.03	0.003	0.0003	0.3	0.4
Resident (6 - 9 years)	0.02	0.002	0.0002	0.2	0.3
RME Scenario					
Resident (0 - 6 years)	0.7	0.04	0.001	1.2	1.9
Resident (6 - 18 years)	0.1	0.02	0.0006	0.6	0.7
Resident (18 - 30 years)	0.07	0.02	0.0002	1.2	1.3

HI Hazard index.
RME Reasonable maximum exposure.

/a/ Chemical specific risks are presented in Tables E3 through E7 in Appendix E.

Table 3.14. Total Cancer Risks for the Commercial Worker Receptor, Site 2 /a/
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario Receptor	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Total Risk
Average Exposure Scenario				
Commercial Worker	1.40E-07	3.56E-08	7.86E-09	2E-07
RME Scenario				
Commercial Worker	1.13E-06	1.28E-06	1.09E-07	3E-06

RME Reasonable maximum exposure.
1.34E-07 1.34 x 10^-7.

/a/ Chemical specific risks are presented in Tables E1 and E2 in Appendix E.

Table 3.15. Total Cancer Risks for the Resident Receptor, Site 12 /a/
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario / Receptor	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Ingestion of Groundwater	Total Risk
Average Exposure Scenario					
Resident (0 - 6 years)	9.93E-07	1.71E-07	9.41E-08	2.72E-06	4E-06
Resident (6 - 9 years)	2.87E-07	5.68E-08	3.42E-08	9.82E-07	1E-06
Total	1.28E-06	2.28E-07	1.28E-07	3.70E-06	5E-06
RME Scenario					
Resident (0 - 6 years)	1.21E-05	1.81E-06	4.42E-07	8.30E-06	2E-05
Resident (6 - 18 years)	1.95E-06	4.10E-06	4.47E-07	8.38E-06	1E-05
Resident (18 - 30 years)	2.44E-06	1.45E-06	1.78E-07	1.66E-05	2E-05
Total	1.65E-05	7.36E-06	1.07E-06	3.33E-05	6E-05

RME Reasonable maximum exposure.
7.62E-07 7.62 x 10^-7.

/a/ Chemical specific risks are presented in Tables E3 through E7 in Appendix E.

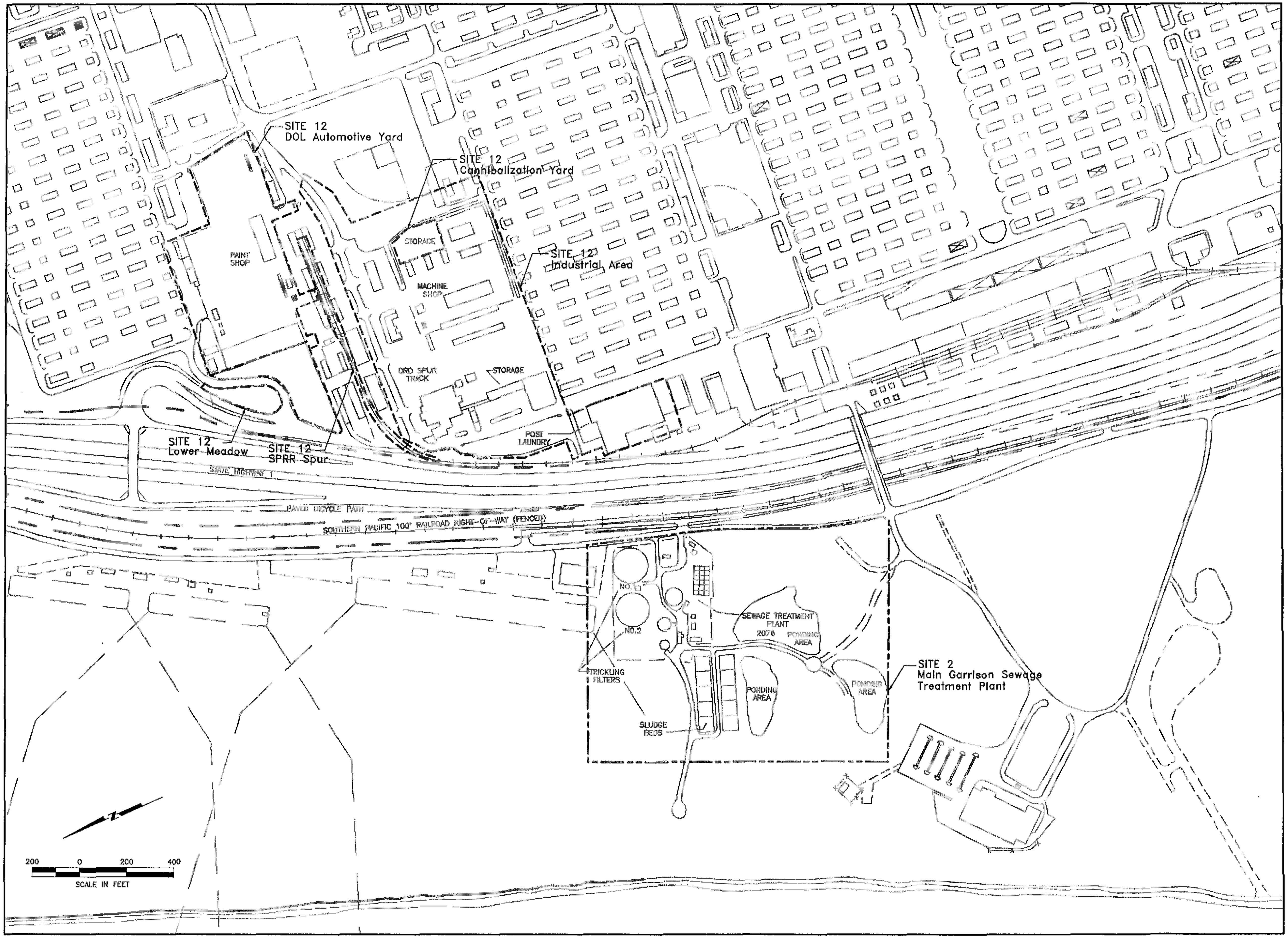
Table 3.16. Summary of Model Predicted Blood-Lead Levels from Multipathway Exposures
Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Model Application, Name Site, Receptor	Blood-Lead Level (µg/dl) Average	RME
Child Receptors, LEAD6 UBK Model /a,b/		
Site 12, Child Resident (0 - 6 years)	3.15	7.29

	Blood-Lead Level (µg/dl) Average		RME	
	95th Percentile	99th Percentile	95th Percentile	99th Percentile
Child and Adult Receptors, LEADSPREAD Model /b,c/				
Site 12, Child and Adult Resident /d/	3.50	4.46	5.99	7.64

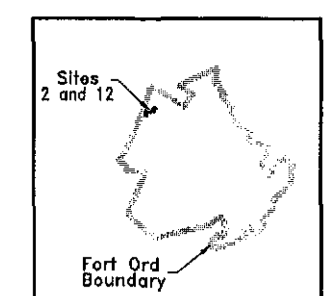
µg/dl Micrograms lead per deciliter blood.
RME Reasonable maximum exposure.
UBK Uptake/Biokinetic.

/a/ Value represents the highest blood-lead level estimated in the child receptor 0 to 6 years of age. Age-specific blood-lead level estimates from the LEAD6 Model are presented in Tables F1 and F2 in Appendix F.
/b/ Site-related lead-in-air concentrations were well below ambient background levels. Therefore estimated blood-lead levels in this table are based almost exclusively on exposure to background levels of lead. Target blood-lead level is 10 µg/dl (EPA, 1990b; Cal/EPA, 1992f); blood-lead levels below this level are not expected to result in adverse health effects.
/c/ These LEADSPREAD Model results are presented in Tables F3 through F4 in Appendix F.
/d/ Predicted blood-lead levels for child resident, ages 6 to 9 years, child resident, ages 6 to18 years; and adult resident ages 18 to 30 years.



EXPLANATION

SITE BOUNDARY
AREA BOUNDARY
FENCE
BUILDING



KEY MAP

NO.	DATE	REVISIONS	HLA FILE NO.	PROJECT NO.	APPROVED	APPROVAL DATE	DRAWN BY
1	7/94	DRAFT	23366264	23366 04161			MEK
2	12/94	DRAFT FINAL	23366264	23366 041723	MEC	11/22/94	MEK

Harding Lawson Associates
Engineering and Environmental Services

Volume III - Baseline Risk Assessment
Basewide RI/FS
Fort Ord, California

Site Plan
Sites 2 and 12

PLATE: 3.1

4.0 BASELINE RISK ASSESSMENT FOR SITES 16 AND 17

The BRA for Sites 16 and 17 is presented in this section. Sites 16 and 17 comprise one RI site, including the DOL Maintenance Yard, Pete's Pond, Pete's Pond Extension, and the Site 17 Disposal Area study areas. This BRA follows the methodology presented in Section 2.0. Any deviations from the methods presented in Section 2.0 are specifically identified in the sections that follow.

4.1 Site Background

This section summarizes background information on the physical setting including geology and hydrogeology, on past and potential future land uses, and on the human populations near Sites 16 and 17. The site background is discussed in greater detail in the RI (Volume II), Sites 16 and 17, Section 1.0.

4.1.1 Physical Setting

Sites 16 and 17 are located in the former Main Garrison in the northwest portion of Fort Ord (Plate 1.1). Site 16 includes three discrete study areas identified in the RI: the DOL Maintenance Yard, Pete's Pond, and Pete's Pond Extension. Site 17 includes the 1400 Block Motor Pool complex, a baseball field, and an area along the east side of Fourth Avenue with several buildings. For this assessment, two study areas have been differentiated at Site 17: the Site 17 Disposal Area and Site 17 Other Areas. The Site 17 Disposal Area is located within the 1400 Block Motor Pool complex. The Site 17 Other Areas refers to all areas outside the Site 17 Disposal Area, as described in Volume II RI, Site 16 and 17, Section 1.1.2. Each of these areas within Sites 16 and 17 is shown on Plate 4.1. A description of the physical setting of each area follows.

DOL Maintenance Yard

The DOL Maintenance Yard occupies an area of approximately 4.5 acres on Eighth Street near the Fifth Avenue Cut-off on the Main Garrison. The northern portion (approximately half of the DOL Maintenance Yard) is paved; the southern portion is unpaved. The area is surrounded by a chain-link fence and is not easily accessible except through gates. Surface runoff from the unpaved area drains to the southeast onto the adjacent Pete's Pond Extension area.

Pete's Pond

Pete's Pond is a 3.3 acre triangular depression between Eighth Street, Fifth Avenue, and the Fifth Avenue Cut-off. The area is bordered on all sides by roadways and is vegetated with low-lying brush and grasses. Six storm drains discharge to Pete's Pond, as described in the *Draft Basewide Surface Water Outfall Investigation*, April 5, 1993. Runoff is received from sites 15, 16 and 17, as well as from other areas to the south and east of Pete's Pond (including Site 23, and housing areas on the Main Garrison). Although the depression is dry most of the year, it floods to depths of up to 5 feet during periods of heavy rainfall.

Pete's Pond Extension

Pete's Pond Extension is adjacent to and east of the Fifth Avenue Cut-off, between Pete's Pond and the DOL Maintenance Yard. The area of approximately 3.5 acres includes a vegetated hillside on the northeast and a relatively flat vegetated area on the southwest. The vegetation includes low-lying brush and trees. There are no buildings.

Site 17 Disposal Area and Other Areas

Site 17 is an area of approximately 56 acres in the Main Garrison west of Site 16 and consists of paved areas, buildings used for motor vehicle maintenance, several wash racks, and a baseball field. The area referred to as the Site 17 Disposal Area extends from the paved area of the motor pool complex along Fifth Avenue to the east of the baseball field. This disposal area covers approximately 8 acres and is mostly paved. The

For future land use planning, Site 17 has been designated as part of polygon 16, an area of approximately 500 acres that includes Sites 14, 15, part of 16, 17, 18, 23, 24, and 38 (*FORG, 1994; COE, 1994*). This area, proposed by California State University (CSU) as the site for its new Monterey Bay campus, includes mostly the developed lands of the former Main Garrison. Existing structures will be used for faculty and student housing, lecture/laboratory spaces, and university administrative offices. In addition, the CSU parcel will provide sites for new facilities, including additional residence halls, a permanent library building, and a science center, to eventually accommodate a 25,000 full-time-equivalent campus. Future land use for the Site 17 area includes removing pavement, installing decorative landscaping, and converting some existing buildings and/or possibly constructing new buildings for use as warehouses and artist studios.

4.1.3 Nearby Populations

U.S. Army personnel may be found at Sites 16 and 17 part time, but neither these sites nor adjacent areas are heavily used. The nearest resident populations currently are in the city of Marina, approximately 3 miles north of the site. No onsite residences are currently near the site, although many former army housing units are approximately 0.5 mile southeast, in the Main Garrison area of Fort Ord. In the future, people who may be present on or near Sites 16 and 17 include those expected to be associated with the California State University and nearby commercial workers.

4.2 Data Evaluation

HLA sampled soil and groundwater between January 1992 and March 1994 at Sites 16 and 17 as part of the RI site characterization. Additional surface soil samples were collected at Site 16 in May 1994 for the Basewide Ecological Risk Assessment (ERA). Previous investigations conducted in these areas for purposes other than the RI are discussed in Volume II, Sites 16 and 17, Section 1.3. Soil samples were collected from the five geographic areas shown in Plate 4.1: the DOL Maintenance Yard, Pete's Pond, Pete's Pond Extension, Site 17 Disposal Area, and Site 17 Other Areas. Groundwater samples were collected from three monitoring wells: MW-16-01-A in the northwest corner of Pete's Pond, and MW-17-01-A and MW-17-02-180 in the southern portion of Site 17. A detailed description of the sampling activities, including the complete analytical program for each area, is presented in Volume II, Sites 16 and 17, Section 2.0.

The methods used to evaluate analytical data and the dataset considered for this BRA are discussed in Section 2.1.1.5 and briefly summarized here. Soil data were segregated by the following depths for each area: surface soil data (0 to 2 feet bgs), subsurface soil data (greater than 2 to 10 feet bgs), subsurface soil data (0 to 10 feet bgs), and deep soil data (greater than 10 feet bgs). Summaries of statistical data for chemicals detected in soil at all areas are presented in Tables 4.1a through 4.5 and for chemicals detected in groundwater in Tables 4.6 and 4.7. Chlorinated dibenzodioxins (CDDs) and chlorodibenzofurans (CDFs) are reported on these statistical summary tables as TCDD-TE, and carcinogenic PAH are reported as total cPAH, as described in Section 2.2.7. For each detected chemical, the tables show the frequency of detection, minimum and maximum detected concentrations, arithmetic mean concentration, standard deviation of the arithmetic mean concentration, and 95 percent upper confidence limit of the arithmetic mean concentration. A brief summary of the analytical program and chemicals detected in soil and groundwater in each area is presented below. The subset of available data used in this BRA is also identified.

Forty-seven samples collected at Site 16 and 48 samples collected at Site 17 were analyzed for Cr VI; none was detected. Detected concentrations of total chromium at Sites 16 and 17 are therefore assumed to represent Cr III.

4.2.1 DOL Maintenance Yard

Soil samples were collected from 15 soil borings and 12 test pits at the DOL Maintenance Yard as part of the RI. One to three samples from each boring or test pit were collected, for a total of 57 soil samples, at depths of 2.5 to 20.5 feet bgs. No surface soil samples were collected as part of (total), copper, lead, mercury, nickel, and zinc.

Summaries of statistical data for chemicals detected in soil at Pete's Pond are presented in Tables 4.2a through 4.2d for surface, subsurface, and deep soils.

TIC data were available for samples analyzed by EPA Test Method's 8240 and 8270. All TICs identified in the Pete's Pond dataset were "unknown compounds." Therefore, TIC data could not be evaluated further in this BRA.

4.2.3 Pete's Pond Extension

Soil samples were collected from 5 soil borings and 22 test pits at Pete's Pond Extension. One to three samples were collected from each boring or test pit, for a total of 45 soil samples, at depths of 0.5 to 42.25 feet bgs. Forty-two samples were analyzed for VOCs, 16 for SOCs, 39 for priority pollutant metals including hexavalent chromium, and 6 for CDDs and CDFs. As part of the Basewide ERA, three surface soil samples were collected and analyzed for pesticides/PCBs, SOCs, CDD, CDFs, and priority pollutant metals. The following chemicals were detected at Pete's Pond Extension:

- Surface soil (0 to 2 feet bgs): benzo(g,h,i)perylene, bis(2-ethylhexyl)phthalate, chlordane, 4,4'-DDD, 4,4'-DDT, TCDD-TE, trichloroethene, antimony, arsenic, beryllium, cadmium, chromium (total), copper, lead, mercury, nickel, silver, and zinc

- Subsurface soil (2 to 10 feet bgs): tetrachloroethene, toluene, trichloroethene, bis(2-ethylhexyl)phthalate, pentachlorophenol, TCDD-TE, antimony, arsenic, beryllium, cadmium, chromium (total), copper, lead, nickel, and zinc

- Subsurface soil (0 to 10 feet bgs): benzo(g,h,i)perylene, bis(2-ethylhexyl)phthalate, chlordane, 4,4'-DDD, 4,4'-DDT, pentachlorophenol, TCDD-TE, tetrachloroethene, toluene, trichloroethene, antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc

- Deep soil (greater than 10 feet bgs): acetone, tetrachloroethene, toluene, trichloroethene, bis(2-ethylhexyl)phthalate, pentachlorophenol, antimony, arsenic, beryllium, cadmium, chromium (total), copper, lead, mercury, nickel, thallium, and zinc.

Summaries of statistical data for chemicals detected in soil at Pete's Pond Extension are presented in Tables 4.3a through 4.3d for surface, subsurface, and deep soils. It should be noted that one sample, TR-16-28, was assigned a depth of 15.5 feet bgs; the actual depth for this sample is 5.5 feet bgs. Data for this sample were reviewed to determine if results of the BRA would be impacted by this error. Because results of the BRA are not impacted by the exclusion of data for sample TR-16-28 from the surface soil dataset, no changes were made to the BRA dataset.

TIC data were available for samples analyzed by EPA Test Methods 8240 and 8270. Five compounds were identified as TICs in the Pete's Pond Extension dataset, in addition to several "unknown compounds." A review of data for this area indicated that the TICs identified in the dataset were either hydrocarbon-related or naturally occurring compounds. Therefore, TIC data were not evaluated further in this BRA.

4.2.4 Site 17 Disposal Area

Soil samples were collected from 10 soil borings and 17 test pits at the Site 17 Disposal Area. One to three samples were collected from each boring or test pit, for a total of 60 soil samples, at depths of 1.0 to 31.25 feet bgs. Fifty-six samples were analyzed for VOCs and priority pollutant metals, 44 including hexavalent chromium. Thirty-four samples were analyzed for SOCs, 18 for PCBs, and 13 for CDDs and CDFs. The following chemicals were detected at the Site 17 Disposal Area:

- Surface soil (0 to 2 feet bgs): acetone, TCDD-TE, antimony, arsenic, beryllium, chromium

August/September and December 1993; and February 1994. No groundwater samples were collected between June 1992 and September 1993. Data collected after September 1993 were considered to be more representative of current groundwater conditions than samples collected prior to June 1992 and were therefore included in this BRA.

The seven samples evaluated were analyzed for priority pollutant metals, halogenated VOCs (EPA Method 8010), aromatic VOCs (EPA Method 8020), and SOCs. Chemicals detected in the A-aquifer include tetrachloroethene, toluene, trichloroethene, antimony, zinc, and sodium. Chemicals detected in the Upper 180-aquifer include carbon tetrachloride, tetrachloroethene, toluene, and trichloroethene. The summaries of statistical data for the chemicals detected in groundwater are presented in Tables 4.6 and 4.7 for the A-aquifer and the Upper 180-foot aquifer.

4.3 Selection of Chemicals of Potential Concern (COPCs)

This section describes the selection of COPCs in soil and groundwater at Sites 16 and 17. COPCs in soil were selected separately for each area evaluated in the BRA, as defined in Section 4.2: the DOL Maintenance Yard, Pete's Pond, Pete's Pond Extension, and Site 17 Disposal Area. Data for surface soil samples (0 to 2 feet bgs) and subsurface soil samples (0 to 10 feet bgs) were considered separately in this BRA; therefore, COPCs were identified for each of these depth intervals in areas where potential receptors were assumed to contact surface and/or subsurface soil.

COPCs in groundwater were selected separately for the A-aquifer and the Upper 180-foot aquifer. Chemicals detected in soil and groundwater in each area were evaluated using the COPC selection criteria described in Section 2.1.2. For comparison of detected soil concentrations to site-specific background concentrations, Fort Ord NQTP soil background concentrations were used, as described in Section 2.1.2.1. Results of the COPC selection for Sites 16 and 17 are presented below.

4.3.1 DOL Maintenance Yard

The COPC selection for the DOL Maintenance Yard is summarized in Tables 4.8a and 4.8b for surface and subsurface (0 to 10 feet bgs) soil. Separate discussions for surface and subsurface soil follow.

4.3.1.1 Surface Soil

Eleven chemicals were detected in surface soil at the DOL Maintenance Yard. The first step of COPC selection, the elimination of metals for which the maximum detected concentration is less than the background concentration, eliminated chromium and nickel. In the next step, lead was eliminated as a COPC because its maximum concentration is less than the HBSL of 240 mg/kg.

The eight chemicals not eliminated in previous steps were evaluated using a toxicity screen, as described in Section 2.1.2.2 and Appendix C. Results of the toxicity screen are presented in Table C4 in Appendix C. Chemicals with a screening cancer risk less than 1×10^{-8} or a screening HQ less than 0.01 were eliminated as COPCs. This step eliminated five chemicals: antimony, B(a)P-TE, copper, mercury, and total cPAH. The screening cancer risks for arsenic, cadmium, and TCDD-TE exceed 1×10^{-8}; the screening HQ for arsenic exceeds 0.01. These three chemicals are therefore retained as COPCs.

4.3.1.2 Subsurface Soil

Twenty-two chemicals were detected in subsurface soil (0 to 10 feet bgs) at the DOL Maintenance Yard. The first step in the COPC selection was to eliminate metals for which the maximum detected concentration is less than the background concentration. Fort Ord background concentrations are available for two depth strata: 0 to 2 feet bgs and greater than 2 feet bgs. To conduct the COPC selection process, the maximum detected concentration in each depth strata was compared to the appropriate background concentration to identify any exceedances of background. This step eliminated beryllium, chromium, nickel, and zinc as COPCs. Because this step eliminated zinc (the only essential nutrient at the DOL Yard), an remaining chemicals: arsenic, beryllium, cadmium, chlordane, and TCDD-TE. The screening cancer risk for each of these chemicals exceeds 1 x 10^{-6}; the screening HQs for arsenic and cadmium exceed 0.01. These five chemicals are therefore retained as COPCs.

Two Group A carcinogens were detected in subsurface soils at Pete's Pond: arsenic and nickel. Nickel was eliminated as a COPC because the maximum detected concentration is less than the background concentration. Arsenic was retained as a COPC, as described above. One chemical, lead, is identified as both a developmental toxicant and reproductive toxicant by California Proposition 65. Lead was eliminated as a COPC because its maximum detected concentration is less than the HBSL of 240 mg/kg.

4.3.3 Pete's Pond Extension

The COPC selection for Pete's Pond Extension is summarized in Tables 4.10a and 4.10b for surface and subsurface (0 to 10 feet bgs) soils. Separate discussions for surface and subsurface soil follow.

4.3.3.1 Surface Soil

Eighteen chemicals were detected in surface soil at Pete's Pond Extension. The first step in the COPC selection was to eliminate metals for which the maximum detected concentration is less than the background concentration. This step eliminated beryllium, chromium, and nickel as COPCs. In the next step, evaluation of essential nutrients, zinc was eliminated because the calculated EDD of 0.21 mg/day is well below the RDA of 5 to 10 mg/day (see Appendix B). In the third step, lead was retained as a COPC because its maximum concentration exceeds the HBSL of 240 mg/kg.

The thirteen chemicals not eliminated or retained in previous steps were evaluated using a toxicity screen. Results of the toxicity screen are presented in Table C6 in Appendix C. Chemicals with a screening cancer risk less than 1 x 10^{-6} or a screening HQ less than 0.01 were eliminated as COPCs. This step eliminated all but seven of the remaining chemicals: antimony, arsenic, cadmium, chlordane, copper, 4,4'-DDT, and TCDD-TE. The screening cancer risks for arsenic, cadmium, chlordane, 4,4'-DDT, and TCDD-TE exceed 1 x 10^{-6}; the screening HQs for antimony, arsenic, and copper, exceed 0.01. These seven chemicals, and lead, are therefore retained as COPCs.

Two Group A carcinogens were detected in surface soils at Pete's Pond Extension: arsenic and nickel. Arsenic was retained as a COPC, as described above. Nickel was eliminated as a COPC because the maximum detected concentration is less than the background concentration. Mercury and lead are identified by California Proposition 65 as developmental toxicants; lead is also identified as a reproductive toxicant. Lead was retained as a COPC because the maximum detected concentration exceeded the HBSL of 240 mg/kg. Mercury was eliminated as a COPC because the screening HQ is less than 0.01.

4.3.3.2 Subsurface Soil

Twenty-one chemicals were detected in subsurface soil (0 to 10 feet bgs) at Pete's Pond Extension. The first step in the COPC selection was to eliminate metals for which the maximum detected concentration is less than the background concentration. The maximum detected concentration in each depth strata was compared to the appropriate background concentration to identify any exceedances of background, as described in Section 4.3.1.2. This step eliminated beryllium as a COPC. In the next step, evaluation of essential nutrients, zinc was eliminated because the calculated EDD of 0.21 mg/day is well below the RDA of 5 to 10 mg/day (see Appendix B). In the third step, lead was retained as a COPC because its maximum concentration exceeds the HBSL of 240 mg/kg.

The nineteen chemicals not eliminated or retained in previous steps were evaluated using a toxicity screen. Results of the toxicity screen are presented in Table C6 in Appendix C. Chemicals with a screening cancer risk less than 1 x 10^{-6} or a screening HQ less than 0.01 were eliminated as COPCs. This step eliminated all but eight of the remaining chemicals: antimony, arsenic, cadmium, chlordane, copper, 4,4'-DDT, nickel,

4.3.5 Groundwater

Five chemicals were detected in groundwater in the A-aquifer (Table 4.12). The first step of the groundwater COPC selection process, evaluation of essential nutrients, eliminated zinc as a COPC. The calculated EDD for zinc is 0.040 mg/day, which is well below the RDA of 5 to 10 mg/day (Appendix B). The four remaining chemicals, tetrachloroethene, toluene, trichloroethene, and antimony, were evaluated using a toxicity screen as described in Section 2.1.2.2 and presented in Table C8 in Appendix C. Because the screening HQ exceeds 0.01, antimony was retained as a COPC in groundwater for the A-aquifer. The screening cancer risk for tetrachloroethene and trichloroethene exceed the 1×10^{-8} screening criteria; these chemicals were therefore retained as COPCs. The three COPCs evaluated for groundwater in the A-aquifer are antimony, tetrachloroethene, and trichloroethene.

Four chemicals were detected in groundwater in the Upper 180-foot aquifer (Table 4.13). None of the chemicals detected in this aquifer are essential nutrients; therefore no chemicals were eliminated on this basis. The four chemicals detected in the Upper 180-foot aquifer were evaluated using a toxicity screen, as described in Section 2.1.2.2 and Table C8 in Appendix C. Because the screening HQ exceeds 0.01 and the screening cancer risk exceeds 1×10^{-8} for carbon tetrachloride, this chemical was retained as a COPC. Tetrachloroethene and trichloroethene were retained as COPCs because the screening cancer risk exceeds 1×10^{-8}. The three COPCs evaluated for groundwater in the Upper 180-foot aquifer are carbon tetrachloride, tetrachloroethene, and trichloroethene.

4.4 Exposure Assessment

The methods used to identify potential exposure scenarios for the sites evaluated in this BRA were described in Section 2.2. This section discusses the nature and degree of potential exposure to the COPCs that may occur at Sites 16 and 17. Section 4.4.1 presents an assessment of the potential chemical sources and potential chemical migration pathways for the COPCs. Section 4.4.2 discusses the potential hypothetical receptors and pathways, and identifies the receptors and pathways selected for quantitative evaluation. Section 4.4.3 describes the exposure scenarios for estimating potential exposures and risks. Section 4.4.4 presents the exposure point concentrations. Section 4.4.5 addresses the methods used to estimate exposure (dose) for all receptors assumed to be exposed to COPCs.

As described in Section 4.1.2, buried debris has been observed in Pete's Pond, Pete's Pond Extension, and the Site 17 Disposal Area. Medical wastes observed in the Site 17 Disposal Area and Pete's Pond Extension, and rusted ordnance observed in Pete's Pond Extension, may present physical hazards. Potential exposure to this buried debris and possible hazards associated with exposure are not evaluated in the BRA.

4.4.1 Chemical Source and Migration Analysis

Section 3.0 of the Introduction to the RI (Volume II) discusses chemical fate and transport for chemicals detected at the five RI sites. Section 3.0 of the Introduction to the RI also includes a table of physical and chemical properties pertaining to environmental fate and transport of these chemicals and a discussion of potential chemical migration pathways. Section 5.0 of the Sites 16 and 17 RI (Volume II) presents a site-specific discussion of chemical fate and transport and identifies potential chemical migration pathways at Sites 16 and 17; the potential migration pathways discussed in that section are addressed below.

The following potential source areas (i.e., retention media) at Sites 16 and 17 were identified:

- Soil at Pete's Pond, as a result of historical dumping of refuse and as a result of surface water outfalls releasing runoff and sediments from surrounding areas (as described in Section 4.1.1)
- Soils at Pete's Pond Extension, as a result of historic dumping of refuse
- Soils at the Site 17 Disposal Area, as a result of historic dumping of refuse

chemical concentration, soil type, pH (for metals), and other site-specific conditions. For example, metals in soil with a low pH (i.e., acidic) generally have a tendency to leach downward through the soil column. The soil pH measured at Site 16 and 17 ranges from 4.4 to 6.6, with an average pH of approximately 5.8, indicating that there is little potential for metals to leach to groundwater. The CDDs and CDFs and the COPC metals detected at the site are expected to sorb strongly to soil particles. In addition, the depth to groundwater at Sites 16 and 17 ranges from approximately 117 to 170 feet bgs, as discussed in Section 4.1.1.2. For these reasons, chemical migration of the COPCs to groundwater at this site is considered unlikely and was not quantitatively evaluated in this BRA. The results of soil leaching modeling conducted for Sites 16 and 17 are discussed in Volume II, Sites 16 and 17 Remedial Investigation, Section 4.6.

4.4.1.5 Summary of Chemical Source and Migration Analysis

To summarize, the emission of fugitive dust was considered the only likely chemical migration pathway and was therefore quantitatively evaluated in the risk assessment for Sites 16 and 17.

4.4.2 Potential Receptors and Exposure Pathways

This section identifies the hypothetical receptors who might be exposed to COPCs at each of the areas at Sites 16 and 17 and defines the potential exposure pathways through which the receptors could contact COPCs. The general methods used to identify receptors were discussed in Sections 2.2, 2.2.2, and 2.2.3. Section 4.1 describes the general site topography, current and possible future land uses, and current and possible future demographics of the sites, and forms the basis of the exposure assessment for this site. Because the site is essentially inactive, there are no likely current receptors. Therefore, only possible future receptors at the sites are considered in this BRA.

Projected future land use is different for Sites 16 and 17, as discussed in Section 4.1.2, and four distinct areas have been defined within Sites 16 and 17, as discussed in Section 4.1.1. Therefore, possible future receptors are identified separately for each of the four areas at Sites 16 and 17: the DOL Maintenance Yard, Pete's Pond, Pete's Pond Extension, and the Site 17 Disposal Area. For receptors potentially exposed to soil, the following exposure pathways were evaluated in this BRA: ingestion of soil, dermal contact with soil, and inhalation of airborne dust. For receptors potentially exposed to groundwater, exposure via ingestion of groundwater and inhalation of vapors during domestic use of groundwater were evaluated in this BRA. Discussions of the possible receptors for each area follow.

4.4.2.1 DOL Maintenance Yard

Possible future receptors who may be exposed to chemicals in soil from 0 to 2 feet bgs at the DOL Maintenance Yard include:

- Commercial workers
- Nearby offsite residents

Possible future receptors who may be exposed to chemicals in soil from 0 to 10 feet bgs include:

- Onsite construction workers
- Onsite utility workers

Exposure of possible future receptors to soil greater than 10 feet bgs is not expected.

As discussed in Section 4.1.2, future land use plans indicate that public agency corporation yards will be developed in the area, including the DOL Maintenance Yard. Due to the size, location, and topography of the DOL Maintenance Yard, it is possible that offices, warehouses, garages, or other buildings associated with the corporation yards may be developed in this immediate area. Commercial workers may therefore be present. Offsite residents might be exposed to chemicals in soil at the DOL Maintenance Yard via inhalation of dust. However, due to the limited area of

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Page 47

In Volume III, Sites 16 and 17 delete third and fourth sentences of the first paragraph, second column of page 47 and replace with:

> *Exposures from potential trespassing on Pete's Pond are evaluated for a student or faculty member at the proposed CSU Monterey Bay Campus.*

In Volume III, Sites 16 and 17 first bullet, second column of page 47, replace "*student resident*" **with** "*student/faculty.*"

Text Revisions
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Page 48

In Volume III, Sites 16 and 17, fifth sentence, first paragraph, first column of page 48, delete: "*resident, as discussed in Section 4.4.2.2*" **and replace with:** "*or faculty member at the proposed CSU Monterey Bay Campus.*"

In Volume III, Sites 16 and 17, third bullet, first column of page 48, delete "*resident*" **and replace with** "*or faculty.*"

Text Revisions
Volume III, Sites 16 and 17
Page 48 and 49

In Volume III, Sites 16 and 17, fourth sentence, last paragraph, second column of page 48 (and first column of page 49), delete remainder of paragraph starting with "*Although*", to the end of the paragraph (which continues on to the top of page 49).

Replace with:

> *For this BRA it is assumed that students and faculty would be working in the artists' studios. Although other student/faculty or visitors may be present in the area, the student/faculty working in the studios would have the highest exposure.*

Possible future receptors who may be exposed to chemicals in soil from 0 to 10 feet bgs include:

- Onsite construction workers
- Utility workers.

Exposure of possible future receptors to soils greater than 10 feet bgs is not expected.

As discussed in Section 4.1.2, public agency corporation yards are to be developed in the area of Fort Ord which includes Site 16. The Pete's Pond Extension area of Site 16 is also unlikely to be developed due to its limited size and location, as described in Section 4.1.1. Therefore, commercial workers are not expected to be present at or near Pete's Pond Extension. Trespassers could potentially enter this area. The hypothetical trespasser was assumed to be a nearby student resident, as discussed in Section 4.4.2.2. The offsite resident and commercial worker might be exposed to chemicals in soil at Pete's Pond Extension via inhalation of dust. However, due to its substantial vegetative cover and limited size, significant dust emission from this area is considered unlikely. An onsite construction worker receptor is not likely to be present at Pete's Pond Extension because construction activities are unlikely to occur on this relatively small, vegetated, and sloped area. However, development in areas near Pete's Pond Extension may require installation and maintenance of utility lines along adjacent roadways by utility workers. Therefore, the following receptors are selected for quantitative evaluation at Pete's Pond Extension:

- Nearby student resident/trespasser exposed to chemicals in surface soil (0 to 2 feet bgs) via ingestion of and dermal contact with soil, and inhalation of dust
- Future onsite utility worker exposed to chemicals in subsurface soil (0 to 10 feet bgs) via ingestion of and dermal contact with soil, and inhalation of dust.

4.4.2.4 Site 17 Disposal Area

Possible future onsite receptors who may be exposed to chemicals in soil from 0 to 2 feet bgs at the Site 17 Disposal Area include:

- Students at the proposed California State University campus
- Faculty at the proposed California State University campus
- Administrative staff at the proposed California State University
- Visitors to the proposed California State University
- Nearby offsite commercial workers
- Nearby offsite residents.

Possible future receptors who may be exposed to chemicals in soil from 0 to 10 feet bgs include:

- Onsite construction workers
- Onsite utility workers.

Exposure of possible future receptors to soils greater than 10 feet bgs is not expected.

Most soils in the Site 17 Disposal Area are currently covered by asphalt or concrete pavement. For this BRA, it was assumed that pavement might be removed in the future and that no clean soil cover would be placed over exposed soils.

As discussed in Section 4.1.2, the proposed California State University Monterey Bay Campus is to be built in an area of Fort Ord of which Site 17 is a part. Student housing, lecture facilities, and other future buildings will most likely be built in areas already developed (i.e., existing buildings on the Main Garrison east of Site 17). Current land use plans indicate than the Site 17 area will be landscaped and will have artist studios and warehouses. Although residential development is unlikely to occur near Site 17, for the BRA it was assumed that student housing may be located at or near what is now

Text Revisions
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Page 49

In Volume III, Sites 16 and 17 first bullet of the first column of page 49 delete, "*onsite student resident*" **and replace with,** "*faculty/student at the artists studios.*"

In Volume III, Sites 16 and 17, second sentence, first paragraph, second column of page 49, delete "resident" **and insert** "*/faculty artist*" **immediately after** "*The hypothetical student.*"

Text Revisions
Volume III, Sites 16 and 17
Page 50

In Volume III, Sites 16 and 17, Section 4.4.3.1 heading on page 50, replace "*Student Resident*" **with** "*Student/Faculty Artist.*"

In Volume III, Sites 16 and 17, first sentence, first paragraph, first column of page 50, replace "*student resident*" **with** "*student/faculty artist*", **and replace** "*student resident/trespasser*" **with** "*student/faculty trespasser*".

In Volume III, Sites 16 and 17, first and fourth bullets of the first column of page 50, replace "*Student resident*" **with** "*Student/faculty artist.*"

In Volume III, Sites 16 and 17 second and third bullets of the first column of page 50, replace "*Student resident/trespasser,*" **with** "*Student/faculty trespasser.*"

In Volume III, Sites 16 and 17 first sentence, of the second paragraph of the first column of page 50, replace "*the student resident*" **and** "*student resident/trespasser*" **with** "*the student/faculty artist*" **and** "*student/faculty trespasser,*" **respectively.**

In Volume III, Sites 16 and 17 delete completely the third paragraph of the first column of page 50 and insert:

Future artist's studios at the proposed university campus were assumed to be constructed in the Site 17 Disposal Area. The student/faculty artist was assumed to have a studio on campus an average of 5 years (average ED = 5 years) and a maximum of 25 years (RME ED = 25 years). Based on an average two-semester school year, the student/faculty artist was assumed to be at CSU 7 days per week for approximately 33 weeks (average EF = 230 days per year). If the student/faculty artist remains on campus for an additional 10-week summer semester, total time at CSU would be approximately 43 weeks, 7 days per week (RME EF = 300 days per year).

In Volume III, Sites 16 and 17, first sentence, first paragraph, second column of page 50, replace "*students*" **with** "*students/faculty.*"

In Volume III, Sites 16 and 17, first bullet, second column of page 50, replace "*Twenty*" **with** "*Sixteen.*"

4.4.3.1 Student Resident

The hypothetical student resident and student resident/trespasser receptors are included for quantitative evaluation in the following areas at Sites 16 and 17.

- Student resident exposed to soil at the Site 17 Disposal Area
- Student resident/trespasser exposed to soil at Pete's Pond
- Student resident/trespasser exposed to soil at Pete's Pond Extension
- Student resident exposed to groundwater beneath Sites 16 and 17.

For this BRA, the student resident and student resident/trespasser receptors were assumed to be the same receptor, and potential exposures were combined for all areas to represent a single, maximally exposed receptor. This future hypothetical receptor is hereafter referred to as the student resident receptor.

Future student housing at the proposed university campus was assumed to be constructed in the Site 17 Disposal Area. As discussed in Section 4.1.2, student housing is more likely to be located east of Site 17 in the developed areas of the Main Garrison, but it is conservatively assumed that dormitories might be constructed on Site 17 in the future. The student resident was assumed to live on campus an average of 3 years (average ED = 3 years) and to spend a maximum of 5 years in residence (RME ED = 5 years) in the dormitories on Site 17. Based on an average two-semester school year, the student resident was assumed to be in residence 7 days per week for approximately 33 weeks (average EF = 230 days per year). If the student remains on campus for an additional 10-week summer semester, total time in residence would be approximately 43 weeks, 7 days per week (RME EF = 300 days per year). These are considered conservative estimates given that dormitories are likely to be located in areas other than Site 17 and that students are likely to reside in off-campus residences for part of their time of attendance at the university.

Although precise future land use for the Pete's Pond and Pete's Pond Extension areas are unknown, students might be present in these areas for such activities as waiting at a bus stop or walking through on their way to other areas of campus. Therefore, it was assumed that 0.25 hours might be spent at both the Pete's Pond and Pete's Pond Extension areas. The following ETs were therefore used to evaluate potential exposures:

- Twenty hours per day at the Site 17 Disposal Area, for both the average and RME scenarios
- One-half hour per day at Pete's Pond and Pete's Pond Extension (i.e., 15 minutes each), for the average and RME scenarios.

The remaining 3.5 hours per day was assumed to be spent off site.

The FI term is used to evaluate exposure to soil via ingestion and dermal contact; this term accounts for the fact that the time the receptor spends outdoors is divided among the three areas evaluated here and other areas offsite where the receptor contacts soil. To estimate the RME FI at each area, the receptor was conservatively assumed to receive 100 percent of his or her daily exposure to soil via ingestion or dermal contact while at Sites 16 and 17. It was also necessary to identify the FI for each of the three areas where the student might be exposed to soil. Because the student was assumed to spend a maximum of 15 minutes per day at both Pete's Pond and Pete's Pond Extension, it was assumed that a relatively small proportion of total exposures to soil would occur at either of these areas. An FI of 0.1 was assumed for both Pete's Pond and Pete's Pond Extension. Therefore, it was assumed that 80 percent of the daily exposure to soil would occur at the Site 17 Disposal Area (FI = 0.8), 10 percent of the daily exposure would occur at Pete's Pond (FI = 0.1), and 10 percent would occur at Pete's Pond Extension (FI = 0.1). For the average scenario, the receptor was assumed to receive 50 percent of his or her daily exposure to soil via ingestion or dermal contact while at Sites 16 and 17. The average FI was therefore assumed to be one-half the RME FI for each area. The average FI for the Site 17 Disposal Area was assumed to be 0.4, and

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Pages 51 and 52

In Volume III, Sites 16 and 17 last sentence of the sixth paragraph of the second column of pages 51 and 52, replace "*student resident receptor*" **with** "*student/faculty artist receptor.*"

Text Revisions
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Page 52

In Volume III, Sites 16 and 17, in the second sentence of the fourth paragraph of the first column of page 52 replace "*student resident*" **with** "*student/faculty artist.*"

In Volume III, Sites 16 and 17, in the first paragraph of Section 4.6 replace "*student resident*" **with** "*student/faculty artist.*"

In Volume III, Sites 16 and 17, in the Section 4.6.1.1 header of page 52 replace "*Student Resident*" **with** "*Student/Faculty Artist.*"

In Volume III, Sites 16 and 17, in first sentence of the sixth paragraph of the second column of page 52 replace "*student resident*" **with** "*student/faculty artist.*"

resident receptor. The EPCs used for evaluation of ingestion of soil, ingestion of groundwater, and dermal contact with soil were represented by the measured soil or groundwater concentrations of the COPCs, as defined in Section 2.2.7. The EPCs used to evaluate inhalation of dust were estimated by multiplying the soil concentrations of the COPCs by the site-specific PM_{10} value, as discussed in detail in Section 2.2.8. The soil and air EPCs are presented in Tables 4.15, 4.16, 4.17, and 4.18 for each area at Sites 16 and 17. Groundwater EPCs are presented in Table 4.19.

The student resident receptor was assumed to be exposed to chemicals detected at the soil surface in the Site 17 Disposal Area, Pete's Pond, and Pete's Pond Extension. This receptor was assumed not to engage in activities (e.g., digging) that would expose him or her to soil at depths greater than 2 feet. The EPCs used for the student receptor in these areas were, therefore, the COPC concentrations detected in soil at 0 to 2 feet bgs. The utility worker and construction worker receptors were assumed to engage in activities (e.g., digging) that would expose him or her to soil at greater depths. The EPCs used for the utility worker at Pete's Pond Extension and the construction worker at the Site 17 Disposal Area were, therefore, the COPC concentrations detected in soil at 0 to 10 feet bgs in these areas. The commercial worker receptor was assumed to be exposed to chemicals detected at the soil surface at the DOL Maintenance Yard. This receptor was assumed not to engage in activities (e.g., digging) that would expose him or her to soil at depths greater than 2 feet.

4.4.5 Estimation of Exposure (Dose)

The methods for estimating the potential dose associated with presumed exposure to all COPCs (except lead) are presented in detail in Section 2.2.4. Exposure (dose) is estimated with an EPC and site-, receptor-, and pathway-specific exposure assumptions. The EPCs for each area at Sites 16 and 17 are presented in Section 4.4.4. Section 2.2.5 presents the receptor- and pathway-specific exposure assumptions used for all the sites evaluated in this risk assessment; assumptions specific to Sites 16 and 17 are presented in Section 4.4.3. The equations used to estimate exposure dose are presented in Section 2.2.4. The dose calculations for each potential receptor at Sites 16 and 17 are presented in Appendix E.

Because of its unique toxicological properties, potential exposure to lead was evaluated for Sites 16 and 17 as described in Section 2.2.9. The results of the lead evaluation are discussed below in Section 4.6.

4.5 Toxicity Assessment

The methods used to evaluate the potential toxic effects of the COPCs at Sites 16 and 17 are presented in detail in Section 2.3. The toxicity values (RfDs and SFs) used to quantitatively evaluate the exposure pathways for Sites 16 and 17 are presented in Table 2.9.

4.6 Risk Characterization

The methods used to estimate potential adverse noncancer health effects and potential upper-bound cancer risks associated with exposure of the hypothetical receptors to the COPCs detected at Sites 16 and 17 are discussed in detail in Section 2.4. The following sections present the results of the risk characterization for the student resident, utility worker, construction worker, and commercial worker receptors at Sites 16 and 17. Possible noncancer health effects are presented in Section 4.6.1, followed by potential cancer risks in Section 4.6.2, and results of the lead exposure evaluation in Section 4.6.3.

4.6.1 Possible Noncancer Health Effects

Potential noncancer health effects are summarized below for each receptor.

4.6.1.1 Student Resident

Estimated hazard indices (HIs) for the student resident receptor are presented in Tables E8 - E15 in Appendix E; total HIs for each area and pathway are summarized in Table 4.20.

As discussed in Section 4.4.2.5, COPCs in the Upper 180-foot and the A-aquifers were

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Page 53

In Volume III, Sites 16 and 17, in the Section 4.6.2.1 header of page 53 replace "*Student Resident***" with "***Student/Faculty Artist.***"**

In Volume III, Sites 16 and 17, in the second full sentence of the first paragraph of the first column of page 53 replace "*0.03***" with "***0.003.***"**

Text Revisions
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Page 54

In Volume III, Sites 16 and 17, in the first sentence of the first full paragraph of the first column of page 54 replace "*5×10^{-9}*" with "*8×10^{-9}*."

In Volume III, Sites 16 and 17, in the first sentence of the first full paragraph of the first column of page 54 replace "*1×10^{-7}*" with "*5×10^{-7}*."

In Volume III, Sites 16 and 17, in the second sentence of the first full paragraph of the first column of page 54 replace "*4×10^{-9}*" with "*7×10^{-9}*."

In Volume III, Sites 16 and 17, in the second sentence of the first full paragraph of the first column of page 54 replace "*1×10^{-7}*" with "*6×10^{-7}*."

In Volume III, Sites 16 and 17, in the third sentence of the first full paragraph of the first column of page 54 replace "*1×10^{-7}*" with "*2×10^{-7}*."

In Volume III, Sites 16 and 17, in the third sentence of the first full paragraph of the first column of page 54 replace "*7×10^{-7}*" with "*4×10^{-6}*."

In Volume III, Sites 16 and 17, in the fourth sentence of the first full paragraph of the first column of page 54 replace "*3×10^{-8}*" with "*4×10^{-8}*."

In Volume III, Sites 16 and 17, in the fourth sentence of the first full paragraph of the first column of page 54 replace "*4×10^{-7}*" with "*2×10^{-6}*."

In Volume III, Sites 16 and 17 in the first sentence of the second full paragraph of the first column of page 54 replace "*1×10^{-7}*" with "*2×10^{-7}*."

In Volume III, Sites 16 and 17 in the first sentence of the second full paragraph of the first column of page 54 replace "*9×10^{-7}*" with "*5×10^{-6}*."

In Volume III, Sites 16 and 17, in the second sentence of the second full paragraph of the first column of page 54 replace "*3×10^{-8}*" with "*4×10^{-8}*."

In Volume III, Sites 16 and 17, in the second sentence of the second full paragraph of the first column of page 54 replace "*7×10^{-7}*" with "*2×10^{-6}*."

In Volume III, Sites 16 and 17, delete the third sentence of the second full paragraph of the first column of page 54 replace with:

> *All estimated lifetime cancer risks are either below or at the low end of the EPA target risk range of 1×10^{-6} to 1×10^{-4}, indicating that the total estimated cancer risks for the student/faculty artist receptors are at or below EPA-defined levels of concern.*

to the COPCs in the Upper 180-aquifer and the A-aquifer are presented separately in Table 4.24.

The estimated multipathway cancer risks for exposures at Pete's Pond are 5×10^{-9} and 1×10^{-7} for the average and RME scenarios, respectively. The estimated multipathway cancer risks for exposures at Pete's Pond Extension are 4×10^{-9} and 1×10^{-7} for the average and RME scenarios, respectively. The estimated multipathway cancer risks for exposures to groundwater in the Upper 180-foot aquifer and soil at the Site 17 Disposal Area are 1×10^{-7} and 7×10^{-7} for the average and RME scenarios, respectively. The estimated multipathway cancer risks for exposures to groundwater in the A-aquifer and soil at the Site 17 Disposal Area are 3×10^{-8} and 4×10^{-7} for the average and RME scenarios, respectively.

The estimated lifetime cancer risk resulting from exposure to groundwater in the Upper 180-foot aquifer plus soil at all three areas are 1×10^{-7} and 9×10^{-7} for the average and RME scenarios, respectively. The estimated lifetime cancer risk from exposure to groundwater in the A-aquifer plus soil in all three areas are 3×10^{-8} and 7×10^{-7} for the average and RME scenarios, respectively. All estimated lifetime cancer risks are below the EPA target risk range of 1×10^{-6} to 1×10^{-4}, indicating that the total estimated cancer risks for the student resident receptor are below EPA-defined levels of concern.

4.6.2.2 Utility Worker

Estimated cancer risks for the utility worker receptors are presented in Tables E16 through E19 in Appendix E. Total cancer risks for each area and pathway are summarized in Table 4.25. The estimated lifetime cancer risks for the utility worker at Pete's Pond are 1×10^{-9} and 7×10^{-8} for the average and RME scenarios, respectively. The estimated lifetime cancer risks for the utility worker at Pete's Pond Extension are 1×10^{-9} and 7×10^{-8} for the average and RME scenarios, respectively. All estimated lifetime cancer risks are below the EPA target risk range of 1×10^{-6} to 1×10^{-4}, indicating that the total estimated cancer risks for the utility worker receptors at Pete's Pond and Pete's Pond Extension are below EPA-defined levels of concern.

4.6.2.3 Construction Worker

Estimated cancer risks for the construction worker receptors are presented in Tables E20 through E23 in Appendix E. Total cancer risks for each area and pathway are summarized in Table 4.26.

The estimated lifetime cancer risks for the construction worker receptor at the Site 17 Disposal Area are 2×10^{-9} and 1×10^{-6} for the average and RME scenarios, respectively. Estimated cancer risks for this receptor are at or below the EPA target risk range of 1×10^{-6} to 1×10^{-4}, indicating that the total estimated cancer risks for this receptor worker are at or below EPA-defined levels of concern.

The estimated lifetime cancer risks for the construction worker receptor at the DOL Maintenance Yard are 3×10^{-9} and 2×10^{-6} for the average and RME scenarios, respectively. Approximately 98 percent of the total RME risk is due to arsenic in soil. Arsenic was detected above background in only 1 of 11 samples collected in soil 0 to 10 feet bgs. This sample was collected from near the fenceline in the northwest portions of the site, and does not appear to be representative of site-wide conditions. However, this data was included in the BRA, resulting in an RME arsenic concentration of 15.7 mg/kg. The background arsenic concentration for soil greater than 2 feet bgs is 4.5 mg/kg; therefore, approximately 29 percent of the risks due to arsenic may be attributed to background concentrations of arsenic in soil. The risk associated with the incremental arsenic concentration above background (i.e., 11.2 mg/kg) is 1×10^{-6}.

The estimated lifetime cancer risk for the RME scenarios are at the low end of the EPA target risk range of 1×10^{-6} to 1×10^{-4}, indicating that the total estimated cancer risks for the utility worker receptors at Pete's Pond and Pete's Pond Extension are at or below EPA-defined levels of concern.

Text Revisions
Volume III, Sites 16 and 17
Page 55

In Volume III, Sites 16 and 17, in the first column in the paragraph under Section 4.6.3 of page 55, replace "*student resident*" with "*student/faculty artist.*"

Volume III, Sites 16 and 17, in the last sentence under Section 4.6.3 of page 55, replace "*Table 4.24*" with "*Table 4.28.*"

Volume III, Sites 16 and 17, in the first and second sentence of the third paragraph of the second column of page 55, replace "*student resident*" with "*student/faculty artist.*"

Text Revisions
Volume III, Sites 16 and 17
Page 56

In Volume III, Sites 16 and 17, in the second full sentence of the only paragraph of page 56 replace "*student resident*" **with** "*student/faculty artist.*"

Volume III, Sites 16 and 17, delete the third full sentence of the only paragraph of page 56, and replace with:

> *RME cancer risks for the commercial worker (1 x 10^{-5}) and the student/faculty artist (5 x 10^{-6}) are within the EPA target risk range.*

noncancer HIs at or below the EPA target HI of 1. Therefore, adverse noncancer health effects are not expected for the receptors evaluated. For the student resident, construction worker, and utility worker receptors the results of the BRA indicate that potential exposures to COPCs will result in adjusted multipathway cancer risks at or below the EPA target range of 1×10^{-4} to 1×10^{-6}. For the commercial worker receptor, the estimated cancer risk for the RME scenario is 1×10^{-5}, which is within the EPA target risk range. In addition, the results indicate that all exposures to lead evaluated in this BRA result in blood-lead level estimates below EPA's 10 μg/dl threshold level of concern (*1990e*). Therefore, potential adverse health effects resulting from exposure to COPCs at Sites 16 and 17 are not expected.

SECTION 4.0
TABLES AND PLATES

Table 4.1a. Statistical Data Summary of Chemicals Detected in Surface Soil (0 to 2 feet bgs)
Sites 16 and 17, DOL Maintenance Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Antimony	1	3	33.3	6.90E-01	- -	6.90E-01	- -	3.80E-01	2.70E-01	9.10E-01	6.90E-01
Arsenic	3	3	100.0	1.80E+00	- -	2.23E+01	- -	8.73E+00	1.18E+01	3.18E+01	2.23E+01
B(a)P-TE	1	3	33.3	2.30E-05	- -	2.30E-05	- -	2.15E-05	1.30E-03	2.30E-05	2.30E-05
Cadmium	1	3	33.3	2.40E+00	- -	2.40E+00	- -	1.10E+00	1.13E+00	3.31E+00	2.40E+00
Chromium /a/	3	3	100.0	1.02E+01	- -	3.17E+01	- -	1.80E+01	1.19E+01	4.13E+01	3.17E+01
Copper	3	3	100.0	6.80E+00	- -	5.31E+01	- -	3.39E+01	2.41E+01	8.12E+01	5.31E+01
Lead	3	3	100.0	3.40E+00	- -	9.84E+01	- -	4.12E+01	5.04E+01	1.40E+02	9.84E+01
Mercury	1	3	33.3	3.40E-01	- -	3.40E-01	- -	1.30E-01	1.80E-01	4.90E-01	3.40E-01
Nickel	2	3	66.7	6.00E+00	- -	1.03E+01	- -	6.27E+00	3.91E+00	1.39E+01	1.03E+01
TCDD-TE	3	3	100.0	2.00E-08	- -	5.76E-06	- -	2.09E-06	3.19E-06	8.33E-06	5.76E-06
Total cPAH	1	3	33.3	2.30E-03	- -	2.30E-03	- -	2.15E-03	1.30E-04	2.41E-03	2.30E-03

bgs Below ground surface.
mg/kg Milligrams per kilogram.
6.90E-01 6.90 x 10^-1.
- - Not applicable.

/a/ No samples were analyzed for hexavalent chromium.

Table 4.1b. Statistical Data Summary of Chemicals Detected in Subsurface Soil (2 to 10 feet bgs)
Sites 16 and 17, DOL Maintenance Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Acetone	1	8	12.5	7.70E-02	5.50	7.70E-02	5.50	1.44E-02	2.53E-02	6.40E-02	6.40E-02
Arsenic	7	8	87.5	4.10E-01	5.50	1.70E+00	5.50	1.06E+00	5.40E-01	2.11E+00	1.70E+00
Beryllium	2	8	25.0	2.00E-01	5.00	2.10E-01	9.00	1.20E-01	5.00E-02	2.20E-01	2.10E-01
Bis(2-ethylhexyl)phthalate	1	9	11.1	3.90E+00	3.00	3.90E+00	3.00	1.15E+00	1.31E+00	3.72E+00	3.72E+00
Chromium /a/	8	8	100.0	1.38E+01	9.00	2.13E+01	5.50	1.62E+01	2.38E+00	2.08E+01	2.08E+01
Copper	8	8	100.0	2.30E+00	9.00	3.40E+00	5.50	2.91E+00	4.00E-01	3.69E+00	3.40E+00
Di-n-butylphthalate	1	9	11.1	9.50E-02	3.00	9.50E-02	3.00	7.25E-01	8.42E-01	2.37E+00	9.50E-02
Dibenzofuran	1	9	11.1	4.10E-01	3.00	4.10E-01	3.00	5.96E-01	7.64E-01	2.09E+00	4.10E-01
Fluorene	2	9	22.2	6.70E-01	6.00	1.10E+00	3.00	4.69E-01	3.75E-01	1.20E+00	1.10E+00
Lead	7	8	87.5	1.90E+00	9.00	3.80E+00	5.50	2.73E+00	1.01E+00	4.71E+00	3.80E+00
Methyl ethyl ketone	1	8	12.5	2.70E-02	5.50	2.70E-02	5.50	8.19E-03	7.60E-03	2.31E-02	2.31E-02
2-Methylnaphthalene	4	9	44.4	1.70E+00	7.50	8.60E+00	3.00	2.42E+00	3.55E+00	9.38E+00	8.60E+00
Naphthalene	4	9	44.4	7.00E-01	6.50	3.70E+00	6.00	8.72E-01	1.17E+00	3.17E+00	3.17E+00
Nickel	8	8	100.0	6.70E+00	9.00	1.40E+01	5.50	9.59E+00	2.45E+00	1.44E+01	1.40E+01
Phenanthrene	3	9	33.3	1.90E-01	6.50	1.80E+00	3.00	5.38E-01	5.96E-01	1.71E+00	1.71E+00
Zinc	8	8	100.0	7.40E+00	5.00	9.60E+00	5.50	8.63E+00	8.40E-01	1.03E+01	9.60E+00

bgs Below ground surface.
mg/kg Milligrams per kilogram.
7.70E-02 7.70 x 10^-2.

/a/ No samples were analyzed for hexavalent chromium.

Table 4.1c. Statistical Data Summary of Chemicals Detected in Subsurface Soil (0 to 10 feet bgs)
Sites 16 and 17, DOL Maintenance Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Acetone	1	8	12.5	7.70E-02	5.50	7.70E-02	5.50	1.44E-02	2.53E-02	6.40E-02	6.40E-02
Antimony	1	11	9.1	6.90E-01	- -	6.90E-01	- -	2.26E+00	1.28E+00	4.77E+00	6.90E-01
Arsenic	10	11	90.9	4.10E-01	5.50	2.23E+01	- -	3.15E+00	6.38E+00	1.57E+01	1.57E+01
B(a)P-TE	1	3	33.3	2.30E-05	- -	2.30E-05	- -	2.15E-05	1.30E-03	2.30E-05	2.30E-05
Beryllium	2	11	18.2	2.00E-01	5.00	2.10E-01	9.00	1.20E-01	5.00E-02	2.00E-01	2.00E-01
Bis(2-ethylhexyl)phthalate	1	9	11.1	3.90E+00	3.00	3.90E+00	3.00	1.15E+00	1.31E+00	3.72E+00	3.72E+00
Cadmium	1	11	9.1	2.40E+00	- -	2.40E+00	- -	5.20E-01	6.30E-01	1.75E+00	1.75E+00
Chromium /a/	11	11	100.0	1.02E+01	- -	3.17E+01	- -	1.67E+01	5.74E+00	2.79E+01	2.79E+01
Copper	11	11	100.0	2.30E+00	9.00	5.31E+01	- -	1.14E+01	1.81E+01	4.68E+01	4.68E+01
Di-n-butylphthalate	1	9	11.1	9.50E-02	3.00	9.50E-02	3.00	7.25E-01	8.42E-01	2.37E+00	9.50E-02
Dibenzofuran	1	9	11.1	4.10E-01	3.00	4.10E-01	3.00	5.96E-01	7.64E-01	2.09E+00	4.10E-01
Fluorene	2	12	16.7	6.70E-01	6.00	1.10E+00	3.00	3.57E-01	3.79E-01	1.10E+00	1.10E+00
Lead	10	11	90.9	1.90E+00	9.00	9.84E+01	- -	1.32E+01	2.88E+01	6.97E+01	6.97E+01
Mercury	1	11	9.1	3.40E-01	- -	3.40E-01	- -	8.00E-02	9.00E-02	2.50E-01	2.50E-01
Methyl ethyl ketone	1	8	12.5	2.70E-02	5.50	2.70E-02	5.50	8.19E-03	7.60E-03	2.31E-02	2.31E-02
2-Methylnaphthalene	4	9	44.4	1.70E+00	7.50	8.60E+00	3.00	2.42E+00	3.55E+00	9.38E+00	8.60E+00
Naphthalene	4	12	33.3	7.00E-01	6.50	3.70E+00	6.00	7.06E-01	1.05E+00	2.76E+00	2.76E+00

Table 4.1c. Statistical Data Summary of Chemicals Detected in Subsurface Soil (0 to 10 feet bgs)
Sites 16 and 17, DOL Maintenance Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Nickel	10	11	90.9	6.00E+00	- -	1.40E+01	5.50	8.68E+00	3.11E+00	1.48E+01	1.40E+01
Phenanthrene	3	12	25.0	1.90E-01	6.50	1.80E+00	3.00	4.19E-01	5.51E-01	1.50E+00	1.50E+00
TCDD-TE	3	3	100.0	2.00E-08	- -	5.76E-06	- -	2.09E-06	3.19E-06	8.33E-06	5.76E-06
Total cPAH	1	3	33.3	2.30E-03	- -	2.30E-03	- -	2.15E-03	1.30E-04	2.41E-03	2.30E-03
Zinc	8	11	72.7	7.40E+00	5.00	9.60E+00	5.50	1.53E+01	1.48E+01	4.43E+01	9.60E+00

bgs Below ground surface.
mg/kg Milligrams per kilogram.
7.70E-02 7.70 x 10^-2.
- - Not applicable.

/a/ No samples were analyzed for hexavalent chromium.

Table 4.1d. Statistical Data Summary of Chemicals Detected in Deep Soil (> 10 feet bgs)
Sites 16 and 17, DOL Maintenance Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Arsenic	9	13	69.2	8.50E-01	20.50	2.00E+00	20.50	1.10E+00	5.80E-01	2.23E+00	2.00E+00
Beryllium	6	13	46.2	2.10E-01	20.50	4.30E-01	15.50	1.70E-01	1.00E-01	3.60E-01	3.60E-01
Chromium /a/	13	13	100.0	8.00E+00	20.50	2.43E+01	15.50	1.43E+01	4.15E+00	2.24E+01	2.24E+01
Copper	6	13	46.2	2.00E+00	15.50	4.30E+00	15.50	1.73E+00	1.07E+00	3.82E+00	3.82E+00
Lead	10	13	76.9	1.10E+00	20.50	2.60E+00	10.50	1.46E+00	6.20E-01	2.67E+00	2.60E+00
Nickel	13	13	100.0	6.70E+00	10.50	1.53E+01	15.50	1.08E+01	2.23E+00	1.51E+01	1.51E+01
Zinc	13	13	100.0	4.00E+00	20.50	1.05E+01	15.50	7.07E+00	1.73E+00	1.05E+01	1.05E+01

bgs Below ground surface.
mg/kg Milligrams per kilogram.
8.50E-01 8.50 x 10^-1.

/a/ No samples were analyzed for hexavalent chromium.

Table 4.2a. Statistical Data Summary of Chemicals Detected in Surface Soil (0 to 2 feet bgs)
Sites 16 and 17, Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Acetone	9	10	90.0	6.60E-02	- -	2.80E-02	1.50	1.24E-02	6.85/1000	2.58E-02	2.58E-02
Antimony	1	14	7.1	6.70E-01	- -	6.70E-01	- -	2.12E+00	1.18E+00	4.44E+00	6.70E-01
Arsenic	14	14	100.0	5.50E-01	- -	3.70E+00	- -	1.56E+00	8.70E-01	3.27E+00	3.27E+00
B(a)P-TE	1	4	25.0	3.30E-04	- -	3.30E-04	- -	2.40E-04	6.00E-05	3.60E-04	3.30E-04
Beryllium	2	14	14.3	2.50E-01	1.50	4.20E-01	1.50	1.40E-01	9.00E-02	3.20E-01	3.20E-01
Cadmium	4	14	28.6	2.40E+00	- -	4.50E+00	- -	1.21E+00	1.47E+00	4.09E+00	4.09E+00
Chlordane	1	12	8.3	8.40E-02	- -	8.40E-02	- -	5.40E-02	2.06E-02	9.44E-02	8.40E-02
Chromium /a/	13	14	92.9	2.80E+00	- -	1.81E+01	1.50	1.03E+01	4.73E+00	1.96E+01	1.81E+01
Copper	10	14	71.4	6.00E+00	- -	4.03E+01	- -	1.22E+01	1.14E+01	3.46E+01	3.46E+01
4,4'-DDT	4	12	33.3	1.40E-02	- -	2.20E-02	- -	1.28E-02	5.01E-03	2.27E-02	2.20E-02
Lead	14	14	100.0	2.60E+00	- -	8.01E+01	- -	2.65E+01	2.20E+01	6.97E+01	6.97E+01
Mercury	1	14	7.1	6.30E-01	1.50	6.30E-01	1.50	9.00E-02	1.60E-01	3.90E-01	3.90E-01
Methylene chloride	1	10	10.0	3.00E-03	- -	3.00E-03	- -	2.74E-03	1.50E-04	3.03E-03	3.00E-03
Nickel	10	14	71.4	5.30E+00	- -	1.61E+01	1.50	7.55E+00	4.18E+00	1.58E+01	1.58E+01
TCDD-TE	5	5	100.0	3.00E-08	- -	2.79E-06	- -	1.12E-06	1.16E-06	3.40E-06	2.79E-06
Total Carcinogenic PAH	1	4	25.0	3.30E-03	- -	3.30E-03	- -	2.38E-03	6.20E-04	3.58E-03	3.30E-03
Zinc	10	14	71.4	1.17E+01	- -	1.73E+03	1.50	1.76E+02	4.51E+02	1.06E+03	1.06E+03

bgs Below ground surface.
mg/kg Milligrams per kilogram.
-- Not applicable.
TCDD-TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
6.60E-02 6.60 x 10^-2.

/a/ No samples were analyzed for hexavalent chromium.

Table 4.2b. Statistical Data Summary of Chemicals Detected in Subsurface Soil (2 to 10 feet bgs)
Sites 16 and 17, Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Acetone	7	25	28.0	6.50E-03	5.00	3.40E-02	5.50	8.14E-03	7.32E-03	2.25E-02	2.25E-02
Arsenic	17	25	68.0	4.80E-01	10.00	2.10E+00	5.00	8.10E-01	4.20E-01	1.63E+00	1.63E+00
Beryllium	16	25	64.0	2.00E-01	9.50	4.50E-01	5.00	2.20E-01	1.00E-01	4.20E-01	4.20E-01
Cadmium	1	25	4.0	1.50E+00	5.00	1.50E+00	5.00	3.70E-01	2.40E-01	8.40E-01	8.40E-01
Chromium /a/	21	25	84.0	4.50E+00	5.00	1.74E+01	5.00	8.70E+00	4.15E+00	1.68E+01	1.68E+01
Copper	4	25	16.0	2.20E+00	5.50	3.63E+01	5.00	2.77E+00	7.05E+00	1.66E+01	1.66E+01
Lead	25	25	100.0	1.00E+00	10.00	2.36E+01	5.00	2.56E+00	4.43E+00	1.12E+01	1.12E+01
Methyl ethyl ketone	1	25	4.0	9.10E-03	9.50	9.10E-03	9.50	5.64E-03	8.50E-04	7.31E-03	7.31E-03
Methylene chloride	2	25	8.0	3.30E-03	9.50	3.40E-03	5.50	2.56E-03	6.20E-04	3.78E-03	3.40E-03
Nickel	21	25	84.0	6.20E+00	9.50	1.42E+01	5.50	8.68E+00	3.22E+00	1.50E+01	1.42E+01
Zinc	24	25	96.0	4.00E+00	9.50	8.50E+01	5.00	1.17E+01	1.71E+01	4.52E+01	4.52E+01

bgs Below ground surface.
mg/kg Milligrams per kilogram.
6.50E-03 6.50 x 10^-3.

/a/ Three samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.21 to 1.1 mg/kg.

Table 4.2c. Statistical Data Summary of Chemicals Detected in Subsurface Soil (0 to 10 feet bgs)
Sites 16 and 17, Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Acetone	16	35	45.7	6.50E-03	5.00	3.40E-02	5.50	9.35E-03	7.35E-03	2.38E-02	2.38E-02
Antimony	1	39	2.6	6.70E-01	- -	6.70E-01	- -	2.38E+00	1.01E+00	4.36E+00	6.70E-01
Arsenic	31	39	79.5	4.80E-01	10.00	3.70E+00	- -	1.08E+00	7.10E-01	2.47E+00	2.47E+00
B(a)P-TE	1	4	25.0	3.30E-04	- -	3.30E-04	- -	2.40E-04	6.00E-05	3.60E-04	3.30E-04
Beryllium	18	39	46.2	2.00E-01	9.50	4.50E-01	5.00	1.90E-01	1.10E-01	4.00E-01	4.00E-01
Cadmium	5	39	12.8	1.50E+00	5.00	4.50E+00	- -	6.70E-01	9.70E-01	2.57E+00	2.57E+00
Chlordane	1	15	6.7	8.40E-02	- -	8.40E-02	- -	5.17E-02	1.89E-02	8.87E-02	8.40E-02
Chromium /a/	34	39	87.2	2.80E+00	- -	1.81E+01	1.50	9.28E+00	4.38E+00	1.79E+01	1.79E+01
Copper	14	39	35.9	2.20E+00	5.50	4.03E+01	- -	6.15E+00	9.85E+00	2.55E+01	2.55E+01
4,4'-DDT	4	15	26.7	1.40E-02	- -	2.20E-02	- -	1.20E-02	4.79E-03	2.14E-02	2.14E-02
Lead	39	39	100.0	1.00E+00	10.00	8.01E+01	- -	1.12E+01	1.77E+01	4.59E+01	4.59E+01
Mercury	1	39	2.6	6.30E-01	1.50	6.30E-01	1.50	6.00E-02	9.00E-02	2.50E-01	2.50E-01
Methyl ethyl ketone	1	35	2.9	9.10E-03	9.50	9.10E-03	9.50	5.59E-03	7.40E-04	7.03E-03	7.03E-03
Methylene chloride	3	35	8.6	3.00E-03	- -	3.40E-03	5.50	2.61E-03	5.30E-04	3.66E-03	3.40E-03
Nickel	31	39	79.5	5.30E+00	- -	1.61E+01	1.50	8.27E+00	3.58E+00	1.53E+01	1.53E+01

Table 4.2d. Statistical Data Summary of Chemicals Detected in Deep Soil (> 10 feet bgs)
Sites 16 and 17, Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Acetone	6	18	33.3	5.50E-03	30.50	1.20E-02	10.50	6.61E+00	2.33E+00	1.12E+01	1.20E-02
Antimony	1	18	5.6	6.00E+00	21.00	6.00E+00	21.00	2.57E+00	1.32E+00	5.16E+00	5.16E+00
Arsenic	10	18	55.6	5.40E-01	20.25	1.90E+00	10.50	8.70E-01	3.90E-01	1.64E+00	1.64E+00
Beryllium	3	18	16.7	2.60E-01	19.75	2.90E-01	10.75	1.30E-01	7.00E-02	2.70E-01	2.70E-01
Chromium /a/	18	18	100.0	4.90E+00	110.50	1.78E+01	20.50	1.04E+01	3.59E+00	1.75E+01	1.75E+01
Copper	5	18	27.8	2.10E+00	20.50	7.70E+00	21.00	1.72E+00	1.72E+00	5.10E+00	5.10E+00
Lead	17	18	94.4	8.80E-01	15.50	4.10E+00	10.50	1.54E+00	9.10E-01	3.32E+00	3.32E+00
Mercury	2	18	11.1	1.20E-01	110.50	2.60E-01	70.50	6.00E-02	5.00E-02	1.70E-01	1.70E-01
Nickel	17	18	94.4	7.50E+00	10.50	1.70E+01	30.50	1.04E+01	3.29E+00	1.69E+01	1.69E+01
Zinc	16	18	88.9	5.50E+00	10.50	1.61E+01	16.00	8.56E+00	3.56E+00	1.55E+01	1.55E+01

bgs Below ground surface.
mg/kg Milligrams per kilogram.
5.50E-03 5.50 x 10^-3.

/a/ Three samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 0.11 mg/kg.

Table 4.3a. Statistical Data Summary of Chemicals Detected in Surface Soil (0 to 2 feet bgs)
Sites 16 and 17, Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Antimony	6	14	42.9	5.90E-01	- -	6.90E+00	2.00	1.54E+00	2.16E+00	5.77E+00	5.77E+00
Arsenic	13	14	92.9	1.00E+00	1.25	6.40E+00	2.00	1.96E+00	1.46E+00	4.81E+00	4.81E+00
Benzo(ghi)perylene	1	9	11.1	8.30E-03	- -	8.30E-03	- -	1.20E-01	8.54E-02	2.87E-01	8.30E-03
Beryllium	4	14	28.6	1.40E-01	2.00	1.90E-01	1.00	1.10E-01	5.00E-02	2.00E-01	1.90E-01
Bis(2-ethylhexyl)phthalate	1	6	16.7	9.60E-02	1.25	9.60E-02	1.25	1.54E-01	2.82E-02	2.09E-01	9.60E-02
Cadmium	4	14	28.6	7.60E-01	2.00	1.70E+00	2.00	6.50E-01	3.70E-01	1.38E+00	1.38E+00
Chlordane	1	3	33.3	6.30E-02	- -	6.30E-02	- -	4.97E-02	1.16E-02	7.25E-02	6.30E-02
Chromium /a/	14	14	100.0	8.70E+00	1.00	2.51E+01	2.00	1.41E+01	4.01E+00	2.20E+01	2.20E+01
Copper	8	14	57.1	4.80E+00	1.25	4.43E+02	2.00	5.63E+01	1.20E+02	2.91E+02	2.91E+02
4,4'-DDD	1	3	33.3	2.00E-02	- -	2.00E-02	- -	1.23E-02	6.66E-03	2.54E-02	2.00E-02
4,4'-DDT	2	3	66.7	9.20E-03	- -	7.60E-02	- -	3.14E-02	3.86E-02	1.07E-01	7.60E-02
Lead	14	14	100.0	1.90E+00	2.00	7.41E+02	2.00	1.23E+02	2.26E+02	5.66E+02	5.66E+02
Mercury	2	14	14.3	6.00E-02	2.00	2.50E-01	0.50	4.00E-02	6.00E-02	1.60E-01	1.60E-01
Nickel	14	14	100.0	5.20E+00	- -	2.02E+01	2.00	1.13E+01	3.66E+00	1.85E+01	1.85E+01
Silver	3	14	21.4	4.20E-01	1.00	1.20E+00	2.00	5.00E-01	2.40E-01	9.70E-01	9.70E-01

Table 4.3a. Statistical Data Summary of Chemicals Detected in Surface Soil (0 to 2 feet bgs)
Sites 16 and 17, Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
TCDD-TE	3	3	100.0	1.60E-07	- -	2.20E-06	- -	1.25E-06	1.03E-06	3.27E-06	2.20E-06
Trichloroethene	1	11	9.1	6.80E-02	1.00	6.80E-02	1.00	8.60E-03	1.97E-02	4.72E-02	4.72E-02
Zinc	11	14	78.6	8.90E+00	2.00	1.03E+03	2.00	1.74E+02	3.12E+02	7.86E+02	7.86E+02

bgs Below ground surface.
mg/kg Milligrams per kilogram.
5.90E-01 5.90 x 10^-1.
- - Not applicable.

/a/ Nine samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.5 to 2.0 mg/kg.

Table 4.3b. Statistical Data Summary of Chemicals Detected in Subsurface Soil (2 to 10 feet bgs)
Sites 16 and 17, Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Antimony	4	21	19.1	5.60E-01	5.75	3.40E+00	2.50	6.40E-01	1.03E+00	2.65E+00	2.65E+00
Arsenic	14	21	66.7	4.90E-01	3.50	3.30E+00	7.00	1.19E+00	8.10E-01	2.78E+00	2.78E+00
Beryllium	5	21	23.8	1.30E-01	7.50	2.50E-01	5.75	1.00E-01	6.00E-02	2.20E-01	2.20E-01
Bis(2-ethylhexyl)phthalate	2	4	50.0	4.50E-02	4.75	7.70E-02	7.00	1.19E-01	6.86E-02	2.54E-01	7.70E-02
Cadmium	1	21	4.8	1.10E+00	7.00	1.10E+00	7.00	4.40E-01	1.60E-01	7.60E-01	7.60E-01
Chromium /a/	21	21	100.0	8.90E+00	3.50	2.47E+01	7.00	1.26E+01	3.32E+00	1.91E+01	1.91E+01
Copper	8	21	38.1	1.30E+00	3.50	1.85E+02	2.50	2.15E+01	4.85E+01	1.17E+02	1.17E+02
Lead	21	21	100.0	7.70E-01	9.00	4.75E+02	7.00	4.66E+01	1.14E+02	2.70E+02	2.70E+02
Nickel	21	21	100.0	6.50E+00	7.50	2.51E+01	7.00	1.22E+01	3.78E+00	1.96E+01	1.96E+01
Pentachlorophenol	1	4	25.0	8.80E-02	6.25	8.80E-02	6.25	6.72E-01	3.90E-01	1.44E+00	8.80E-02
TCDD-TE	2	2	100.0	1.70E-07	5.75	2.18E-05	7.00	1.10E-05	1.53E-05	4.10E-05	2.18E-05
Tetrachloroethene	1	22	4.6	6.40E-03	4.50	6.40E-03	4.50	2.78E-03	8.10E-04	4.38E-03	4.38E-03
Toluene	1	22	4.6	1.20E-03	5.00	1.20E-03	5.00	2.55E-03	3.10E-04	3.17E-03	1.20E-03
Trichloroethene	4	22	18.2	1.40E-03	2.50	1.20E-02	3.00	3.15E-03	2.22E-03	7.50E-03	7.50E-03
Zinc	15	21	71.4	9.20E+00	5.00	6.78E+02	7.00	9.53E+01	1.96E+02	4.79E+02	4.79E+02

bgs Below ground surface.
mg/kg Milligrams per kilogram.
TCDD-TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
5.60E-01 5.60 x 10^-1.

/a/ Nineteen samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 4.0 mg/kg.

Table 4.3c. Statistical Data Summary of Chemicals Detected in Subsurface Soil (0 to 10 feet bgs)
Sites 16 and 17, Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Antimony	10	35	28.6	5.60E-01	5.75	6.90E+00	2.00	1.00E+00	1.61E+00	4.16E+00	4.16E+00
Arsenic	27	35	77.1	4.90E-01	3.50	6.40E+00	2.00	1.50E+00	1.16E+00	3.77E+00	3.77E+00
Benzo(ghi)perylene	1	13	7.7	8.30E-03	- -	8.30E-03	- -	1.38E-01	7.56E-02	2.86E-01	8.30E-03
Beryllium	9	35	25.7	1.30E-01	7.50	2.50E-01	5.75	1.00E-01	6.00E-02	2.10E-01	2.10E-01
Bis(2-ethylhexyl)phthalate	3	10	30.0	4.50E-02	4.75	9.60E-02	1.25	1.40E-01	4.82E-02	2.34E-01	9.60E-02
Cadmium	5	35	14.3	7.60E-01	2.00	1.70E+00	2.00	5.30E-01	2.80E-01	1.08E+00	1.08E+00
Chlordane	1	3	33.3	6.30E-02	- -	6.30E-02	- -	4.97E-02	1.16E-02	7.25E-02	6.30E-02
Chromium /a/	35	35	100.0	8.70E+00	1.00	2.51E+01	2.00	1.32E+01	3.63E+00	2.04E+01	2.04E+01
Copper	16	35	45.7	1.30E+00	3.50	4.43E+02	2.00	3.54E+01	8.46E+01	2.01E+02	2.01E+02
4,4'-DDD	1	3	33.3	2.00E-02	- -	2.00E-02	- -	1.23E-02	6.66E-03	2.54E-02	2.00E-02
4,4'-DDT	2	3	66.7	9.20E-03	- -	7.60E-02	- -	3.14E-02	3.86E-02	1.07E-01	7.60E-02
Lead	35	35	100.0	7.70E-01	9.00	7.41E+02	2.00	7.72E+01	1.69E+02	4.08E+02	4.08E+02
Mercury	2	35	5.7	6.00E-02	2.00	2.50E-01	0.50	3.00E-02	4.00E-02	1.10E-01	1.10E-01
Nickel	35	35	100.0	5.20E+00	- -	2.51E+01	7.00	1.18E+01	3.71E+00	1.91E+01	1.91E+01
Pentachlorophenol	1	10	10.0	8.80E-02	6.25	8.80E-02	6.25	7.79E-01	2.60E-01	1.29E+00	8.80E-02
Silver	3	35	8.6	4.20E-01	1.00	1.20E+00	2.00	4.50E-01	2.00E-01	8.50E-01	8.50E-01

Table 4.3c. Statistical Data Summary of Chemicals Detected in Subsurface Soil (0 to 10 feet bgs)
Sites 16 and 17, Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
TCDD-TE	5	5	100.0	1.60E-07	- -	2.18E-05	7.00	5.15E-06	9.37E-06	2.35E-05	2.18E-05
Tetrachloroethene	1	33	3.0	6.40E-03	4.50	6.40E-03	4.50	2.74E-03	6.80E-04	4.06E-03	4.06E-03
Toluene	1	33	3.0	1.20E-03	5.00	1.20E-03	5.00	2.58E-03	2.90E-04	3.16E-03	1.20E-03
Trichloroethene	5	33	15.2	1.40E-03	2.50	6.80E-02	1.00	4.97E-03	1.15E-02	2.74E-02	2.74E-02
Zinc	26	35	74.3	8.90E+00	2.00	1.03E+03	2.00	1.27E+02	2.48E+02	6.12E+02	6.12E+02

bgs Below ground surface.
mg/kg Milligrams per kilogram.
TCDD-TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
2.00E-02 2.00 x 10^-2.
- - Not applicable.

/a/ Twenty-eight samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 4.0 mg/kg.

Table 4.3d. Statistical Data Summary of Chemicals Detected in Deep Soil (> 10 feet bgs)
Sites 16 and 17, Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Acetone	1	8	12.5	5.50E-03	31.00	5.50E-03	31.00	4.83E-03	9.00E-04	6.59E-03	5.50E-03
Antimony	2	7	28.6	5.30E-01	15.75	3.90E+00	15.50	8.00E-01	1.37E+00	3.49E+00	3.49E+00
Arsenic	5	7	71.4	6.40E-01	31.00	3.70E+00	15.50	1.13E+00	1.19E+00	3.47E+00	3.47E+00
Beryllium	3	7	42.9	2.60E-01	30.75	4.40E-01	15.75	2.30E-01	1.40E-01	4.90E-01	4.40E-01
Bis(2-ethylhexyl)phthalate	1	7	14.3	1.50E-01	15.50	1.50E-01	15.50	1.69E-01	9.32E-03	1.88E-01	1.50E-01
Cadmium	1	7	14.3	2.50E+00	15.50	2.40E+00	15.50	7.30E-01	7.40E-01	2.17E+00	2.17E+00
Chromium /a/	7	7	100.0	5.80E+00	15.75	3.25E+01	15.50	1.25E+01	9.02E+00	3.02E+01	3.02E+01
Copper	2	7	28.6	8.20E+01	15.50	3.20E+02	30.75	5.80E+01	1.19E+02	2.92E+02	2.92E+02
Lead	7	7	100.0	6.30E-01	42.25	1.24E+02	15.50	1.87E+01	4.65E+01	1.10E+02	1.10E+02
Mercury	1	7	14.3	9.00E-02	15.50	9.00E-02	15.50	4.00E-02	2.00E-02	8.00E-02	8.00E-02
Nickel	7	7	100.0	7.20E+00	15.75	4.56E+01	15.50	1.52E+01	1.36E+01	4.18E+01	4.18E+01
Pentachlorophenol	1	7	14.3	8.30E-02	15.75	8.30E-02	15.75	8.40E-01	4.39E-01	1.70E+00	8.30E-02
Tetrachloroethene	1	9	11.1	1.10E-02	15.50	1.10E-02	15.50	3.56E-03	2.79E-03	9.03E-03	9.03E-03
Thallium	1	7	14.3	4.70E-01	15.75	4.70E-01	15.75	2.50E-01	1.00E-01	4.40E-01	4.40E-01
Toluene	1	9	11.1	1.60E-03	15.50	1.60E-03	15.50	2.52E-03	3.50E-04	3.20E-03	1.60E-03
Trichloroethene	1	9	11.1	5.20E-03	15.50	5.20E-03	15.50	2.92E-03	8.60E-04	4.60E-03	4.60E-03
Zinc	4	7	57.1	9.50E+00	42.25	1.00E+03	15.50	1.60E+02	3.72E+02	8.88E+02	8.88E+02

bgs Below ground surface.
mg/kg Milligrams per kilogram.
5.50E-03 5.50 x 10^-3.

/a/ Four samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 2.0 mg/kg.

Table 4.4b. Statistical Data Summary of Chemicals Detected in Subsurface Soil (2 to 10 feet bgs)
Sites 16 and 17, Site 17 Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Acetone	6	27	22.2	1.60E-03	6.75	3.10E-02	5.00	6.44E-03	6.12E-03	1.84E-02	1.84E-02
Antimony	9	27	33.3	4.00E-01	9.50	5.50E+00	8.50	1.64E+00	1.46E+00	4.50E+00	4.50E+00
Arsenic	18	27	66.7	6.00E-01	9.00	1.31E+01	5.00	1.82E+00	2.87E+00	7.44E+00	7.44E+00
Beryllium	2	27	7.4	2.50E-01	6.75	2.50E-01	6.75	1.20E-01	7.00E-02	2.50E-01	2.50E-01
Bis(2-ethylhexyl)phthalate	1	13	7.7	1.30E-01	8.50	1.30E-01	8.50	3.28E-01	4.50E-01	1.21E+00	1.30E-01
Cadmium	3	27	11.1	1.10E+00	5.50	3.20E+00	8.50	5.60E-01	5.90E-01	1.72E+00	1.72E+00
Chromium /a/	27	27	100.0	5.30E+00	6.00	5.27E+01	5.50	1.41E+01	1.25E+01	3.85E+01	3.85E+01
Copper	6	27	22.2	1.10E+01	2.50	2.57E+02	6.75	2.79E+01	6.68E+01	1.59E+02	1.59E+02
Lead	27	27	100.0	6.90E-01	7.00	4.42E+02	5.00	6.56E+01	1.33E+02	3.26E+02	3.26E+02
Mercury	11	27	40.7	6.00E-02	6.75	7.50E+00	5.50	6.50E-01	1.68E+00	3.94E+00	3.94E+00
Methylene chloride	1	27	3.7	3.50E-03	2.50	3.50E-03	2.50	3.09E-03	1.03E-03	5.11E-03	3.50E-03
Nickel	23	27	85.2	5.00E+00	6.75	1.70E+02	8.50	2.07E+01	3.81E+01	9.54E+01	9.54E+01
Selenium	1	27	3.7	1.20E+00	5.00	1.20E+00	5.00	3.80E-01	1.80E-01	7.30E-01	7.30E-01
Silver	1	27	3.7	4.80E+00	5.00	4.80E+00	5.00	5.50E-01	9.20E-01	2.37E+00	2.37E+00
TCDD-TE	2	2	100.0	4.00E-08	2.25	3.02E-05	6.75	1.51E-05	2.13E-05	5.69E-05	3.02E-05
Zinc	18	27	66.7	5.20E+00	6.50	6.73E+02	9.50	9.79E+01	1.77E+02	4.45E+02	4.45E+02

bgs Below ground surface.
mg/kg Milligrams per kilogram.
TCDD-TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
1.60E-03 1.60 x 10^-3.

/a/ Sixteen samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 2.0 mg/kg.

Table 4.4c. Statistical Data Summary of Chemicals Detected in Subsurface Soil (0 to 10 feet bgs)
Sites 16 and 17, Site 17 Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Acetone	7	36	19.4	1.60E-03	6.75	3.10E-02	5.00	6.19E-03	5.34E-03	1.67E-02	1.67E-02
Antimony	11	36	30.6	3.80E-01	0.50	5.50E+00	8.50	1.51E+00	1.41E+00	4.27E+00	4.27E+00
Arsenic	24	36	66.7	6.00E-01	9.00	1.31E+01	5.00	1.60E+00	2.51E+00	6.52E+00	6.52E+00
Beryllium	4	36	11.1	1.50E-01	0.50	2.50E-01	6.75	1.20E-01	6.00E-02	2.50E-01	2.50E-01
Bis(2-ethylhexyl)phthalate	1	15	6.7	1.30E-01	8.50	1.30E-01	8.50	3.07E-01	4.20E-01	1.13E+00	1.30E-01
Cadmium	3	36	8.3	1.10E+00	5.50	3.20E+00	8.50	5.20E-01	5.10E-01	1.53E+00	1.53E+00
Chromium /a/	36	36	100.0	5.30E+00	6.00	5.27E+01	5.50	1.35E+01	1.08E+01	3.47E+01	3.47E+01
Copper	10	36	27.8	6.10E+00	2.00	2.57E+02	6.75	2.21E+01	5.85E+01	1.37E+02	1.37E+02
Lead	36	36	100.0	6.90E-01	7.00	4.42E+02	5.00	5.22E+01	1.17E+02	2.82E+02	2.82E+02
Mercury	13	36	36.1	6.00E-02	6.75	7.50E+00	5.50	5.00E-01	1.47E+00	3.38E+00	3.38E+00
Methylene chloride	1	36	2.8	3.50E-03	2.50	3.50E-03	2.50	3.19E-03	1.31E-03	5.75E-03	3.50E-03
Nickel	32	36	88.9	5.00E+00	6.75	1.70E+02	8.50	1.79E+01	3.32E+01	8.30E+01	8.30E+01
Selenium	1	36	2.8	1.20E+00	5.00	1.20E+00	5.00	3.70E-01	1.60E-01	6.80E-01	6.80E-01
Silver	1	36	2.8	4.80E+00	5.00	4.80E+00	5.00	5.10E-01	8.10E-01	2.09E+00	2.09E+00
TCDD-TE	5	5	100.0	4.00E-08	2.25	3.02E-05	6.75	7.11E-06	1.30E-05	3.26E-05	3.02E-05
Zinc	25	36	69.4	5.20E+00	6.50	6.73E+02	9.50	7.84E+01	1.57E+02	3.85E+02	3.85E+02

bgs Below ground surface.
mg/kg Milligrams per kilogram.
TCDD-TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
1.60E-03 1.60 x 10^-3.

/a/ Twenty-two samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 2.0 mg/kg.

Table 4.4d. Statistical Data Summary of Chemicals Detected in Deep Soil (> 10 feet bgs)
Sites 16 and 17, Site 17 Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Acetone	1	20	5.0	5.00E-03	20.75	5.00E-03	20.75	5.80E-03	2.64E-03	1.10E-02	5.00E-03
Antimony	9	20	45.0	4.70E-01	25.75	1.20E+00	11.75	4.30E-01	2.80E-01	9.90E-01	9.90E-01
Arsenic	18	20	90.0	5.10E-01	11.25	2.10E+00	11.75	9.20E-01	4.90E-01	1.89E+00	1.89E+00
Beryllium	3	20	15.0	2.00E-01	20.75	4.40E-01	11.25	2.00E-01	8.00E-02	3.50E-01	3.50E-01
Bis(2-ethylhexyl)phthalate	1	19	5.3	3.60E-01	11.75	3.60E-01	11.75	1.83E-01	4.32E-02	2.68E-01	2.68E-01
Chromium /a/	20	20	100.0	5.60E+00	25.75	1.68E+01	16.25	1.11E+01	2.93E+00	1.68E+01	1.68E+01
Copper	2	20	10.0	4.60E+00	11.25	7.05E+01	11.75	5.07E+00	1.56E+01	3.56E+01	3.56E+01
Lead	19	20	95.0	6.30E-01	11.25	9.65E+01	11.00	7.75E+00	2.24E+01	5.17E+01	5.17E+01
Mercury	1	20	5.0	2.00E-01	11.75	2.00E-01	11.75	3.00E-02	4.00E-02	1.10E-01	1.10E-01
Nickel	19	20	95.0	5.60E+00	11.25	1.49E+01	11.75	9.69E+00	3.21E+00	1.60E+01	1.49E+01
TCDD-TE	1	1	100.0	7.87E-06	11.75	7.87E-06	11.75	- -	- -	- -	- -
Zinc	12	20	60.0	5.90E+00	25.75	1.24E+02	11.00	1.54E+01	2.73E+01	6.88E+01	6.88E+01

bgs Below ground surface.
mg/kg Milligrams per kilogram.
TCDD-TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
5.00E-03 5.00 x 10^-3.
- - Not applicable.

/a/ Twenty samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 1.0 mg/kg.

Table 4.5. Statistical Data Summary of Chemicals Detected in Soil, All Depths
Sites 16 and 17, Site 17 Other Areas
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Acetone	2	17	11.8	7.90E-03	- -	9.60E-03	- -	5.65E-03	1.23E-03	8.06E-03	8.06E-03
Arsenic	18	24	75.0	4.20E-01	45.50	1.90E+00	2.00	1.14E+00	5.10E-01	2.14E+00	1.90E+00
Beryllium	8	24	33.3	1.90E-01	1.75	3.00E-01	20.50	1.70E-01	7.00E-02	3.00E-01	3.00E-01
Cadmium	1	24	4.2	6.10E-01	1.75	6.10E-01	1.75	3.10E-01	6.00E-02	4.30E-01	4.30E-01
Chromium /a/	24	24	100.0	9.90E+00	2.00	2.86E+01	2.00	1.58E+01	5.19E+00	2.60E+01	2.60E+01
Copper	10	24	41.7	2.50E+00	45.50	1.92E+01	2.00	2.91E+00	3.66E+00	1.01E+01	1.01E+01
Lead	23	24	95.8	1.20E+00	2.00	5.10E+00	1.25	1.92E+00	9.50E-01	3.78E+00	3.78E+00
Nickel	24	24	100.0	6.50E+00	5.75	1.70E+01	2.00	1.11E+01	2.70E+00	1.64E+01	1.64E+01
Silver	1	23	4.4	4.40E-01	- -	4.40E-01	- -	1.90E-01	5.00E-02	3.00E-01	3.00E-01
Zinc	24	24	100.0	5.30E+00	- -	1.87E+01	1.25	8.74E+00	3.10E+00	1.48E+01	1.48E+01

mg/kg Milligrams per kilogram.
7.90E-03 7.90 x 10^-3.
- - Not applicable.

/a/ No samples were analyzed for hexavalent chromium.

Table 4.6. Statistical Data Summary of Chemicals Detected in Groundwater, A-Aquifer
Sites 16 and 17
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/l)	Maximum Detection Value (mg/l)	Arithmetic Mean (mg/l)	Standard Deviation of the Arithmetic Mean (mg/l)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/l)	Lesser of 95% UCL and Maximum Concentrations (mg/l)
Antimony	2	2	100.0	3.60E-03	9.60E-03	6.60E-03	4.24E-03	1.49E-02	9.60E-03
Tetrachloroethene	3	5	60.0	3.30E-04	1.90E-03	6.20E-04	7.20E-04	2.03E-03	1.90E-03
Toluene	2	5	40.0	4.10E-04	1.10E-03	4.50E-04	3.70E-04	1.17E-03	1.10E-03
Trichloroethene	3	5	60.0	4.00E-04	2.20E-03	8.00E-04	8.30E-04	2.43E-03	2.20E-03
Zinc	1	2	50.0	3.96E-02	3.96E-02	3.03E-02	1.32E-02	5.61E-02	3.96E-02

mg/l Milligrams per liter.
3.60E-03 3.60 x 10^-3.

Table 4.7. Statistical Data Summary of Chemicals Detected in Groundwater, Upper 180-Foot Aquifer
Sites 16 and 17
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/l)	Maximum Detection Value (mg/l)	Arithmetic Mean (mg/l)	Standard Deviation of the Arithmetic Mean (mg/l)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/l)	Lesser of 95% UCL and Maximum Concentrations (mg/l)
Carbon tetrachloride	3	3	100.0	7.40E-04	1.10E-03	9.20E-04	1.80E-04	1.28E-03	1.10E-03
Tetrachloroethene	2	3	66.7	2.50E-04	7.40E-04	4.10E-04	2.80E-04	9.70E-04	7.40E-04
Toluene	1	3	33.3	4.80E-04	4.80E-04	3.30E-04	1.30E-04	5.90E-04	4.80E-04
Trichloroethene	3	3	100.0	4.30E-04	5.80E-04	5.00E-04	8.00E-05	6.50E-04	5.80E-04

mg/l Milligrams per liter.
7.40E-04 7.40 x 10^-4.

Table 4.8a. Selection of COPCs for Chemicals Detected in Surface Soil (0 to 2 feet bgs) /a/
Sites 16 and 17, DOL Maintenance Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Antimony	0.69	ND	- -	- -	0.003	- -	NO
Arsenic	22.30	3.4	- -	- -	0.1	5E-04	YES
B(a)P-TE	2.30E-05	- -	- -	- -	- -	2E-10	NO
Cadmium	2.40	ND	- -	- -	0.007	5E-05	YES
Chromium /f/	31.70	46.1	- -	- -	- -	- -	NO
Copper	53.10	18.2	- -	- -	0.002	- -	NO
Lead	98.40	51.8	- -	240	- -	- -	NO
Mercury	0.34	0.12	- -	- -	0.002	- -	NO
Nickel	10.30	58	- -	- -	- -	- -	NO
TCDD-TE	5.76E-06	- -	- -	- -	- -	5E-07	YES
Total cPAH	0.0023	- -	- -	- -	1E-07	- -	NO

COPCs	Chemicals of potential concern.
bgs	Below ground surface.
DOL	Directorate of Logistics.
mg/kg	Milligrams per kilogram.
- -	Not applicable or not available.
5.76E-06	5.76 x 10^-6.

/a/ See Section 4.3 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 4.1a.
/c/ Estimated daily dose (see Appendix B for explanation). The EDD was compared to the Recommended Daily Allowance for various essential nutrients (National Research Council, 1989).
/d/ Health based screening level for a child receptor (Harding Lawson Associates, Draft Technical Memorandum, Preliminary Remediation Goals, Fort Ord, California, June 14, 1993).
/e/ See Table C4 of Appendix C for development of screening values.
/f/ Evaluated as chromium III. Chromium VI was not detected.

Table 4.8b. Selection of COPCs for Chemicals Detected in Subsurface Soil (0 to 10 feet bgs) /a/
Sites 16 and 17, DOL Maintenance Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration 0 to 10 feet bgs (mg/kg)	Maximum Concentration 0 to 2 feet bgs (Metals Only) (mg/kg)	Background Concentration 0 to 2 feet bgs (mg/kg)	Maximum Concentration 2 to 10 feet bgs (Metals Only) (mg/kg)	Background Concentration >2 feet bgs (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Acetone	0.077	--	--	--	--	--	--	0.000001	--	NO
Antimony	0.69	0.69	ND	ND	8.2	--	--	0.003	--	NO
Arsenic	22.30	22.3	3.4	1.7	4.5	--	--	0.1	5E-04	YES
B(a)P-TE	0.000023	--	--	--	--	--	--	--	2E-10	NO
Beryllium	0.21	ND	0.35	0.21	0.48	--	--	--	--	NO
Bis(2-ethylhexyl)phthalate /f/	3.90	--	--	--	--	--	--	0.0003	3E-08	YES
Cadmium	2.40	2.40	ND	ND	1.9	--	--	0.007	5E-05	YES
Chromium /g/	31.70	31.7	46.1	21.3	22.7	--	--	--	--	NO
Copper	53.10	53.1	18.2	3.4	8.2	--	--	0.002	--	NO
Di-n-butylphthalate	0.095	--	--	--	--	--	--	0.000001	--	NO
Dibenzofuran	0.41	--	--	--	--	--	--	0.000002	--	NO
Fluorene	1.10	--	--	--	--	--	--	0.00004	--	NO
Lead	98.40	98.4	51.8	3.8	3.7	--	240	--	--	NO
Mercury	0.34	0.34	0.12	ND	ND	--	--	0.002	--	NO
Methyl ethyl ketone	0.027	--	--	--	--	--	--	0.00000006	--	NO
2-Methylnaphthalene	8.60	--	--	--	--	--	--	0.0002	--	NO
Naphthalene	3.70	--	--	--	--	--	--	0.00009	--	NO
Nickel	14.00	10.3	58	14.0	19.5	--	--	--	--	NO
Phenanthrene	1.80	--	--	--	--	--	--	0.000009	--	NO

Table 4.8b. Selection of COPCs for Chemicals Detected in Subsurface Soil (0 to 10 feet bgs) /a/
Sites 16 and 17, DOL Maintenance Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration 0 to 10 feet bgs (mg/kg)	Maximum Concentration 0 to 2 feet bgs (Metals Only) (mg/kg)	Background Concentration 0 to 2 feet bgs (mg/kg)	Maximum Concentration 2 to 10 feet bgs (Metals Only) (mg/kg)	Background Concentration >2 feet bgs (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
TCDD-TE	5.76E-06	--	--	--	--	--	--	--	5E-07	YES
Total cPAH	0.0023	--	--	--	--	--	--	1E-07	--	NO
Zinc	9.60	ND	75.8	9.6	13.9	--	--	--	--	NO

COPCs Chemicals of potential concern.
bgs Below ground surface.
DOL Directorate of Logistics.
mg/kg Milligrams per kilogram.
-- Not applicable or not available.
5.76E-06 5.76 x 10^-6.

/a/ See Section 4.3 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 4.1a.
/c/ Estimated daily dose (see Appendix B for explanation). The EDD was compared to the Recommended Daily Allowance for various essential nutrients (National Research Council, 1989).
/d/ Health based screening level for a child receptor (Harding Lawson Associates, Draft Technical Memorandum, Preliminary Remediation Goals, Fort Ord, California, June 14, 1993).
/e/ See Table C4 of Appendix C for development of screening values.
/f/ Bis(2-ethylhexyl)phthalate was detected in only one sample. The detected concentration is likely to be an artifact of sampling procedures.
/g/ Evaluated as chromium III. Chromium VI was not detected.

Table 4.9a. Selection of COPCs for Chemicals Detected in Surface Soil (0 to 2 feet bgs) /a/
Sites 16 and 17, Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Acetone	0.028	- -	- -	- -	0.0000004	- -	NO
Antimony	0.67	ND	- -	- -	0.002	- -	NO
Arsenic	3.70	3.4	- -	- -	0.02	8E-05	YES
B(a)P-TE	0.00033	- -	- -	- -	NA	2E-09	NO
Beryllium	0.42	0.35	- -	- -	0.0001	7E-06	YES
Cadmium	4.50	ND	- -	- -	0.01	1E-04	YES
Chlordane	0.084	- -	- -	- -	0.002	7E-08	YES
Chromium /f/	18.10	46.1	- -	- -	- -	- -	NO
Copper	40.30	18.2	- -	- -	0.002	- -	NO
4,4'-DDT	0.022	- -	- -		0.00006	5E-09	NO
Lead	80.10	51.8	- -	240	- -	- -	NO
Mercury	0.63	0.12	- -	- -	0.003	- -	NO
Methylene chloride	0.003	- -	- -	- -	0.00000007	3E-11	NO
Nickel	16.10	58	- -	- -	- -	- -	NO
Total cPAH	0.0033	- -	- -	- -	2E-07	- -	NO

Table 4.9a. Selection of COPCs for Chemicals Detected in Surface Soil (0 to 2 feet bgs) /a/
Sites 16 and 17, Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Cancer Risk	COPC (Yes/No)
TCDD-TE	2.79E-06	- -	- -	- -	- -	3E-07	YES
Zinc	1730.00	75.8	0.35	- -	- -	- -	NO

COPCs	Chemicals of potential concern.
bgs	Below ground surface.
mg/kg	Milligrams per kilogram.
- -	Not applicable or not available.
ND	Not detected.
TCDD-TE	2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
2.79E-06	2.79 x 10^-6.

/a/ See Section 4.3 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 4.2a.
/c/ Estimated daily dose (see Section 4.3 for explanation). The EDD for zinc was compared to the Recommended Daily Allowance for zinc of 5 to10 mg/day (National Research Council, 1989).
/d/ Health based screening level for a child receptor (Harding Lawson Associates, Draft Technical Memorandum, Preliminary Remediation Goals, Fort Ord, California, June 14, 1993).
/e/ See Table C5 of Appendix C for development of screening values.
/f/ Evaluated as chromium III. Chromium VI was not detected.

Table 4.9b. Selection of COPCs for Chemicals Detected in Subsurface Soil (0 to 10 feet bgs) /a/
Sites 16 and 17, Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration 0 to 10 feet bgs (mg/kg)	Maximum Concentration 0 to 2 feet bgs (Metals Only) (mg/kg)	Background Concentration 0 to 2 feet bgs (mg/kg)	Maximum Concentration 2 to 10 feet bgs (Metals Only) (mg/kg)	Background Concentration >2 feet bgs (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Acetone	0.034	--	--	--	--	--	--	0.0000005	--	NO
Antimony	0.67	0.67	ND	ND	8.2	--	--	0.002	--	NO
Arsenic	3.7	3.7	3.4	2.1	4.5	--	--	0.02	8E-05	YES
B(a)P-TE	0.00033	--	--	--	--	--	--	--	2E-09	NO
Beryllium	0.45	0.42	0.35	0.45	0.48	--	--	0.0001	7E-06	YES
Cadmium	4.5	4.5	ND	1.5	1.90	--	--	0.01	1E-04	YES
Chlordane	0.084	--	--	--	--	--	--	0.002	7E-08	YES
Chromium /f/	18.1	18.1	46.1	17.4	22.7	--	--	--	--	NO
Copper	40.3	40.3	18.2	36.3	8.2	--	--	0.002	--	NO
4,4'-DDT	0.022	--	--	--	--	--	--	0.00006	5E-09	NO
Lead	80.1	80.1	51.8	23.6	3.7	--	240	--	--	NO
Mercury	0.63	0.63	0.12	ND	ND	--	--	0.003	--	NO
Methyl ethyl ketone	0.0091	--	--	--	--	--	--	0.00000002	--	NO
Methylene chloride	0.0034	--	--	--	--	--	--	0.00000008	3E-11	NO
Nickel	16.1	16.1	58	14.2	19.5	--	--	--	--	NO
TCDD-TE	2.79E-06	--	--	--	--	--	--	--	3E-07	YES

Table 4.9b. Selection of COPCs for Chemicals Detected in Subsurface Soil (0 to 10 feet bgs) /a/
Sites 16 and 17, Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration 0 to 10 feet bgs (mg/kg)	Maximum Concentration 0 to 2 feet bgs (Metals Only) (mg/kg)	Background Concentration 0 to 2 feet bgs (mg/kg)	Maximum Concentration 2 to 10 feet bgs (Metals Only) (mg/kg)	Background Concentration >2 feet bgs (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Total Carcinogenic PAH	0.003	--	--	--	--	--	--	2E-07	--	NO
Zinc	1730	1730	75.8	85.0	13.9	0.35	--	--	--	NO

COPCs — Chemicals of potential concern
bgs — Below ground surface.
mg/kg — Milligrams per kilogram.
-- — Not applicable or not available.
2.79E-06 — 2.79 x 10^-6.

/a/ See Section 4.3 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 4.2b.
/c/ Estimated daily dose (see Appendix B for explanation). The EDD for zinc was compared to the Recommended Daily Allowance for zinc of 5 to 10 mg/day (National Research Council, 1989).
/d/ Health based screening level for a child receptor (Harding Lawson Associates, Draft Technical Memorandum, Preliminary Remediation Goals, Fort Ord, California, June 14, 1993).
/e/ See Table C5 of Appendix C for development of screening values.
/f/ Evaluated as chromium III. Chromium VI was not detected.

Table 4.10a. Selection of COPCs for Chemicals Detected in Surface Soil (0 to 2 feet bgs) /a/
Sites 16 and 17, Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Antimony	6.90	ND	- -	- -	0.02	- -	YES
Arsenic	6.40	3.4	- -	- -	0.03	1E-04	YES
Benzo(ghi)perylene	0.0083	- -	- -	- -	0.0000003	- -	NO
Beryllium	0.19	0.35	- -	- -	- -	- -	NO
Bis(2-ethylhexyl)phthalate	0.096	- -	- -	- -	0.000007	8E-10	NO
Cadmium	1.70	ND	- -	- -	0.005	4E-05	YES
Chlordane	0.063	- -	- -	- -	0.002	5E-08	YES
Chromium /f/	25.10	46.1	- -	- -	- -	- -	NO
Copper	443.00	18.2	- -	- -	0.02	- -	YES
4,4'-DDD	0.020	- -	- -	- -	- -	3E-09	NO
4,4'-DDT	0.076	- -	- -	- -	0.0002	2E-08	YES
Lead	741.00	51.8	- -	240	- -	- -	YES
Mercury	0.25	0.12	- -	- -	0.001	- -	NO
Nickel	20.20	58	- -	- -	- -	- -	NO
Silver	1.20	0.36	- -	- -	0.0003	- -	NO
TCDD-TE	2.20E-06	- -	- -	- -	- -	2E-07	YES

Table 4.10a. Selection of COPCs for Chemicals Detected in Surface Soil (0 to 2 feet bgs) /a/
Sites 16 and 17, Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Trichloroethene	0.068	- -	- -	- -	- -	6E-10	NO
Zinc	1030.00	75.8	0.21	- -	- -	- -	NO

COPC — Chemicals of potential concern.
bgs — Below ground surface.
mg/kg — Milligrams per kilogram.
- - — Not applicable or not available.
1E-04 — 1 x 10^-04.
ND — Not detected.

/a/ See Section 4.3 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 4.3a.
/c/ Estimated daily dose (see Appendix B for explanation). The EDD for zinc was compared to the Recommended Daily Allowance for zinc of 5 to 10 mg/day (National Research Council, 1989).
/d/ Health based screening level for a child receptor (Harding Lawson Associates, Draft Technical Memorandum, Preliminary Remediation Goals, Fort Ord, California, June 14, 1993).
/e/ See Table C6 of Appendix C for development of screening values.
/f/ Evaluated as chromium III. Chromium VI was not detected.

Table 4.10b. Selection of COPCs for Chemicals Detected in Subsurface Soil (0 to 10 feet bgs) /a/
Sites 16 and 17, Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration 0 to 10 feet bgs (mg/kg)	Maximum Concentration 0 to 2 feet bgs (Metals Only) (mg/kg)	Background Concentration 0 to 2 feet bgs (mg/kg)	Maximum Concentration 2 to 10 feet bgs (Metals Only) (mg/kg)	Background Concentration >2 feet bgs (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Antimony	6.9	6.9	ND	3.4	8.2	--	--	0.03	--	YES
Arsenic	6.4	6.4	3.4	3.3	4.5	--	--	0.03	1E-04	YES
Benzo(ghi)perylene	0.0083	--	--	--	--	--	--	0.0000003	--	NO
Beryllium	0.25	0.19	0.35	0.25	0.48	--	--	--	--	NO
Bis(2-ethylhexyl)phthalate	0.096	--	--	--	--	--	--	0.000007	8E-10	NO
Cadmium	1.7	1.7	ND	1.1	1.9	--	--	0.005	4E-06	YES
Chlordane	0.063	--	--	--	--	--	--	0.002	5E-08	YES
Chromium /f/	25.1	25.1	46.1	24.7	22.7	--	--	0.00004	--	NO
Copper	443	443	18.2	185	8.2	--	--	0.02	--	YES
4,4'-DDD	0.02	--	--	--	--	--	--	--	3E-09	NO
4,4'-DDT	0.076	--	--	--	--	--	--	0.0002	2E-08	YES
Lead	741	741	51.8	475	3.7	--	240	--	--	YES
Mercury	0.25	0.25	0.12	ND	ND	--	--	0.001	--	NO
Nickel	25.1	20.2	58	25.1	19.5	--	--	0.002	3E-05	YES
Pentachlorophenol	0.088	--	--	--	--	--	--	0.000004	7E-09	NO
Silver	1.2	1.2	0.36	ND	0.49	--	--	0.0003	--	NO
TCDD-TE	2.18E-05	--	--	--	--	--	--	--	2E-06	YES
Tetrachloroethene	0.0064	--	--	--	--	--	--	0.0000009	2E-10	NO
Toluene	0.0012	--	--	--	--	--	--	0.000000009	--	NO

Table 4.10b. Selection of COPCs for Chemicals Detected in Subsurface Soil (0 to 10 feet bgs) /a/
Sites 16 and 17, Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration 0 to 10 feet bgs (mg/kg)	Maximum Concentration 0 to 2 feet bgs (Metals Only) (mg/kg)	Background Concentration 0 to 2 feet bgs (mg/kg)	Maximum Concentration 2 to 10 feet bgs (Metals Only) (mg/kg)	Background Concentration >2 feet bgs (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Trichloroethene	0.068	- -	- -	- -	- -	- -	- -	0.00002	6E-10	NO
Zinc	1030	1030	75.8	678	13.9	0.21	- -	- -	- -	NO

COPCs Chemicals of Potential Concern.
bgs Below ground surface.
mg/kg Milligrams per kilogram.
-- Not applicable or not available.
TCDD-TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
1E-04 1 x 10^-4.
ND Not detected.

/a/ See Section 4.3 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 4.3b.
/c/ Estimated daily dose (see Appendix B for explanation). The EDD for zinc was compared to the Recommended Daily Allowance for zinc of 5 to 10 mg/day (National Research Council, 1989).
/d/ Health based screening level for a child receptor (Harding Lawson Associates, Draft Technical Memorandum, Preliminary Remediation Goals, Fort Ord, California, June 14, 1993).
/e/ See Table C6 of Appendix C for development of screening values.
/f/ Evaluated as chromium III. Chromium VI was not detected.

Table 4.11a. Selection of COPCs for Chemicals Detected in Surface Soil (0 to 2 feet bgs) /a/
Sites 16 and 17, Site 17 Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Acetone	0.0088	--	--	--	0.0000001	--	NO
Antimony	0.72	--	--	--	0.003	--	NO
Arsenic	1.40	3.4	--	--	--	--	NO
Beryllium	0.24	0.35	--	--	--	--	NO
Chromium /f/	15.20	46.1	--	--	--	--	NO
Copper	10.50	18.2	--	--	--	--	NO
Lead	29.00	51.8	--	--	--	--	NO
Mercury	0.13	0.12	--	--	0.0006	--	NO
Nickel	11.60	58	--	--	--	--	NO
TCDD-TE	4.06E-06	--	--	--	--	4E-07	YES
Zinc	39.80	75.8	--	--	--	--	NO

COPC	Chemicals of potential concern.
bgs	Below ground surface.
mg/kg	Milligrams per kilogram.
- -	Not applicable or not available.
TCDD-TE	2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
4.06E-06	4.06 x 10^-6.

/a/ See Section 4.3 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 4.4a.
/c/ Estimated daily dose (see Section 4.3 for explanation). The EDD was compared to the Recommended Daily Allowance for various essential nutrients (National Research Council, 1989).
/d/ Health based screening level for a child receptor (Harding Lawson Associates, Draft Technical Memorandum, Preliminary Remediation Goals, Fort Ord, California, June 14, 1993).
/e/ See Table C7 of Appendix C for development of screening values.
/f/ Evaluated as chromium III. Chromium VI was not detected.

Table 4.11b. Selection of COPCs for Chemicals Detected in Subsurface Soil (0 to 10 feet bgs) /a/
Sites 16 and 17, Site 17 Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration 0 to 10 feet bgs (mg/kg)	Maximum Concentration 0 to 2 feet bgs (Metals Only) (mg/kg)	Background Concentration 0 to 2 feet bgs (mg/kg)	Maximum Concentration 2 to 10 feet bgs (Metals Only) (mg/kg)	Background Concentration >2 feet bgs (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Acetone	0.031	--	--	--	--	--	--	0.0000004	--	NO
Antimony	5.5	0.72	ND	5.5	8.2	--	--	0.02	--	YES
Arsenic	13.1	1.4	3.4	13.1	4.5	--	--	0.06	3E-04	YES
Beryllium	0.25	0.24	0.35	0.25	0.48	--	--	--	--	NO
Bis(2-ethylhexyl)phthalate	0.13	--	--	--	--	--	--	0.000009	1E-09	NO
Cadmium	3.2	ND	ND	3.2	1.9	--	--	0.009	7E-05	YES
Chromium /f/	52.7	15.2	46.1	52.7	22.7	--	--	0.00008	--	NO
Copper	257	10.5	18.2	257	8.2	--	--	0.01	--	YES
Lead	442	29.0	51.8	442	3.7	--	240	--	--	YES
Mercury	7.5	0.13	0.12	7.5	ND	--	--	0.04	--	YES
Methylene chloride	0.0035	--	--	--	--	--	--	0.00000008	3E-11	NO
Nickel	170	11.6	58	170	19.5	--	--	0.01	2E-04	YES
Selenium	1.2	ND	NA	1.2	NA	--	--	0.0003	--	NO
Silver	4.8	ND	0.36	4.8	0.49	--	--	0.001	--	NO

Table 4.11b. Selection of COPCs for Chemicals Detected in Subsurface Soil (0 to 10 feet bgs) /a/
Sites 16 and 17, Site 17 Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration 0 to 10 feet bgs (mg/kg)	Maximum Concentration 0 to 2 feet bgs (Metals Only) (mg/kg)	Background Concentration 0 to 2 feet bgs (mg/kg)	Maximum Concentration 2 to 10 feet bgs (Metals Only) (mg/kg)	Background Concentration >2 feet bgs (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
TCDD-TE	3.02E-05	- -	- -	- -	- -	- -	- -	- -	3E-06	YES
Zinc	673	39.8	75.8	673	13.9	0.13	- -	- -	- -	NO

COPCs Chemicals of potential concern.
bgs Below ground surface.
mg/kg Milligrams per kilogram.
-- Not applicable or not available.
3E-04 3 x 10^-4.
TCDD-TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.

/a/ See Section 4.3 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 4.4b.
/c/ Estimated daily dose (see Section 4.3 for explanation). The EDD for zinc was compared to the Recommended Daily Allowance for zinc of 5 to 10 mg/day (National Research Council, 1989).
/d/ Health based screening level for a child receptor (Harding Lawson Associates, Draft Technical Memorandum, Preliminary Remediation Goals, Fort Ord, California, June 14, 1993).
/e/ See Table C7 of Appendix C for development of screening values.
/f/ Evaluated as chromium III. Chromium VI was not detected.

Table 4.12. Selection of COPCs for Chemicals Detected in Groundwater, A-Aquifer /a/
Sites 16 and 17
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/l)	Essential Nutrient EDD /c/	Screening Results /d/ Hazard Quotient	Screening Results /d/ Cancer Risk	COPC (Yes/No)
Antimony	0.0096	--	0.7	--	YES
Tetrachloroethene	0.0019	--	0.005	1E-06	YES
Toluene	0.0011	--	0.0002	--	NO
Trichloroethene	0.0022	--	0.01	4E-07	YES
Zinc	0.0396	0.040	--	--	NO

COPCs Chemicals of potential concern.
mg/l Milligrams per liter.
-- Not applicable or not available.
1E-06 1 x 10^-6.

/a/ See Section 4.3 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 4.6.
/c/ Estimated daily dose (see Appendix B for explanation). This was compared to the Recommended Daily Allowance of 5 to 10 mg/day (National Research Council, 1989).
/d/ See Table C8 of Appendix C for development of screening values.

Table 4.13. Selection of COPCs for Chemicals Detected in Groundwater, Upper 180-Foot Aquifer /a/
Sites 16 and 17
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/l)	Screening Results /c/ Hazard Quotient	Screening Results /c/ Cancer Risk	COPC (Yes/No)
Carbon tetrachloride	0.00110	0.04	2E-06	YES
Tetrachloroethene	0.00074	0.002	5E-07	YES
Toluene	0.00048	0.00007	--	NO
Trichloroethene	0.00058	0.003	1E-07	YES

COPCs Chemicals of potential concern.
mg/l Milligrams per liter.
-- Not applicable or not available.
2E-06 2 x 10^-6.

/a/ See Appendix B for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 4.7.
/c/ See Table C8 of Appendix C for development of screening values.

Table Revisions
Volume III, Sites 16 and 17
Table 4.14

In Volume III, Sites 16 and 17, in Table 4.14 of pages 1 and 2 replace "*Student Resident*" with "*Student/Faculty Artist.*"

Table 4.14. Site-Specific Intake Assumptions /a/
Sites 16 and 17
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Site Area Scenario/Receptor	Intake Assumptions: Exposure Time ET (hours/day)	Fraction of Intake FI (unitless)	Exposure Frequency EF (days/year)	Exposure Duration ED (years)
DOL Maintenance Yard				
Average Scenario				
Commercial Worker	8	0.5	250	10
Construction Worker	8	0.5	30	1
RME Scenario				
Commercial Worker	8	1	250	25
Construction Worker	8	1	250	1
Pete's Pond				
Average Scenario				
Student Resident	0.25	0.05	230	3
Utility Worker	8	0.05	20	1
RME Scenario				
Student Resident	0.25	0.10	300	5
Utility Worker	8	1.00	30	1
Pete's Pond Extension				
Average Scenario				
Student Resident	0.25	0.05	230	3
Utility Worker	8	0.5	20	1
RME Scenario				
Student Resident	0.25	0.10	300	5
Utility Worker	8	1	30	1

Table 4.14. Site-Specific Intake Assumptions /a/
Sites 16 and 17
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Site Area Scenario/Receptor	Intake Assumptions Exposure Time ET (hours/day)	Fraction of Intake FI (unitless)	Exposure Frequency EF (days/year)	Exposure Duration ED (years)
Site 17 Disposal Area				
Average Scenario				
Student Resident	20	0.4	230	3
Construction Worker	8	0.5	30	1
RME Scenario				
Student Resident	20	0.8	300	5
Construction Worker	8	1	250	1

RME Reasonable maximum exposure.

/a/ See Section 6.4.3 for explanation.

Table 4.15. Exposure Point Concentrations (EPCs) for Soil and Air
Sites 16 and 17, DOL Maintenance Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Soil Depth Chemicals of Potential Concern	Average Exposure Scenario Soil Concentration /a/ (mg/kg)	Average Exposure Scenario Air Concentration /b/ (mg/m^3)	RME Scenario Soil Concentration /c/ (mg/kg)	RME Scenario Air Concentration /b/ (mg/m^3)
Surface Soil (0-2 feet bgs)				
Arsenic	8.73E+00	1.00E-07	2.23E+01	2.56E-07
Cadmium	1.10E+00	1.27E-08	2.40E+00	2.76E-08
TCDD-TE	2.09E-06	2.40E-14	5.76E-06	6.62E-14
Subsurface Soil (0-10 feet bgs)				
Arsenic	3.15E+00	3.62E-08	1.57E+01	1.80E-07
Bis(2-ethylhexyl)phthalate	1.15E+00	1.32E-08	3.72E+00	4.27E-08
Cadmium	5.20E-01	5.98E-09	1.75E+00	2.01E-08
TCDD-TE	2.09E-06	2.40E-14	5.76E-06	6.62E-14

RME Reasonable maximum Exposure.
mg/kg Milligrams per kilogram.
mg/m^3 Milligrams per cubic meter.
bgs Below ground surface.
TCDD-TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
8.73E+00 8.73 x 10^+00.
PM10 Particles with a diameter less than or equal to 10 microns.

/a/ Arithmetic mean.
/b/ Air concentration (mg/m^3) = soil concentration (mg/kg) x site-specific PM10 (1.15E-2 mg/m^3) x conversion factor (1E-6 kg/mg).
/c/ Lesser of the maximum concentration and 95 percent upper confidence limit of the arithmetic mean.

Table 4.16. Exposure Point Concentrations (EPCs) for Soil and Air
Sites 16 and 17, Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Soil Depth / Chemicals of Potential Concern	Average Exposure Scenario		RME Scenario	
	Soil Concentration /a/ (mg/kg)	Air Concentration /b/ (mg/m³)	Soil Concentration /c/ (mg/kg)	Air Concentration /b/ (mg/m³)
Surface Soil (0-2 feet bgs)				
Arsenic	1.56E+00	1.79E-08	3.27E+00	3.76E-08
Beryllium	1.40E-01	1.61E-09	3.20E-01	3.68E-09
Cadmium	1.21E+00	1.39E-08	4.09E+00	4.70E-08
Chlordane	5.40E-02	6.21E-10	8.40E-02	9.66E-10
TCDD-TE	1.12E-06	1.29E-14	2.79E-06	3.21E-14
Subsurface Soil (0-10 feet bgs)				
Arsenic	1.08E+00	1.24E-08	2.47E+00	2.84E-08
Beryllium	1.90E-01	2.19E-09	4.00E-01	4.60E-09
Cadmium	6.70E-01	7.71E-09	2.57E+00	2.96E-08
Chlordane	5.17E-02	5.95E-10	8.40E-02	9.66E-10
TCDD-TE	1.12E-06	1.29E-14	2.79E-06	3.21E-14

RME — Reasonable maximum Exposure.
mg/kg — Milligrams per kilogram.
mg/m³ — Milligrams per cubic meter.
bgs — Below ground surface.
TCDD-TE — 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
1.56E+00 — 1.56 x 10^+00.
PM10 — Particles with a diameter less than or equal to 10 microns.

/a/ Arithmetic mean.
/b/ Air concentration (mg/m³) = soil concentration (mg/kg) x site-specific PM10 (1.15E-2 mg/m³) x conversion factor (1E-6 kg/mg).
/c/ Lesser of the maximum concentration and 95 percent upper confidence limit of the arithmetic mean.

Table 4.17. Exposure Point Concentrations (EPCs) for Soil and Air
Sites 16 and 17, Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Soil Depth / Chemicals of Potential Concern	Average Exposure Scenario: Soil Concentration /a/ (mg/kg)	Average Exposure Scenario: Air Concentration /b/ (mg/m³)	RME Scenario: Soil Concentration /c/ (mg/kg)	RME Scenario: Air Concentration /b/ (mg/m³)
Surface Soil (0-2 feet bgs)				
Antimony	1.54E+00	1.77E-08	5.77E+00	6.64E-08
Arsenic	1.96E+00	2.25E-08	4.81E+00	5.53E-08
Cadmium	6.50E-01	7.48E-09	1.38E+00	1.59E-08
Chlordane	4.97E-02	5.71E-10	6.30E-02	7.25E-10
Copper	5.63E+01	6.47E-07	2.91E+02	3.34E-06
4,4'-DDT	3.14E-02	3.61E-10	7.60E-02	8.74E-10
Lead	1.23E+02	1.42E-06	5.66E+02	6.51E-06
TCDD-TE	1.25E-06	1.44E-14	2.20E-06	2.53E-14
Subsurface Soil (0-10 feet bgs)				
Antimony	1.00E+00	1.15E-08	4.16E+00	4.78E-08
Arsenic	1.50E+00	1.73E-08	3.77E+00	4.34E-08
Cadmium	5.30E-01	6.10E-09	1.08E+00	1.24E-08
Chlordane	4.97E-02	5.71E-10	6.30E-02	7.25E-10
Copper	3.54E+01	4.07E-07	2.01E+02	2.31E-06
4,4'-DDT	3.14E-02	3.61E-10	7.60E-02	8.74E-10
Lead	7.72E+01	8.88E-07	4.08E+02	4.70E-06
Nickel	1.18E+01	1.36E-07	1.91E+01	2.20E-07
TCDD-TE	5.15E-06	5.92E-14	2.18E-05	2.51E-13

RME Reasonable maximum exposure.
mg/kg Milligrams per kilogram.
mg/m³ Milligrams per cubic meter.
bgs Below ground surface.
TCDD-TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
1.54E+00 1.54 x 10 ^ +00.
PM10 Particles with a diameter less than or equal to 10 microns.

/a/ Arithmetic mean.
/b/ Air concentration (mg/m³) = soil concentration (mg/kg) x site-specific PM10 (1.15E-2 mg/m³) x conversion factor (1E-6 kg/mg).
/c/ Lesser of the maximum concentration and 95 percent upper confidence limit of the arithmetic mean.

Table 4.18. Exposure Point Concentrations (EPCs) for Soil and Air
Sites 16 and 17, Site 17 Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Soil Depth	Average Exposure Scenario		RME Scenario	
Chemicals of Potential Concern	Soil Concentration /a/ (mg/kg)	Air Concentration /b/ (mg/m³)	Soil Concentration /c/ (mg/kg)	Air Concentration /b/ (mg/m³)
Surface Soil (0-2 feet bgs)				
TCDD-TE	1.77E-06	2.04E-14	4.06E-06	4.67E-14
Subsurface Soil (0-10 feet bgs)				
Antimony	1.51E+00	1.74E-08	4.27E+00	4.91E-08
Arsenic	1.60E+00	1.84E-08	6.52E+00	7.50E-08
Cadmium	5.20E-01	5.98E-09	1.53E+00	1.76E-08
Copper	2.21E+01	2.54E-07	1.37E+02	1.57E-06
Lead	5.22E+01	6.01E-07	2.82E+02	3.24E-06
Mercury	5.00E-01	5.75E-09	3.38E+00	3.89E-08
Nickel	1.79E+01	2.06E-07	8.30E+01	9.55E-07
TCDD-TE	7.11E-06	8.18E-14	3.02E-05	3.47E-13

RME	Reasonable maximum exposure.
mg/kg	Milligrams per kilogram.
mg/m³	Milligrams per cubic meter.
bgs	Below ground surface.
TCDD-TE	2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
1.77E-06	1.77 x 10^-6.
PM10	Particles with a diameter less than or equal to 10 microns.

/a/ Arithmetic mean.
/b/ Air concentration (mg/m³) = soil concentration (mg/kg) x site-specific PM10 (1.15E-2 mg/m³) x conversion factor (1E-6 kg/mg).
/c/ Lesser of the maximum concentration and 95 percent upper confidence limit of the arithmetic mean.

Table 4.21. Total Hazard Index (HI), Utility Worker Receptor /a/
Sites 16 and 17
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario / Receptor Location	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Total HI
Average Scenario				
Pete's Pond	0.0001	0.00003	<0.000001	0.0001
Pete's Pond Extension	0.0002	0.00004	<0.000001	0.0003
RME Scenario				
Pete's Pond	0.008	0.0007	0.000002	0.009
Pete's Pond Extension	0.02	0.004	0.000004	0.02

RME Reasonable maximum exposure.

/a/ Chemical-specific hazard quotients are presented in Tables E16 - E19 (Appendix E).

Table 4.22. Total Hazard Index (HI), Construction Worker Receptor /a/
Sites 16 and 17
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario / Receptor Location	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Total HI
Average Scenario				
Site 17 Disposal Area	0.0004	0.00006	0.000003	0.0005
DOL Maintentance Yard	0.0003	0.00008	0.000002	0.0004
RME Scenario				
Site 17 Disposal Area	0.3	0.02	0.0002	0.3
DOL Maintentance Yard	0.3	0.03	0.0002	0.3

RME Reasonable maximum exposure.

/a/ Chemical-specific hazard quotients are presented in Tables E20 - E23 (Appendix E).

Table 4.23. Total Hazard Index (HI), Commercial Worker Receptor /a/
Sites 16 and 17
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario / Receptor Location	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Total HI
Average Scenario				
DOL Maintenance Yard	0.008	0.002	0.00002	0.009
RME Scenario				
DOL Maintenance Yard	0.04	0.04	0.00009	0.08

RME Reasonable maximum exposure.

/a/ Chemical-specific hazard quotients are presented in Tables E24 - E25 (Appendix E).

Table 4.24-R. Total Cancer Risk by Area, Student Resident Receptor /a/
Sites 16 and 17
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario Receptor Location	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Ingestion of Groundwater /b/	Inhalation of VOCs from Groundwater /b/	Total Risk by Area /b/
Average Scenario						
Pete's Pond	6.21E-09	1.31E-09	6.58E-11	NA	NA	8E-09
Pete's Pond Extension	5.77E-09	1.48E-09	6.03E-11	NA	NA	7E-09
Site 17 Disposal Area	1.47E-09	2.87E-10	1.30E-11	8.02E-08 (2.10E-08)	7.90E-08 (1.91E-08)	2E-07 (4E-08)
Pathway Totals	1E-08	3E-09	1E-10	8E-08 (2E-08)	8E-08 (2E-08)	
Total Risk						2E-07 (4E-08)
RME Scenario						
Pete's Pond	3.46E-07	1.61E-07	1.71E-09	NA	NA	5E-07
Pete's Pond Extension	3.63E-07	2.07E-07	1.41E-09	NA	NA	6E-07
Site 17 Disposal Area	8.77E-08	3.85E-08	5.88E-10	1.77E-06 (1.09E-06)	1.75E-06 (9.98E-07)	5E-06 (2E-06)
Pathway Totals	8E-07	4E-07	4E-09	2E-06 (1E-06)	2E-06 (1E-06)	
Total Risk						6E-06 (2E-06)

3.71E-09 — 3.71 x 10^-9.
NA — Not available/pathway not evaluated.
RME — Reasonable maximum exposure.

/a/ Chemical-specific risks are presented in Tables E8 - E15 (Appendix E).
/b/ Exposure to COPCs in groundwater were evaluated separately for the Upper 180-foot and A-aquifers. Risks for exposures to COPCs in the A-aquifer are presented in parentheses beside the risks for exposure to COPCs in the 180-foot aquifer. See Section 4.6.2.1.

Table 4.25. Total Cancer Risk, Utility Worker Receptor /a/
Sites 16 and 17
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario Receptor Location	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Total Risk
Average Scenario				
Pete's Pond	9.40E-10	1.77E-10	2.40E-11	1E-09
Pete's Pond Extension	8.49E-10	2.13E-10	3.59E-11	1E-09
RME Scenario				
Pete's Pond	5.96E-08	5.29E-09	1.54E-10	7E-08
Pete's Pond Extension	6.53E-08	7.46E-09	1.80E-10	7E-08

9.40E-10 — 9.40 x 10^-10.
RME — Reasonable maximum exposure.

/a/ Chemical-specific risks are presented in Tables E16 - E19 (Appendix E).

Table 4.26. Total Cancer Risk, Construction Worker Receptor /a/
Sites 16 and 17
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario Receptor Location	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Total Risk
Average Scenario				
Site 17 Disposal Area	1.36E-09	3.35E-10	1.06E-10	2E-09
DOL Maintenance Yard	2.37E-09	6.02E-10	1.20E-10	3E-09
RME Scenario				
Site 17 Disposal Area	8.97E-07	1.02E-07	7.74E-09	1E-06
DOL Maintenance Yard	1.87E-06	2.25E-07	1.01E-08	2E-06

1.36E-09 1.36 x 10^-9.
RME Reasonable maximum exposure.

/a/ Chemical-specific risks are presented in Tables E20 - E23 (Appendix E).

Table 4.19. Exposure Point Concentrations (EPCs) for Groundwater
Sites 16 and 17, Site 17 Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Aquifer Chemicals of Potential Concern	Average Scenario Groundwater Concentration /a/ (mg/l)	RME Scenario Groundwater Concentration /b/ (mg/l)
A-Aquifer		
Antimony	6.60E-03	9.60E-03
Tetrachloroethene	6.20E-04	1.90E-03
Trichloroethene	8.00E-04	2.20E-03
180-Foot Aquifer		
Carbon tetrachloride	9.20E-04	1.10E-03
Tetrachloroethene	4.10E-04	7.40E-04
Trichloroethene	5.00E-04	5.80E-04

RME Reasonable maximum exposure.
mg/l Milligrams per liter.
6.60E-03 6.60 x 10^-3.

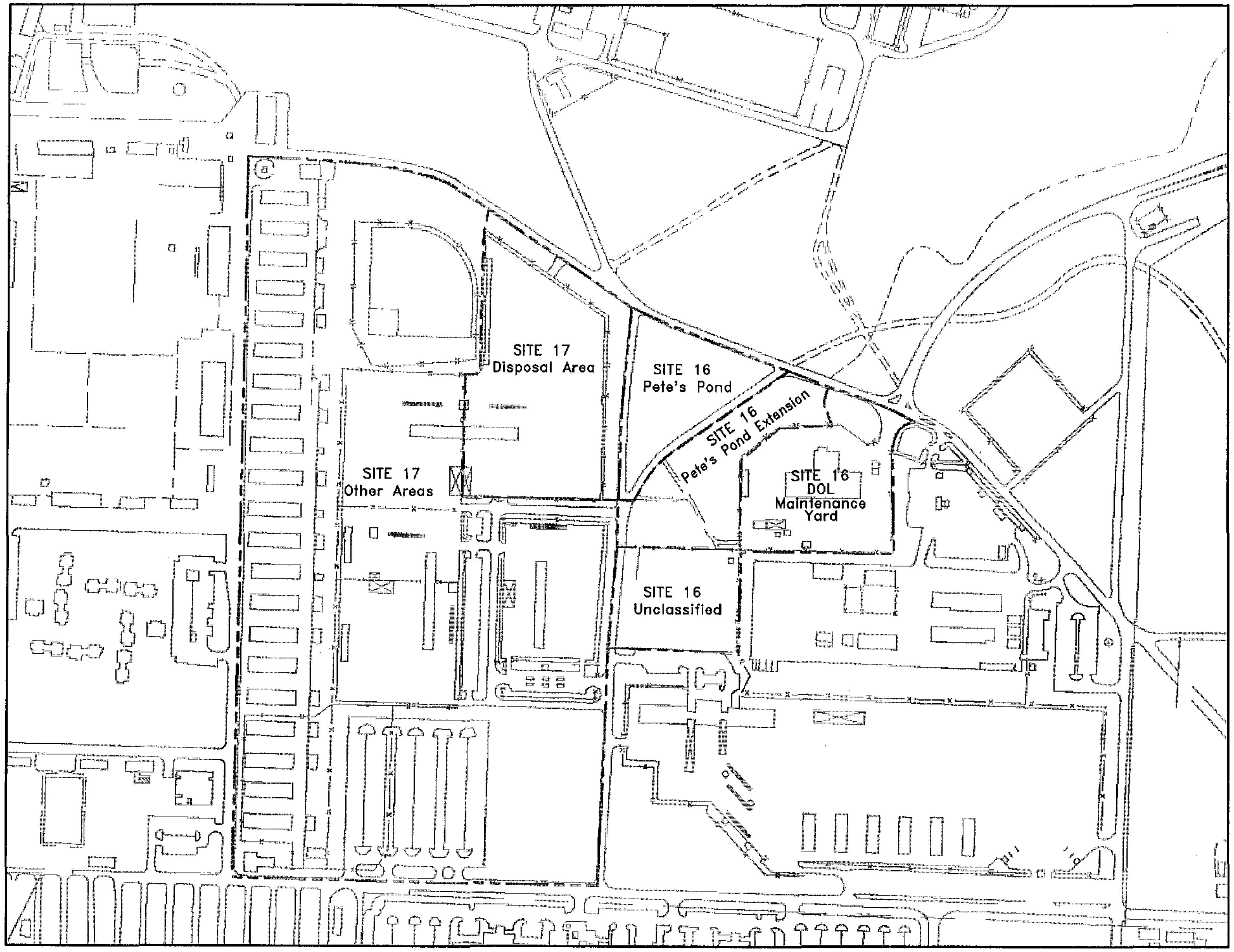
/a/ Arithmetic mean.
/b/ Lesser of the maximum concentration and 95 percent upper confidence limit of the arithmetic mean.

Table 4.20-R. Total Hazard Index (HI) by Area, Student Resident Receptor /a/
Sites 16 and 17
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario / Receptor Location	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Ingestion of Groundwater /b/		Inhalation of VOCs from Groundwater /b/		Total HIs by Area /b/	
Average Scenario									
Pete's Pond	0.0002	0.00004	<0.000001	NA		NA		0.0002	
Pete's Pond Extension	0.0003	0.00006	<0.000001	NA		NA		0.0004	
Site 17 Disposal Area /c/	NA	NA	NA	0.01	(0.1)	0.01	(0.1)	0.02	(0.2)
Pathway Totals	0.001	0.0001	<0.000001	0.01	(0.1)	0.01	(0.1)		
Total Multipathway HI								0.02	(0.2)
RME Scenario									
Pete's Pond	0.002	0.001	<0.000001	NA		NA		0.003	
Pete's Pond Extension	0.005	0.002	0.000002	NA		NA		0.007	
Site 17 Disposal Area /c/	NA	NA	NA	0.04	(0.5)	0.04	(0.5)	0.08	(1)
Pathway Totals	0.007	0.003	0.000002	0.04	(0.5)	0.04	(0.5)		
Total Multipathway HI								0.09	(1)

NA Not available.
RME Reasonable maximum exposure.

/a/ Chemical-specific hazard quotients are presented in Tables E8 - E15 (Appendix E).
/b/ Exposures to COPCs in groundwater were evaluated separately for the Upper 180-foot and A-aquifers. Hazard indices for exposures to COPCs in the A-aquifer are presented in parentheses beside the hazard indices for exposures to COPCs in the 180-foot aquifer. See Section 4.6.1.1.
/c/ Potential noncarcinogenic health effects were not evaluated for soil pathways at the Site 17 Disposal Area because the one chemical of potential concern in soil, 2,3,7,8-TCDD toxic equivalents (TCDD-TE), has a carcinogenic slope factor but no available noncancer reference dose.



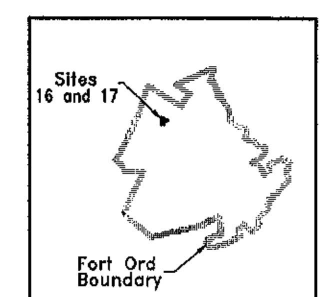
EXPLANATION

SITE BOUNDARY

AREA BOUNDARY

BUILDING

FENCE



KEY MAP

200 0 200 400

SCALE IN FEET

N

NO.	DATE	REVISIONS	HLA FILE NO.	PROJECT NO.	APPROVED	APPROVAL DATE	DRAWN BY
1	7/94	DRAFT	23366265	23366 04162			MEK
2	12/94	DRAFT FINAL	23366265	23366 041723	MEC	11/22/94	MEK

Harding Lawson Associates
Engineering and
Environmental Services

Volume III – Baseline Risk Assessment
Basewide RI/FS
Fort Ord, California

Site Plan
Sites 16 and 17

PLATE:
4.1

5.0 BASELINE RISK ASSESSMENT FOR SITE 3

The baseline risk assessment for Site 3, the former Beach Trainfire Range, is presented in this section. This BRA follows the methodology presented in Section 2.0, with any deviations from these methods identified in the sections that follow.

5.1 Background

This section briefly summarizes background information on site history and the physical setting, past and planned future potential land uses, and the human populations near Site 3.

5.1.1 Physical Setting

Site 3 spans approximately 3.2 miles and occupies 780 acres along the western boundary of Fort Ord (Plate 1.1). The site is bordered to the south by Sand City, to the north by the city of Marina, to the west by Monterey Bay, and to the east by Highway 1. Most of the surface area of Site 3 is unpaved and vegetated, with dune sands present at the surface. The topography is controlled by a series of sand dunes that have been eroded on the west side by wind and waves, resulting in steep drops to the beach along Monterey Bay. Depth to groundwater ranges from approximately 20 (near the shoreline) to over 100 feet below ground surface (feet bgs). Small arms firing ranges, numbered 1 through 17, are scattered along the eastern half of the site. There are no firing ranges numbered 10 or 13. A former ammunition storage area is between ranges 3 and 4.

Stilwell Hall and two sewage treatment plants are the main on-site structures. Stilwell Hall is located in the central part of Site 3 and was formerly used as a recreational center. Stilwell Hall was 200 to 300 feet from the shoreline when it was built in the 1940s, but natural forces have eroded the shoreline cliffs so that Stilwell Hall is now adjacent to the shoreline. A seawall was constructed to protect the structure from the encroaching surf. The Ord Village Sewage Treatment Plant (STP) and Main Garrison STP lie within the Site 3 boundaries but are not considered part of Site 3 in the RI; these STPs are being investigated separately as Sites 1 and 2, respectively. Site 2 has been grouped with Site 12. Site 1 is still under investigation as one of the site elimination actions sites. Sewage is no longer treated at either of these plants but is instead pumped from Site 1 and gravity fed from Site 2 to the Monterey Regional Treatment Plant in the city of Marina.

Seven storm drain outfalls, which collect stormwater from the Main Garrison area of Fort Ord (east of Site 3), discharge either to the dune area or to the intertidal zone of Site 3: three outfalls discharge to the dunes near Range 11, Range 8, and Site 1; and four outfalls discharge to Monterey Bay in the surfzone. The storm drain outfalls were investigated as part of the Basewide Storm Drain and Sanitary Sewer Investigation (see the Remedial Investigation, Volume II, Section 2.5).

5.1.2 Land Use

Although not currently active, the site was used since the 1940s for small arms training. Activities at the Beach Trainfire Ranges consisted of firing hand-held weapons at targets located near the leeward (east-facing) dune faces. According to the California Department of Parks and Recreation, proposed future land use entails conversion to a limited-access state park that would include construction of hiking trails, hike-in/bike-in campgrounds, and boardwalks from proposed parking lots to the beaches (*Fax transmittal from Jay Verett, COE to Steve Farley, HLA May 2, 1994*). These boardwalks will be constructed to limit human impacts on the dunes.

5.1.3 Nearby Populations

The nearest resident populations are within 1/2 mile of the site in the city of Marina, which borders Site 3 to the northeast. In addition, U.S. Army personnel are on Fort Ord east of Site 3, across Highway 1 (Plate 5.1). Although

As shown on the tables, seven metals were detected in soil: antimony, chromium, copper, iron, lead, tin, and zinc. As discussed in the RI, the results of the leachate analyses suggest that metals have not migrated downward to groundwater aquifers beneath Site 3. A number of groundwater monitoring wells exist on and near Site 3; these wells were installed to evaluate the potential migration of chemicals from Sites 2 and 12. Therefore, Site 3 groundwater data are not considered appropriate to assess conditions related to past use of Site 3. In addition, because the leachate concentration of chemicals decreased with depth, and only two chemicals collected from the deepest samples (lead and iron) exceeded MCLs, no detected chemicals in sand at Site 3 are expected to be in the groundwater. As indicated in Section 5.1.1, depth to groundwater at the site ranges from approximately 20 (near the beaches) to over 100 feet bgs.

The data used for this BRA consist of soil samples collected from 20 test pit locations in Study Areas 1 and 2 at depths ranging from 0 to 2 feet bgs. Of all the data collected at Site 3, this subset represents a reasonable worst-case dataset. Given the likely future use of this site, it is assumed that humans would not likely be exposed to sand deeper than 2 feet bgs. Since measured concentrations of chemicals at Site 3 decrease with depth, any potential exposures to sand deeper than 2 feet bgs will pose a much lower risk than the exposures to surface soil estimated in this BRA.

Data collected at Site 3 were evaluated assuming two potential exposure scenarios. Soil data were analyzed to evaluate the possibility of a human receptor either walking randomly throughout Site 3 or walking exclusively within one of the three bullet distribution areas. Specific methods used to evaluate these are described below.

5.2.1 Weighted Surface Area Concentrations

Potential exposure by any potential human receptor at Site 3 is not expected to be limited to a single hotspot nor is it expected only in an area with little or no bullet cover. Rather, a hypothetical future receptor at the site would likely walk through areas of varying type. In addition, because over 90 percent contains little or no bullet cover and, therefore, has lower concentrations of chemicals, potential exposure to chemicals at Site 3 will likely not be at the maximum concentrations detected in the areas of heavy bullet cover.

Methods used to estimate site-related chemical concentrations representative of all three bullet distribution areas is described in the following text.

The concentrations of chemicals detected at Site 3 were weighted surface area, that is, weighted in proportion to the surface areas of Study Areas 1 and 2 having different percentages of bullet cover as follows:

- Four percent of the surface area has heavy bullet cover (≥10 percent)
- Five percent of the surface area has moderate bullet cover (1 to 10 percent)
- Ninety-one percent of the surface area has little or no bullet cover (<1 percent to none).

Weighting the chemical concentrations by transforming the data prior to statistical analysis takes into account variations in potential exposure that a receptor is likely to encounter at Site 3. Chemical concentrations for each sample were transformed using the following equation:

$$C_i\text{-}wx = \frac{Cs_i \times SA_x}{SA_t}$$

Where:

C_i-wx = Weighted surface area concentration of chemical i in mg/kg in category x, where "x" is one of the three categories of surface bullet cover: light (<1 percent or none), moderate (1 to 10 percent), and heavy (≥10 percent) (Table 5.1).

Cs_i = Absolute detected chemical concentration for chemical i in soil or one-half the detection limit for NDs (mg/kg) screening level (HBSL). As a result of this analysis, lead was retained as a COPC. The maximum weighted surface area concentration of 1852 mg/kg for lead is well above the HBSL of 240 mg/kg.

In the fourth step, any detected chemicals still remaining were evaluated using a toxicity screen as described in Section 2.1.2. The details of this screening analysis are discussed in Appendix C and presented in Table C9. This step eliminated chromium and tin, whose screening HQs are less than the target screening HQ of 0.01. The remaining chemicals, antimony, copper, and lead, were retained as COPCs for this BRA. Table 5.4a summarizes the criteria used in the selection of COPCs for the weighted surface area.

5.3.2 Bullet Distribution Areas

In the <1 percent area, copper, lead, zinc were below background levels. In the 1 to 10 percent area, zinc was below background levels. In the ≥10 percent area, only chromium was below background levels. These three chemicals were therefore eliminated as COPCs from their respective areas.

In the evaluation of chemicals as essential nutrients, the EDDs for iron and zinc for each of the three datasets (where applicable) were:

- 6.24 mg/day for iron in the <1 percent area
- 4.34 mg/day for iron in the 1 to 10 percent area
- 6.08 mg/day for iron and 0.43 mg/day for zinc in the ≥10 percent area.

Because the EDDs for iron were below the RDA of 6 to 10 mg/day at all three areas, iron was eliminated as a COPC. The EDD for zinc at the ≥10 percent area was below the RDA of 5 to 10 mg/day and was therefore eliminated as a COPC at this area.

The maximum concentrations of lead in the 1 to 10 percent area (32600 mg/kg) and the ≥10 percent area (46300 mg/kg) exceeded the HBSL of 240 mg/kg, so lead was retained as a COPC. In the <1 percent area, the maximum detected concentration of lead (43.2 mg/kg) was below the HBSL, so lead was eliminated as COPC.

Based on the toxicity screen, for the <1 percent area, the remaining detected chemical, chromium, was eliminated as a COPC. Chromium and tin were eliminated as COPCs from the 1 to 10 percent area and the ≥10 percent areas. Tables C10, C11, and C12 in Appendix C present the results of the toxicity screen for the <1 percent, 1 to 10 percent, and ≥10 percent areas, respectively. Table 5.4b summarizes the criteria used in COPC selection for these three bullet distribution areas. As a result of this selection process, no chemicals were identified as COPCs for the <1 percent area. Antimony, copper, and lead were selected as COPCs for both the 1 to 10 percent and the ≥10 percent areas.

None of the chemicals detected in Site 3 soil are considered Group A carcinogens by EPA or Cal/EPA. In addition, only lead has been identified by Cal/EPA under California Proposition 65 as a developmental and reproductive toxicant.

5.4 Exposure Assessment

The methods used to evaluate potential exposure scenarios for Site 3 are outlined in detail in Section 2.2. The following section discusses the nature and degree of potential exposure to the COPCs that may occur at Site 3.

5.4.1 Chemical Source and Migration Analysis

Section 3.0 of the Introduction to the RI (Volume II) presents a general discussion of chemical fate and transport. Section 3.0 of the Introduction to the RI also includes a table of physical and chemical properties pertaining to environmental fate and transport of chemicals detected at the Fort Ord RI sites, and a discussion of potential chemical migration pathways. Section 6.0 of the Site 3 RI presents a site-specific discussion of chemical fate and transport, and identifies potential chemical migration pathways at Site 3. The potential migration pathways identified in Section 6.0 of

- Hypothetical onsite recreational users
  - Long-distance day and overnight visitor (i.e., living over 100 miles from Site 3)
  - Nearby resident day visitor/trespasser
  - Nearby resident overnight camper
- Hypothetical onsite workers
  - Construction or utility worker
  - Maintenance worker
  - Park ranger.

The potential future recreational users were assumed to be involved with very similar activities with similar probabilities of exposure to site-related chemicals. The onsite camper was not evaluated because the estimated total worst-case exposure to Site 3-related chemicals of 5040 hours per year (24 hours/day x 7 days/year x 30 years) was less than that of the nearby resident day visitor/trespasser of 5820 hours per year (2 hours/day x 97 days/year x 30 years). Because the hypothetical nearby resident would most likely experience the longest exposure of these hypothetical receptors, this reasonable worst-case receptor was selected for quantitative evaluation.

Although a construction or utility worker receptor may be present on the site, it was not evaluated in this BRA. It is expected that a construction worker would be exposed to higher concentrations of chemicals than a resident (via a higher ingestion rate, for example); however this is expected to occur over a much shorter time: 1 year for a construction worker versus 30 years for the resident. In addition, a statistical analysis indicated that residents would be exposed to higher concentrations of chemicals, i.e., 20637 mg/kg (surface soil, 0 to 2 feet bgs) versus 17240 mg/kg (soil at 0 to 10 feet bgs) for the worst case scenario.

The park ranger was also selected for quantitative evaluation because this receptor's assumed exposure is likely to be greater than that of a maintenance worker. Maintenance workers were assumed to be present at Site 3 infrequently, perhaps to fix and repair park property as needed. And their visits to the site would be limited to pre-existing structures such as buildings or parking lots places where exposure to site-related chemicals would be highly unlikely. The job duties of a park ranger, on the other hand, would daily involve work on the site. They would also be more likely to contact site-related chemicals during their duties such as guiding tours and patrolling. Therefore, the park ranger was quantitatively evaluated.

These two receptors may be exposed to the COPCs at Site 3 via the pathways of ingestion of soil, dermal contact with soil, or inhalation of dust. Given the uncertainty associated with future land use plans at Site 3, it was assumed that movement by visitors on the dunes at Site 3 may be restricted solely to boardwalks. For this reason, the "average" nearby resident was assumed to be exposed to Site 3 chemicals via inhalation of dust only. In the event, however, that campsites are constructed on Site 3, the RME nearby resident was assumed to be exposed to Site 3 chemicals via dermal contact, ingestion of soil, and inhalation of dust.

Given the uncertainty associated with accessibility to various sections of Site 3, exposure to chemicals was assumed to occur through either (1) a random walk throughout the site or from (2) exclusive exposure to only one of the three bullet distribution areas.

5.4.3 Exposure Scenarios

This section presents a discussion of the site-specific conditions (i.e., exposure assumptions) used to quantitatively evaluate the exposures of the nearby resident and the park ranger at Site 3. Two types of exposure scenarios were evaluated in this BRA: an average exposure scenario; and a reasonable maximum exposure (RME) scenario. As indicated in Section 5.1.2, future land use plans include conversion of Site 3 to a limited-access state park involving construction of hiking trails, hike-in/bike-in campgrounds, and boardwalks spanning the distance between proposed parking lots and the beaches (*Verett, 1994*). Because boardwalk construction has been proposed to limit damage was used to estimate the average scenario. The lesser of either the upper 95th percentile upper confidence limit or the maximum weighted surface area COPC concentration in soil was used to estimate the RME scenario. The methods used to estimate EPCs are discussed in Section 2.2.7. EPCs for weighted surface area soil and air are presented in Table 5.6a. Tables 5.6b and 5.6c present soil and air EPCs for the 1 to 10 percent and the ≥10 percent areas, respectively.

5.4.5 Estimation of Exposure (Dose)

Intake assumptions presented in Tables 2.4, 2.5, and 5.5b were used with the EPCs (Section 5.4.4; Table 5.6) and chemical-specific absorption factors (Table 2.6) to estimate pathway-specific doses or daily intakes. Equations for daily intakes are presented in Section 2.2.4. These values represent estimates of the total amount of chemical (i.e., concentration) that a specific receptor may incur over the length of an assumed exposure duration. Potential adverse effects resulting from exposure to lead are not evaluated via this method; the unique toxicological properties of lead require exposure assessment and risk characterization techniques different from those used for all other chemicals (Section 2.2.9). The results of the lead evaluation for Site 3 are in Section 5.6.3.

5.5 Toxicity Assessment

Section 2.3 presents information on the purpose of the toxicity assessment and describes the basis for developing RfDs and SFs for noncarcinogenic and carcinogenic chemicals, respectively. SFs have not been developed by EPA or Cal/EPA for any of the COPCs at Site 3. Therefore, only noncarcinogenic endpoints are evaluated in this assessment. Section 2.3.3 discusses the unique toxicological properties of lead, which preclude development of either an RfD or a SF. Table 2.9 presents the RfDs for antimony and copper that were used to estimate noncancer effects.

5.6 Risk Characterization

Section 2.4 presents the methods used to quantify potential human health risks associated with the COPCs at Site 3. Sections 2.4.1 describes the methods used to estimate noncancer adverse health effects for all the COPCs except lead. Section 2.4.3 describes the methods used to evaluate the potential health risks associated with exposure to lead. The following sections present the results of risk characterization for Site 3.

5.6.1 Possible Noncancer Health Effects

5.6.1.1 Weighted Surface Areas

For the average exposure scenario, multipathway hazard indices (HIs) for nearby resident receptors are 0.000009 and 0.000007 for the 0 to 6 and 6 to 9 year old groups, respectively. For the RME scenario, the multipathway HIs for the nearby resident receptors are 0.7, 0.1, and 0.08 for the 0 to 6, 6 to 18, and the 18 to 30 year old groups, respectively. The estimated multipathway HIs for the Park ranger are 0.01 and 0.4 for the average and RME scenarios, respectively. None of these HIs exceeds the threshold level of concern for noncarcinogenic effects. The results of the risk characterization based on the weighted surface area chemical concentrations are presented in Tables E26 through E32 of Appendix E and summarized in Tables 5.7a (residents) and 5.7b (park ranger).

5.6.1.2 Bullet Distribution Areas

For the 1 to 10 percent area, the average exposure scenario multipathway HIs for the nearby resident receptors are 0.00003 for both the 0 to 6 and the 6 to 9 year old groups. For the RME scenario, the multipathway HIs for the nearby resident receptors are 2, 0.4, and 0.2 for the 0 to 6, 6 to 18, and the 18 to 30 year old groups, respectively (Table 5.7c). The multipathway HIs for the onsite park ranger are 0.03 and 1 for the average and RME scenarios, respectively (Table 5.7d).

For the ≥10 percent area, the average exposure scenario multipathway HIs for the nearby

Text Revisions
Volume III, Site 3
Page 67

In Volume III, Site 3, fourth paragraph, second column of page 67:

a) In the first sentence delete: *"health-based cleanup level (level of concern)"* **and replace with:** *"health-based level of concern (HBLC)"*

b) In the third sentence delete: *"cleanup level of"* **and replace with** *"level of concern"*

c) In the fourth sentence insert: *"threshold"* **immediately after** *"EPA."*

d) Insert new paragraph at end of second column

> *This (HBLC) is used in the feasibility study to focus remediation in area of highest potential human-health risk. However, it is important to note that cleanup in the high-density bullet areas at Site 3 will achieve a soil-lead level below the HBLC, and in most cases lead levels (following cleanup activities) should be at background. Please see Volume V for further details.*

≥10 Percent Area

At the ≥10 percent area, the blood-lead levels estimated for children 0 to 6 years old are 2.79 and 177.42 μg/dl for the average and RME scenarios, respectively. The blood-lead levels for the 6 to 9 year old offsite child resident (average scenario) are 3.43 (95th percentile) and 4.37 μg/dl (99th percentile). The blood-lead levels for the 6 to 18 year old child and the adult offsite resident (RME Scenario) are 48.14 (95th percentile) and 61.32 μg/dl (99th percentile). The blood-lead level estimated for the park ranger are 16.09 (95th percentile) and 20.50 μg/dl (99th percentile) for the average scenario and 48.14 (95 percentile) and 61.32 μg/dl (99th percentile) for the RME scenario.

Blood-lead levels in all receptors (except the 0 to 6 and the 6 to 9 year old average resident receptors) exceed the EPA's (1990e) 10 μg/dl threshold level of concern. The results of these analyses are presented in Tables F23 through F28 in Appendix F and are summarized in Table 5.8c for receptors exposed to chemicals in the ≥10 percent area.

5.7 Uncertainty Analysis

Section 8.0 summarizes the uncertainties common to BRAs conducted for all five RI sites. An uncertainty peculiar to Site 3 involves the method of weighting the chemical concentrations by distribution of spent ammunition at certain locations within Site 3, i.e., Study Areas 1 and 2. For this BRA, it was assumed that the distribution of COPCs within Study Areas 1 and 2 reflects conditions throughout Site 3. The degree to which this affects the results of the BRA is not clear. From visual inspections and an evaluation of past use at Site 3, it appears that the distribution of chemicals within Study Areas 1 and 2 represent sitewide conditions. Therefore, this assumption may not significantly add to the uncertainty of the BRA for Site 3.

5.8 Summary of the Baseline Risk Assessment for Site 3

The BRA for site 3 evaluated exposure of future nearby resident and onsite park ranger receptors to three COPCs (antimony, copper, and lead). It was assumed that the receptors would be either (1) walking randomly throughout the site or (2) limiting their visits to only one of the three bullet distribution areas (i.e., ⟨1 percent, 1 to 10 percent, or ≥10 percent).

For the "random" site walk exposure scenario, HIs estimated for both the nearby resident and the park ranger were all below 1 for antimony and copper. In addition, the results of the lead exposure modelling indicate that exposure to lead would result in estimated blood-lead levels below EPA's 10 μg/dl threshold level of concern *(EPA, 1990e)*. Therefore, potential adverse health effects resulting from exposure to COPCs are not expected for a random walk at Site 3. If, however, a receptor were to limit their visits solely to either the 1 to 10 percent or the ≥10 percent bullet distribution area, estimated HIs and blood-lead levels for some receptors exceed agency threshold levels of concern.

5.9 Health-Based Levels of Concern

Blood-level levels and HIs associated with some resident and onsite park ranger receptors exposed solely to the 1 to 10 percent or ≥10 percent bullet distribution areas exceed regulatory threshold levels of concern. Because lead is present in the highest concentrations among the three COPCs throughout Study Areas 1 and 2, it may represent the greatest concern for human health.

Therefore, a health-based cleanup level (level of concern) for lead in soil was estimated so that the EPA threshold level of blood-lead for children and adults would not be exceeded. The EPA *(1990e)* UBK and the Cal/EPA *(1992)* LEADSPREAD lead exposure models described in Section 2.3.3 were used to estimate the cleanup lead concentration level for children and for adults, respectively. Results of this modeling indicated an estimated cleanup level of 1,860 mg/kg for children and 4,192 mg/kg for adults. Long-term exposure to a lead concentration of 1,860 mg/kg (the level of concern for children) is not expected to result in any exceedance of the EPA level of concern of 10 μg/dl blood-lead level for children or adults.

SECTION 5.0
TABLES AND PLATES

Table 5.1. Percent of Surface Area Covered by Bullet Fragments
Site 3 - Study Areas 1 and 2
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Categories by Percent of Surface Area Covered by Bullet Fragments	Surface Area of Study Area			Percent of Surface Area of Study Areas 1 and 2 by Percent Coverage Categories
	Study Area 1 (ft^2)	Study Area 2 (ft^2)	Total of Study Areas 1 and 2 (ft^2)	
>10	132,480	91,152	223,632	4
1-10	182,736	132,048	314,784	5
<1 and non present	811,872	4,495,824	5,307,696	91
Total Area	1,127,088	4,719,024	5,846,112	- -

ft^2 Square feet.
-- Not applicable.

Table 5.2a. Statistical Data Summary of Chemicals Detected in Surface Soil (0 to 2 feet bgs)
Site 3 - Study Area 1
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Antimony	9	15	60.0	9.30E+00	1.00	3.36E+03	0.13	5.66E+02	1.11E+03	2.75E+03	2.75E+03
Chromium	19	19	100.0	1.07E+01	0.13	5.38E+01	0.13	2.71E+01	9.52E+00	4.57E+01	4.57E+01
Copper	19	19	100.0	2.20E+00	0.96	1.99E+04	0.13	1.26E+03	4.54E+03	1.02E+04	1.02E+04
Iron	19	19	100.0	5.39E+03	0.13	3.12E+04	0.13	1.40E+04	6.02E+03	2.58E+04	2.58E+04
Lead	12	19	63.2	1.27E+01	0.13	3.26E+04	0.13	5.31E+03	9.52E+03	2.40E+04	2.40E+04
Tin	8	19	42.1	1.50E+00	0.92	6.74E+01	0.13	7.04E+00	1.62E+01	3.87E+01	3.87E+01
Zinc	19	19	100.0	1.08E+01	0.96	2.16E+03	0.13	1.61E+02	4.87E+02	1.12E+03	1.12E+03

bgs Below ground surface.
mg/kg Milligrams per kilogram.

Table 5.2b. Statistical Data Summary of Chemicals Detected in Subsurface Soil (>2 feet bgs)
Site 3 - Study Area 1
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Antimony	2	6	33.3	1.69E+01	2.75	2.24E+01	2.25	8.79E+00	8.59E+00	2.56E+01	2.24E+01
Chromium	11	11	100.0	7.00E+00	2.75	4.69E+01	2.25	2.49E+01	1.04E+01	4.53E+01	4.53E+01
Copper	11	11	100.0	2.40E+00	2.75	1.12E+03	2.25	1.24E+02	3.33E+02	7.76E+02	7.76E+02
Iron	11	11	100.0	3.31E+03	2.75	2.53E+04	2.25	1.25E+04	5.60E+03	2.35E+04	2.35E+04
Lead	6	11	54.6	1.45E+01	2.75	5.39E+03	2.25	5.89E+02	1.61E+03	3.74E+03	3.74E+03
Zinc	10	11	90.9	1.21E+01	2.75	1.61E+02	2.25	3.13E+01	4.38E+01	1.17E+02	1.17E+02

bgs Below ground surface.
mg/kg Milligrams per kilogram.

Table 5.2c. Statistical Data Summary of Chemicals Detected in Surface Soil (0 to 2 feet bgs)
Site 3 - Study Area 2
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Antimony	7	26	26.9	1.05E+01	2.00	9.70E+02	0.13	7.91E+01	2.22E+02	5.14E+02	5.14E+02
Chromium	26	26	100.0	6.80E+00	1.75	2.49E+01	0.13	1.22E+01	4.28E+00	2.06E+01	2.06E+01
Copper	26	26	100.0	1.30E+00	1.75	4.18E+03	0.08	4.99E+02	9.79E+02	2.42E+03	2.42E+03
Iron	26	26	100.0	3.01E+03	1.25	3.04E+04	0.08	7.07E+03	5.52E+03	1.79E+04	1.79E+04
Lead	21	26	80.8	1.10E+01	0.38	4.63E+04	0.08	5.89E+03	1.26E+04	3.06E+04	3.06E+04
Tin	5	25	20.0	1.00E+00	0.13	8.90E+00	0.33	1.42E+00	2.34E+00	6.02E+00	6.02E+00
Zinc	26	26	100.0	6.30E+00	1.75	5.31E+02	0.08	7.12E+01	1.22E+02	3.09E+02	3.09E+02

bgs Below ground surface.
mg/kg Milligrams per kilogram.

Table 5.2d. Statistical Data Summary of Chemicals Detected in Subsurface Soil (>2 feet bgs)
Site 3 - Study Area 2
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Chromium	4	4	100.0	6.20E+00	2.25	1.34E+01	2.25	1.02E+01	3.00E+00	1.61E+01	1.34E+01
Copper	4	4	100.0	1.30E+00	2.25	3.30E+00	2.13	1.95E+00	9.10E-01	3.74E+00	3.30E+00
Iron	4	4	100.0	3.22E+03	2.25	5.21E+03	2.25	4.23E+03	8.71E+02	5.94E+03	5.21E+03
Zinc	4	4	100.0	9.80E+00	2.25	1.59E+01	2.25	1.20E+01	2.70E+00	1.73E+01	1.59E+01

bgs Below ground surface.
mg/kg Milligrams per kilogram.

Table 5.2e. Statistical Data Summary of Chemicals Detected in Surface Soil (0 to 2 feet bgs)
Site 3 - Control Area Samples
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Chromium	8	8	100.00	3.20E+00	0.88	1.79E+01	0.88	1.04E+01	6.34E+00	2.29E+01	1.79E+01
Copper	8	8	100.00	4.70E-01	0.88	2.00E+00	0.13	1.32E+00	5.60E-01	2.41E+00	2.00E+00
Iron	8	8	100.00	1.81E+03	0.88	8.56E+03	0.13	5.03E+03	2.73E+03	1.04E+04	8.56E+03
Lead	1	8	12.50	1.42E+01	2.00	1.42E+01	2.00	6.01E+00	3.31E+00	1.25E+01	1.25E+01
Zinc	6	8	75.00	7.30E+00	2.00	1.25E+01	0.13	7.84E+00	3.71E+00	1.51E+01	1.25E+01

bgs Below ground surface.
mg/kg Milligrams per kilogram.

Table 5.2f. Statistical Data Summary of Chemicals Detected in Subsurface Soil (>2 feet bgs)
Site 3 - Control Area Samples
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Chromium	1	1	100.0	1.22E+01	2.25	1.22E+01	2.25	--	--	--	--
Copper	1	1	100.0	1.40E+00	2.25	1.40E+00	2.25	--	--	--	--
Iron	1	1	100.0	6.59E+03	2.25	6.59E+03	2.25	--	--	--	--
Zinc	1	1	100.0	1.08E+01	2.25	1.08E+01	2.25	--	--	--	--

bgs Below ground surface.
mg/kg Milligrams per kilogram.
-- Not applicable.

Table 5.2g. Statistical Data Summary of Chemicals Detected in Surface Soil (0 to 2 feet bgs)
Site 3 - Surface Concentration of Spent Ammunition Less Than 1 Percent
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Chromium /a/	13	13	100.0	6.8	1.2	5.38E+01	0.1	2.00E+01	1.25E+01	4.45E+01	4.45E+01
Copper	13	13	100.0	1.4	0.8	8.70E+00	0.1	3.27E+00	2.12E+00	7.42E+00	7.42E+00
Iron	13	13	100.0	3010.0	1.2	3.12E+04	0.1	9.38E+03	7.38E+03	2.38E+04	2.38E+04
Lead	5	13	38.5	11.5	0.1	4.32E+01	0.1	1.16E+01	1.17E+01	3.45E+01	3.45E+01
Zinc	13	13	100.0	8.6	0.7	3.35E+01	0.1	1.52E+01	6.60E+00	2.81E+01	2.81E+01

bgs Below ground surface.
mg/kg Milligrams per kilogram.
- - Not applicable.

/a/ Thirteen samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 2.0 mg/kg.

Table 5.2h. Statistical Data Summary of Chemicals Detected in Surface Soil (>2 feet bgs)
Site 3 - Surface Concentration of Spent Ammunition Less Than 1 Percent
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Chromium /a/	5	5	100.0	6.20E+00	2.25	2.29E+01	2.25	1.26E+01	6.89E+00	2.61E+01	2.29E+01
Copper	5	5	100.0	1.30E+00	2.25	2.50E+00	2.25	2.04E+00	5.90E-01	3.20E+00	2.50E+00
Iron	5	5	100.0	3.22E+03	2.25	1.15E+04	2.25	5.96E+03	3.66E+03	1.31E+04	1.15E+04
Zinc	4	5	80.0	9.80E+00	2.25	1.57E+01	2.25	1.04E+01	4.49E+00	1.92E+01	1.57E+01

bgs Below ground surface.
mg/kg Milligrams per kilogram.

/a/ Five samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 0.5 mg/kg.

Table 5.2i. Statistical Data Summary of Chemicals Detected in Surface Soil (0 to 2 feet bgs)
Site 3 - Surface Concentration of Spent Ammunition Between 1 and 10 Percent
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Antimony	2	11	18.2	2.08E+01	0.7	3.00E+02	0.1	3.19E+01	8.91E+01	2.06E+02	2.06E+02
Chromium /a/	13	13	100.0	8.40E+00	1.1	4.27E+01	0.1	1.86E+01	1.01E+01	3.83E+01	3.83E+01
Copper	13	13	100.0	1.30E+00	1.7	1.32E+03	0.1	1.67E+02	3.66E+02	8.84E+02	8.84E+02
Iron	13	13	100.0	4.10E+03	0.3	2.17E+04	0.1	8.80E+03	5.46E+03	1.95E+04	1.95E+04
Lead	10	13	76.9	1.20E+01	1.7	3.26E+04	0.1	3.13E+03	8.93E+03	2.06E+04	2.06E+04
Tin	2	13	15.4	1.90E+00	0.7	2.90E+00	0.1	7.90E-01	7.40E-01	2.25E+00	2.25E+00
Zinc	13	13	100.0	7.10E+00	1.7	1.59E+02	0.1	3.44E+01	4.20E+01	1.17E+02	1.17E+02

bgs Below ground surface.
mg/kg Milligrams per kilogram.
- - Not applicable.

/a/ Eleven samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 2.0 mg/kg.

Table 5.2j. Statistical Data Summary of Chemicals Detected in Surface Soil (>2 feet bgs)
Site 3 - Surface Concentration of Spent Ammunition Between 1 and 10 Percent
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Chromium /a/	5	5	100.0	1.01E+01	2.13	3.31E+01	2.25	2.00E+01	9.64E+00	3.89E+01	3.31E+01
Copper	5	5	100.0	1.70E+00	2.25	1.04E+01	2.75	4.08E+00	3.58E+00	1.11E+01	1.04E+01
Iron	5	5	100.0	4.63E+03	2.13	1.47E+04	2.25	9.52E+03	4.81E+03	1.90E+04	1.47E+04
Lead	1	5	20.0	4.43E+01	2.75	4.43E+01	2.75	1.27E+01	1.77E+01	4.73E+01	4.43E+01
Zinc	5	5	100.0	1.14E+01	2.13	1.76E+01	2.25	1.52E+01	2.54E+00	2.02E+01	1.76E+01

bgs Below ground surface.
mg/kg Milligrams per kilogram.

/a/ Six samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 2.0 mg/kg.

Table 5.2I. Statistical Data Summary of Chemicals Detected in Surface Soil (>2 feet bgs)
Site 3 - Surface Concentration of Spent Ammunition >10 Percent
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Antimony	2	2	100.0	1.69E+01	2.75	2.24E+01	2.25	1.97E+01	3.89E+00	2.73E+01	2.24E+01
Chromium /a/	5	5	100.0	2.26E+01	2.25	4.69E+01	2.25	3.02E+01	9.93E+00	4.97E+01	4.69E+01
Copper	5	5	100.0	2.90E+00	2.75	1.12E+03	2.25	2.68E+02	4.78E+02	1.21E+03	1.12E+03
Iron	5	5	100.0	9.44E+03	6.25	2.53E+04	2.25	1.54E+04	5.98E+03	2.71E+04	2.53E+04
Lead	5	5	100.0	1.45E+01	2.25	5.39E+03	2.25	1.28E+03	2.32E+03	5.83E+03	5.39E+03
Zinc	5	5	100.0	2.04E+01	2.25	1.61E+02	2.25	5.29E+01	6.07E+01	1.72E+02	1.61E+02

bgs Below ground surface.
mg/kg Milligrams per kilogram.

/a/ Five samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 0.5 mg/kg.

Table 5.3. Statistical Data Summary of Chemicals Detected in Soil
Site 3 - Weighted Surface-Area Concentrations
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Antimony	16	41	39	3.70E-01	1.00	1.34E+02	0.13	1.12E+01	2.87E+01	6.73E+01	6.73E+01
Chromium	45	45	100.0	2.80E-01	2.00	4.90E+01	0.13	5.83E+00	9.96E+00	2.54E+01	2.54E+01
Copper	45	45	100.0	6.00E-02	1.75	7.96E+02	0.13	3.42E+01	1.21E+02	2.70E+02	2.70E+02
Iron	45	45	100.0	1.41E+02	2.00	2.84E+04	0.13	2.78E+03	5.11E+03	1.28E+04	1.28E+04
Lead	33	45	73	4.40E-01	0.38	1.85E+03	0.08	2.38E+02	4.69E+02	1.16E+03	1.16E+03
Tin	13	44	30	4.00E-02	0.13	2.70E+00	0.13	2.80E-01	4.40E-01	1.15E+00	1.15E+00
Zinc	45	45	100.0	2.50E-01	1.75	8.64E+01	0.13	8.27E+00	1.37E+01	3.52E+01	3.52E+01

mg/kg Milligrams per kilogram.

Table 5.4a. Selection of COPCs for Chemicals Detected in Soil /a/
Site 3 - Weighted Surface-Area Concentrations
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/		COPC (Yes/No)
					Hazard Quotient	Cancer Risk	
Antimony	134.40	ND	--	--	0.5	--	YES
Chromium (total) /f/	48.96	46.1	--	--	0.00007	--	NO
Copper	796.00	18.2	--	--	0.03	--	YES
Iron	28392	ND	2.8	--	--	--	NO
Lead	1852.00	51.8	--	240	--	--	YES
Tin	2.70	ND	--	--	0.000006	--	NO
Zinc	86.40	75.8	0.009	--	--	--	NO

mg/kg Milligrams per kilogram.
ND Not detected.
-- Not available or not applicable.

/a/ See Section 5.3 for explanation.
/b/ From Table 5.3.
/c/ Estimated daily dose (see Appendix B for explanation). This was compared to the Recommended Daily Allowance of 6 to 10 mg/day for iron and 5 to 10 mg/day for zinc (National Research Council, 1989).
/d/ Health based screening level (Harding Lawson Associates, Draft Final Technical Memorandum, Preliminary Remediation Goals, Fort Ord, California, June 24, 1994).
/e/ See Table C9 of Appendix C for development of screening values.
/f/ Evaluated as chromium III. Chromium VI was not detected.

Table 5.4b. Selection of COPCs for Chemicals Detected in Soil /a/
Site 3 - Three Bullet Distribution Areas
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Concentration of Spent Ammunition	Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/		COPC (Yes/No)
						Hazard Quotient	Cancer Risk	
<1 Percent	Chromium	53.80	46.1	--	--	7.70E-05	--	NO
	Copper	8.70	18.2	--	--	--	--	NO
	Iron	31200.00	--	6.24	--	--	--	NO
	Lead	43.20	51.8	--	--	--	--	NO
	Zinc	33.50	75.8	--	--	--	--	NO
Between 1 and 10 Percent	Antimony	300.00	--	--	--	1.10E+00	--	YES
	Chromium	42.70	46.1	--	--	--	--	NO
	Copper	1320.00	18.2	--	--	5.10E-02	--	YES
	Iron	21700.00	--	4.34	--	--	--	NO
	Lead	32600.00	51.8	--	240	--	--	YES
	Tin	2.90	--	--	--	6.90E-06	--	NO
	Zinc	159.00	75.8	0.03	--	7.60E-04	--	NO
>10 Percent	Antimony	3360.00	--	--	--	1.20E+01	--	YES
	Chromium	31.00	46.1	--	--	--	--	NO
	Copper	19900.00	18.2	--	--	7.70E-01	--	YES
	Iron	30400.00	--	6.08	--	--	--	NO
	Lead	46300.00	51.8	--	240	--	--	YES
	Tin	67.40	--	--	--	1.60E-04	--	NO
	Zinc	2160.00	75.8	0.43	--	1.00E-02	--	NO

Table 5.4b. Selection of COPCs for Chemicals Detected in Soil /a/
Site 3 - Three Bullet Distribution Areas
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Concentration of Spent Ammunition	Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/		COPC (Yes/No)
						Hazard Quotient	Cancer Risk	

mg/kg Milligrams per kilogram.
ND Not detected.
-- Not available or not applicable.

/a/ See Section 5.3 for explanation.
/b/ From Table 5.3.
/c/ Estimated daily dose (see Appendix B for explanation). This was compared to the Recommended Daily Allowance of 6 to 15 mg/day for iron and 5 to 10 mg/day for zinc (National Research Council, 1989). All other chemicals listed in this table are not considered an essential nutrient.
/d/ Health based screening level (Harding Lawson Associates, Draft Final Technical Memorandum, Preliminary Remediation Goals, Fort Ord, California, June 24, 1994).
/e/ See Tables C10-C12 of Appendix C for development of screening values for the <1 percent, 1-10 percent, and >10 percent areas, respectively.
/f/ Total chromium was evaluated as chromium III. Chromium VI was not detected.

Table 5.5a. Visitor Use Survey for Marina State Park, Site 3 /a/
Volume III - Baseline Risk Assessment. Basewide RI/FS
Fort Ord, California

Months in 1993	Number of Visitors
January	4,888
February	5,340
March	6,351
April	7,568
May	9,622
June	10,962
July	11,296
August	12,569
September	22,369
October	21,578
November	17,896
December	10,258

/a/ Source: Monterey District of Parks and Recreation, 1994.

Table 5.5b. Site-Specific Intake Assumptions, Site 3 /a/
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

	Intake Assumptions			
Scenario/Receptor	Exposure Time ET (hours/day)	Fraction of Intake FI (unitless)	Exposure Frequency EF (days/year)	Exposure Duration ED (years)
Average Exposure Scenario				
Nearby Child (0 - 6 and 6 - 9 years) and Adult Resident	2	0.5	57	9
Onsite Park Ranger	8	0.5	250	10
RME Scenario				
Nearby Child (0 - 6 and 6 - 18 years) and Adult Resident	2	1.0	97	30
Onsite Park Ranger	8	1.0	250	25

RME Reasonable maximum exposure.

/a/ See Section 5.4.3 for explanation.

Table 5.6a. Exposure Point Concentrations (EPCs) for Soil and Air
Site 3 - Weighted Surface Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals of Potential Concern	Average Exposure Scenario: Soil Concentration /a/ (mg/kg)	Average Exposure Scenario: Air Concentration /b/ (mg/m^3)	RME Scenario: Soil Concentration /c/ (mg/kg)	RME Scenario: Air Concentration /b/ (mg/m^3)
Surface Soil (0 to 2 feet bgs)				
Antimony	1.12E+01	1.29E-07	6.73E+01	7.74E-07
Copper	3.42E+01	3.93E-07	2.70E+02	3.11E-06
Lead	2.38E+02	2.74E-06	1.16E+03	1.33E-05

RME Reasonable maximum exposure.
mg/kg Milligrams per kilogram.
mg/m^3 Milligrams per cubic meter.
bgs Below ground surface.
1.12E+01 1.12 x 10^+1.
PM10 Particles with a diameter less than or equal to 10 microns.

/a/ Arithmetic mean of surface-area weighted concentrations (Table 5.3).
/b/ Air concentration (mg/m^3) = soil concentration (mg/kg) x site-specific PM10 (1.15E-2 mg/m^3) x conversion factor (1E-6 kg/mg).
/c/ Lesser of the maximum concentration and 95 percent upper confidence limit of the arithmetic mean (Table 5.3).

Table 5.6b. Exposure Point Concentrations (EPCs) for Soil and Air
Site 3 - 1 to 10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals of Potential Concern	Average Exposure Scenario: Soil Concentration /a/ (mg/kg)	Average Exposure Scenario: Air Concentration /b/ (mg/m^3)	RME Scenario: Soil Concentration /c/ (mg/kg)	RME Scenario: Air Concentration /b/ (mg/m^3)
Surface Soil (0 to 2 feet bgs)				
Antimony	3.19E+01	3.67E-07	2.06E+02	2.37E-06
Copper	1.67E+02	1.92E-06	8.84E+02	1.02E-05
Lead	3.13E+03	3.60E-05	2.06E+04	2.37E-04

RME Reasonable maximum exposure.
mg/kg Milligrams per kilogram.
mg/m^3 Milligrams per cubic meter.
bgs Below ground surface.
3.19E+01 3.19 x 10 ^ +1.
PM10 Particles with a diameter less than or equal to 10 microns.

/a/ Arithmetic mean of surface-area weighted concentrations (Table 5.3).
/b/ Air concentration (mg/m^3) = soil concentration (mg/kg) x site-specific PM10 (1.15E-2 mg/m^3) x conversion factor (1E-6 kg/mg).
/c/ Lesser of the maximum concentration and 95 percent upper confidence limit of the arithmetic mean (Table 5.3).

Table 5.6c. Exposure Point Concentrations (EPCs) for Soil and Air
Site 3 - ≥10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals of Potential Concern	Average Exposure Scenario: Soil Concentration /a/ (mg/kg)	Average Exposure Scenario: Air Concentration /b/ (mg/m^3)	RME Scenario: Soil Concentration /c/ (mg/kg)	RME Scenario: Air Concentration /b/ (mg/m^3)
Surface Soil (0 to 2 feet bgs)				
Antimony	5.34E+02	6.15E-06	2.50E+03	2.87E-05
Copper	1.83E+03	2.10E-05	1.07E+04	1.23E-04
Lead	1.12E+04	1.29E-04	3.88E+04	4.46E-04

RME Reasonable maximum exposure.
mg/kg Milligrams per kilogram.
mg/m^3 Milligrams per cubic meter.
bgs Below ground surface.
5.34E+02 5.34 x 10^+2.
PM10 Particles with a diameter less than or equal to 10 microns.

/a/ Arithmetic mean of surface-area weighted concentrations (Table 5.3).
/b/ Air concentration (mg/m^3) = soil concentration (mg/kg) x site-specific PM10 (1.15E-2 mg/m^3) x conversion factor (1E-6 kg/mg).
/c/ Lesser of the maximum concentration and 95 percent upper confidence limit of the arithmetic mean (Table 5.3).

Table 5.7a. Total Hazard Index for the Nearby Resident Receptor
Site 3 - Weighted Surface Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario Receptor	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Total HI
Average Exposure Scenario				
Resident (0 - 6 years)	NA	NA	0.000009	0.000009
Resident (6 - 9 years)	NA	NA	0.000007	0.000007
RME Scenario				
Resident (0 - 6 years)	0.7	0.03	0.0001	0.7
Resident (6 - 18 years)	0.1	0.02	0.00005	0.1
Resident (18 - 30 years)	0.07	0.01	0.00002	0.08

HI Hazard index.
RME Reasonable maximum exposure.
NA Not applicable.

Table 5.7b. Total Hazard Index for the Park Ranger Receptor
Site 3 - Weighted Surface Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario Receptor	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Total HI
Average Exposure Scenario				
Park Ranger	0.007	0.005	0.00002	0.01
RME Scenario				
Park Ranger	0.2	0.3	0.0002	0.4

HI Hazard index.
RME Reasonable maximum exposure.

Table 5.7c. Total Hazard Index for the Nearby Resident Receptor
Site 3 - 1 to 10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario Receptor	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Total HI
Average Exposure Scenario				
Resident (0 - 6 years)	NA	NA	0.00003	0.00003
Resident (6 - 9 years)	NA	NA	0.00003	0.00003
RME Scenario				
Resident (0 - 6 years)	2	0.1	0.0003	2
Resident (6 - 18 years)	0.3	0.05	0.0001	0.4
Resident (18 - 30 years)	0.2	0.04	0.0001	0.2

HI Hazard index.
RME Reasonable maximum exposure.
NA Not applicable.

Table 5.7d. Total Hazard Index for the Park Ranger Receptor
Site 3 - 1 to 10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario Receptor	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Total HI
Average Exposure Scenario				
Park Ranger	0.02	0.01	0.0001	0.03
RME Scenario				
Park Ranger	0.5	0.8	0.0006	1

HI Hazard index.
RME Reasonable maximum exposure.

Table 5.7e. Total Hazard Index for the Nearby Resident Receptor
Site 3 - ≥10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario Receptor	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Total HI
Average Exposure Scenario				
Resident (0 - 6 years)	NA	NA	0.0004	0.0004
Resident (6 - 9 years)	NA	NA	0.0004	0.0004
RME Scenario				
Resident (0 - 6 years)	25	1	0.004	26
Resident (6 - 18 years)	4	0.6	0.002	5
Resident (18 - 30 years)	2	0.5	0.0007	3

HI Hazard index.
RME Reasonable maximum exposure.
NA Not applicable.

Table 5.7f. Total Hazard Index for the Park Ranger Receptor
Site 3 - ≥10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

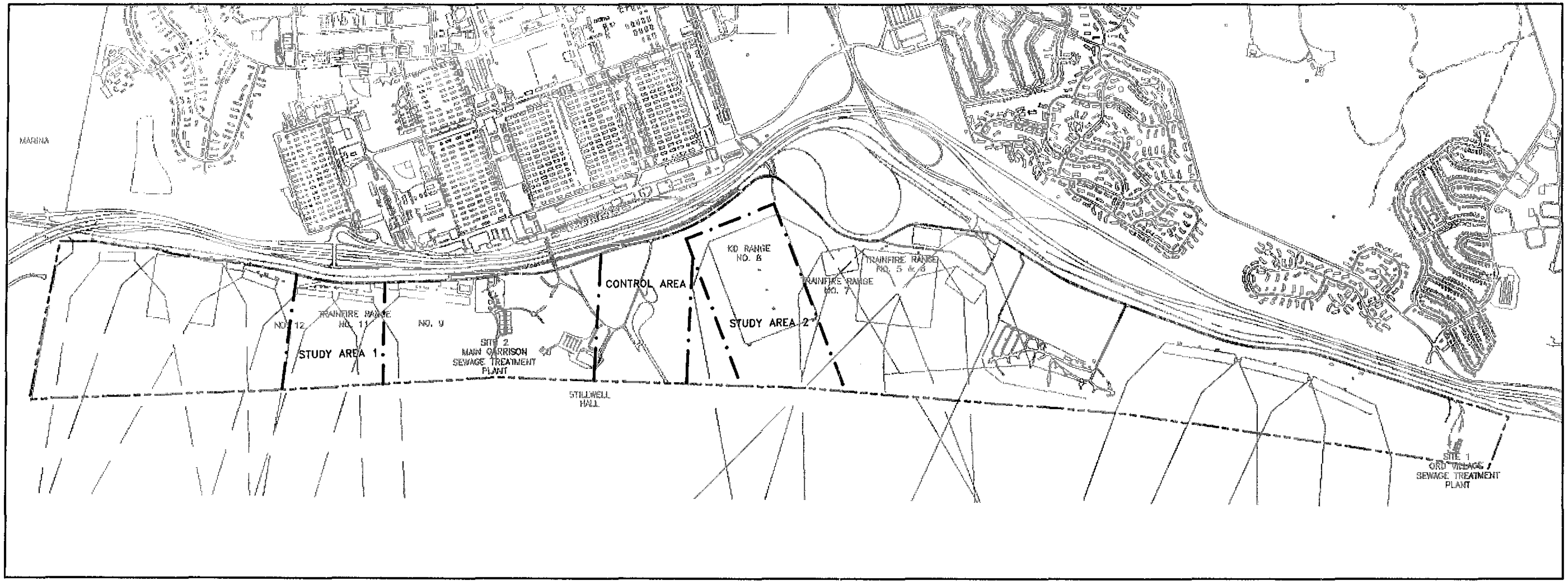
Scenario Receptor	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Total HI
Average Exposure Scenario				
Park Ranger	0.3	0.2	0.001	0.6
RME Scenario				
Park Ranger	6	10	0.007	16

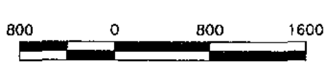
HI Hazard index.
RME Reasonable maximum exposure.

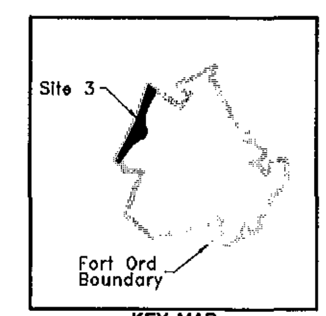
EXPLANATION

FORT ORD BOUNDARY

AREA BOUNDARY







KEY MAP

NO.	DATE	REVISIONS	HLA FILE NO.	PROJECT NO.	APPROVED	APPROVAL DATE	DRAWN BY
1	7/94	DRAFT	23366266	23366 04162			MEK
2	12/94	DRAFT FINAL	23366266	23366 041723	MEC	11/22/94	MEK

Harding Lawson Associates
Engineering and
Environmental Services

Volume III – Baseline Risk Assessment
Basewide RI/FS
Fort Ord, California

Site Plan
Site 3

PLATE:
5.1

6.0 BASELINE RISK ASSESSMENT FOR SITE 31

The baseline human health risk assessment (BRA) for Site 31, the Former Dump Site, is presented in this section. This BRA follows the methods presented in Section 2.0. Any specific deviations from these methods are identified in the sections that follow.

6.1 Site Background

The following sections summarize the background information for Site 31, including a discussion of its history and features such as geology, hydrogeology, land use, and a review of nearby populations.

6.1.1 Physical Setting

Site 31 is in the southern part of the East Garrison on elevated land overlooking the Salinas Valley to the north. The site is approximately 0.2 mile southeast of the intersection of Watkins Gate and Barloy Canyon roads. Site 31 is located within and adjacent to a ravine that is oriented from west to east (Plate 6.1). Site 31 is subdivided topographically into three areas for the purposes of risk assessment: the North Slope, the South Slope, and the Leadership Reaction Training Compound (LRTC) Area. The North Slope encompasses the northern slope of the ravine; the South Slope encompasses the ravine floor and lower part of the southern ravine slope; and the LRTC Area includes the relatively level area above the North Slope (Plate 6.1). The LRTC Area is partially occupied by the Leadership Reaction Training Structure, an obstacle course previously used by the military as part of the training activities at Fort Ord. Unused structures from this training area remain onsite.

The ravine at Site 31 is approximately 70 feet deep. The North Slope is very steep, with a gradient of about 50 percent. Surface soil on this slope is loose, and visible debris can be found over an approximately 500-foot-long section. The North Slope is vegetated mostly with grasses, with several small patches of coast live oak trees. An ephemeral stream is located on the ravine floor; this stream contains water only during heavy rains. The South Slope is heavily vegetated with coast live oak woodland. The LRTC Area is vegetated mostly with grasses, with some small patches of oaks.

Site 31 is underlain by dense to very dense silty sand of the Aromas Sand. In the relatively flat LRTC Area, up to 1 foot of disturbed sandy material overlies undisturbed native silty sands. Generally, 13 or more feet of loose sand overlies undisturbed native silty sand along the North Slope. Past cut-and-fill practices may have resulted in the deposition of clean sandy material on this slope. Native surface sandy soil is found at the relatively undisturbed South Slope. The depth to groundwater is assumed to be approximately 12 feet below MSL, which is approximately 135 feet below the floor of the ravine. A detailed description of the site is provided in Volume II Remedial Investigation, Site 31, Section 3.0.

6.1.2 Land Use

Site 31 was used as a dump site in the 1940s, when the East Garrison had its largest population. Items of refuse found on the North Slope appear to be from the 1940s and 1950s, indicating that Site 31 was used as a dump site into the 1950s. Site 31 may also have been used as a general refuse landfill from the 1930s. Ash and melted glass within the debris indicate that a significant amount of the refuse was incinerated prior to dumping. The incinerator most likely used to burn the refuse was at the top of the ravine, within the area now called the LRTC Area. A detailed description of historical land use is provided in Volume II Remedial Investigation, Site 31, Section 1.2.

For future land use planning, Site 31 has been designated as part of Polygon 11B, comprising 734 acres that include the East Garrison. Sites 29, 30, and 32 of the basewide investigation are part of the East Garrison and are included in Polygon 11B. Two hundred acres of this parcel are slated to become the Monterey Agricultural

As described in Section 2.1.1.5, data were segregated by depth for the North Slope, South Slope, and LRTC Area. North Slope data were divided into surface soil data (0 to 2 feet bgs), subsurface data (greater than 2 to 10 feet bgs) and deep soil data (greater than 10 feet bgs). The South Slope and the LRTC Area data were divided into surface data (0 feet bgs); subsurface data (greater than 0 to 10 feet bgs), and deep data (greater than 10 feet bgs). Chemicals detected at each area are summarized in the sections that follow.

6.2.1 North Slope

Chemicals detected in North Slope soils are summarized as follows:

- Surface Soil (0 to 2 feet bgs): SOCs (carcinogenic PAH expressed as B[a]P-TE and total cPAH, dibenzofuran, fluoranthene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene), pesticides (4,4'-DDE and 4,4'-DDT), CDDs and CDFs expressed as TCDD-TE, and metals (antimony, arsenic, beryllium, cadmium, total chromium, copper, lead, mercury, nickel, silver, and zinc) (Table 6.1a)

- Subsurface Soil (greater than 2 to 10 feet bgs): VOCs (acetone and methylene chloride), pesticides (4,4'-DDE and 4,4'-DDT), CDDs and CDFs expressed as TCDD-TE, TPH as diesel, and metals (antimony, arsenic, beryllium, cadmium, total chromium, copper, lead, mercury, nickel, silver, thallium, and zinc) (Table 6.1b)

- Deep Soil (greater than 10 feet bgs): Pesticides (aldrin, gamma-BHC [lindane], 4,4'-DDE, 4,4'-DDT, dieldrin, endrin, and heptachlor) and metals (antimony, arsenic, beryllium, total chromium, copper, lead, nickel, and zinc) (Table 6.1c).

6.2.2 South Slope

Chemicals detected in South Slope soils are summarized as follows:

- Surface Soil (0 feet bgs): TCDD-TE and metals (antimony, arsenic, beryllium, cadmium, total chromium, copper, lead, mercury, nickel, and zinc) (Table 6.2a)

- Subsurface Soil (greater than 0 to 10 feet bgs): VOCs (acetone), TCDD-TE, and metals (antimony, arsenic, beryllium, cadmium, total chromium, copper, lead, mercury, nickel, and zinc) (Table 6.2b)

- Deep Soil (greater than 10 feet bgs): Samples were not collected.

6.2.3 LRTC Area

Chemicals detected in LRTC Area soils are summarized as follows:

- Surface Soil (0 feet bgs): TCDD-TE and metals (antimony, arsenic, beryllium, total chromium, copper, lead, mercury, nickel, and zinc) (Table 6.3a)

- Subsurface Soil (greater than 0 to 10 feet bgs): TCDD-TE and metals (antimony, arsenic, beryllium, total chromium, copper, lead, mercury, nickel, and zinc) (Table 6.3b)

- Deep Soil (greater than 10 feet bgs): Metals (arsenic, beryllium, total chromium, lead, nickel, and zinc) (Table 6.3c).

6.2.4 All Areas

Statistical data analyses for chemicals detected in soil at these three areas are presented in Tables 6.1a to 6.3c. CDDs and CDFs are reported as TCDD-TE, and carcinogenic PAH are reported as B(a)P-TE and Total cPAH in these tables, as described in detail in Section 2.2.7. Also presented for each detected chemical are the frequency of detection, minimum and maximum detected concentrations, arithmetic mean concentration, standard deviation of the arithmetic mean, and 95 percent upper confidence limit of the arithmetic mean concentration.

Carcinogenic PAH was detected in only one out of 8 analyses in surface soil at the North Slope. At a site where a chemical is detected at some sampling stations and nondetected at others, EPA *(1989b)* recommends that the arithmetic mean be

0.01: chromium, dibenzofuran, fluoranthene, mercury, 2-methylnaphthalene, naphthalene, phenanthrene, pyrene, and silver. The following chemicals were retained as COPCs because their screening HQs exceed 0.01: antimony, arsenic, cadmium, and copper. For chemicals detected at the North Slope that have available slope factors, all screening cancer risks exceed 1×10^{-8}, including those calculated for arsenic, B(a)P-TE, beryllium, 4,4'-DDE, 4,4'-DDT, and TCDD-TE. These chemicals were therefore retained as COPCs.

As described in Section 2.2.7, carcinogenic PAH (cPAH) were evaluated using B(a)P-TE concentrations to assess carcinogenic effects and Total cPAH concentrations to assess noncarcinogenic effects. If concentrations of either B(a)P-TE or Total cPAH were selected by the screening steps, both were evaluated in the quantitative risk assessment.

Two Group A carcinogens were detected at the North Slope, nickel and arsenic. Nickel was eliminated as a COPC because the maximum concentration was less than background, as discussed above. Arsenic was retained on the basis of the toxicity screen. Lead, mercury, and 2,3,7,8-TCDD are identified as California Proposition 65 chemicals; lead and TCDD-TE were retained as COPCs as described above. Mercury, however, was eliminated because the screening HQ is less than 0.01.

To summarize, the following chemicals were retained as COPCs for the North Slope at Site 31 (Table 6.4): antimony, arsenic, B(a)P-TE (and therefore Total cPAH), beryllium, cadmium, copper, 4,4'-DDE, 4,4'-DDT, lead, and TCDD-TE.

6.3.2 South Slope

The selection of COPCs at the South Slope is summarized in Table 6.5. TCDD-TE and 10 metals were detected in South Slope surface soil (0 feet bgs). The first step, comparison to background concentrations, eliminated arsenic, beryllium, chromium, mercury, and nickel. The second step, evaluation of essential nutrients, eliminated zinc. An EDD of 0.038 mg/day was calculated for zinc for the South Slope, as described in Appendix B. This value is below the RDA of 5 to 10 mg/day.

The third step, evaluation of lead, eliminated lead as a COPC because the maximum concentration, 166 mg/kg, is below the HBSL of 240 mg/kg. The fourth step, the toxicity screen, eliminated antimony and copper because the screening HQs are less than 0.01. Screening cancer risks were calculated for cadmium and TCDD-TE at this area; both screening risks exceed 1×10^{-8}. The details of the toxicity screen are presented in Table C14 in Appendix C. Cadmium and TCDD-TE were, therefore, retained as COPCs for this area.

Two Group A carcinogenic chemicals, arsenic and nickel, were detected at the South Slope. Both metals were eliminated as COPCs in the background comparison. Mercury, lead, and 2,3,7,8-TCDD are California Proposition 65 chemicals; mercury was eliminated in the background comparison, and lead was eliminated by comparison to the HBSL. TCDD-TE was retained as a COPC for this area, as described above.

To summarize, two chemicals, cadmium and TCDD-TE, were retained as COPCs for the South Slope (Table 6.5).

6.3.3 LRTC Area

Table 6.6 summarizes the selection of COPCs for the LRTC Area at Site 31. TCDD-TE and nine metals were detected in surface soil (0 feet bgs) at the LRTC Area. The following chemicals were eliminated in the first step, the background comparison: arsenic, beryllium, chromium, mercury, nickel, and zinc. Because the background comparison eliminated zinc, the evaluation of essential nutrients was not conducted for the LRTC Area. The next step, evaluation of lead, eliminated lead as a COPC because the maximum concentration of 79.90 mg/kg is below the HBSL of 240 mg/kg. The final step, the toxicity screen, eliminated antimony but retained copper because the screening HQ of copper exceeds 0.01. A screening cancer risk was calculated only for TCDD-TE, the other known or suspected carcinogenic chemicals having been eliminated

6.4.1.3 Stormwater Runoff

The extent to which chemicals are transported in stormwater runoff depends on the physical and chemical characteristics of the chemicals, soil type, and amount of rainfall. The organic COPCs present in onsite soil have limited water solubilities and high soil sorption tendencies and may therefore be prone to runoff by sorption to soil particles that are transported to onsite or offsite soil or surface water bodies. The metal COPCs detected are also expected to sorb moderately strongly to site soil, and might therefore be prone to runoff. Due to the friable surface soil conditions and sparse vegetation found at some parts of the North Slope, some transport of chemicals via stormwater runoff to the ravine floor may occur. Data from surface soil collected at the bottom of the ravine were evaluated as part of the South Slope data set.

6.4.1.5 Leaching

The potential for chemicals to leach from soil to groundwater depends on the physical and chemical properties of the chemicals, the chemical concentration, soil type, pH (for metals), and other site-specific conditions. For example, metals in soil in a low pH (i.e., acid) environment generally have a tendency to leach downward through the soil column. The soil pH measured at Site 31 ranged from 5.1 to 8, indicating that there is little potential for metals to leach to groundwater. The SOCs, pesticides, CDDs and CDFs, and metals detected at the site are expected to sorb strongly to soil particles. In addition, the depth to groundwater from the floor of the ravine is over 130 feet. Soil leachate modeling conducted for Site 31, as described in Appendix D of Volume II RI, Site 31, indicated that the COPCs are not expected to leach from soil to groundwater. This potential chemical migration route was not, therefore, quantitatively evaluated in this BRA.

To summarize, the emission of fugitive dust was considered the most likely chemical migration mechanism to occur and was therefore quantitatively evaluated in the risk assessment for Site 31.

6.4.2 Potential Receptors and Exposure Pathways

This section identifies the hypothetical receptors that could be exposed to COPCs at Site 31. The general methods used to identify receptors are discussed in Section 2.2. The information presented in Section 6.1, describing the general site topography, current and possible future land uses, and current and possible future demographics, form the basis of the exposure assessment of Site 31. Because the site is inactive, there are no receptors currently onsite. This discussion therefore considers only possible future receptors (i.e., on- or offsite).

Possible future on- and offsite receptors who may be exposed to chemicals at Site 31 include child and adult residents, construction workers, farm and other Agricultural Center workers (e.g., office or distribution facility workers), recreational visitors/trespassers, and park rangers. Scientists and students from the proposed future universities who are interested in the local habitat may also be receptors. Each of these receptors is discussed in more detail below.

As discussed in Section 6.1.2, the proposed Monterey County Agricultural Center is expected to be located in areas of Polygon 11B that are already developed and relatively level. This information indicates that the developed part of the East Garrison and the Ammo Supply Point, which are northwest and southeast of the site, respectively, are likely to be considered as sites for the Agricultural Center. The ravine at Site 31 (i.e., the North Slope and South Slope), having a 50 percent gradient, is too steep for construction. Onsite residents, construction workers, and other workers are, therefore, considered unlikely to be located in these areas. Residences could possibly be built at the LRTC Area which, while small, is generally level. However, possible resident receptors at this area would be unlikely to spend more time at the steep and inaccessible North Slope (where the highest onsite chemical concentrations were detected) than a visitor from offsite. Moreover, concentrations of chemicals detected in soil at the LRTC Area are the lowest of the three onsite areas (Tables 6.3a - 6.3c), and are unlikely to substantially contribute to risks and hazards possibly associated with exposure to duration (ED), exposure frequency (EF), exposure time (ET), and fraction of intake (FI). Because the topography, access, and other physical conditions are different for the North Slope, South Slope, and LRTC Area, some exposure assumptions for these areas also differ and are addressed separately.

Children from the proposed residences associated with the Agricultural Center were assumed to possibly play at the site. Despite the relatively inaccessible nature of much of the site (i.e., the steep and heavily wooded ravine), ingress is gained relatively easily. These hypothetical nearby resident trespassers would be expected to enter Site 31 by Barloy Canyon Road to the west or Watkins Gate Road to the east.

For the average scenario, a child receptor aged 6 through 9 years was evaluated, giving an ED of 3 years. The receptor was assumed to be aged 6 through 18 years for the RME scenario, giving an RME ED of 12 years. It was considered unlikely that children younger than 6 years of age would visit the site because of the steep ravine and heavily wooded areas.

For the average scenario, the nearby resident trespasser receptor was assumed to play at the site each day of the weekend, for every week for 6 months of the year, giving an average EF of 48 days per year (i.e., 2 days times 4 weeks times 6 months). The receptor was assumed not to visit the site for the remaining 6 months of the year due to inclement weather. Once the nearby resident trespasser receptor enters Site 31, he or she may visit all three areas (i.e., the North Slope, South Slope, and LRTC Area). The EF for all three areas was therefore assumed to be equal, i.e., 48 days per year. The RME EF was assumed to be twice the average EF, or 96 days per year for all areas. This RME EF is very conservative because it assumes that the receptor plays at Site 31 every weekend day every week of the year, whatever the weather, and does this for all of the 12 years from 6 to 18 years of age.

An analysis of children's activities conducted by the EPA (*1990b*) found that children are likely to spend approximately 2 hours per day playing outdoors while at home. The nearby resident trespasser receptor was, therefore, assumed to spend 2 hours at the site on any visit. Moreover, this receptor was assumed to spend an equal amount of time at each of the three onsite areas, giving an ET of 0.66 hour (i.e., 2 hours divided by 3) for the North Slope, South Slope, and LRTC Area. This ET of 0.66 hour was used to evaluate exposure to soil through inhalation of dust for both the average and RME exposure scenarios.

In risk assessments, FI is used to evaluate exposure to soil by ingestion and dermal contact; this term accounts for the fact that the time the receptor spends at Site 31 was divided between three areas. The receptor was conservatively assumed to receive 100 percent of his or her daily exposure to soil by ingestion or dermal contact while at Site 31, equally divided among the three areas. The North Slope is less accessible because of the approximately 1:1 gradient. However, it was assumed to have the same FI as the South Slope and LRTC Area because the steep side and loose surface soil were considered to potentially increase the receptor's contact with the soil, compared to the degree of direct contact with soil that is possible at the other two areas. The nearby resident trespasser receptor was, therefore, assumed to spend one third of his or her total time at the site at each of the three areas, giving an RME FI of 0.33 each for the North Slope, South Slope, and LRTC Area. The FI for the average scenario was assumed to be 0.16, or half the RME FI, for each of the three areas.

The very conservative RME scenario likely overestimates actual exposure conditions that may occur at the site in the future, and, therefore, may lead to an overestimation of potential RME risks and hazards. The site-specific exposure assumptions used in the risk assessment for Site 31 are summarized in Table 6.7.

6.4.4 Exposure Point Concentrations (EPCs)

Section 2.2.7 presents the methods used for developing EPCs. As discussed in Section 6.4.2, the exposure pathways quantitatively evaluated for the nearby resident trespasser at Site 31 are exposure to soil by ingestion, dermal contact, effects are anticipated for the nearby resident trespasser receptor at the North Slope.

6.6.1.2 South Slope

Possible noncancer health effects estimated for the receptor for the South Slope are presented in Tables E49 and E50 in Appendix E. The multipathway noncarcinogenic HIs are estimated to be 0.00004 and 0.0004 for the average and RME scenarios, respectively. This indicates that no noncarcinogenic adverse health effects are anticipated for the nearby resident trespasser receptor at the South Slope.

6.6.1.3 LRTC Area

Possible noncancer health effects estimated for the receptor at the LRTC Area are presented in Tables E51 and E52 in Appendix E. The multipathway noncarcinogenic HIs are estimated to be 0.00007 and 0.003 for the average and RME scenarios, respectively. This indicates that no noncarcinogenic adverse health effects are anticipated for the nearby resident trespasser receptor at the LRTC Area.

6.6.1.4 Summary of Possible Noncancer Health Effects

Table 6.11 presents the estimated total HIs for Site 31, which are the sums of the multipathway noncarcinogenic HIs for the North Slope, South Slope, and LRTC Area. The average and RME total HIs are 0.0009 and 0.02, respectively. This indicates that no noncarcinogenic adverse health effects are anticipated for the nearby resident trespasser receptor for Site 31.

6.6.2 Possible Cancer Risks

This section discusses the possible cancer risks associated with potential exposure of the nearby resident trespasser receptor to COPCs in soil at all three areas of Site 31.

6.6.2.1 North Slope

Possible cancer risks estimated for the receptor for the North Slope are presented in Tables E47 and E48 in Appendix E. The estimated lifetime cancer risk for the average scenario is 1×10^{-8}, and the estimated lifetime cancer risk for the RME scenario is 8×10^{-7}. These values are both below the EPA target risk range of 1×10^{-6} to 1×10^{-4}.

6.6.2.2 South Slope

Possible cancer risks estimated for the receptor for the South Slope are presented in Tables E49 and E50 in Appendix E. The estimated lifetime cancer risks are 8×10^{-11} and 6×10^{-9} for the average and RME scenarios, respectively. These are both below the EPA target risk range of 1×10^{-6} to 1×10^{-4}.

6.6.2.3 LRTC Area

Possible cancer risks estimated for the receptor for the LRTC Area are presented in Tables E51 and E52 in Appendix E. The estimated lifetime cancer risks are 9×10^{-10} and 6×10^{-8} for the average and RME scenarios, respectively. These are both below the EPA target risk range of 1×10^{-6} to 1×10^{-4}.

6.6.2.4 Summary of Possible Cancer Risks

Table 6.12 presents the estimated total cancer risks for Site 31, which are the sum of the multipathway cancer risks estimated for the North Slope, South Slope, and LRTC Area. The average and RME total cancer risks are 2×10^{-8} and 8×10^{-7}, respectively. These risks are below the EPA target risk range of 1×10^{-6} to 1×10^{-4}.

6.6.3 Results of Lead Exposure Evaluation

The methods for evaluating lead exposure are discussed in Section 2.2.9. The output of the LEADSPREAD model performed to evaluate possible lead exposure for the nearby resident trespasser receptor at Site 31 is presented in Tables F29 and F30 (Appendix F), and the results are summarized in Table 6.13. Possible lead exposure was evaluated for only one area at Site 31, the North Slope, because it is the only area where lead is a COPC.

The ninety-ninth percentile blood-lead level estimated for the receptor for the average

SECTION 6.0
TABLES AND PLATES

Table 6.1a. Statistical Data Summary of Chemicals Detected in Surface Soil (0 to 2 feet bgs)
Site 31, North Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Antimony	16	36	44.4	3.40E-01	--	2.54E+01	--	2.47E+00	5.52E+00	1.33E+01	1.33E+01
Arsenic	23	36	63.9	6.40E-01	--	5.80E+00	--	1.75E+00	1.45E+00	4.59E+00	4.59E+00
B(a)P-TE /a/	1	1	100.0	7.85E-02	--	7.85E-02	--	--	--	--	--
Beryllium	26	36	72.2	1.30E-01	--	3.80E-01	--	1.80E-01	9.00E-02	3.50E-01	3.50E-01
Cadmium	14	36	38.9	9.00E-01	--	8.20E+00	--	1.35E+00	1.88E+00	5.03E+00	5.03E+00
Chromium (total) /b/	36	36	100.0	1.04E+01	--	4.98E+01	--	1.85E+01	1.05E+01	3.91E+01	3.91E+01
Copper	36	36	100.0	2.10E+00	--	3.91E+02	--	4.60E+01	9.82E+01	2.38E+02	2.38E+02
4,4'-DDE	3	9	33.3	7.80E-02	--	1.20E+00	--	2.01E-01	4.05E-01	9.95E-01	9.95E-01
4,4'-DDT	3	9	33.3	7.00E-02	--	1.70E+00	--	2.37E-01	5.58E-01	1.33E+00	1.33E+00
Dibenzofuran	1	8	12.5	3.40E-02	--	3.40E-02	--	1.54E-01	4.97E-02	2.52E-01	3.40E-02
Fluoranthene	1	8	12.5	3.50E-02	--	3.50E-02	--	1.54E-01	4.93E-02	2.51E-01	3.50E-02
Lead	36	36	100.0	1.80E+00	--	2.21E+04	--	9.79E+02	3.74E+03	8.31E+03	8.31E+03
Mercury	15	36	41.7	7.00E-02	--	1.30E+00	--	1.10E-01	2.20E-01	5.40E-01	5.40E-01
2-Methylnaphthalene	3	8	37.5	4.30E-02	--	1.70E-01	--	1.39E-01	5.87E-02	2.54E-01	1.70E-01
Naphthalene	2	8	25.0	3.70E-02	--	1.30E-01	--	1.50E-01	4.91E-02	2.47E-01	1.30E-01
Nickel	22	36	61.1	5.80E+00	--	3.38E+01	--	7.71E+00	6.93E+00	2.13E+01	2.13E+01
Phenanthrene	2	8	25.0	3.60E-02	--	6.80E-02	--	1.40E-01	5.56E-02	2.49E-01	6.80E-02
Pyrene	1	8	12.5	4.70E-02	--	4.70E-02	--	1.56E-01	4.52E-02	2.44E-01	4.70E-02

Table 6.1a. Statistical Data Summary of Chemicals Detected in Surface Soil (0 to 2 feet bgs)
Site 31, North Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Silver	5	36	13.9	2.70E+00	--	7.40E+00	--	1.17E+00	1.68E+00	4.47E+00	4.47E+00
TCDD-TE	9	9	100.0	2.00E-08	--	2.81E-05	--	8.24E-06	1.01E-05	2.81E-05	2.81E-05
Total cPAH /a/	1	1	100.0	2.03E-01	--	2.03E-01	--	--	--	--	--
Zinc	36	36	100.00	9.40E+00	--	3.09E+03	--	3.87E+02	7.82E+02	1.92E+03	1.92E+03

bgs Below ground surface.
mg/kg Milligrams per kilogram.
-- Not applicable.
B(a)P-TE Benzo(a)pyrene toxic equivalents.
TCDD-TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
2.00E-08 2.00 x 10^-8.
cPAH Carcinogenic polycyclic aromatic hydrocarbons.

/a/ Carcinogenic PAH were analyzed for in eight samples, and detected in one. One-half the detection limits of the nondetect samples were not used to calculate an arithmetic mean because they exceeded the maximum (i.e., detected) concentration. Therefore, only one data point is available (Section 6.2).
/b/ Thirty-five samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.5 to 5.0 mg/kg.

Table 6.1b. Statistical Data Summary of Chemicals Detected in Subsurface Soil (>2 to 10 feet bgs)
Site 31, North Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Acetone	6	12	50.0	6.20E-03	9.50	1.00E-02	10.00	6.61E-03	1.72E-03	9.98E-03	9.98E-03
Antimony	9	25	36.0	7.80E-01	9.00	2.10E+01	3.00	2.68E+00	3.95E+00	1.04E+01	1.04E+01
Arsenic	19	25	76.0	5.90E-01	3.00	4.08E+01	9.50	4.67E+00	8.80E+00	2.19E+01	2.19E+01
Beryllium	14	25	56.0	1.90E-01	6.00	5.90E-01	9.00	2.70E-01	1.50E-01	5.60E-01	5.60E-01
Cadmium	4	25	16.0	1.20E+00	9.00	6.70E+00	3.00	9.20E-01	1.48E+00	3.82E+00	3.82E+00
Chromium (total) /a/	25	25	100.0	6.10E+00	9.50	6.44E+01	3.00	2.05E+01	1.41E+01	4.81E+01	4.81E+01
Copper	17	25	68.0	2.00E+00	10.00	1.18E+03	9.00	1.15E+02	2.95E+02	6.94E+02	6.94E+02
4,4'-DDE	2	4	50.0	1.80E-02	6.00	6.50E-02	3.00	2.53E-02	2.69E-02	7.79E-02	6.50E-02
4,4'-DDT	2	4	50.0	4.20E-02	6.00	1.20E-01	3.00	4.50E-02	5.24E-02	1.48E-01	1.20E-01
Lead	25	25	100.0	1.60E+00	3.00	3.62E+03	3.00	4.23E+02	8.96E+02	2.18E+03	2.18E+03
Mercury	8	25	32.0	8.00E-02	3.00	5.10E-01	6.00	8.00E-02	1.00E-01	2.70E-01	2.70E-01
Methylene chloride	1	12	8.3	3.60E-03	9.50	3.60E-03	9.50	2.73E-03	2.90E-04	3.29E-03	3.29E-03
Nickel	19	25	76.0	7.00E+00	3.00	1.40E+02	9.00	1.89E+01	2.83E+01	7.43E+01	7.43E+01
Silver	2	25	8.0	2.50E+00	9.50	3.00E+00	9.00	7.00E-01	8.60E-01	2.40E+00	2.40E+00
TCDD-TE	8	8	100.0	5.00E-07	6.00	2.91E-05	3.00	4.55E-06	9.92E-06	2.40E-05	2.40E-05
Thallium	2	25	8.0	5.15E-01	3.00	5.30E-01	9.50	3.80E-01	3.50E-01	1.08E+00	5.30E-01
Zinc	23	25	92.0	6.60E+00	10.00	2.58E+03	3.00	3.81E+02	7.11E+02	1.77E+03	1.77E+03

bgs Below ground surface.
mg/kg Milligrams per kilogram.
2.90E-04 2.90 x 10^-4.
TCDD-TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.

/a/ Twelve samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.11 to 2.3 mg/kg.

Table 6.2a. Statistical Data Summary of Chemicals Detected in Surface Soil (0 feet bgs)
Site 31, South Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detectioı	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Antimony	1	10	10.0	3.40E-01	--	3.40E-01	--	2.50E-01	1.40E-01	5.30E-01	3.40E-01
Arsenic	6	10	60.0	8.20E-01	--	1.20E+00	--	8.40E-01	3.00E-01	1.44E+00	1.20E+00
Beryllium	5	10	50.0	1.80E-01	--	3.20E-01	--	1.60E-01	1.10E-01	3.70E-01	3.20E-01
Cadmium	1	10	10.0	1.00E+00	--	1.00E+00	--	5.10E-01	1.80E-01	8.60E-01	8.60E-01
Chromium (total) /a/	10	10	100.0	5.90E+00	--	1.71E+01	--	1.06E+01	4.20E+00	1.88E+01	1.71E+01
Copper	8	10	80.0	1.50E+00	--	1.85E+01	--	6.15E+00	7.26E+00	2.04E+01	1.85E+01
Lead	10	10	100.0	2.00E+00	--	1.66E+02	--	4.17E+01	5.82E+01	1.56E+02	1.56E+02
Mercury	3	10	30.0	6.00E-02	--	8.00E-02	--	4.00E-02	2.00E-02	9.00E-02	8.00E-02
Nickel	3	10	30.0	5.60E+00	--	7.20E+00	--	3.99E+00	1.81E+00	7.54E+00	7.20E+00
TCDD-TE	5	5	100.0	2.00E-08	--	1.84E-06	--	4.10E-07	8.00E-07	1.98E-06	1.84E-06
Zinc	10	10	100.0	9.90E+00	--	1.88E+02	--	5.29E+01	6.46E+01	1.79E+02	1.79E+02

bgs Below ground surface.
mg/kg Milligrams per kilogram.
-- Not applicable.
TCDD-TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
2.00E-08 2 x 10^-8.

/a/ Eleven samples were analyzed for hexavalent chromium; none was detected. Detection limits range from 0.1 to 2.0 mg/kg.

Table Revisions
Volume III Site 31
Tables 6.2b

In Volume III, Site 31 Table 6.2b in footnote /a/ replace the word "*total*" with "*hexavalent.*"

Table 6.2b. Statistical Data Summary of Chemicals Detected in Subsurface Soil (> 0 to 10 feet bgs)
Site 31, South Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detectioı	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Acetone	3	6	50.0	6.30E-03	10.00	8.30E-03	10.00	6.23E-03	1.50E-03	9.18E-03	8.30E-03
Antimony	2	17	11.8	3.40E-01	--	1.10E+00	5.50	1.19E+00	1.22E+00	3.59E+00	1.10E+00
Arsenic	8	17	47.1	8.20E-01	--	1.50E+00	10.00	8.10E-01	3.30E-01	1.46E+00	1.46E+00
Beryllium	7	17	41.2	1.80E-01	--	3.20E-01	10.00	1.60E-01	1.00E-01	3.60E-01	3.20E-01
Cadmium	1	17	5.9	1.00E+00	--	1.00E+00	--	4.30E-01	1.70E-01	7.60E-01	7.60E-01
Chromium (total) /a/	17	17	100.0	5.50E+00	10.00	1.72E+01	5.50	1.04E+01	3.86E+00	1.80E+01	1.72E+01
Copper	12	17	70.6	1.30E+00	10.00	1.85E+01	--	4.54E+00	5.88E+00	1.61E+01	1.61E+01
Lead	17	17	100.0	1.40E+00	10.00	1.66E+02	--	2.54E+01	4.80E+01	1.20E+02	1.20E+02
Mercury	3	17	17.7	6.00E-02	--	8.00E-02	--	4.00E-02	2.00E-02	8.00E-02	8.00E-02
Nickel	6	17	35.3	5.30E+00	5.50	7.90E+00	10.00	4.24E+00	1.89E+00	7.94E+00	7.90E+00
TCDD-TE	6	6	100.0	2.00E-08	--	2.87E-05	2.00	5.13E-06	1.16E-05	2.78E-05	2.78E-05
Zinc	17	17	100.0	6.40E+00	10.00	1.88E+02	--	3.44E+01	5.36E+01	1.39E+02	1.39E+02

bgs Below ground surface.
mg/kg Milligrams per kilogram.
-- Not applicable.
TCDD-TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
2.00E-08 2.00 x 10^-8.

/a/ One sample was analyzed for total chromium; none was detected. The detection limit was 1.0 mg/kg.

Table Revisions
Volume III Site 31
Tables 6.3a

In Volume III, Site 31 Table 6.3a in footnote /a/ replace the word "*total*" with "*hexavalent.*"

Table 6.3a. Statistical Data Summary of Chemicals Detected in Surface Soil (0 feet bgs)
Site 31, LRTC Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detectioı	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Antimony	2	9	22.2	5.10E-01	--	5.10E-01	--	2.60E-01	1.50E-01	5.50E-01	5.10E-01
Arsenic	6	9	66.7	6.80E-01	--	2.50E+00	--	1.04E+00	6.40E-01	2.28E+00	2.28E+00
Beryllium	8	9	88.9	1.70E-01	--	3.40E-01	--	2.00E-01	7.00E-02	3.40E-01	3.40E-01
Chromium (total) /a/	9	9	100.0	1.01E+01	--	1.62E+01	--	1.25E+01	2.27E+00	1.69E+01	1.62E+01
Copper	9	13	69.2	2.90E+00	--	6.99E+02	--	5.73E+01	1.93E+02	4.35E+02	4.35E+02
Lead	9	9	100.0	4.70E+00	--	7.99E+01	--	2.22E+01	2.33E+01	6.79E+01	6.79E+01
Mercury	1	9	11.1	7.00E-02	--	7.00E-02	--	3.00E-02	1.00E-02	6.00E-02	6.00E-02
Nickel	6	9	66.7	5.80E+00	--	1.44E+01	--	7.09E+00	4.18E+00	1.53E+01	1.44E+01
TCDD-TE	3	3	100.0	1.90E-07	--	1.96E-05	--	6.71E-06	1.11E-05	2.85E-05	1.96E-05
Zinc	9	9	100.0	2.16E+01	--	5.83E+01	--	3.38E+01	1.22E+01	5.77E+01	5.77E+01

bgs Below ground surface.
LRTC Leadership Reaction Training Compound.
mg/kg Milligrams per kilogram.
-- Not applicable.
TCDD-TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
1.90E-07 1.90 x 10^-7.

/a/ Nine samples were analyzed for total chromium; none was detected. Detection limits range from 0.5 to 20 mg/kg.

Table Revisions
Volume III Site 31
Tables 6.3b

In Volume III, Site 31 Table 6.3b in footnote /a/ replace the word "*total*" with "*hexavalent.*"

Table 6.3b. Statistical Data Summary of Chemicals Detected in Subsurface Soil (> 0 to 10 feet bgs)
Site 31, LRTC Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detectioı	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Antimony	2	11	18.2	5.10E-01	--	5.10E-01	--	2.50E-01	1.30E-01	5.10E-01	5.10E-01
Arsenic	6	11	54.6	6.80E-01	--	2.50E+00	--	8.90E-01	6.50E-01	2.17E+00	2.17E+00
Beryllium	10	11	90.9	1.70E-01	--	3.40E-01	--	2.10E-01	7.00E-02	3.50E-01	3.40E-01
Chromium (total) /a/	11	11	100.0	1.01E+01	--	1.62E+01	--	1.26E+01	2.06E+00	1.67E+01	1.62E+01
Copper	8	18	44.4	2.90E+00	--	6.99E+02	--	4.15E+01	1.64E+02	3.63E+02	3.63E+02
Lead	11	11	100.0	1.50E+00	6.00	7.99E+01	--	1.85E+01	2.24E+01	6.25E+01	6.25E+01
Mercury	1	11	9.1	7.00E-02	--	7.00E-02	--	3.00E-02	1.00E-02	6.00E-02	6.00E-02
Nickel	7	11	63.6	5.40E+00	6.00	1.44E+01	--	6.52E+00	4.00E+00	1.44E+01	1.44E+01
TCDD-TE	3	3	100.0	1.90E-07	--	1.96E-05	--	6.71E-06	1.11E-05	2.85E-05	1.96E-05
Zinc	11	11	100.0	6.90E+00	6.00	5.83E+01	--	2.93E+01	1.49E+01	5.84E+01	5.83E+01

bgs Below ground surface.
LRTC Leadership Reaction Training Compound.
mg/kg Milligrams per kilogram.
-- Not applicable.
TCDD-TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
1.90E-07 1.90 x 10^-07.

/a/ Ten samples were analyzed for total chromium; none was detected. Detection limits range from 0.1 to 20 mg/kg.

Table Revisions
Volume III Site 31
Tables 6.3c

In Volume III, Site 31 Table 6.3c in footnote /a/ replace the word "*total*" with "*hexavalent.*"

Table 6.3c. Statistical Data Summary of Chemicals Detected in Deep Soil (> 10 feet bgs)
Site 31, LRTC Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detectioı	Number of Analyses	Frequency of Detection (percent)	Minimum Detection Value (mg/kg)	Depth of Minimum (feet)	Maximum Detection Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Arsenic	1	1	100	2.30E+00	12.00	2.30E+00	12.00	--	--	--	--
Beryllium	1	1	100	2.50E-01	12.00	2.50E-01	12.00	--	--	--	--
Chromium (total) /a/	1	1	100	2.01E+01	12.00	2.01E+01	12.00	--	--	--	--
Lead	1	1	100	2.90E+00	12.00	2.90E+00	12.00	--	--	--	--
Nickel	1	1	100	1.02E+01	12.00	1.02E+01	12.00	--	--	--	--
Zinc	1	1	100	9.50E+00	12.00	9.50E+00	12.00	--	--	--	--

bgs Below ground surface.
LRTC Leadership Reaction Training Compound.
mg/kg Milligrams per kilogram.
-- Not applicable.

/a/ One sample was analyzed for total chromium; none was detected. The detection limit was 0.11 mg/kg.

Table 6.4. Selection of COPCs for Chemicals Detected in Surface Soil (0 to 2 feet bgs) /a/
Site 31, North Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Antimony	25.40	ND /f/	--	--	0.09	--	YES
Arsenic	5.80	3.4	--	--	0.03	1E-04	YES
B(a)P-TE	0.078	--	--		--	6E-07	YES
Beryllium	0.38	0.35	--	--	0.0001	6E-06	YES
Cadmium	8.20	ND /f/	--	--	0.02	2E-04	YES
Chromium (total) /g/	49.80	46.1	--	--	0.00007	--	NO
Copper	391.00	18.2	--	--	0.02	--	YES
4,4-DDE	1.20	--	--	--	--	3E-07	YES
4,4-DDT	1.70	--	--	--	0.005	4E-07	YES
Dibenzofuran	0.034	--	--	--	<0.000001	--	NO
Fluoranthene	0.035	--	--	--	0.000001	--	NO
Lead	22,100	51.8	--	240	--	--	YES
Mercury	1.30	0.12	--	--	0.006	--	NO
2-Methylnaphthalene	0.17	--	--	--	0.000004	--	NO
Naphthalene	0.13	--	--	--	0.000003	--	NO
Nickel	33.80	58	--	--	--	--	NO
Phenanthrene	0.068	--	--	--	<0.000001	--	NO
Pyrene	0.047	--	--	--	0.000002	--	NO
Silver	7.40	0.36	--	--	0.002	--	NO
TCDD-TE	2.81E-05	--	--	--	--	3E-06	YES
Total cPAH /h/	0.203	--	--	--	0.00001	--	NO

Table 6.6. Selection of COPCs for Chemicals Detected in Surface Soil (0 feet bgs) /a/
Site 31, LRTC Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/		COPC (Yes/No)
					Hazard Quotient	Cancer Risk	

/a/ See Section 6.3 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 6.3a.
/c/ Because the maximum detected concentration of zinc is below background, no comparison with the essential nutrient estimated daily dose (EDD) was made.
/d/ Health based screening level for a child receptor (Harding Lawson Associates, Draft Technical Memorandum, Preliminary Remediation Goals, Fort Ord, California, June 14, 1993).
/e/ See Table C15 in Appendix C for development of screening values.
/f/ Antimony was not detected in shallow (0-2 feet bgs) NQTP soil in the background soil analysis. Any site-related detection of this metal therefore exceeds background.
/g/ Evaluated as chromium III. Chromium VI was not detected.

Table 6.7. Site-Specific Intake Assumptions /a/
Site 31
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

	Intake Assumptions			
Site Area Scenario/Receptor	Exposure Time ET (hours/day)	Fraction of Intake FI (unitless)	Exposure Frequency EF (days/year)	Exposure Duration ED (years)
North Slope				
Average Exposure Scenario				
Nearby Resident Trespasser (6 - 9 years)	0.66 /b/	0.16	48	3
RME Scenario				
Nearby Resident Trespasser (6 - 18 years)	0.66	0.33	96	12
South Slope				
Average Exposure Scenario				
Nearby Resident Trespasser (6 - 9 years)	0.66	0.16	48	3
RME Scenario				
Nearby Resident Trespasser (6 - 18 years)	0.66	0.33	96	12
LTRC Area				
Average Exposure Scenario				
Nearby Resident Trespasser (6 - 9 years)	0.66	0.16	48	3
RME Scenario				
Nearby Resident Trespasser (6 - 18 years)	0.66	0.33	96	12

RME Reasonable maximum exposure.

/a/ See Section 6.4.3 for explanation.
/b/ The ETs for each area sum to a total of 2 hours per day at Site 31.

Table 6.8. Exposure Point Concentrations (EPCs) for Soil and Air
Site 31, North Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals of Potential Concern	Average Exposure Scenario		RME Scenario	
	Soil Concentration /a/ (mg/kg)	Air Concentration /b/ (mg/m^3)	Soil Concentration /c/ (mg/kg)	Air Concentration /b/ (mg/m^3)
Surface Soil (0 to 2 feet bgs)				
Antimony	2.47E+00	2.84E-08	1.33E+01	1.53E-07
Arsenic	1.75E+00	2.01E-08	4.59E+00	5.28E-08
B(a)P-TE /d/	7.85E-02	9.03E-10	7.85E-02	9.03E-10
Beryllium	1.80E-01	2.07E-09	3.50E-01	4.03E-09
Cadmium	1.35E+00	1.55E-08	5.03E+00	5.78E-08
Copper	4.60E+01	5.29E-07	2.38E+02	2.74E-06
4,4'-DDE	2.01E-01	2.31E-09	9.95E-01	1.14E-08
4,4'-DDT	2.37E-01	2.73E-09	1.33E+00	1.53E-08
Lead	9.79E+02	1.13E-05	8.31E+03	9.56E-05
TCDD-TE	8.24E-06	9.48E-14	2.81E-05	3.23E-13
Total cPAH /d/	2.03E-01	2.33E-09	2.03E-01	2.33E-09

RME	Reasonable maximum exposure.
mg/kg	Milligrams per kilogram.
mg/m^3	Milligrams per cubic meter.
bgs	Below ground surface.
2.47E+00	2.47 x 10^0.
B(a)P-TE	Benzo(a)pyrene toxic equivalents.
TCDD-TE	2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
cPAH	Carcinogenic polycyclic aromatic hydrocarbons.
PM10	Particulates with a diameter less than or equal to 10 microns.

/a/ Arithmetic mean.
/b/ Air concentration (mg/m^3) = soil concentration (mg/kg) x site-specific PM10 (1.15E-2 mg/m^3) x conversion factor (1E-6 kg/mg).
/c/ Lesser of the maximum concentration and 95 percent upper confidence limit of the arithmetic mean.
/d/ For B(a)P-TE and total cPAH, the maximum concentration was used to evaluate both the average and RME scenarios (see Sections 6.2 and 6.4.4).

Table 6.9. Exposure Point Concentrations (EPCs) for Soil and Air
Site 31, South Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

	Average Exposure Scenario		RME Scenario	
Chemicals of Potential Concern	Soil Concentration /a/ (mg/kg)	Air Concentration /b/ (mg/m^3)	Soil Concentration /c/ (mg/kg)	Air Concentration /b/ (mg/m^3)
Surface Soil (0 feet bgs)				
Cadmium	5.10E-01	5.87E-09	8.60E-01	9.89E-09
TCDD-TE	4.10E-07	4.72E-15	1.84E-06	2.12E-14

RME	Reasonable maximum exposure.
mg/kg	Milligrams per kilogram.
mg/m^3	Milligrams per cubic meter.
bgs	Below ground surface.
TCDD-TE	2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
4.10E-07	4.10 x 10^-7.
PM10	Particulates with a diameter less than or equal to 10 microns.

/a/ Arithmetic mean.
/b/ Air concentration (mg/m^3) = soil concentration (mg/kg) x site-specific PM10 (1.15E-2 mg/m^3) x conversion factor (1E-6 kg/mg).
/c/ Lesser of the maximum concentration and 95 percent upper confidence limit of the arithmetic mean.

Table 6.10. Exposure Point Concentrations (EPCs) for Soil and Air
Site 31, LRTC Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals of Potential Concern	Average Exposure Scenario		RME Scenario	
	Soil Concentration /a/ (mg/kg)	Air Concentration /b/ (mg/m^3)	Soil Concentration /c/ (mg/kg)	Air Concentration /b/ (mg/m^3)
Surface Soil (0 feet bgs)				
Copper	5.73E+01	6.59E-07	4.35E+02	5.00E-06
TCDD-TE	6.71E-06	7.72E-14	1.96E-05	2.25E-13

LRTC	Leadership Reaction Training Compound.
RME	Reasonable maximum exposure.
mg/kg	Milligrams per kilogram.
mg/m^3	Milligrams per cubic meter.
bgs	Below ground surface.
TCDD -TE	2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
5.73E+01	5.73 x 10^+1
PM10	Particulates with a diameter less than or equal to 10 microns.

/a/ Arithmetic mean.
/b/ Air concentration (mg/m^3) = soil concentration (mg/kg) x site-specific PM10 (1.15E-2 mg/m^3) x conversion factor (1E-6 kg/mg).
/c/ Lesser of the maximum concentration and 95 percent upper confidence limit of the arithmetic mean.

Table 6.4. Selection of COPCs for Chemicals Detected in Surface Soil (0 to 2 feet bgs) /a/
Site 31, North Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Zinc	3090.00	75.8	0.618	--	--	--	NO

COPCs Chemicals of potential concern.
bgs Below ground surface.
mg/kg Milligrams per kilogram.
mg/day Milligrams per day.
ND Not detected.
-- Not applicable or not available.
6E-06 6 x 10^-6.
B(a)P-TE Benzo(a)pyrene toxic equivalents.
cPAH Carcinogenic polycyclic aromatic hydrocarbons.
TCDD-TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.

/a/ See Section 6.3 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 6.1a.
/c/ Estimated daily dose (see Appendix B for explanation). The EDD for zinc was compared to the Recommended Daily Allowance (RDA) for zinc of 5 to10 mg/day (National Research Council, 1989).
/d/ Health based screening level for a child receptor (Harding Lawson Associates, Draft Technical Memorandum, Preliminary Remediation Goals, Fort Ord, California, June 14, 1993).
/e/ See Table C13 in Appendix C for development of screening values.
/f/ Antimony and cadmium were not detected in shallow (0-2 feet bgs) NQTP soil in the background soil analysis. Any site-related detection of these metals therefore exceeds background.
/g/ Evaluated as chromium III. Chromium VI was not detected.
/h/ Total cPAH was quantitatively evaluated in the risk assessment as the noncarcinogenic component of B(a)P-TE, which was selected as a COPC.

Table 6.5. Selection of COPCs for Chemicals Detected in Surface Soil (0 feet bgs) /a/
Site 31, South Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Cancer Risk	COPC (Yes/No)
Antimony	0.34	ND /f/	--	--	0.001	--	NO
Arsenic	1.20	3.40	--	--	--	--	NO
Beryllium	0.32	0.35	--	--	--	--	NO
Cadmium	1.00	ND /f/	--	--	0.003	2E-05	YES
Chromium (total) /g/	17.10	46.1	--	--	--	--	NO
Copper	18.50	18.2	--	--	0.0007	--	NO
Lead	166.00	51.8	--	240	--	--	NO
Mercury	0.08	0.12	--	--	--	--	NO
Nickel	7.20	58	--	--	--	--	NO
TCDD-TE	1.84E-06	--	--	--	--	2E-07	YES
Zinc	188.00	75.8	0.038	--	--	--	NO

COPCs	Chemicals of potential concern.
bgs	Below ground surface.
mg/kg	Milligrams per kilogram.
mb/day	Milligrams per day.
ND	Not detected.
--	Not applicable or not available.
1.84E-06	1.84 x 10^-6.
TCDD -TE	2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.

Table 6.5. Selection of COPCs for Chemicals Detected in Surface Soil (0 feet bgs) /a/
Site 31, South Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Cancer Risk	COPC (Yes/No)

/a/ See Section 6.3 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 6.2a.
/c/ Estimated daily dose (see Appendix B for explanation). The EDD for zinc was compared to the Recommended Daily Allowance (RDA) for zinc of 5 to10 mg/day (National Research Council, 1989).
/d/ Health based screening level for a child receptor (Harding Lawson Associates, Draft Technical Memorandum, Preliminary Remediation Goals, Fort Ord, California, June 14, 1993.
/e/ See Table C14 in Appendix C for development of screening values.
/f/ Antimony and cadmium were not detected in shallow (0-2 feet bgs) NQTP soil in the background soil analysis. Any site-related detection of these metals therefore exceeds background.
/g/ Evaluated as chromium III. Chromium VI was not detected.

Table 6.6. Selection of COPCs for Chemicals Detected in Surface Soil (0 feet bgs) /a/
Site 31, LRTC Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
Antimony	0.51	ND /f/	--	--	0.002	--	NO
Arsenic	2.50	3.4	--	--	--	--	NO
Beryllium	0.34	0.35	--	--	--	--	NO
Chromium (total) /g/	16.20	46.1	--	--	--	--	NO
Copper	699.00	18.2	--	--	0.03	--	YES
Lead	79.90	51.8	--	240	--	--	NO
Mercury	0.07	0.12	--	--	--	--	NO
Nickel	14.40	58	--	--	--	--	NO
TCDD-TE	1.96E-05	--	--	--	--	2E-06	YES
Zinc	58.30	75.8	--	--	--	--	NO

COPCs Chemicals of potential concern.
bgs Below ground surface.
LRTC Leadership Reaction Training Compounds.
mg/kg Milligrams per kilogram.
mg/day Milligrams per day.
ND Not detected.
-- Not applicable or not available.
TCDD -TE 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
1.96E-05 1.96 x 10^-5.

Table 6.11. Total Hazard Index for the Nearby Resident Trespasser Receptor /a/
Site 31, All Areas
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario Site Area	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Total HI by Area
Average Exposure Scenario				
North Slope	0.0007	0.00008	0.000001	0.0008
South Slope	0.00004	<0.000001	<0.000001	0.00004
LRTC Area	0.00007	0.000004	<0.000001	0.00007
Total	0.0008	0.00008	0.000001	0.0009
RME Scenario				
North Slope	0.01	0.003	0.000001	0.02
South Slope	0.0004	0.000005	<0.000001	0.0004
LRTC Area	0.002	0.0004	0.000001	0.003
Total	0.02	0.004	0.000002	0.02

HI Hazard Index.
LRTC Leadership Reaction Training Compound.
RME Reasonable maximum exposure.

/a/ Chemical-specific HIs are presented in Tables E47 through E52 in Appendix E. HIs are reported to 1 significant figure.

Table 6.12. Total Cancer Risks for the Nearby Resident Trespasser Receptor /a/
Site 31, All Areas
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario Site Area	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Total Risk by Area
Average Exposure Scenario				
North Slope	1.11E-08	3.24E-09	1.39E-10	1E-08
South Slope /a/	4.92E-11	7.50E-12	2.13E-11	8E-11
LRTC Area	8.05E-10	1.23E-10	2.78E-12	9E-10
Total	1.20E-08	3.37E-09	1.63E-10	2E-08
RME Scenario				
North Slope	5.03E-07	2.63E-07	2.36E-09	8E-07
South Slope /a/	4.25E-09	1.49E-09	2.03E-10	6E-09
LRTC Area	4.52E-08	1.58E-08	4.52E-11	6E-08
Total	5.52E-07	2.80E-07	2.61E-09	8E-07

LRTC — Leadership Reaction Training Compound
RME — Reasonable maximum exposure.
8.72E-09 — 8.72 x 10^-9.

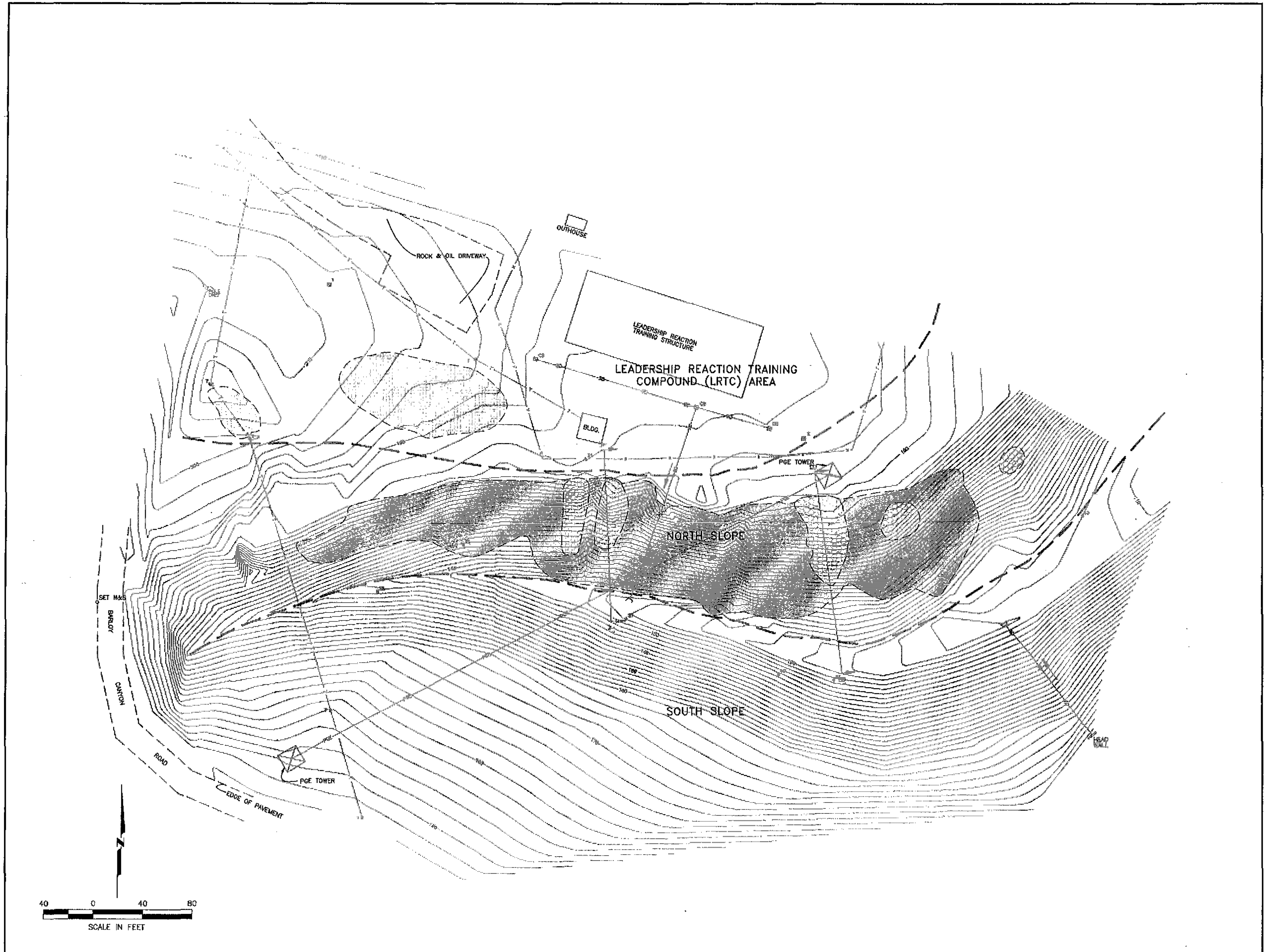
/a/ Chemical-specific risks are presented in Tables E47 through E52 in Appendix E.

Table 6.13. Summary of Model-Predicted Blood-Lead Levels from Multipathway Exposures
Site 31, North Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Model Application, Name Receptor	Blood-Lead Level (µg/dl) Average 95th Percentile	 99th Percentile	 RME 95th Percentile	 99th Percentile
Child Receptor, LEADSPREAD Model /a/				
Offsite Nearby Resident Trespasser (6 - 9 years)	4.12	5.25	12.64	16.10
Offsite Nearby Resident Trespasser (6 - 18 years)	4.12	5.25	12.64	16.10

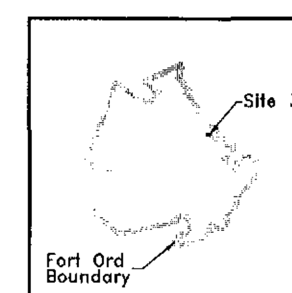
µg/dl Micrograms lead per deciliter blood.
RME Reasonable maximum exposure.

/a/ LEADSPREAD Model outputs are presented in Tables F17 and F18 in Appendix F.



EXPLANATION

- GROUND SURFACE CONTOUR (FEET ABOVE MEAN SEA LEVEL, CONTOUR INTERVAL 2 FEET)
- BUILDING
- STORM DRAIN OUTFALL PIPE
- FENCE
- GLOBAL POSITIONING SYSTEM (GPS) POINT
- WATER CATCH BASIN
- FENCE POST REFERENCE POINT
- TELEPHONE POLE
- TELEPHONE LINE
- PACIFIC GAS & ELECTRIC POWER LINE
- STORM DRAIN LINE
- AREA OF SPORADIC SURFACE DEBRIS (WOOD, METAL PIECES, WHOLE AND BROKEN GLASS AND COAL); OVERLIES YELLOWISH BROWN TO LIGHT YELLOWISH BROWN SILTY SAND TO SANDY SILT, LOCALLY BECOMES DARK YELLOWISH BROWN.
- AREA OF COAL DEBRIS LESS THAN 8 INCHES BELOW GROUND SURFACE (BGS).
- AREA OF EXTENSIVE DEBRIS EXTENDING GREATER THAN 2 FEET BGS; 25%-75% IS GREYISH BROWN SILTY SAND TO SANDY SILT, 25%-75% IS DEBRIS (BOTTLECAPS, PIECES OF POTTERY AND METAL, MELTED AND NON-MELTED GLASS PIECES AND BOTTLES, FORK, GLASS STOPPER)
- AREA OF MODERATELY EXTENSIVE TO SPORADIC DEBRIS GENERALLY LESS THAN 8 INCHES BGS; DEBRIS EXTENDS BELOW 2 FEET BGS IN LOCALIZED AREAS; 90-100% IS DARK YELLOWISH BROWN SILTY SAND SANDY SILT. 0-10% IS DEBRIS (METAL FRAGMENTS, WHOLE AND BROKEN BOTTLES, RUSTED CANS, WOOD, COAL, AND NYLON NETTING).
- APPROXIMATE BOUNDARY OF DEBRIS
- APPROXIMATE AREA BOUNDARY LINE



KEY MAP

NO.	DATE	REVISIONS	HLA FILE NO.	PROJECT NO.	APPROVED	APPROVAL DATE	DRAWN BY
1	7/94	DRAFT	23366267	23366 04164			MEK
2	12/94	DRAFT FINAL	23366267	23366 041723	MEC	11-22-94	MEK

Harding Lawson Associates
Engineering and Environmental Services

Volume III – Baseline Risk Assessment
Basewide RI/FS
Fort Ord, California

Site Plan
Site 31

PLATE: 6.1

7.0 BASELINE RISK ASSESSMENT FOR SITE 39

The baseline human health risk assessment (BRA) for Site 39, the Inland Ranges, is presented in this section. This BRA was conducted following the methods described in Section 2.0. Any specific deviations from these methods are identified in the sections that follow.

7.1 Site Background

The following sections summarize background information for Site 39. A description of the physical setting of Site 39, including topography, geology, and hydrogeology, is presented, as is information on past and potential future land uses and nearby human populations.

7.1.1 Physical Setting

Site 39 is located in the southwest portion of Fort Ord. It is an area that encompasses the Inland Ranges (approximately 8,000 acres) and the 2.36-inch Rocket Range (approximately 50 acres). The Inland Ranges include several study areas which are evaluated separately in the Site 39 RI: Range 36A, Range 40A, Range 33, the explosive ordnance target areas, and the small arms ranges (Volume II, Section 2.0). The delineation of these study areas is based on previous investigations (including field work) at several individual ranges and research regarding potential ordnance-related training areas. For the purposes of this BRA, Site 39 was evaluated as one area; the study areas identified and discussed in the Site 39 RI (Volume II) are not considered separately.

The Inland Ranges are bounded by Eucalyptus Road to the north, Barloy Canyon Road to the east, Old South Boundary Road to the south, and North-South Road to the west (Plate 7.1). Most ordnance-related activities within the Inland Ranges were associated with the trainfire ranges situated just inside the perimeter; weapons were generally fired toward the center of the Inland Ranges. The High Impact Area (HIA), an area of approximately 1,100 acres in the center of the Inland Ranges, is defined as the area whose boundaries were based on maximum ordnance trajectory, overlapping range fans, and the extent of restricted air space for Monterey Airport. The main target areas for the high explosive ordnance used at some ranges are within the HIA; however, other high explosive target areas are within the Inland Ranges but outside of the HIA. The locations and limits of the individual trainfire ranges did not change appreciably over the years, although several have been decommissioned. Targets constructed in the ranges include fixed silhouettes, track-mounted moving targets, pneumatic and electric popups, automobiles, trucks, tanks, and armored personnel carriers. Remnants of some of these targets are present at some of the ranges. Information on the use of each of the inland ranges is presented in Section 1.1 of Volume II, Remedial Investigation, Site 39.

The 17 small arms ranges included in Site 39 were evaluated as one study area. These ranges are predominantly along the northern, southern, and western perimeter of the Inland Ranges. Pistols, rifles, machine guns, and subcaliber weapons were fired in these areas. As at Site 3, the small arms ranges at Site 39 were visually inspected and percent bullet cover was noted (i.e., less than 1 percent bullet cover, 1 to 10 percent bullet cover, and greater than 10 percent bullet cover). Chemical data were collected at Site 3 from representative areas of each specified percent bullet cover to characterize chemical concentrations in each of these areas. Because conditions at Site 3 and the small arms ranges are similar, the chemical data collected at Site 3 were considered representative of chemical concentrations in each area of specified percent bullet cover at the small arms ranges. Therefore, no additional chemical data were collected at the small arms ranges. The field investigation for the Site 39 small arms ranges is described in Volume II, Remedial Investigation, Site 39, Section 3.5.2.

The 2.36-inch Rocket Range is immediately north of Eucalyptus Road, outside of but near the north-central portion of the Inland Ranges. This range is relatively flat with low shrubs and is bounded on the east side by a manmade berm. No physical boundary defines the west site of the range. A low, broad ridge provides a natural backstop at the northern extent of the range. Two sections of narrow gauge track for moving targets and disturbed ground possibly from a third track extend across the range from east to west. No other evidence of target remnants is present.

7.1.1.1 General Topography

The western and central portions of Site 39 consist of low rolling hills and closed depressions; the ground surface generally slopes to the west and northwest throughout most of the area. In the eastern portions of the site, the terrain is more rugged and consists of ridges that rises up to 600 feet above the canyon bottoms. Elevations range from approximately 900 feet mean sea level (MSL) in the southeast to approximately 200 feet MSL in the southwest. Vegetation at Site 39 is primarily central maritime chaparral, with low sparsely distributed shrubs.

7.1.1.2 Hydrogeology

On the basis of limited available hydrogeologic information, Site 39 appears to be nearly entirely underlain by the Seaside Basin. Groundwater flow regimes beneath Site 39 are complex, with independent flow regimes present in different areas of the site. The Seaside Basin has three distinct water-bearing units which are, from surface to depth, the Uppermost, Paso Robles, and Santa Margarita aquifers. Depth to the Uppermost aquifer ranges from 60 to 180 feet. The general flow direction of groundwater at Site 39 is to the north and northwest.

Surface water hydrology at Site 39 is influenced by variations in topography in the western, central, and eastern portions of the site. In the western and central portions, seasonal runoff is minimal due to low rolling hills and a high rate of infiltration into the permeable dune sand that comprises much of the surface soil.

Well-developed natural drainages are absent through much of this area. The eastern portion of the site, which is characterized by rugged terrain formed in more resistant lithologies, has eastward-flowing ephemeral stream drainages within narrow canyons that have moderate to steep sloping walls. Runoff is toward the Salinas Valley.

The hydrogeology of the site is described in detail in Volume II, Remedial Investigation, Site 39, Sections 1.5 and 1.6.

7.1.2 Land Use

Most of Site 39 was previously used for target practice. The Inland Ranges were reportedly used since the early 1900s for ordnance training exercises, including naval gunfire from offshore. Over the years various types of ordnance have been used or found in the Inland Ranges, including hand grenades, mortars, rockets, mines, artillery rounds, flame throwers, and machine gun and small arms rounds. The 2.36-inch Rocket Range was used as an antitank rocket (bazooka) range, probably during and shortly after World War II.

Because of base closure activities at Fort Ord, Site 39 is currently inactive. Proposed future plans call for most of Site 39 to become part of a habitat reserve, managed by the Bureau of Land Management (BLM) (*COE, 1994*). The Fort Ord Environmental Impact Statement (*COE, 1993*) describes this area as a natural resource management area (NRMA). BLM will manage the NRMA for the benefit of natural resources, with priority given to conservation, enhancement, and restoration of habitat.

Several areas within the proposed NRMA but along the southwest border of the Inland Ranges have other proposed future land uses. These include recreational facilities, education and research facilities related to the area's natural resources, a fire and law enforcement training area, and relocation of Highway 68 *(COE, 1994)*. These areas comprise a very small portion of Site 39 and are outside the high impact areas. Available future land use plans indicate that the site is not expected to be developed for residential, industrial, or commercial use.

Text Revisions
Volume III, Site 39
Page 82

In Volume III, Site 39, Section 7.1.3, change the second sentence of the second paragraph in the first column of page 82 to read:

Pedestrians may also visit the NRMA for recreational purposes.

7.1.3 Nearby Populations

Site 39 is bordered to the west, southwest, south, and southeast by residential areas of the city of Seaside. These residential areas are heaviest along the western border of Site 39. York School, a secondary day school, is located on the southern border of the site. Nearby residents, both children and adults, may currently be found in these offsite areas. No residential areas are present within Site 39.

In the future, people who may be found onsite at the NRMA include habitat management personnel and scientists and students from the universities planned to be constructed at other Fort Ord areas; such scientists and students would be expected to be engaged in biological studies. Trespassers may also visit the NRMA for recreational purposes, although access is expected to be restricted. Other people who may be found onsite include law enforcement trainees at the peace officer training area, construction workers associated with highway construction or engaged in building planned onsite facilities, workers at the proposed state and county parks, and visitors to these parks.

7.2 Data Evaluation

HLA sampled soil and groundwater at Site 39 in April and May 1994 as part of the RI chemical site characterization. In addition, HLA performed several investigations at individual ranges at Site 39 between 1992 and 1994. Soil samples were collected from areas expected to be highly impacted by ordnance (e.g., soil near targets). These areas include the high impact area and several ranges in the northern portion of the site (Plate 7.1). For the purpose of this BRA, it was conservatively assumed that the chemical data were representative of conditions throughout Site 39. Groundwater samples were collected from seven monitoring wells at Site 39: MW-05-02 at Range 36A in the eastern part of the site and six basewide wells in the western portion of the site. Soil and groundwater data from all investigations performed by HLA at Site 39 are included in this BRA. A detailed description of the sampling activities, including the complete analytical program for each study area evaluated is presented in Volume II, Remedial Investigation, Site 39, Sections 2.0 and 3.0.

In 1990, 24 soil samples from Range 36A were collected and analyzed for metals and explosives during an investigation performed by James M. Montgomery (JMM) Consulting Engineers. Detected concentrations of metals and explosives in these JMM samples are within the range of concentrations detected in soil samples collected by HLA during subsequent investigations (Volume II, Remedial Investigation Site 39, Tables 4 through 6). Data for these samples were reviewed but were not included in the BRA because complete validation of the data was not possible and exclusion of the data is unlikely to significantly impact the results of this BRA.

The methods used to evaluate chemical data and the data set considered for this BRA are discussed in Section 2.1.1.5 and summarized here. Soil data are segregated by the following depths: surface soil data (0 to 2 feet bgs), subsurface soil data (2 to 10 feet bgs), and deep soil data (greater than 10 feet bgs). Statistical data analyses for the chemicals detected in soil are presented on Tables 7.1a through 7.1c, and for chemicals detected in groundwater on Tables 7.2 and 7.3. The frequency of detection, minimum and maximum detected concentrations, arithmetic mean concentration, standard deviation on the arithmetic mean concentration, and 95 percent upper confidence limit on the arithmetic mean concentration are presented for each detected chemical. The analytical program and chemicals detected in soil and groundwater in each area are summarized below.

7.2.1 Soil

Soil samples were collected from 203 soil borings at Site 39. Of these 203 borings, 6 were boreholes for the 6 basewide monitoring wells at Site 39. Soil samples were collected from these borings at depths of 0 foot (i.e., surface samples) to 180 feet bgs. Soil samples collected from the remaining 197 borings were collected at depths of 0 to 21 feet bgs, with at least one surface sample from all but 1 boring. A total of 616 samples were collected and analyzed for the following:

- Priority pollutant metals (approximately 535 samples)
- Explosives (approximately 375 samples)
- Semivolatile organic compounds (30 samples)
- Chlorinated pesticides (18 samples)
- BTEX (138 samples).

As discussed in Section 2.1.1.1, results for screening analyses such as soil gas sampling and TPH analysis are not included in this BRA.

Analysis for Chromium VI (Cr VI) was not performed at Site 39. Detected concentrations of total chromium are assumed to represent Cr III. Chromium VI is not expected to occur in soils at Site 39 for the following reasons:

- No potential source of Cr VI was identified at Site 39
- A total of 262 soil samples from Sites 2 and 12, 16 and 17, 3, and 31 were analyzed for Cr VI; none was detected. Chromium VI has not been detected in soil at other locations at Fort Ord.

The following chemicals were detected in soil at Site 39:

- Surface soil (0 to 2 feet bgs): 2-amino-dinitrotoluene, 4-amino-dinitrotoluene, di-n-octyl phthalate, bis(2-ethylhexyl)phthalate, cyclotetramethylene tetranitramine (HMX), 2-methylnaphthalene, tetryl, 4-nitrophenol, pentachlorophenol, pentaerythritoltetranitrate (PETN), phenanthrene, pyrene, cyclotrimethylene trinitramine (RDX), 1,3,5-trinitrobenzene, 2,4,6-trinitrotoluene, nitroglycerin, antimony, arsenic, beryllium, cadmium, chromium (total), copper, lead, mercury, nickel, selenium, silver, and zinc (Table 7.1a)
- Subsurface soil (2 to 10 feet bgs): 2-amino-dinitrotoluene, bis(2-ethylhexyl)phthalate, HMX, 4-nitrophenol, pentachlorophenol, RDX, antimony, arsenic, beryllium, cadmium, chromium (total), copper, lead, mercury, nickel, selenium, silver, and zinc (Table 7.1b)
- Deep soil (greater than 10 feet bgs): arsenic, beryllium, cadmium, chromium (total), copper, lead, mercury, nickel, selenium, silver, thallium, and zinc (Table 7.1c)

Except for HMX, which was detected at a maximum concentration of 1,100 milligrams per kilogram (mg/kg), explosive compounds and SOCs are generally present at low concentrations (e.g., 1-10 mg/kg). Both explosives and SOCs were detected primarily in surface or near-surface soil samples (0 to approximately 2.5 feet bgs), and concentrations decrease significantly from the surface to 2.5 feet bgs. All metals were detected above the site-specific maximum background concentration for Fort Ord in at least one sample.

TIC data are available for samples analyzed using EPA Test Method 8270. Sixteen compounds were identified as TICs in the Site 39 dataset, in addition to several "unknown compounds." A review of data for this site indicates that the TICs identified are most likely either hydrocarbon-related or naturally occurring (i.e., biological compounds such as fatty acids). Petroleum hydrocarbons are considered to be fully characterized in the SOC and BTEX analysis (EPA Methods 8270 and 8240), and potential exposure to hydrocarbons is evaluated in this BRA using SOC data. TICs identified as naturally occurring were not evaluated in this BRA because they were detected at low concentrations, low frequency, and other chemicals with known toxicity were detected in this area. Therefore, TIC data are not evaluated further in this BRA.

7.2.2 Groundwater

A comprehensive groundwater study was not performed at Site 39. However, groundwater sampling was performed at existing monitoring wells at Site 39 in response to regulatory agency comments concerning groundwater quality, as discussed in Volume II, Remedial Investigation Site 39, Section 3.6. The purpose of the sampling was to evaluate the potential presence of explosive compounds, priority pollutant metals, and nitrates in groundwater beneath the site. As discussed in the Site 39 Remedial Investigation (Volume II), groundwater beneath Site 39 does not appear to have been impacted by site activities for the following reasons:

- No organic chemicals were detected in groundwater
- Metals detected in soil are unlikely to leach to groundwater (Volume II Remedial Investigation, Site 39, Section 5.0; Volume II Introduction, Section 3.0). In addition, detected concentrations of metals in groundwater are generally low and consistent between the Uppermost and Paso Robles Aquifers.

Results of the groundwater sampling conducted at the site are discussed in Volume II, Remedial Investigation, Site 39, Section 3.6.3.

Groundwater samples have been collected from both the Uppermost aquifer and the Paso Robles aquifer beneath Site 39. In this BRA, data for the Uppermost aquifer and Paso Robles aquifer were treated as separate datasets. Chemicals detected in the groundwater beneath Site 39 include:

- Uppermost aquifer: antimony, arsenic, beryllium, calcium, chloride, chromium (total), copper, iron, magnesium, lead, mercury, nitrate, potassium, sodium, sulfate, and zinc
- Paso Robles aquifer: antimony, arsenic, bromide, calcium, chloride, chromium (total), copper, iron, magnesium, mercury, nitrate, nitrite, potassium, sodium, sulfate, and zinc

The summaries of statistical data for the chemicals detected in groundwater are presented in Tables 7.2 and 7.3 for the Uppermost and Paso Robles aquifers, respectively.

7.3 Selection of Chemicals of Potential Concern (COPCs)

This section describes the selection of COPCs in soil and groundwater for quantitative risk assessment at Site 39. Chemicals detected in soil and groundwater were evaluated using the COPC selection criteria described in Section 2.1.2. For comparison of detected soil concentrations to site-specific background concentrations, Fort Ord NQTP shallow soil background concentrations were used, as described in Section 2.1.2.1. Results of the COPC selection for soil and groundwater are presented in the following sections.

7.3.1 Soil

COPC selection for soil at Site 39 is summarized in Table 7.4. The COPCs were selected only for chemicals detected in surface soil (0 to 2 feet bgs) on the basis of the exposure assessment described in Section 7.4. Seven SOCs, 9 explosives, and 12 metals were detected in surface soil. COPC selection was conducted in four steps, as discussed below.

The first step, background comparison, eliminated one metal, mercury, for which the maximum concentration detected in soil at Site 39 was less than the background concentration. The second step was elimination of chemicals considered to be essential human nutrients. An estimated daily dose (EDD) was calculated for zinc as described in Appendix B. Zinc was eliminated as a COPC because the EDD of 1.78 mg/day is lower than the recommended daily allowance of 5 to 10 mg/day.

In the third step, lead was retained as a COPC because the maximum concentration of 4,060 mg/kg is greater than the health-based screening level (HBSL) of 240 mg/kg.

In the fourth step, the detected chemicals not yet eliminated were evaluated using a toxicity screen, as described in Section 2.1.2.2. The details of the toxicity screen are presented in Appendix C. This step eliminated the following chemicals detected in soil because their screening HQs were less than the target HQ of 0.01: bis(2-ethylhexyl)phthalate [BEHP], chromium, di-n-octyl phthalate, 2-methylnaphthalene, pentachlorophenol, phenanthrene, pyrene, silver, tetryl, and 1,3,5-trinitrobenzene. Two of these chemicals, BEHP and pentachlorophenol, also had screening risks less than 1×10^{-8}.

The following chemicals were retained as COPCs because their screening HQs were greater than 0.01: antimony, beryllium, cadmium, copper, HMX, and nickel. In addition, 2-amino-dinitrotoluene, 4-amino-dinitrotoluene, arsenic, RDX, and 2,4,6-trinitrotoluene were retained as COPCs because their screening risks were greater than the target risk of 1×10^{-8}.

Nitroglycerin, 4-nitrophenol, and pentaerythitol (PETN) were not included as COPCs. The elimination of these chemicals as COPCs were based on the lack of EPA or Cal/EPA toxicity values, very low frequencies of detection (i.e., 0.6 to 4.8 percent), and an evaluation of chemical-specific fate and transport data.

Data indicate that these three chemicals are not stable nor are they likely to persistent in the environment. Published data indicate that when released into soil, 4-nitrophenol rapidly biodegrades, with half-lives ranging from approximately 1 to 10 days in agricultural topsoil and in flooded soil, respectively *(Gile and Gillet, 1981)*. In subsoil (undisclosed depth), its biodegradation half-life has been reported at 40 days under aerobic conditions *(Gile and Gillet, 1981)*. Howard et al *(1991)* report a half-life for nitroglycerin in soil ranging from 2 to 7 days. No quantitative information regarding soil-half lives for PETN was found, but laboratory studies indicate biodegradation in soil is should be an important fate process for PETN *(HSDB, 1994)*.

To summarize, the following 12 chemicals were retained as COPCs in soil at Site 39: 2-amino-dinitrotoluene, 4-amino-dinitrotoluene, antimony, arsenic, beryllium, cadmium, copper, HMX, lead, nickel, RDX, and 2,4,6-trinitrotoluene (Table 7.4).

7.3.2 Groundwater

The following section describes the selection of COPCs in groundwater. Although groundwater beneath Site 39 does not appear to be impacted by site activities, available groundwater data were reviewed for selection of COPCs. COPCs were selected separately for the Uppermost and Paso Robles Aquifers.

7.3.2.1 Uppermost Aquifer

Table 7.5 summarizes the selection of COPCs in the Uppermost aquifer. Eleven metals and 5 inorganic chemicals were detected in groundwater samples from this aquifer. COPCs were selected in two steps.

The first step, evaluation of essential nutrients, eliminated calcium, iron, magnesium, and zinc as COPCs because the EDDs calculated for these chemicals are less than their RDAs for 0- to 6-year-old children (Table 7.5 and Appendix B). Of these chemicals, zinc was detected both in soil and in groundwater in the Uppermost aquifer. Assuming that receptors may be exposed to zinc via ingestion in both soil and groundwater, the EDD for zinc in soil (i.e., 1.8 mg/day; Table 7.4) was added to the EDD for zinc in the Uppermost aquifer (i.e., 0.01 mg/day; Table 7.5). The sum EDD of 1.8 for both these sources is still significantly lower than the RDA of 5 to 10 mg/day for zinc.

The second step, the toxicity screen, eliminated the following chemicals whose screening HQs were less than the target HQ of 0.01: chromium and copper. The following chemicals were retained as COPCs because their screening HQs exceeded 0.01: antimony, mercury, and nitrate. In addition, arsenic and beryllium were retained as COPCs because their screening risk exceeded 1×10^{-8}.

Several detected chemicals (i.e., chloride, potassium, sodium, and sulfate) could not be evaluated because they lack toxicity values. These inorganics are ubiquitous in the environment, are generally of low toxicity, and include essential nutrients. They were not, therefore, further evaluated in this BRA. Because lead was detected but lacks toxicity values, it could also not be evaluated in the toxicity screen. Exposure to lead in groundwater is evaluated as described in Section 7.4.6.

To summarize, the following five chemicals were retained as COPCs in groundwater in the Uppermost aquifer: antimony, arsenic, beryllium, mercury, and nitrate (Table 7.5).

7.3.2.2 Paso Robles Aquifer

Table 7.6 summarizes the selection of COPCs in groundwater in the Paso Robles aquifer. Nine metals and seven inorganic chemicals were detected in samples collected from this aquifer.

The first step in COPC selection, evaluation of essential nutrients, eliminated calcium, iron, magnesium, and zinc, because the EDDs calculated for these chemicals are lower than their RDAs for 0- to 6-year-old children (Table 7.6 and Appendix B). Of these chemicals, zinc was detected in both soil and groundwater of the Paso Robles aquifer. As was done for the Uppermost aquifer, the EDD for zinc in soil (i.e., 1.8 mg/day, Table 7.4) was added to the EDD for zinc in the Paso Robles aquifer (i.e., 0.018 mg/day, Table 7.6). The summed EDD of 1.8 for zinc from these combined sources is still significantly lower than the RDA for zinc of 5 to 10 mg/day.

The second step, the toxicity screen, eliminated chromium and copper because the screening HQs calculated for these chemicals were less than 0.01. The following chemicals were retained as COPCs because their screening HQs exceeded 0.01: antimony, mercury, nitrate, and nitrite. In addition, arsenic was retained as a COPC because its screening risk exceeded 1 x 10^{-8}. The toxicity screen could not be conducted for several chemicals (i.e., bromide, chloride, potassium, sodium, and sulfate) because they lack toxicity values, as discussed above in Section 7.3.2.1. These chemicals are, therefore, not considered further in this BRA.

To summarize, the following five chemicals were retained as COPCs in groundwater in the Paso Robles aquifer: antimony, arsenic, mercury, nitrate, and nitrite (Table 7.6).

7.4 Exposure Assessment

The following section provides a discussion of the nature and degree of potential exposure to the COPCs that may occur at Site 39. Section 7.4.1 presents an assessment of the potential chemical sources and potential chemical migration pathways for the COPCs. Section 7.4.2 discusses potential hypothetical receptors and identifies the receptors selected for quantitative evaluation. Section 7.4.3 discusses potential exposure pathways for the receptors identified in Section 7.4.2, and identifies the pathways selected for quantitative evaluation. Section 7.4.4 describes the exposure scenarios used in this BRA for estimating potential exposures. Section 7.4.5 presents the exposure point concentrations used to estimate exposures. Section 7.4.6 addresses the methods used to estimate exposure (dose) for all receptors assumed to be exposed to COPCs at Site 39.

7.4.1 Chemical Source and Migration Analysis

Section 3.0 of the introduction to the RI (Volume II) presents a general discussion of chemical fate and transport. Section 3.0 of the Introduction to the RI also includes a table of physical and chemical properties pertaining to environmental fate and transport of chemicals detected at the Fort Ord RI sites, and a discussion of potential chemical migration pathways. Section 5.0 of the Site 39 RI presents a site-specific discussion of chemical fate and transport, and identifies potential chemical migration pathways at Site 39. The potential migration pathways identified in Section 5.0 of the Site 39 RI are discussed in the following sections.

The source of chemical contamination in soil at Site 39 is assumed to be the historical use of ordnance and hydrocarbon fuels during target/training practices. Groundwater at Site 39 does not appear to have been impacted by site activities. However, it was considered a potential source because COPCs were identified in both aquifers and because maximum detected concentrations of antimony and nitrate exceed MCLs, as discussed in Volume II Remedial Investigation, Site 39, Section 3.6.3. Release of chemicals from soil can occur through volatilization, wind erosion, stormwater runoff, and downward migration into groundwater. Migration of chemicals in groundwater can occur through volatilization, solubilization, and recharge to surface water. For the COPCs detected in surface soil and groundwater, these potential release mechanisms are discussed below in relation to the characteristics of Site 39.

7.4.1.1 Volatilization

Through volatilization, certain chemicals can be released from soil in a vapor phase. As indicated in Section 7.3, the COPCs detected in soil at Site 39 include SOCs, explosives, and metals. SOCs and explosives generally have either high molecular weights or low to moderate vapor pressures and Henry's Law constants. Chemicals having either of these properties are generally unlikely to volatilize to air. In addition, these chemicals have moderate to high organic carbon partition coefficients (K_{oc}), indicating that they tend to sorb readily to soil, further reducing the potential for chemical volatilization. Metals are generally present in the environment either in their pure elemental form or as inorganic salts, both of which are essentially nonvolatile. For these reasons, volatilization was not considered a viable migration pathway for the COPCs; therefore, vapor emissions from soil to air were not evaluated.

Volatilization of chemicals from groundwater can result in the release of chemicals in groundwater to soil gas, with subsequent migration of chemical vapors through soil gas to ambient air. As indicated in Section 7.3.2, only metals and inorganic chemicals were selected as COPCs in groundwater. Potential volatilization of chemicals in groundwater to soil gas and migration to ambient air is therefore not a likely migration pathway, and was not evaluated in this BRA.

7.4.1.2 Fugitive Dust

Wind or mechanical erosion can lead to the release of chemicals from soil. The same physicochemical properties that limit the migration of the COPCs from soil by volatilization result in the tendency of these chemicals to sorb to soil particles; the particles may become entrained in the air as fugitive dust as a result of wind erosion. This potential migration pathway can result in human exposures to the COPCs through the inhalation of dust. This chemical migration route was, therefore, quantitatively evaluated.

7.4.1.3 Stormwater Runoff

The extent to which chemicals in soil are transported in stormwater runoff depends on the physical and chemical characteristics of the chemicals, soil type, and amount of rainfall. The organic COPCs present in onsite soil have limited water solubilities and high soil sorption tendencies and may therefore be prone to runoff by sorption to soil particles that are transported to onsite or offsite soil or surface water bodies. The metal COPCs detected are expected to sorb moderately strongly to site soil, and might therefore be prone to runoff. However, the soil at Site 39 is largely sandy. Rainwater will likely either be absorbed by the soil or volatilize by evapotranspiration. The runoff potential is therefore expected to be low, and stormwater runoff was not evaluated.

7.4.1.4 Leaching

The potential for chemicals to leach from soil to groundwater depends on the physical and chemical properties of the chemicals, the chemical concentrations, soil type, pH (for metals), and other site-specific conditions. For example, metals in soil with a low pH (i.e., acid) have a tendency to leach downward through the soil column. The soil pH measured at Site 39 ranges from 4.7 to 7, which is not highly acidic. This range indicates that the potential for metals to leach to groundwater is low. The SOCs and metals detected at the site are expected to sorb strongly to soil particles. These factors, in addition to the relatively low concentrations of chemicals detected in soil and the depth to groundwater (60 to 180 feet) indicate that leaching is unlikely to occur.

As shown in Table 7.1c, no organic chemicals were detected at depths greater than 10 feet. Moreover, as discussed in Section 7.2.2, no organic chemicals were detected in groundwater samples (Tables 7.2 and 7.3). These results indicate that there is no current evidence of migration of organic chemicals detected in soil at Site 39 to groundwater beneath the site. In addition, the concentrations of metals at depths greater than 10 feet bgs are generally below background values in contrast to the concentrations in surface soil, which generally

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In Volume III, Site 39, Section 7.4.2, change the third sentence of the paragraph starting at the bottom of the first column and ending at the top of the second column of page 88 to read:

The presence of potential future onsite receptors is limited due to the proposed land uses.

In Volume III, Site 39, Section 7.4.2, change the fifth bullet in the second column of page 88 to read:

Onsite or nearby recreational visitors who may be present at recreational and nonrecreational areas of the NRMA

In Volume III, Site 39, Section 7.4.2, change the first sentence in the first full paragraph in the second column of page 88 to read:

Because of the proposed future land uses, it was assumed that no construction or other intrusive activities that might expose subsurface soil are likely to occur.

In Volume III, Site 39, Section 7.4.2, change the second sentence in the second full paragraph in the second column of page 88 to read:

Additionally, they are not expected to frequently visit the more isolated north and central parts of the site where the highest concentrations of COPCs are present.

exceed background values. These factors also indicate that leaching of metals is unlikely to have occurred.

7.4.1.5 Migration in Groundwater

Chemicals in groundwater may move through groundwater by solubilization and recharge to surface water. Only metals and inorganic chemicals were detected in groundwater. Chemicals that are dissolved in groundwater are likely to remain dissolved (e.g., metals and inorganics that are present as salts). Dissolved compounds may move offsite in groundwater; however, the detected concentrations are low and further dilution is likely to occur. The movement of undissolved metals through groundwater is limited by the tendency of metals to sorb tightly to soil particles in the aquifer. This sorption slows their migration and decreases the concentration of metals as the groundwater concentration equilibrates with the concentration of metals in the surrounding soil. The transport of chemicals via recharge to surface water from groundwater at Site 39 is unlikely to occur because no permanent surface water bodies exist onsite; intermittent drainages are present only following heavy rains.

7.4.1.6 Summary of Chemical Source and Migration Analysis

To summarize, the emission of fugitive dust was considered the most likely chemical migration mechanism to occur for chemicals detected in soil and was therefore quantitatively evaluated in the risk assessment for Site 39.

7.4.2 Potential Receptors

This section identifies the hypothetical receptors evaluated at Site 39. Methods used to identify receptors are discussed in Section 2.2. Receptor identification is based on the background information presented in Section 7.1, describing the general site topography, current and possible future land uses, and current and possible future demographics.

Onsite human receptors are not currently present at Site 39 because the site is inactive. Current offsite receptors at Site 39 are limited to nearby offsite residents. The presence of potential future onsite receptors is limited due to the proposed land uses, the presence of unexploded ordnance, and possible restricted access to parts of the NRMA. However, receptors who may be present on the basis of proposed future land uses include:

- Onsite habitat management workers associated with the NRMA
- Onsite scientists and students from the education and research facilities that may be constructed at the site or from universities expected to be built at other locations on Fort Ord
- Onsite trainees from the proposed fire and law enforcement training area
- Onsite and offsite workers associated with proposed recreational facilities that may be located onsite
- Onsite or nearby recreational visitors who may be present at the nonrestricted recreation areas of the NRMA
- Offsite residents.

Because unexploded ordnance is present at Site 39, it was assumed that no construction or other intrusive activities that might expose subsurface soil are likely to occur. Therefore, potential receptors associated with these activities are unlikely.

Onsite scientist/student, fire and law enforcement trainee, city and state park worker, and recreational visitor receptors are not evaluated in this BRA because they are expected to be present onsite less frequently than habitat management workers and, therefore, to have significantly less potential exposure to site-related chemicals. Additionally, they are not expected to have access to the more isolated northern and central parts of the site where the highest concentrations of COPCs are present. Nearby offsite workers or onsite visitors are not evaluated in this BRA because they are expected to be present less frequently than the offsite residents or onsite habitat management worker, and therefore to have significantly less potential exposure to site-related chemicals.

Trespassers may occasionally be present along the perimeter of Site 39. Contaminated areas at Site 39 are located within the interior of the site (Volume II, Remedial Investigation, Site 39). Due to the presence of unexploded ordnance at the site, the probability of a trespasser successfully reaching the inner portions of the site on a repeated basis (i.e. exposure of a significant frequency and duration) is low. Therefore, potential trespassers are not evaluated in this BRA.

Habitat management personnel at the NRMA are expected to be onsite on a regular and frequent basis and are therefore evaluated in this BRA. Residents (both children and adults) currently live in offsite areas adjacent to the site, as described in Section 7.1.3, and are therefore also evaluated in this BRA.

7.4.3 Potential Exposure Pathways

This section identifies potential exposure pathways for the future onsite habitat management worker and current offsite resident receptors, and identifies the pathways selected for quantitative evaluation. Because of the presence of unexploded ordnance and the proposed protection of habitat at Site 39, intrusive activities that might expose subsurface soil are not expected to occur. Therefore, only exposures to surface soil (0 to 2 feet bgs) are evaluated further in this BRA.

The future habitat management worker might be exposed to chemicals in soil at Site 39 via incidental ingestion of soil, dermal contact with soil, and inhalation of dusts entrained in air. Exposure to chemicals in groundwater might occur via ingestion of groundwater. These exposure routes are quantitatively evaluated in this BRA. Because dust emissions are likely to be reduced by the vegetative cover over much of the site, thus reducing the potential for receptors to inhale dusts, the inclusion of this pathway for quantitative evaluation is considered conservative. Similarly, because it is considered unlikely that groundwater in either the Uppermost or Paso Robles aquifers will be used to provide water supplies for the future facilities proposed for the site, evaluation of this exposure pathway is conservative.

Exposure to COPCs in both the Uppermost and Paso Robles aquifers was quantitatively evaluated. However, potential exposure was considered be limited to either the Uppermost or the Paso Robles aquifer. Exposure to groundwater from each of these aquifers is separately evaluated.

The offsite resident receptor may be exposed to COPCs in soil via inhalation of airborne dust. Offsite resident receptors have no direct access to the site and are, therefore, not expected to directly contact onsite soil via ingestion or dermal contact. Because nearby offsite residents currently receive their domestic water supply from municipal wells, exposure to groundwater beneath Site 39 is not expected for the offsite resident receptor. Inhalation of airborne dust was, therefore, the sole exposure pathway quantitatively evaluated for the offsite resident receptor. Evaluation of this pathway is considered highly conservative for the following reasons:

- The prevailing winds for most of the year are westerly and tend to blow dust toward the east, away from the residential areas south, southwest, and southeast of the site. Moreover, most of the contamination at Site 39 is in the northern portion of the site, making it unlikely for residents to the southeast to be exposed to contaminated dust
- The vegetative cover at the site tends to reduce dust emissions to ambient air, making it less likely that people at these offsite locations would be exposed to dust.

To summarize, the following hypothetical receptors and potential exposure pathways were quantitatively evaluated for soil and groundwater at Site 39:

- Future onsite habitat management worker exposed to COPCs in surface soil (0 to 2 feet bgs) via dermal contact, ingestion, and

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In Volume III, Site 39, Section 7.4.2, delete the first full paragraph in the first column of page 89.

inhalation of dust, and to COPCs in the Uppermost aquifer via ingestion of groundwater

- Offsite resident exposed to chemicals in surface soil (0 to 2 feet bgs) via inhalation of dust.

7.4.4 Exposure Scenarios

This section discusses the site-specific conditions that are used to quantitatively evaluate exposures of the potential receptors defined in Section 7.4.2: a hypothetical future onsite habitat management worker and an offsite resident. Both average and reasonable maximum exposure (RME) scenarios are presented, as discussed in Section 2.2.3. Section 2.2.5 presents the exposure assumptions (e.g., soil contact rates) common to receptors considered for this and the other sites evaluated in this BRA. In addition, general definitions of exposure duration (ED), exposure frequency (EF), exposure time (ET) and fraction of intake (FI) are presented in Section 2.2.5. The following sections present the assumed values for these terms for each of the potential future receptors evaluated at Site 39. The assumed exposures of the hypothetical habitat management worker and offsite resident are described below in Sections 7.4.4.1 and 7.4.4.2, respectively.

7.4.4.1 Habitat Management Worker

For the conversion of Site 39 to a NRMA, as discussed in Section 7.1.2, it was assumed that a habitat management worker would be present onsite. For both the average and RME scenarios, it was assumed that the habitat management worker would be present onsite 8 hours per day (ET), 250 days per year (EF). Based on EPA *(1990b)* data, the habitat management worker was assumed to work at the NRMA for 10 years and 25 years (ED) for the average and RME scenarios, respectively.

To estimate the RME FI, the habitat management worker receptor was conservatively assumed to receive 100 percent of his or her daily exposure to soil via ingestion or dermal contact while working at the site (i.e., RME FI of 1.0). For the average scenario, the receptor was assumed to receive 50 percent of his or her daily exposure to soil via ingestion or dermal contact while working onsite (i.e., average FI of 0.5).

The site-specific exposure assumptions used in the risk assessment for the habitat management worker receptor are summarized in Table 7.7.

7.4.4.2 Offsite Resident

As discussed in Section 7.4.3, the offsite resident receptor is assumed to be exposed to COPCs in soil via inhalation of airborne dust. For the purposes of this BRA, it was conservatively assumed that exposure to airborne dust would occur indoors and outdoors and that indoor dust concentrations would be the same as outdoor dust concentrations. The offsite resident was conservatively assumed to be present 20 hours per day and 24 hours per day, for the average and RME scenarios, respectively. For both the average and RME scenarios, it was assumed that the offsite resident would be present 350 days per year (EF). Based on EPA *(1990b)* data, the offsite resident was assumed to live near the future NRMA for 9 years and 30 years (ED) for the average and RME scenarios, respectively.

The FI term does not apply to exposure via inhalation and was therefore not estimated for the offsite resident receptor.

7.4.5 Exposure Point Concentrations (EPCs)

Section 2.2.7 presents the methods used for developing EPCs. As discussed in Section 7.4.3, the pathways quantitatively evaluated for the hypothetical receptors at Site 39 include exposure to surface soil via ingestion, dermal contact, and inhalation of airborne dust, and exposure to groundwater via ingestion. The EPCs used to evaluate ingestion of soil, ingestion of groundwater, and dermal contact with soil are represented by the measured soil or groundwater concentrations of the COPCs, as defined in Section 2.2.7. As discussed in Section 7.4.3, the habitat management receptor is assumed to be exposed only to chemicals detected in surface soil. The soil EPCs used are therefore the COPC risk (i.e., 3×10^{-6}) is considered to overestimate risks because chemical concentrations in offsite dust were assumed to equal concentrations in onsite dust, and concentrations in indoor air were assumed to equal concentrations in outdoor ambient air. These receptors were also conservatively assumed to spend 20 or 24 hours per day at home, for the average and RME scenarios, respectively. These assumptions increase the conservatism this evaluation.

The results of the lead exposure evaluation indicate that all exposures to lead evaluated in this BRA result in blood-lead level estimates well below EPA's *(1990z)* 10 μg/dl threshold level of concern.

SECTION 7.0
TABLES AND PLATES

Table 7.1a. Statistical Data Summary of Chemicals Detected in Surface Soil (0 to 2 feet bgs)
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detected Value (mg/kg)	Maximum Detected Value (mg/kg)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
2-Amino-dinitrotoluene	11	166	6.6	0.10	1.20	0.14	0.11	0.36	0.36
4-Amino-dinitrotoluene	12	166	7.2	0.10	1.50	0.14	0.13	0.40	0.40
Antimony	48	223	21.5	0.46	100.00	1.87	7.83	17.22	17.22
Arsenic	167	221	75.6	0.46	10.50	1.46	1.13	3.68	3.68
Beryllium	59	218	27.1	0.12	66.90	0.47	4.52	9.34	9.34
Bis(2-ethylhexyl)phthalate	10	21	47.6	0.05	0.42	0.33	0.41	1.14	0.42
Cadmium	40	218	18.4	0.93	104.00	3.06	12.16	26.90	26.90
Chromium	212	219	96.8	3.70	380.00	15.06	29.00	71.91	71.91
Copper	100	220	45.5	0.49	12900.00	138.39	941.43	1983.59	1983.59
Di-n-octyl phthalate	1	21	4.8	0.06	0.06	0.34	0.40	1.13	0.06
HMX	31	189	16.4	0.10	1100.00	10.33	82.27	171.57	171.57
Lead	231	233	99.1	1.10	4060.00	88.39	381.35	835.83	835.83
Mercury	3	218	1.4	0.05	0.08	0.03	0.01	0.05	0.05
2-Methylnaphthalene	1	21	4.8	2.60	2.60	0.42	0.62	1.64	1.64
Nickel	157	218	72.0	4.90	344.00	10.71	25.09	59.90	59.90
Nitroglycerin	3	166	1.8	0.28	8.10	0.30	0.61	1.49	1.49
4-Nitrophenol	1	21	4.8	0.07	0.07	1.63	1.98	5.50	0.07
Pentachlorophenol	3	21	14.3	0.05	0.08	1.55	2.02	5.52	0.08
PETN	1	166	0.6	1.50	1.50	0.26	0.10	0.45	0.45
Phenanthrene	1	21	4.8	0.21	0.21	0.31	0.37	1.04	0.21
Pyrene	1	21	4.8	0.19	0.19	0.31	0.37	1.04	0.19

Table 7.1a. Statistical Data Summary of Chemicals Detected in Surface Soil (0 to 2 feet bgs)
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detected Value (mg/kg)	Maximum Detected Value (mg/kg)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
RDX	29	189	15.3	0.11	16.50	0.45	1.73	3.83	3.83
Selenium	6	220	2.7	0.55	1.00	0.42	0.11	0.63	0.63
Silver	9	218	4.1	0.38	12.30	0.37	0.99	2.32	2.32
Tetryl	1	189	0.5	0.39	0.39	0.14	0.03	0.20	0.20
1,3,5-Trinitrobenzene	1	189	0.5	0.14	0.14	0.12	0.01	0.14	0.14
2,4,6-Trinitrotoluene	2	189	1.1	0.16	4.00	0.15	0.28	0.71	0.71
Zinc	140	218	64.2	5.20	8910.00	108.97	673.83	1429.67	1429.67

bgs	Below ground surface.
mg/kg	Milligrams per kilogram.
--	Not applicable.
HMX	Cyclotetramethylene tetranitramine.
PETN	Pentaerythritol tetranitrate.
RDX	Cyclotrimethylene trinitramine.

Table 7.1b. Statistical Data Summary of Chemicals Detected in Subsurface Soil (2 to 10 feet bgs)
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detected Value (mg/kg)	Depth of Minimum (feet)	Maximum Detected Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
2-Amino-dinitrotoluene	1	140	0.7	0.10	2.50	0.10	2.50	0.12	2.10E-03	0.13	0.10
Antimony	13	227	5.7	0.50	2.50	0.84	2.50	0.38	0.49	1.33	0.84
Arsenic	161	226	71.2	0.53	2.50	7.90	2.50	1.41	0.95	3.27	3.27
Beryllium	87	226	38.5	0.13	2.50	1.30	10.00	0.26	0.25	0.74	0.74
Bis(2-ethylhexyl)phthalate	1	9	11.1	0.14	2.50	0.14	2.50	0.18	1.48E-02	0.21	0.14
Cadmium	5	226	2.2	0.65	6.00	3.30	2.50	0.51	0.30	1.10	1.10
Chromium	219	227	96.5	4.40	5.00	69.20	5.00	16.04	11.24	38.08	38.08
Copper	76	226	33.6	1.80	2.50	1220.00	2.50	11.35	82.83	173.69	173.69
HMX	15	149	10.1	0.18	2.50	56.00	2.50	0.71	4.77	10.06	10.06
Lead	235	235	100.0	0.62	2.50	362.00	2.50	7.28	26.63	59.48	59.48
Mercury	18	223	8.1	0.05	2.50	0.19	10.00	0.03	0.02	0.07	0.07
Nickel	155	226	68.6	5.10	5.00	43.10	5.00	9.22	6.95	22.83	22.83
4-Nitrophenol	1	9	11.1	0.10	2.50	0.10	2.50	0.80	0.27	1.32	0.10
Pentachlorophenol	1	9	11.1	0.07	2.50	0.07	2.50	0.80	0.28	1.34	0.07
RDX	6	149	4.0	0.11	5.00	0.50	2.50	0.13	0.03	0.20	0.20
Selenium	10	228	4.4	0.66	6.00	1.80	2.50	0.46	0.15	0.76	0.76
Silver	2	226	0.9	0.55	6.00	0.91	10.00	0.25	0.06	0.36	0.36
Zinc	121	227	53.3	5.70	2.50	542.00	2.50	15.80	39.10	92.44	92.44

bgs — Below ground surface.
mg/kg — Milligrams per kilogram.
-- — Not applicable.
2.10E-03 — 2.10 x 10^-3.
HMX — Cyclotetramethylene tetranitramine.
RDX — Cyclotrimethylene trinitramine.

Table 7.1c. Statistical Data Summary of Chemicals Detected in Deep Soil (>10 feet bgs)
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detected Value (mg/kg)	Depth of Minimum (feet)	Maximum Detected Value (mg/kg)	Depth of Maximum (feet)	Arithmetic Mean (mg/kg)	Standard Deviation of the Arithmetic Mean (mg/kg)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/kg)	Lesser of 95% UCL and Maximum Concentrations (mg/kg)
Arsenic	64	89	71.9	0.40	21.00	4.50	50.50	1.65	0.88	3.37	3.37
Beryllium	36	88	40.9	0.19	20.50	0.76	16.00	0.23	0.17	0.56	0.56
Cadmium	2	89	2.3	0.62	30.50	0.86	30.50	0.32	0.08	0.49	0.49
Chromium	87	89	97.8	5.00	30.50	38.90	16.00	13.09	7.73	28.23	28.23
Copper	43	89	48.3	1.40	30.50	11.20	11.00	2.30	1.99	6.19	6.19
Lead	78	89	87.6	0.87	60.50	8.20	11.00	2.01	1.38	4.71	4.71
Mercury	3	83	3.6	0.11	21.00	0.12	120.50	0.05	0.01	0.08	0.08
Nickel	56	89	62.9	6.10	21.00	25.00	180.50	8.78	5.87	20.29	20.29
Selenium	1	89	1.1	1.30	140.50	1.30	140.50	0.29	0.12	0.52	0.52
Silver	2	89	2.3	0.43	16.00	0.73	11.00	0.20	0.07	0.32	0.32
Thallium	1	89	1.1	0.39	50.50	0.39	50.50	0.21	0.08	0.36	0.36
Zinc	70	89	78.7	2.80	11.00	25.40	11.00	9.21	5.96	20.89	20.89

bgs Below ground surface.
mg/kg Milligrams per kilogram.

Table 7.2. Statistical Data Summary of Chemicals Detected in Groundwater, Uppermost Aquifer
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detected Value (mg/l)	Maximum Detected Value (mg/l)	Arithmetic Mean (mg/l)	Standard Deviation of the Arithmetic Mean (mg/l)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/l)	Lesser of 95% UCL and Maximum Concentrations (mg/l)
Antimony	3	9	33.3	1.06E-02	1.14E-02	1.40E-02	2.34E-03	1.86E-02	1.14E-02
Arsenic	2	9	22.2	2.50E-03	3.20E-03	1.48E-03	8.10E-04	3.07E-03	3.07E-03
Beryllium	1	9	11.1	5.40E-04	5.40E-04	3.10E-04	9.00E-05	4.90E-04	4.90E-04
Calcium	8	8	100.0	10.30	33.60	18.81	8.91	36.27	33.60
Chloride	5	5	100.0	41.00	220.00	112.42	85.15	279.31	220.00
Chromium	5	9	55.6	3.60E-03	5.40E-03	3.39E-03	1.86E-03	7.03E-03	5.40E-03
Copper	1	9	11.1	9.20E-03	9.20E-03	1.82E-03	2.77E-03	7.24E-03	7.24E-03
Iron	3	6	50.0	1.90E-02	4.31E-02	2.18E-02	1.26E-02	4.65E-02	4.31E-02
Lead	1	9	11.1	1.80E-03	1.80E-03	1.08E-03	4.60E-04	1.99E-03	1.80E-03
Magnesium	8	8	100.0	6.14	24.90	12.14	7.30	26.44	24.90
Mercury	3	9	33.3	2.30E-04	2.80E-04	1.50E-04	8.00E-05	3.00E-04	2.80E-04
Nitrate as N	8	8	100.0	2.10	22.00	6.76	7.46	21.39	21.39
Potassium	6	8	75.0	2.04	4.15	2.30	1.05	4.36	4.15
Sodium	8	8	100.0	28.80	91.80	55.69	25.11	104.90	91.80
Sulfate	5	5	100.0	5.40	11.00	7.76	2.60	12.85	11.00
Zinc	3	9	33.3	8.90E-03	1.41E-02	7.55E-03	4.24E-03	1.59E-02	1.41E-02

mg/l Milligrams per liter.

Table 7.3. Statistical Data Summary of Chemicals Detected in Groundwater, Paso Robles Aquifer
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Number of Detections	Number of Analyses	Frequency of Detection (percent)	Minimum Detected Value (mg/l)	Maximum Detected Value (mg/l)	Arithmetic Mean (mg/l)	Standard Deviation of the Arithmetic Mean (mg/l)	95% Upper Confidence Limit (UCL) of the Arithmetic Mean (mg/l)	Lesser of 95% UCL and Maximum Concentrations (mg/l)
Antimony	2	7	28.6	8.80E-03	1.36E-02	1.43E-02	2.53E-03	1.93E-02	1.36E-02
Arsenic	1	7	14.3	5.70E-03	5.70E-03	1.72E-03	1.76E-03	5.17E-03	5.17E-03
Bromide	1	3	33.3	0.51	0.51	0.34	0.15	0.63	0.51
Calcium	8	8	100.0	5.11	27.00	13.25	8.55	30.01	27.00
Chloride	6	6	100.0	67.70	112.00	80.73	15.88	111.85	111.85
Chromium	3	7	42.9	3.60E-03	4.90E-03	2.74E-03	1.58E-03	5.85E-03	4.90E-03
Copper	2	7	28.6	5.30E-03	5.30E-03	2.16E-03	2.15E-03	6.37E-03	5.30E-03
Iron	3	5	60.0	1.88E-02	4.85E-02	2.45E-02	1.75E-02	5.87E-02	4.85E-02
Magnesium	8	8	100.0	2.15	10.30	6.22	2.80	11.72	10.30
Mercury	1	7	14.3	3.10E-04	3.10E-04	1.30E-04	8.00E-05	2.90E-04	2.90E-04
Nitrate as N	10	11	90.9	0.77	1.50	0.88	0.36	1.58	1.50
Nitrite as N	1	6	16.7	0.90	0.90	0.32	0.30	0.90	0.90
Potassium	8	8	100.0	2.62	4.77	3.80	0.69	5.16	4.77
Sodium	8	8	100.0	51.20	143.00	79.43	34.81	147.66	143.00
Sulfate	6	6	100.0	7.70	91.00	36.37	31.25	97.63	91.00
Zinc	3	7	42.9	3.10E-03	1.81E-02	8.03E-03	5.17E-03	1.82E-02	1.81E-02

mg/l Milligrams per liter.

Table 7.4. Selection of COPCs for Chemicals Detected in Surface Soil (0 to 2 feet bgs) /a/
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
2-Amino-dinitrotoluene	1.20	--	--	--	0.003	2E-08	YES
4-Amino-dinitrotoluene	1.50	--	--	--	0.004	3E-08	YES
Antimony	100	--	--	--	0.4	--	YES
Arsenic	10.50	3.4	--	--	0.05	2E-04	YES
Beryllium	66.90	0.35	--	--	0.02	1E-03	YES
Bis(2-ethylhexyl)phthalate	0.42	--	--	--	0.00003	4E-09	NO
Cadmium	104	ND	--	--	0.3	2E-03	YES
Chromium /f/	380	46.1	--	--	0.0005	--	NO
Copper	12900	18.2	--	--	0.5	--	YES
Di-n-octyl phthalate	0.06	--	--	--	0.000004	--	NO
HMX	1100	--	--	--	0.03	--	YES
Lead	4060	51.8	--	240	--	--	YES
Mercury	0.08	0.12	--	--	--	--	NO
2-Methylnaphthalene	2.60	--	--	--	0.00006	--	NO
Nickel	344.00	58	--	--	0.02	4E-04	YES
Nitroglycerin	8.10	--	--	--	--	--	NO
4-Nitrophenol	0.07	--	--	--	--	--	NO
Pentachlorophenol	0.08	--	--	--	0.000004	6E-09	NO
PETN	1.50	--	--	--	--	--	NO
Phenanthrene	0.21	--	--	--	0.000001	--	NO
Pyrene	0.19	--	--	--	0.000009	--	NO
RDX	16.50	--	--	--	0.008	1E-06	YES
Selenium	1.00	--	0.0002	--	--	--	NO
Silver	12.30	0.36	--	--	0.004	--	NO
Tetryl	0.39	--	--	--	0.00006	--	NO

Table 7.4. Selection of COPCs for Chemicals Detected in Surface Soil (0 to 2 feet bgs) /a/
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/kg)	Background Concentration (mg/kg)	Essential Nutrient EDD /c/ (mg/day)	HBSL /d/ (mg/kg)	Screening Results /e/ Hazard Quotient	Screening Results /e/ Cancer Risk	COPC (Yes/No)
1,3,5-Trinitrobenzene	0.14	--	--	--	0.004	--	NO
2,4,6-Trinitrotoluene	4.00	--	--	--	0.01	7E-08	YES
Zinc	8910	75.80	1.78	--	--	--	NO

COPCs Chemicals of potential concern.
bgs Below ground surface.
mg/kg Milligrams per kilogram.
-- Not applicable or not available.
ND Not detected.
3.43E-03 3.43 x 10^-3.
HMX Cyclotetramethylene tetranitramine.
PETN Pentaerythritol tetranitrate.
RDX Cyclotrimethylene trinitramine.

/a/ See Section 7.3.1 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 7.1a.
/c/ Estimated daily dose (see Appendix B for explanation). This was compared to the Recommended Daily Allowances of 0.01 to 0.02 mg/day for selenium and 5 to10 mg/day for zinc (National Research Council, 1989).
/d/ Health based screening level for a child receptor (Harding Lawson Associates, Draft Technical Memorandum, Preliminary Remediation Goals, Fort Ord, California, June 14, 1993).
/e/ See Table C16 of Appendix C for development of screening values.
/f/ Evaluated as chromium III. Chromium VI was not detected.

Table 7.5. Selection of COPCs for Chemicals Detected in Groundwater, Uppermost Aquifer /a/
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/l)	Essential Nutrient EDD /c/	Screening Results /d/ Hazard Quotient	Cancer Risk	COPC (Yes/No)
Antimony	0.0114	--	0.8	--	YES
Arsenic	0.00307	--	0.3	7E-05	YES
Beryllium	0.00049	--	0.003	4E-05	YES
Calcium	33.6	33.6	--	--	NO
Chloride	220	--	--	--	NO
Chromium	0.0054	--	0.0002	--	NO
Copper	0.00724	--	0.007	--	NO
Iron	0.0431	0.0431	--	--	NO
Lead	0.0018	--	--	--	NO
Magnesium	24.9	24.9	--	--	NO
Mercury	0.00028	--	0.03	--	YES
Nitrate as N	21.39	--	0.4	--	YES
Potassium	4.15	--	--	--	NO
Sodium	91.8	--	--	--	NO
Sulfate	11	--	--	--	NO
Zinc	0.0141	0.0141	0.001	--	NO

COPCs Chemicals of potential concern.
mg/l Milligrams per liter.
-- Not applicable or not available.
1.14E-02 1.14 x 10^-2.

/a/ See Section 7.3.2.1 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 2.2.
/c/ Estimated daily dose in milligrams per day (mg/day; see Appendix B for explanation). This was compared to Recommended Daily Allowances of 400 to 800 mg/day for calcium, 6 to 10 mg/day for iron, 40 to 120 mg/day for magnesium, and 5 to 10 mg/day for zinc (National Research Council, 1989).
/d/ See Table C17 of Appendix C for development of screening values.

Table 7.6. Selection of COPCs for Chemicals Detected in Groundwater, Paso Robles Aquifer /a/
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals Detected	Maximum /b/ Concentration (mg/l)	Essential Nutrient EDD /c/	Screening Results /d/ Hazard Quotient	Screening Results /d/ Cancer Risk	COPC (Yes/No)
Antimony	0.0136	- -	1.0	- -	Y
Arsenic	0.0057	- -	0.5	1.0E-04	Y
Bromide	0.51	- -	- -	- -	N
Calcium	27	27.0	- -	- -	N
Chloride	112	- -	- -	- -	N
Chromium	0.0049	- -	0.0001	- -	N
Copper	0.0053	- -	0.004	- -	N
Iron	0.0485	0.0485	- -	- -	N
Magnesium	10.3	10.3	- -	- -	N
Mercury	0.00031	- -	0.03	- -	Y
Nitrate as N	1.5	- -	0.03	- -	Y
Nitrite as N	0.9	- -	0.3	- -	Y
Potassium	4.77	- -	- -	- -	N
Sodium	143	- -	- -	- -	N
Sulfate	91	- -	- -	- -	N
Zinc	0.0181	0.0181	0.002	- -	N

COPCs Chemicals of potential concern.
mg/l Milligrams per liter.
- - Not applicable or not available.
1.36E-02 1.36 x 10^-2.

/a/ See Section 7.3.2.2 for explanation. If a chemical is eliminated by any of the steps shown, no further screening information is provided in this table for that chemical.
/b/ From: Table 7.3.
/c/ Estimated daily dose in milligrams per day (mg/day; see Appendix B for explanation). This was compared to Recommended Daily Allowances of 400 to 800 mg/day for calcium, 6 to 10 mg/day for iron, 40 to 120 mg/day for magnesium, and 5 to 10 mg/day for zinc (National Research Council, 1989).
/d/ See Table C18 of Appendix C for development of screening values.

Table 7.7. Site-Specific Intake Assumptions /a/
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

	Intake Assumptions			
Scenario/Receptor	Exposure Time ET (hours/day)	Fraction of Intake FI (unitless)	Exposure Frequency EF (days/year)	Exposure Duration ED (years)
Average Exposure Scenario				
Habitat Management Worker	8	0.5	250	10
Offsite Resident (0-6 years)	20	NA	350	6
Offsite Resident (6-9 years)	20	NA	350	3
RME Scenario				
Habitat Management Worker	8	1.0	250	25
Offsite Resident (0-6 years)	24	NA	350	6
Offsite Resident (6-18 years)	24	NA	350	12
Offsite Resident (18-30 years)	24	NA	350	12

RME Reasonable maximum exposure.

/a/ See Section 6.4.3 for explanation.

Table 7.8. Exposure Point Concentrations (EPCs) for Soil and Air
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemicals of Potential Concern	Average Exposure Scenario Soil Concentration /a/ (mg/kg)	Average Exposure Scenario Air Concentration /b/ (mg/m^3)	RME Scenario Soil Concentration /c/ (mg/kg)	RME Scenario Air Concentration /b/ (mg/m^3)
2-Amino-dinitrotoluene	1.40E-01	1.61E-09	3.60E-01	4.14E-09
4-Amino-dinitrotoluene	1.40E-01	1.61E-09	4.00E-01	4.60E-09
Antimony	1.87E+00	2.15E-08	1.72E+01	1.98E-07
Arsenic	1.46E+00	1.68E-08	3.68E+00	4.23E-08
Beryllium	4.70E-01	5.41E-09	9.34E+00	1.07E-07
Cadmium	3.06E+00	3.52E-08	2.69E+01	3.09E-07
Copper	1.38E+02	1.59E-06	1.98E+03	2.28E-05
HMX	1.03E+01	1.19E-07	1.72E+02	1.97E-06
Lead	8.84E+01	1.02E-06	8.36E+02	9.61E-06
Nickel	1.07E+01	1.23E-07	5.99E+01	6.89E-07
RDX	4.50E-01	5.18E-09	3.83E+00	4.40E-08
2,4,6-Trinitrotoluene	1.50E-01	1.73E-09	7.10E-01	8.17E-09

RME Reasonable maximum exposure.
mg/kg Milligrams per kilogram.
mg/m^3 Milligrams per cubic meter.
bgs Below ground surface.
1.40E-01 1.40 x 10^-1.
HMX Cyclotetramethylene tetranitramine.
RDX Cyclotrimethylene trinitramine.
PM10 Particles with a diameter less than or equal to 10 microns.

/a/ Arithmetic mean.
/b/ Air concentration (mg/m^3) = soil concentration (mg/kg) x site-specific PM10 (1.15E-2 mg/m^3) x conversion factor (1E-6 kg/mg).
/c/ Lesser of the maximum concentration and 95 percent upper confidence limit of the arithmetic mean.

Table 7.9. Exposure Point Concentrations (EPCs) for Groundwater
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Aquifer Chemicals of Potential Concern	Average Scenario Groundwater Concentration /a/ (mg/l)	RME Scenario Groundwater Concentration /b/ (mg/l)
Uppermost Aquifer		
Antimony	1.40E-02	1.14E-02
Arsenic	1.48E-03	3.07E-03
Beryllium	3.10E-04	4.90E-04
Mercury	1.50E-04	2.80E-04
Nitrate as N	6.76E+00	2.14E+01
Paso Robles Aquifer		
Antimony	1.43E-02	1.36E-02
Arsenic	1.72E-03	5.17E-03
Mercury	1.30E-04	2.90E-04
Nitrate	8.80E-01	1.50E+00
Nitrite	3.20E-01	9.00E-01

RME Reasonable maximum exposure.
mg/l Milligrams per liter.
1.40E-02 1.40 x 10^-2.

/a/ Arithmetic mean.
/b/ Lesser of the maximum concentration and 95 percent upper confidence limit of the arithmetic mean.

Table 7.10. Total Hazard Index for the Habitat Management Worker Receptor /a/
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Ingestion of Groundwater	Total HI
Average Scenario	0.005	0.008	0.00002	0.1	0.1
RME Scenario	0.2	0.4	0.0002	0.5	1

HI Hazard index.
RME Reasonable maximum exposure.

/a/ Chemical-specific hazard quotients are presented in Tables E53-E56 (Appendix E). HIs are reported to 1 significant figure.

Table 7.11. Total Hazard Index for the Offsite Resident Receptor /a/
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario Receptor	HI (Inhalation of Dust)
Average Exposure Scenario	
Resident (0 - 6 years)	0.0004
Resident (6 - 9 years)	0.0003
RME Scenario	
Resident (0 - 6 years)	0.004
Resident (6 - 18 years)	0.002
Resident (18 - 30 years)	0.0008

HI Hazard index.
RME Reasonable maximum exposure.

/a/ Chemical-specific hazard quotients are presented in Tables E59-E63 (Appendix E). HIs are reported to 1 significant figure.

Table 7.12. Total Cancer Risk for the Habitat Management Worker Receptor /a/
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario	Ingestion of Soil	Dermal Contact with Soil	Inhalation of Dust	Ingestion of Groundwater	Total Risk
Average Scenario	2.06E-07	1.27E-07	8.71E-09	1.66E-06	2E-06
RME Scenario	2.52E-05	2.17E-05	2.38E-07	3.08E-05	8E-05

9.14E-08   9.14 x 10^-8.
RME   Reasonable maximum exposure.

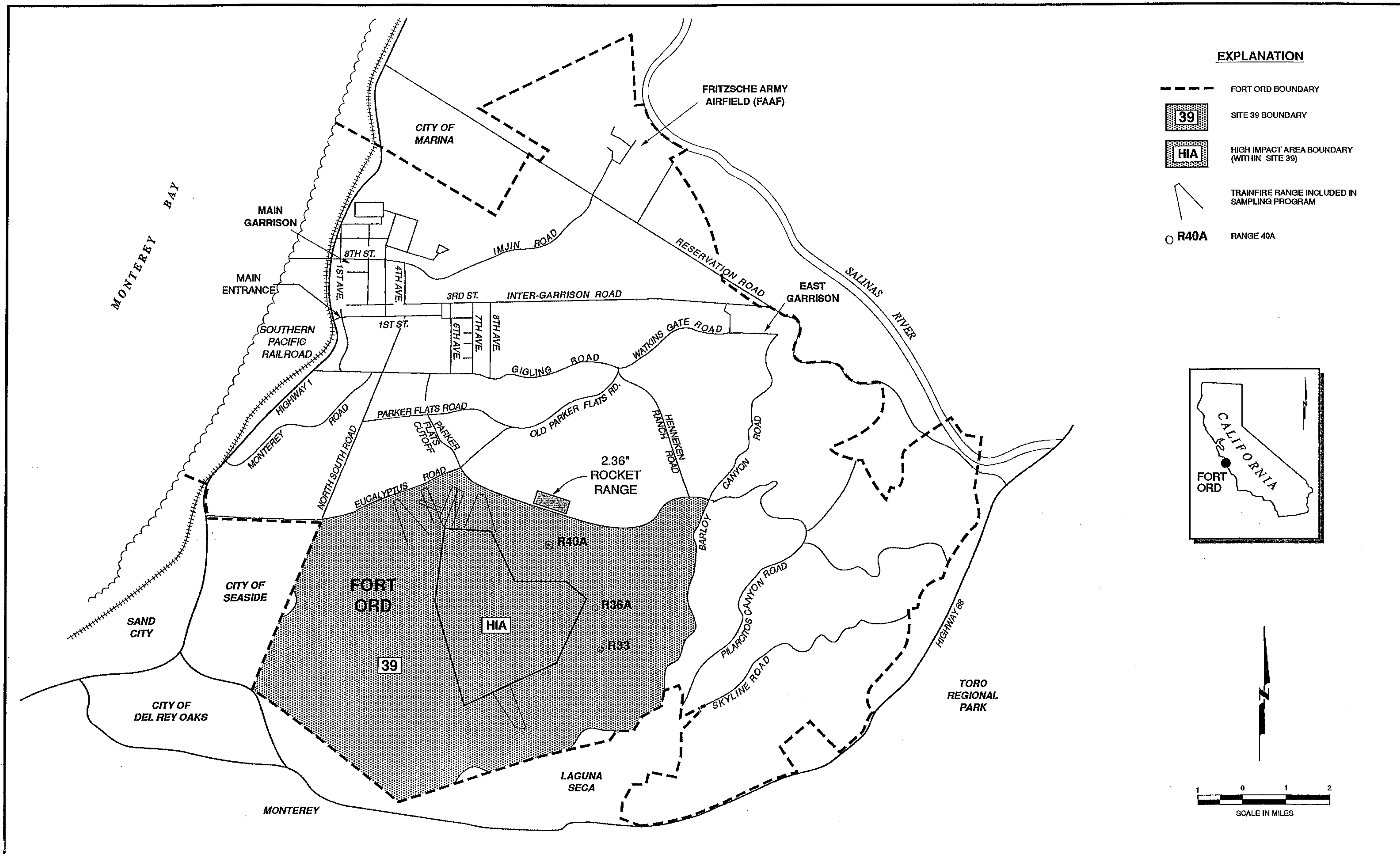
/a/ Chemical-specific risks are presented in Tables E53-E56 (Appendix E).

Table 7.13. Total Cancer Risks for the Offsite Resident Receptor /a/
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Scenario / Receptor	Risk (Inhalation of Dust)
Average Exposure Scenario	
Resident (0 - 6 years)	1.37E-07
Resident (6 - 9 years)	4.97E-08
Total Risk (0 - 9 years)	2E-07
RME Scenario	
Resident (0 - 6 years)	1.19E-06
Resident (6 - 18 years)	1.20E-06
Resident (18 - 30 years)	4.80E-07
Total Risk (0 - 30 years)	3E-06

1.37E-07 1.37 x 10^-7.
RME Reasonable maximum exposure.

/a/ Chemical-specific risks are presented in Tables E59-E63 (Appendix E).



NO.	DATE	REVISIONS	HLA FILE NO.	PROJECT NO.	APPROVED	APPROVAL DATE	DRAWN BY
1	7/94	DRAFT		23366 07175			DJP
2	12/94	DRAFT FINAL		23366 041723	MEC	11-22-14	

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080294RHC

Harding Lawson Associates
Engineering and Environmental Services

Volume III - Baseline Risk Assessment
Basewide RI/FS
Fort Ord, California

Site Plan
Site 39

PLATE:
7.1

8.0 UNCERTAINTY ANALYSIS

Uncertainty is inherent in many aspects of the risk assessment process. The use of many conservative assumptions and approximations is one source of the uncertainty, as the identification and analysis of environmental conditions is difficult and inexact. Table 8.1 summarizes uncertainties identified for this risk assessment using the format recommended by EPA (*1989b*). The potential magnitude of possible over- or underestimation of risks was estimated for each assumption listed in Table 8.1, on the basis of the professional judgment of the risk assessor. Table 8.1 demonstrates the general bias in the assumptions toward overestimating possible risks.

SECTION 8.0
TABLES

Table 8.1. Summary of Uncertainties - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS.
Fort Ord, California.

Assumption	Potential Magnitude of Overestimation of Risk	Potential Magnitude of Underestimation of Risk	Comments
Collection of Site-Specific Data			
All chemicals of toxicological significance at the site were detected	low	low	Analyte lists based on site use and previous investigations
COPC Selection			
Toxicity screen adequately characterizes total site risk	low	low	Screening thresholds are low
Background threshold values are adequate screening criteria for COPC selection	low	low	Site-specific background data are used
Exposure Estimation			
Chemicals do not degrade in the environment over time but remain at measured concentrations	moderate-high	low	Conservative; degradation of CDDs and CDFs and other chemicals will occur
Use of one half the reporting limit accurately reflects values for nondetected compounds	moderate	low	Reporting limits are generally low
All significant exposure pathways were identified and quantified	moderate	low	Major potential pathways identified based on current knowledge of future site use; assumptions about future site use are conservative
Future land-use assumptions are accurate	moderate	low	Based on current land re-use plans; receptors selected for evaluation are considered conservative based on land-use plans
Human receptors accurately represent potentially exposed populations	moderate	low	Conservative choice of receptors
Sensitive human receptors were identified and evaluated	low	low	Child receptors included where appropriate

Table 8.1. Summary of Uncertainties - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS.
Fort Ord, California.

Assumption	Potential Magnitude of Overestimation of Risk	Potential Magnitude of Underestimation of Risk	Comments
Factors used to estimate exposure are applicable for all human population groups	moderate	low	Intake assumptions generally conservative
Exposure frequency and exposure duration accurately represent potentially exposed populations	moderate	low	Considered conservative
Soil ingestion rates used accurately represent actual ingestion rates	moderate	low	RME values recommended by EPA; average exposure values based on published data
Dermal surface area assumptions accurately reflect actual exposure	moderate	low	Considered conservative for local climate
Dermal adherence factors accurately reflect actual exposure	moderate	low	Considered conservative based on limited study data
Inhalation rates used accurately reflect actual exposure	low	low	Considered conservative; variations minimal
Dust in ambient air concentration (PM10) accurately reflects actual exposure	low	low	Area-specific value used
Oral absorption factor for CDDs and CDFs accurately reflects actual absorption	high	low	Conservative upperbound of published data
Oral absorption for all other compounds is 100 percent	high	low	Conservative estimates based on limited data
Dermal absorption factors accurately reflect actual absorption	high	low	Conservative estimates based on limited data
Pulmonary absorption for all compounds is 100 percent	high	low	Conservative estimates based on limited data
<u>Chemical Toxicity Evaluation</u>			
Chemicals do not react with each other or other chemicals to generate new toxic chemicals or less toxic chemicals	low	low	Not known to occur; data insufficient to quantify

Table 8.1. Summary of Uncertainties - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS.
Fort Ord, California.

Assumption	Potential Magnitude of Overestimation of Risk	Potential Magnitude of Underestimation of Risk	Comments
Most conservative toxicity values are used	moderate-high	low	Peer-reviewed data often represent less conservative toxicity values
Animal data can be extrapolated to humans with little error	moderate-high	low	Most sensitive animal species used with conservative extrapolation methods
High-dose experiments can be extrapolated to low-dose exposures with little error	moderate	low	Extrapolation techniques considered conservative
Toxicity values developed for oral exposures may be used to evaluate dermal exposures	moderate	moderate	If toxicity is systemic in nature, approach unlikely to substantially underestimate toxicity
TCDD-TEFs may be used to accurately represent the toxicity of all detected CDDs and CDFs	low	low	TCDD-TEF values extensively peer reviewed
B(a)P-TEFs may be used to accurately represent the toxicity of all carcinogenic PAH	low	low	B(a)P-TEF values were peer reviewed
<u>Risk Characterization</u>			
Chemicals at the site do not have synergistic or antagonistic effects	low	low	Not known to occur; data insufficient to quantify
HIs generated without consideration of target organs accurately represent risks	moderate	low	

COPC Chemical of potential concern.
CDDs Chlorinated dibenzodioxins.
CDFs Chlorinated dibenzofurans.
RME Reasonable maximum exposure.
EPA U.S. Environmental Protection Agency.
PM10 Particles less than or equal to 10 microns in diameter.
TCDD-TEFs 2,3,7,8-Tetrachlorodibenzo-p-dioxin toxicity equivalent factors.
B(a)P-TEFs Benzo(a)pyrene toxicity equivalent factors.
PAH Polycyclic aromatic hydrocarbons.
HIs Hazard indices.

9.0 SUMMARY AND CONCLUSIONS

This section summarizes the previous and the projected future site uses, the exposure scenarios considered, and the results and conclusions of the baseline risk assessment for the five RI sites: 2 and 12, 16 and 17, 3, 31, and 39. These sites were evaluated separately because simultaneous exposure to more than one site is not expected; exposure to one site would proportionally diminish exposure to other sites. The total hazard indices and the cancer risks estimated for each site are summarized in Table 9.1.

9.1 Sites 2 and 12

Sites 2 and 12 are in the northwestern portion of Fort Ord near the ocean on opposite sides of Highway 1. Site 12 is in the northwest corner of the Main Garrison, and Site 2 is across the highway to the southwest. Site 2 was previously used as a sewage treatment plant, with sludge drying beds and unlined pond areas. Site 12 was previously used for automotive storage, maintenance, repair, and dismantling; fuel and solvent storage; dumping of refuse; and a railroad right-of-way. Future land use at Site 2 is expected to be facilities for indoor and outdoor aquaculture and oceanographic research. Future land use at Site 12 is expected to include commercial and industrial development, a transit center, medium- to high-density residential development, and a school. Exposure scenarios quantitatively evaluated the following receptors: hypothetical commercial worker (Site 2), child resident (Site 12), and long-term (30-year) resident (Site 12).

Site 2

The total multipathway noncarcinogenic HIs for the average exposure and RME scenarios for future onsite workers at Site 2 are 0.01 and 0.1, respectively. These results indicate that noncarcinogenic adverse health effects are not expected for future populations at Site 2.

Estimated lifetime cancer risks for the future worker at Site 2 are 2×10^{-7} and 3×10^{-6}, for the average and the RME scenarios, respectively.

The estimated background RME cancer risk at Site 2 is 2×10^{-6} (Table A1 in Appendix A), which accounts for approximately 89 percent of the site specific RME risk of 3×10^{-6}. When the background related risk is subtracted from the RME site risk, the residual risk is 3×10^{-7}.

This information is summarized in Table 9.1.

Site 12

Noncarcinogenic hazard indices for average exposure are less than 1 for all receptors evaluated. Estimated RME HIs range from 0.7 (Child 6-18 years) to 2 (Child 0-6 years). The HI for the future adult resident, ages 18 to 30, is 1.

The groundwater ingestion pathway accounts for approximately 63 percent (HI = 1.2) and 92 (HI = 1.2) percent of the HI for the child and the adult respectively. The remainder of the HI (0.74 and 0.09 for the child and adult residents, respectively) results from exposure to concentrations of metals, BEHP, and total carcinogenic PAHs in soil.

Total cancer risks estimated for the future onsite resident receptor at Site 12 were 5×10^{-6} and 6×10^{-5}, for the average and RME scenarios, respectively. Nearly all of the cancer risk estimated at Site 12 is due to the presence of 2 metals in soil (arsenic and beryllium) at background concentrations and 5 VOCs in groundwater (1,2 DCA; 1,1 DCE; methylene chloride, PCE; and TCE). The groundwater ingestion pathway accounts for approximately 69 percent (average) and 57 percent (RME) of the total risk estimated at the site. Background concentrations of arsenic and beryllium in soil account for approximately 53 percent and 32 percent of the total average and RME cancer risk, respectively.

The total Site 12 soil-related cancer risks associated with arsenic and beryllium are usually lower than estimated risks associated with background concentrations of these metals. This suggests that, in general, site-related concentrations of arsenic and beryllium are below naturally occurring background levels and exceedances may reflect the presence of hotspot(s) - not extensive site-related contamination.

The average exposure and RME blood lead levels estimated for all future receptors at Site 12 are well below the target 99th percentile blood lead level of 10 μg/dl (Table 3.16).

The incremental cancer risk estimates (Table 9.1) including and excluding background risks are all either within or less than the 10^{-6} to 10^{-4} range identified as acceptable in the National Oil Spill and Hazardous Substances Pollution Contingency Plan (NCP Title 40 Code of Federal Regulations, Section 300), (40 CFR 300). The estimated blood-lead concentrations are all less than the target concentration of 10 μg/dl (*EPA, 1990e*), indicating that no adverse health effects are expected from lead.

9.2 Sites 16 and 17

Sites 16 and 17 are in the northeastern part of the Main Garrison. Areas of Site 16 were previously used as a corporation yard, for stormwater runoff percolation, and as open space. Areas of Site 17 were previously used for motor vehicle storage and maintenance; storage of petroleum products, solvents, and other chemicals; an incinerator site; debris disposal including incinerated and unincinerated medical waste and other materials; and a baseball field. Site 17 is expected to become part of a CSU campus. Site 16 is expected be used as a corporation yard for public agencies. Exposure scenarios quantitatively evaluated the following receptors: hypothetical student resident, utility worker construction worker, and commercial worker.

For all receptors evaluated at Sites 16 and 17, results of the BRA indicate that potential exposure to COPCs will result in estimated multipathway noncancer HIs at or below the EPA target HI of 1. Therefore, noncancer health effects are not of concern for the receptors evaluated. For the student resident, construction worker, and utility worker receptors, the results of the BRA indicate that potential exposures to COPCs will result in adjusted (i.e., to account for background concentrations of metals) multipathway cancer risks at the low end or below the EPA target range of 1×10^{-4} to 1×10^{-6}. For the commercial worker receptor, the estimated cancer risk for the RME scenario is 1×10^{-5}, which is within the EPA target risk range and at the target risk of 1×10^{-5} often used for commercial worker scenarios.

The results of the lead exposure evaluation indicate that all estimated blood-lead levels are below the target concentration of 10 μg/dl. This indicates that no adverse health effects are expected from exposure of the hypothetical receptors to lead at Sites 16 and 17.

9.3 Site 3

Site 3 comprises the area of Fort Ord between Highway 1 and Monterey Bay except for Site 2. Site 3 was previously used for small arms training ranges and as open space. The expected future land use is as a limited-access state park. The following receptors were quantitatively evaluated: hypothetical child and adult nearby residents and park ranger. These receptors were evaluated for exposure to chemicals at Site 3 in two ways: first, to surface area-weighted concentrations of chemicals (i.e., assuming the receptor will be equally exposed to all bullet distribution type areas at the site); and second, to chemicals in areas where bullets constitute 1 to 10 percent soil cover, and where bullets constitute 10 percent or greater soil cover. The 1 to 10 percent and ≥10 percent areas were evaluated separately.

HIs for noncancer health effects estimated for all receptors exposed to weighted surface area concentrations range from 0.000009 to 0.7 for the child resident for the average and RME scenarios, respectively. For the 1 to 10 percent area, HIs ranged from 0.00003 to 2, and for the ≥10 percent area, from 0.0004 to 26; all values are for child residents.

Estimated site-related blood-lead concentrations for receptors exposed to weighted surface area concentrations ranged from 2.76 μg/dl to 7.15 μg/dl for average and RME scenarios, respectively (both for resident child). Estimated blood-lead concentrations for receptors exposed to 1 to 10 percent areas ranged from 2.77 μg/dl to 89.36 μg/dl, and for the $\geq$10 percent area, ranged from 2.79μg/dl to 177.42 μg/dl. These values are all for child residents. Cancer risks are not estimated for Site 3 because the chemicals of potential concern at the site were not considered carcinogenic.

These results indicate that, for a receptor exposed to the site on a random walk, no adverse health effects are expected from the chemicals of potential concern at the site. The hazard indices are all less than 1.0 (Table 9.1). The estimated blood-lead concentrations are all less than the target concentration of 10 μg/dl (*EPA, 1990e*), indicating that no adverse health effects would be expected from lead exposure.

However, HIs and blood lead levels exceeding acceptable levels are predicted for the unlikely event that a nearby resident or park ranger is exposed solely to areas where greater than 1 percent of the surface is covered with bullet fragments. Given that over 90 percent of the site contains little or no bullet cover, such exposure is highly unlikely.

9.4 Site 31

Site 31 is situated in and atop the north side of a steep-sided ravine in the southeast part of the East Garrison. Areas of Site 31 were previously used as an obstacle course, an incinerator building, dumping of refuse including ashes apparently from an incinerator at the site, and open space. Future land use plans are to use the area for an agricultural center and open space for wildlife habitat. The agricultural center is to include production, processing, and distribution facilities and worker housing. A hypothetical resident trespasser receptor is quantitatively evaluated.

Hazard indices for noncancer health effects range from 0.0009 to 0.02. Cancer risk estimates range from 2 x 10^{-8} to 8 x 10^{-7}. Estimated site-related blood-lead concentrations ranged from 4.12 μg/dl to 16.1 μg/dl.

Noncancer health effects are not expected from chemicals other than lead because the hazard indices are all less than 1 (Table 9.1). The cancer risk estimates (Table 9.1) are all below the EPA target risk range of 10^{-6} to 10^{-4}. The estimated RME blood-lead concentrations exceed the target concentration of 10 μg/dl (*EPA, 1990e*), indicating that lead-related adverse health effects might occur if the hypothetical exposures evaluated at this site were to occur.

9.5 Site 39

Site 39 is in the southwest portion of Fort Ord. Most of Site 39 was used for target practice; the Inland Ranges were used since the early 1900s for ordnance training exercises, including naval gunfire from offshore. Firearms training exercises were also conducted at small arms and trainfire ranges. In the future most of Site 39 is expected to become part of a habitat reserve or Natural Resources Management Area (NRMA). Several areas along the southwest border of the NRMA may be used for other purposes including recreational, education, research, and training facilities. In addition, Highway 68 may be relocated within this area. Exposure scenarios quantitatively evaluated onsite habitat management and offsite child and long-term (30-year) receptors.

Estimated RME HIs are 0.004 for the offsite child resident, and 1 for the habitat management worker. These results indicate that noncancer health effects are not expected from exposure to COPCs at Site 39 because the highest hazard index for an individual receptor is 1 (Table 9.1).

Average multipathway cancer risks for both the offsite resident and habitat management worker receptors are at the low end or below the EPA target risk range of 1 x 10^{-6} to 1 x 10^{-4}. RME multipathway cancer risk estimates are 3 x 10^{-6} and 8 x 10^{-5} for the offsite resident and habitat management worker receptors, respectively. The RME risk for the offsite resident is at the low end of the EPA target risk range. In addition, the evaluation of this receptor is considered to be highly conservative as discussed in Section 7.6.2.2. The RME cancer risk for the habitat management worker is predominantly due to potential exposure to COPCs in groundwater (3 x 10^{-5}, or 39 percent of the total RME risk), arsenic in soil (5 x 10^{-6}, or 7 percent of the total RME risk), beryllium in soil (3×10^{-5}, or 42 percent of total RME risk), and RDX in soil (7×10^{-6}, or 9 percent of the total RME risk). Available data suggests that the detected concentrations of metals in groundwater at Site 39 are naturally occurring. Moreover, direct exposure of the worker receptor from groundwater at Site 39 is unlikely. As discussed in Volume II Remedial Investigation, Site 39, additional groundwater monitoring will be performed to assess potential site-related impacts to groundwater. Adjusting this risk from arsenic in soil to account for background levels of arsenic in soil reduces this component of the multipathway risk to a risk that is below the EPA's level of concern.

The results of the lead exposure evaluation indicate that all estimated blood-lead levels are below the target concentration of 10 μg/dl. This indicates that no adverse health effects are expected from exposure of the hypothetical habitat management worker or offsite resident to lead.

SECTION 9.0
TABLES

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APPENDIX A

BACKGROUND SOIL EVALUATION

CONTENTS

TABLES

BACKGROUND SOIL EVALUATION

This appendix presents a quantitative risk analysis of background levels of metals detected at four Fort Ord RI/FS sites: 2 and 12, 16 and 17, 3, and 31. The results of this analysis are used to evaluate potential health risks from metals considered to be related to background concentrations as opposed to potential health risks from metals considered to be related to past site activities.

The analysis was performed for metals considered to be chemicals of potential concern (COPCs), as well as non-COPCs. COPC metals are defined as those metals with measured maximum detected concentrations that exceed reported background concentrations and have toxicity screening values that exceed target thresholds (Hazard Quotient or Index of 0.01 and/or estimated risks of 1×10^{-8}). Non-COPCs are defined as those metals detected at a site but not selected as COPCs for quantitative evaluation in the Sections 3.0 through 6.0 of the Baseline Human Health Risk Assessment (BRA).

COPC metals were evaluated using the maximum soil background concentration specific to the soil type identified at each site (Table 2.2 in the main text) which for all four RI sites was identified as non-QTP (NQTP) soil. Non-COPC metals are those with measured maximum detected concentrations exceeding reported background concentrations but not the toxicity screening values, and metals with measured maximum detected concentrations below reported background concentrations. In the former case, non-COPC metals were evaluated using the maximum soil background concentration to evaluate possible health risks from reported background concentrations only. In the latter case, the non-COPC metals were evaluated using the maximum measured soil concentration. Higher background concentrations were not detected; therefore quantifying possible health risks from background concentrations was deemed inappropriate. Background metals concentrations are available for two soil strata: 0 to 2 feet bgs and greater than 2 feet bgs. To evaluate COPC and non-COPC metals in subsurface soil (0 to 10 feet bgs), the background concentrations used in this analysis are based on the stratum in which the maximum detected concentration of each metal was detected.

This background risk analysis does not consider metals identified as essential nutrients in the risk assessments (i.e., iron and zinc). Appendix B provides information about the identification of metals as essential nutrients in this evaluation. In addition, this analysis does not include metals without reported background concentrations in the soil-type-specific background soil data presented in the *Draft Final Background Soil Investigation* dated March 15, 1993.

Based on this analysis, in the case of the COPC metals, the estimated health risks associated with background concentrations can be subtracted from the total estimated health risks presented in Sections 3.0 through 6.0 of the BRA, to estimate possible incremental health risks from COPCs. These then represent the health risk estimates associated with past site activities (nonbackground conditions) at the sites. In the case of the non-COPCs, the estimated health risks associated with non-COPC metals using their measured or background concentrations provide additional information for risk managers to evaluate potential health risks associated with background conditions.

The exposure pathways evaluated in the BRAs include ingestion of soil, dermal contact with soil, and inhalation of dust, as appropriate. The assumed dermal, oral, and inhalation absorption factors and background or maximum measured concentrations were then used to estimate a chemical-, pathway- and receptor-specific average and reasonable maximum exposure (RME) daily intake, consistent with the methods presented in Section 2.2.4. Toxicity values such as oral and/or inhalation reference doses (RfDs) and slope factors were used for all chemicals other than lead, consistent with Table 2.9 in the main text. In addition, average and RME hazard indices (HIs) and cancer risks were estimated, as appropriate, consistent with methods presented

Table A1. Summary of Background Analysis - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Site Number Site Area/Receptor	RME COPCs Hazard Index	RME COPCs Cancer Risk	RME Non-COPCs Hazard Index	RME Non-COPCs Cancer Risk	RME Sum Total Hazard Index	RME Sum Total Cancer Risk	Blood Lead Level (µg/dl)
Site 2							
Commercial Worker (18 to 28 years)	0.02	2E-06	0.001	4E-07	0.02	3E-06	3.97
Site 12							
Resident (0 to 6 years)	0.2	1E-05	0.03	3E-08	0.2	1E-05	3.97
Resident (6 to18 years)	0.04	4E-06	0.005	3E-08	0.04	4E-06	3.97
Resident (18 to 30 years)	0.03	2E-06	0.003	1E-08	0.03	2E-06	3.97
Sites 16 and 17							
Pete's Pond Extension							
Student (18 to 23 years)	0.002	8E-08	0.002	9E-08	0.004	2E-07	3.97
Utility Worker (18 to 19 years)	0.008	5E-08	0.00006	1E-08	0.008	6E-08	3.97
Pete's Pond							
Student (18 to 23 years)	0.002	1E-07	0.0002	4E-11	0.002	1E-07	3.97
Utility Worker (18 to 19 years)	0.007	8E-08	0.001	3E-11	0.01	8E-08	3.97
Site 17 Disposal Area							
Student (18 to 23 years)	- -	- -	0.008	4E-07	0.008	4E-07	3.94
Construction Worker (18 to 19 years)	0.2	6E-07	0.0008	1E-07	0.2	7E-07	3.90
Site 16 DOL Yard							
Construction Worker (18 to 19 years)	0.06	5E-07	0.008	1E-07	0.07	6E-07	3.97
Commercial Worker (18 to 19 years)	0.007	2E-06	0.007	4E-09	0.01	2E-06	3.97

Table A1. Summary of Background Analysis - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Site Number Site Area/Receptor	RME COPCs Hazard Index	RME COPCs Cancer Risk	RME Non-COPCs Hazard Index	RME Non-COPCs Cancer Risk	RME Sum Total Hazard Index	RME Sum Total Cancer Risk	Blood Lead Level ($\mu g/dl$)
Site 3 - <1 Percent Area							
Resident (0 to 6 years)	- -	- -	0.001	- -	0.001	- -	2.76
Resident (6 to18 years)	- -	- -	0.0002	- -	0.0002	- -	3.97
Resident (18 to 30 years)	- -	- -	0.0001	- -	0.0001	- -	3.97
Park Ranger (18 to 43 years)	- -	- -	0.0003	- -	0.0003	- -	3.97
Site 3 - 1 to 10 Percent Area							
Resident (0 to 6 years)	0.002	- -	0.0002	- -	0.002	- -	2.76
Resident (6 to18 years)	0.0004	- -	0.00003	- -	0.0004	- -	3.97
Resident (18 to 30 years)	0.0002	- -	0.00002	- -	0.0002	- -	3.97
Park Ranger (18 to 43 years)	0.0006	- -	0.00005	- -	0.0006	- -	3.97
Site 3 Weighted Surface & 10 Percent Area							
Resident (0 to 6 years)	0.002	- -	0.0001	- -	0.002	- -	2.76
Resident (6 to18 years)	0.0004	- -	0.00002	- -	0.0004	- -	3.97
Resident (18 to 30 years)	0.0002	- -	0.00001	- -	0.0002	- -	3.97
Park Ranger (18 to 43 years)	0.0006	- -	0.00004	- -	0.0006	- -	3.97
Site 31							
North Slope							
Nearby Resident/Trespasser (6 to 18 years)	0.004	4E-07	0.0005	5E-10	0.004	4E-07	3.97
South Slope							
Nearby Resident/Trespasser (6 to 18 years)	- -	- -	0.002	2E-07	0.002	2E-07	3.97
LRTC Area							
Nearby Resident/Trespasser (6 to 18 years)	0.0001	- -	0.003	3E-07	0.003	3E-07	3.97

Table A1. Summary of Background Analysis - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Site Number Site Area/Receptor	RME COPCs		RME Non-COPCs		RME Sum Total		Blood Lead Level (μg/dl)
	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk	
Site 39							
Habitat Management Worker	0.03	6E-06	0.0009	- -	0.03	6E-06	3.97
Resident (0 to 6 years)	0.0003	2E-07	0.00003	- -	0.0003	2E-07	3.97
Resident (6 to18 years)	0.0002	2E-07	0.00001	- -	0.0002	2E-07	3.97
Resident (18 to 30 years)	0.00005	9E-08	0.000006	- -	0.00005	9E-08	3.97

RME — Reasonable maximum exposure.
COPCs — Chemicals of potential concern.
RME Sum Total — Sum of RME Hazard Indices or RME Cancer Risks for COPCs, Non-COPCs, and lead.
- - — Not calculated; toxicity values not available for COPCs or nonCOPCs.

Note: COPCs and nonCOPCs are listed in site-specific tables in Sections 3.0 through 7.0.
An acceptable blood level of 10 μg/l was used to evaluate background lead exposures.

APPENDIX B

ESSENTIAL NUTRIENT EVALUATION

CONTENTS

TABLES

ESSENTIAL NUTRIENT EVALUATION

This appendix describes the methods used to calculate estimated daily doses (EDDs) for essential nutrient chemicals detected in soil or groundwater at any of the Fort Ord RI sites evaluated in this report (2 and 12, 16 and 17, 3, 31, and 39). EDDs are calculated to assess whether exposure to the measured concentrations at the site under investigation is within an acceptable range or poses a potential risk to human health.

Only those essential nutrient chemicals detected in a given area and medium are presented. Table B-1 lists the essential nutrient chemicals by site and medium. EDDs were estimated assuming that exposure to site-related essential nutrients could occur via ingestion of either soil or groundwater. As a conservative measure, EDDs were estimated assuming that exposure would occur to the maximum detected essential nutrient concentration. Chemical-specific EDDs were estimated using the equation below:

$$EDDi = Ci \times IgR \times CF$$

Where:

EDDi	=	Estimated dose of chemical i (mg/day)
Ci	=	Maximum detected soil (mg/kg) or water concentration (mg/l)
IgR	=	Ingestion rates for soil (200 mg/day; *EPA, 1991d*) or water (1 l/day; *EPA, 1990b*)[/1/]
CF	=	Conversion factor of 1×10^{-6} kg/mg for soil only

As indicated in Section 2.1.2, essential nutrient chemicals were eliminated as potential COPCs if the EDDs were below or within an acceptable range. The acceptable ranges used in this BRA are Food and Drug Administration's (FDA) recommended daily allowances (RDAs) for children 0 to 6 years of age (*NRC, 1989*). The RDA is considered a threshold value/range below which intake of an essential nutrient is considered inadequate or deficient and subsequently may affect human health. All criteria used to assess chemicals as essential nutrients at Fort Ord RI sites, including available RDAs are presented in Table B-1.

/1/ Soil ingestion rate is for a child 0 to 6 years old (*EPA, 1991z*). Water ingestion rate represents the average drinking water ingestion rate for children (*EPA, 1990b*).

Table B1. Comparision of Estimated Daily Doses (EDDs) with the Food and Drug Administration's (FDA's) Recommended Daily Allowances (RDAs) - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Site Number	Chemical	Maximum Detected Concentration in Soil (mg/kg)	Maximum Detected Concentration in Groundwater (mg/l)	EDD for Soil Ingestion (mg/day)	EDD for Water Ingestion (mg/day)	RDA (mg/day) /a/	Does EDD Exceed the RDA?
Sites 2 and 12							
Site 12	Calcium	--	56.51	--	5.65E+01	400-800	No
Site 12	Iron	--	0.138	--	1.38E-01	6 - 10	No
Site 12	Magnesium	--	29.50	--	2.95E+01	40 - 120	No
Site 12	Zinc	499.0	0.098	9.98E-02	9.80E-02	5-10	No
Site 3							
Site 3	Iron	28392.00	--	5.68E+00	--	6 - 10	No
Site 3	Zinc	86.40	--	1.73E-02	--	6 - 10	No
Concentration of Spent Ammunition Less Than 1 Percent	Iron	31200.00	--	6.24E+00	--	6 - 10	No
Concentration of Spent Ammunition Between 1 and 10 Percent	Iron	21700.00	--	4.34E+00	--	6 - 10	Yes
	Zinc	159.00	--	3.18E-02	--	5 - 10	No
Concentration of Spent Ammunition Greater Than 10 Percent	Iron	30400.00	--	6.08E+00	--	6 - 10	Yes
	Zinc	2160.00	--	4.32E-01	--	5 - 10	No

Table B1. Comparision of Estimated Daily Doses (EDDs) with the Food and Drug Administration's (FDA's) Recommended Daily Allowances (RDAs) - All Sites
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Site Number	Chemical	Maximum Detected Concentration in Soil (mg/kg)	Maximum Detected Concentration in Groundwater (mg/l)	EDD for Soil Ingestion (mg/day)	EDD for Water Ingestion (mg/day)	RDA (mg/day) /a/	Does EDD Exceed the RDA?
<u>Site 39</u>							
Uppermost Aquifer	Calcium	--	33.6		3.36E+01	400 - 800	No
Uppermost Aquifer	Magnesium	--	24.9		2.49E+01	40 - 120	No
Uppermost Aquifer	Zinc	--	0.0141		1.41E-02	5 - 10	No
Paso Robles Aquifer	Calcium	--	27.0		2.70E+01	400 - 800	No
Paso Robles Aquifer	Magnesium	--	10.3		1.03E+01	40 - 120	No
Paso Robles Aquifer	Zinc	--	0.0181		1.81E-02	5 - 10	No
Soil	Zinc	8910	--	1.78E+00	--	5 - 10	No

mg/kg	Milligrams per kilogram.
mg/l	Milligrams per liter.
mg/day	Milligrams per day.
--	Not detected or not applicable.
2.34E+00	2.34 x 10^0.
DOL	Department of Logistics.
LRTC	Leadership Reaction Training Compound.

/a/ Values are presented as a range for children ages 0 to 6 years old. From National Research Council, 1989.

APPENDIX C

TOXICITY SCREENING

CONTENTS

TOXICITY SCREEN EVALUATION

This appendix describes the toxicity screen evaluation, which is a step used in the selection process for chemicals of potential concern (COPCs) (Section 2.1.2). The toxicity screen evaluation estimated lifetime cancer risks and hazard indices or quotients (HIs or HQs) for all chemicals that were not omitted in the first steps of the COPC selection process (Section 2.1.2). Screening risks estimated in the toxicity evaluation were based exclusively on potential ingestion of soil and groundwater. It was assumed that ingestion would represent the most significant exposure route, and therefore toxicity screens did not evaluate either inhalation or dermal contact with most chemicals. However, for metals identified as carcinogenic via inhalation (i.e., metals with inhalation slope factors), inhalation may represent the most significant exposure route. Therefore, the toxicity screens include an evaluation of inhalation exposures for the following metals: arsenic, beryllium, cadmium, and nickel. Note that this toxicity screen was conducted using a conservative threshold selection criteria (i.e., the levels below which chemicals would be omitted as COPCs). Chemicals were omitted as COPCs if estimated chemical-specific cancer risk was less than one in one hundred million (1×10^{-8}) or for noncarcinogenic chemicals, if the screening HI was less than 0.01, two orders of magnitude below federal and state agency levels of concern.

This toxicity screen evaluation was applied to all remaining chemicals (after the first COPC selection criteria), except for lead. Given its unique toxicological properties, which are discussed in Section 2.3.3, lead was evaluated differently from what is described in this appendix. Potential health effects resulting from lead exposure were based on estimates of blood-lead levels in children and adults, which was accomplished using lead exposure models developed by Cal/EPA (*1992a*) and EPA (*1990e*). These models are described in Section 2.4.3. Based on earlier work conducted by Harding Lawson Associates (*1993e*), a health-based level of 240 mg/kg for lead in soil was estimated for children. It is expected that exposure by humans at or below this concentration of lead in soil will not result in adverse health effects. The following equations were used in the toxicity screen evaluation to estimate screening risks and HIs.

<u>Screening Risks for Chemicals Detected in Soil:</u>

Oral Exposure:

$$\text{Screening Risk}_{Soil} = \frac{C_x \text{ IR} \times \text{CF} \times \text{EF} \times \text{ED} \times \text{SF}_x}{\text{BW} \times \text{AT}}$$

(Equation C-1)

Where:

C_x	=	Maximum detected concentration for chemical x (mg/kg)
IR	=	Soil ingestion rate (100 mg soil/day)
CF	=	Units conversion factor (10^{-6} kg/mg)
EF	=	Exposure Frequency (365 days/year)
ED	=	Exposure Duration (30 years)
SF_x	=	Cancer oral slope factor for chemical x $(\text{kg-day/mg})^{-1}$
BW	=	Body weight (70 kg)
AT	=	Averaging Time (70 years x 365 days/year)

The screening cancer risks for arsenic, beryllium, cadmium, and nickel are based on both oral and inhalation exposure. To evaluate inhalation exposure, the maximum concentration of a metal in air (i.e., in suspended dust) was estimated by multiplying the maximum soil concentration by the PM_{10} for the Monterey County area (see

EF	=	Exposure Duration (365 days/year)
ED	=	Exposure Duration (30 years)
BW	=	Body weight (70 kg)
AT	=	Averaging Time (30 years x 365 days/year)
RfD_x	=	Reference dose for chemical x (mg/kg-day)

SITES 2 AND 12

Table C1. Calculations for Screening HIs and Screening Risks for Chemicals Detected in Surface Soil (0 to 2 feet bgs), Site 2
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Maximum Concentration (mg/kg)	Maximum Air Concentration (mg/m³)	HI Screening Factor	Oral Risk Screening Factor	Inhalation Risk Screening Factor	Toxicity Values			Screening Results	
						Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (kg-day/mg)^-1	Inhalation Slope Factor (kg-day/mg)^-1	Hazard Quotient /a/	Cancer Risk /a/
Antimony	23.10	-- /b/	1.43E-06	6.12E-07	--	4.00E-04	NA	--	8.3E-02	NA
Arsenic	3.70	4.26E-05	1.43E-06	6.12E-07	1.22E-01	3.00E-04	1.75E+00	1.50E+01	1.8E-02	8.2E-05
Cadmium	17.50	2.01E-04	1.43E-06	6.12E-07	1.22E-01	5.00E-04	NA	1.50E+01	5.0E-02	3.7E-04
Chromium (total) /c/	90.80	--	1.43E-06	6.12E-07	--	1.00E+00	NA	--	1.3E-04	NA
Copper	1160.00	--	1.43E-06	6.12E-07	--	3.70E-02	NA	--	4.5E-02	NA
Mercury	5.30	--	1.43E-06	6.12E-07	--	3.00E-04	DI	--	2.5E-02	NA
Selenium	8.40	--	1.43E-06	6.12E-07	--	5.00E-03	NA	--	2.4E-03	NA
Silver	58.60	--	1.43E-06	6.12E-07	--	5.00E-03	NA	--	1.7E-02	NA
Thallium	0.60	--	1.43E-06	6.12E-07	--	7.00E-05	DI	--	1.2E-02	NA

mg/kg	Milligrams per kilogram.
HI	Hazard index.
NA	Not available or not applicable.
DI	Data inadequate for quantitative risk assessment.
RfD	Reference dose.
mg/kg-day	Milligrams per kilogram per day.
kg-day/mg	Kilogram-day per milligram.
2.66E-04	2.66 x 10^-4.

/a/ Calculated to 2 significant figures.
/b/ Evaluation of cancer risks resulting from inhalation exposure was limited to metals with inhalation slope factors.
/c/ Chromium (total) evaluated as Chromium III.

Table C2. Calculations for Screening HIs and Screening Risks for Chemicals Detected in Surface Soil (0 to 2 feet bgs), Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Maximum Concentration (mg/kg)	Maximum Air Concentration (mg/m³)	HI Screening Factor	Oral Risk Screening Factor	Inhalation Risk Screening Factor	Toxicity Values			Screening Results	
						Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (kg-day/mg)	Inhalation Slope Factor (kg-day/mg)	Hazard Quotient /a/	Cancer Risk /a/
Acetone	0.016	- - /b/	1.43E-06	6.12E-07	- -	1.00E-01	ND	- -	2.3E-07	NA
Antimony	8.70	- -	1.43E-06	6.12E-07	- -	4.00E-04	NA	- -	3.1E-02	NA
Arsenic	6.80	7.82E-05	1.43E-06	6.12E-07	1.22E-01	3.00E-04	1.75E+00	1.50E+01	3.2E-02	1.5E-04
B(a)P-TE	0.0458	- -	1.43E-06	6.12E-07	- -	NA	1.20E+01	- -	NA	3.4E-07
Beryllium	0.36	4.14E-06	1.43E-06	6.12E-07	1.22E-01	5.00E-03	7.00E+00	8.40E+00	1.0E-04	5.8E-06
Bis(2-ethylhexyl)phthalate	9.9	- -	1.43E-06	6.12E-07	- -	2.00E-02	1.40E-02	- -	7.1E-04	8.5E-08
Cadmium	18.60	2.14E-04	1.43E-06	6.12E-07	1.22E-01	5.00E-04	NA	1.50E+01	5.3E-02	3.9E-04
Chromium (total) /c/	184.00	- -	1.43E-06	6.12E-07	- -	1.00E+00	NA	- -	2.6E-04	NA
Copper	125.00	- -	1.43E-06	6.12E-07	- -	3.70E-02	NA	- -	4.8E-03	NA
4,4'-DDT	0.015	- -	1.43E-06	6.12E-07	- -	5.00E-04	3.40E-01	- -	4.3E-05	3.1E-09
Di-n-butylphthalate	0.11	- -	1.43E-06	6.12E-07	- -	1.00E-01	DI	- -	1.6E-06	NA
Diethylphthalate	0.041	- -	1.43E-06	6.12E-07	- -	8.00E-01	DI	- -	7.3E-08	NA
Mercury	0.56	- -	1.43E-06	6.12E-07	- -	3.00E-04	DI	- -	2.7E-03	NA
Pyrene	0.95	- -	1.43E-06	6.12E-07	- -	3.00E-02	NA	- -	4.5E-05	NA
Selenium	0.77	- -	1.43E-06	6.12E-07	- -	5.00E-03	NA	- -	2.2E-04	NA

Table C3. Calculations for Screening HIs and Screening Risks for Chemicals Detected in Groundwater, Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Maximum Concentration (mg/l)	HI Screening Factor	Oral Risk Screening Factor	Toxicity Values		Screening Results	
				Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (kg-day/mg)^-1	Hazard Quotient /a/	Cancer Risk /a/
Antimony	0.0101	2.86E-02	1.22E-02	4.00E-04	NA	7.2E-01	NA
Chloride	134	2.86E-02	1.22E-02	NA	NA	NA	NA
Chromium (total) /b/	0.0162	2.86E-02	1.22E-02	1.00E+00	NA	4.6E-04	NA
Copper	0.0137	2.86E-02	1.22E-02	3.70E-02	NA	1.1E-02	NA
1,1-Dichloroethene	0.0013	2.86E-02	1.22E-02	9.00E-03	6.00E-01	4.1E-03	9.6E-06
1,2-Dichloroethane	0.0015	2.86E-02	1.22E-02	NA	9.10E-02	NA	1.7E-06
1,2-Dichloroethene (total)	0.05	2.86E-02	1.22E-02	9.00E-03	NA	1.6E-01	NA
Magnesium	29.5	2.86E-02	1.22E-02	NA	NA	NA	NA
Manganese	0.503	2.86E-02	1.22E-02	1.40E-01	NA	1.0E-01	NA
Mercury	0.0003	2.86E-02	1.22E-02	3.00E-04	NA	2.9E-02	NA
Methylene chloride	0.0029	2.86E-02	1.22E-02	6.00E-02	1.40E-02	1.4E-03	5.0E-07
Nickel	0.0356	2.86E-02	1.22E-02	2.00E-02	NA	5.1E-02	NA
Nitrate as N	15.5	2.86E-02	1.22E-02	1.60E+00	NA	2.8E-01	NA
Potassium	3.68	2.86E-02	1.22E-02	NA	NA	NA	NA
Sodium	85.1	2.86E-02	1.22E-02	NA	NA	NA	NA
Sulfate	61.6	2.86E-02	1.22E-02	NA	NA	NA	NA

Table C9. Calculations for Screening HIs and Screening Risks for Chemicals Detected in Soil
Site 3 - Weighted Surface Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Maximum Concentration (mg/kg)	Maximum Air Concentration (mg/m³)	HI Screening Factor	Oral Risk Screening Factor	Inhalation Risk Screening Factor	Toxicity Values			Screening Results	
						Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (kg-day/mg)^-1	Inhalation Slope Factor (kg-day/mg)^-1	Hazard Quotient /a/	Cancer Risk /a/
Antimony	134.40	-- /b/	1.43E-06	6.12E-07	--	4.00E-04	NA	--	4.8E-01	NA
Chromium (total) /c/	48.96	--	1.43E-06	6.12E-07	--	1.00E+00	NA	--	7.0E-05	NA
Copper	796.00	--	1.43E-06	6.12E-07	--	3.70E-02	NA	--	3.1E-02	NA
Tin	2.70	--	1.43E-06	6.12E-07	--	6.00E-01	NA	--	6.4E-06	NA

mg/kg Milligrams per kilogram.
HI Hazard Index.
NA Not available or not applicable.
DI Data inadequate for quantitative risk assessment.
RfD Reference dose.
mg/kg-day Milligrams per kilogram per day.
kg-day/mg Kilogram-day per milligram.
1.43E-06 1.43 x 10^6

/a/ Calculated to 2 significant figures.
/b/ Evaluation of cancer risks resulting from inhalation exposure was limited to metals with inhalation slope factors.
/c/ Chromium (total) evaluated as chromium III.

SITES 16 AND 17

Table C4. Calculations for Screening HIs and Screening Risks for Chemicals Detected in Soil
Site 16, DOL Maintenance Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Maximum Concentration (mg/kg)	Maximum Air Concentration (mg/m³)	HI Screening Factor	Oral Risk Screening Factor	Inhalation Risk Screening Factor	Toxicity Values			Screening Results	
						Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (kg-day/mg)^-1	Inhalation Slope Factor (kg-day/mg)^-1	Hazard Quotient /a/	Cancer Risk /a/
<u>Surface Soil</u>										
Antimony	0.69	-- /b/	1.43E-06	6.12E-07	--	4.00E-04	NA	--	2.5E-03	NA
Arsenic	22.3	2.56E-04	1.43E-06	6.12E-07	1.22E-01	3.00E-04	1.75E+00	1.50E+01	1.1E-01	4.9E-04
B(a)P-TE	2.30E-05	--	1.43E-06	6.12E-07	--	NA	1.20E+01	--	NA	1.7E-10
Cadmium	2.4	2.76E-05	1.43E-06	6.12E-07	1.22E-01	5.00E-04	NA	1.50E+01	6.9E-03	5.1E-05
Copper	53.1	--	1.43E-06	6.12E-07	--	3.70E-02	NA	--	2.1E-03	NA
Mercury	0.34	--	1.43E-06	6.12E-07	--	3.00E-04	DI	--	1.6E-03	NA
TCDD-TE	5.76E-06	--	1.43E-06	6.12E-07	--	NA	1.50E+05	--	NA	5.3E-07
Total cPAH	0.0023	--	1.43E-06	6.12E-07	--	3.00E-02	DI	--	1.1E-07	NA
<u>Subsurface soil</u>										
Acetone	0.077	--	1.43E-06	6.12E-07	--	1.00E-01	ND	--	1.1E-06	NA
Antimony	0.69	--	1.43E-06	6.12E-07	--	4.00E-04	NA	--	2.5E-03	NA
Arsenic	22.3	2.56E-04	1.43E-06	6.12E-07	1.22E-01	3.00E-04	1.75E+00	1.50E+01	1.1E-01	4.9E-04
B(a)P-TE	2.30E-05	--	1.43E-06	6.12E-07	--	NA	1.20E+01	--	NA	1.7E-10
Bis(2-ethylhexyl)phthalate	3.9	--	1.43E-06	6.12E-07	--	2.00E-02	1.40E-02	--	2.8E-04	3.3E-08
Cadmium	2.4	2.76E-05	1.43E-06	6.12E-07	1.22E-01	5.00E-04	NA	1.50E+01	6.9E-03	5.1E-05
Copper	53.1	--	1.43E-06	6.12E-07	--	3.70E-02	NA	--	2.1E-03	NA
Di-n-butylphthalate	0.095	--	1.43E-06	6.12E-07	--	1.00E-01	DI	--	1.4E-06	NA
Dibenzofuran	0.41	--	1.43E-06	6.12E-07	--	3.00E-01	ND	--	2.0E-06	NA
Fluorene	1.1	--	1.43E-06	6.12E-07	--	4.00E-02	DI	--	3.9E-05	NA

Table C5. Calculations for Screening HIs and Screening Risks for Chemicals Detected in Soil
Site 16, Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Maximum Concentration (mg/kg)	Maximum Air Concentration (mg/m³)	HI Screening Factor	Oral Risk Screening Factor	Inhalation Risk Screening Factor	Toxicity Values			Screening Results	
						Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (kg-day/mg)^-1	Inhalation Slope Factor (kg-day/mg)^-1	Hazard Quotient /a/	Cancer Risk /a/
Surface Soil										
Acetone	0.028	-- /b/	1.43E-06	6.12E-07	--	1.00E-01	ND	--	4.0E-07	NA
Antimony	0.67	--	1.43E-06	6.12E-07		4.00E-04	NA		2.4E-03	NA
Arsenic	3.7	4.26E-05	1.43E-06	6.12E-07	1.22E-01	3.00E-04	1.75E+00	1.50E+01	1.8E-02	8.2E-05
B(a)P-TE	0.00033	--	1.43E-06	6.12E-07		NA	1.20E+01		NA	2.4E-09
Beryllium	0.42	4.83E-06	1.43E-06	6.12E-07	1.22E-01	5.00E-03	7.00E+00	8.40E+00	1.2E-04	6.8E-06
Cadmium	4.5	5.18E-05	1.43E-06	6.12E-07	1.22E-01	5.00E-04	NA	1.50E+01	1.3E-02	9.5E-05
Chlordane	0.084	--	1.43E-06	6.12E-07		6.00E-05	1.30E+00		2.0E-03	6.7E-08
Copper	40.3	--	1.43E-06	6.12E-07	--	3.70E-02	NA	--	1.6E-03	NA
4,4'-DDT	0.022	--	1.43E-06	6.12E-07	--	5.00E-04	3.40E-01	--	6.3E-05	4.6E-09
Mercury	0.63	--	1.43E-06	6.12E-07	--	3.00E-04	DI	--	3.0E-03	NA
Methylene chloride	0.003	--	1.43E-06	6.12E-07	--	6.00E-02	1.40E-02	--	7.1E-08	2.6E-11
Total cPAH	0.0033	--	1.43E-06	6.12E-07		3.00E-02	DI		1.6E-07	NA
TCDD-TE	2.79E-06	--	1.43E-06	6.12E-07	--	NA	1.50E+05	--	NA	2.6E-07
Zinc (total)	1730	--	1.43E-06	6.12E-07	--	3.00E-01	DI	--	8.2E-03	NA
Subsurface Soil										
Acetone	0.034	--	1.43E-06	6.12E-07	--	1.00E-01	ND	--	4.9E-07	NA
Antimony	0.67	--	1.43E-06	6.12E-07	--	4.00E-04	NA	--	2.4E-03	NA
Arsenic	3.7	4.26E-05	1.43E-06	6.12E-07	1.22E-01	3.00E-04	1.75E+00	1.50E+01	1.8E-02	8.2E-05
B(a)P-TE	0.00033	--	1.43E-06	6.12E-07	--	NA	1.20E+01	--	NA	2.4E-09
Beryllium	0.45	5.18E-06	1.43E-06	6.12E-07	1.22E-01	5.00E-03	7.00E+00	8.40E+00	1.3E-04	7.3E-06
Cadmium	4.5	5.18E-05	1.43E-06	6.12E-07	1.22E-01	5.00E-04	NA	1.50E+01	1.3E-02	9.5E-05
Chlordane	0.084	--	1.43E-06	6.12E-07	--	6.00E-05	1.30E+00	--	2.0E-03	6.7E-08
Copper	40.3	--	1.43E-06	6.12E-07	--	3.70E-02	NA	--	1.6E-03	NA

Table C6. Calculations for Screening HIs and Screening Risks for Chemicals Detected in Soil
Site 16, Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Maximum Concentration (mg/kg)	Maximum Air Concentration (mg/m³)	HI Screening Factor	Oral Risk Screening Factor	Inhalation Risk Screening Factor	Toxicity Values: Oral Chronic RfD (mg/kg-day)	Toxicity Values: Oral Slope Factor (kg-day/mg)^-1	Toxicity Values: Inhalation Slope Factor (kg-day/mg)^-1	Screening Results: Hazard Quotient /a/	Screening Results: Cancer Risk /a/
Surface Soil										
Antimony	6.9	-- /b/	1.43E-06	6.12E-07	--	4.00E-04	NA	--	2.5E-02	NA
Arsenic	6.4	7.36E-05	1.43E-06	6.12E-07	1.22E-01	3.00E-04	1.75E+00	1.50E+01	3.0E-02	1.4E-04
Benzo(ghi)perylene	0.0083	--	1.43E-06	6.12E-07	--	4.00E-02	DI	--	3.0E-07	NA
Bis(2-ethylhexyl)phthalate	0.096	--	1.43E-06	6.12E-07	--	2.00E-02	1.40E-02	--	6.9E-06	8.2E-10
Cadmium	1.7	1.96E-05	1.43E-06	6.12E-07	1.22E-01	5.00E-04	NA	1.50E+01	4.9E-03	3.6E-05
Chlordane	0.063	--	1.43E-06	6.12E-07	--	6.00E-05	1.30E+00	--	1.5E-03	5.0E-08
Copper	443	--	1.43E-06	6.12E-07	--	3.70E-02	NA	--	1.7E-02	NA
4,4'-DDD	0.02	--	1.43E-06	6.12E-07	--	NA	2.40E-01	--	NA	2.9E-09
4,4'-DDT	0.076	--	1.43E-06	6.12E-07	--	5.00E-04	3.40E-01	--	2.2E-04	1.6E-08
Mercury	0.25	--	1.43E-06	6.12E-07	--	3.00E-04	DI	--	1.2E-03	NA
Silver	1.2	--	1.43E-06	6.12E-07	--	5.00E-03	NA	--	3.4E-04	NA
TCDD-TE	2.20E-06	--	1.43E-06	6.12E-07	--	NA	1.50E+05	--	NA	2.0E-07
Trichloroethene	0.068	--	1.43E-06	6.12E-07	--	6.00E-03	1.50E-02	--	1.6E-05	6.2E-10
Zinc	1030	--	1.43E-06	6.12E-07	--	3.00E-01	DI	--	4.9E-03	NA
Subsurface Soil										
4,4'-DDD	0.02	--	1.43E-06	6.12E-07	--	NA	2.40E-01	--	NA	2.9E-09
4,4'-DDT	0.076	--	1.43E-06	6.12E-07	--	5.00E-04	3.40E-01	--	2.2E-04	1.6E-08
Antimony	6.9	--	1.43E-06	6.12E-07	--	4.00E-04	NA	--	2.5E-02	NA
Arsenic	6.4	7.36E-05	1.43E-06	6.12E-07	1.22E-01	3.00E-04	1.75E+00	1.50E+01	3.0E-02	1.4E-04
Benzo(ghi)perylene	0.0083	--	1.43E-06	6.12E-07	--	4.00E-02	DI	NA	3.0E-07	NA
Bis(2-ethylhexyl)phthalate	0.096	--	1.43E-06	6.12E-07	--	2.00E-02	1.40E-02	--	6.9E-06	8.2E-10
Cadmium	1.7	1.96E-05	1.43E-06	6.12E-07	1.22E-01	5.00E-04	NA	1.50E+00	4.9E-03	3.6E-06

Table C7. Calculations for Screening HIs and Screening Risks for Chemicals Detected in Soil
Site 17, Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
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Chemical	Maximum Concentration (mg/kg)	Maximum Air Concentration (mg/m³)	HI Screening Factor	Oral Risk Screening Factor	Inhalation Risk Screening Factor	Toxicity Values			Screening Results	
						Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (kg-day/mg)^-1	Inhalation Slope Factor (kg-day/mg)^-1	Hazard Quotient /a/	Cancer Risk /a/
Surface Soil										
Acetone	0.0088	- - /b/	1.43E-06	6.12E-07	- -	1.00E-01	ND	- -	1.3E-07	NA
Antimony	0.72	- -	1.43E-06	6.12E-07	- -	4.00E-04	NA	- -	2.6E-03	NA
Mercury	0.13	- -	1.43E-06	6.12E-07	- -	3.00E-04	DI	- -	6.2E-04	NA
TCDD-TE	4.06E-06	- -	1.43E-06	6.12E-07	- -	NA	1.50E+05	- -	NA	3.7E-07
Subsurface Soil										
Acetone	0.031	- -	1.43E-06	6.12E-07	- -	1.00E-01	ND	- -	4.4E-07	NA
Antimony	5.5	- -	1.43E-06	6.12E-07	- -	4.00E-04	NA	- -	2.0E-02	NA
Arsenic	13.1	1.51E-04	1.43E-06	6.12E-07	1.22E-01	3.00E-04	1.75E+00	1.50E+01	6.2E-02	2.9E-04
Bis(2-ethylhexyl)phthalate	0.13	- -	1.43E-06	6.12E-07	- -	2.00E-02	1.40E-02	- -	9.3E-06	1.1E-09
Cadmium	3.2	3.68E-05	1.43E-06	6.12E-07	1.22E-01	5.00E-04	NA	1.50E+01	9.1E-03	6.8E-05
Chromium (total) /c/	52.7	- -	1.43E-06	6.12E-07	- -	1.00E+00	NA	- -	7.5E-05	NA
Copper	257	- -	1.43E-06	6.12E-07	- -	3.70E-02	NA	- -	9.9E-03	NA
Lead	442	- -	1.43E-06	6.12E-07	- -	NA	NA	- -	NA	NA
Mercury	7.5	- -	1.43E-06	6.12E-07	- -	3.00E-04	DI	- -	3.6E-02	NA
Methylene chloride	0.0035	- -	1.43E-06	6.12E-07	- -	6.00E-02	1.40E-02	- -	8.3E-08	3.0E-11
Nickel	170	1.96E-03	1.43E-06	6.12E-07	1.22E-01	2.00E-02	NA	9.10E-01	1.2E-02	2.2E-04

Table C8. Calculations for Screening HIs and Screening Risks for Chemicals Detected in Groundwater
Sites 16 and 17
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Maximum Concentration (mg/l)	HI Screening Factor	Oral Risk Screening Factor	Toxicity Values		Screening Results	
				Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (kg-day/mg)^-1	Hazard Quotient /a/	Cancer Risk /a/
A Aquifer							
Antimony	0.0096	2.86E-02	1.22E-02	4.00E-04	NA	6.9E-01	NA
Tetrachloroethene	0.0019	2.86E-02	1.22E-02	1.00E-02	5.10E-02	5.4E-03	1.2E-06
Toluene	0.0011	2.86E-02	1.22E-02	2.00E-01	NA	1.6E-04	NA
Trichloroethene	0.0022	2.86E-02	1.22E-02	6.00E-03	1.50E-02	1.0E-02	4.0E-07
Zinc	0.0396	2.86E-02	1.22E-02	3.00E-01	NA	3.8E-03	NA
180 Aquifer							
Carbon tetrachloride	0.0011	2.86E-02	1.22E-02	7.00E-04	1.50E-01	4.5E-02	2.0E-06
Tetrachloroethene	0.00074	2.86E-02	1.22E-02	1.00E-02	5.10E-02	2.1E-03	4.6E-07
Toluene	0.00048	2.86E-02	1.22E-02	2.00E-01	NA	6.9E-05	NA
Trichloroethene	0.00058	2.86E-02	1.22E-02	6.00E-03	1.50E-02	2.8E-03	1.1E-07

mg/l Milligrams per liter.
HI Hazard index.
NA Not available or not applicable.
DI Data inadequate for quantitative risk assessment.
RfD Reference dose.
mg/kg-day Milligrams per kilogram per day.
kg-day/mg Kilogram-day per milligram.
2.86E-02 2.86 X 10^-2.

/a/ Calculated to 2 significant figures.

SITE 3

Table C11. Calculations for Screening HIs and Screening Risks for Chemicals Detected in Soil
Site 3 Surface Area - Concentration of Spent Ammunition Between 1 and 10 Percent
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Maximum Concentration (mg/kg)	Maximum Air Concentration (mg/m³)	HI Screening Factor	Oral Risk Screening Factor	Inhalation Risk Screening Factor	Toxicity Values			Screening Results	
						Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (kg-day/mg)^-1	Inhalation Slope Factor (kg-day/mg)^-1	Hazard Quotient /a/	Cancer Risk /a/
Antimony	300.00	-- /b/	1.43E-06	6.12E-07	--	4.00E-04	NA	--	1.1E+00	NA
Chromium (total) /c/	42.70	--	1.43E-06	6.12E-07	--	1.00E+00	NA	--	6.1E-05	NA
Copper	1320.00	--	1.43E-06	6.12E-07	--	3.70E-02	NA	--	5.1E-02	NA
Tin	2.90	--	1.43E-06	6.12E-07	--	6.00E-01	NA	--	6.9E-06	NA

mg/kg Milligrams per kilogram.
HI Hazard Index.
NA Not available or not applicable.
DI Data inadequate for quantitative risk assessment.
RfD Reference dose.
mg/kg-day Milligrams per kilogram per day.
kg-day/mg Kilogram-day per milligram.
1.55E-03 1.55 x 10^-3.

/a/ Calculated to 2 significant figures.
/b/ Evaluation of cancer risks resulting from inhalation exposure was limited to metals with inhalation slope factors.
/c/ Chromium (total) was evaluated as chromium III.

SITE 31

Table C13. Calculations for Screening HIs and Screening Risks for Chemicals Detected in Surface Soil (0 to 2 feet bgs)
Site 31, North Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Maximum Concentration (mg/kg)	Maximum Air Concentration (mg/m³)	HI Screening Factor	Oral Risk Screening Factor	Inhalation Risk Screening Factor	Toxicity Values			Screening Results	
						Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (kg-day/mg)^-1	Inhalation Slope Factor (kg-day/mg)^-1	Hazard Quotient /a/	Cancer Risk /a/
Antimony	25.40	-- /b/	1.43E-06	6.12E-07	--	4.0E-04	NA	--	9.1E-02	NA
Arsenic	5.80	6.67E-05	1.43E-06	6.12E-07	1.22E-01	3.0E-04	1.8E+00	1.5E+01	2.8E-02	1.3E-04
B(a)P-TE	0.078	--	1.43E-06	6.12E-07	--	NA	1.2E+01	--	NA	5.7E-07
Beryllium	0.38	4.37E-06	1.43E-06	6.12E-07	1.22E-01	5.0E-03	7.0E+00	8.4E+00	1.1E-04	6.1E-06
Cadmium	8.20	9.43E-05	1.43E-06	6.12E-07	1.22E-01	5.0E-04	NA	1.5E+01	2.3E-02	1.7E-04
Chromium	49.80	--	1.43E-06	6.12E-07	--	1.0E+00	NA	--	7.1E-05	NA
Copper	391.00	--	1.43E-06	6.12E-07	--	3.7E-02	NA	--	1.5E-02	NA
4,4'-DDE	1.20	--	1.43E-06	6.12E-07	--	NA	3.4E-01	--	NA	2.5E-07
4,4'-DDT	1.70	--	1.43E-06	6.12E-07	--	5.0E-04	3.4E-01	--	4.9E-03	3.5E-07
Dibenzofuran	0.034	--	1.43E-06	6.12E-07	--	3.0E-01	NA	--	1.6E-07	NA
Fluoranthene	0.035	--	1.43E-06	6.12E-07	--	4.0E-02	NA	--	1.3E-06	NA
Mercury	1.30	--	1.43E-06	6.12E-07	--	3.0E-04	NA	--	6.2E-03	NA
2-Methylnaphthalene	0.17	--	1.43E-06	6.12E-07	--	6.0E-02	NA	--	4.0E-06	NA
Naphthalene	0.13	--	1.43E-06	6.12E-07	--	6.0E-02	NA	--	3.1E-06	NA
Phenanthrene	0.068	--	1.43E-06	6.12E-07	--	3.0E-01	NA	--	3.2E-07	NA
Pyrene	0.047	--	1.43E-06	6.12E-07	--	3.0E-02	NA	--	2.2E-06	NA
Silver	7.40	--	1.43E-06	6.12E-07	--	5.0E-03	NA	--	2.1E-03	NA

Table C13. Calculations for Screening HIs and Screening Risks for Chemicals Detected in Surface Soil (0 to 2 feet bgs)
Site 31, North Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Maximum Concentration (mg/kg)	Maximum Air Concentration (mg/m^3)	HI Screening Factor	Oral Risk Screening Factor	Inhalation Risk Screening Factor	Toxicity Values			Screening Results	
						Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (kg-day/mg)^-1	Inhalation Slope Factor (kg-day/mg)^-1	Hazard Quotient /a/	Cancer Risk /a/
TCDD-TE	2.81E-05	- -	1.43E-06	6.12E-07	- -	NA	1.5E+05	- -	NA	2.6E-06
Total cPAHs	0.203	- -	1.43E-06	6.12E-07	- -	3.0E-02	NA	- -	9.7E-06	NA

mg/kg Milligrams per kilogram.
HI Hazard Index.
NA Not available or not applicable.
DI Data inadequate for quantitative risk assessment.
RfD Reference dose.
mg/kg-day Milligrams per kilogram per day.
kg-day/mg Kilogram-day per milligram.
1.43E-06 1.43 X 10^-6.
B(a)P-TE Benzo(a)pyrene toxic equivalents.
TCDD-TE 2,3,7,8-Tetrachlorodiobenzo-p-dioxin toxic equivalents.
cPAHs Carcinogenic polycyclic aromatic hydrocarbons.

/a/ Calculated to 2 significant figures.
/b/ Evaluation of cancer risks resulting from inhalation exposure was limited to metals with inhalation slope factors.

Table C14. Calculations for Screening HIs and Screening Risks for Chemicals Detected in Surface Soil (0 to 2 feet bgs)
Site 31, South Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Maximum Concentration (mg/kg)	Maximum Air Concentration (mg/m³)	HI Screening Factor	Oral Risk Screening Factor	Inhalation Risk Screening Factor	Toxicity Values: Oral Chronic RfD (mg/kg-day)	Toxicity Values: Oral Slope Factor (kg-day/mg)^-1	Toxicity Values: Inhalation Slope Factor (kg-day/mg)^-1	Screening Results: Hazard Quotient /a/	Screening Results: Cancer Risk /a/
Antimony	0.34	- - /b/	1.43E-06	6.12E-07	- -	4.0E-04	NA	- -	1.2E-03	NA
Cadmium	1.00	1.15E-05	1.43E-06	6.12E-07	1.22E-01	5.0E-04	NA	1.5E+01	2.9E-03	2.1E-05
Copper	18.50	- -	1.43E-06	6.12E-07	- -	3.7E-02	NA	- -	7.1E-04	NA
TCDD-TE	1.84E-06	- -	1.43E-06	6.12E-07	- -	NA	1.5E+05	- -	NA	1.7E-07

mg/kg Milligrams per kilogram.
HI Hazard Index.
NA Not available or not applicable.
DI Data inadequate for quantitative risk assessment.
RfD Reference dose.
mg/kg-day Milligrams per kilogram per day.
kg-day/mg Kilogram-day per milligram.
3.91E-06 3.91 X 10^-6.
TCDD-TE 2,3,7,8-Tetrachlorodibenoz-p-dioxin toxic equivalents.

/a/ Calculated to 2 significant figures.
/b/ Evaluation of cancer risks resulting from inhalation exposure was limited to metals with inhalation slope factors.

Table C16. Calculations for Screening HIs and Screening Risks for Chemicals Detected in Surface Soil (0 to 2 feet bgs), Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Maximum Concentration (mg/kg)	Maximum Air Concentration (mg/m³)	HI Screening Factor	Oral Risk Screening Factor	Inhalation Risk Screening Factor	Toxicity Values: Oral Chronic RfD (mg/kg-day)	Toxicity Values: Oral Slope Factor (kg-day/mg)^-1	Toxicity Values: Inhalation Slope Factor (kg-day/mg)^-1	Screening Results: Hazard Quotient /a/	Screening Results: Cancer Risk /a/
2-amino-dinitrotoluene	1.2	- - /b/	1.43E-06	6.12E-07	- -	5.00E-04	3.00E-02	- -	3.4E-03	NA
4-amino-dinitrotoluene	1.5	- -	1.43E-06	6.12E-07	- -	5.00E-04	3.00E-02	- -	4.3E-03	2.8E-08
Antimony	100	- -	1.43E-06	6.12E-07	- -	4.00E-04	NA	- -	NA	NA
Arsenic	10.5	1.21E-04	1.43E-06	6.12E-07	1.22E-01	3.00E-04	1.75E+00	1.50E+01	5.0E-02	2.3E-04
Beryllium	66.9	7.69E-04	1.43E-06	6.12E-07	1.22E-01	5.00E-03	7.00E+00	8.40E+00	1.9E-02	1.1E-03
Bis(2-ethylhexyl)phthalate	0.42	- -	1.43E-06	6.12E-07	- -	2.00E-02	1.40E-02	- -	3.0E-05	3.6E-09
Cadmium	104	1.20E-03	1.43E-06	6.12E-07	1.22E-01	5.00E-04	NA	1.50E+01	3.0E-01	2.2E-03
Chromium (total) /c/	380	- -	1.43E-06	6.12E-07	- -	1.00E+00	NA	- -	5.4E-04	NA
Copper	12900	- -	1.43E-06	6.12E-07	- -	3.70E-02	NA	- -	5.0E-01	NA
Di-n-octyl-phthalate	0.055	- -	1.43E-06	6.12E-07	- -	2.00E-02	NA	- -	3.9E-06	NA
HMX	1100	- -	1.43E-06	6.12E-07	- -	5.00E-02	NA	- -	3.1E-02	NA
Lead	4060	- -	1.43E-06	6.12E-07	- -	NA	NA	- -	NA	NA
Mercury	0.08	- -	1.43E-06	6.12E-07	- -	3.00E-04	DI	- -	3.8E-04	NA
2-Methylnaphthalene	2.6	- -	1.43E-06	6.12E-07	- -	6.00E-02	NA	- -	6.2E-05	NA
Nickel	344	3.96E-03	1.43E-06	6.12E-07	1.22E-01	2.00E-02	NA	9.10E-01	2.5E-02	4.4E-04
Nitroglycerine	8.1	- -	1.43E-06	6.12E-07	- -	NA	NA	- -	NA	NA
4-Nitrophenol	0.068	- -	1.43E-06	6.12E-07	- -	DI	DI	- -	NA	NA
PETN	1.5	- -	1.43E-06	6.12E-07	- -	NA	NA	- -	NA	NA
Pentachlorophenol	0.075	- -	1.43E-06	6.12E-07	- -	3.00E-02	1.20E-01	- -	3.6E-06	5.5E-09
Phenanthrene	0.21	- -	1.43E-06	6.12E-07	- -	3.00E-01	DI	- -	1.0E-06	NA
Pyrene	0.19	- -	1.43E-06	6.12E-07	- -	3.00E-02	DI	- -	9.0E-06	NA
RDX	16.5	- -	1.43E-06	6.12E-07	- -	3.00E-03	1.10E-01	- -	7.9E-03	1.1E-06
Selenium	1	- -	1.43E-06	6.12E-07	- -	5.00E-03	NA	- -	2.9E-04	NA
Silver	12.3	- -	1.43E-06	6.12E-07	- -	5.00E-03	NA	- -	3.5E-03	NA

Table C17. Calculations for Screening HIs and Screening Risks for Chemicals Detected in Groundwater
Site 39 - Uppermost Aquifer
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Maximum Concentration (mg/l)	HI Screening Factor	Oral Risk Screening Factor	Toxicity Values		Screening Results	
				Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (kg-day/mg)^-1	Hazard Quotient /a/	Cancer Risk /a/
Sodium	91.8	2.86E-02	1.22E-02	NA	NA	NA	NA
Sulfate	11	2.86E-02	1.22E-02	NA	NA	NA	NA
Zinc	0.0141	2.86E-02	1.22E-02	3.00E-01	DI	1.3E-03	NA

mg/l	Milligrams per liter.
HI	Hazard index.
NA	Not available or not applicable.
DI	Data inadequate for quantitative risk assessment.
RfD	Reference dose.
mg/kg-day	Milligrams per kilogram per day.
kg-day/mg	Kilogram-day per milligram.
2.86E-02	2.86 X 10^-2.

/a/ Calculated to 2 significant figures.
/b/ Chromium (total) was evaluated as chromium III.

Table C18. Calculations for Screening HIs and Screening Risks for Chemicals Detected in Groundwater
Site 39 - Paso Robles Aquifer
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Maximum Concentration (mg/l)	HI Screening Factor	Oral Risk Screening Factor	Toxicity Values		Screening Results	
				Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (kg-day/mg)^-1	Hazard Quotient /a/	Cancer Risk /a/
Antimony	0.0136	2.86E-02	1.22E-02	4.00E-04	NA	9.7E-01	NA
Arsenic	0.0057	2.86E-02	1.22E-02	3.00E-04	1.75E+00	5.4E-01	1.2E-04
Bromide	0.51	2.86E-02	1.22E-02	NA	NAS	NA	NA
Calcium	27	2.86E-02	1.22E-02	NA	NA	NA	NA
Chloride	112	2.86E-02	1.22E-02	NA	NA	NA	NA
Chromium (total) /b/	0.0049	2.86E-02	1.22E-02	1.00E+00	NA	1.4E-04	NA
Copper	0.0053	2.86E-02	1.22E-02	3.70E-02	NA	4.1E-03	NA
Iron	0.0485	2.86E-02	1.22E-02	DI	NA	NA	NA
Magnesiuim	10.3	2.86E-02	1.22E-02	NA	NA	NA	NA
Mercury	0.00031	2.86E-02	1.22E-02	3.00E-04	DI	3.0E-02	NA
Nitrate as N	1.5	2.86E-02	1.22E-02	1.60E+00	NA	2.7E-02	NA
Nitrite as N	0.9	2.86E-02	1.22E-02	1.00E-01	NA	2.6E-01	NA
Potassium	4.77	2.86E-02	1.22E-02	NA	NA	NA	NA

Table C18. Calculations for Screening HIs and Screening Risks for Chemicals Detected in Groundwater
Site 39 - Paso Robles Aquifer
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Maximum Concentration (mg/l)	HI Screening Factor	Oral Risk Screening Factor	Toxicity Values		Screening Results	
				Oral Chronic RfD (mg/kg-day)	Oral Slope Factor (kg-day/mg) ^-1	Hazard Quotient /a/	Cancer Risk /a/
Sodium	143	2.86E-02	1.22E-02	NA	NA	NA	NA
Sulfate	91	2.86E-02	1.22E-02	NA	NA	NA	NA
Zinc	0.0181	2.86E-02	1.22E-02	3.00E-01	DI	1.7E-03	NA

mg/l Milligrams per liter.
HI Hazard index.
NA Not available or not applicable.
DI Data inadequate for quantitative risk assessment.
RfD Reference dose.
mg/kg-day Milligrams per kilogram per day.
kg-day/mg Kilogram-day per milligram.
2.86E-02 2.86 X 10^-2.

/a/ Calculated to 2 significant figures.
/b/ Chromium (total) was evaluated as chromium III.

APPENDIX E

RISK ASSESSMENT DATA MANAGEMENT AND REPORTING SYSTEM (RADMARS) OUTPUT

CONTENTS

Site 3

Site 31

Site 39

LIST OF MAJOR ACRONYMS AND UNITS

mg/kg	Milligrams per kilogram.
kg/kg-day	Kilograms per kilogram per day.
mg/kg/day	Milligrams per kilogram per day.
mg/m^3	Milligrams per cubic meter.
m3/kg-day	Cubic meters per kilogram per day.
E	Denotes scientific notation.
mg/l	Milligrams per liter.
l/kg-day	Liters per kilogram per day.
PAHs	Polycyclic aromatic hydrocarbons.
TCDD-TE	2,3,7,8-Tetrachlorodibenzo-p-dioxin toxic equivalents.
B(a)P-TE	Benzo(a)pyrene toxic equivalents.
N	Nitrogen.
P	Phosphorus.

SITES 2 AND 12

Table E1. Hazard Quotient and Index Detail
Commercial Worker - Average Scenario, Sites 2 and 12 - Site 2
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	3.56E+00	1.00E+00	2.06E-06	7.33E-08	4.00E-04	1.83E-04	1.91%
Arsenic	2.30E+00	3.00E+00	2.06E-06	1.42E-07	3.00E-04	4.74E-04	4.95%
Cadmium	2.61E+00	1.00E-01	2.06E-06	5.38E-09	5.00E-04	1.08E-05	.11%
Copper	1.56E+02	1.00E+00	2.06E-06	3.22E-06	3.70E-02	8.71E-05	.91%
Mercury	1.07E+00	1.00E+00	2.06E-06	2.20E-08	3.00E-04	7.35E-05	.77%
Silver	8.90E+00	1.00E+00	2.06E-06	1.83E-07	5.00E-03	3.67E-05	.38%
Thallium (as Thallic oxide)	2.60E-01	1.00E+00	2.06E-06	5.36E-09	7.00E-05	7.65E-05	.80%
Pathway Total						9.42E-04	9.83%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	3.56E+00	1.00E+02	2.45E-07	8.72E-07	4.00E-04	2.18E-03	22.77%
Arsenic	2.30E+00	1.00E+02	2.45E-07	5.63E-07	3.00E-04	1.88E-03	19.64%
Cadmium	2.61E+00	1.00E+02	2.45E-07	6.39E-07	5.00E-04	1.28E-03	13.37%
Copper	1.56E+02	1.00E+02	2.45E-07	3.83E-05	3.70E-02	1.04E-03	10.86%
Mercury	1.07E+00	1.00E+02	2.45E-07	2.62E-07	3.00E-04	8.74E-04	9.13%
Silver	8.90E+00	1.00E+02	2.45E-07	2.18E-06	5.00E-03	4.36E-04	4.55%
Thallium (as Thallic oxide)	2.60E-01	1.00E+02	2.45E-07	6.37E-08	7.00E-05	9.10E-04	9.50%
Pathway Total						8.60E-03	89.82%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	4.09E-08	1.00E+02	6.50E-02	2.66E-09	4.00E-04	6.65E-06	.07%
Arsenic	2.64E-08	1.00E+02	6.50E-02	1.72E-09	3.00E-04	5.73E-06	.06%
Cadmium	3.00E-08	1.00E+02	6.50E-02	1.95E-09	5.00E-04	3.90E-06	.04%
Copper	1.80E-06	1.00E+02	6.50E-02	1.17E-07	3.70E-02	3.16E-06	.03%
Mercury	1.23E-08	1.00E+02	6.50E-02	8.00E-10	9.00E-05	8.89E-06	.09%
Silver	1.02E-07	1.00E+02	6.50E-02	6.65E-09	5.00E-03	1.33E-06	.01%
Thallium (as Thallic oxide)	2.99E-09	1.00E+02	6.50E-02	1.94E-10	7.00E-05	2.78E-06	.03%
Pathway Total						3.24E-05	.33%
Multipathway Total						1E-02	

Table E1. Estimated Cancer Risk Detail
Commercial Worker - Average Scenario, Sites 2 and 12 - Site 2
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.30E+00	3.00E+00	2.95E-07	2.04E-08	1.75E+00	3.56E-08	19.40%
Pathway Total						3.56E-08	19.40%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.30E+00	1.00E+02	3.49E-08	8.03E-08	1.75E+00	1.40E-07	76.31%
Pathway Total						1.40E-07	76.31%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.64E-08	1.00E+02	9.28E-03	2.45E-10	1.50E+01	3.68E-09	2.01%
Cadmium	3.00E-08	1.00E+02	9.28E-03	2.79E-10	1.50E+01	4.18E-09	2.28%
Pathway Total						7.86E-09	4.29%
Multipathway Total						2E-07	

Table E2. Hazard Quotient and Index Detail
Commercial Worker - RME Scenario, Sites 2 and 12 - Site 2
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.91E+01	1.00E+00	1.85E-05	3.54E-06	4.00E-04	8.86E-03	8.93%
Arsenic	3.70E+00	3.00E+00	1.85E-05	2.05E-06	3.00E-04	6.85E-03	6.91%
Cadmium	1.44E+01	1.00E-01	1.85E-05	2.67E-07	5.00E-04	5.33E-04	.54%
Copper	9.53E+02	1.00E+00	1.85E-05	1.76E-04	3.70E-02	4.76E-03	4.80%
Mercury	4.53E+00	1.00E+00	1.85E-05	8.38E-07	3.00E-04	2.79E-03	2.81%
Silver	4.87E+01	1.00E+00	1.85E-05	9.01E-06	5.00E-03	1.80E-03	1.82%
Thallium (as Thallic oxide)	5.30E-01	1.00E+00	1.85E-05	9.80E-08	7.00E-05	1.40E-03	1.41%
Pathway Total						2.70E-02	27.22%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.91E+01	1.00E+02	4.89E-07	9.36E-06	4.00E-04	2.34E-02	23.60%
Arsenic	3.70E+00	1.00E+02	4.89E-07	1.81E-06	3.00E-04	6.03E-03	6.08%
Cadmium	1.44E+01	1.00E+02	4.89E-07	7.05E-06	5.00E-04	1.41E-02	14.22%
Copper	9.53E+02	1.00E+02	4.89E-07	4.66E-04	3.70E-02	1.26E-02	12.71%
Mercury	4.53E+00	1.00E+02	4.89E-07	2.22E-06	3.00E-04	7.38E-03	7.44%
Silver	4.87E+01	1.00E+02	4.89E-07	2.38E-05	5.00E-03	4.76E-03	4.80%
Thallium (as Thallic oxide)	5.30E-01	1.00E+02	4.89E-07	2.59E-07	7.00E-05	3.70E-03	3.73%
Pathway Total						7.20E-02	72.58%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.20E-07	1.00E+02	9.78E-02	2.15E-08	4.00E-04	5.38E-05	.05%
Arsenic	4.26E-08	1.00E+02	9.78E-02	4.16E-09	3.00E-04	1.39E-05	.01%
Cadmium	1.66E-07	1.00E+02	9.78E-02	1.62E-08	5.00E-04	3.24E-05	.03%
Copper	1.10E-05	1.00E+02	9.78E-02	1.07E-06	3.70E-02	2.90E-05	.03%
Mercury	5.21E-08	1.00E+02	9.78E-02	5.09E-09	9.00E-05	5.66E-05	.06%
Silver	5.60E-07	1.00E+02	9.78E-02	5.48E-08	5.00E-03	1.10E-05	.01%
Thallium (as Thallic oxide)	6.10E-09	1.00E+02	9.78E-02	5.96E-10	7.00E-05	8.52E-06	.01%
Pathway Total						2.05E-04	.20%
Multipathway Total						1E-01	

Table E2. Estimated Cancer Risk Detail
Commercial Worker - RME Scenario, Sites 2 and 12 - Site 2
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.70E+00	3.00E+00	6.59E-06	7.31E-07	1.75E+00	1.28E-06	50.81%
Pathway Total						1.28E-06	50.81%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.70E+00	1.00E+02	1.75E-07	6.48E-07	1.75E+00	1.13E-06	44.86%
Pathway Total						1.13E-06	44.86%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	4.26E-08	1.00E+02	3.49E-02	1.48E-09	1.50E+01	2.23E-08	.89%
Cadmium	1.66E-07	1.00E+02	3.49E-02	5.78E-09	1.50E+01	8.68E-08	3.45%
Pathway Total						1.09E-07	4.34%
Multipathway Total						3E-06	

SITES 2 AND 12
SITE 12

RESIDENT RECEPTOR

Table E3. Hazard Quotient and Index Detail
Resident Ages 0-6 - Average Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.36E+00	1.00E+00	1.46E-05	1.99E-07	4.00E-04	4.96E-04	.14%
Arsenic	1.87E+00	3.00E+00	1.46E-05	8.19E-07	3.00E-04	2.73E-03	.78%
Beryllium	1.50E-01	1.00E+00	1.46E-05	2.19E-08	5.00E-03	4.38E-06	.00%
Bis(2-ethylhexyl)phthalate	9.58E-01	1.00E+01	1.46E-05	1.40E-06	2.00E-02	6.99E-05	.02%
Cadmium	1.77E+00	1.00E-01	1.46E-05	2.58E-08	5.00E-04	5.17E-05	.01%
Total Carcinogenic PAHs	3.17E-01	1.50E+01	1.46E-05	6.94E-07	3.00E-02	2.31E-05	.01%
Pathway Total						3.38E-03	.96%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.36E+00	1.00E+02	2.57E-06	3.50E-06	4.00E-04	8.74E-03	2.48%
Arsenic	1.87E+00	1.00E+02	2.57E-06	4.81E-06	3.00E-04	1.60E-02	4.54%
Beryllium	1.50E-01	1.00E+02	2.57E-06	3.86E-07	5.00E-03	7.71E-05	.02%
Bis(2-ethylhexyl)phthalate	9.58E-01	1.00E+02	2.57E-06	2.46E-06	2.00E-02	1.23E-04	.03%
Cadmium	1.77E+00	1.00E+02	2.57E-06	4.55E-06	5.00E-04	9.10E-03	2.58%
Total Carcinogenic PAHs	3.17E-01	1.00E+02	2.57E-06	8.15E-07	3.00E-02	2.72E-05	.01%
Pathway Total						3.41E-02	9.66%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.56E-08	1.00E+02	1.70E+00	2.66E-08	4.00E-04	6.65E-05	.02%
Arsenic	2.15E-08	1.00E+02	1.70E+00	3.66E-08	3.00E-04	1.22E-04	.03%
Beryllium	1.73E-09	1.00E+02	1.70E+00	2.94E-09	5.00E-03	5.88E-07	.00%
Bis(2-ethylhexyl)phthalate	1.10E-08	1.00E+02	1.70E+00	1.87E-08	2.00E-02	9.36E-07	.00%
Cadmium	2.04E-08	1.00E+02	1.70E+00	3.46E-08	5.00E-04	6.92E-05	.02%
Total Carcinogenic PAHs	3.65E-09	1.00E+02	1.70E+00	6.20E-09	3.00E-02	2.07E-07	.00%
Pathway Total						2.59E-04	.07%
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	3.38E-03	1.00E+02	2.05E-02	6.93E-05	4.00E-04	1.73E-01	49.14%
Copper	4.32E-03	1.00E+02	2.05E-02	8.86E-05	3.70E-02	2.39E-03	.68%
1,1-Dichloroethene	1.10E-03	1.00E+02	2.05E-02	2.25E-05	9.00E-03	2.51E-03	.71%
1,2-Dichloroethene (total)	9.80E-03	1.00E+02	2.05E-02	2.01E-04	9.00E-03	2.23E-02	6.33%
Manganese	7.66E-02	1.00E+02	2.05E-02	1.57E-03	1.40E-01	1.12E-02	3.18%
Mercury	1.10E-04	1.00E+02	2.05E-02	2.26E-06	3.00E-04	7.52E-03	2.14%

Table E3. Hazard Quotient and Index Detail
Resident Ages 0-6 - Average Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Methylene chloride	2.49E-03	1.00E+02	2.05E-02	5.10E-05	6.00E-02	8.51E-04	.24%
Nickel	1.50E-02	1.00E+02	2.05E-02	3.07E-04	2.00E-02	1.54E-02	4.37%
Nitrate as N	7.09E-03	1.00E+02	2.05E-02	1.45E-04	1.60E+00	9.08E-05	.03%
Tetrachloroethene	9.28E-03	1.00E+02	2.05E-02	1.90E-04	1.00E-02	1.90E-02	5.40%
Trichloroethene	1.76E-02	1.00E+02	2.05E-02	3.61E-04	6.00E-03	6.01E-02	17.07%
Pathway Total						3.14E-01	89.29%

Multipathway Total	4E-01	

Table E3. Estimated Cancer Risk Detail
Resident Ages 0-6 - Average Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.87E+00	3.00E+00	1.25E-06	7.01E-08	1.75E+00	1.23E-07	3.09%
B(a)P-TE	1.49E-02	1.50E+01	1.25E-06	2.79E-09	1.20E+01	3.35E-08	.84%
Beryllium	1.50E-01	1.00E+00	1.25E-06	1.87E-09	7.00E+00	1.31E-08	.33%
Bis(2-ethylhexyl)phthalate	9.58E-01	1.00E+01	1.25E-06	1.20E-07	1.40E-02	1.68E-09	.04%
Pathway Total						1.71E-07	4.30%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.87E+00	1.00E+02	2.20E-07	4.11E-07	1.75E+00	7.20E-07	18.11%
B(a)P-TE	1.49E-02	1.00E+02	2.20E-07	3.28E-09	1.20E+01	3.93E-08	.99%
Beryllium	1.50E-01	1.00E+02	2.20E-07	3.30E-08	7.00E+00	2.31E-07	5.81%
Bis(2-ethylhexyl)phthalate	9.58E-01	1.00E+02	2.20E-07	2.11E-07	1.40E-02	2.95E-09	.07%
Pathway Total						9.93E-07	24.98%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.15E-08	1.00E+02	1.46E-01	3.14E-09	1.50E+01	4.71E-08	1.18%
B(a)P-TE	1.72E-10	1.00E+02	1.46E-01	2.51E-11	1.20E+01	3.01E-10	.01%
Beryllium	1.73E-09	1.00E+02	1.46E-01	2.53E-10	8.40E+00	2.12E-09	.05%
Bis(2-ethylhexyl)phthalate	1.10E-08	1.00E+02	1.46E-01	1.61E-09	8.40E-03	1.35E-11	.00%
Cadmium	2.04E-08	1.00E+02	1.46E-01	2.97E-09	1.50E+01	4.46E-08	1.12%
Pathway Total						9.41E-08	2.36%
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
1,2-Dichloroethane	1.23E-03	1.00E+02	1.76E-03	2.16E-06	9.10E-02	1.97E-07	4.96%
1,1-Dichloroethene	1.10E-03	1.00E+02	1.76E-03	1.94E-06	6.00E-01	1.16E-06	29.18%
Methylene chloride	2.49E-03	1.00E+02	1.76E-03	4.38E-06	1.40E-02	6.14E-08	1.54%
Tetrachloroethene	9.28E-03	1.00E+02	1.76E-03	1.63E-05	5.10E-02	8.33E-07	20.96%
Trichloroethene	1.76E-02	1.00E+02	1.76E-03	3.10E-05	1.50E-02	4.65E-07	11.70%
Pathway Total						2.72E-06	68.34%

Table E3. Estimated Cancer Risk Detail
Resident Ages 0-6 - Average Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Multipathway Total						4E-06	

Table E4. Hazard Quotient and Index Detail
Resident Ages 0-6 - RME Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
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Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	5.06E+00	1.00E+00	6.43E-05	3.25E-06	4.00E-04	8.13E-03	.43%
Arsenic	4.48E+00	3.00E+00	6.43E-05	8.64E-06	3.00E-04	2.88E-02	1.51%
Beryllium	2.90E-01	1.00E+00	6.43E-05	1.86E-07	5.00E-03	3.73E-05	.00%
Bis(2-ethylhexyl)phthalate	6.25E+00	1.00E+01	6.43E-05	4.02E-05	2.00E-02	2.01E-03	.11%
Cadmium	9.96E+00	1.00E-01	6.43E-05	6.40E-07	5.00E-04	1.28E-03	.07%
Total Carcinogenic PAHs	8.42E-01	1.50E+01	6.43E-05	8.12E-06	3.00E-02	2.71E-04	.01%
Pathway Total						4.05E-02	2.13%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	5.06E+00	1.00E+02	1.37E-05	6.93E-05	4.00E-04	1.73E-01	9.09%
Arsenic	4.48E+00	1.00E+02	1.37E-05	6.14E-05	3.00E-04	2.05E-01	10.77%
Beryllium	2.90E-01	1.00E+02	1.37E-05	3.97E-06	5.00E-03	7.95E-04	.04%
Bis(2-ethylhexyl)phthalate	6.25E+00	1.00E+02	1.37E-05	8.56E-05	2.00E-02	4.28E-03	.22%
Cadmium	9.96E+00	1.00E+02	1.37E-05	1.36E-04	5.00E-04	2.73E-01	14.34%
Total Carcinogenic PAHs	8.42E-01	1.00E+02	1.37E-05	1.15E-05	3.00E-02	3.85E-04	.02%
Pathway Total						6.56E-01	34.48%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	5.82E-08	1.00E+02	2.04E+00	1.19E-07	4.00E-04	2.97E-04	.02%
Arsenic	5.15E-08	1.00E+02	2.04E+00	1.05E-07	3.00E-04	3.50E-04	.02%
Beryllium	3.34E-09	1.00E+02	2.04E+00	6.81E-09	5.00E-03	1.36E-06	.00%
Bis(2-ethylhexyl)phthalate	7.18E-08	1.00E+02	2.04E+00	1.47E-07	2.00E-02	7.33E-06	.00%
Cadmium	1.15E-07	1.00E+02	2.04E+00	2.34E-07	5.00E-04	4.67E-04	.02%
Total Carcinogenic PAHs	9.68E-09	1.00E+02	2.04E+00	1.97E-08	3.00E-02	6.58E-07	.00%
Pathway Total						1.12E-03	.06%
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	7.90E-03	1.00E+02	2.74E-02	2.16E-04	4.00E-04	5.41E-01	28.41%
Copper	1.23E-02	1.00E+02	2.74E-02	3.37E-04	3.70E-02	9.11E-03	.48%
1,1-Dichloroethene	1.30E-03	1.00E+02	2.74E-02	3.56E-05	9.00E-03	3.96E-03	.21%
1,2-Dichloroethene (total)	3.58E-02	1.00E+02	2.74E-02	9.81E-04	9.00E-03	1.09E-01	5.72%
Manganese	3.74E-01	1.00E+02	2.74E-02	1.02E-02	1.40E-01	7.32E-02	3.84%
Mercury	1.90E-04	1.00E+02	2.74E-02	5.21E-06	3.00E-04	1.74E-02	.91%

Table E4. Hazard Quotient and Index Detail
Resident Ages 0-6 - RME Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Methylene chloride	2.77E-03	1.00E+02	2.74E-02	7.59E-05	6.00E-02	1.26E-03	.07%
Nickel	2.73E-02	1.00E+02	2.74E-02	7.48E-04	2.00E-02	3.74E-02	1.96%
Nitrate as N	1.42E-02	1.00E+02	2.74E-02	3.89E-04	1.60E+00	2.43E-04	.01%
Tetrachloroethene	2.90E-02	1.00E+02	2.74E-02	7.95E-04	1.00E-02	7.95E-02	4.18%
Trichloroethene	7.31E-02	1.00E+02	2.74E-02	2.00E-03	6.00E-03	3.34E-01	17.54%
Pathway Total						1.21E+00	63.33%

Multipathway Total	2E+00

Table E4. Estimated Cancer Risk Detail
Resident Ages 0-6 - RME Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	4.48E+00	3.00E+00	5.51E-06	7.41E-07	1.75E+00	1.30E-06	5.73%
B(a)P-TE	3.52E-02	1.50E+01	5.51E-06	2.91E-08	1.20E+01	3.49E-07	1.54%
Beryllium	2.90E-01	1.00E+00	5.51E-06	1.60E-08	7.00E+00	1.12E-07	.49%
Bis(2-ethylhexyl)phthalate	6.25E+00	1.00E+01	5.51E-06	3.44E-06	1.40E-02	4.82E-08	.21%
Pathway Total						1.81E-06	7.97%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	4.48E+00	1.00E+02	1.17E-06	5.24E-06	1.75E+00	9.17E-06	40.40%
B(a)P-TE	3.52E-02	1.00E+02	1.17E-06	4.12E-08	1.20E+01	4.94E-07	2.18%
Beryllium	2.90E-01	1.00E+02	1.17E-06	3.39E-07	7.00E+00	2.38E-06	10.48%
Bis(2-ethylhexyl)phthalate	6.25E+00	1.00E+02	1.17E-06	7.31E-06	1.40E-02	1.02E-07	.45%
Pathway Total						1.21E-05	53.51%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	5.15E-08	1.00E+02	1.75E-01	9.02E-09	1.50E+01	1.35E-07	.59%
B(a)P-TE	4.05E-10	1.00E+02	1.75E-01	7.09E-11	1.20E+01	8.51E-10	.00%
Beryllium	3.34E-09	1.00E+02	1.75E-01	5.84E-10	8.40E+00	4.91E-09	.02%
Bis(2-ethylhexyl)phthalate	7.18E-08	1.00E+02	1.75E-01	1.26E-08	8.40E-03	1.05E-10	.00%
Cadmium	1.15E-07	1.00E+02	1.75E-01	2.00E-08	1.50E+01	3.01E-07	1.33%
Pathway Total						4.42E-07	1.94%
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
1,2-Dichloroethane	1.50E-03	1.00E+02	2.35E-03	3.53E-06	9.10E-02	3.21E-07	1.41%
1,1-Dichloroethene	1.30E-03	1.00E+02	2.35E-03	3.05E-06	6.00E-01	1.83E-06	8.06%
Methylene chloride	2.77E-03	1.00E+02	2.35E-03	6.51E-06	1.40E-02	9.11E-08	.40%
Tetrachloroethene	2.90E-02	1.00E+02	2.35E-03	6.82E-05	5.10E-02	3.48E-06	15.33%
Trichloroethene	7.31E-02	1.00E+02	2.35E-03	1.72E-04	1.50E-02	2.58E-06	11.37%
Pathway Total						8.30E-06	36.57%

Table E4. Estimated Cancer Risk Detail
Resident Ages 0-6 - RME Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Multipathway Total						2E-05	

Table E5. Hazard Quotient and Index Detail
Resident Ages 6-9 - Average Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.36E+00	1.00E+00	9.72E-06	1.32E-07	4.00E-04	3.30E-04	.13%
Arsenic	1.87E+00	3.00E+00	9.72E-06	5.45E-07	3.00E-04	1.82E-03	.73%
Beryllium	1.50E-01	1.00E+00	9.72E-06	1.46E-08	5.00E-03	2.92E-06	.00%
Bis(2-ethylhexyl)phthalate	9.58E-01	1.00E+01	9.72E-06	9.31E-07	2.00E-02	4.65E-05	.02%
Cadmium	1.77E+00	1.00E-01	9.72E-06	1.72E-08	5.00E-04	3.44E-05	.01%
Total Carcinogenic PAHs	3.17E-01	1.50E+01	9.72E-06	4.62E-07	3.00E-02	1.54E-05	.01%
Pathway Total						2.25E-03	.90%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.36E+00	1.00E+02	1.49E-06	2.03E-06	4.00E-04	5.07E-03	2.02%
Arsenic	1.87E+00	1.00E+02	1.49E-06	2.79E-06	3.00E-04	9.29E-03	3.70%
Beryllium	1.50E-01	1.00E+02	1.49E-06	2.24E-07	5.00E-03	4.47E-05	.02%
Bis(2-ethylhexyl)phthalate	9.58E-01	1.00E+02	1.49E-06	1.43E-06	2.00E-02	7.13E-05	.03%
Cadmium	1.77E+00	1.00E+02	1.49E-06	2.64E-06	5.00E-04	5.27E-03	2.10%
Total Carcinogenic PAHs	3.17E-01	1.00E+02	1.49E-06	4.72E-07	3.00E-02	1.57E-05	.01%
Pathway Total						1.98E-02	7.88%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.56E-08	1.00E+02	1.24E+00	1.94E-08	4.00E-04	4.85E-05	.02%
Arsenic	2.15E-08	1.00E+02	1.24E+00	2.67E-08	3.00E-04	8.89E-05	.04%
Beryllium	1.73E-09	1.00E+02	1.24E+00	2.15E-09	5.00E-03	4.29E-07	.00%
Bis(2-ethylhexyl)phthalate	1.10E-08	1.00E+02	1.24E+00	1.37E-08	2.00E-02	6.83E-07	.00%
Cadmium	2.04E-08	1.00E+02	1.24E+00	2.52E-08	5.00E-04	5.05E-05	.02%
Total Carcinogenic PAHs	3.65E-09	1.00E+02	1.24E+00	4.53E-09	3.00E-02	1.51E-07	.00%
Pathway Total						1.89E-04	.08%
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	3.38E-03	1.00E+02	1.49E-02	5.04E-05	4.00E-04	1.26E-01	50.21%
Copper	4.32E-03	1.00E+02	1.49E-02	6.44E-05	3.70E-02	1.74E-03	.69%
1,1-Dichloroethene	1.10E-03	1.00E+02	1.49E-02	1.64E-05	9.00E-03	1.82E-03	.73%
1,2-Dichloroethene (total)	9.80E-03	1.00E+02	1.49E-02	1.46E-04	9.00E-03	1.62E-02	6.46%
Manganese	7.66E-02	1.00E+02	1.49E-02	1.14E-03	1.40E-01	8.15E-03	3.25%
Mercury	1.10E-04	1.00E+02	1.49E-02	1.64E-06	3.00E-04	5.46E-03	2.18%

Table E5. Hazard Quotient and Index Detail
Resident Ages 6-9 - Average Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Methylene chloride	2.49E-03	1.00E+02	1.49E-02	3.71E-05	6.00E-02	6.18E-04	.25%
Nickel	1.50E-02	1.00E+02	1.49E-02	2.24E-04	2.00E-02	1.12E-02	4.46%
Nitrate as N	7.09E-03	1.00E+02	1.49E-02	1.06E-04	1.60E+00	6.60E-05	.03%
Tetrachloroethene	9.28E-03	1.00E+02	1.49E-02	1.38E-04	1.00E-02	1.38E-02	5.50%
Trichloroethene	1.76E-02	1.00E+02	1.49E-02	2.62E-04	6.00E-03	4.37E-02	17.41%
Pathway Total						2.29E-01	91.17%
Multipathway Total						3E-01	

Table E5. Estimated Cancer Risk Detail
Resident Ages 6-9 - Average Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.87E+00	3.00E+00	4.16E-07	2.33E-08	1.75E+00	4.08E-08	3.00%
B(a)P-TE	1.49E-02	1.50E+01	4.16E-07	9.30E-10	1.20E+01	1.12E-08	.82%
Beryllium	1.50E-01	1.00E+00	4.16E-07	6.24E-10	7.00E+00	4.37E-09	.32%
Bis(2-ethylhexyl)phthalate	9.58E-01	1.00E+01	4.16E-07	3.98E-08	1.40E-02	5.58E-10	.04%
Pathway Total						5.69E-08	4.18%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.87E+00	1.00E+02	6.37E-08	1.19E-07	1.75E+00	2.08E-07	15.29%
B(a)P-TE	1.49E-02	1.00E+02	6.37E-08	9.49E-10	1.20E+01	1.14E-08	.84%
Beryllium	1.50E-01	1.00E+02	6.37E-08	9.56E-09	7.00E+00	6.69E-08	4.92%
Bis(2-ethylhexyl)phthalate	9.58E-01	1.00E+02	6.37E-08	6.10E-08	1.40E-02	8.54E-10	.06%
Pathway Total						2.87E-07	21.11%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.15E-08	1.00E+02	5.30E-02	1.14E-09	1.50E+01	1.71E-08	1.26%
B(a)P-TE	1.72E-10	1.00E+02	5.30E-02	9.12E-12	1.20E+01	1.09E-10	.01%
Beryllium	1.73E-09	1.00E+02	5.30E-02	9.17E-11	8.40E+00	7.70E-10	.06%
Bis(2-ethylhexyl)phthalate	1.10E-08	1.00E+02	5.30E-02	5.84E-10	8.40E-03	4.90E-12	.00%
Cadmium	2.04E-08	1.00E+02	5.30E-02	1.08E-09	1.50E+01	1.62E-08	1.19%
Pathway Total						3.42E-08	2.52%
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
1,2-Dichloroethane	1.23E-03	1.00E+02	6.37E-04	7.84E-07	9.10E-02	7.13E-08	5.24%
1,1-Dichloroethene	1.10E-03	1.00E+02	6.37E-04	7.01E-07	6.00E-01	4.20E-07	30.86%
Methylene chloride	2.49E-03	1.00E+02	6.37E-04	1.59E-06	1.40E-02	2.22E-08	1.63%
Tetrachloroethene	9.28E-03	1.00E+02	6.37E-04	5.91E-06	5.10E-02	3.01E-07	22.12%
Trichloroethene	1.76E-02	1.00E+02	6.37E-04	1.12E-05	1.50E-02	1.68E-07	12.35%
Pathway Total						9.82E-07	72.20%

Table E5. Estimated Cancer Risk Detail
Resident Ages 6-9 - Average Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Multipathway Total						1E-06	

Table E6. Hazard Quotient and Index Detail
Resident Ages 6-18 - RME Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	5.06E+00	1.00E+00	3.47E-05	1.76E-06	4.00E-04	4.39E-03	.59%
Arsenic	4.48E+00	3.00E+00	3.47E-05	4.66E-06	3.00E-04	1.55E-02	2.09%
Beryllium	2.90E-01	1.00E+00	3.47E-05	1.01E-07	5.00E-03	2.01E-05	.00%
Bis(2-ethylhexyl)phthalate	6.25E+00	1.00E+01	3.47E-05	2.17E-05	2.00E-02	1.08E-03	.15%
Cadmium	9.96E+00	1.00E-01	3.47E-05	3.46E-07	5.00E-04	6.91E-04	.09%
Total Carcinogenic PAHs	8.42E-01	1.50E+01	3.47E-05	4.38E-06	3.00E-02	1.46E-04	.02%
Pathway Total						2.18E-02	2.94%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	5.06E+00	1.00E+02	2.31E-06	1.17E-05	4.00E-04	2.92E-02	3.94%
Arsenic	4.48E+00	1.00E+02	2.31E-06	1.03E-05	3.00E-04	3.45E-02	4.66%
Beryllium	2.90E-01	1.00E+02	2.31E-06	6.70E-07	5.00E-03	1.34E-04	.02%
Bis(2-ethylhexyl)phthalate	6.25E+00	1.00E+02	2.31E-06	1.44E-05	2.00E-02	7.21E-04	.10%
Cadmium	9.96E+00	1.00E+02	2.31E-06	2.30E-05	5.00E-04	4.60E-02	6.21%
Total Carcinogenic PAHs	8.42E-01	1.00E+02	2.31E-06	1.95E-06	3.00E-02	6.48E-05	.01%
Pathway Total						1.11E-01	14.94%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	5.82E-08	1.00E+02	1.03E+00	5.99E-08	4.00E-04	1.50E-04	.02%
Arsenic	5.15E-08	1.00E+02	1.03E+00	5.31E-08	3.00E-04	1.77E-04	.02%
Beryllium	3.34E-09	1.00E+02	1.03E+00	3.44E-09	5.00E-03	6.88E-07	.00%
Bis(2-ethylhexyl)phthalate	7.18E-08	1.00E+02	1.03E+00	7.40E-08	2.00E-02	3.70E-06	.00%
Cadmium	1.15E-07	1.00E+02	1.03E+00	1.18E-07	5.00E-04	2.36E-04	.03%
Total Carcinogenic PAHs	9.68E-09	1.00E+02	1.03E+00	9.97E-09	3.00E-02	3.32E-07	.00%
Pathway Total						5.68E-04	.07%
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	7.90E-03	1.00E+02	1.38E-02	1.09E-04	4.00E-04	2.73E-01	36.86%
Copper	1.23E-02	1.00E+02	1.38E-02	1.70E-04	3.70E-02	4.59E-03	.62%
1,1-Dichloroethene	1.30E-03	1.00E+02	1.38E-02	1.79E-05	9.00E-03	1.99E-03	.27%
1,2-Dichloroethene (total)	3.58E-02	1.00E+02	1.38E-02	4.94E-04	9.00E-03	5.49E-02	7.41%
Manganese	3.74E-01	1.00E+02	1.38E-02	5.16E-03	1.40E-01	3.69E-02	4.98%
Mercury	1.90E-04	1.00E+02	1.38E-02	2.62E-06	3.00E-04	8.74E-03	1.18%

Table E6. Hazard Quotient and Index Detail
Resident Ages 6-18 - RME Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Methylene chloride	2.77E-03	1.00E+02	1.38E-02	3.82E-05	6.00E-02	6.37E-04	.09%
Nickel	2.73E-02	1.00E+02	1.38E-02	3.77E-04	2.00E-02	1.88E-02	2.54%
Nitrate as N	1.42E-02	1.00E+02	1.38E-02	1.96E-04	1.60E+00	1.22E-04	.02%
Tetrachloroethene	2.90E-02	1.00E+02	1.38E-02	4.00E-04	1.00E-02	4.00E-02	5.40%
Trichloroethene	7.31E-02	1.00E+02	1.38E-02	1.01E-03	6.00E-03	1.68E-01	22.68%
Pathway Total						6.08E-01	82.05%

Multipathway Total	7E-01

Table E6. Estimated Cancer Risk Detail
Resident Ages 6-18 - RME Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	4.48E+00	3.00E+00	5.95E-06	8.00E-07	1.75E+00	1.40E-06	9.41%
B(a)P-TE	3.52E-02	1.50E+01	5.95E-06	3.14E-08	1.20E+01	3.77E-07	2.53%
Beryllium	2.90E-01	1.00E+00	5.95E-06	1.73E-08	7.00E+00	1.21E-07	.81%
Bis(2-ethylhexyl)phthalate	6.25E+00	1.00E+01	5.95E-06	3.72E-06	1.40E-02	5.20E-08	.35%
Pathway Total						1.95E-06	13.10%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	4.48E+00	1.00E+02	3.95E-07	1.77E-06	1.75E+00	3.10E-06	20.84%
B(a)P-TE	3.52E-02	1.00E+02	3.95E-07	1.39E-08	1.20E+01	1.67E-07	1.12%
Beryllium	2.90E-01	1.00E+02	3.95E-07	1.15E-07	7.00E+00	8.02E-07	5.39%
Bis(2-ethylhexyl)phthalate	6.25E+00	1.00E+02	3.95E-07	2.47E-06	1.40E-02	3.45E-08	.23%
Pathway Total						4.10E-06	27.58%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	5.15E-08	1.00E+02	1.77E-01	9.12E-09	1.50E+01	1.37E-07	.92%
B(a)P-TE	4.05E-10	1.00E+02	1.77E-01	7.17E-11	1.20E+01	8.60E-10	.01%
Beryllium	3.34E-09	1.00E+02	1.77E-01	5.91E-10	8.40E+00	4.97E-09	.03%
Bis(2-ethylhexyl)phthalate	7.18E-08	1.00E+02	1.77E-01	1.27E-08	8.40E-03	1.07E-10	.00%
Cadmium	1.15E-07	1.00E+02	1.77E-01	2.03E-08	1.50E+01	3.04E-07	2.04%
Pathway Total						4.47E-07	3.00%
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
1,2-Dichloroethane	1.50E-03	1.00E+02	2.37E-03	3.55E-06	9.10E-02	3.24E-07	2.18%
1,1-Dichloroethene	1.30E-03	1.00E+02	2.37E-03	3.08E-06	6.00E-01	1.85E-06	12.44%
Methylene chloride	2.77E-03	1.00E+02	2.37E-03	6.56E-06	1.40E-02	9.19E-08	.62%
Tetrachloroethene	2.90E-02	1.00E+02	2.37E-03	6.87E-05	5.10E-02	3.51E-06	23.59%
Trichloroethene	7.31E-02	1.00E+02	2.37E-03	1.73E-04	1.50E-02	2.60E-06	17.48%
Pathway Total						8.38E-06	56.31%

Table E6. Estimated Cancer Risk Detail
Resident Ages 6-18 - RME Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Multipathway Total						1E-05	

Table E7. Hazard Quotient and Index Detail
Resident Ages 18-30 - RME Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	5.06E+00	1.00E+00	2.58E-05	1.31E-06	4.00E-04	3.26E-03	.25%
Arsenic	4.48E+00	3.00E+00	2.58E-05	3.47E-06	3.00E-04	1.16E-02	.90%
Beryllium	2.90E-01	1.00E+00	2.58E-05	7.48E-08	5.00E-03	1.50E-05	.00%
Bis(2-ethylhexyl)phthalate	6.25E+00	1.00E+01	2.58E-05	1.61E-05	2.00E-02	8.06E-04	.06%
Cadmium	9.96E+00	1.00E-01	2.58E-05	2.57E-07	5.00E-04	5.14E-04	.04%
Total Carcinogenic PAHs	8.42E-01	1.50E+01	2.58E-05	3.26E-06	3.00E-02	1.09E-04	.01%
Pathway Total						1.63E-02	1.26%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	5.06E+00	1.00E+02	1.37E-06	6.93E-06	4.00E-04	1.73E-02	1.34%
Arsenic	4.48E+00	1.00E+02	1.37E-06	6.14E-06	3.00E-04	2.05E-02	1.59%
Beryllium	2.90E-01	1.00E+02	1.37E-06	3.97E-07	5.00E-03	7.95E-05	.01%
Bis(2-ethylhexyl)phthalate	6.25E+00	1.00E+02	1,37E-06	8.56E-06	2.00E-02	4.28E-04	.03%
Cadmium	9.96E+00	1.00E+02	1.37E-06	1.36E-05	5.00E-04	2.73E-02	2.12%
Total Carcinogenic PAHs	8.42E-01	1.00E+02	1.37E-06	1.15E-06	3.00E-02	3.85E-05	.00%
Pathway Total						6.56E-02	5.09%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	5.82E-08	1.00E+02	4.11E-01	2.39E-08	4.00E-04	5.98E-05	.00%
Arsenic	5.15E-08	1.00E+02	4.11E-01	2.12E-08	3.00E-04	7.06E-05	.01%
Beryllium	3.34E-09	1.00E+02	4.11E-01	1.37E-09	5.00E-03	2.75E-07	.00%
Bis(2-ethylhexyl)phthalate	7.18E-08	1.00E+02	4.11E-01	2.95E-08	2.00E-02	1.48E-06	.00%
Cadmium	1.15E-07	1.00E+02	4.11E-01	4.71E-08	5.00E-04	9.42E-05	.01%
Total Carcinogenic PAHs	9.68E-09	1.00E+02	4.11E-01	3.98E-09	3.00E-02	1.33E-07	.00%
Pathway Total						2.26E-04	.02%
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	7.90E-03	1.00E+02	2.74E-02	2.16E-04	4.00E-04	5.41E-01	41.99%
Copper	1.23E-02	1.00E+02	2.74E-02	3.37E-04	3.70E-02	9.11E-03	.71%
1,1-Dichloroethene	1.30E-03	1.00E+02	2.74E-02	3.56E-05	9.00E-03	3.96E-03	.31%
1,2-Dichloroethene (total)	3.58E-02	1.00E+02	2.74E-02	9.81E-04	9.00E-03	1.09E-01	8.46%
Manganese	3.74E-01	1.00E+02	2.74E-02	1.02E-02	1.40E-01	7.32E-02	5.68%
Mercury	1.90E-04	1.00E+02	2.74E-02	5.21E-06	3.00E-04	1.74E-02	1.35%

Table E7. Hazard Quotient and Index Detail
Resident Ages 18-30 - RME Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Methylene chloride	2.77E-03	1.00E+02	2.74E-02	7.59E-05	6.00E-02	1.26E-03	.10%
Nickel	2.73E-02	1.00E+02	2.74E-02	7.48E-04	2.00E-02	3.74E-02	2.90%
Nitrate as N	1.42E-02	1.00E+02	2.74E-02	3.89E-04	1.60E+00	2.43E-04	.02%
Tetrachloroethene	2.90E-02	1.00E+02	2.74E-02	7.95E-04	1.00E-02	7.95E-02	6.17%
Trichloroethene	7.31E-02	1.00E+02	2.74E-02	2.00E-03	6.00E-03	3.34E-01	25.93%
Pathway Total						1.21E+00	93.62%

Multipathway Total	1E+00	

Table E7. Estimated Cancer Risk Detail
Resident Ages 18-30 - RME Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	4.48E+00	3.00E+00	4.43E-06	5.95E-07	1.75E+00	1.04E-06	5.03%
B(a)P-TE	3.52E-02	1.50E+01	4.43E-06	2.34E-08	1.20E+01	2.81E-07	1.36%
Beryllium	2.90E-01	1.00E+00	4.43E-06	1.28E-08	7.00E+00	8.99E-08	.44%
Bis(2-ethylhexyl)phthalate	6.25E+00	1.00E+01	4.43E-06	2.77E-06	1.40E-02	3.87E-08	.19%
Pathway Total						1.45E-06	7.02%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	4.48E+00	1.00E+02	2.35E-07	1.05E-06	1.75E+00	1.84E-06	8.91%
B(a)P-TE	3.52E-02	1.00E+02	2.35E-07	8.27E-09	1.20E+01	9.93E-08	.48%
Beryllium	2.90E-01	1.00E+02	2.35E-07	6.81E-08	7.00E+00	4.77E-07	2.31%
Bis(2-ethylhexyl)phthalate	6.25E+00	1.00E+02	2.35E-07	1.47E-06	1.40E-02	2.05E-08	.10%
Pathway Total						2.44E-06	11.80%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	5.15E-08	1.00E+02	7.05E-02	3.63E-09	1.50E+01	5.45E-08	.26%
B(a)P-TE	4.05E-10	1.00E+02	7.05E-02	2.86E-11	1.20E+01	3.43E-10	.00%
Beryllium	3.34E-09	1.00E+02	7.05E-02	2.35E-10	8.40E+00	1.98E-09	.01%
Bis(2-ethylhexyl)phthalate	7.18E-08	1.00E+02	7.05E-02	5.06E-09	8.40E-03	4.25E-11	.00%
Cadmium	1.15E-07	1.00E+02	7.05E-02	8.08E-09	1.50E+01	1.21E-07	.59%
Pathway Total						1.78E-07	.86%
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
1,2-Dichloroethane	1.50E-03	1.00E+02	4.70E-03	7.05E-06	9.10E-02	6.42E-07	3.11%
1,1-Dichloroethene	1.30E-03	1.00E+02	4.70E-03	6.11E-06	6.00E-01	3.67E-06	17.77%
Methylene chloride	2.77E-03	1.00E+02	4.70E-03	1.30E-05	1.40E-02	1.82E-07	.88%
Tetrachloroethene	2.90E-02	1.00E+02	4.70E-03	1.36E-04	5.10E-02	6.95E-06	33.64%
Trichloroethene	7.31E-02	1.00E+02	4.70E-03	3.44E-04	1.50E-02	5.15E-06	24.93%
Pathway Total						1.66E-05	80.33%

Table E7. Estimated Cancer Risk Detail
Resident Ages 18-30 - RME Scenario, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Multipathway Total						2E-05	

SITES 16 AND 17

Table E8-R. Hazard Quotient and Index Detail
Student/Faculty/Artist Receptor - Average Scenario, Sites 16 and 17 - Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.56E+00	1.00E+02	2.25E-08	3.51E-08	3.00E-04	1.17E-04	50.59%
Beryllium	1.40E-01	1.00E+02	2.25E-08	3.15E-09	5.00E-03	6.30E-07	.27%
Cadmium	1.21E+00	1.00E+02	2.25E-08	2.72E-08	5.00E-04	5.45E-05	23.56%
Chlordane	5.40E-02	1.00E+02	2.25E-08	1.22E-09	6.00E-05	2.03E-05	8.78%
Pathway Total						1.92E-04	83.20%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.56E+00	3.00E+00	1.90E-07	8.89E-09	3.00E-04	2.96E-05	12.80%
Beryllium	1.40E-01	1.00E+00	1.90E-07	2.66E-10	5.00E-03	5.32E-08	.02%
Cadmium	1.21E+00	1.00E-01	1.90E-07	2.30E-10	5.00E-04	4.60E-07	.20%
Chlordane	5.40E-02	5.00E+00	1.90E-07	5.13E-10	6.00E-05	8.55E-06	3.70%
Pathway Total						3.87E-05	16.72%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.79E-08	1.00E+02	1.87E-03	3.35E-11	3.00E-04	1.12E-07	.05%
Beryllium	1.61E-09	1.00E+02	1.87E-03	3.01E-12	5.00E-03	6.02E-10	.00%
Cadmium	1.39E-08	1.00E+02	1.87E-03	2.60E-11	5.00E-04	5.20E-08	.02%
Chlordane	6.21E-10	1.00E+02	1.87E-03	1.16E-12	6.00E-05	1.94E-08	.01%
Pathway Total						1.84E-07	.08%
Multipathway Total						2E-04	

Table E8-R. Estimated Cancer Risk Detail
Student/Faculty/Artist Receptor - Average Scenario, Sites 16 and 17 - Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.56E+00	1.00E+02	1.61E-09	2.51E-09	1.75E+00	4.40E-09	57.98%
Beryllium	1.40E-01	1.00E+02	1.61E-09	2.25E-10	7.00E+00	1.58E-09	20.82%
Chlordane	5.40E-02	1.00E+02	1.61E-09	8.69E-11	1.30E+00	1.13E-10	1.49%
TCDD-TE	1.12E-06	4.30E+01	1.61E-09	7.75E-16	1.50E+05	1.16E-10	1.53%
Pathway Total						6.21E-09	81.82%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.56E+00	3.00E+00	1.36E-08	6.36E-10	1.75E+00	1.11E-09	14.63%
Beryllium	1.40E-01	1.00E+00	1.36E-08	1.90E-11	7.00E+00	1.33E-10	1.75%
Chlordane	5.40E-02	5.00E+00	1.36E-08	3.67E-11	1.30E+00	4.77E-11	.63%
TCDD-TE	1.12E-06	1.00E+00	1.36E-08	1.52E-16	1.50E+05	2.28E-11	.30%
Pathway Total						1.31E-09	17.31%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.79E-08	1.00E+02	1.33E-04	2.39E-12	1.50E+01	3.58E-11	.47%
Beryllium	1.61E-09	1.00E+02	1.33E-04	2.14E-13	8.40E+00	1.80E-12	.02%
Cadmium	1.39E-08	1.00E+02	1.33E-04	1.85E-12	1.50E+01	2.78E-11	.37%
Chlordane	6.21E-10	1.00E+02	1.33E-04	8.26E-14	1.30E+00	1.07E-13	.00%
TCDD-TE	1.29E-14	1.00E+02	1.33E-04	1.71E-18	1.50E+05	2.57E-13	.00%
Pathway Total						6.58E-11	.86%
Multipathway Total						8E-09	

Table E9-R. Hazard Quotient and Index Detail
Student/Faculty/Artist Receptor - RME Scenario, Sites 16 and 17 - Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.27E+00	1.00E+02	1.17E-07	3.83E-07	3.00E-04	1.28E-03	38.71%
Beryllium	3.20E-01	1.00E+02	1.17E-07	3.74E-08	5.00E-03	7.49E-06	.23%
Cadmium	4.09E+00	1.00E+02	1.17E-07	4.79E-07	5.00E-04	9.57E-04	28.94%
Chlordane	8.40E-02	1.00E+02	1.17E-07	9.83E-09	6.00E-05	1.64E-04	4.96%
Pathway Total						2.41E-03	72.84%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.27E+00	3.00E+00	2.21E-06	2.17E-07	3.00E-04	7.23E-04	21.86%
Beryllium	3.20E-01	1.00E+00	2.21E-06	7.07E-09	5.00E-03	1.41E-06	.04%
Cadmium	4.09E+00	1.00E-01	2.21E-06	9.04E-09	5.00E-04	1.81E-05	.55%
Chlordane	8.40E-02	5.00E+00	2.21E-06	9.28E-09	6.00E-05	1.55E-04	4.69%
Pathway Total						8.98E-04	27.14%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.76E-08	1.00E+02	3.67E-03	1.38E-10	3.00E-04	4.60E-07	.01%
Beryllium	3.68E-09	1.00E+02	3.67E-03	1.35E-11	5.00E-03	2.70E-09	.00%
Cadmium	4.70E-08	1.00E+02	3.67E-03	1.73E-10	5.00E-04	3.45E-07	.01%
Chlordane	9.66E-10	1.00E+02	3.67E-03	3.55E-12	6.00E-05	5.91E-08	.00%
Pathway Total						8.67E-07	.02%
Multipathway Total						3E-03	

Table E9-R. Estimated Cancer Risk Detail
Student/Faculty/Artist Receptor - RME Scenario, Sites 16 and 17 - Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.27E+00	1.00E+02	4.19E-08	1.37E-07	1.75E+00	2.40E-07	47.15%
Beryllium	3.20E-01	1.00E+02	4.19E-08	1.34E-08	7.00E+00	9.39E-08	18.45%
Chlordane	8.40E-02	1.00E+02	4.19E-08	3.52E-09	1.30E+00	4.58E-09	.90%
TCDD-TE	2.79E-06	4.30E+01	4.19E-08	5.03E-14	1.50E+05	7.54E-09	1.48%
Pathway Total						3.46E-07	67.98%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.27E+00	3.00E+00	7.91E-07	7.76E-08	1.75E+00	1.36E-07	26.72%
Beryllium	3.20E-01	1.00E+00	7.91E-07	2.53E-09	7.00E+00	1.77E-08	3.48%
Chlordane	8.40E-02	5.00E+00	7.91E-07	3.32E-09	1.30E+00	4.32E-09	.85%
TCDD-TE	2.79E-06	1.00E+00	7.91E-07	2.21E-14	1.50E+05	3.31E-09	.65%
Pathway Total						1.61E-07	31.70%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.76E-08	1.00E+02	1.31E-03	4.93E-11	1.50E+01	7.39E-10	.15%
Beryllium	3.68E-09	1.00E+02	1.31E-03	4.82E-12	8.40E+00	4.05E-11	.01%
Cadmium	4.70E-08	1.00E+02	1.31E-03	6.16E-11	1.50E+01	9.24E-10	.18%
Chlordane	9.66E-10	1.00E+02	1.31E-03	1.27E-12	1.30E+00	1.65E-12	.00%
TCDD-TE	3.21E-14	1.00E+02	1.31E-03	4.20E-17	1.50E+05	6.30E-12	.00%
Pathway Total						1.71E-09	.34%
Multipathway Total						5E-07	

Table E10-R. Hazard Quotient and Index Detail
Student/Faculty/Artist Receptor - Average Scenario, Sites 16 and 17 - Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.54E+00	1.00E+02	2.25E-08	3.47E-08	4.00E-04	8.66E-05	23.19%
Arsenic	1.96E+00	1.00E+02	2.25E-08	4.41E-08	3.00E-04	1.47E-04	39.37%
Cadmium	6.50E-01	1.00E+02	2.25E-08	1.46E-08	5.00E-04	2.92E-05	7.82%
Chlordane	4.97E-02	1.00E+02	2.25E-08	1.12E-09	6.00E-05	1.86E-05	4.98%
Copper	5.63E+01	1.00E+02	2.25E-08	1.27E-06	3.70E-02	3.42E-05	9.16%
4,4'-DDT	3.14E-02	1.00E+02	2.25E-08	7.06E-10	5.00E-04	1.41E-06	.38%
Pathway Total						3.17E-04	84.90%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.54E+00	1.00E+00	1.90E-07	2.93E-09	4.00E-04	7.32E-06	1.96%
Arsenic	1.96E+00	3.00E+00	1.90E-07	1.12E-08	3.00E-04	3.72E-05	9.96%
Cadmium	6.50E-01	1.00E-01	1.90E-07	1.23E-10	5.00E-04	2.47E-07	.07%
Chlordane	4.97E-02	5.00E+00	1.90E-07	4.72E-10	6.00E-05	7.86E-06	2.10%
Copper	5.63E+01	1.00E+00	1.90E-07	1.07E-07	3.70E-02	2.89E-06	.77%
4,4'-DDT	3.14E-02	5.00E+00	1.90E-07	2.98E-10	5.00E-04	5.97E-07	.16%
Pathway Total						5.61E-05	15.02%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.77E-08	1.00E+02	1.87E-03	3.31E-11	4.00E-04	8.28E-08	.02%
Arsenic	2.25E-08	1.00E+02	1.87E-03	4.21E-11	3.00E-04	1.40E-07	.04%
Cadmium	7.48E-09	1.00E+02	1.87E-03	1.40E-11	5.00E-04	2.80E-08	.01%
Chlordane	5.71E-10	1.00E+02	1.87E-03	1.07E-12	6.00E-05	1.78E-08	.00%
Copper	6.47E-07	1.00E+02	1.87E-03	1.21E-09	3.70E-02	3.27E-08	.01%
4,4'-DDT	3.61E-10	1.00E+02	1.87E-03	6.75E-13	5.00E-04	1.35E-09	.00%
Pathway Total						3.03E-07	.08%
Multipathway Total						4E-04	

Table E10-R. Estimated Cancer Risk Detail
Student/Faculty/Artist Receptor - Average Scenario, Sites 16 and 17 - Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.96E+00	1.00E+02	1.61E-09	3.16E-09	1.75E+00	5.52E-09	75.53%
Chlordane	4.97E-02	1.00E+02	1.61E-09	8.00E-11	1.30E+00	1.04E-10	1.42%
4,4'-DDT	3.14E-02	1.00E+02	1.61E-09	5.06E-11	3.40E-01	1.72E-11	.24%
TCDD-TE	1.25E-06	4.30E+01	1.61E-09	8.65E-16	1.50E+05	1.30E-10	1.78%
Pathway Total						5.77E-09	78.97%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.96E+00	3.00E+00	1.36E-08	8.00E-10	1.75E+00	1.40E-09	19.16%
Chlordane	4.97E-02	5.00E+00	1.36E-08	3.38E-11	1.30E+00	4.39E-11	.60%
4,4'-DDT	3.14E-02	5.00E+00	1.36E-08	2.14E-11	3.40E-01	7.26E-12	.10%
TCDD-TE	1.25E-06	1.00E+00	1.36E-08	1.70E-16	1.50E+05	2.55E-11	.35%
Pathway Total						1.48E-09	20.21%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.25E-08	1.00E+02	1.33E-04	3.00E-12	1.50E+01	4.50E-11	.62%
Cadmium	7.48E-09	1.00E+02	1.33E-04	9.94E-13	1.50E+01	1.49E-11	.20%
Chlordane	5.71E-10	1.00E+02	1.33E-04	7.60E-14	1.30E+00	9.88E-14	.00%
4,4'-DDT	3.61E-10	1.00E+02	1.33E-04	4.80E-14	3.40E-01	1.63E-14	.00%
TCDD-TE	1.44E-14	1.00E+02	1.33E-04	1.91E-18	1.50E+05	2.87E-13	.00%
Pathway Total						6.03E-11	.82%
Multipathway Total						7E-09	

Table E11-R. Hazard Quotient and Index Detail
Student/Faculty/Artist Receptor - RME Scenario, Sites 16 and 17 - Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	5.77E+00	1.00E+02	1.17E-07	6.75E-07	4.00E-04	1.69E-03	25.43%
Arsenic	4.81E+00	1.00E+02	1.17E-07	5.63E-07	3.00E-04	1.88E-03	28.29%
Cadmium	1.38E+00	1.00E+02	1.17E-07	1.61E-07	5.00E-04	3.23E-04	4.86%
Chlordane	6.30E-02	1.00E+02	1.17E-07	7.37E-09	6.00E-05	1.23E-04	1.85%
Copper	2.91E+02	1.00E+02	1.17E-07	3.40E-05	3.70E-02	9.19E-04	13.83%
4,4'-DDT	7.60E-02	1.00E+02	1.17E-07	8.89E-09	5.00E-04	1.78E-05	.27%
Pathway Total						4.95E-03	74.53%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	5.77E+00	1.00E+00	2.21E-06	1.28E-07	4.00E-04	3.19E-04	4.80%
Arsenic	4.81E+00	3.00E+00	2.21E-06	3.19E-07	3.00E-04	1.06E-03	15.95%
Cadmium	1.38E+00	1.00E-01	2.21E-06	3.05E-09	5.00E-04	6.10E-06	.09%
Chlordane	6.30E-02	5.00E+00	2.21E-06	6.96E-09	6.00E-05	1.16E-04	1.75%
Copper	2.91E+02	1.00E+00	2.21E-06	6.42E-06	3.70E-02	1.74E-04	2.62%
4,4'-DDT	7.60E-02	5.00E+00	2.21E-06	8.40E-09	5.00E-04	1.68E-05	.25%
Pathway Total						1.69E-03	25.46%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	6.64E-08	1.00E+02	3.67E-03	2.44E-10	4.00E-04	6.09E-07	.01%
Arsenic	5.53E-08	1.00E+02	3.67E-03	2.03E-10	3.00E-04	6.77E-07	.01%
Cadmium	1.59E-08	1.00E+02	3.67E-03	5.82E-11	5.00E-04	1.16E-07	.00%
Chlordane	7.25E-10	1.00E+02	3.67E-03	2.66E-12	6.00E-05	4.43E-08	.00%
Copper	3.34E-06	1.00E+02	3.67E-03	1.23E-08	3.70E-02	3.32E-07	.00%
4,4'-DDT	8.74E-10	1.00E+02	3.67E-03	3.21E-12	5.00E-04	6.42E-09	.00%
Pathway Total						1.78E-06	.02%
Multipathway Total						7E-03	

Table E11-R. Estimated Cancer Risk Detail
Student/Faculty/Artist Receptor - RME Scenario, Sites 16 and 17 - Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	4.81E+00	1.00E+02	4.19E-08	2.02E-07	1.75E+00	3.53E-07	61.74%
Chlordane	6.30E-02	1.00E+02	4.19E-08	2.64E-09	1.30E+00	3.43E-09	.60%
4,4'-DDT	7.60E-02	1.00E+02	4.19E-08	3.18E-09	3.40E-01	1.08E-09	.19%
TCDD-TE	2.20E-06	4.30E+01	4.19E-08	3.96E-14	1.50E+05	5.95E-09	1.04%
Pathway Total						3.63E-07	63.57%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	4.81E+00	3.00E+00	7.91E-07	1.14E-07	1.75E+00	2.00E-07	34.98%
Chlordane	6.30E-02	5.00E+00	7.91E-07	2.49E-09	1.30E+00	3.24E-09	.57%
4,4'-DDT	7.60E-02	5.00E+00	7.91E-07	3.01E-09	3.40E-01	1.02E-09	.18%
TCDD-TE	2.20E-06	1.00E+00	7.91E-07	1.74E-14	1.50E+05	2.61E-09	.46%
Pathway Total						2.07E-07	36.19%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	5.53E-08	1.00E+02	1.31E-03	7.25E-11	1.50E+01	1.09E-09	.19%
Cadmium	1.59E-08	1.00E+02	1.31E-03	2.08E-11	1.50E+01	3.12E-10	.05%
Chlordane	7.25E-10	1.00E+02	1.31E-03	9.49E-13	1.30E+00	1.23E-12	.00%
4,4'-DDT	8.74E-10	1.00E+02	1.31E-03	1.14E-12	3.40E-01	3.89E-13	.00%
TCDD-TE	2.53E-14	1.00E+02	1.31E-03	3.31E-17	1.50E+05	4.97E-12	.00%
Pathway Total						1.41E-09	.24%
Multipathway Total						6E-07	

Table E12-R. Hazard Quotient and Index Detail
Student/Faculty/Artist Receptor - Average Scenario, Sites 16 and 17 - Site 17 Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Carbon tetrachloride	9.20E-04	1.00E+02	6.75E-03	6.21E-06	7.00E-04	8.87E-03	45.68%
Tetrachloroethene	4.10E-04	1.00E+02	6.75E-03	2.77E-06	1.00E-02	2.77E-04	1.43%
Trichloroethene	5.00E-04	1.00E+02	6.75E-03	3.37E-06	6.00E-03	5.62E-04	2.89%
Pathway Total						9.71E-03	50.00%
Pathway: Inhalation of Volatile Chemicals from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Carbon tetrachloride	9.20E-04	1.00E+02	6.75E-03	6.21E-06	7.00E-04	8.87E-03	45.68%
Tetrachloroethene	4.10E-04	1.00E+02	6.75E-03	2.77E-06	1.00E-02	2.77E-04	1.43%
Trichloroethene	5.00E-04	1.00E+02	6.75E-03	3.37E-06	6.00E-03	5.62E-04	2.89%
Pathway Total						9.71E-03	50.00%
Multipathway Total						2E-02	

Table E12-R. Estimated Cancer Risk Detail
Student/Faculty/Artist Receptor - Average Scenario, Sites 16 and 17 - Site 17 Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
TCDD-TE	1.77E-06	4.30E+01	1.29E-08	9.82E-15	1.50E+05	1.47E-09	.91%
Pathway Total						1.47E-09	.91%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
TCDD-TE	1.77E-06	1.00E+00	1.08E-07	1.91E-15	1.50E+05	2.87E-10	.18%
Pathway Total						2.87E-10	.18%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
TCDD-TE	2.04E-14	1.00E+02	4.27E-03	8.69E-17	1.50E+05	1.30E-11	.01%
Pathway Total						1.30E-11	.01%
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Carbon tetrachloride	9.20E-04	1.00E+02	4.82E-04	4.43E-07	1.50E-01	6.65E-08	41.30%
Tetrachloroethene	4.10E-04	1.00E+02	4.82E-04	1.98E-07	5.10E-02	1.01E-08	6.27%
Trichloroethene	5.00E-04	1.00E+02	4.82E-04	2.41E-07	1.50E-02	3.62E-09	2.25%
Pathway Total						8.02E-08	49.82%
Pathway: Inhalation of Volatile Chemicals from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Carbon tetrachloride	9.20E-04	1.00E+02	4.82E-04	4.43E-07	1.50E-01	6.65E-08	41.30%
Tetrachloroethene	4.10E-04	1.00E+02	4.82E-04	1.98E-07	5.10E-02	1.01E-08	6.27%
Trichloroethene	5.00E-04	1.00E+02	4.82E-04	2.41E-07	1.00E-02	2.41E-09	1.50%
Pathway Total						7.90E-08	49.07%
Multipathway Total						2E-07	

Table E13-R. Hazard Quotient and Index Detail
Student/Faculty/Artist Receptor - RME Scenario, Sites 16 and 17 - Site Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Carbon tetrachloride	1.10E-03	1.00E+02	2.35E-02	2.59E-05	7.00E-04	3.69E-02	45.10%
Tetrachloroethene	7.40E-04	1.00E+02	2.35E-02	1.74E-05	1.00E-02	1.74E-03	2.13%
Trichloroethene	5.80E-04	1.00E+02	2.35E-02	1.36E-05	6.00E-03	2.27E-03	2.77%
Pathway Total						4.09E-02	50.00%
Pathway: Inhalation of Volatile Chemicals from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Carbon tetrachloride	1.10E-03	1.00E+02	2.35E-02	2.59E-05	7.00E-04	3.69E-02	45.10%
Tetrachloroethene	7.40E-04	1.00E+02	2.35E-02	1.74E-05	1.00E-02	1.74E-03	2.13%
Trichloroethene	5.80E-04	1.00E+02	2.35E-02	1.36E-05	6.00E-03	2.27E-03	2.77%
Pathway Total						4.09E-02	50.00%
Multipathway Total						8E-02	

Table E13-R. Estimated Cancer Risk Detail
Student/Faculty/Artist Receptor - RME Scenario, Sites 16 and 17 - Site Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
TCDD-TE	4.06E-06	4.30E+01	3.35E-07	5.85E-13	1.50E+05	8.77E-08	2.41%
Pathway Total						8.77E-08	2.41%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
TCDD-TE	4.06E-06	1.00E+00	6.33E-06	2.57E-13	1.50E+05	3.85E-08	1.06%
Pathway Total						3.85E-08	1.06%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
TCDD-TE	4.67E-14	1.00E+02	8.39E-02	3.92E-15	1.50E+05	5.88E-10	.02%
Pathway Total						5.88E-10	.02%
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Carbon tetrachloride	1.10E-03	1.00E+02	8.39E-03	9.23E-06	1.50E-01	1.38E-06	37.89%
Tetrachloroethene	7.40E-04	1.00E+02	8.39E-03	6.21E-06	5.10E-02	3.17E-07	8.70%
Trichloroethene	5.80E-04	1.00E+02	8.39E-03	4.87E-06	1.50E-02	7.30E-08	2.00%
Pathway Total						1.77E-06	48.59%
Pathway: Inhalation of Volatile Chemicals from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Carbon tetrachloride	1.10E-03	1.00E+02	8.39E-03	9.23E-06	1.50E-01	1.38E-06	37.89%
Tetrachloroethene	7.40E-04	1.00E+02	8.39E-03	6.21E-06	5.10E-02	3.17E-07	8.70%
Trichloroethene	5.80E-04	1.00E+02	8.39E-03	4.87E-06	1.00E-02	4.87E-08	1.34%
Pathway Total						1.75E-06	47.93%
Multipathway Total						4E-06	

Table E14-R. Hazard Quotient and Index Detail
Student/Faculty/Artist Receptor - Average Scenario, Sites 16 and 17 - Groundwater, A-Aquifer
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	6.60E-03	1.00E+02	6.75E-03	4.45E-05	4.00E-04	1.11E-01	49.41%
Tetrachloroethene	6.20E-04	1.00E+02	6.75E-03	4.18E-06	1.00E-02	4.18E-04	.19%
Trichloroethene	8.00E-04	1.00E+02	6.75E-03	5.40E-06	6.00E-03	9.00E-04	.40%
Pathway Total						1.12E-01	50.00%
Pathway: Inhalation of Volatile Chemicals from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	6.60E-03	1.00E+02	6.75E-03	4.45E-05	4.00E-04	1.11E-01	49.41%
Tetrachloroethene	6.20E-04	1.00E+02	6.75E-03	4.18E-06	1.00E-02	4.18E-04	.19%
Trichloroethene	8.00E-04	1.00E+02	6.75E-03	5.40E-06	6.00E-03	9.00E-04	.40%
Pathway Total						1.12E-01	50.00%
Multipathway Total						2E-01	

Table E14-R. Estimated Cancer Risk Detail
Student/Faculty/Artist Receptor - Average Scenario, Sites 16 and 17 - Groundwater, A-Aquifer
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Tetrachloroethene	6.20E-04	1.00E+02	4.82E-04	2.99E-07	5.10E-02	1.52E-08	37.96%
Trichloroethene	8.00E-04	1.00E+02	4.82E-04	3.86E-07	1.50E-02	5.78E-09	14.44%
Pathway Total						2.10E-08	52.40%
Pathway: Inhalation of Volatile Chemicals from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Tetrachloroethene	6.20E-04	1.00E+02	4.82E-04	2.99E-07	5.10E-02	1.52E-08	37.96%
Trichloroethene	8.00E-04	1.00E+02	4.82E-04	3.86E-07	1.00E-02	3.86E-09	9.64%
Pathway Total						1.91E-08	47.60%
Multipathway Total						4E-08	

Table E15-R. Hazard Quotient and Index Detail
Student/Faculty/Artist Receptor - RME Scenario, Sites 16 and 17 - Groundwater, A-Aquifer
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	9.60E-03	1.00E+02	2.35E-02	2.26E-04	4.00E-04	5.64E-01	48.87%
Tetrachloroethene	1.90E-03	1.00E+02	2.35E-02	4.47E-05	1.00E-02	4.47E-03	.39%
Trichloroethene	2.20E-03	1.00E+02	2.35E-02	5.17E-05	6.00E-03	8.62E-03	.75%
Pathway Total						5.77E-01	50.01%
Pathway: Inhalation of Volatile Chemicals from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	9.60E-03	1.00E+02	2.35E-02	2.26E-04	4.00E-04	5.64E-01	48.87%
Tetrachloroethene	1.90E-03	1.00E+02	2.35E-02	4.47E-05	1.00E-02	4.47E-03	.39%
Trichloroethene	2.20E-03	1.00E+02	2.35E-02	5.17E-05	6.00E-03	8.62E-03	.75%
Pathway Total						5.77E-01	50.01%
Multipathway Total						1E+00	

Table E15-R. Estimated Cancer Risk Detail
Student/Faculty/Artist Receptor - RME Scenario, Sites 16 and 17 - Groundwater, A-Aquifer
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Tetrachloroethene	1.90E-03	1.00E+02	8.39E-03	1.59E-05	5.10E-02	8.13E-07	38.94%
Trichloroethene	2.20E-03	1.00E+02	8.39E-03	1.85E-05	1.50E-02	2.77E-07	13.27%
Pathway Total						1.09E-06	52.21%
Pathway: Inhalation of Volatile Chemicals from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Tetrachloroethene	1.90E-03	1.00E+02	8.39E-03	1.59E-05	5.10E-02	8.13E-07	38.94%
Trichloroethene	2.20E-03	1.00E+02	8.39E-03	1.85E-05	1.00E-02	1.85E-07	8.86%
Pathway Total						9.98E-07	47.80%
Multipathway Total						2E-06	

Table E16. Hazard Quotient and Index Detail
Utility Worker - Average Scenario, Sites 16 and 17 - Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.08E+00	1.00E+02	1.96E-08	2.12E-08	3.00E-04	7.06E-05	50.40%
Beryllium	1.90E-01	1.00E+02	1.96E-08	3.72E-09	5.00E-03	7.45E-07	.53%
Cadmium	6.70E-01	1.00E+02	1.96E-08	1.31E-08	5.00E-04	2.63E-05	18.77%
Chlordane	5.17E-02	1.00E+02	1.96E-08	1.01E-09	6.00E-05	1.69E-05	12.06%
Pathway Total						1.15E-04	81.76%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.08E+00	3.00E+00	1.65E-07	5.35E-09	3.00E-04	1.78E-05	12.71%
Beryllium	1.90E-01	1.00E+00	1.65E-07	3.14E-10	5.00E-03	6.27E-08	.04%
Cadmium	6.70E-01	1.00E-01	1.65E-07	1.11E-10	5.00E-04	2.21E-07	.16%
Chlordane	5.17E-02	5.00E+00	1.65E-07	4.27E-10	6.00E-05	7.11E-06	5.08%
Pathway Total						2.52E-05	17.99%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.24E-08	1.00E+02	5.20E-03	6.46E-11	3.00E-04	2.15E-07	.15%
Beryllium	2.18E-09	1.00E+02	5.20E-03	1.14E-11	5.00E-03	2.27E-09	.00%
Cadmium	7.71E-09	1.00E+02	5.20E-03	4.01E-11	5.00E-04	8.01E-08	.06%
Chlordane	5.95E-10	1.00E+02	5.20E-03	3.09E-12	6.00E-05	5.16E-08	.04%
Pathway Total						3.49E-07	.25%

Multipathway Total 1E-04

Table E16. Estimated Cancer Risk Detail
Utility Worker - Average Scenario, Sites 16 and 17 - Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.08E+00	1.00E+02	2.80E-10	3.02E-10	1.75E+00	5.29E-10	46.35%
Beryllium	1.90E-01	1.00E+02	2.80E-10	5.32E-11	7.00E+00	3.72E-10	32.60%
Chlordane	5.17E-02	1.00E+02	2.80E-10	1.45E-11	1.30E+00	1.88E-11	1.65%
TCDD-TE	1.12E-06	4.30E+01	2.80E-10	1.35E-16	1.50E+05	2.02E-11	1.77%
Pathway Total						9.40E-10	82.37%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.08E+00	3.00E+00	2.36E-09	7.65E-11	1.75E+00	1.34E-10	11.74%
Beryllium	1.90E-01	1.00E+00	2.36E-09	4.48E-12	7.00E+00	3.14E-11	2.75%
Chlordane	5.17E-02	5.00E+00	2.36E-09	6.10E-12	1.30E+00	7.94E-12	.70%
TCDD-TE	1.12E-06	1.00E+00	2.36E-09	2.64E-17	1.50E+05	3.96E-12	.35%
Pathway Total						1.77E-10	15.54%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.24E-08	1.00E+02	7.43E-05	9.23E-13	1.50E+01	1.38E-11	1.21%
Beryllium	2.18E-09	1.00E+02	7.43E-05	1.62E-13	8.40E+00	1.36E-12	.12%
Cadmium	7.71E-09	1.00E+02	7.43E-05	5.72E-13	1.50E+01	8.59E-12	.75%
Chlordane	5.95E-10	1.00E+02	7.43E-05	4.42E-14	1.30E+00	5.75E-14	.01%
TCDD-TE	1.29E-14	1.00E+02	7.43E-05	9.57E-19	1.50E+05	1.44E-13	.01%
Pathway Total						2.40E-11	2.10%
Multipathway Total						1E-09	

Table E17. Hazard Quotient and Index Detail
Utility Worker - RME Scenario, Site 16 and 17 - Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.47E+00	1.00E+02	5.64E-07	1.39E-06	3.00E-04	4.64E-03	51.04%
Beryllium	4.00E-01	1.00E+02	5.64E-07	2.26E-07	5.00E-03	4.51E-05	.50%
Cadmium	2.57E+00	1.00E+02	5.64E-07	1.45E-06	5.00E-04	2.90E-03	31.90%
Chlordane	8.40E-02	1.00E+02	5.64E-07	4.74E-08	6.00E-05	7.90E-04	8.69%
Pathway Total						8.38E-03	92.13%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.47E+00	3.00E+00	2.21E-06	1.64E-07	3.00E-04	5.46E-04	6.01%
Beryllium	4.00E-01	1.00E+00	2.21E-06	8.84E-09	5.00E-03	1.77E-06	.02%
Cadmium	2.57E+00	1.00E-01	2.21E-06	5.68E-09	5.00E-04	1.14E-05	.13%
Chlordane	8.40E-02	5.00E+00	2.21E-06	9.28E-09	6.00E-05	1.55E-04	1.70%
Pathway Total						7.14E-04	7.86%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.84E-08	1.00E+02	1.17E-02	3.32E-10	3.00E-04	1.11E-06	.01%
Beryllium	4.60E-09	1.00E+02	1.17E-02	5.38E-11	5.00E-03	1.08E-08	.00%
Cadmium	2.96E-08	1.00E+02	1.17E-02	3.46E-10	5.00E-04	6.92E-07	.01%
Chlordane	9.66E-10	1.00E+02	1.17E-02	1.13E-11	6.00E-05	1.88E-07	.00%
Pathway Total						2.00E-06	.02%
Multipathway Total						9E-03	

Table E17. Estimated Cancer Risk Detail
Utility Worker - RME Scenario, Site 16 and 17 - Pete's Pond
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.47E+00	1.00E+02	8.05E-09	1.99E-08	1.75E+00	3.48E-08	53.48%
Beryllium	4.00E-01	1.00E+02	8.05E-09	3.22E-09	7.00E+00	2.25E-08	34.58%
Chlordane	8.40E-02	1.00E+02	8.05E-09	6.76E-10	1.30E+00	8.79E-10	1.35%
TCDD-TE	2.79E-06	4.30E+01	8.05E-09	9.66E-15	1.50E+05	1.45E-09	2.23%
Pathway Total						5.96E-08	91.64%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.47E+00	3.00E+00	3.16E-08	2.34E-09	1.75E+00	4.10E-09	6.30%
Beryllium	4.00E-01	1.00E+00	3.16E-08	1.26E-10	7.00E+00	8.85E-10	1.36%
Chlordane	8.40E-02	5.00E+00	3.16E-08	1.33E-10	1.30E+00	1.73E-10	.27%
TCDD-TE	2.79E-06	1.00E+00	3.16E-08	8.82E-16	1.50E+05	1.32E-10	.20%
Pathway Total						5.29E-09	8.13%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.84E-08	1.00E+02	1.68E-04	4.77E-12	1.50E+01	7.16E-11	.11%
Beryllium	4.60E-09	1.00E+02	1.68E-04	7.73E-13	8.40E+00	6.49E-12	.01%
Cadmium	2.96E-08	1.00E+02	1.68E-04	4.97E-12	1.50E+01	7.45E-11	.11%
Chlordane	9.66E-10	1.00E+02	1.68E-04	1.62E-13	1.30E+00	2.11E-13	.00%
TCDD-TE	3.21E-14	1.00E+02	1.68E-04	5.39E-18	1.50E+05	8.09E-13	.00%
Pathway Total						1.54E-10	.23%
Multipathway Total						7E-08	

Table E18. Hazard Quotient and Index Detail
Utility Worker - Average Scenario, Sites 16 and 17 - Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.00E+00	1.00E+02	1.96E-08	1.96E-08	4.00E-04	4.90E-05	19.20%
Arsenic	1.50E+00	1.00E+02	1.96E-08	2.94E-08	3.00E-04	9.80E-05	38.40%
Cadmium	5.30E-01	1.00E+02	1.96E-08	1.04E-08	5.00E-04	2.08E-05	8.15%
Chlordane	4.97E-02	1.00E+02	1.96E-08	9.74E-10	6.00E-05	1.62E-05	6.35%
Copper	3.54E+01	1.00E+02	1.96E-08	6.94E-07	3.70E-02	1.88E-05	7.37%
4,4'-DDT	3.14E-02	1.00E+02	1.96E-08	6.15E-10	5.00E-04	1.23E-06	.48%
Nickel	1.18E+01	1.00E+02	1.96E-08	2.32E-07	2.00E-02	1.16E-05	4.55%
Pathway Total						2.16E-04	84.50%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.00E+00	1.00E+00	1.65E-07	1.65E-09	4.00E-04	4.13E-06	1.62%
Arsenic	1.50E+00	3.00E+00	1.65E-07	7.43E-09	3.00E-04	2.47E-05	9.68%
Cadmium	5.30E-01	1.00E-01	1.65E-07	8.75E-11	5.00E-04	1.75E-07	.07%
Chlordane	4.97E-02	5.00E+00	1.65E-07	4.10E-10	6.00E-05	6.83E-06	2.68%
Copper	3.54E+01	1.00E+00	1.65E-07	5.84E-08	3.70E-02	1.58E-06	.62%
4,4'-DDT	3.14E-02	5.00E+00	1.65E-07	2.59E-10	5.00E-04	5.18E-07	.20%
Nickel	1.18E+01	1.00E+00	1.65E-07	1.95E-08	2.00E-02	9.77E-07	.38%
Pathway Total						3.89E-05	15.25%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.15E-08	1.00E+02	5.20E-03	5.98E-11	4.00E-04	1.50E-07	.06%
Arsenic	1.72E-08	1.00E+02	5.20E-03	8.97E-11	3.00E-04	2.99E-07	.12%
Cadmium	6.10E-09	1.00E+02	5.20E-03	3.17E-11	5.00E-04	6.34E-08	.02%
Chlordane	5.71E-10	1.00E+02	5.20E-03	2.97E-12	6.00E-05	4.95E-08	.02%
Copper	4.07E-07	1.00E+02	5.20E-03	2.12E-09	3.70E-02	5.72E-08	.02%
4,4'-DDT	3.61E-10	1.00E+02	5.20E-03	1.88E-12	5.00E-04	3.76E-09	.00%
Nickel	1.36E-07	1.00E+02	5.20E-03	7.08E-10	2.00E-02	3.54E-08	.01%
Pathway Total						6.58E-07	.25%
Multipathway Total						3E-04	

Table E18. Estimated Cancer Risk Detail
Utility Worker - Average Scenario, Sites 16 and 17 - Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.50E+00	1.00E+02	2.80E-10	4.20E-10	1.75E+00	7.35E-10	66.93%
Chlordane	4.97E-02	1.00E+02	2.80E-10	1.39E-11	1.30E+00	1.81E-11	1.65%
4,4'-DDT	3.14E-02	1.00E+02	2.80E-10	8.79E-12	3.40E-01	2.99E-12	.27%
TCDD-TE	5.15E-06	4.30E+01	2.80E-10	6.20E-16	1.50E+05	9.30E-11	8.47%
Pathway Total						8.49E-10	77.32%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.50E+00	3.00E+00	2.36E-09	1.06E-10	1.75E+00	1.86E-10	16.94%
Chlordane	4.97E-02	5.00E+00	2.36E-09	5.86E-12	1.30E+00	7.62E-12	.69%
4,4'-DDT	3.14E-02	5.00E+00	2.36E-09	3.71E-12	3.40E-01	1.26E-12	.11%
TCDD-TE	5.15E-06	1.00E+00	2.36E-09	1.22E-16	1.50E+05	1.82E-11	1.66%
Pathway Total						2.13E-10	19.40%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.72E-08	1.00E+02	7.43E-05	1.28E-12	1.50E+01	1.92E-11	1.75%
Cadmium	6.10E-09	1.00E+02	7.43E-05	4.53E-13	1.50E+01	6.79E-12	.62%
Chlordane	5.71E-10	1.00E+02	7.43E-05	4.24E-14	1.30E+00	5.52E-14	.01%
4,4'-DDT	3.61E-10	1.00E+02	7.43E-05	2.68E-14	3.40E-01	9.12E-15	.00%
Nickel	1.36E-07	1.00E+02	7.43E-05	1.01E-11	9.10E-01	9.21E-12	.84%
TCDD-TE	5.92E-14	1.00E+02	7.43E-05	4.40E-18	1.50E+05	6.60E-13	.06%
Pathway Total						3.59E-11	3.28%
Multipathway Total						1E-09	

Table E19. Hazard Quotient and Index Detail
Utility Worker - RME Scenario, Sites 16 and 17 - Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	4.16E+00	1.00E+02	5.64E-07	2.35E-06	4.00E-04	5.87E-03	29.63%
Arsenic	3.77E+00	1.00E+02	5.64E-07	2.13E-06	3.00E-04	7.09E-03	35.78%
Cadmium	1.08E+00	1.00E+02	5.64E-07	6.09E-07	5.00E-04	1.22E-03	6.16%
Chlordane	6.30E-02	1.00E+02	5.64E-07	3.55E-08	6.00E-05	5.92E-04	2.99%
Copper	2.01E+02	1.00E+02	5.64E-07	1.13E-04	3.70E-02	3.07E-03	15.50%
4,4'-DDT	7.60E-02	1.00E+02	5.64E-07	4.29E-08	5.00E-04	8.57E-05	.43%
Nickel	1.91E+01	1.00E+02	5.64E-07	1.08E-05	2.00E-02	5.39E-04	2.72%
Pathway Total						1.85E-02	93.21%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	4.16E+00	1.00E+00	2.21E-06	9.19E-08	4.00E-04	2.30E-04	1.16%
Arsenic	3.77E+00	3.00E+00	2.21E-06	2.50E-07	3.00E-04	8.33E-04	4.20%
Cadmium	1.08E+00	1.00E-01	2.21E-06	2.39E-09	5.00E-04	4.77E-06	.02%
Chlordane	6.30E-02	5.00E+00	2.21E-06	6.96E-09	6.00E-05	1.16E-04	.59%
Copper	2.01E+02	1.00E+00	2.21E-06	4.44E-06	3.70E-02	1.20E-04	.61%
4,4'-DDT	7.60E-02	5.00E+00	2.21E-06	8.40E-09	5.00E-04	1.68E-05	.08%
Nickel	1.91E+01	1.00E+00	2.21E-06	4.22E-07	2.00E-02	2.11E-05	.11%
Pathway Total						1.34E-03	6.77%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	4.78E-08	1.00E+02	1.17E-02	5.60E-10	4.00E-04	1.40E-06	.01%
Arsenic	4.34E-08	1.00E+02	1.17E-02	5.07E-10	3.00E-04	1.69E-06	.01%
Cadmium	1.24E-08	1.00E+02	1.17E-02	1.45E-10	5.00E-04	2.91E-07	.00%
Chlordane	7.25E-10	1.00E+02	1.17E-02	8.48E-12	6.00E-05	1.41E-07	.00%
Copper	2.31E-06	1.00E+02	1.17E-02	2.71E-08	3.70E-02	7.31E-07	.00%
4,4'-DDT	8.74E-10	1.00E+02	1.17E-02	1.02E-11	5.00E-04	2.05E-08	.00%
Nickel	2.20E-07	1.00E+02	1.17E-02	2.57E-09	2.00E-02	1.28E-07	.00%
Pathway Total						4.40E-06	.02%
Multipathway Total						2E-02	

Table E19. Estimated Cancer Risk Detail
Utility Worker - RME Scenario, Sites 16 and 17 - Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.77E+00	1.00E+02	8.05E-09	3.03E-08	1.75E+00	5.31E-08	72.83%
Chlordane	6.30E-02	1.00E+02	8.05E-09	5.07E-10	1.30E+00	6.59E-10	.90%
4,4'-DDT	7.60E-02	1.00E+02	8.05E-09	6.12E-10	3.40E-01	2.08E-10	.29%
TCDD-TE	2.18E-05	4.30E+01	8.05E-09	7.56E-14	1.50E+05	1.13E-08	15.50%
Pathway Total						6.53E-08	89.52%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.77E+00	3.00E+00	3.16E-08	3.57E-09	1.75E+00	6.25E-09	8.57%
Chlordane	6.30E-02	5.00E+00	3.16E-08	9.95E-11	1.30E+00	1.29E-10	.18%
4,4'-DDT	7.60E-02	5.00E+00	3.16E-08	1.20E-10	3.40E-01	4.08E-11	.06%
TCDD-TE	2.18E-05	1.00E+00	3.16E-08	6.90E-15	1.50E+05	1.04E-09	1.43%
Pathway Total						7.46E-09	10.24%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	4.34E-08	1.00E+02	1.68E-04	7.28E-12	1.50E+01	1.09E-10	.15%
Cadmium	1.24E-08	1.00E+02	1.68E-04	2.09E-12	1.50E+01	3.13E-11	.04%
Chlordane	7.25E-10	1.00E+02	1.68E-04	1.22E-13	1.30E+00	1.58E-13	.00%
4,4'-DDT	8.74E-10	1.00E+02	1.68E-04	1.47E-13	3.40E-01	4.99E-14	.00%
Nickel	2.20E-07	1.00E+02	1.68E-04	3.69E-11	9.10E-01	3.36E-11	.05%
TCDD-TE	2.51E-13	1.00E+02	1.68E-04	4.22E-17	1.50E+05	6.33E-12	.01%
Pathway Total						1.80E-10	.25%
Multipathway Total						7E-08	

Table E20. Hazard Quotient and Index Detail
Construction Worker - Average Scenario, Sites 16 and 17 - Site 17 Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.51E+00	1.00E+02	2.94E-08	4.44E-08	4.00E-04	1.11E-04	24.60%
Arsenic	1.60E+00	1.00E+02	2.94E-08	4.70E-08	3.00E-04	1.57E-04	34.79%
Cadmium	5.20E-01	1.00E+02	2.94E-08	1.53E-08	5.00E-04	3.06E-05	6.78%
Copper	2.21E+01	1.00E+02	2.94E-08	6.51E-07	3.70E-02	1.76E-05	3.90%
Mercury	5.00E-01	1.00E+02	2.94E-08	1.47E-08	3.00E-04	4.90E-05	10.86%
Nickel	1.79E+01	1.00E+02	2.94E-08	5.26E-07	2.00E-02	2.63E-05	5.83%
Pathway Total						3.91E-04	86.76%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.51E+00	1.00E+00	2.48E-07	3.74E-09	4.00E-04	9.36E-06	2.07%
Arsenic	1.60E+00	3.00E+00	2.48E-07	1.19E-08	3.00E-04	3.97E-05	8.80%
Cadmium	5.20E-01	1.00E-01	2.48E-07	1.29E-10	5.00E-04	2.58E-07	.06%
Copper	2.21E+01	1.00E+00	2.48E-07	5.49E-08	3.70E-02	1.48E-06	.33%
Mercury	5.00E-01	1.00E+00	2.48E-07	1.24E-09	3.00E-04	4.13E-06	.92%
Nickel	1.79E+01	1.00E+00	2.48E-07	4.44E-08	2.00E-02	2.22E-06	.49%
Pathway Total						5.71E-05	12.67%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.74E-08	1.00E+02	1.32E-02	2.29E-10	4.00E-04	5.73E-07	.13%
Arsenic	1.84E-08	1.00E+02	1.32E-02	2.43E-10	3.00E-04	8.10E-07	.18%
Cadmium	5.98E-09	1.00E+02	1.32E-02	7.89E-11	5.00E-04	1.58E-07	.04%
Copper	2.54E-07	1.00E+02	1.32E-02	3.36E-09	3.70E-02	9.08E-08	.02%
Mercury	5.75E-09	1.00E+02	1.32E-02	7.59E-11	9.00E-05	8.43E-07	.19%
Nickel	2.06E-07	1.00E+02	1.32E-02	2.72E-09	2.00E-02	1.36E-07	.03%
Pathway Total						2.61E-06	.59%
Multipathway Total						5E-04	

Table E20. Estimated Cancer Risk Detail
Construction Worker - Average Scenario, Sites 16 and 17 - Site 17 Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.60E+00	1.00E+02	4.19E-10	6.70E-10	1.75E+00	1.17E-09	64.89%
TCDD-TE	7.11E-06	4.30E+01	4.19E-10	1.28E-15	1.50E+05	1.92E-10	10.65%
Pathway Total						1.36E-09	75.54%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.60E+00	3.00E+00	3.54E-09	1.70E-10	1.75E+00	2.97E-10	16.47%
TCDD-TE	7.11E-06	1.00E+00	3.54E-09	2.52E-16	1.50E+05	3.78E-11	2.10%
Pathway Total						3.35E-10	18.57%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.84E-08	1.00E+02	1.88E-04	3.46E-12	1.50E+01	5.19E-11	2.88%
Cadmium	5.98E-09	1.00E+02	1.88E-04	1.12E-12	1.50E+01	1.69E-11	.94%
Nickel	2.06E-07	1.00E+02	1.88E-04	3.87E-11	9.10E-01	3.52E-11	1.95%
TCDD-TE	8.18E-14	1.00E+02	1.88E-04	1.54E-17	1.50E+05	2.31E-12	.13%
Pathway Total						1.06E-10	5.90%
Multipathway Total						2E-09	

Table E21. Hazard Quotient and Index Detail
Construction Worker - RME Scenario, Sites 16 and 17 - Site 17 Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	4.27E+00	1.00E+02	4.70E-06	2.01E-05	4.00E-04	5.02E-02	18.30%
Arsenic	6.52E+00	1.00E+02	4.70E-06	3.06E-05	3.00E-04	1.02E-01	37.18%
Cadmium	1.53E+00	1.00E+02	4.70E-06	7.19E-06	5.00E-04	1.44E-02	5.25%
Copper	1.37E+02	1.00E+02	4.70E-06	6.43E-04	3.70E-02	1.74E-02	6.34%
Mercury	3.38E+00	1.00E+02	4.70E-06	1.59E-05	3.00E-04	5.30E-02	19.32%
Nickel	8.30E+01	1.00E+02	4.70E-06	3.90E-04	2.00E-02	1.95E-02	7.11%
Pathway Total						2.57E-01	93.50%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	4.27E+00	1.00E+00	1.85E-05	7.90E-07	4.00E-04	1.97E-03	.72%
Arsenic	6.52E+00	3.00E+00	1.85E-05	3.62E-06	3.00E-04	1.21E-02	4.41%
Cadmium	1.53E+00	1.00E-01	1.85E-05	2.83E-08	5.00E-04	5.66E-05	.02%
Copper	1.37E+02	1.00E+00	1.85E-05	2.53E-05	3.70E-02	6.84E-04	.25%
Mercury	3.38E+00	1.00E+00	1.85E-05	6.25E-07	3.00E-04	2.08E-03	.76%
Nickel	8.30E+01	1.00E+00	1.85E-05	1.54E-05	2.00E-02	7.68E-04	.28%
Pathway Total						1.77E-02	6.44%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	4.91E-08	1.00E+02	2.35E-01	1.15E-08	4.00E-04	2.88E-05	.01%
Arsenic	7.50E-08	1.00E+02	2.35E-01	1.76E-08	3.00E-04	5.87E-05	.02%
Cadmium	1.76E-08	1.00E+02	2.35E-01	4.13E-09	5.00E-04	8.27E-06	.00%
Copper	1.57E-06	1.00E+02	2.35E-01	3.70E-07	3.70E-02	9.99E-06	.00%
Mercury	3.89E-08	1.00E+02	2.35E-01	9.13E-09	9.00E-05	1.01E-04	.04%
Nickel	9.54E-07	1.00E+02	2.35E-01	2.24E-07	2.00E-02	1.12E-05	.00%
Pathway Total						2.18E-04	.07%
Multipathway Total						3E-01	

Table E21. Estimated Cancer Risk Detail
Construction Worker - RME Scenario, Sites 16 and 17 - Site 17 Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	6.52E+00	1.00E+02	6.71E-08	4.37E-07	1.75E+00	7.66E-07	76.06%
TCDD-TE	3.02E-05	4.30E+01	6.71E-08	8.71E-13	1.50E+05	1.31E-07	13.01%
Pathway Total						8.97E-07	89.07%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	6.52E+00	3.00E+00	2.64E-07	5.16E-08	1.75E+00	9.04E-08	8.98%
TCDD-TE	3.02E-05	1.00E+00	2.64E-07	7.97E-14	1.50E+05	1.20E-08	1.19%
Pathway Total						1.02E-07	10.17%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	7.50E-08	1.00E+02	3.35E-03	2.51E-10	1.50E+01	3.77E-09	.37%
Cadmium	1.76E-08	1.00E+02	3.35E-03	5.89E-11	1.50E+01	8.84E-10	.09%
Nickel	9.54E-07	1.00E+02	3.35E-03	3.20E-09	9.10E-01	2.91E-09	.29%
TCDD-TE	3.47E-13	1.00E+02	3.35E-03	1.16E-15	1.50E+05	1.74E-10	.02%
Pathway Total						7.74E-09	.77%
Multipathway Total						1E-06	

Table E22. Hazard Quotient and Index Detail
Construction Worker - Average Scenario, Sites 16 and 17 - DOL Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.15E+00	1.00E+02	2.94E-08	9.26E-08	3.00E-04	3.09E-04	73.08%
Bis(2-ethylhexyl)phthalate	1.15E+00	1.00E+02	2.94E-08	3.37E-08	2.00E-02	1.69E-06	.40%
Cadmium	5.20E-01	1.00E+02	2.94E-08	1.53E-08	5.00E-04	3.06E-05	7.24%
Pathway Total						3.41E-04	80.72%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.15E+00	3.00E+00	2.48E-07	2.34E-08	3.00E-04	7.81E-05	18.47%
Bis(2-ethylhexyl)phthalate	1.15E+00	1.00E+01	2.48E-07	2.85E-08	2.00E-02	1.42E-06	.34%
Cadmium	5.20E-01	1.00E-01	2.48E-07	1.29E-10	5.00E-04	2.58E-07	.06%
Pathway Total						7.98E-05	18.87%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.62E-08	1.00E+02	1.32E-02	4.78E-10	3.00E-04	1.59E-06	.38%
Bis(2-ethylhexyl)phthalate	1.32E-08	1.00E+02	1.32E-02	1.74E-10	2.00E-02	8.71E-09	.00%
Cadmium	5.98E-09	1.00E+02	1.32E-02	7.89E-11	5.00E-04	1.58E-07	.04%
Pathway Total						1.76E-06	.42%
Multipathway Total						4E-04	

Table E22. Estimated Cancer Risk Detail
Construction Worker - Average Scenario, Sites 16 and 17 - DOL Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.15E+00	1.00E+02	4.19E-10	1.32E-09	1.75E+00	2.31E-09	74.65%
Bis(2-ethylhexyl)phthalate	1.15E+00	1.00E+02	4.19E-10	4.81E-10	1.40E-02	6.73E-12	.22%
TCDD-TE	2.09E-06	4.30E+01	4.19E-10	3.77E-16	1.50E+05	5.65E-11	1.83%
Pathway Total						2.37E-09	76.70%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.15E+00	3.00E+00	3.54E-09	3.35E-10	1.75E+00	5.85E-10	18.90%
Bis(2-ethylhexyl)phthalate	1.15E+00	1.00E+01	3.54E-09	4.06E-10	1.40E-02	5.69E-12	.18%
TCDD-TE	2.09E-06	1.00E+00	3.54E-09	7.40E-17	1.50E+05	1.11E-11	.36%
Pathway Total						6.02E-10	19.44%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.62E-08	1.00E+02	1.88E-04	6.81E-12	1.50E+01	1.02E-10	3.30%
Bis(2-ethylhexyl)phthalate	1.32E-08	1.00E+02	1.88E-04	2.48E-12	8.40E-03	2.08E-14	.00%
Cadmium	5.98E-09	1.00E+02	1.88E-04	1.12E-12	1.50E+01	1.69E-11	.55%
TCDD-TE	2.40E-14	1.00E+02	1.88E-04	4.52E-18	1.50E+05	6.78E-13	.02%
Pathway Total						1.20E-10	3.87%
Multipathway Total						3E-09	

Table E23. Hazard Quotient and Index Detail
Construction Worker - RME Scenario, Sites 16 and 17 - DOL Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.57E+01	1.00E+02	4.70E-06	7.36E-05	3.00E-04	2.45E-01	83.95%
Bis(2-ethylhexyl)phthalate	3.72E+00	1.00E+02	4.70E-06	1.75E-05	2.00E-02	8.73E-04	.30%
Cadmium	1.75E+00	1.00E+02	4.70E-06	8.23E-06	5.00E-04	1.64E-02	5.62%
Pathway Total						2.62E-01	89.87%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.57E+01	3.00E+00	1.85E-05	8.69E-06	3.00E-04	2.90E-02	9.94%
Bis(2-ethylhexyl)phthalate	3.72E+00	1.00E+01	1.85E-05	6.88E-06	2.00E-02	3.44E-04	.12%
Cadmium	1.75E+00	1.00E-01	1.85E-05	3.24E-08	5.00E-04	6.48E-05	.02%
Pathway Total						2.94E-02	10.08%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.80E-07	1.00E+02	2.35E-01	4.23E-08	3.00E-04	1.41E-04	.05%
Bis(2-ethylhexyl)phthalate	4.27E-08	1.00E+02	2.35E-01	1.00E-08	2.00E-02	5.02E-07	.00%
Cadmium	2.01E-08	1.00E+02	2.35E-01	4.73E-09	5.00E-04	9.46E-06	.00%
Pathway Total						1.51E-04	.05%
Multipathway Total						3E-01	

Table E23. Estimated Cancer Risk Detail
Construction Worker - RME Scenario, Sites 16 and 17 - DOL Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.57E+01	1.00E+02	6.71E-08	1.05E-06	1.75E+00	1.84E-06	87.66%
Bis(2-ethylhexyl)phthalate	3.72E+00	1.00E+02	6.71E-08	2.49E-07	1.40E-02	3.49E-09	.17%
TCDD-TE	5.76E-06	4.30E+01	6.71E-08	1.66E-13	1.50E+05	2.49E-08	1.19%
Pathway Total						1.87E-06	89.02%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.57E+01	3.00E+00	2.64E-07	1.24E-07	1.75E+00	2.17E-07	10.34%
Bis(2-ethylhexyl)phthalate	3.72E+00	1.00E+01	2.64E-07	9.81E-08	1.40E-02	1.37E-09	.07%
TCDD-TE	5.76E-06	1.00E+00	2.64E-07	1.52E-14	1.50E+05	2.28E-09	.11%
Pathway Total						2.21E-07	10.52%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.80E-07	1.00E+02	3.35E-03	6.03E-10	1.50E+01	9.04E-09	.43%
Bis(2-ethylhexyl)phthalate	4.27E-08	1.00E+02	3.35E-03	1.43E-10	8.40E-03	1.20E-12	.00%
Cadmium	2.01E-08	1.00E+02	3.35E-03	6.74E-11	1.50E+01	1.01E-09	.05%
TCDD-TE	6.62E-14	1.00E+02	3.35E-03	2.22E-16	1.50E+05	3.33E-11	.00%
Pathway Total						1.01E-08	.48%
Multipathway Total						2E-06	

Table E24. Hazard Quotient and Index Detail
Commercial Worker - Average Scenario, Sites 16 and 17 - DOL Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	8.73E+00	1.00E+02	2.45E-07	2.14E-06	3.00E-04	7.13E-03	75.08%
Cadmium	1.10E+00	1.00E+02	2.45E-07	2.70E-07	5.00E-04	5.39E-04	5.68%
Pathway Total						7.67E-03	80.76%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	8.73E+00	3.00E+00	2.06E-06	5.40E-07	3.00E-04	1.80E-03	18.95%
Cadmium	1.10E+00	1.00E-01	2.06E-06	2.27E-09	5.00E-04	4.53E-06	.05%
Pathway Total						1.80E-03	19.00%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.00E-07	1.00E+02	6.50E-02	6.53E-09	3.00E-04	2.18E-05	.23%
Cadmium	1.27E-08	1.00E+02	6.50E-02	8.22E-10	5.00E-04	1.64E-06	.02%
Pathway Total						2.34E-05	.25%
Multipathway Total						9E-03	

Table E24. Estimated Cancer Risk Detail
Commercial Worker - Average Scenario, Sites 16 and 17 - DOL Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	8.73E+00	1.00E+02	3.49E-08	3.05E-07	1.75E+00	5.33E-07	77.31%
TCDD-TE	2.09E-06	4.30E+01	3.49E-08	3.14E-14	1.50E+05	4.70E-09	.68%
Pathway Total						5.38E-07	77.99%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	8.73E+00	3.00E+00	2.95E-07	7.73E-08	1.75E+00	1.35E-07	19.58%
TCDD-TE	2.09E-06	1.00E+00	2.95E-07	6.17E-15	1.50E+05	9.25E-10	.13%
Pathway Total						1.36E-07	19.71%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.00E-07	1.00E+02	9.28E-03	9.32E-10	1.50E+01	1.40E-08	2.03%
Cadmium	1.27E-08	1.00E+02	9.28E-03	1.17E-10	1.50E+01	1.76E-09	.26%
TCDD-TE	2.40E-14	1.00E+02	9.28E-03	2.23E-16	1.50E+05	3.35E-11	.00%
Pathway Total						1.58E-08	2.29%
Multipathway Total						7E-07	

Table E25. Hazard Quotient and Index Detail
Commercial Worker - RME Scenario, Sites 16 and 17 - DOL Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.23E+01	1.00E+02	4.89E-07	1.09E-05	3.00E-04	3.63E-02	45.30%
Cadmium	2.40E+00	1.00E+02	4.89E-07	1.17E-06	5.00E-04	2.35E-03	2.93%
Pathway Total						3.86E-02	48.23%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.23E+01	3.00E+00	1.85E-05	1.24E-05	3.00E-04	4.13E-02	51.54%
Cadmium	2.40E+00	1.00E-01	1.85E-05	4.44E-08	5.00E-04	8.88E-05	.11%
Pathway Total						4.14E-02	51.65%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.56E-07	1.00E+02	9.78E-02	2.51E-08	3.00E-04	8.36E-05	.10%
Cadmium	2.76E-08	1.00E+02	9.78E-02	2.70E-09	5.00E-04	5.40E-06	.01%
Pathway Total						8.90E-05	.11%
Multipathway Total						8E-02	

Table E25. Estimated Cancer Risk Detail
Commercial Worker - RME Scenario, Sites 16 and 17 - DOL Yard
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.23E+01	1.00E+02	1.75E-07	3.90E-06	1.75E+00	6.83E-06	46.08%
TCDD-TE	5.76E-06	4.30E+01	1.75E-07	4.33E-13	1.50E+05	6.50E-08	.44%
Pathway Total						6.90E-06	46.52%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.23E+01	3.00E+00	6.59E-06	4.41E-06	1.75E+00	7.72E-06	52.09%
TCDD-TE	5.76E-06	1.00E+00	6.59E-06	3.80E-13	1.50E+05	5.69E-08	.38%
Pathway Total						7.78E-06	52.47%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.56E-07	1.00E+02	3.49E-02	8.95E-09	1.50E+01	1.34E-07	.90%
Cadmium	2.76E-08	1.00E+02	3.49E-02	9.63E-10	1.50E+01	1.44E-08	.10%
TCDD-TE	6.62E-14	1.00E+02	3.49E-02	2.31E-15	1.50E+05	3.47E-10	.00%
Pathway Total						1.49E-07	1.00%
Multipathway Total						1E-05	

SITE 3

Table E26. Hazard Quotient and Index Detail
Resident Ages 0-6 - Average Scenario, Site 3
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.28E-07	1.00E+02	2.77E-02	3.56E-09	4.00E-04	8.89E-06	96.80%
Copper	3.93E-07	1.00E+02	2.77E-02	1.09E-08	3.70E-02	2.94E-07	3.20%
Pathway Total						9.18E-06	100.00%

Multipathway Total	9E-06

Table E27. Hazard Quotient and Index Detail
Resident Ages 0-6 - RME Scenario, Site 3
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	6.73E+01	1.00E+00	1.78E-05	1.20E-05	4.00E-04	3.00E-02	4.30%
Copper	2.70E+02	1.00E+00	1.78E-05	4.81E-05	3.70E-02	1.30E-03	.19%
Pathway Total						3.13E-02	4.49%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	6.73E+01	1.00E+02	3.80E-06	2.56E-04	4.00E-04	6.39E-01	91.52%
Copper	2.70E+02	1.00E+02	3.80E-06	1.03E-03	3.70E-02	2.78E-02	3.98%
Pathway Total						6.67E-01	95.50%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	7.74E-07	1.00E+02	4.71E-02	3.65E-08	4.00E-04	9.11E-05	.01%
Copper	3.11E-06	1.00E+02	4.71E-02	1.46E-07	3.70E-02	3.96E-06	.00%
Pathway Total						9.51E-05	.01%
Multipathway Total						7E-01	

Table E28. Hazard Quotient and Index Detail
Resident Ages 6-9 - Average Scenario, Site 3
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.28E-07	1.00E+02	2.01E-02	2.58E-09	4.00E-04	6.45E-06	96.79%
Copper	3.93E-07	1.00E+02	2.01E-02	7.90E-09	3.70E-02	2.14E-07	3.21%
Pathway Total						6.66E-06	100.00%
Multipathway Total						7E-06	

Table E29. Hazard Quotient and Index Detail
Resident Ages 6-18 - RME Scenario, Site 3
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	6.73E+01	1.00E+00	9.62E-06	6.48E-06	4.00E-04	1.62E-02	12.50%
Copper	2.70E+02	1.00E+00	9.62E-06	2.60E-05	3.70E-02	7.03E-04	.54%
Pathway Total						1.69E-02	13.04%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	6.73E+01	1.00E+02	6.39E-07	4.30E-05	4.00E-04	1.08E-01	83.32%
Copper	2.70E+02	1.00E+02	6.39E-07	1.73E-04	3.70E-02	4.67E-03	3.60%
Pathway Total						1.13E-01	86.92%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	7.74E-07	1.00E+02	2.39E-02	1.85E-08	4.00E-04	4.63E-05	.04%
Copper	3.11E-06	1.00E+02	2.39E-02	7.43E-08	3.70E-02	2.01E-06	.00%
Pathway Total						4.83E-05	.04%
Multipathway Total						1E-01	

Table E30. Hazard Quotient and Index Detail
Resident Ages 18-30 - RME Scenario, Site 3
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	6.73E+01	1.00E+00	7.16E-06	4.82E-06	4.00E-04	1.20E-02	15.15%
Copper	2.70E+02	1.00E+00	7.16E-06	1.94E-05	3.70E-02	5.23E-04	.66%
Pathway Total						1.25E-02	15.81%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	6.73E+01	1.00E+02	3.80E-07	2.56E-05	4.00E-04	6.39E-02	80.66%
Copper	2.70E+02	1.00E+02	3.80E-07	1.03E-04	3.70E-02	2.78E-03	3.51%
Pathway Total						6.67E-02	84.17%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	7.74E-07	1.00E+02	9.49E-03	7.35E-09	4.00E-04	1.84E-05	.02%
Copper	3.11E-06	1.00E+02	9.49E-03	2.95E-08	3.70E-02	7.98E-07	.00%
Pathway Total						1.92E-05	.02%
Multipathway Total						8E-02	

Table E33. Hazard Quotient and Index Detail
Resident 0-6 - Average Scenario, Site 3 - Surface Area Between 1 and 10%
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	3.67E-07	1.00E+02	2.77E-02	1.02E-08	4.00E-04	2.54E-05	94.63%
Copper	1.92E-06	1.00E+02	2.77E-02	5.32E-08	3.70E-02	1.44E-06	5.37%
Pathway Total						2.68E-05	100.00%
Multipathway Total						3E-05	

Table E34. Hazard Quotient and Index Detail
Resident 0-6 - RME Scenario, Site 3 - Surface Area Between 1 and 10%
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.06E+02	1.00E+00	1.78E-05	3.68E-05	4.00E-04	9.19E-02	4.28%
Copper	8.84E+02	1.00E+00	1.78E-05	1.57E-04	3.70E-02	4.25E-03	.20%
Pathway Total						9.61E-02	4.48%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.06E+02	1.00E+02	3.80E-06	7.85E-04	4.00E-04	1.96E+00	91.28%
Copper	8.84E+02	1.00E+02	3.80E-06	3.36E-03	3.70E-02	9.08E-02	4.23%
Pathway Total						2.05E+00	95.51%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.37E-06	1.00E+02	4.71E-02	1.12E-07	4.00E-04	2.80E-04	.01%
Copper	1.02E-05	1.00E+02	4.71E-02	4.79E-07	3.70E-02	1.29E-05	.00%
Pathway Total						2.93E-04	.01%
Multipathway Total						2E+00	

Table E35. Hazard Quotient and Index Detail
Resident 6-9 - Average Scenario, Site 3 - Surface Area Between 1 and 10%
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	3.67E-07	1.00E+02	2.77E-02	1.02E-08	4.00E-04	2.54E-05	94.63%
Copper	1.92E-06	1.00E+02	2.77E-02	5.32E-08	3.70E-02	1.44E-06	5.37%
Pathway Total						2.68E-05	100.00%
Multipathway Total						3E-05	

Table E36. Hazard Quotient and Index Detail
Resident 6-18 - RME Scenario, Site 3 - Surface Area Between 1 and 10%
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.06E+02	1.00E+00	9.62E-06	1.99E-05	4.00E-04	4.97E-02	12.50%
Copper	8.84E+02	1.00E+00	9.62E-06	8.51E-05	3.70E-02	2.30E-03	.58%
Pathway Total						5.20E-02	13.08%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.06E+02	1.00E+02	6.39E-07	1.32E-04	4.00E-04	3.30E-01	83.03%
Copper	8.84E+02	1.00E+02	6.39E-07	5.65E-04	3.70E-02	1.53E-02	3.85%
Pathway Total						3.45E-01	86.88%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.37E-06	1.00E+02	2.39E-02	5.68E-08	4.00E-04	1.42E-04	.04%
Copper	1.02E-05	1.00E+02	2.39E-02	2.43E-07	3.70E-02	6.57E-06	.00%
Pathway Total						1.49E-04	.04%
Multipathway Total						4E-01	

Table E37. Hazard Quotient and Index Detail
Resident 18-30 - Average Scenario, Site 3 - Surface Area Between 1 and 10%
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.06E+02	1.00E+00	7.16E-06	1.48E-05	4.00E-04	3.70E-02	15.17%
Copper	8.84E+02	1.00E+00	7.16E-06	6.33E-05	3.70E-02	1.71E-03	.70%
Pathway Total						3.87E-02	15.87%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.06E+02	1.00E+02	3.80E-07	7.85E-05	4.00E-04	1.96E-01	80.38%
Copper	8.84E+02	1.00E+02	3.80E-07	3.36E-04	3.70E-02	9.08E-03	3.72%
Pathway Total						2.05E-01	84.10%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.37E-06	1.00E+02	9.49E-03	2.25E-08	4.00E-04	5.63E-05	.02%
Copper	1.02E-05	1.00E+02	9.49E-03	9.65E-08	3.70E-02	2.61E-06	.00%
Pathway Total						5.89E-05	.02%
Multipathway Total						2E-01	

Table E38. Hazard Quotient and Index Detail
Park Ranger - Average Scenario, Site 3 - Surface Area Between 1 and 10%
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	3.19E+01	1.00E+00	1.65E-05	5.27E-06	4.00E-04	1.32E-02	38.02%
Copper	1.67E+02	1.00E+00	1.65E-05	2.76E-05	3.70E-02	7.45E-04	2.15%
Pathway Total						1.39E-02	40.17%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	3.19E+01	1.00E+02	2.45E-07	7.82E-06	4.00E-04	1.96E-02	56.45%
Copper	1.67E+02	1.00E+02	2.45E-07	4.09E-05	3.70E-02	1.11E-03	3.20%
Pathway Total						2.07E-02	59.65%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	3.67E-07	1.00E+02	6.50E-02	2.39E-08	4.00E-04	5.97E-05	.17%
Copper	1.92E-06	1.00E+02	6.50E-02	1.25E-07	3.70E-02	3.38E-06	.01%
Pathway Total						6.31E-05	.18%
Multipathway Total						3E-02	

Table E39. Hazard Quotient and Index Detail
Park Ranger - RME Scenario, Site 3 - Surface Area Between 1 and 10%
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.06E+02	1.00E+00	1.48E-04	3.06E-04	4.00E-04	7.64E-01	57.51%
Copper	8.84E+02	1.00E+00	1.48E-04	1.31E-03	3.70E-02	3.54E-02	2.66%
Pathway Total						7.99E-01	60.17%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.06E+02	1.00E+02	9.78E-07	2.02E-04	4.00E-04	5.05E-01	38.02%
Copper	8.84E+02	1.00E+02	9.78E-07	8.65E-04	3.70E-02	2.34E-02	1.76%
Pathway Total						5.28E-01	39.78%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.37E-06	1.00E+02	9.78E-02	2.32E-07	4.00E-04	5.81E-04	.04%
Copper	1.02E-05	1.00E+02	9.78E-02	9.95E-07	3.70E-02	2.69E-05	.00%
Pathway Total						6.08E-04	.04%
Multipathway Total						1E+00	

Table E40. Hazard Quotient and Index Detail
Resident 0-6 - Average Scenario, Site 3 - Surface Area Greater Than 10%
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	6.15E-06	1.00E+02	2.77E-02	1.70E-07	4.00E-04	4.26E-04	96.42%
Copper	2.10E-05	1.00E+02	2.77E-02	5.83E-07	3.70E-02	1.58E-05	3.58%
Pathway Total						4.42E-04	100.00%
Multipathway Total						4E-04	

Table E41. Hazard Quotient and Index Detail
Resident 0-6 - RME Scenario, Site 3 - Surface Area Greater Than 10%
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.50E+03	1.00E+00	1.78E-05	4.45E-04	4.00E-04	1.11E+00	4.28%
Copper	1.07E+04	1.00E+00	1.78E-05	1.90E-03	3.70E-02	5.13E-02	.20%
Pathway Total						1.16E+00	4.48%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.50E+03	1.00E+02	3.80E-06	9.49E-03	4.00E-04	2.37E+01	91.31%
Copper	1.07E+04	1.00E+02	3.80E-06	4.05E-02	3.70E-02	1.09E+00	4.20%
Pathway Total						2.48E+01	95.51%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.87E-05	1.00E+02	4.71E-02	1.35E-06	4.00E-04	3.38E-03	.01%
Copper	1.23E-04	1.00E+02	4.71E-02	5.77E-06	3.70E-02	1.56E-04	.00%
Pathway Total						3.54E-03	.01%
Multipathway Total						3E+01	

Table E42. Hazard Quotient and Index Detail
Resident 6-9 - Average Scenario, Site 3 - Surface Area Greater Than 10%
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	6.15E-06	1.00E+02	2.77E-02	1.70E-07	4.00E-04	4.26E-04	96.42%
Copper	2.10E-05	1.00E+02	2.77E-02	5.83E-07	3.70E-02	1.58E-05	3.58%
Pathway Total						4.42E-04	100.00%
Multipathway Total						4E-04	

Table E43. Hazard Quotient and Index Detail
Resident 6-18 - RME Scenario, Site 3 - Surface Area Greater Than 10%
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.50E+03	1.00E+00	9.62E-06	2.40E-04	4.00E-04	6.01E-01	12.51%
Copper	1.07E+04	1.00E+00	9.62E-06	1.03E-03	3.70E-02	2.77E-02	.58%
Pathway Total						6.29E-01	13.09%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.50E+03	1.00E+02	6.39E-07	1.60E-03	4.00E-04	3.99E+00	83.05%
Copper	1.07E+04	1.00E+02	6.39E-07	6.81E-03	3.70E-02	1.84E-01	3.83%
Pathway Total						4.17E+00	86.88%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.87E-05	1.00E+02	2.39E-02	6.87E-07	4.00E-04	1.72E-03	.04%
Copper	1.23E-04	1.00E+02	2.39E-02	2.93E-06	3.70E-02	7.92E-05	.00%
Pathway Total						1.80E-03	.04%
Multipathway Total						5E+00	

Table E44. Hazard Quotient and Index Detail
Resident 18-30 - RME Scenario, Site 3 - Surface Area Greater Than 10%
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.50E+03	1.00E+00	7.16E-06	1.79E-04	4.00E-04	4.47E-01	15.17%
Copper	1.07E+04	1.00E+00	7.16E-06	7.63E-04	3.70E-02	2.06E-02	.70%
Pathway Total						4.68E-01	15.87%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.50E+03	1.00E+02	3.80E-07	9.49E-04	4.00E-04	2.37E+00	80.41%
Copper	1.07E+04	1.00E+02	3.80E-07	4.05E-03	3.70E-02	1.09E-01	3.70%
Pathway Total						2.48E+00	84.11%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.87E-05	1.00E+02	9.49E-03	2.73E-07	4.00E-04	6.82E-04	.02%
Copper	1.23E-04	1.00E+02	9.49E-03	1.16E-06	3.70E-02	3.14E-05	.00%
Pathway Total						7.13E-04	.02%
Multipathway Total						3E+00	

Table E45. Hazard Quotient and Index Detail
Park Ranger - Average Scenario, Site 3 - Surface Area Greater Than 10%
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	5.34E+02	1.00E+00	1.65E-05	8.82E-05	4.00E-04	2.20E-01	38.71%
Copper	1.83E+03	1.00E+00	1.65E-05	3.02E-04	3.70E-02	8.16E-03	1.44%
Pathway Total						2.28E-01	40.15%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	5.34E+02	1.00E+02	2.45E-07	1.31E-04	4.00E-04	3.27E-01	57.54%
Copper	1.83E+03	1.00E+02	2.45E-07	4.48E-04	3.70E-02	1.21E-02	2.13%
Pathway Total						3.39E-01	59.67%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	6.15E-06	1.00E+02	6.50E-02	4.00E-07	4.00E-04	9.99E-04	.18%
Copper	2.10E-05	1.00E+02	6.50E-02	1.37E-06	3.70E-02	3.70E-05	.01%
Pathway Total						1.04E-03	.19%
Multipathway Total						6E-01	

Table E46. Hazard Quotient and Index Detail
Park Ranger - RME Scenario, Site 3 - Surface Area Greater Than 10%
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.50E+03	1.00E+00	1.48E-04	3.70E-03	4.00E-04	9.24E+00	57.52%
Copper	1.07E+04	1.00E+00	1.48E-04	1.58E-02	3.70E-02	4.26E-01	2.65%
Pathway Total						9.67E+00	60.17%
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.50E+03	1.00E+02	9.78E-07	2.44E-03	4.00E-04	6.11E+00	38.03%
Copper	1.07E+04	1.00E+02	9.78E-07	1.04E-02	3.70E-02	2.82E-01	1.76%
Pathway Total						6.39E+00	39.79%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.87E-05	1.00E+02	9.78E-02	2.81E-06	4.00E-04	7.03E-03	.04%
Copper	1.23E-04	1.00E+02	9.78E-02	1.20E-05	3.70E-02	3.24E-04	.00%
Pathway Total						7.35E-03	.04%
Multipathway Total						2E+01	

SITE 31

Table E47. Hazard Quotient and Index Detail
Nearby Resident Ages 6-9 - Average Scenario, Site 31 - North Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.47E+00	1.00E+02	4.35E-08	1.07E-07	4.00E-04	2.69E-04	33.78%
Arsenic	1.75E+00	1.00E+02	4.35E-08	7.61E-08	3.00E-04	2.54E-04	31.90%
Beryllium	1.80E-01	1.00E+02	4.35E-08	7.83E-09	5.00E-03	1.57E-06	.20%
Cadmium	1.35E+00	1.00E+02	4.35E-08	5.87E-08	5.00E-04	1.17E-04	14.69%
Copper	4.60E+01	1.00E+02	4.35E-08	2.00E-06	3.70E-02	5.41E-05	6.79%
4,4'-DDT	2.37E-01	1.00E+02	4.35E-08	1.03E-08	5.00E-04	2.06E-05	2.59%
Total Carcinogenic PAHs	2.03E-01	1.00E+02	4.35E-08	8.83E-09	3.00E-02	2.94E-07	.04%
Pathway Total						7.17E-04	89.99%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.47E+00	1.00E+00	2.84E-07	7.01E-09	4.00E-04	1.75E-05	2.20%
Arsenic	1.75E+00	3.00E+00	2.84E-07	1.49E-08	3.00E-04	4.97E-05	6.24%
Beryllium	1.80E-01	1.00E+00	2.84E-07	5.11E-10	5.00E-03	1.02E-07	.01%
Cadmium	1.35E+00	1.00E-01	2.84E-07	3.83E-10	5.00E-04	7.67E-07	.10%
Copper	4.60E+01	1.00E+00	2.84E-07	1.31E-07	3.70E-02	3.53E-06	.44%
4,4'-DDT	2.37E-01	5.00E+00	2.84E-07	3.36E-09	5.00E-04	6.72E-06	.84%
Total Carcinogenic PAHs	2.03E-01	1.50E+01	2.84E-07	8.65E-09	3.00E-02	2.88E-07	.04%
Pathway Total						7.86E-05	9.87%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.84E-08	1.00E+02	5.60E-03	1.59E-10	4.00E-04	3.98E-07	.05%
Arsenic	2.01E-08	1.00E+02	5.60E-03	1.13E-10	3.00E-04	3.76E-07	.05%
Beryllium	2.07E-09	1.00E+02	5.60E-03	1.16E-11	5.00E-03	2.32E-09	.00%
Cadmium	1.55E-08	1.00E+02	5.60E-03	8.69E-11	5.00E-04	1.74E-07	.02%
Copper	5.16E-07	1.00E+02	5.60E-03	2.89E-09	3.70E-02	7.80E-08	.01%
4,4'-DDT	2.72E-09	1.00E+02	5.60E-03	1.52E-11	5.00E-04	3.05E-08	.00%
Total Carcinogenic PAHs	2.33E-09	1.00E+02	5.60E-03	1.30E-11	3.00E-02	4.35E-10	.00%
Pathway Total						1.06E-06	.13%
Multipathway Total						8E-04	

Table E47. Estimated Cancer Risk Detail
Nearby Resident Ages 6-9 - Average Scenario, Site 31 - North Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.75E+00	1.00E+02	1.86E-09	3.26E-09	1.75E+00	5.70E-09	39.50%
B(a)P-TE	7.85E-02	1.00E+02	1.86E-09	1.46E-10	1.20E+01	1.75E-09	12.13%
Beryllium	1.80E-01	1.00E+02	1.86E-09	3.35E-10	7.00E+00	2.34E-09	16.22%
4,4'-DDE	2.01E-01	1.00E+02	1.86E-09	3.74E-10	3.40E-01	1.27E-10	.88%
4,4'-DDT	2.37E-01	1.00E+02	1.86E-09	4.40E-10	3.40E-01	1.50E-10	1.04%
TCDD-TE	8.24E-06	4.30E+01	1.86E-09	6.59E-15	1.50E+05	9.89E-10	6.85%
Pathway Total						1.11E-08	76.62%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.75E+00	3.00E+00	1.22E-08	6.41E-10	1.75E+00	1.12E-09	7.76%
B(a)P-TE	7.85E-02	1.50E+01	1.22E-08	1.44E-10	1.20E+01	1.72E-09	11.92%
Beryllium	1.80E-01	1.00E+00	1.22E-08	2.20E-11	7.00E+00	1.54E-10	1.07%
4,4'-DDE	2.01E-01	5.00E+00	1.22E-08	1.23E-10	3.40E-01	4.17E-11	.29%
4,4'-DDT	2.37E-01	5.00E+00	1.22E-08	1.44E-10	3.40E-01	4.91E-11	.34%
TCDD-TE	8.24E-06	1.00E+00	1.22E-08	1.01E-15	1.50E+05	1.51E-10	1.05%
Pathway Total						3.24E-09	22.43%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	2.01E-08	1.00E+02	2.40E-04	4.83E-12	1.50E+01	7.25E-11	.50%
B(a)P-TE	9.03E-10	1.00E+02	2.40E-04	2.17E-13	1.20E+01	2.60E-12	.02%
Beryllium	2.07E-09	1.00E+02	2.40E-04	4.97E-13	8.40E+00	4.17E-12	.03%
Cadmium	1.55E-08	1.00E+02	2.40E-04	3.73E-12	1.50E+01	5.59E-11	.39%
4,4'-DDE	2.31E-09	1.00E+02	2.40E-04	5.54E-13	3.40E-01	1.88E-13	.00%
4,4'-DDT	2.72E-09	1.00E+02	2.40E-04	6.53E-13	3.40E-01	2.22E-13	.00%
TCDD-TE	9.48E-14	1.00E+02	2.40E-04	2.27E-17	1.50E+05	3.41E-12	.02%
Pathway Total						1.39E-10	.96%
Multipathway Total						1E-08	

Table E48. Hazard Quotient and Index Detail
Nearby Resident Ages 6-18 - RME Scenario, Site 31 - North Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.33E+01	1.00E+02	2.09E-07	2.78E-06	4.00E-04	6.94E-03	40.13%
Arsenic	4.59E+00	1.00E+02	2.09E-07	9.59E-07	3.00E-04	3.20E-03	18.50%
Beryllium	3.50E-01	1.00E+02	2.09E-07	7.32E-08	5.00E-03	1.46E-05	.08%
Cadmium	5.03E+00	1.00E+02	2.09E-07	1.05E-06	5.00E-04	2.10E-03	12.14%
Copper	2.38E+02	1.00E+02	2.09E-07	4.97E-05	3.70E-02	1.34E-03	7.75%
4,4'-DDT	1.33E+00	1.00E+02	2.09E-07	2.78E-07	5.00E-04	5.56E-04	3.21%
Total Carcinogenic PAHs	2.03E-01	1.00E+02	2.09E-07	4.24E-08	3.00E-02	1.41E-06	.01%
Pathway Total						1.42E-02	81.82%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.33E+01	1.00E+00	3.14E-06	4.17E-07	4.00E-04	1.04E-03	6.01%
Arsenic	4.59E+00	3.00E+00	3.14E-06	4.32E-07	3.00E-04	1.44E-03	8.33%
Beryllium	3.50E-01	1.00E+00	3.14E-06	1.10E-08	5.00E-03	2.20E-06	.01%
Cadmium	5.03E+00	1.00E-01	3.14E-06	1.58E-08	5.00E-04	3.16E-05	.18%
Copper	2.38E+02	1.00E+00	3.14E-06	7.47E-06	3.70E-02	2.02E-04	1.17%
4,4'-DDT	1.33E+00	5.00E+00	3.14E-06	2.09E-07	5.00E-04	4.17E-04	2.41%
Total Carcinogenic PAHs	2.03E-01	1.50E+01	3.14E-06	9.56E-08	3.00E-02	3.19E-06	.02%
Pathway Total						3.14E-03	18.13%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.53E-07	1.00E+02	7.80E-03	1.19E-09	4.00E-04	2.98E-06	.02%
Arsenic	5.28E-08	1.00E+02	7.80E-03	4.12E-10	3.00E-04	1.37E-06	.01%
Beryllium	4.02E-09	1.00E+02	7.80E-03	3.14E-11	5.00E-03	6.27E-09	.00%
Cadmium	5.78E-08	1.00E+02	7.80E-03	4.51E-10	5.00E-04	9.02E-07	.01%
Copper	2.70E-06	1.00E+02	7.80E-03	2.11E-08	3.70E-02	5.70E-07	.00%
4,4'-DDT	1.53E-08	1.00E+02	7.80E-03	1.19E-10	5.00E-04	2.39E-07	.00%
Total Carcinogenic PAHs	2.33E-09	1.00E+02	7.80E-03	1.82E-11	3.00E-02	6.06E-10	.00%
Pathway Total						6.07E-06	.04%
Multipathway Total						2E-02	

Table E48. Estimated Cancer Risk Detail
Nearby Resident Ages 6-18 - RME Scenario, Site 31 - North Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	4.59E+00	1.00E+02	3.58E-08	1.64E-07	1.75E+00	2.88E-07	37.48%
B(a)P-TE	7.85E-02	1.00E+02	3.58E-08	2.81E-09	1.20E+01	3.37E-08	4.39%
Beryllium	3.50E-01	1.00E+02	3.58E-08	1.25E-08	7.00E+00	8.77E-08	11.41%
4,4'-DDE	9.95E-01	1.00E+02	3.58E-08	3.56E-08	3.40E-01	1.21E-08	1.57%
4,4'-DDT	1.33E+00	1.00E+02	3.58E-08	4.76E-08	3.40E-01	1.62E-08	2.11%
TCDD-TE	2.81E-05	4.30E+01	3.58E-08	4.33E-13	1.50E+05	6.49E-08	8.45%
Pathway Total						5.03E-07	65.41%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	4.59E+00	3.00E+00	5.39E-07	7.42E-08	1.75E+00	1.30E-07	16.92%
B(a)P-TE	7.85E-02	1.50E+01	5.39E-07	6.35E-09	1.20E+01	7.62E-08	9.92%
Beryllium	3.50E-01	1.00E+00	5.39E-07	1.89E-09	7.00E+00	1.32E-08	1.72%
4,4'-DDE	9.95E-01	5.00E+00	5.39E-07	2.68E-08	3.40E-01	9.12E-09	1.19%
4,4'-DDT	1.33E+00	5.00E+00	5.39E-07	3.58E-08	3.40E-01	1.22E-08	1.59%
TCDD-TE	2.81E-05	1.00E+00	5.39E-07	1.52E-13	1.50E+05	2.27E-08	2.95%
Pathway Total						2.63E-07	34.29%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	5.28E-08	1.00E+02	1.34E-03	7.07E-11	1.50E+01	1.06E-09	.14%
B(a)P-TE	9.03E-10	1.00E+02	1.34E-03	1.21E-12	1.20E+01	1.45E-11	.00%
Beryllium	4.02E-09	1.00E+02	1.34E-03	5.39E-12	8.40E+00	4.52E-11	.01%
Cadmium	5.78E-08	1.00E+02	1.34E-03	7.75E-11	1.50E+01	1.16E-09	.15%
4,4'-DDE	1.14E-08	1.00E+02	1.34E-03	1.53E-11	3.40E-01	5.21E-12	.00%
4,4'-DDT	1.53E-08	1.00E+02	1.34E-03	2.05E-11	3.40E-01	6.97E-12	.00%
TCDD-TE	3.23E-13	1.00E+02	1.34E-03	4.33E-16	1.50E+05	6.50E-11	.01%
Pathway Total						2.36E-09	.31%
Multipathway Total						8E-07	

Table E49. Hazard Quotient and Index Detail
Nearby Resident Ages 6-9 - Average Scenario, Site 31 - South Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Cadmium	5.10E-01	1.00E+02	4.35E-08	2.22E-08	5.00E-04	4.44E-05	99.21%
Pathway Total						4.44E-05	99.21%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Cadmium	5.10E-01	1.00E-01	2.84E-07	1.45E-10	5.00E-04	2.90E-07	.65%
Pathway Total						2.90E-07	.65%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Cadmium	5.86E-09	1.00E+02	5.60E-03	3.28E-11	5.00E-04	6.56E-08	.15%
Pathway Total						6.56E-08	.15%
Multipathway Total						4E-05	

Table E49. Estimated Cancer Risk Detail
Nearby Resident Ages 6-9 - Average Scenario, Site 31 - South Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
TCDD-TE	4.10E-07	4.30E+01	1.86E-09	3.28E-16	1.50E+05	4.92E-11	63.10%
Pathway Total						4.92E-11	63.10%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
TCDD-TE	4.10E-07	1.00E+00	1.22E-08	5.00E-17	1.50E+05	7.50E-12	9.62%
Pathway Total						7.50E-12	9.62%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Cadmium	5.86E-09	1.00E+02	2.40E-04	1.41E-12	1.50E+01	2.11E-11	27.06%
TCDD-TE	4.72E-15	1.00E+02	2.40E-04	1.13E-18	1.50E+05	1.70E-13	.22%
Pathway Total						2.13E-11	27.28%
Multipathway Total						8E-11	

Table E50. Hazard Quotient and Index Detail
Nearby Resident Ages 6-18 - RME Scenario, Site 31 - South Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Cadmium	8.60E-01	1.00E+02	2.09E-07	1.80E-07	5.00E-04	3.59E-04	98.48%
Pathway Total						3.59E-04	98.48%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Cadmium	8.60E-01	1.00E-01	3.14E-06	2.70E-09	5.00E-04	5.40E-06	1.48%
Pathway Total						5.40E-06	1.48%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Cadmium	9.89E-09	1.00E+02	7.80E-03	7.71E-11	5.00E-04	1.54E-07	.04%
Pathway Total						1.54E-07	.04%
Multipathway Total						4E-04	

Table E50. Estimated Cancer Risk Detail
Nearby Resident Ages 6-18 - RME Scenario, Site 31 - South Slope
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
TCDD-TE	1.84E-06	4.30E+01	3.58E-08	2.83E-14	1.50E+05	4.25E-09	71.51%
Pathway Total						4.25E-09	71.51%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
TCDD-TE	1.84E-06	1.00E+00	5.39E-07	9.92E-15	1.50E+05	1.49E-09	25.07%
Pathway Total						1.49E-09	25.07%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Cadmium	9.89E-09	1.00E+02	1.34E-03	1.33E-11	1.50E+01	1.99E-10	3.35%
TCDD-TE	2.12E-14	1.00E+02	1.34E-03	2.84E-17	1.50E+05	4.25E-12	.07%
Pathway Total						2.03E-10	3.42%
Multipathway Total						6E-09	

Table E51. Hazard Quotient and Index Detail
Nearby Resident Ages 6-9 - Average Scenario, Site 31 - LRTC Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Copper	5.73E+01	1.00E+02	4.35E-08	2.49E-06	3.70E-02	6.74E-05	93.73%
Pathway Total						6.74E-05	93.73%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Copper	5.73E+01	1.00E+00	2.84E-07	1.63E-07	3.70E-02	4.40E-06	6.12%
Pathway Total						4.40E-06	6.12%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Copper	7.09E-07	1.00E+02	5.60E-03	3.97E-09	3.70E-02	1.07E-07	.15%
Pathway Total						1.07E-07	.15%
Multipathway Total						7E-05	

Table E51. Estimated Cancer Risk Detail
Nearby Resident Ages 6-9 - Average Scenario, Site 31 - LRTC Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
TCDD-TE	6.71E-06	4.30E+01	1.86E-09	5.37E-15	1.50E+05	8.05E-10	86.49%
Pathway Total						8.05E-10	86.49%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
TCDD-TE	6.71E-06	1.00E+00	1.22E-08	8.19E-16	1.50E+05	1.23E-10	13.21%
Pathway Total						1.23E-10	13.21%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
TCDD-TE	7.72E-14	1.00E+02	2.40E-04	1.85E-17	1.50E+05	2.78E-12	.30%
Pathway Total						2.78E-12	.30%
Multipathway Total						9E-10	

Table E52. Hazard Quotient and Index Detail
Nearby Resident Ages 6-18 - RME Scenario, Site 31 - LRTC Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Copper	4.35E+02	1.00E+02	2.09E-07	9.09E-05	3.70E-02	2.46E-03	86.92%
Pathway Total						2.46E-03	86.92%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Copper	4.35E+02	1.00E+00	3.14E-06	1.37E-05	3.70E-02	3.69E-04	13.04%
Pathway Total						3.69E-04	13.04%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Copper	5.23E-06	1.00E+02	7.80E-03	4.08E-08	3.70E-02	1.10E-06	.04%
Pathway Total						1.10E-06	.04%
Multipathway Total						3E-03	

Table E52. Estimated Cancer Risk Detail
Nearby Resident Ages 6-18 - RME Scenario, Site 31 - LRTC Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
TCDD-TE	1.96E-05	4.30E+01	3.58E-08	3.01E-13	1.50E+05	4.52E-08	74.04%
Pathway Total						4.52E-08	74.04%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
TCDD-TE	1.96E-05	1.00E+C0	5.39E-07	1.05E-13	1.50E+05	1.58E-08	25.88%
Pathway Total						1.58E-08	25.88%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
TCDD-TE	2.25E-13	1.00E+02	1.34E-03	3.01E-16	1.50E+05	4.52E-11	.07%
Pathway Total						4.52E-11	.07%
Multipathway Total						6E-08	

SITE 39

Table E53. Hazard Quotient and Index Detail
Habitat Management Personnel - Average Scenario, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.87E+00	1.00E+02	2.45E-07	4.58E-07	4.00E-04	1.15E-03	9.02%
Arsenic	1.46E+00	1.00E+02	2.45E-07	3.58E-07	3.00E-04	1.19E-03	9.33%
Beryllium	4.70E-01	1.00E+02	2.45E-07	1.15E-07	5.00E-03	2.30E-05	.18%
Cadmium	3.06E+00	1.00E+02	2.45E-07	7.50E-07	5.00E-04	1.50E-03	11.77%
Copper	1.38E+02	1.00E+02	2.45E-07	3.39E-05	3.70E-02	9.16E-04	7.18%
Cyclonite (RDX)	4.50E-01	1.00E+02	2.45E-07	1.10E-07	3.00E-03	3.67E-05	.29%
2-amino-Dinitrotoluene	1.40E-01	1.00E+02	2.45E-07	3.43E-08	5.00E-04	6.86E-05	.54%
4-amino-Dinitrotoluene	1.40E-01	1.00E+02	2.45E-07	3.43E-08	5.00E-04	6.86E-05	.54%
HMX	1.03E+01	1.00E+02	2.45E-07	2.53E-06	5.00E-02	5.06E-05	.40%
Nickel	1.07E+01	1.00E+02	2.45E-07	2.62E-06	2.00E-02	1.31E-04	1.03%
Trinitrotoluene	1.50E-01	1.00E+02	2.45E-07	3.68E-08	5.00E-04	7.35E-05	.58%
Pathway Total						5.21E-03	40.86%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.87E+00	1.00E+00	5.16E-06	9.65E-08	4.00E-04	2.41E-04	1.89%
Arsenic	1.46E+00	3.00E+00	5.16E-06	2.26E-07	3.00E-04	7.53E-04	5.91%
Beryllium	4.70E-01	1.00E+00	5.16E-06	2.43E-08	5.00E-03	4.85E-06	.04%
Cadmium	3.06E+00	1.00E-01	5.16E-06	1.58E-08	5.00E-04	3.16E-05	.25%
Copper	1.38E+02	1.00E+00	5.16E-06	7.14E-06	3.70E-02	1.93E-04	1.51%
Cyclonite (RDX)	4.50E-01	1.00E+02	5.16E-06	2.32E-06	3.00E-03	7.74E-04	6.07%
2-amino-Dinitrotoluene	1.40E-01	1.00E+02	5.16E-06	7.22E-07	5.00E-04	1.44E-03	11.30%
4-amino-Dinitrotoluene	1.40E-01	1.00E+02	5.16E-06	7.22E-07	5.00E-04	1.44E-03	11.30%
HMX	1.03E+01	1.00E+02	5.16E-06	5.33E-05	5.00E-02	1.07E-03	8.39%
Nickel	1.07E+01	1.00E+00	5.16E-06	5.53E-07	2.00E-02	2.76E-05	.22%
Trinitrotoluene	1.50E-01	1.00E+02	5.16E-06	7.74E-07	5.00E-04	1.55E-03	12.16%
Pathway Total						7.53E-03	59.04%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.15E-08	1.00E+02	6.50E-02	1.40E-09	4.00E-04	3.49E-06	.03%
Arsenic	1.68E-08	1.00E+02	6.50E-02	1.09E-09	3.00E-04	3.64E-06	.03%
Beryllium	5.41E-09	1.00E+02	6.50E-02	3.52E-10	5.00E-03	7.03E-08	.00%
Cadmium	3.52E-08	1.00E+02	6.50E-02	2.29E-09	5.00E-04	4.57E-06	.04%
Copper	1.59E-06	1.00E+02	6.50E-02	1.03E-07	3.70E-02	2.80E-06	.02%
Cyclonite (RDX)	5.18E-09	1.00E+02	6.50E-02	3.36E-10	3.00E-03	1.12E-07	.00%
2-amino-Dinitrotoluene	1.61E-09	1.00E+02	6.50E-02	1.05E-10	5.00E-04	2.09E-07	.00%
4-amino-Dinitrotoluene	1.61E-09	1.00E+02	6.50E-02	1.05E-10	5.00E-04	2.09E-07	.00%

Table E53. Hazard Quotient and Index Detail
Habitat Management Personnel - Average Scenario, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
HMX	1.19E-07	1.00E+02	6.50E-02	7.72E-09	5.00E-02	1.54E-07	.00%
Nickel	1.23E-07	1.00E+02	6.50E-02	8.01E-09	2.00E-02	4.00E-07	.00%
Trinitrotoluene	1.72E-09	1.00E+02	6.50E-02	1.12E-10	5.00E-04	2.24E-07	.00%
Pathway Total						1.59E-05	.12%

Multipathway Total	1E-02

Table E53. Estimated Cancer Risk Detail
Habitat Management Personnel - Average Scenario, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.46E+00	1.00E+02	3.49E-08	5.10E-08	1.75E+00	8.92E-08	26.10%
Beryllium	4.70E-01	1.00E+02	3.49E-08	1.64E-08	7.00E+00	1.15E-07	33.64%
Cyclonite (RDX)	4.50E-01	1.00E+02	3.49E-08	1.57E-08	1.10E-01	1.73E-09	.51%
2-amino-Dinitrotoluene	1.40E-01	1.00E+02	3.49E-08	4.89E-09	3.00E-02	1.47E-10	.04%
4-amino-Dinitrotoluene	1.40E-01	1.00E+02	3.49E-08	4.89E-09	3.00E-02	1.47E-10	.04%
Trinitrotoluene	1.50E-01	1.00E+02	3.49E-08	5.24E-09	3.00E-02	1.57E-10	.05%
Pathway Total						2.06E-07	60.38%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.46E+00	3.00E+00	7.37E-07	3.23E-08	1.75E+00	5.65E-08	16.53%
Beryllium	4.70E-01	1.00E+00	7.37E-07	3.46E-09	7.00E+00	2.42E-08	7.08%
Cyclonite (RDX)	4.50E-01	1.00E+02	7.37E-07	3.32E-07	1.10E-01	3.65E-08	10.68%
2-amino-Dinitrotoluene	1.40E-01	1.00E+02	7.37E-07	1.03E-07	3.00E-02	3.10E-09	.91%
4-amino-Dinitrotoluene	1.40E-01	1.00E+02	7.37E-07	1.03E-07	3.00E-02	3.10E-09	.91%
Trinitrotoluene	1.50E-01	1.00E+02	7.37E-07	1.11E-07	3.00E-02	3.32E-09	.97%
Pathway Total						1.27E-07	37.08%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.68E-08	1.00E+02	9.28E-03	1.56E-10	1.50E+01	2.34E-09	.68%
Beryllium	5.41E-09	1.00E+02	9.28E-03	5.02E-11	8.40E+00	4.22E-10	.12%
Cadmium	3.52E-08	1.00E+02	9.28E-03	3.27E-10	1.50E+01	4.90E-09	1.43%
Cyclonite (RDX)	5.18E-09	1.00E+02	9.28E-03	4.80E-11	1.10E-01	5.28E-12	.00%
2-amino-Dinitrotoluene	1.61E-09	1.00E+02	9.28E-03	1.49E-11	3.00E-02	4.48E-13	.00%
4-amino-Dinitrotoluene	1.61E-09	1.00E+02	9.28E-03	1.49E-11	3.00E-02	4.48E-13	.00%
Nickel	1.23E-07	1.00E+02	9.28E-03	1.14E-09	9.10E-01	1.04E-09	.30%
Trinitrotoluene	1.72E-09	1.00E+02	9.28E-03	1.60E-11	3.00E-02	4.80E-13	.00%
Pathway Total						8.71E-09	2.53%
Multipathway Total						3E-07	

Table E54. Hazard Quotient and Index Detail
Habitat Management Personnel - RME Scenario, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.72E+01	1.00E+02	9.78E-07	1.68E-05	4.00E-04	4.21E-02	7.13%
Arsenic	3.68E+00	1.00E+02	9.78E-07	3.60E-06	3.00E-04	1.20E-02	2.03%
Beryllium	9.34E+00	1.00E+02	9.78E-07	9.13E-06	5.00E-03	1.83E-03	.31%
Cadmium	2.69E+01	1.00E+02	9.78E-07	2.63E-05	5.00E-04	5.26E-02	8.91%
Copper	1.98E+03	1.00E+02	9.78E-07	1.94E-03	3.70E-02	5.24E-02	8.88%
Cyclonite (RDX)	3.83E+00	1.00E+02	9.78E-07	3.75E-06	3.00E-03	1.25E-03	.21%
2-amino-Dinitrotoluene	3.60E-01	1.00E+02	9.78E-07	3.52E-07	5.00E-04	7.04E-04	.12%
4-amino-Dinitrotoluene	4.00E-01	1.00E+02	9.78E-07	3.91E-07	5.00E-04	7.82E-04	.13%
HMX	1.72E+02	1.00E+02	9.78E-07	1.68E-04	5.00E-02	3.36E-03	.57%
Nickel	5.99E+01	1.00E+02	9.78E-07	5.86E-05	2.00E-02	2.93E-03	.50%
Trinitrotoluene	7.10E-01	1.00E+02	9.78E-07	6.94E-07	5.00E-04	1.39E-03	.24%
Pathway Total						1.71E-01	29.03%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.72E+01	1.00E+00	4.61E-05	7.94E-06	4.00E-04	1.98E-02	3.35%
Arsenic	3.68E+00	3.00E+00	4.61E-05	5.09E-06	3.00E-04	1.70E-02	2.88%
Beryllium	9.34E+00	1.00E+00	4.61E-05	4.31E-06	5.00E-03	8.61E-04	.15%
Cadmium	2.69E+01	1.00E-01	4.61E-05	1.24E-06	5.00E-04	2.48E-03	.42%
Copper	1.98E+03	1.00E+00	4.61E-05	9.14E-04	3.70E-02	2.47E-02	4.18%
Cyclonite (RDX)	3.83E+00	1.00E+02	4.61E-05	1.77E-04	3.00E-03	5.89E-02	9.98%
2-amino-Dinitrotoluene	3.60E-01	1.00E+02	4.61E-05	1.66E-05	5.00E-04	3.32E-02	5.62%
4-amino-Dinitrotoluene	4.00E-01	1.00E+02	4.61E-05	1.84E-05	5.00E-04	3.69E-02	6.25%
HMX	1.72E+02	1.00E+02	4.61E-05	7.91E-03	5.00E-02	1.58E-01	26.77%
Nickel	5.99E+01	1.00E+00	4.61E-05	2.76E-05	2.00E-02	1.38E-03	.23%
Trinitrotoluene	7.10E-01	1.00E+02	4.61E-05	3.27E-05	5.00E-04	6.55E-02	11.10%
Pathway Total						4.19E-01	70.93%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.98E-07	1.00E+02	9.78E-02	1.94E-08	4.00E-04	4.84E-05	.01%
Arsenic	4.23E-08	1.00E+02	9.78E-02	4.14E-09	3.00E-04	1.38E-05	.00%
Beryllium	1.07E-07	1.00E+02	9.78E-02	1.05E-08	5.00E-03	2.10E-06	.00%
Cadmium	3.09E-07	1.00E+02	9.78E-02	3.03E-08	5.00E-04	6.05E-05	.01%
Copper	2.28E-05	1.00E+02	9.78E-02	2.23E-06	3.70E-02	6.03E-05	.01%
Cyclonite (RDX)	4.40E-08	1.00E+02	9.78E-02	4.31E-09	3.00E-03	1.44E-06	.00%
2-amino-Dinitrotoluene	4.14E-09	1.00E+02	9.78E-02	4.05E-10	5.00E-04	8.10E-07	.00%
4-amino-Dinitrotoluene	4.60E-09	1.00E+02	9.78E-02	4.50E-10	5.00E-04	9.00E-07	.00%

Table E54. Hazard Quotient and Index Detail
Habitat Management Personnel - RME Scenario, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
HMX	1.97E-06	1.00E+02	9.78E-02	1.93E-07	5.00E-02	3.86E-06	.00%
Nickel	6.89E-07	1.00E+02	9.78E-02	6.74E-08	2.00E-02	3.37E-06	.00%
Trinitrotoluene	8.17E-09	1.00E+02	9.78E-02	7.99E-10	5.00E-04	1.60E-06	.00%
Pathway Total						1.97E-04	.03%

Multipathway Total	6E-01	

Table E54. Estimated Cancer Risk Detail
Habitat Management Personnel - RME Scenario, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.68E+00	1.00E+02	3.49E-07	1.28E-06	1.75E+00	2.25E-06	4.78%
Beryllium	9.34E+00	1.00E+02	3.49E-07	3.26E-06	7.00E+00	2.28E-05	48.39%
Cyclonite (RDX)	3.83E+00	1.00E+02	3.49E-07	1.34E-06	1.10E-01	1.47E-07	.31%
2-amino-Dinitrotoluene	3.60E-01	1.00E+02	3.49E-07	1.26E-07	3.00E-02	3.77E-09	.01%
4-amino-Dinitrotoluene	4.00E-01	1.00E+02	3.49E-07	1.40E-07	3.00E-02	4.19E-09	.01%
Trinitrotoluene	7.10E-01	1.00E+02	3.49E-07	2.48E-07	3.00E-02	7.43E-09	.02%
Pathway Total						2.52E-05	53.52%
Pathway: Dermal Contact with Soil							
	(mg/kg)	(percent)	(kg/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.68E+00	3.00E+00	1.65E-05	1.82E-06	1.75E+00	3.19E-06	6.77%
Beryllium	9.34E+00	1.00E+00	1.65E-05	1.54E-06	7.00E+00	1.08E-05	22.92%
Cyclonite (RDX)	3.83E+00	1.00E+02	1.65E-05	6.32E-05	1.10E-01	6.95E-06	14.75%
2-amino-Dinitrotoluene	3.60E-01	1.00E+02	1.65E-05	5.94E-06	3.00E-02	1.78E-07	.38%
4-amino-Dinitrotoluene	4.00E-01	1.00E+02	1.65E-05	6.60E-06	3.00E-02	1.98E-07	.42%
Trinitrotoluene	7.10E-01	1.00E+02	1.65E-05	1.17E-05	3.00E-02	3.51E-07	.74%
Pathway Total						2.17E-05	45.98%
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	4.23E-08	1.00E+02	3.49E-02	1.48E-09	1.50E+01	2.22E-08	.05%
Beryllium	1.07E-07	1.00E+02	3.49E-02	3.75E-09	8.40E+00	3.15E-08	.07%
Cadmium	3.09E-07	1.00E+02	3.49E-02	1.08E-08	1.50E+01	1.62E-07	.34%
Cyclonite (RDX)	4.40E-08	1.00E+02	3.49E-02	1.54E-09	1.10E-01	1.69E-10	.00%
2-amino-Dinitrotoluene	4.14E-09	1.00E+02	3.49E-02	1.44E-10	3.00E-02	4.33E-12	.00%
4-amino-Dinitrotoluene	4.60E-09	1.00E+02	3.49E-02	1.61E-10	3.00E-02	4.82E-12	.00%
Nickel	6.89E-07	1.00E+02	3.49E-02	2.40E-08	9.10E-01	2.19E-08	.05%
Trinitrotoluene	8.17E-09	1.00E+02	3.49E-02	2.85E-10	3.00E-02	8.55E-12	.00%
Pathway Total						2.38E-07	.51%
Multipathway Total						5E-05	

Table E55. Hazard Quotient and Index Detail
Habitat Management Personnel - Average Scenario, Upper Most Aquifer, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.40E-02	1.00E+02	2.45E-03	3.43E-05	4.00E-04	8.58E-02	78.23%
Arsenic	1.48E-03	1.00E+02	2.45E-03	3.63E-06	3.00E-04	1.21E-02	11.03%
Beryllium	3.10E-04	1.00E+02	2.45E-03	7.59E-07	5.00E-03	1.52E-04	.14%
Mercury	1.50E-04	1.00E+02	2.45E-03	3.67E-07	3.00E-04	1.22E-03	1.11%
Nitrate as N	6.76E+00	1.00E+02	2.45E-03	1.66E-02	1.60E+00	1.04E-02	9.48%
Pathway Total						1.10E-01	99.99%

Multipathway Total	1E-01	

Table E55. Estimated Cancer Risk Detail
Habitat Management Personnel - Average Scenario, Upper Most Aquifer, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.48E-03	1.00E+02	3.49E-04	5.17E-07	1.75E+00	9.04E-07	54.43%
Beryllium	3.10E-04	1.00E+02	3.49E-04	1.08E-07	7.00E+00	7.57E-07	45.57%
Pathway Total						1.66E-06	100.00%
Multipathway Total						2E-06	

Table E56. Hazard Quotient and Index Detail
Habitat Management Personnel - RME Scenario, Upper Most Aquifer, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.14E-02	1.00E+02	9.78E-03	1.11E-04	4.00E-04	2.79E-01	53.64%
Arsenic	3.07E-03	1.00E+02	9.78E-03	3.00E-05	3.00E-04	1.00E-01	19.23%
Beryllium	4.90E-04	1.00E+02	9.78E-03	4.79E-06	5.00E-03	9.58E-04	.18%
Mercury	2.80E-04	1.00E+02	9.78E-03	2.74E-06	3.00E-04	9.13E-03	1.76%
Nitrate as N	2.14E+01	1.00E+02	9.78E-03	2.09E-01	1.60E+00	1.31E-01	25.19%
Pathway Total						5.20E-01	100.00%
Multipathway Total						5E-01	

Table E56. Estimated Cancer Risk Detail
Habitat Management Personnel - RME Scenario, Upper Most Aquifer, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	3.07E-03	1.00E+02	3.49E-03	1.07E-05	1.75E+00	1.88E-05	61.04%
Beryllium	4.90E-04	1.00E+02	3.49E-03	1.71E-06	7.00E+00	1.20E-05	38.96%
Pathway Total						3.08E-05	100.00%
Multipathway Total						3E-05	

Table E57. Hazard Quotient and Index Detail
Habitat Management Personnel - Average Scenario, Paso Robles Aquifer, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.43E-02	1.00E+02	2.45E-03	3.51E-05	4.00E-04	8.76E-02	78.32%
Arsenic	1.72E-03	1.00E+02	2.45E-03	4.21E-06	3.00E-04	1.40E-02	12.52%
Mercury	1.30E-04	1.00E+02	2.45E-03	3.18E-07	3.00E-04	1.06E-03	.95%
Nitrate as N	8.80E-01	1.00E+02	2.45E-03	2.16E-03	1.60E+00	1.35E-03	1.21%
Nitrite	3.20E-01	1.00E+02	2.45E-03	7.84E-04	1.00E-01	7.84E-03	7.01%
Pathway Total						1.12E-01	100.01%
Multipathway Total						1E-01	

Table E57. Estimated Cancer Risk Detail
Habitat Management Personnel - Average Scenario, Paso Robles Aquifer, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.72E-03	1.00E+02	3.49E-04	6.00E-07	1.75E+00	1.05E-06	100.00%
Pathway Total						1.05E-06	100.00%
Multipathway Total						1E-06	

Table E58. Hazard Quotient and Index Detail
Habitat Management Personnel - RME Scenario, Paso Robles Aquifer, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.36E-02	1.00E+02	9.78E-03	1.33E-04	4.00E-04	3.33E-01	54.71%
Arsenic	5.17E-03	1.00E+02	9.78E-03	5.06E-05	3.00E-04	1.69E-01	27.77%
Mercury	2.90E-04	1.00E+02	9.78E-03	2.84E-06	3.00E-04	9.45E-03	1.55%
Nitrate as N	1.50E+00	1.00E+02	9.78E-03	1.47E-02	1.60E+00	9.17E-03	1.51%
Nitrite	9.00E-01	1.00E+02	9.78E-03	8.80E-03	1.00E-01	8.80E-02	14.46%
Pathway Total						6.09E-01	100.00%
Multipathway Total						6E-01	

Table E58. Estimated Cancer Risk Detail
Habitat Management Personnel - RME Scenario, Paso Robles Aquifer, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Ingestion of Groundwater							
	(mg/l)	(percent)	(l/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	5.17E-03	1.00E+02	3.49E-03	1.80E-05	1.75E+00	3.16E-05	100.00%
Pathway Total						3.16E-05	100.00%
Multipathway Total						3E-05	

Table E59. Hazard Quotient and Index Detail
Offsite Resident 0-6 Years - Average Scenario, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.15E-08	1.00E+02	1.70E+00	3.66E-08	4.00E-04	9.14E-05	21.99%
Arsenic	1.68E-08	1.00E+02	1.70E+00	2.85E-08	3.00E-04	9.51E-05	22.88%
Beryllium	5.41E-09	1.00E+02	1.70E+00	9.20E-09	5.00E-03	1.84E-06	.44%
Cadmium	3.52E-08	1.00E+02	1.70E+00	5.98E-08	5.00E-04	1.20E-04	28.87%
Copper	1.59E-06	1.00E+02	1.70E+00	2.71E-06	3.70E-02	7.31E-05	17.58%
Cyclonite (RDX)	5.18E-09	1.00E+02	1.70E+00	8.80E-09	3.00E-03	2.93E-06	.70%
2-amino-Dinitrotoluene	1.61E-09	1.00E+02	1.70E+00	2.74E-09	5.00E-04	5.47E-06	1.32%
4-amino-Dinitrotoluene	1.61E-09	1.00E+02	1.70E+00	2.74E-09	5.00E-04	5.47E-06	1.32%
HMX	1.19E-07	1.00E+02	1.70E+00	2.02E-07	5.00E-02	4.04E-06	.97%
Nickel	1.23E-07	1.00E+02	1.70E+00	2.09E-07	2.00E-02	1.05E-05	2.53%
Trinitrotoluene	1.72E-09	1.00E+02	1.70E+00	2.93E-09	5.00E-04	5.86E-06	1.41%
Pathway Total						4.16E-04	100.01%

Multipathway Total	4E-04	

Table E59. Estimated Cancer Risk Detail
Offsite Resident 0-6 Years - Average Scenario, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.68E-08	1.00E+02	1.46E-01	2.45E-09	1.50E+01	3.68E-08	26.85%
Beryllium	5.41E-09	1.00E+02	1.46E-01	7.90E-10	8.40E+00	6.63E-09	4.84%
Cadmium	3.52E-08	1.00E+02	1.46E-01	5.14E-09	1.50E+01	7.71E-08	56.26%
Cyclonite (RDX)	5.18E-09	1.00E+02	1.46E-01	7.56E-10	1.10E-01	8.31E-11	.06%
2-amino-Dinitrotoluene	1.61E-09	1.00E+02	1.46E-01	2.35E-10	3.00E-02	7.05E-12	.01%
4-amino-Dinitrotoluene	1.61E-09	1.00E+02	1.46E-01	2.35E-10	3.00E-02	7.05E-12	.01%
Nickel	1.23E-07	1.00E+02	1.46E-01	1.80E-08	9.10E-01	1.64E-08	11.97%
Trinitrotoluene	1.72E-09	1.00E+02	1.46E-01	2.52E-10	3.00E-02	7.56E-12	.01%
Pathway Total						1.37E-07	100.01%

Multipathway Total	1E-07

Table E60. Hazard Quotient and Index Detail
Offsite Resident 0-6 Years - RME Scenario, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.98E-07	1.00E+02	2.04E+00	4.04E-07	4.00E-04	1.01E-03	24.56%
Arsenic	4.23E-08	1.00E+02	2.04E+00	8.63E-08	3.00E-04	2.88E-04	7.00%
Beryllium	1.07E-07	1.00E+02	2.04E+00	2.19E-07	5.00E-03	4.38E-05	1.07%
Cadmium	3.09E-07	1.00E+02	2.04E+00	6.31E-07	5.00E-04	1.26E-03	30.65%
Copper	2.28E-05	1.00E+02	2.04E+00	4.65E-05	3.70E-02	1.26E-03	30.65%
Cyclonite (RDX)	4.40E-08	1.00E+02	2.04E+00	8.99E-08	3.00E-03	3.00E-05	.73%
2-amino-Dinitrotoluene	4.14E-09	1.00E+02	2.04E+00	8.45E-09	5.00E-04	1.69E-05	.41%
4-amino-Dinitrotoluene	4.60E-09	1.00E+02	2.04E+00	9.38E-09	5.00E-04	1.88E-05	.46%
HMX	1.97E-06	1.00E+02	2.04E+00	4.03E-06	5.00E-02	8.05E-05	1.96%
Nickel	6.89E-07	1.00E+02	2.04E+00	1.41E-06	2.00E-02	7.03E-05	1.71%
Trinitrotoluene	8.17E-09	1.00E+02	2.04E+00	1.67E-08	5.00E-04	3.33E-05	.81%
Pathway Total						4.11E-03	100.01%
Multipathway Total						4E-03	

Table E60. Estimated Cancer Risk Detail
Offsite Resident 0-6 Years - RME Scenario, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	4.23E-08	1.00E+02	1.75E-01	7.41E-09	1.50E+01	1.11E-07	9.31%
Beryllium	1.07E-07	1.00E+02	1.75E-01	1.88E-08	8.40E+00	1.58E-07	13.26%
Cadmium	3.09E-07	1.00E+02	1.75E-01	5.41E-08	1.50E+01	8.12E-07	68.12%
Cyclonite (RDX)	4.40E-08	1.00E+02	1.75E-01	7.71E-09	1.10E-01	8.48E-10	.07%
2-amino-Dinitrotoluene	4.14E-09	1.00E+02	1.75E-01	7.25E-10	3.00E-02	2.17E-11	.00%
4-amino-Dinitrotoluene	4.60E-09	1.00E+02	1.75E-01	8.05E-10	3.00E-02	2.41E-11	.00%
Nickel	6.89E-07	1.00E+02	1.75E-01	1.21E-07	9.10E-01	1.10E-07	9.23%
Trinitrotoluene	8.17E-09	1.00E+02	1.75E-01	1.43E-09	3.00E-02	4.29E-11	.00%
Pathway Total						1.19E-06	99.99%

Multipathway Total	1E-06	

Table E61. Hazard Quotient and Index Detail
Offsite Resident 6-9 Years - Average Scenario, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	2.15E-08	1.00E+02	1.24E+00	2.67E-08	4.00E-04	6.67E-05	22.01%
Arsenic	1.68E-08	1.00E+02	1.24E+00	2.08E-08	3.00E-04	6.94E-05	22.90%
Beryllium	5.41E-09	1.00E+02	1.24E+00	6.71E-09	5.00E-03	1.34E-06	.44%
Cadmium	3.52E-08	1.00E+02	1.24E+00	4.36E-08	5.00E-04	8.73E-05	28.81%
Copper	1.59E-06	1.00E+02	1.24E+00	1.97E-06	3.70E-02	5.33E-05	17.59%
Cyclonite (RDX)	5.18E-09	1.00E+02	1.24E+00	6.42E-09	3.00E-03	2.14E-06	.71%
2-amino-Dinitrotoluene	1.61E-09	1.00E+02	1.24E+00	2.00E-09	5.00E-04	3.99E-06	1.32%
4-amino-Dinitrotoluene	1.61E-09	1.00E+02	1.24E+00	2.00E-09	5.00E-04	3.99E-06	1.32%
HMX	1.19E-07	1.00E+02	1.24E+00	1.47E-07	5.00E-02	2.95E-06	.97%
Nickel	1.23E-07	1.00E+02	1.24E+00	1.53E-07	2.00E-02	7.64E-06	2.52%
Trinitrotoluene	1.72E-09	1.00E+02	1.24E+00	2.14E-09	5.00E-04	4.28E-06	1.41%
Pathway Total						3.03E-04	100.00%
Multipathway Total						3E-04	

Table E61. Estimated Cancer Risk Detail
Offsite Resident 6-9 Years - Average Scenario, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	1.68E-08	1.00E+02	5.30E-02	8.90E-10	1.50E+01	1.33E-08	26.77%
Beryllium	5.41E-09	1.00E+02	5.30E-02	2.87E-10	8.40E+00	2.41E-09	4.85%
Cadmium	3.52E-08	1.00E+02	5.30E-02	1.87E-09	1.50E+01	2.80E-08	56.35%
Cyclonite (RDX)	5.18E-09	1.00E+02	5.30E-02	2.74E-10	1.10E-01	3.02E-11	.06%
2-amino-Dinitrotoluene	1.61E-09	1.00E+02	5.30E-02	8.53E-11	3.00E-02	2.56E-12	.01%
4-amino-Dinitrotoluene	1.61E-09	1.00E+02	5.30E-02	8.53E-11	3.00E-02	2.56E-12	.01%
Nickel	1.23E-07	1.00E+02	5.30E-02	6.53E-09	9.10E-01	5.94E-09	11.95%
Trinitrotoluene	1.72E-09	1.00E+02	5.30E-02	9.14E-11	3.00E-02	2.74E-12	.01%
Pathway Total						4.97E-08	100.01%

Multipathway Total	5E-08

Table E62. Hazard Quotient and Index Detail
Offsite Resident 6-18 Years - RME Scenario, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.98E-07	1.00E+02	1.03E+00	2.04E-07	4.00E-04	5.10E-04	24.58%
Arsenic	4.23E-08	1.00E+02	1.03E+00	4.36E-08	3.00E-04	1.45E-04	6.99%
Beryllium	1.07E-07	1.00E+02	1.03E+00	1.11E-07	5.00E-03	2.21E-05	1.07%
Cadmium	3.09E-07	1.00E+02	1.03E+00	3.19E-07	5.00E-04	6.37E-04	30.70%
Copper	2.28E-05	1.00E+02	1.03E+00	2.35E-05	3.70E-02	6.35E-04	30.60%
Cyclonite (RDX)	4.40E-08	1.00E+02	1.03E+00	4.54E-08	3.00E-03	1.51E-05	.73%
2-amino-Dinitrotoluene	4.14E-09	1.00E+02	1.03E+00	4.26E-09	5.00E-04	8.53E-06	.41%
4-amino-Dinitrotoluene	4.60E-09	1.00E+02	1.03E+00	4.74E-09	5.00E-04	9.48E-06	.46%
HMX	1.97E-06	1.00E+02	1.03E+00	2.03E-06	5.00E-02	4.06E-05	1.96%
Nickel	6.89E-07	1.00E+02	1.03E+00	7.10E-07	2.00E-02	3.55E-05	1.71%
Trinitrotoluene	8.17E-09	1.00E+02	1.03E+00	8.41E-09	5.00E-04	1.68E-05	.81%
Pathway Total						2.08E-03	100.02%
Multipathway Total						2E-03	

Table E62. Estimated Cancer Risk Detail
Offsite Resident 6-18 Years - RME Scenario, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	4.23E-08	1.00E+02	1.77E-01	7.49E-09	1.50E+01	1.12E-07	9.30%
Beryllium	1.07E-07	1.00E+02	1.77E-01	1.90E-08	8.40E+00	1.60E-07	13.28%
Cadmium	3.09E-07	1.00E+02	1.77E-01	5.48E-08	1.50E+01	8.21E-07	68.14%
Cyclonite (RDX)	4.40E-08	1.00E+02	1.77E-01	7.80E-09	1.10E-01	8.58E-10	.07%
2-amino-Dinitrotoluene	4.14E-09	1.00E+02	1.77E-01	7.33E-10	3.00E-02	2.20E-11	.00%
4-amino-Dinitrotoluene	4.60E-09	1.00E+02	1.77E-01	8.14E-10	3.00E-02	2.44E-11	.00%
Nickel	6.89E-07	1.00E+02	1.77E-01	1.22E-07	9.10E-01	1.11E-07	9.21%
Trinitrotoluene	8.17E-09	1.00E+02	1.77E-01	1.45E-09	3.00E-02	4.34E-11	.00%
Pathway Total						1.20E-06	100.00%

Multipathway Total	1E-06

Table E63. Hazard Quotient and Index Detail
Offsite Resident 18-30 Years - RME Scenario, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Reference Dose	Hazard Quotient	Percent of Receptor Hazard Index
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Antimony	1.98E-07	1.00E+02	4.11E-01	8.14E-08	4.00E-04	2.03E-04	24.54%
Arsenic	4.23E-08	1.00E+02	4.11E-01	1.74E-08	3.00E-04	5.80E-05	7.01%
Beryllium	1.07E-07	1.00E+02	4.11E-01	4.41E-08	5.00E-03	8.83E-06	1.07%
Cadmium	3.09E-07	1.00E+02	4.11E-01	1.27E-07	5.00E-04	2.54E-04	30.71%
Copper	2.28E-05	1.00E+02	4.11E-01	9.38E-06	3.70E-02	2.53E-04	30.59%
Cyclonite (RDX)	4.40E-08	1.00E+02	4.11E-01	1.81E-08	3.00E-03	6.03E-06	.73%
2-amino-Dinitrotoluene	4.14E-09	1.00E+02	4.11E-01	1.70E-09	5.00E-04	3.40E-06	.41%
4-amino-Dinitrotoluene	4.60E-09	1.00E+02	4.11E-01	1.89E-09	5.00E-04	3.78E-06	.46%
HMX	1.97E-06	1.00E+02	4.11E-01	8.11E-07	5.00E-02	1.62E-05	1.96%
Nickel	6.89E-07	1.00E+02	4.11E-01	2.83E-07	2.00E-02	1.42E-05	1.72%
Trinitrotoluene	8.17E-09	1.00E+02	4.11E-01	3.36E-09	5.00E-04	6.71E-06	.81%
Pathway Total						8.27E-04	100.01%
Multipathway Total						8E-04	

Table E63. Estimated Cancer Risk Detail
Offsite Resident 18-30 Years - RME Scenario, Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

Chemical	Chemical Concentration	Absorption Factor	Intake Factor	Daily Intake	Slope Factor	Cancer Risk	Percent of Receptor Cancer Risk
Pathway: Inhalation of Dust from Outdoor Air							
	(mg/m^3)	(percent)	(m^3/kg-day)	(mg/kg/day)	(mg/kg/day)		
Arsenic	4.23E-08	1.00E+02	7.05E-02	2.98E-09	1.50E+01	4.48E-08	9.33%
Beryllium	1.07E-07	1.00E+02	7.05E-02	7.57E-09	8.40E+00	6.36E-08	13.25%
Cadmium	3.09E-07	1.00E+02	7.05E-02	2.18E-08	1.50E+01	3.27E-07	68.13%
Cyclonite (RDX)	4.40E-08	1.00E+02	7.05E-02	3.11E-09	1.10E-01	3.42E-10	.07%
2-amino-Dinitrotoluene	4.14E-09	1.00E+02	7.05E-02	2.92E-10	3.00E-02	8.76E-12	.00%
4-amino-Dinitrotoluene	4.60E-09	1.00E+02	7.05E-02	3.24E-10	3.00E-02	9.73E-12	.00%
Nickel	6.89E-07	1.00E+02	7.05E-02	4.86E-08	9.10E-01	4.42E-08	9.21%
Trinitrotoluene	8.17E-09	1.00E+02	7.05E-02	5.76E-10	3.00E-02	1.73E-11	.00%
Pathway Total						4.80E-07	99.99%

Multipathway Total	5E-07

APPENDIX F

LEAD MODEL OUTPUT

CONTENTS

TABLES

F36 LEADSPREAD Model Output for the Habitat Management Worker Receptor - RME, Site 39

SITES 2 AND 12

Table F1. UBK Model Output for the Onsite Child Resident Receptor Ages 0-6 - Average Exposure, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

ABSORPTION METHODOLOGY: Linear Absorption

Outdoor Air Conc.: 0.001 μg Pb/m^3 /a/

Indoor Air Pb Conc.: 30.0 percent of lead outdoor air concentration

Other Air Parameters:

Age	Time Outdoors (hr/day)	Ventilation Rate (m^3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

Diet: DEFAULT

DRINKING WATER Conc.: 15.00 μg Pb/L /b/

WATER Consumption: DEFAULT

SOIL & DUST

Soil: constant conc.
Dust: constant conc.

Age	Soil (μg Pb/g)	House Dust (μg Pb/g)
0-1	96.4	96.4
1-2	96.4	96.4
2-3	96.4	96.4
3-4	96.4	96.4
4-5	96.4	96.4
5-6	96.4	96.4
6-7	96.4	96.4

Additional Dust Sources: None DEFAULT

PAINT: Alternate Method NOT used!
PAINT INTAKE: 0.0 μg Pb/day DEFAULT

Table F1. UBK Model Output for the Onsite Child Resident Receptor Ages 0-6 - Average Exposure, Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc.: 7.50 μg Pb/dl

CALCULATED BLOOD Pb and Pb UPTAKES:

Year	Blood Level (μg/dl)	Total Uptake (μg/day)	Soil+Dust Uptake (μg/day)
0.5-1	2.71	7.33	2.89
1-2	2.71	9.60	2.89
2-3	2.84	10.19	2.89
3-4	2.93	10.15	2.89
4-5	3.04	10.20	2.89
5-6	3.09	10.62	2.89
6-7	3.15	11.06	2.89

Year	Diet Uptake (μg/day)	Water Uptake (μg/day)	Paint Uptake /c/ (μg/day)	Air Uptake /d/ (μg/day)
0.5-1	2.94	1.50	0.00	0.00
1-2	2.96	3.75	0.00	0.00
2-3	3.40	3.90	0.00	0.00
3-4	3.29	3.97	0.00	0.00
4-5	3.18	4.13	0.00	0.00
5-6	3.38	4.35	0.00	0.00
6-7	3.74	4.42	0.00	0.00

Conc.	Concentration.
Abs.	Absorption.
μg Pb/m^3	Micrograms of lead per cubic meter of air.
hr/day	Hours per day.
m^3/day	Cubic meters per day.
μg Pb/L	Micrograms of lead per liter of water.
μg Pb/g	Micrograms of lead per gram of soil or dust.
μg Pb/day	Micrograms of lead per day.
μg Pb/dl	Micrograms of lead per deciliter of blood.
μg/day	Micrograms per day.

/a/ Lead in air = Estimated lead air concentration (Table 3.11).
/b/ Cal/EPA, 1992a.
/c/ Exposure to lead-based paint was not evaluated.
/d/ Estimated air uptake from exposure to summed air concentrations was below 0.01 μg/day.

Table F2. UBK Model Output for the Onsite Child Resident Receptor Ages 0-6 - RME
Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

ABSORPTION METHODOLOGY: Linear Absorption

Outdoor Air Conc.: 0.007 μg Pb/m^3 /a/

Indoor Air Pb Conc.: 30.0 percent of lead outdoor air concentration

Other Air Parameters:

Age	Time Outdoors (hr/day)	Ventilation Rate (m^3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

Diet: DEFAULT

DRINKING WATER Conc.: 15.00 μg Pb/L /b/

WATER Consumption: DEFAULT

SOIL & DUST:

Soil: constant conc.
Dust: constant conc.

Age	Soil (μg Pb/g)	House Dust (μg Pb/g)
0-1	565.5	565.5
1-2	565.5	565.5
2-3	565.5	565.5
3-4	565.5	565.5
4-5	565.5	565.5
5-6	565.5	565.5
6-7	565.5	565.5

Additional Dust Sources: None DEFAULT

PAINT: Alternate Method NOT used!
PAINT INTAKE: 0.0 μg Pb/day DEFAULT

Table F2. UBK Model Output for the Onsite Child Resident Receptor Ages 0-6 - RME
Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc.: 7.50 μg Pb/dl

CALCULATED BLOOD Pb and Pb UPTAKES:

Year	Blood Level (μg/dl)	Total Uptake (μg/day)	Soil+Dust Uptake (μg/day)
0.5-1	6.77	21.41	16.97
1-2	6.86	23.68	16.97
2-3	6.89	24.26	16.97
3-4	7.01	24.23	16.97
4-5	7.26	24.27	16.97
5-6	7.30	24.70	16.97
6-7	7.29	25.14	16.97

Year	Diet Uptake (μg/day)	Water Uptake (μg/day)	Paint Uptake /c/ (μg/day)	Air Uptake /d/ (μg/day)
0.5-1	2.94	1.50	0.00	0.00
1-2	2.96	3.75	0.00	0.00
2-3	3.40	3.90	0.00	0.00
3-4	3.29	3.97	0.00	0.00
4-5	3.18	4.13	0.00	0.00
5-6	3.38	4.35	0.00	0.01
6-7	3.74	4.42	0.00	0.01

RME Reasonable maximum exposure.
Conc. Concentration.
Abs. Absorption.
μg Pb/m^3 Micrograms of lead per cubic meter of air.
hr/day Hours per day.
m^3/day Cubic meters per day.
μg Pb/L Micrograms of lead per liter of water.
μg Pb/g Micrograms of lead per gram of soil or dust.
μg Pb/day Micrograms of lead per day.
μg Pb/dl Micrograms of lead per deciliter of blood.
μg/day Micrograms per day.

/a/ Lead in air = Estimated lead air concentration (Table 3.11).
/b/ Cal/EPA, 1992a.
/c/ Exposure to lead-based paint was not evaluated.
/d/ Estimated air uptake from exposure to summed air concentrations was below 0.01 μg/day.

Table F3. LEADSPREAD Model Output for the Onsite Resident Receptors - Average Exposure /a/
Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR ($\mu g/m^3$)	1.1E-03 /b/	BLOOD LEAD (μg/dl)	1.97	3.50	4.46
LEAD IN SOIL (μg/g)	104.88 /b/				
LEAD IN WATER (μg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	1 /e/				

EQUATIONS, ADULTS

Blood Pb pathway	μg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.02	=	1E-04	(μg/dl)/(μg/day)	*	105	μg/g	*	1.85	g soil/day (5 g/m² * 0.37 m²)	1%
SOIL INGESTION:	0.05	=	0.018	(μg/dl)/(μg/day)	*	105	μg/g	*	0.025	g soil/day	2%
INHALATION:	0.002	=	1.64	(μg/dl)/($\mu g/m^3$)	*	1E-03	$\mu g/m^3$				0%
WATER INGESTION:	0.84	=	0.04	(μg/dl)/(μg/day)	*	15	μg/l /c/	*	1.4	l water/day	43%
FOOD INGESTION: /d/	1.06	=	0.04	(μg/dl)/(μg/day)	*	12.0	μg Pb/kg diet /c/	*	2.2	kg diet/day	54%

$\mu g/m^3$ Micrograms per cubic meter.
1.2E-03 1.2 x 10^-3.
μg/g Micrograms per gram.
μg/l Micrograms per liter.
μg Pb/dl Micrograms of lead per deciliter of blood.
μg/day Micrograms per day.
μg/kg Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-9.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 3.11).
/c/ Cal/EPA, 1992a.
/d/ TOTAL DIETARY LEAD = 0.945 * 10 + 0.055 * Pb in Site-Grown Produce (μg/kg) = 12.0 μg/kg
/e/ Lead in Site-Grown Produce = 0.45 * Pb in Soil μg/kg = 4.7E+01 μg/kg

Table F4. LEADSPREAD Model Output for the Onsite Resident Receptors - RME /a/
Sites 2 and 12 - Site 12
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR ($\mu g/m^3$)	6.5E-03 /b/	BLOOD LEAD (μg/dl)	3.37	5.99	7.64
LEAD IN SOIL (μg/g)	600.89 /b/				
LEAD IN WATER (μg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	1 /e/				

EQUATIONS, ADULTS

Blood Pb pathway	μg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.12	=	1E-04	(μg/dl)/(μg/day)	*	601	μg/g	*	1.85	g soil/day (5 g/m^2 * 0.37 m^2)	3%
SOIL INGESTION:	0.26	=	0.018	(μg/dl)/(μg/day)	*	601	μg/g	*	0.025	g soil/day	8%
INHALATION:	0.011	=	1.64	(μg/dl)/($\mu g/m^3$)	*	7E-03	$\mu g/m^3$				0%
WATER INGESTION:	0.84	=	0.04	(μg/dl)/(μg/day)	*	15	μg/l /c/	*	1.4	l water/day	25%
FOOD INGESTION: /d/	2.14	=	0.04	(μg/dl)/(μg/day)	*	24.3	μg Pb/kg diet /c/	*	2.2	kg diet/day	63%

RME Reasonable Maximum Exposure.
$\mu g/m^3$ Micrograms per cubic meter.
6.9E-03 6.9 x 10^-3.
μg/g Micrograms per gram.
μg/l Micrograms per liter.
μg Pb/dl Micrograms of lead per deciliter of blood.
μg/day Micrograms per day.
μg/kg Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-18 and adult resident receptors.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 3.11).
/c/ Cal/EPA, 1992a.
/d/ TOTAL DIETARY LEAD = 0.945 * 10 + 0.055 * Pb in Site-Grown Produce (μg/kg) = 24.3 μg/kg
/e/ Lead in Site-Grown Produce = 0.45 * Pb in Soil μg/kg = 2.7E+02 μg/kg

SITES 16 AND 17

Table F5. LEADSPREAD Model Output for the Student Resident Receptor - Average Exposure /a/
Sites 16 and 17 - Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR (μg/m³)	1.41E-03 /b/	BLOOD LEAD (μg/dl)	1.8	3.2	4.1
LEAD IN SOIL (μg/g)	123 /b/				
LEAD IN WATER (μg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS

Blood Pb pathway	μg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.02	=	1E-04	(μg/dl)/(μg/day)	*	123	μg/g	*	1.85	g soil/day (5 g/m² * 0.37 m²)	1%
SOIL INGESTION:	0.05	=	0.018	(μg/dl)/(μg/day)	*	123	μg/g	*	0.025	g soil/day	3%
INHALATION:	0.002	=	1.64	(μg/dl)/(μg/m³)	*	1E-03	μg/m³				0%
WATER INGESTION:	0.84	=	0.04	(μg/dl)/(μg/day)	*	15	μg/l /c/	*	1.4	l water/day	47%
FOOD INGESTION: /d/	0.88	=	0.04	(μg/dl)/(μg/day)	*	10.0	μg Pb/kg diet /c,d/	*	2.2	kg diet/day	49%

μg/m³	Micrograms per cubic meter.
1.7E-03	1.7 x 10^-3.
μg/g	Micrograms per gram.
μg/l	Micrograms per liter.
μg Pb/dl	Micrograms of lead per deciliter of blood.
μg/day	Micrograms per day.
μg/kg	Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-9.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 4.16).
/c/ Cal/EPA, 1992a.
/d/ TOTAL DIETARY LEAD = 10.0 μg/kg

Table F6. LEADSPREAD Model Output for the Student Resident Receptor - RME /a/
Sites 16 and 17 - Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR ($\mu g/m^3$)	6.51E-03 /b/	BLOOD LEAD ($\mu g/dl$)	2.09	3.72	4.73
LEAD IN SOIL ($\mu g/g$)	566 /b/				
LEAD IN WATER ($\mu g/l$)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS

Blood Pb pathway	$\mu g/dl$		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.11	=	1E-04	(μg/dl)/(μg/day)	*	566	μg/g	*	1.85	g soil/day (5 g/m² * 0.37 m²)	5%
SOIL INGESTION:	0.25	=	0.018	(μg/dl)/(μg/day)	*	566	μg/g	*	0.025	g soil/day	12%
INHALATION:	0.011	=	1.64	(μg/dl)/(μg/m³)	*	7E-03	μg/m³				1%
WATER INGESTION:	0.84	=	0.04	(μg/dl)/(μg/day)	*	15	μg/l /c/	*	1.4	l water/day	40%
FOOD INGESTION: /d/	0.88	=	0.04	(μg/dl)/(μg/day)	*	10.0	μg Pb/kg diet /c,d/	*	2.2	kg diet/day	42%

$\mu g/m^3$	Micrograms per cubic meter.
1.7E-03	1.7 x 10^-3.
$\mu g/g$	Micrograms per gram.
$\mu g/l$	Micrograms per liter.
μg Pb/dl	Micrograms of lead per deciliter of blood.
$\mu g/day$	Micrograms per day.
$\mu g/kg$	Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-18 and adult resident receptors.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 4.16).
/c/ Cal/EPA, 1992a.
/d/ TOTAL DIETARY LEAD = 10.0 $\mu g/kg$

Table F7. LEADSPREAD Model Output for the Utility Worker Receptor - Average Exposure /a/
Sites 16 and 17 - Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL				
			50th percentile	95th percentile	99th percentile
LEAD IN AIR ($\mu g/m^3$)	8.88E-04 /b/	BLOOD LEAD (μg/dl)	1.77	3.15	4.01
LEAD IN SOIL (μg/g)	77.2 /b/				
LEAD IN WATER (μg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS Blood Pb pathway	μg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.02	=	1E-04	(μg/dl)/(μg/day)	*	77	μg/g	*	1.85	g soil/day (5 g/m² * 0.37 m²)	1%
SOIL INGESTION:	0.03	=	0.018	(μg/dl)/(μg/day)	*	77	μg/g	*	0.025	g soil/day	2%
INHALATION:	0.001	=	1.64	(μg/dl)/($\mu g/m^3$)	*	9E-04	$\mu g/m^3$				0%
WATER INGESTION:	0.84	=	0.04	(μg/dl)/(μg/day)	*	15	μg/l /c/	*	1.4	l water/day	47%
FOOD INGESTION:	0.88	=	0.04	(μg/dl)/(μg/day)	*	10.0	μg Pb/kg diet /c/	*	2.2	kg diet/day	50%

$\mu g/m^3$ Micrograms per cubic meter.
5.4E-04 5.4 x 10^-4.
μg/g Micrograms per gram.
μg/l Micrograms per liter.
μg Pb/dl Micrograms of lead per deciliter of blood.
μg/day Micrograms per day.
μg/kg Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-9.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 4.16).
/c/ Cal/EPA, 1992a.

Table F8. LEADSPREAD Model Output for the Utility Worker Receptor - RME /a/
Sites 16 and 17 - Pete's Pond Extension
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR ($\mu g/m^3$)	4.69E-03 /b/	BLOOD LEAD ($\mu g/dl$)	1.99	3.53	4.50
LEAD IN SOIL ($\mu g/g$)	408 /b/				
LEAD IN WATER ($\mu g/l$)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS

Blood Pb pathway	$\mu g/dl$		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.08	=	1E-04	($\mu g/dl$)/($\mu g/day$)	*	408	$\mu g/g$	*	1.85	g soil/day (5 g/m² * 0.37 m²)	4%
SOIL INGESTION:	0.18	=	0.018	($\mu g/dl$)/($\mu g/day$)	*	408	$\mu g/g$	*	0.025	g soil/day	9%
INHALATION:	0.008	=	1.64	($\mu g/dl$)/($\mu g/m^3$)	*	5E-03	$\mu g/m^3$				0%
WATER INGESTION:	0.84	=	0.04	($\mu g/dl$)/($\mu g/day$)	*	15	$\mu g/l$ /c/	*	1.4	l water/day	42%
FOOD INGESTION:	0.88	=	0.04	($\mu g/dl$)/($\mu g/day$)	*	10.0	μg Pb/kg diet /c/	*	2.2	kg diet/day	44%

RME — Reasonable Maximum Exposure.
$\mu g/m^3$ — Micrograms per cubic meter.
3.1E-03 — 3.1 x 10^-3.
$\mu g/g$ — Micrograms per gram.
$\mu g/l$ — Micrograms per liter.
μg Pb/dl — Micrograms of lead per deciliter of blood.
$\mu g/day$ — Micrograms per day.
$\mu g/kg$ — Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-18 and adult resident receptors.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 4.16).
/c/ Cal/EPA, 1992a.

Table F9. LEADSPREAD Model Output for the Construction Worker Receptor - Average Exposure /a/
Sites 16 and 17 - Site 17 Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR (µg/m³)	6.00E-04 /b/	BLOOD LEAD (µg/dl)	1.75	3.12	3.97
LEAD IN SOIL (µg/g)	52.2 /b/				
LEAD IN WATER (µg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS Blood Pb pathway	µg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.01	=	1E-04	(µg/dl)/(µg/day)	*	52	µg/g	*	1.85	g soil/day (5 g/m² * 0.37 m²)	1%
SOIL INGESTION:	0.02	=	0.018	(µg/dl)/(µg/day)	*	52	µg/g	*	0.025	g soil/day	1%
INHALATION:	0.001	=	1.64	(µg/dl)/(µg/m³)	*	6E-04	µg/m³				0%
WATER INGESTION:	0.84	=	0.04	(µg/dl)/(µg/day)	*	15	µg/l /c/	*	1.4	l water/day	48%
FOOD INGESTION:	0.88	=	0.04	(µg/dl)/(µg/day)	*	10.0	µg Pb/kg diet /c/	*	2.2	kg diet/day	50%

µg/m³ Micrograms per cubic meter.
7.6E-04 7.6 x 10^-4.
µg/g Micrograms per gram.
µg/l Micrograms per liter.
µg Pb/dl Micrograms of lead per deciliter of blood.
µg/day Micrograms per day.
µg/kg Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-9.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 4.17).
/c/ Cal/EPA, 1992a.

Table F10. LEADSPREAD Model Output for the Construction Worker Receptor - RME /a/
Sites 16 and 17 - Site 17 Disposal Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR (µg/m³)	3.24E-03 /b/	BLOOD LEAD (µg/dl)	1.90	3.38	4.31
LEAD IN SOIL (µg/g)	282 /b/				
LEAD IN WATER (µg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS Blood Pb pathway	µg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.06	=	1E-04	(µg/dl)/(µg/day)	*	282	µg/g	*	1.85	g soil/day (5 g/m² * 0.37 m²)	3%
SOIL INGESTION:	0.12	=	0.018	(µg/dl)/(µg/day)	*	282	µg/g	*	0.025	g soil/day	7%
INHALATION:	0.005	=	1.64	(µg/dl)/(µg/m³)	*	3E-03	µg/m³				0%
WATER INGESTION:	0.84	=	0.04	(µg/dl)/(µg/day)	*	15	µg/l /c/	*	1.4	l water/day	44%
FOOD INGESTION:	0.88	=	0.04	(µg/dl)/(µg/day)	*	10.0	µg Pb/kg diet /c/	*	2.2	kg diet/day	46%

RME Reasonable Maximum Exposure.
µg/m³ Micrograms per cubic meter.
3.7E-03 3.7 x 10^-3.
µg/g Micrograms per gram.
µg/l Micrograms per liter.
µg Pb/dl Micrograms of lead per deciliter of blood.
µg/day Micrograms per day.
µg/kg Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-18 and adult resident receptors.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 4.17).
/c/ Cal/EPA, 1992a.

SITE 3

Table F11. UBK Model Output for the Nearby Child Resident Receptor Ages 0-6 - Average Exposure, Site 3 - Weighted Surface Area Volume III - Baseline Risk Assessment, Basewide RI/FS Fort Ord, California

ABSORPTION METHODOLOGY: Linear Absorption

Outdoor Air Conc.: 0.003 μg Pb/m^3 /a/

Indoor Air Pb Conc.: 30.0 percent of lead outdoor air concentration

Other Air Parameters:

Age	Time Outdoors (hr/day)	Ventilation Rate (m^3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

Diet: DEFAULT

DRINKING WATER Conc.: 15.00 μg Pb/L /b/

WATER Consumption: DEFAULT

SOIL & DUST:

Soil: constant conc.
Dust: constant conc.

Age	Soil (μg Pb/g)	House Dust (μg Pb/g)
0-1	51.8	51.8
1-2	51.8	51.8
2-3	51.8	51.8
3-4	51.8	51.8
4-5	51.8	51.8
5-6	51.8	51.8
6-7	51.8	51.8

Additional Dust Sources: None DEFAULT

PAINT: ALTERNATE METHOD NOT USED!!
PAINT INTAKE: 0.0 μg Pb/day DEFAULT

Table F11. UBK Model Output for the Nearby Child Resident Receptor Ages 0-6 - Average Exposure, Site 3 - Weighted Surface Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc.: 7.50 μg Pb/dl

CALCULATED BLOOD Pb and Pb UPTAKES:

Year	Blood Level (μg/dl)	Total Uptake (μg/day)	Soil+Dust Uptake (μg/day)
0.5-1	2.33	5.99	1.55
1-2	2.31	8.27	1.55
2-3	2.46	8.85	1.55
3-4	2.54	8.82	1.55
4-5	2.64	8.86	1.55
5-6	2.70	9.28	1.55
6-7	2.76	9.72	1.55

Year	Diet Uptake (μg/day)	Water Uptake (μg/day)	Paint Uptake /c/ (μg/day)	Air Uptake /d/ (μg/day)
0.5-1	2.94	1.50	0.00	0.00
1-2	2.96	3.75	0.00	0.00
2-3	3.40	3.90	0.00	0.00
3-4	3.29	3.97	0.00	0.00
4-5	3.18	4.13	0.00	0.00
5-6	3.38	4.35	0.00	0.00
6-7	3.74	4.42	0.00	0.00

Conc. Concentration.
Abs. Absorption.
μg Pb/m^3 Micrograms of lead per cubic meter of air.
hr/day Hours per day.
m^3/day Cubic meters per day.
μg Pb/L Micrograms of lead per liter of water.
μg Pb/g Micrograms of lead per gram of soil or dust.
μg Pb/day Micrograms of lead per day.
μg Pb/dl Micrograms of lead per deciliter of blood.
μg/day Micrograms per day.

/a/ Lead in air = Estimated lead air concentration (Table 5.6a).
/b/ Cal/EPA, 1992a.
/c/ Exposure to lead-based paint was not evaluated.
/d/ Estimated air uptake from exposure to summed air concentrations was below 0.01 μg/day.

Table F12. UBK Model Output for the Nearby Child Resident Receptor Ages 0-6 - RME
Site 3 - Weighted Surface Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

ABSORPTION METHODOLOGY: Non-Linear Active-Passive

Outdoor Air Conc.: 0.013 μg Pb/m^3 /a/

Indoor Air Pb Conc.: 30.0 percent of lead outdoor air concentration

Other Air Parameters:

Age	Time Outdoors (hr/day)	Ventilation Rate (m^3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

Diet: DEFAULT

DRINKING WATER Conc.: 15.00 μg Pb/L /b/

WATER Consumption: DEFAULT

SOIL & DUST:

Soil: constant conc.
Dust: constant conc.

Age	Soil (μg Pb/g)	House Dust (μg Pb/g)
0-1	1157.5	51.8
1-2	1157.5	51.8
2-3	1157.5	51.8
3-4	1157.5	51.8
4-5	1157.5	51.8
5-6	1157.5	51.8
6-7	1157.5	51.8

Additional Dust Sources: None DEFAULT

PAINT: ALTERNATE METHOD NOT USED!!
PAINT INTAKE: 0.0 μg Pb/day DEFAULT

Table F12. UBK Model Output for the Nearby Child Resident Receptor Ages 0-6 - RME
Site 3 - Weighted Surface Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc.: 7.50 μg Pb/dl

CALCULATED BLOOD Pb and Pb UPTAKES:

Year	Blood Level (μg/dl)	Total Uptake (μg/day)	Soil+Dust Uptake (μg/day)
0.5-1	6.63	20.92	16.48
1-2	6.72	23.20	16.48
2-3	6.75	23.78	16.48
3-4	6.87	23.75	16.48
4-5	7.11	23.79	16.48
5-6	7.15	24.22	16.48
6-7	7.15	24.66	16.48

Year	Diet Uptake (μg/day)	Water Uptake (μg/day)	Paint Uptake /c/ (μg/day)	Air Uptake /d/ (μg/day)
0.5-1	2.94	1.50	0.00	0.00
1-2	2.96	3.75	0.00	0.00
2-3	3.40	3.90	0.00	0.01
3-4	3.29	3.97	0.00	0.01
4-5	3.18	4.13	0.00	0.01
5-6	3.38	4.35	0.00	0.01
6-7	3.74	4.42	0.00	0.01

RME Reasonable maximum exposure.
Conc. Concentration.
Abs. Absorption.
μg Pb/m^3 Micrograms of lead per cubic meter of air.
hr/day Hours per day.
m^3/day Cubic meters per day.
μg Pb/L Micrograms of lead per liter of water.
μg Pb/g Micrograms of lead per gram of soil or dust.
μg Pb/day Micrograms of lead per day.
μg Pb/dl Micrograms of lead per deciliter of blood.
μg/day Micrograms per day.

/a/ Lead in air = Estimated lead air concentration (Table 5.6).
/b/ Cal/EPA, 1992a.
/c/ Exposure to lead-based paint was not evaluated.
/d/ Estimated air uptake from exposure to summed air concentrations was below 0.01 μg/day.

Table F13. LEADSPREAD Model Output for the Nearby Resident Receptor - Average Exposure /a/
Site 3 - Weighted Surface Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR (µg/m³)	2.7E-03 /b/	BLOOD LEAD (µg/dl)	1.72	3.06	3.90
LEAD IN SOIL (µg/g)	0 /b/				
LEAD IN WATER (µg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS

Blood Pb pathway	µg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.0000	=	1E-04	(µg/dl)/(µg/day)	*	0	µg/g	*	1.85	g soil/day (5 g/m² * 0.37 m²)	0%
SOIL INGESTION:	0.000	=	0.018	(µg/dl)/(µg/day)	*	0	µg/g	*	0.025	g soil/day	0%
INHALATION:	0.004	=	1.64	(µg/dl)/(µg/m³)	*	3E-03	µg/m³				0%
WATER INGESTION:	0.84	=	0.04	(µg/dl)/(µg/day)	*	15	µg/l /c/	*	1.4	l water/day	49%
FOOD INGESTION:	0.88	=	0.04	(µg/dl)/(µg/day)	*	10.0	µg Pb/kg diet /c/	*	2.2	kg diet/day	51%

µg/m³ Micrograms per cubic meter.
2.7E-03 2.7 x 10^-3.
µg/g Micrograms per gram.
µg/l Micrograms per liter.
µg Pb/dl Micrograms of lead per deciliter of blood.
µg/day Micrograms per day.
µg/kg Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-9.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 5.6a).
/c/ Cal/EPA, 1992a.

Table F14. LEADSPREAD Model Output for the Nearby Resident Receptor - RME /a/
Site 3 - Weighted Surface Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR (µg/m³)	1.3E-02 /b/	BLOOD LEAD (µg/dl)	2.48	4.40	5.61
LEAD IN SOIL (µg/g)	1157.5 /b/				
LEAD IN WATER (µg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS Blood Pb pathway	µg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.23	=	1E-04	(µg/dl)/(µg/day)	*	1157	µg/g	*	1.85	g soil/day (5 g/m² * 0.37 m²)	9%
SOIL INGESTION:	0.51	=	0.018	(µg/dl)/(µg/day)	*	1157	µg/g	*	0.025	g soil/day	21%
INHALATION:	0.021	=	1.64	(µg/dl)/(µg/m³)	*	1E-02	µg/m³				1%
WATER INGESTION:	0.84	=	0.04	(µg/dl)/(µg/day)	*	15	µg/l /c/	*	1.4	l water/day	34%
FOOD INGESTION:	0.88	=	0.04	(µg/dl)/(µg/day)	*	10.0	µg Pb/kg diet /c/	*	2.2	kg diet/day	36%

RME Reasonable maximum exposure.
µg/m³ Micrograms per cubic meter.
1.3E-02 1.3 x 10^-2.
µg/g Micrograms per gram.
µg/l Micrograms per liter.
µg Pb/dl Micrograms of lead per deciliter of blood.
µg/day Micrograms per day.
µg/kg Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-18 and adult resident receptors.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 5.16).
/c/ Cal/EPA, 1992a.

Table F15. LEADSPREAD Model Output for the Onsite Adult Park Ranger Receptor - Average Exposure /a/
Site 3 - Weighted Surface Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR (µg/m³)	2.7E-03 /b/	BLOOD LEAD (µg/dl)	1.88	3.33	4.25
LEAD IN SOIL (µg/g)	237.67 /b/				
LEAD IN WATER (µg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS Blood Pb pathway	µg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.0464	=	1E-04	(µg/dl)/(µg/day)	*	238	µg/g	*	1.85	g soil/day (5 g/m² * 0.37 m²)	2%
SOIL INGESTION:	0.105	=	0.018	(µg/dl)/(µg/day)	*	238	µg/g	*	0.025	g soil/day	6%
INHALATION:	0.004	=	1.64	(µg/dl)/(µg/m³)	*	3E-03	µg/m³				0%
WATER INGESTION:	0.84	=	0.04	(µg/dl)/(µg/day)	*	15	µg/l /c/	*	1.4	l water/day	45%
FOOD INGESTION:	0.88	=	0.04	(µg/dl)/(µg/day)	*	10.0	µg Pb/kg diet /c/	*	2.2	kg diet/day	47%

µg/m³ Micrograms per cubic meter.
2.7E-03 2.7 x 10^-3.
µg/g Micrograms per gram.
µg/l Micrograms per liter.
µg Pb/dl Micrograms of lead per deciliter of blood.
µg/day Micrograms per day.
µg/kg Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-9 and 6-18, and adult resident receptors.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 5.6a).
/c/ Cal/EPA, 1992a.

Table F16. LEADSPREAD Model Output for the Onsite Adult Park Ranger Receptor - RME /a/
Site 3 - Weighted Surface Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR ($\mu g/m^3$)	1.3E-02 /b/	BLOOD LEAD (μg/dl)	2.48	4.40	5.61
LEAD IN SOIL (μg/g)	1157.4 /b/				
LEAD IN WATER (μg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS

Blood Pb pathway	μg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.2261	=	1E-04	(μg/dl)/(μg/day)	*	1157	μg/g	*	1.85	g soil/day (5 g/m^2 * 0.37 m^2)	9%
SOIL INGESTION:	0.509	=	0.018	(μg/dl)/(μg/day)	*	1157	μg/g	*	0.025	g soil/day	21%
INHALATION:	0.021	=	1.64	(μg/dl)/($\mu g/m^3$)	*	1E-02	$\mu g/m^3$				1%
WATER INGESTION:	0.84	=	0.04	(μg/dl)/(μg/day)	*	15	μg/l /c/	*	1.4	l water/day	34%
FOOD INGESTION:	0.88	=	0.04	(μg/dl)/(μg/day)	*	10.0	μg Pb/kg diet /c/	*	2.2	kg diet/day	36%

RME Reasonable maximum exposure.
$\mu g/m^3$ Micrograms per cubic meter.
1.3E-02 1.3 x 10^-2.
μg/g Micrograms per gram.
μg/l Micrograms per liter.
μg Pb/dl Micrograms of lead per deciliter of blood.
μg/day Micrograms per day.
μg/kg Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-18 and adult resident receptors.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 5.6a).
/c/ Cal/EPA, 1992a.

Table F17. UBK Model Output for the Nearby Child Resident Receptor Ages 0-6 - Average Exposure, Site 3 - 1 To 10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

ABSORPTION METHODOLOGY: Linear Absorption

Outdoor Air Conc.: 0.036 μg Pb/m^3 /a/

Indoor Air Pb Conc.: 30.0 percent of lead outdoor air concentration

Other Air Parameters:

Age	Time Outdoors (hr/day)	Ventilation Rate (m^3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

Diet: DEFAULT

DRINKING WATER Conc.: 15.00 μg Pb/L /b/

WATER Consumption: DEFAULT

SOIL & DUST:

Soil: constant conc.
Dust: constant conc.

Age	Soil (μg Pb/g)	House Dust (μg Pb/g)
0-1	51.8	51.8
1-2	51.8	51.8
2-3	51.8	51.8
3-4	51.8	51.8
4-5	51.8	51.8
5-6	51.8	51.8
6-7	51.8	51.8

Additional Dust Sources: None DEFAULT

PAINT: ALTERNATE METHOD NOT USED!!
PAINT INTAKE: 0.0 μg Pb/day DEFAULT

Table F17. UBK Model Output for the Nearby Child Resident Receptor Ages 0-6 - Average Exposure, Site 3 - 1 To 10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc.: 7.50 μg Pb/dl

CALCULATED BLOOD Pb and Pb UPTAKES:

Year	Blood Level (μg/dl)	Total Uptake (μg/day)	Soil+Dust Uptake (μg/day)
0.5-1	2.33	6.00	1.55
1-2	2.32	8.28	1.55
2-3	2.46	8.87	1.55
3-4	2.55	8.84	1.55
4-5	2.65	8.88	1.55
5-6	2.70	9.31	1.55
6-7	2.77	9.75	1.55

Year	Diet Uptake (μg/day)	Water Uptake (μg/day)	Paint Uptake /c/ (μg/day)	Air Uptake /d/ (μg/day)
0.5-1	2.94	1.50	0.00	0.01
1-2	2.96	3.75	0.00	0.01
2-3	3.40	3.90	0.00	0.02
3-4	3.29	3.97	0.00	0.02
4-5	3.18	4.13	0.00	0.02
5-6	3.38	4.35	0.00	0.03
6-7	3.74	4.42	0.00	0.03

RME	Reasonable maximum exposure.
Conc.	Concentration.
Abs.	Absorption.
μg Pb/m^3	Micrograms of lead per cubic meter of air.
hr/day	Hours per day.
m^3/day	Cubic meters per day.
μg Pb/L	Micrograms of lead per liter of water.
μg Pb/g	Micrograms of lead per gram of soil or dust.
μg Pb/day	Micrograms of lead per day.
μg Pb/dl	Micrograms of lead per deciliter of blood.
μg/day	Micrograms per day.

/a/ Lead in air = Estimated lead air concentration (Table 5.6b).
/b/ Cal/EPA, 1992a.
/c/ Exposure to lead-based paint was not evaluated.
/d/ Estimated air uptake from exposure to summed air concentrations was below 0.01 μg/day.

Table F18. UBK Model Output for the Nearby Child Resident Receptor Ages 0-6 - RME
Site 3 - 1 To 10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

ABSORPTION METHODOLOGY: Linear Absorption

Outdoor Air Conc.: 0.237 μg Pb/m^3 /a/

Indoor Air Pb Conc.: 30.0 percent of lead outdoor air concentration

Other Air Parameters:

Age	Time Outdoors (hr/day)	Ventilation Rate (m^3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

Diet: DEFAULT

DRINKING WATER Conc.: 15.00 μg Pb/L /b/

WATER Consumption: DEFAULT

SOIL & DUST:

Soil: constant conc.
Dust: constant conc.

Age	Soil (μg Pb/g)	House Dust (μg Pb/g)
0-1	20636.5	51.8
1-2	20636.5	51.8
2-3	20636.5	51.8
3-4	20636.5	51.8
4-5	20636.5	51.8
5-6	20636.5	51.8
6-7	20636.5	51.8

Additional Dust Sources: None DEFAULT

PAINT: ALTERNATE METHOD NOT USED!!
PAINT INTAKE: 0.0 μg Pb/day DEFAULT

Table F18. UBK Model Output for the Nearby Child Resident Receptor Ages 0-6 - RME
Site 3 - 1 To 10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc.: 7.50 μg Pb/dl

CALCULATED BLOOD Pb and Pb UPTAKES:

Year	Blood Level (μg/dl)	Total Uptake (μg/day)	Soil+Dust Uptake (μg/day)
0.5-1	82.34	283.84	279.35
1-2	85.89	286.21	279.42
2-3	84.91	286.87	279.43
3-4	85.96	286.86	279.44
4-5	89.23	286.90	279.44
5-6	89.36	287.39	279.44
6-7	88.39	287.83	279.44

Year	Diet Uptake (μg/day)	Water Uptake (μg/day)	Paint Uptake /c/ (μg/day)	Air Uptake /d/ (μg/day)
0.5-1	2.94	1.50	0.00	0.05
1-2	2.96	3.75	0.00	0.08
2-3	3.40	3.90	0.00	0.15
3-4	3.29	3.97	0.00	0.16
4-5	3.18	4.13	0.00	0.16
5-6	3.38	4.35	0.00	0.22
6-7	3.74	4.42	0.00	0.22

RME Reasonable maximum exposure.
Conc. Concentration.
Abs. Absorption.
μg Pb/m³ Micrograms of lead per cubic meter of air.
hr/day Hours per day.
m³/day Cubic meters per day.
μg Pb/L Micrograms of lead per liter of water.
μg Pb/g Micrograms of lead per gram of soil or dust.
μg Pb/day Micrograms of lead per day.
μg Pb/dl Micrograms of lead per deciliter of blood.
μg/day Micrograms per day.

/a/ Lead in air = Estimated lead air concentration (Table 5.6b).
/b/ Cal/EPA, 1992a.
/c/ Exposure to lead-based paint was not evaluated.
/d/ Estimated air uptake from exposure to summed air concentrations was below 0.01 μg/day.

Table F19. LEADSPREAD Model Output for the Nearby Resident Receptor - Average Exposure /a/
Site 3 - 1 To 10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR ($\mu g/m^3$)	3.60E-02 /b/	BLOOD LEAD (μg/dl)	1.78	3.16	4.03
LEAD IN SOIL (μg/g)	0 /b/				
LEAD IN WATER (μg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS Blood Pb pathway	μg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.0000	=	1E-04	(μg/dl)/(μg/day)	*	0	μg/g	*	1.85	g soil/day (5 g/m^2 * 0.37 m^2)	0%
SOIL INGESTION:	0.000	=	0.018	(μg/dl)/(μg/day)	*	0	μg/g	*	0.025	g soil/day	0%
INHALATION:	0.059	=	1.64	(μg/dl)/($\mu g/m^3$)	*	4E-02	$\mu g/m^3$				3%
WATER INGESTION:	0.84	=	0.04	(μg/dl)/(μg/day)	*	15	μg/l /c/	*	1.4	l water/day	47%
FOOD INGESTION:	0.88	=	0.04	(μg/dl)/(μg/day)	*	10.0	μg Pb/kg diet /c/	*	2.2	kg diet/day	49%

$\mu g/m^3$ Micrograms per cubic meter.
2.7E-03 2.7 x 10^-3.
μg/g Micrograms per gram.
μg/l Micrograms per liter.
μg Pb/dl Micrograms of lead per deciliter of blood.
μg/day Micrograms per day.
μg/kg Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-9.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 5.6b).
/c/ Cal/EPA, 1992a.

Table F20. LEADSPREAD Model Output for the Nearby Resident Receptor - RME /a/
Site 3 - 1 To 10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR ($\mu g/m^3$)	2.37E-01 /b/	BLOOD LEAD (μg/dl)	15.22	27.05	34.46
LEAD IN SOIL (μg/g)	20636.54 /b/				
LEAD IN WATER (μg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS

Blood Pb pathway	μg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	4.03	=	1E-04	(μg/dl)/(μg/day)	*	20637	μg/g	*	1.85	g soil/day (5 g/m^2 * 0.37 m^2)	26%
SOIL INGESTION:	9.08	=	0.018	(μg/dl)/(μg/day)	*	20637	μg/g	*	0.025	g soil/day	60%
INHALATION:	0.389	=	1.64	(μg/dl)/($\mu g/m^3$)	*	2E-01	$\mu g/m^3$				3%
WATER INGESTION:	0.84	=	0.04	(μg/dl)/(μg/day)	*	15	μg/l /c/	*	1.4	l water/day	6%
FOOD INGESTION:	0.88	=	0.04	(μg/dl)/(μg/day)	*	10.0	μg Pb/kg diet /c/	*	2.2	kg diet/day	6%

RME	Reasonable maximum exposure.
$\mu g/m^3$	Micrograms per cubic meter.
1.3E-02	1.3 x 10^-2.
μg/g	Micrograms per gram.
μg/l	Micrograms per liter.
μg Pb/dl	Micrograms of lead per deciliter of blood.
μg/day	Micrograms per day.
μg/kg	Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-18 and adult resident receptors.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 5.6b).
/c/ Cal/EPA, 1992a.

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR ($\mu g/m^3$)	3.60E-02 /b/	BLOOD LEAD ($\mu g/dl$)	3.77	6.70	8.53
LEAD IN SOIL ($\mu g/g$)	3131.46 /b/				
LEAD IN WATER ($\mu g/l$)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS

Blood Pb pathway	$\mu g/dl$		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.6118	=	1E-04	($\mu g/dl$)/($\mu g/day$)	*	3131	$\mu g/g$	*	1.85	g soil/day (5 g/m² * 0.37 m²)	16%
SOIL INGESTION:	1.378	=	0.018	($\mu g/dl$)/($\mu g/day$)	*	3131	$\mu g/g$	*	0.025	g soil/day	37%
INHALATION:	0.059	=	1.64	($\mu g/dl$)/($\mu g/m^3$)	*	4E-02	$\mu g/m^3$				2%
WATER INGESTION:	0.84	=	0.04	($\mu g/dl$)/($\mu g/day$)	*	15	$\mu g/l$ /c/	*	1.4	l water/day	22%
FOOD INGESTION:	0.88	=	0.04	($\mu g/dl$)/($\mu g/day$)	*	10.0	μg Pb/kg diet /c/	*	2.2	kg diet/day	23%

$\mu g/m^3$ Micrograms per cubic meter.
2.7E-03 2.7 x 10^-3.
$\mu g/g$ Micrograms per gram.
$\mu g/l$ Micrograms per liter.
μg Pb/dl Micrograms of lead per deciliter of blood.
$\mu g/day$ Micrograms per day.
$\mu g/kg$ Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-9.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 5.6b).
/c/ Cal/EPA, 1992a.

Table F22. LEADSPREAD Model Output for the Onsite Adult Park Ranger Receptor - RME /a/
Site 3 - 1 To 10 Percent
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR ($\mu g/m^3$)	2.37E-01 /b/	BLOOD LEAD (μg/dl)	15.18	26.97	34.36
LEAD IN SOIL (μg/g)	20636.5 /b/				
LEAD IN WATER (μg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS

Blood Pb pathway	μg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	4.0316	=	1E-04	(μg/dl)/(μg/day)	*	20637	μg/g	*	1.85	g soil/day (5 g/m^2 * 0.37 m^2)	27%
SOIL INGESTION:	9.080	=	0.018	(μg/dl)/(μg/day)	*	20637	μg/g	*	0.025	g soil/day	60%
INHALATION:	0.389	=	1.64	(μg/dl)/($\mu g/m^3$)	*	2E-01	$\mu g/m^3$				3%
WATER INGESTION:	0.84	=	0.04	(μg/dl)/(μg/day)	*	15	μg/l /c/	*	1.4	l water/day	6%
FOOD INGESTION:	0.84	=	0.04	(μg/dl)/(μg/day)	*	9.5	μg Pb/kg diet /c/	*	2.2	kg diet/day	6%

RME	Reasonable maximum exposure.
$\mu g/m^3$	Micrograms per cubic meter.
1.3E-02	1.3 x 10^-2.
μg/g	Micrograms per gram.
μg/l	Micrograms per liter.
μg Pb/dl	Micrograms of lead per deciliter of blood.
μg/day	Micrograms per day.
μg/kg	Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-18 and adult resident receptors.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 5.6b).
/c/ Cal/EPA, 1992a.

Table F23. UBK Model Output for the Nearby Child Resident Receptor Ages 0-6 - Average Exposure, Site 3 - ≥10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

ABSORPTION METHODOLOGY: Linear Absorption

Outdoor Air Conc.: 0.129 μg Pb/m^3 /a/

Indoor Air Pb Conc.: 30.0 percent of lead outdoor air concentration

Other Air Parameters:

Age	Time Outdoors (hr/day)	Ventilation Rate (m^3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

Diet: DEFAULT

DRINKING WATER Conc.: 15.00 μg Pb/L /b/

WATER Consumption: DEFAULT

SOIL & DUST:

Soil: constant conc.
Dust: constant conc.

Age	Soil (μg Pb/g)	House Dust (μg Pb/g)
0-1	51.8	51.8
1-2	51.8	51.8
2-3	51.8	51.8
3-4	51.8	51.8
4-5	51.8	51.8
5-6	51.8	51.8
6-7	51.8	51.8

Additional Dust Sources: None DEFAULT

PAINT: ALTERNATE METHOD NOT USED!!
PAINT INTAKE: 0.0 μg Pb/day DEFAULT

Table F23. UBK Model Output for the Nearby Child Resident Receptor Ages 0-6 - Average Exposure, Site 3 - ≥10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc.: 7.50 μg Pb/dl

CALCULATED BLOOD Pb and Pb UPTAKES:

Year	Blood Level (μg/dl)	Total Uptake (μg/day)	Soil+Dust Uptake (μg/day)
0.5-1	2.33	6.02	1.55
1-2	2.33	8.31	1.55
2-3	2.48	8.93	1.55
3-4	2.56	8.90	1.55
4-5	2.66	8.94	1.55
5-6	2.72	9.40	1.55
6-7	2.79	9.84	1.55

Year	Diet Uptake (μg/day)	Water Uptake (μg/day)	Paint Uptake /c/ (μg/day)	Air Uptake /d/ (μg/day)
0.5-1	2.94	1.50	0.00	0.03
1-2	2.96	3.75	0.00	0.04
2-3	3.40	3.90	0.00	0.08
3-4	3.29	3.97	0.00	0.09
4-5	3.18	4.13	0.00	0.09
5-6	3.38	4.35	0.00	0.12
6-7	3.74	4.42	0.00	0.12

RME Reasonable maximum exposure.
Conc. Concentration.
Abs. Absorption.
μg Pb/m^3 Micrograms of lead per cubic meter of air.
hr/day Hours per day.
m^3/day Cubic meters per day.
μg Pb/L Micrograms of lead per liter of water.
μg Pb/g Micrograms of lead per gram of soil or dust.
μg Pb/day Micrograms of lead per day.
μg Pb/dl Micrograms of lead per deciliter of blood.
μg/day Micrograms per day.

/a/ Lead in air = Estimated lead air concentration (Table 5.6c).
/b/ Cal/EPA, 1992a.
/c/ Exposure to lead-based paint was not evaluated.
/d/ Estimated air uptake from exposure to summed air concentrations was below 0.01 μg/day.

Table F24. UBK Model Output for the Nearby Child Resident Receptor Ages 0-6 - RME
Site 3 - $\geq$10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

ABSORPTION METHODOLOGY: Non-Linear Active-Passive

Outdoor Air Conc.: 0.446 μg Pb/m^3 /a/

Indoor Air Pb Conc.: 30.0 percent of lead outdoor air concentration

Other Air Parameters:

Age	Time Outdoors (hr/day)	Ventilation Rate (m^3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

Diet: DEFAULT

DRINKING WATER Conc.: 15.00 μg Pb/L /b/

WATER Consumption: DEFAULT

SOIL & DUST:

Soil: constant conc.
Dust: constant conc.

Age	Soil (μg Pb/g)	House Dust (μg Pb/g)
0-1	38775.8	51.8
1-2	38775.8	51.8
2-3	38775.8	51.8
3-4	38775.8	51.8
4-5	38775.8	51.8
5-6	38775.8	51.8
6-7	38775.8	51.8

Additional Dust Sources: None DEFAULT

PAINT: ALTERNATE METHOD NOT USED!!
PAINT INTAKE: 0.0 μg Pb/day DEFAULT

Table F24. UBK Model Output for the Nearby Child Resident Receptor Ages 0-6 - RME
Site 3 - ≥10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc.: 7.50 μg Pb/dl

CALCULATED BLOOD Pb and Pb UPTAKES:

Year	Blood Level (μg/dl)	Total Uptake (μg/day)	Soil+Dust Uptake (μg/day)
0.5-1	152.01	527.67	523.13
1-2	163.34	530.79	523.93
2-3	164.42	531.69	524.12
3-4	167.78	531.75	524.19
4-5	175.55	531.84	524.24
5-6	177.32	532.41	524.26
6-7	176.42	532.86	524.25

Year	Diet Uptake (μg/day)	Water Uptake (μg/day)	Paint Uptake /c/ (μg/day)	Air Uptake /d/ (μg/day)
0.5-1	2.94	1.50	0.00	0.09
1-2	2.96	3.75	0.00	0.15
2-3	3.40	3.90	0.00	0.28
3-4	3.29	3.97	0.00	0.30
4-5	3.18	4.13	0.00	0.30
5-6	3.38	4.35	0.00	0.42
6-7	3.74	4.42	0.00	0.42

RME Reasonable maximum exposure.
Conc. Concentration.
Abs. Absorption.
μg Pb/m^3 Micrograms of lead per cubic meter of air.
hr/day Hours per day.
m^3/day Cubic meters per day.
μg Pb/L Micrograms of lead per liter of water.
μg Pb/g Micrograms of lead per gram of soil or dust.
μg Pb/day Micrograms of lead per day.
μg Pb/dl Micrograms of lead per deciliter of blood.
μg/day Micrograms per day.

/a/ Lead in air = Estimated lead air concentration (Table 5.6c).
/b/ Cal/EPA, 1992a.
/c/ Exposure to lead-based paint was not evaluated.
/d/ Estimated air uptake from exposure to summed air concentrations was below 0.01 μg/day.

Table F25. LEADSPREAD Model Output for the Nearby Resident Receptor - Average Exposure /a/
Site 3 - ≥10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR (μg/m³)	1.29E-01 /b/	BLOOD LEAD (μg/dl)	1.93	3.43	4.37
LEAD IN SOIL (μg/g)	0 /b/				
LEAD IN WATER (μg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS

Blood Pb pathway	μg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.0000	=	1E-04	(μg/dl)/(μg/day)	*	0	μg/g	*	1.85	g soil/day (5 g/m² * 0.37 m²)	0%
SOIL INGESTION:	0.000	=	0.018	(μg/dl)/(μg/day)	*	0	μg/g	*	0.025	g soil/day	0%
INHALATION:	0.212	=	1.64	(μg/dl)/(μg/m³)	*	1E-01	μg/m³				11%
WATER INGESTION:	0.84	=	0.04	(μg/dl)/(μg/day)	*	15	μg/l /c/	*	1.4	l water/day	43%
FOOD INGESTION:	0.88	=	0.04	(μg/dl)/(μg/day)	*	10.0	μg Pb/kg diet /c/	*	2.2	kg diet/day	46%

μg/m³ Micrograms per cubic meter.
2.7E-03 2.7 x 10^-3.
μg/g Micrograms per gram.
μg/l Micrograms per liter.
μg Pb/dl Micrograms of lead per deciliter of blood.
μg/day Micrograms per day.
μg/kg Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-9.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 5.6c).
/c/ Cal/EPA, 1992a.

Table F26. LEADSPREAD Model Output for the Nearby Resident Receptor - RME /a/
Site 3 - ≥10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR (µg/m³)	4.46E-01 /b/	BLOOD LEAD (µg/dl)	27.09	48.14	61.32
LEAD IN SOIL (µg/g)	38775.8 /b/				
LEAD IN WATER (µg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS

Blood Pb pathway	µg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	7.58	=	1E-04	(µg/dl)/(µg/day)	*	38776	µg/g	*	1.85	g soil/day (5 g/m² * 0.37 m²)	28%
SOIL INGESTION:	17.06	=	0.018	(µg/dl)/(µg/day)	*	38776	µg/g	*	0.025	g soil/day	63%
INHALATION:	0.731	=	1.64	(µg/dl)/(µg/m³)	*	4E-01	µg/m³				3%
WATER INGESTION:	0.84	=	0.04	(µg/dl)/(µg/day)	*	15	µg/l /c/	*	1.4	l water/day	3%
FOOD INGESTION:	0.88	=	0.04	(µg/dl)/(µg/day)	*	10.0	µg Pb/kg diet /c/	*	2.2	kg diet/day	3%

RME	Reasonable maximum exposure.
µg/m³	Micrograms per cubic meter.
1.3E-02	1.3 x 10^-2.
µg/g	Micrograms per gram.
µg/l	Micrograms per liter.
µg Pb/dl	Micrograms of lead per deciliter of blood.
µg/day	Micrograms per day.
µg/kg	Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-18 and adult resident receptors.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 5.6c).
/c/ Cal/EPA, 1992a.

Table F27. LEADSPREAD Model Output for the Onsite Adult Park Ranger Receptor - Average Exposure /a/
Site 3 - ≥10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR ($\mu g/m^3$)	1.20E-01 /b/	BLOOD LEAD ($\mu g/dl$)	9.06	16.09	20.50
LEAD IN SOIL ($\mu g/g$)	11213.1 /b/				
LEAD IN WATER ($\mu g/l$)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS

Blood Pb pathway	$\mu g/dl$		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	2.1906	=	1E-04	($\mu g/dl$)/($\mu g/day$)	*	11213	$\mu g/g$	*	1.85	g soil/day (5 g/m^2 * 0.37 m^2)	24%
SOIL INGESTION:	4.934	=	0.018	($\mu g/dl$)/($\mu g/day$)	*	11213	$\mu g/g$	*	0.025	g soil/day	54%
INHALATION:	0.211	=	1.64	($\mu g/dl$)/($\mu g/m^3$)	*	1E-01	$\mu g/m^3$				2%
WATER INGESTION:	0.84	=	0.04	($\mu g/dl$)/($\mu g/day$)	*	15	$\mu g/l$ /c/	*	1.4	l water/day	9%
FOOD INGESTION:	0.88	=	0.04	($\mu g/dl$)/($\mu g/day$)	*	10.0	μg Pb/kg diet /c/	*	2.2	kg diet/day	10%

$\mu g/m^3$	Micrograms per cubic meter.
2.7E-03	2.7 x 10^-3.
$\mu g/g$	Micrograms per gram.
$\mu g/l$	Micrograms per liter.
μg Pb/dl	Micrograms of lead per deciliter of blood.
$\mu g/day$	Micrograms per day.
$\mu g/kg$	Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-9.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 5.6c).
/c/ Cal/EPA, 1992a.

Table F28. LEADSPREAD Model Output for the Onsite Adult Park Ranger Receptor - RME /a/
Site 3 - ≥10 Percent Area
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR ($\mu g/m^3$)	4.46E-01 /b/	BLOOD LEAD ($\mu g/dl$)	27.09	48.14	61.32
LEAD IN SOIL ($\mu g/g$)	38775.8 /b/				
LEAD IN WATER ($\mu g/l$)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS

Blood Pb pathway	$\mu g/dl$		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	7.5752	=	1E-04	(μg/dl)/(μg/day)	*	38776	μg/g	*	1.85	g soil/day (5 g/m² * 0.37 m²)	28%
SOIL INGESTION:	17.061	=	0.018	(μg/dl)/(μg/day)	*	38776	μg/g	*	0.025	g soil/day	63%
INHALATION:	0.731	=	1.64	(μg/dl)/(μg/m³)	*	4E-01	μg/m³				3%
WATER INGESTION:	0.84	=	0.04	(μg/dl)/(μg/day)	*	15	μg/l /c/	*	1.4	l water/day	3%
FOOD INGESTION:	0.88	=	0.04	(μg/dl)/(μg/day)	*	10.0	μg Pb/kg diet /c/	*	2.2	kg diet/day	3%

RME Reasonable maximum exposure.
$\mu g/m^3$ Micrograms per cubic meter.
1.3E-02 1.3 x 10^-2.
$\mu g/g$ Micrograms per gram.
$\mu g/l$ Micrograms per liter.
μg Pb/dl Micrograms of lead per deciliter of blood.
$\mu g/day$ Micrograms per day.
$\mu g/kg$ Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-18 and adult resident receptors.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 5.6c).
/c/ Cal/EPA, 1992a.

SITE 31

Table F29. LEADSPREAD Model Output for the Nearby Resident Trespasser Receptor - Average Exposure /a/
Site 31
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR ($\mu g/m^3$)	1.13E-02 /b/	BLOOD LEAD (μg/dl)	2.36	4.20	5.34
LEAD IN SOIL (μg/g)	979 /b/				
LEAD IN WATER (μg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS Blood Pb pathway	μg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.191	=	1E-04	(μg/dl)/(μg/day)	*	979	μg/g	*	1.85	g soil/day (5 g/m^2 * 0.37 m^2)	8%
SOIL INGESTION:	0.431	=	0.018	(μg/dl)/(μg/day)	*	979	μg/g	*	0.025	g soil/day	18%
INHALATION:	0.018	=	1.64	(μg/dl)/($\mu g/m^3$)	*	1E-02	$\mu g/m^3$				1%
WATER INGESTION:	0.84	=	0.04	(μg/dl)/(μg/day)	*	15	μg/l /c/	*	1.4	l water/day	36%
FOOD INGESTION:	0.88	=	0.04	(μg/dl)/(μg/day)	*	10.0	μg Pb/kg diet /c/	*	2.2	kg diet/day	37%

$\mu g/m^3$ Micrograms per cubic meter.
1.1E-02 1.1 x 10^-2.
μg/g Micrograms per gram.
μg/l Micrograms per liter.
μg Pb/dl Micrograms of lead per deciliter of blood.
μg/day Micrograms per day.
μg/kg Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-9.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 6.8).
/c/ Cal/EPA, 1992a.

Table F30. LEADSPREAD Model Output for the Nearby Resident Trespasser Receptor - RME /a/
Site 31
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL				
			50th percentile	95th percentile	99th percentile
LEAD IN AIR (µg/m³)	9.56E-02 /b/				
LEAD IN SOIL (µg/g)	8310 /b/	BLOOD LEAD (µg/dl)	7.16	12.72	16.20
LEAD IN WATER (µg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS Blood Pb pathway	µg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	1.62	=	1E-04	(µg/dl)/(µg/day)	*	8310	µg/g	*	1.85	g soil/day (5 g/m² * 0.37 m²)	23%
SOIL INGESTION:	3.66	=	0.018	(µg/dl)/(µg/day)	*	8310	µg/g	*	0.025	g soil/day	51%
INHALATION:	0.157	=	1.64	(µg/dl)/(µg/m³)	*	1E-01	µg/m³				2%
WATER INGESTION:	0.84	=	0.04	(µg/dl)/(µg/day)	*	15	µg/l /c/	*	1.4	l water/day	12%
FOOD INGESTION:	0.88	=	0.04	(µg/dl)/(µg/day)	*	10.0	µg Pb/kg diet /c/	*	2.2	kg diet/day	12%

RME Reasonable maximum exposure.
µg/m³ Micrograms per cubic meter.
9.6E-02 9.6 x 10^-2.
µg/g Micrograms per gram.
µg/l Micrograms per liter.
µg Pb/dl Micrograms of lead per deciliter of blood.
µg/day Micrograms per day.
µg/kg Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-18 and adult resident receptors.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 6.8).
/c/ Cal/EPA, 1992a.

SITE 39

Table F31. UBK Model Output for the Offsite Child Resident Receptor Ages 0-6 - Average Exposure
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

ABSORPTION METHODOLOGY: Linear Absorption

Outdoor Air Conc.: 0.001 μg Pb/m³ /a/

Indoor Air Pb Conc.: 30.0 percent of lead outdoor air concentration

Other Air Parameters:

Age	Time Outdoors (hr/day)	Ventilation Rate (m³/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

Diet: DEFAULT

DRINKING WATER Conc.: 15.00 μg Pb/L /b/

WATER Consumption: DEFAULT

SOIL & DUST:

Soil: constant conc.
Dust: constant conc.

Age	Soil (μg Pb/g)	House Dust (μg Pb/g)
0-1	51.8	51.8
1-2	51.8	51.8
2-3	51.8	51.8
3-4	51.8	51.8
4-5	51.8	51.8
5-6	51.8	51.8
6-7	51.8	51.8

Additional Dust Sources: None DEFAULT

PAINT: ALTERNATE METHOD NOT USED!!
PAINT INTAKE: 0.0 μg Pb/day DEFAULT

Table F31. UBK Model Output for the Offsite Child Resident Receptor Ages 0-6 - Average Exposure
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc.: 7.50 μg Pb/dl

CALCULATED BLOOD Pb and Pb UPTAKES:

Year	Blood Level (μg/dl)	Total Uptake (μg/day)	Soil+Dust Uptake (μg/day)
0.5-1	2.33	5.99	1.55
1-2	2.31	8.26	1.55
2-3	2.46	8.85	1.55
3-4	2.54	8.81	1.55
4-5	2.64	8.86	1.55
5-6	2.69	9.28	1.55
6-7	2.76	9.72	1.55

Year	Diet Uptake (μg/day)	Water Uptake (μg/day)	Paint Uptake /c/ (μg/day)	Air Uptake /d/ (μg/day)
0.5-1	2.94	1.50	0.00	0.00
1-2	2.96	3.75	0.00	0.00
2-3	3.40	3.90	0.00	0.00
3-4	3.29	3.97	0.00	0.00
4-5	3.18	4.13	0.00	0.00
5-6	3.38	4.35	0.00	0.00
6-7	3.74	4.42	0.00	0.00

Conc.	Concentration.
Abs.	Absorption.
μg Pb/m^3	Micrograms of lead per cubic meter of air.
hr/day	Hours per day.
m^3/day	Cubic meters per day.
μg Pb/L	Micrograms of lead per liter of water.
μg Pb/g	Micrograms of lead per gram of Soil or dust.
μg Pb/day	Micrograms of lead per day.
μg Pb/dl	Micrograms of lead per deciliter of blood.
μg/day	Micrograms per day.

/a/ Lead in air = Estimated lead air concentration (Table 9.8).
/b/ Cal/EPA, 1992a.
/c/ Exposure to lead-based paint was not evaluated.
/d/ Estimated air uptake from exposure to summed air concentrations was below 0.01 μg/day.

Table F32. UBK Model Output for the Offsite Child Resident Receptor Ages 0-6 - RME
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

ABSORPTION METHODOLOGY: Linear Absorption

Outdoor Air Conc.: 0.010 μg Pb/m^3 /a/

Indoor Air Pb Conc.: 30.0 percent of lead outdoor air concentration

Other Air Parameters:

Age	Time Outdoors (hr/day)	Ventilation Rate (m^3/day)	Lung Abs. (%)
0-1	1.0	2.0	32.0
1-2	2.0	3.0	32.0
2-3	3.0	5.0	32.0
3-4	4.0	5.0	32.0
4-5	4.0	5.0	32.0
5-6	4.0	7.0	32.0
6-7	4.0	7.0	32.0

Diet: DEFAULT

DRINKING WATER Conc.: 15.00 μg Pb/L /b/

WATER Consumption: DEFAULT

SOIL & DUST:

Soil: constant conc.
Dust: constant conc.

Age	Soil (μg Pb/g)	House Dust (μg Pb/g)
0-1	51.8	51.8
1-2	51.8	51.8
2-3	51.8	51.8
3-4	51.8	51.8
4-5	51.8	51.8
5-6	51.8	51.8
6-7	51.8	51.8

Additional Dust Sources: None DEFAULT

PAINT: ALTERNATE METHOD NOT USED!!
PAINT INTAKE: 0.0 μg Pb/day DEFAULT

Table F32. UBK Model Output for the Offsite Child Resident Receptor Ages 0-6 - RME
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc.: 7.50 μg Pb/dl

CALCULATED BLOOD Pb and Pb UPTAKES:

Year	Blood Level (μg/dl)	Total Uptake (μg/day)	Soil+Dust Uptake (μg/day)
0.5-1	2.33	6.00	1.55
1-2	2.32	8.27	1.55
2-3	2.46	8.86	1.55
3-4	2.54	8.82	1.55
4-5	2.64	8.87	1.55
5-6	2.70	9.29	1.55
6-7	2.76	9.73	1.55

Year	Diet Uptake (μg/day)	Water Uptake (μg/day)	Paint Uptake /c/ (μg/day)	Air Uptake /d/ (μg/day)
0.5-1	2.94	1.50	0.00	0.00
1-2	2.96	3.75	0.00	0.00
2-3	3.40	3.90	0.00	0.01
3-4	3.29	3.97	0.00	0.01
4-5	3.18	4.13	0.00	0.01
5-6	3.38	4.35	0.00	0.01
6-7	3.74	4.42	0.00	0.01

Conc. Concentration.
Abs. Absorption.
μg Pb/m^3 Micrograms of lead per cubic meter of air.
hr/day Hours per day.
m^3/day Cubic meters per day.
μg Pb/L Micrograms of lead per liter of water.
μg Pb/g Micrograms of lead per gram of Soil or dust.
μg Pb/day Micrograms of lead per day.
μg Pb/dl Micrograms of lead per deciliter of blood.
μg/day Micrograms per day.

/a/ Lead in air = Estimated lead air concentration (Table 9.8).
/b/ Cal/EPA, 1992a.
/c/ Exposure to lead-based paint was not evaluated.
/d/ Estimated air uptake from exposure to summed air concentrations was below 0.01 μg/day.

Table F33. LEADSPREAD Model Output for the Offsite Resident Receptors - Average Exposure /a/
Site 39
Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR ($\mu g/m^3$)	1.02E-03 /b/	BLOOD LEAD (μg/dl)	1.72	3.06	3.90
LEAD IN SOIL (μg/g)	0 /b/				
LEAD IN WATER (μg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS

Blood Pb pathway	μg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.00	=	1E-04	(μg/dl)/(μg/day)	*	0	μg/g	*	1.85	g soil/day (5 g/m^2 * 0.37 m^2)	0%
SOIL INGESTION:	0.00	=	0.018	(μg/dl)/(μg/day)	*	0	μg/g	*	0.025	g soil/day	0%
INHALATION:	0.002	=	1.64	(μg/dl)/($\mu g/m^3$)	*	1E-03	$\mu g/m^3$				0%
WATER INGESTION:	0.84	=	0.04	(μg/dl)/(μg/day)	*	15	μg/l /c/	*	1.4	l water/day	49%
FOOD INGESTION:	0.88	=	0.04	(μg/dl)/(μg/day)	*	10.0	μg Pb/kg diet /c/	*	2.2	kg diet/day	51%

$\mu g/m^3$ Micrograms per cubic meter.
1.2E-03 1.2 x 10^-3.
μg/g Micrograms per gram.
μg/l Micrograms per liter.
μg Pb/dl Micrograms of lead per deciliter of blood.
μg/day Micrograms per day.
μg/kg Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-9.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 9.8).
/c/ Cal/EPA, 1992a.

Table F34. LEADSPREAD Model Output for the Offsite Resident Receptors - RME /a/
Site 39
Volume III - Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR ($\mu g/m^3$)	9.61E-03 /b/	BLOOD LEAD (μg/dl)	1.74	3.08	3.93
LEAD IN SOIL (μg/g)	0 /b/				
LEAD IN WATER (μg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS

Blood Pb pathway	μg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.00	=	1E-04	(μg/dl)/(μg/day)	*	0	μg/g	*	1.85	g soil/day (5 g/m^2 * 0.37 m^2)	0%
SOIL INGESTION:	0.00	=	0.018	(μg/dl)/(μg/day)	*	0	μg/g	*	0.025	g soil/day	0%
INHALATION:	0.016	=	1.64	(μg/dl)/($\mu g/m^3$)	*	1E-02	$\mu g/m^3$				1%
WATER INGESTION:	0.84	=	0.04	(μg/dl)/(μg/day)	*	15	μg/l /c/	*	1.4	l water/day	48%
FOOD INGESTION:	0.88	=	0.04	(μg/dl)/(μg/day)	*	10.0	μg Pb/kg diet /c/	*	2.2	kg diet/day	51%

RME Reasonable Maximum Exposure.
$\mu g/m^3$ Micrograms per cubic meter.
6.9E-03 6.9 x 10^-3.
μg/g Micrograms per gram.
μg/l Micrograms per liter.
μg Pb/dl Micrograms of lead per deciliter of blood.
μg/day Micrograms per day.
μg/kg Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-18 and adult resident receptors.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 9.8).
/c/ Cal/EPA, 1992a.

Table F35. LEADSPREAD Model Output for the Habitat Management Worker Receptor - Average Exposure /a/
Site 39
Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR ($\mu g/m^3$)	1.02E-03 /b/	BLOOD LEAD (μg/dl)	1.78	3.16	4.02
LEAD IN SOIL (μg/g)	88.4 /b/				
LEAD IN WATER (μg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS

Blood Pb pathway	μg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.02	=	1E-04	(μg/dl)/(μg/day)	*	88	μg/g	*	1.85	g soil/day (5 g/m^2 * 0.37 m^2)	1%
SOIL INGESTION:	0.04	=	0.018	(μg/dl)/(μg/day)	*	88	μg/g	*	0.025	g soil/day	2%
INHALATION:	0.002	=	1.64	(μg/dl)/($\mu g/m^3$)	*	1E-03	$\mu g/m^3$				0%
WATER INGESTION:	0.84	=	0.04	(μg/dl)/(μg/day)	*	15	μg/l /c/	*	1.4	l water/day	47%
FOOD INGESTION:	0.88	=	0.04	(μg/dl)/(μg/day)	*	10.0	μg Pb/kg diet /c/	*	2.2	kg diet/day	49%

$\mu g/m^3$ Micrograms per cubic meter.
1.7E-03 1.7 x 10^-3.
μg/g Micrograms per gram.
μg/l Micrograms per liter.
μg Pb/dl Micrograms of lead per deciliter of blood.
μg/day Micrograms per day.
μg/kg Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-9.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 9.8).
/c/ Cal/EPA, 1992a.

Table F36. LEADSPREAD Model Output for the Habitat Management Worker Receptor - RME /a/
Site 39
Baseline Risk Assessment, Basewide RI/FS
Fort Ord, California

INPUT		OUTPUT			
MEDIUM	LEVEL		50th percentile	95th percentile	99th percentile
LEAD IN AIR (µg/m³)	9.61E-03 /b/	BLOOD LEAD (µg/dl)	2.27	4.03	5.13
LEAD IN SOIL (µg/g)	836 /b/				
LEAD IN WATER (µg/l)	15 /c/				
SITE-GROWN PRODUCE? (1 = Yes; 0 = No)	0				

EQUATIONS, ADULTS

Blood Pb pathway	µg/dl		Route-specific constant			Concentration in medium			Contact rate /c/		Percent of total
SOIL CONTACT:	0.16	=	1E-04	(µg/dl)/(µg/day)	*	836	µg/g	*	1.85	g soil/day (5 g/m² * 0.37 m²)	7%
SOIL INGESTION:	0.37	=	0.018	(µg/dl)/(µg/day)	*	836	µg/g	*	0.025	g soil/day	16%
INHALATION:	0.016	=	1.64	(µg/dl)/(µg/m³)	*	1E-02	µg/m³				1%
WATER INGESTION:	0.84	=	0.04	(µg/dl)/(µg/day)	*	15	µg/l /c/	*	1.4	l water/day	37%
FOOD INGESTION:	0.88	=	0.04	(µg/dl)/(µg/day)	*	10.0	µg Pb/kg diet /c/	*	2.2	kg diet/day	39%

RME	Reasonable Maximum Exposure.
µg/m³	Micrograms per cubic meter.
7.3E-03	7.3 x 10^-3.
µg/g	Micrograms per gram.
µg/l	Micrograms per liter.
µg Pb/dl	Micrograms of lead per deciliter of blood.
µg/day	Micrograms per day.
µg/kg	Micrograms per kilogram.

/a/ LEADSPREAD Model output used to estimate blood-lead levels for child resident ages 6-18 and adult resident receptors.
/b/ Lead in air = Estimated lead air concentration. Represents estimated concentrations (Table 9.8).
/c/ Cal/EPA, 1992a.

APPENDIX G

BACKGROUND SOIL CONCENTRATIONS

Table 14. Statistics of Background Datasets
Basewide Background Soil Investigation
Volume II - Remedial Investigation, Basewide RI/FS
Fort Ord, California

Metals/Statistical Parameters (Units)	Adjusted Background Dataset for Fort Ord Soils n = 123	Shallow NQTP Soil Conditions (depth <2.0 feet) n = 43	Deep NQTP Soil Conditions (depth >2.0 feet) n = 58	Shallow QTP Soil Conditions (depth <2.0 feet) n = 11	Deep QTP Soil Conditions (depth >2.0 feet) n = 11
Metals with High Frequency of Detection					
Arsenic					
Frequency of Detection (%)[*]	99	98	100	100	100
Maximum Value (mg/kg)	5.1	3.4	4.5	5.1	5.1
Arithmetic Mean (mg/kg)	1.7	1.33	1.639	2.527	2.664
Standard Deviation (mg/kg)	1	0.731	0.718	1.612	1.443
Coefficient of Variation	0.59	0.55	0.44	0.64	0.54
Chromium					
Frequency of Detection (%)[*]	93	81	100	100	100
Maximum Value (mg/kg)	46.1	46.1	22.7	16.3	28.1
Arithmetic Mean (mg/kg)	10.15	9.218 [**]	8.795	10.227	16.536
Standard Deviation (mg/kg)	6.53	7.021 [**]	3.838	4.419	5.952
Coefficient of Variation	0.86	0.93	0.55	0.36	0.32
Lead					
Frequency of Detection (%)[*]	100	100	100	100	100
Maximum Value (mg/kg)	51.8	51.8	3.7	28	3.8
Arithmetic Mean (mg/kg)	4.83	9.286	1.458	7.755	2.282
Standard Deviation (mg/kg)	6.91	9.216	0.709	7.392	0.78
Coefficient of Variation	1.43	0.99	0.49	0.95	0.34
Nickel					
Frequency of Detection (%)[*]	54	51	56	36	90
Maximum Value (mg/kg)	58	58	19.5	9.1	25
Arithmetic Mean (mg/kg)	7.5	7.813	6.511	4.986	14.032
Standard Deviation (mg/kg)	7.25	10.238	3.931	2.715	6.692
Coefficient of Variation	0.97	1.31	0.60	0.54	0.48
Zinc					
Frequency of Detection (%)[*]	92	80	100	100	100
Maximum Value (mg/kg)	75.8	75.8	13.9	35.6	21.8
Arithmetic Mean (mg/kg)	11.94	14.892	7.486	22.209	13.709
Standard Deviation (mg/kg)	11.03	15.919	2.599	9.452	5.593
Coefficient of Variation	0.92	1.07	0.35	0.43	0.41

Metals/Statistical Parameters (Units)	Adjusted Background Dataset for Fort Ord Soils n = 123	Shallow NQTP Soil Conditions (depth <2.0 feet) n = 43	Deep NQTP Soil Conditions (depth >2.0 feet) n = 58	Shallow QTP Soil Conditions (depth <2.0 feet) n = 11	Deep QTP Soil Conditions (depth >2.0 feet) n = 11
Metals with Low Frequency of Detection					
Antimony					
Number of Detected Results	2	0	2	0	0
Frequency of Detection (%)[*]	1.67	0.00	3.64	0.00	0.00
Maximum Value (mg/kg)	8.2	NA	8.2	NA	NA
Beryllium					
Number of Detected Results	30	9	8	7	6
Frequency of Detection (%)[*]	28	23	16	78	55
Maximum Value (mg/kg)	0.56	0.35	0.48	0.5	0.56
Arithmetic Mean (mg/kg)				0.290**	0.320**
Standard Deviation (mg/kg)				0.175**	0.194**
Cadmium					
Number of Detected Results	4	0	3	1	0
Frequency of Detection (%)[*]	3.33	0.00	5.36	9.09	0.00
Maximum Value (mg/kg)	1.9	NA	1.9	0.6	NA
Mercury					
Number of Detected Results	2	1	0	0	1
Frequency of Detection (%)[*]	1.63	2.33	0.00	0.00	9.09
Maximum Value (mg/kg)	0.12	0.12	NA	NA	0.12
Selenium					
Number of Detected Results	3	0	0	2	1
Frequency of Detection (%)[*]	2.48	0.00	0.00	18.18	9.09
Maximum Value (mg/kg)	1.1	NA	NA	0.73	1.1
Silver					
Number of Detected Results	3	1	1	1	0
Frequency of Detection (%)[*]	2.50	4.76	1.75	0.00	0.00
Maximum Value (mg/kg)	0.49	0.36	0.49	0.44	NA
Thallium					
Number of Detected Results	3	2	1	0	0
Frequency of Detection (%)[*]	2.50	4.76	1.75	0.00	0.00
Maximum Value (mg/kg)	0.45	0.45	0.39	NA	NA

n	=	Number of Samples.

NQTP	Not QTP, i.e., Qal, Qoal, Qar, Qod, Qd, or Tsm.
QTP	QTp, Paso Robles Formation.
Qal	Alluvium.
Qoal	Older alluvium.
Qar	Aromas Sand.
Qod	Older dune sand.
Qd	Recent dune sand.
Tsm	Santa Margarita Formation.

NA	=	Not applicable.
*	=	Frequency of detection equals number of detected occurrences divided by the number of unqualified analyses. Analyses qualified as rejected, "R2," or as nondetect due to laboratory blank results, "U2," are not included in the total of unqualified analyses.
**	=	Mean and standard deviation adjusted using Cohen's method.

APPENDIX H

RESPONSE TO AGENCY COMMENTS

RESPONSE TO AGENCY COMMENTS
DRAFT BASEWIDE REMEDIAL INVESTIGATION/FEASIBILITY STUDY
VOLUME III - BASELINE HUMAN HEALTH RISK ASSESSMENT
FORT ORD, CALIFORNIA

The following are the Army's responses to the comments of the regulatory agencies on the Draft Basewide Remedial Investigation/Feasibility Study. All comments and the associated responses pertaining to Volume III of the Basewide Remedial Investigation/Feasibility Study are provided below.

I. U.S. ENVIRONMENTAL PROTECTION AGENCY GENERAL REVIEW COMMENTS

Comment 17: **Attached please find Attachment C, which includes EPA comments dated October 13, 1994, on Volume III, provided by Jeffrey Paull, EPA Region 9 Toxicologist.**

Response: This comment is acknowledged. The document was not changed in response to this comment.

Comment 18: **Fate and Transport. As discussed in comments on Volume II, the fate and transport of contaminants in soil and groundwater must be evaluated before an adequate baseline risk assessment can be completed. With respect to contaminants found in soils, for instance, the fate and transport analysis should determine at what levels, if any, these contaminants would be at is they migrated to groundwater [this appears to have been done at most RI sites]. Then, if the BRA considered exposure to groundwater as a pathway, the risk from exposure to those levels, if any, should be factored into the BRA.**

Response: Potential migration of contaminants in soil to groundwater is addressed in Volume II, Remedial Investigation, for each of the RI Sites. Fate and transport analysis (using the VLEACH model) was performed as necessary. No impacts to groundwater were identified.

Comment 19: **Please provide additional details to document the certainty of the proposed future reuse scenarios with which the risk assessments are based. For instance, documents, interviews, understandings, etc that form the basis for these scenarios should be further discussed. If uncertainty exists (ie, Site 31,), it may be most prudent to consider the future reuse to be residential in order to be conservative.**

Response: The land use scenarios used in the baseline risk assessment were based on the Fort Ord Reuse Group (FORG) *Summary of Base Reuse Plan* dated January 14, 1994. These scenarios were confirmed for this draft final report by reviewing the Fort Ord Reuse Authority (FORA) *Fort Ord Base Reuse Plan* dated October 14, 1994, and in telephone conversations with Mr. David Salazar of California State University and Ms. Gail Youngblood of Fort Ord. Additionally, the Army has indicated it is willing to accept requirements that land use restrictions be incorporated into deeds and lease agreements for specific areas at Fort Ord.

Comment 20: **Most of the BRA calculations are based on non-residential future scenarios, some of which are quite similar to a standard residential scenario. The BRA showed that the majority of these sites have risk calculations that do not exceed EPAs 10^{-6} "point of departure" cancer risk level, are significantly below 1 of the**

non-carcinogen Hazard index, and do not exceed the blood-lead level for lead. Are there any sites for which the Army thinks a BRA calculation based on a residential scenario would meet the protective standards mentioned above? If so, the site would qualify for No Action without triggering the need to comply with ARARs. This would be a calculation that, despite the fact that is does not represent the future cleanup scenario, could alleviate the need for an unnecessary cleanup and save taxpayers' money.

Response: For all of the Fort Ord sites, screening risk evaluations (SREs) were performed using preliminary remediation goals (PRGs) based on a residential scenario. The five RI sites were selected for evaluation in the BRA because the SREs indicated that exposure at these sites is expected to exceed acceptable levels. Therefore, although BRA calculations based on a residential scenario were not performed for some of the RI sites, these sites are not expected to meet the protective standards mentioned above (e.g., 10^{-6} cancer risk level).

II. U.S. ENVIRONMENTAL PROTECTION AGENCY TECHNICAL REVIEW COMMENTS, VOLUME III - BASELINE HUMAN HEALTH RISK ASSESSMENT

General Comments

Comment 1: **Selection of Receptors and Exposure Pathways: As noted under our specific comments, the potential future receptors considered at each site, are very narrowly defined based upon very specific reuse plans. There is a concern that where reuse plans are subject to change, the risk assessment may not account for all possible receptors and pathways. In particular, the residential setting is the customary default exposure scenario for baseline risk assessments at Superfund sites, and should always be considered wherever reuse plans for a site have not been finalized. The risk assessment should be flexible enough to allow for different types of receptors, and for future changes in reuse plans.**

Response: As discussed between EPA, Cal/EPA, RWQCB, COE, and HLA, future land use plans from the Fort Ord Reuse Group (FORG) were used as the basis of the future exposure scenarios in the Baseline Risk Assessment (BRA). The use of these plans is considered to represent a reasonable approach for assessing potential future impacts. Additionally, the Army has indicated it is willing to accept requirements that land use restrictions be incorporated into deeds and lease agreements for specific areas at Fort Ord.

A residential exposure scenario was conservatively evaluated for all sites in which there was not definitive future land use information. EPA guidance was followed in evaluating those sites not expected to be used as residential property in the future; this guidance clearly indicates that residential land use should not be evaluated in cases where it is not expected (EPA, 1989b, 1990f). In addition, the toxicity assessment and exposure scenarios evaluated in the BRA are conservative in nature and provide estimates of potential health risks from long- and short-term reasonable maximum exposures. As demonstrated in the Uncertainty Analysis in Section 8.0, it is expected that the results of the BRA overestimate, rather than underestimate, potential health risks.

Although they are not expected to occur, significant changes in proposed land uses (e.g., change of commercial/industrial use to residential property) in the future may warrant reevaluation of the potential for health impacts, if exposures associated with the change in land use status are expected to be greater than those evaluated in the BRA. For land uses with expected exposures equal to or less than those evaluated in the BRA, the analysis provides a conservative framework for health-protective management of the properties in the future.

Comment 2: **Site Conceptual Models: The inclusion of diagrams of conceptual models which illustrate exposure sources would greatly clarify the site descriptions and data tables provided in the risk assessment.**

Response: Schematic diagrams presenting the Conceptual Site Model (CSM) for each site have been added to the document as Figures 2.1 through 2.5 in the Draft Final BRA. These CSMs are discussed in Volume II, Section 1.0, and in the Exposure Assessment sections for each site of Volume III (Sections 3.4.1, 3.4.2, 4.4.1, 4.4.2, 5.4.1, 5.4.2, 6.4.1, 6.4.2, 9.4.1, and 9.4.2).

Comment 3: **Site Characterization: We strongly recommend that the target ranges be characterized separately from the rest of Site 3, and that human health risk be assessed independently for them. Their unique topographical features, deposits of spent ammunition, high lead surface soil concentrations, restricted access, and sensitive ecological habit make them qualitatively different from the rest of the site.**

Response: Section 5.0 of the BRA has been revised to provide separate risk estimates for areas with less than 1 percent, between 1 and 10 percent, and greater than 10 percent bullet cover, in addition to the evaluation of weighted surface area exposures presented in the draft report.

Comment 4: **Hazard Identification/Data Analysis: There are many references in the text and tables to samples analyzed for hexavalent chromium, but the results of these analyses were not presented in the document. In order to evaluate total chromium as the trivalent form, representative monitoring and analytical data for hexavalent chromium, with the corresponding limits of detection, are required.**

Response: The statistical summary tables for each site have been revised to include the available data for hexavalent chromium. The number of samples collected and the corresponding range of detection limits for the metal are also presented; no hexavalent chromium was detected in any of the samples from the RI sites.

Comment 5: **Health-Based Soil Threshold Level for Lead: The health-based soil threshold level of concern of 1,925 mg/kg estimated for the resident child is significantly higher than the USEPA Region IX Pre-Remedial Goal (PRG) for lead of 400 mg/kg, and appears to be the result of non-standard inputs into the UBK lead exposure model (see specific comments below).**

Response: The LEAD6 uptake/biokinetic (UBK) model was used to evaluate offsite child residents visiting or trespassing at Sites 3 and 31. Several modifications have been made to the analysis (see Appendix F of Volume III) to address concerns raised by EPA and DTSC regarding the UBK modeling. A revised health-based threshold soil concentration for the visitor/trespasser resident receptor of

1860 mg/kg has been developed. This threshold concentration was derived on the basis of site-specific exposure assumptions about a possible child visitor/trespasser receptor. The Region IX Preliminary Remediation Goal (PRG) of 400 mg/kg is a screening concentration based on onsite residential exposures. It is therefore not directly comparable to this threshold soil concentration.

Comment 6: **Background Concentrations and Risk Characterization: The risk assessment utilizes background concentrations in the process of screening for chemicals of potential concern (COPCs), and in estimating the site-related contribution to health risk. However, it is inappropriate to subtract background when characterizing the probability of non-cancer toxicity. Doing so could lead to erroneous conclusions about the potential for adverse health effects to occur.**

Response: The comment is acknowledged. The text and tables have been revised as suggested.

Specific Comments

Comment 1: **Table 2.9, Reference Doses and Slope Factors for Chemicals of Potential Concern: A random check of the values listed in this table revealed numerous departures from current USEPA Region IX toxicity values. The current USEPA toxicity values are listed in Table 1. The last column in the table indicates that the current EPA toxicity values will result in the calculation of a decreased cancer risk for most substances, but an *increased risk* for bis(2-ethylhexyl)phthalate, and pentachlorophenol.**

Please consult and use current USEPA toxicity values, available on-line, and updated monthly, from the USEPA Integrated Risk Information System (IRIS) Database. Where current Cal/EPA toxicity values are more conservative (result in higher calculated risks) they should be used in place of USEPA values. The reference and date for the toxicity values used, whether USEPA, or Cal/EPA, should be specified in the document. Risks for all chemicals of potential concern (COPCs) should be calculated using the most current toxicity values.

Table 1. Current USEPA Region IX Toxicity Values

Chemical	Oral RfD Chronic (mg/kg-day)	Inhalation RfD Chronic (mg/kg-day)	Oral SF $(mg/kg\text{-}day)^{-1}$	Inhalation SF $(mg/kg\text{-}day)^{-1}$	Magnitude of Recalculated Risk
VOCs					
Carbon tetrachloride		5.7E-04	1.3E-01	5.3E-02	decrease**
Chloroform		1.0E-02	6.1E-03		decrease**
Methylene chloride		8.6E-01	7.5E-03	1.6E-03	decrease
Tetrachloroethene		1.0E-02	5.2E-02	2.0E-03	decrease**
Trichloroethene	6.0E-03	6.0E-03	1.1E-02	6.0E-03	decrease**
SOCs					
Benzo(a)pyrene			7.3E+00	7.3E+00	decrease
Bis(2-ethylhexyl)phthalate		2.2E-02		1.4E-02	increase
Pentachlorophenol		3.0E-02		1.2E-01	increase
Pesticides					
4,4'-DDT		5.0E-04			unchanged**
Metals					
Cadmium				6.3E+00	decrease
Manganese	5.0E-03				decrease
Mercury		8.6E-05			decrease
Nickel				8.4E-01	decrease

* *From Region IX Preliminary Remediation Goals (PRGs) Second Half 1994*, dated August 1, 1994.
** Noncancer risk may increase.

Response : The toxicity values used in the draft BRA report are consistent with the hierarchy and suggestions made in this comment. The BRA was revised to use additional toxicity values as discussed in the October 5, 1994 meeting between the Army, EPA, and HLA. Specifically, ingestion reference doses have been used as inhalation reference doses when no EPA or Cal/EPA value is available. Section 2.3 has been revised to present those values, and to present more information on the basis for the toxicity values used.

Comment 2: **Soil to Skin Adherence Factor, Sec. 2.2.5.3, p. 13: As noted in the document, EPA's dermal absorption guidance recommends a soil-to-skin adherence factor of 1.0 mg/cm^2-day for upper-bound exposures. The adherence factor of 0.4 mg/cm^2-day utilized in the risk assessment is inconsistent with this guidance, and with the default value of 1.0 used for estimating alternative PRGs for Fort Ord (Second Addendum to the Technical Memorandum Preliminary Remediation Goals,**

Alternate PRGs for Site 33, HLA, April 7, 1994). When alternative exposure factors are utilized in place of standardized EPA default exposure assumptions, particularly in the RME scenario, the document needs to present supporting documentation, and reference(s) to the literature which supports the proposed value.

Response: A RME soil-to-skin adherence factor (AF) of 0.4 milligrams per square centimeter (mg/cm^2) was developed based on information presented in the *Dermal Exposure Assessment: Principles and Applications* (*EPA, 1992m*). The RME AF was developed using the assumption that not all of the skin is exposed at upper-bound levels. The heaviest soiling occurs on the palms of the hands and inner forearms, and the balance of the arms, and the face and neck are less exposed. Specific EPA information that resulted in an RME AF of 0.4 mg/cm^2-day is presented below:

- The AF of 0.5 mg/cm^2 to 1.5 mg/cm^2 based on two studies of skin soiling measured on the palms of the hands of children in playgrounds "may be high for other parts of the body that probably have less contact"
- The contact rates measured in the other study upon which the default AFs were based "may not be representative of normal behavior. Parts of the body that have less intimate contact with the soil will likely have lower values"
- The range of values considered in developing the default AFs "is derived from hand measurement only; it may overestimate average adherence for the entire exposed skin area"
- "the lower end of this range (0.2 mg/cm^2) may be the best value to represent an average overall exposed skin", which apparently includes heavily soiled skin.

Therefore, the upper-bound AF of 1.0 mg/cm^2 was used to estimate exposure at the most heavily soiled skin areas, and the AF of 0.2 mg/cm^2 was used to estimate exposure to other skin areas. These AFs were used with 50th percentile values for the areas of the surfaces considered to develop an area-weighted AF of 0.4 mg/cm^2 (See table below).

Description	Adherence Factor (AF) (mg/cm^2)	Area (A) (cm^2)	Adhered Soil (AS) (mg)
hands (front)	1	420	420
hands (back)	0.2	420	84
forearms (front)	1	570	570
forearms (back)	0.2	570	114
upper arms	0.2	1430	286
face and neck (head)	0.2	1180	236
Sum		4590	1710

Area-weighted AF[b]	0.37

Area values obtained from *Exposure Factors Handbook* (*EPA 1990b*) Table 4-1
[a]AS = AF x A
[b]Area-weighted AF = Sum of areas divided by the sum of adhered soil

Additionally, day-to-day exposure generally involves a variety of different activities. Activities resulting in heavy soiling are unlikely to occur at every exposure opportunity. This analysis indicates that an AF of 0.4 provides a very conservative estimate of day-to-day soiling of exposed skin areas. This justification has been added to Section 2.2.5.3.

Comment 3: **Methods for the Uptake Biokinetic Model, Sec. 2.2.9.1, p. 18: Certain default values selected as inputs to the UBK model appear to be incorrect, resulting in an underestimate of blood-lead concentrations, and an overestimate in the health-based soil threshold level of concern (see comment on Lead Model Output, Appendix F).**

Response: The UBK modeling and associated text have been revised in response to this comment. See responses to EPA General Comment 5 and Specific Comment 41 for more details on the revised approach.

Comment 4: **Data Evaluated, Site 2, Sec. 3.2.1, p. 24: The text states that the following 13 metals were detected in at least one soil surface sample: antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc. However, as shown in Table 3.1a., there were only three analyses for each of these metals, and for seven of them, they were detected in only one sample. The document did not offer an explanation as to why so few surface soil samples were taken for these metals, or relate the sampling locations back to the site conceptual model.**

To find an explanation for this lack of monitoring data, Volume II of the Remedial Investigation was examined. Based on the description presented in Sec. 2.1.2.2, p. 13, of that document, it appears that the two soil samples were collected from within the sludge of one sludge bed, and immediately below the asphalt liner of the other sludge bed. The third surface sample appears to have been collected near the drain pipe outlet in the southeast corner of the site. Apparently no surface soil samples were collected from either of the two ponding areas.

The limited number of monitoring sites, and distribution of the surface soil monitoring data appears to be insufficient to adequately represent site 2 surface soil concentrations, particularly in the presence of significant background concentrations of many these metals.

Response: No chemical discharges to surface soils were suspected at Site 2. Soil sampling was initially performed to evaluate the potential for contamination of soils by sludges in drying beds. No substantial contamination was detected and additional sampling was therefore not performed as part of the RI/FS. Additional surface soil sampling at the site was recently conducted as part of the Ecological Risk Assessment (ERA). These data were incorporated into the Draft Final BRA data set, and potential health risks were recalculated for the site. These changes are reflected in Sections 3.0, 3.2, and 3.3.1, and Tables 3.1a, 3.5, 3.10, and 3.15.

Comment 5: **Selection of Chemicals of Potential Concern (COPCs), Soil, Sec. 3.3.1, p. 25: The document states that the maximum concentration of each metal was first compared to the depth-specific Fort Ord NQTP soil background concentration for the metal, and eliminated as COPCs if their concentrations did not exceed background. However, it may be statistically inappropriate to compare the maximum detected value from limited monitoring consisting of three samples, with either the maximum concentration, or the 95 percent UCL of the mean concentration from more extensive background monitoring, as is done in Table 3.5 of the risk assessment.**

An explanation of how background concentrations were determined needs to be incorporated into the document. This explanation should present the number of samples analyzed at each depth, and for each soil type, and descriptive statistics for soil sample background concentrations, including the frequency of detection, sample mean, standard deviation, variance, and 95 percent upper tolerance limit. If this data is presented elsewhere, it should be referenced, and clearly summarized in the document.

Response: The maximum detected concentration was used because calculation of an upper 95 percent confidence level for a set of three samples for which there is no expectation that the population is normally distributed does not provide a meaningful or useful concentration estimate. If a metal did not exceed the maximum background concentrations in any sample analyzed, the metal was not considered to be present as the result of a release at the site and was not selected as a COPC. Using the maximum concentration in the COPC screen is conservative. No changes were made in the document in response to this comment.

Descriptive statistics of background concentrations of metals in soil at Fort Ord are presented in Appendix A. The development of these background values follows the consensus approach reached in meetings between the COE, EPA, Cal/EPA DTSC, RWQCB, and HLA, and described in detail the *Draft Final Basewide Background Soil Investigation, Fort Ord, California* (BBSI) dated March 15, 1993 (*HLA, 1993e*). The use of background soil concentrations in the BRA are discussed in Section 2.1.2.1. The text of Section 2.1.2.1 has been revised to refer the reader to the BBSI for further information. In addition, Appendix G has been added to present the background concentrations used.

Comment 6: **Leaching, Sec. 3.4.1.4, p. 28: The document states that "the chemicals identified as COPCs in soil at Sites 2 and 12 have limited water solubilities and high soil sorption tendencies." Supporting data for this statement should be presented.**

Response: The comment is acknowledged. Chemical properties pertaining to chemical fate and transport are presented in Section 3 of the Introduction to Volume II of the RI/FS report (i.e. Binder 2). The text of Section 3.4.1.4 was revised to identify the basis for statements about chemical mobility.

Comment 7: **Possible Noncancer Health Effects, Site 12, Sec. 3.6.1.2, p. 30: The total multipathway hazard index (HI) of 2 for a resident child, indicates the potential for noncarcinogenic health effects under RME conditions. There should be no "correction" made for background by subtracting the multipathway RME HI for exposure to the background concentration of arsenic in soil. It is important for**

the risk manager to recognize that a child might receive a dose of arsenic in excess of the threshold for toxicity at Site 12, regardless of the fact that some fraction of the dose arises from background arsenic.

Response: Discussion of correcting hazard indices to account for background exposures has been removed from the text throughout the document.

Comment 8: **Statistical Data Summary of Chemicals Detected in Surface Soil, Subsurface Soil, Deep Soil, and Groundwater, Tables 3.1, 3.2, 3.3, and 3.4: These data tables do not indicate which chromium samples were analyzed for hexavalent chromium. Note (f) to Table 3.5 states that chromium was evaluated as chromium III and that chromium VI was not detected, but nowhere in the document are the sampling results for chromium VI presented. Without this data, chromium VI cannot be eliminated as a COPC.**

Response: See the response to EPA General Comment 4.

Comment 9: **Possible Cancer Risk, Site 12, Sec. 3.6.2.2, p. 31: It is not clear why, in characterizing the risk associated with carcinogenic PAH, only data for two surface samples analyzed by EPA Method 8310 were used, and why the data from 35 surface soil samples analyzed by EPA Method 8270 were rejected. Although the detection limit for the Method 8270 samples is higher, these 35 sample results (using one-half the detection limit of 0.3 mg/kg for non-detects) provide a better statistical representation of actual site PAH concentrations than does the single data point of 1.25 mg/kg detected using the 8310 method.**

Response: The text and tables to Section 3.0 were changed to reflect a dataset including PAH analyses from both EPA Methods 8310 and 8270.

Comment 10: **Uncertainty Analysis, Sec. 3.7, p. 31: This section refers to maximum intake rates for drinking water (i.e., 2 liters per day for adults) as unrealistic, and that it "most likely overestimates actual exposure, particularly in light of the probability distributions for tap water ingestion rates recently presented in peer-reviewed literature." Although there is no need to present reference(s) to the literature which support this assertion, since 2 liters/day is used in the RME scenario, in the absence of such references, this assertion stands as an unsupported editorial comment, and should be deleted.**

Response: The subject statement has been deleted from Section 3.7.

Comment 11: **Groundwater, Sec. 4.2.6, p. 38: In evaluating the groundwater data, the criteria used to select the dataset collected from August 1993 to February 1994, as representative of current groundwater conditions, needs to be explicitly stated.**

Response: The text of Section 4.2.6 has been modified to clarify the rationale for selecting the groundwater dataset used in the BRA.

Comment 12: **DOL Maintenance Yard, Sec. 4.3.1, p. 38: An explanation is needed for why no surface soil samples were collected in this area, particularly when 16 chemicals were detected in subsurface soil. Without data for surface soil samples, it is inappropriate to omit this area from the quantitative risk evaluation.**

Response: Additional surface soil samples at the DOL Maintenance Yard were recently collected and analyzed as part of the Fort Ord Basewide Ecological Risk Assessment. The resultant data have been incorporated into the Draft Final BRA dataset, and potential health risk estimates have been recalculated using the new dataset. Additional surface soil samples have also been recently collected for site characterization purposes; however these data are not available for inclusion in the Draft Final BRA. The results of this additional soil sampling will be qualitatively evaluated at a later date to assess the potential impact (if any) on the results of the BRA.

Comment 13: **Pete's Pond, Surface Soil, Sec. 4.3.2.1, p. 39: Beryllium, which exceeded surface soil background concentrations, was eliminated as a COPC based on noncancer risk. This is not consistent with EPA cancer risk assessment guidelines, which considers beryllium potentially carcinogenic through the oral as well as the inhalation route, with an oral slope factor of 4.3 (mg/kg-day)$^{-1}$.**

A random check of the toxicity screen evaluation, using standard EPA exposure assumptions for residential soil, as listed in the Region IX Preliminary Remediation Goals (PRGs) showed that two metals detected above background concentrations in surface soil, copper and mercury, exceeded the screening hazard quotient of 0.01, and should be retained as COPCs.

Response: The oral SF for beryllium was not included in the Draft BRA on the basis of Cal/EPA guidance indicating that the chemical is not carcinogenic via oral exposures. However, to address EPA's concern with this approach, oral exposure to beryllium has been added to the toxicity screening analysis (Appendix C) and subsequent risk estimates to evaluate possible cancer risks from such exposure. Also, see the response to EPA specific Comment 1.

The toxicity screening approach used in the Draft BRA was discussed with EPA and Cal/EPA representatives and agreed upon prior to submittal of the document. Although the screening assessment did not specifically use Region IX PRGs, the methods used are conservative and provide a reasonable basis for COPC selection. The use of a target hazard index of 0.01 and a target cancer risk of 10^{-8} provides a substantial margin of conservatism to the analysis. Also see the response to EPA Specific Comment 1.

As discussed in the October 5, 1994 meeting of EPA, the Army, and HLA, the toxicity screening methods have been revised to include evaluation of potential inhalation exposures for carcinogenic metals. The text and tables in Appendix C have been revised to reflect this change; the selection of COPCs and risk characterization results have also been revised accordingly.

Comment 14: **Pete's Pond Extension, Sec. 4.3.3, p. 40: A random check of the toxicity screen evaluation, using standard EPA exposure assumptions for residential soil, as listed in the Region IX PRGs showed that two metals detected above background concentrations in surface soil, cadmium and mercury, exceeded the screening hazard quotient of 0.01, and should be retained as COPCs.**

Response: See the response to EPA Specific Comment 13.

Comment 15:	**Site 17 Disposal Area, Subsurface Soil, Sec. 4.3.4.2, p. 41: As indicated in Table 4.11b, copper, with a calculated screening hazard quotient of 0.01, should be retained as a COPC.**
Response:	The analysis (Section 4.3.4.2, and Table 4.11b) has been modified to include copper as a COPC.
Comment 16:	**Site 17 Disposal Area, Groundwater, Sec. 4.3.5, p. 42: Toluene, detected at a maximum concentration of 1.1 mg/liter in the A-aquifer, exceeds the USEPA Region IX PRG of 0.72 mg/liter. This indicates that the use of standard EPA exposure assumptions would result in a hazard quotient exceeding 1.0, and that toluene should be retained as a COPC.**
Response:	The groundwater concentrations presented in Table 4.12 were erroneously presented in units of mg/l; toluene was actually detected at 1.1 ug/l. Table 4.12 has been revised to reflect the correct units. Toluene remains a non-COPC at Site 17 Disposal Area.
Comment 17:	**Exposure Assessment, Chemical Vapors, Sec. 4.4.1.1, p. 43: As noted in the comment on Section 3.4.1.4 above, rather than making general statements concerning the physical properties of each COPC, specific data, including solubility, molecular weight, vapor pressure, Henry's Law constant, and organic carbon partition coefficient should be provided in a table, and a screening risk calculation for a representative COPC (e.g., TCDD-TE) should be performed, before the volatilization pathway is eliminated for all COPCs detected.**
Response:	See the response to EPA Specific Comment 6. In addition to providing table of chemical properties in the Draft Final RI (Volume II) which indicates TCDD is unlikely to significantly volatilize, screening calculations based on these chemical properties were performed and indicate that volatilization of TCDD from Site 16/17 soils would not result in cancer risk estimates greater than 10^{-6}.
Comment 18:	**Potential Receptors and Exposure Pathways, DOL Maintenance Yard, Sec. 4.4.2.1, p. 44: As noted in the comment on Section 4.3.1 above, the lack of any surface soil samples for the DOL Maintenance yard is a serious data omission, particularly in view of the fact that possible future onsite receptors include construction workers. The statement that no COPCs were identified in subsurface soils does not provide adequate justification for not quantitatively evaluating exposures of potential future receptors in the DOL Maintenance Yard, particularly when 16 chemicals were detected in subsurface soil, and the potential for leaching is considered to be low (as stated on the same page of the document, in Section 4.4.1.4). Without data for surface soil samples, it is inappropriate to omit this area from the quantitative risk evaluation in the Baseline Risk Assessment.**
Response:	See the response to EPA Specific Comment 12.
Comment 19:	**Potential Receptors and Exposure Pathways, Site 17 Disposal Area, Sec. 4.4.2.4, p. 46: The assumption that student residents are likely to be on campus more frequently and for longer periods of time than other potential receptors is subject to doubt. Faculty and administrative staff may be present on campus over**

periods of time that spans decades, while students average 5 years or less. It is also entirely possible that some faculty and administrative staff, like some students, would choose to live in on-campus housing. The potential receptors for Site 17 should therefore include resident faculty and their families; account for exposure to sensitive subgroups (e.g., pregnant women, infants, children); and include the relevant exposure pathways (e.g., breast milk, homegrown vegetables).

Response: As agreed during discussions between the EPA, Fort Ord, and HLA, review of the site reuse plans for the Site 17 Disposal Area indicates that unrestricted residential development of the site is unlikely. Accordingly, possible health risks associated with Site 17 were evaluated using a student resident receptor residing at the Site 17 Disposal Area to address RME.

Comment 20: Potential Receptors and Exposure Pathways, Groundwater, Sec. 4.4.2.5, p. 46: See comment on Section 4.4.2.4 above. In addition, the statement, "Other groundwater COPCs exceed either the screening HQ or the cancer screening risk, but not both" is not an adequate explanation for why only carbon tetrachloride is mentioned for evaluation as a COPC in the upper 180-foot aquifer, and not the other two COPCs, tetrachloroethylene, and trichloroethylene that were detected there.

Response: The text (Section 4.4.2.5) has been modified to clarify the COPC selection process for groundwater at Sites 16 and 17. Also, see the response to EPA specific Comment 19, above.

Comment 21: Exposure Scenarios, Student Resident, Sec. 4.4.3.1, p. 47: The basis for the assumption that student residents spend only 2.5 hours per day outdoors should be provided. For students who engage in sports, or other outdoor activities (e.g., bicycling, hiking, jogging) this estimate would appear to be low.

Response: The analysis has been revised to include a student resident receptor with an exposure time of 20 hours per day. The text of Section 4.4.3 has been revised to include the rationale for this assumption.

Comment 22: Exposure Scenarios, Construction Worker, Sec. 4.4.3.3, p. 48: The soil ingestion rate of 50 mg/day suggested as the upper-bound value for the commercial/industrial worker in Section 2.2.5.1, is not appropriate for the construction worker that is directly exposed to soil while working onsite. For this exposure scenario, a soil ingestion rate of 480 mg/day should be used (Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors, OSWER Directive 9285.6-03, March, 1991).

Response: The reasonable maximum exposure (RME) scenarios for the utility and construction workers evaluated in the BRA utilized a soil ingestion rate of 100 mg/day (not 50 mg/day), as indicated in Table 2.5. However, the BRA has been revised to use the recommended RME soil ingestion rate of 480 mg/day for these receptors in response to this comment; 50 mg/day has been retained in the average exposure scenario. The appropriate changes have been made in Section 2.2.5.1 and Table 2.5.

Comment 23: Exposure Point Concentrations, Sec. 4.4.4, p. 49: The exposure point

concentrations (EPCs) used for the utility worker at Pete's Pond Extension, and the construction worker at the Site 17 Disposal Area should include the COPC concentrations detected in soil at the surface (0 to 2 bgs) as well as the subsurface (2 to 10 bgs) depths. In addition, the average and RME EPC calculated for TCDD-TE at Pete's Pond is highly uncertain because only one sample was analyzed for CDDs and CDFs.

Response: The exposure point concentration estimates for the both the utility and construction workers have been changed as recommended to include all soil data collected to a depth of 10 feet. Also, additional soil samples were collected and analyzed as part of the Fort Ord Basewide Ecological Risk Assessment for Sites 16 and 17, as indicated in the response to EPA Specific Comment 12 above. These data, which include the results of additional dioxin and furan analyses, have been incorporated into the dataset for the Draft Final BRA and are carried through the BRA analysis. The appropriate changes have been made to the text and tables of Sections 4.0 and 9.0 of the Draft Final BRA.

Comment 24: **Data Evaluation, Sec. 5.2, p. 54: We do not approve of the method of "surface area weighting" the concentrations of chemicals detected at Site 3, in proportion to the surface areas of Study Areas 1 and 2 having different percentage of bullet cover. This is a non-validated, subjective, and unreliable method of treating the data, and cannot be substituted for representative soil monitoring data. Since the target areas represent exposure areas of potential concern to future receptors, particularly children, the soil concentration data should be evaluated separately from the rest of Site 3, and EPCs should be derived specifically for the target areas. We also view as inappropriate, the presentation of surface area weighted chemical concentrations, rather than the actual concentrations detected, in Table 5.3.**

Response: The BRA has been revised to evaluate risks for each target area separately, in addition to the evaluation of weighted surface area exposures. Potential health risks have been separately evaluated for those areas with: less than 1 percent, between 1 and 10 percent, and greater than 10 percent bullet cover. EPCs estimated using the analytical data from 0 to 10 feet below ground surface (bgs) for those areas were substantially lower than the EPCs used to evaluate park ranger receptors and visitors. A construction worker receptor, used to evaluate possible exposure to subsurface soils, was therefore not evaluated separately. The Section 5.0 text and tables have been revised to provide more details of this analysis.

Comment 25: **Potential Receptors and Exposure Pathways, Sec. 5.4.2, p. 57: Based on the reuse description for Site 3, utility and construction workers should also be considered as potential receptors, using the recommended soil ingestion rate of 480 mg/day for an excavation worker.**

Response: The BRA has been revised to discuss utility and construction worker receptors at Site 3.

Comment 26: **Exposure Point Concentrations, Sec. 5.4.4, p. 59: As in the comment above, surface area-weighted soil concentrations should not be used to calculate EPCs; they should be calculated directly from site-specific soil concentrations.**

Response: See the response to EPA Specific Comment 24.

Comment 27: **Toxicity Assessment, Sec. 5.5, p. 59: Although Inhalation Reference Concentrations (RfCs) have not yet been developed for either antimony or copper, the inhalation pathway should not be eliminated from consideration of noncancer effects resulting from inhalation of these two metals. RfCs, estimated from the ingestion RfDs, after making appropriate route-to-route dosimetric adjustments, may be employed.**

Response: See the response to EPA Specific Comment 1.

Comment 28: **Possible Noncancer Health Effects, Sec. 5.6.1, p. 59: The multipathway HI for the RME of 30 years for the nearby resident receptor is very close to 1 (0.9), and with the recalculation of EPCs, as indicated above, could easily exceed 1. In addition, exposure assumptions for these receptors need modification--the park ranger receptor, or excavation worker would be expected to be more highly exposed to lead on the site than park visitors.**

Response: Comparisons of the HIs estimated for the resident receptor and the park ranger are shown on Tables 5.7 and 5.8, respectively. The method used to calculate HIs in the Draft BRA was changed in the Draft Final BRA. The HI calculation in the Draft BRA summed the age-range HIs for child receptors; the Draft Final BRA does not because such summing is unnecessarily conservative (see NTSC specific Comment 36). The offsite child resident receptor has the highest HI because of very conservative assumptions about: 1) the low body weight (the child receptor body weight is assumed to be one-fifth that of the adult receptor), and 2) the high soil ingestion rate (twice that of the adult receptor) (Tables 2.5, 5.5b, and 5.7). This differential is only partly offset by the difference in exposure frequency (the park ranger receptor is assumed to be present 2.6 times as often as the offsite child resident receptor).

Comment 29: **Lead Exposure, Sec. 5.6.3, p. 60: The lead models (UBK AND LEADSPREAD) needs to be re-run using the recalculated EPCs that are based on non-surface area-weighted soil concentrations.**

Response: Please see response to EPA Comment 24 above. The LEADSPREAD and UBK models were rerun as requested.

Comment 30: **Uncertainty Analysis, Sec. 5.7, p. 60: We do not agree with the assumption that the uncertainty involving the methods used to weight the chemical concentrations by the distribution of spent ammunition at locations within Site 3 does not significantly add to the uncertainty of the BRA for Site 3--it is our view that it does.**

Response: The BRA has been revised to provide additional analysis addressing this comment (see Sections 5.2, 5.4.4, 5.6, and 5.7).

Comment 31: **Summary of the Baseline Risk Assessment for Site 3, Sec. 5.8, p. 60: For the reasons set forth in comments on Sections 5.2, 5.4.4, 5.5, 5.6.1, 5.6.3, and 5.7 above, we cannot agree with the conclusion that potential adverse health effects resulting from potential exposure to the COPCs at Site 3 are not expected.**

Response: The BRA for Site 3 (Section 5.0) has been revised substantially, as described in the responses to EPA Specific Comments 24 through 30 above.

Comment 32: **Possible Cancer Risks, North Slope, Site 31, Sec. 6.6.2.1, p. 71: We do not agree with the conclusion that the cancer risk estimated for B(a)P-TE for the RME scenario is not a valid result, representative of actual conditions, based on the finding that the arithmetic mean concentration exceeded the actual measured concentration in only one detected sample. It appears, from Table 6.1a, that the detection limits for B(a)P-TE were too high relative to the actual soil concentrations, and the single value reported of 0.2 mg/kg, may in fact, be representative.**

Response: The detection limits for the PAHs were not substantially elevated in the analyses performed on Site 31 soil samples, but the maximum detected concentration was less than the reporting limit. The statistical methods used were revised to eliminate from the calculations concentrations reflecting one-half the detection limit (i.e., in samples where the chemical was not detected) if the value was greater than the maximum detected concentration. Section 6.6.2.1 has been revised to reflect this approach.

Comment 33: **Summary of Possible Cancer Risks, Sec. 6.6.2.4, p. 72: Because we do not agree with the conclusion drawn for B(a)P-TE cancer risk in the comment above, we do not agree with the conclusion drawn here, that the RME total cancer risk of 2×10^{-6} does not represent an actual elevated risk.**

Response: See the response to EPA Specific Comment 32. No changes were made to the document in response to this comment.

Comment 34: **Summary of Baseline Risk Assessment for Site 31, Sec. 6.8, p. 73: The last sentence should be changed to read: "The results of the lead exposure evaluation, *and the cancer risk evaluation*, indicate that remediation based on possible human health effects is required for Site 31.**

Response: Cancer risk estimates for Site 31 have been revised in response to other EPA and Cal/EPA DTSC comments; the highest cancer risks no longer exceed 10^{-6}. The text of Section 6.8 has been revised to reflect the revised risk estimates.

Comment 35: **Physical Setting, Site 39, Sec. 9.1.1, p. 1: Please provide a more complete explanation for why no chemical data were collected from the 17 small arms ranges.**

Response: Please note that section numbers for the Site 39 BRA have changed from 9.0 to 7.0. The text of Section 7.1.1 has been revised to address this comment.

Comment 36: **Data Evaluation, Sec. 9.2, p. 3: Please provide a more complete explanation for why the analytical data for 24 soil samples from Range 36A were not included in the BRA.**

Response: The analytical data for 24 soil samples collected from Range 36A by JMM were reviewed, and are discussed in detail in Volume II, Remedial Investigation Site 39, Section 3.1. Data for these 24 samples were not included in the BRA because complete validation by HLA was not possible, and a review of the data indicated exclusion of these data does not significantly impact the results of the BRA.

Comment 37:	**Groundwater, Sec. 9.2.2, p. 4: Please provide a more complete rationale for the statement: "Results of the groundwater sampling indicate that groundwater beneath Site 39 does not appear to have been impacted by site activities."**
Response:	The text of Section 7.2.2 has been revised to address this comment. In addition, potential impacts to groundwater quality at Site 39 are discussed in Volume II, Remedial Investigation Site 39. Although the groundwater at Site 39 does not appear to have been impacted by site activity, potential exposures to COPCs in groundwater were evaluated in the BRA.
Comment 38:	**Selection of Chemicals of Potential Concern, Soil, Sec. 9.3.1, p. 5: Please provide data on environmental stability, transformation, and degradation rates for the three explosives (nitroglycerin, 4-nitrophenol, and PETN) which could not be evaluated in the toxicity screen.**
Response:	Section 7.3.1 has been modified to incorporate information regarding the stability and persistence of nitroglycerin, 4-nitrophenol, and PETN.
Comment 39:	**Potential Exposure Pathways, Sec. 9.4.3, p. 9: This is another site in which additional future receptors, and exposure pathways should be considered; for example, the hypothetical offsite resident exposed to chemicals in surface soil via inhalation of dust, may also be exposed via ingestion, dermal absorption, and inhalation on site, as a visitor/trespasser.**
Response:	The text of Section 7.4.3 has been modified to emphasize that exposure to COPCs at Site 39 by trespassers is not expected because contaminated areas at Site 39 are located within the interior of the site. The probability of a trespasser successfully reaching the inner portions of the site on a repeated basis (i.e. exposure of a significant frequency and duration) is low due to unexploded ordnance in the area.
Comment 40:	**Toxicity Screen Evaluation, Appendix C, p. C1: The risk assessment assumes that ingestion represents the most significant exposure route, and therefore toxicity screens did not evaluate either inhalation or dermal contact. Although it is unlikely that either of these routes drive the overall risk, the inhalation route, particularly for the carcinogenic metals, and the dermal route, particularly for the semivolatiles, such as PAHs, should be included in the toxicity screen. In addition the toxicity screening evaluation should be conducted for the most sensitive receptor (i.e., the child) for noncancer endpoints.** **For the purpose of conducting toxicity screening evaluations, we recommend the use of USEPA Region IX PRGs, which incorporate the appropriate exposure pathways and receptors, and have been approved for this purpose by Cal/EPA.**
Response:	See the response to EPA Specific Comment 13.
Comment 41:	**Lead Model Output, Appendix F, Tables F-1 & F-2: We do not understand the use of the term sediment in the tables. Does this value refer to outdoor soil concentrations? We also do not understand the zero exposure assumption for house dust. This value would not be supportable for any residential scenario on site, and would result in a significant underestimate of blood lead concentrations in the output of the model. The health-based soil threshold level of concern of 1,925 mg/kg estimated for the resident child is significantly higher than the**

USEPA Region IX Pre-Remedial Goal (PRG) of 400 mg/kg, and appears to be the result of non-standard inputs into the UBK lead exposure model. All departures from standard default values for the UBK lead model must be well-supported by specific data, and thoroughly documented.

Response: The term "sediment" has been changed to "soil" in the UBK output tables. Exposures from lead in house dust have also been added to the model; the house dust concentrations are considered to be equal to the onsite soil concentrations for onsite receptors, and equal to surface soil background lead concentrations for offsite receptors. See the responses to EPA General Comment 5 and Specific Comment 3 for additional information. The text and tables in Appendix F reflect the changes made to the lead modeling.

Conclusions and Recommendations

Comment 1: **The data and information contained in the Baseline Risk Assessment document is thorough and clearly presented, but it is not acceptable as it stands, as it may underestimate potential human health risk at Fort Ord, due to a variety of reasons enumerated in our general and specific comments outlined above. We anticipate that these comments can be readily addressed in the final draft of the risk assessment.**

Response: As reflected in the responses to EPA's General and Specific Comments, substantial changes have been made in the analysis and document to address the EPA's concerns.

III. DEPARTMENT OF TOXIC SUBSTANCE CONTROL TECHNICAL REVIEW COMMENTS - VOLUME III - BASELINE HUMAN HEALTH RISK ASSESSMENT

Scope of Review

Comment 1: **The document was reviewed for scientific content. Minor grammatical or typographical errors that do not affect the interpretation have not been noted. However, these should be corrected in the final version of the document. We assume that the sampling of environmental media, analytical chemistry data, and quality assurance procedure described in the document reviewed by OSA were adequately reviewed by Regional staff. If deficiencies or data gaps were encountered to adequacy of risk assessment, these are noted. Future changes in the document should be clearly identified. This may be done in several ways: by submitting revised pages with the reason for the changes noted, by the use of strikeout and underline, by the use of shading and italics, or by cover letter stating how each of the comments herein has been addressed.**

Response: A number of changes have been made in the analysis and document in response to EPA and Cal/EPA DTSC comments. The responses to the specific comments presented below identify specific changes made. Responses that entail changes in many locations in the document are not specifically identified. Other changes were made in response to EPA comments and may not be represented in the responses to Cal/EPA-DTSC comments.

General Comments

The risk assessment is thorough for the sites it covers, but it is not acceptable as it stands, principally

for the reasons given in the first two comments below. We anticipate that the other general and specific comments can be addressed readily as the final draft is prepared.

Comment 1: **Selecting Receptors and Pathways According to Reuse Plans: Our experience at other closing military facilities has been that reuse plans are subject to change, sometimes quite often. We fear that the dependence on a particular reuse plan is too great in this risk assessment. By this we mean that risks were not quantified for a great number of potential future receptors and pathways. If the approach had been more generic in nature (e.g., evaluation of all the receptors shown in Table 2.3), greater flexibility would have been achieved.**

The Army has often stated that their policy is to clean Ft. Ord adequately for reuse. This is a risk management decision. Such a policy is best served by assessing risks for several possible future receptors at each site. In that manner, changes in the reuse plan are likely to be accommodated in the baseline risk assessment.

Response: As discussed between the EPA, Cal/EPA, RWQCB, COE, and HLA, future land use plans from the Fort Ord Reuse Group (FORG) were used as the basis of the future exposure scenarios in the BRA. The Amy considers the use of these plans to represent a reasonable approach for assessing potential future impacts. Additionally, the Army has indicated it is willing to accept requirements that land use restrictions be incorporated into deeds and lease and other agreements for specific areas at Fort Ord. Significant changes in the proposed future land uses (e.g., change of commercial/industrial use to residential property) may warrant reevaluation of the potential for health impacts, if exposures are expected to be greater than those currently evaluated in the BRA. Specific changes made in the document are identified in the responses to EPA and Cal/EPA DTSC's specific comments.

Comment 2: **Residential Scenario: The residential setting is the customary default exposure scenario for baseline risk assessments at Superfund sites, but it is not quantified often enough in this risk assessment. Future users of this base cannot point to this document as assurance that any other activities other than those narrowly defined herein are free from risk or hazard due to exposure to contaminants.**

The residential setting is quantified for the wrong group of future residents at Sites 16 and 17 and it is missing altogether for Site 31. This baseline risk assessment is incomplete and will remain so until the residential setting has been adequately assessed at these sites.

Response: A residential exposure scenario was conservatively evaluated for all sites in which there was no definitive information on future land use. EPA guidance was followed in evaluating those sites not expected to be used as residential property in the future; this guidance clearly indicates that residential land use should not be evaluated in cases where it is not expected (*EPA, 1989b, 1990f*). Potential exposure of residents at Sites 16 and 17 and Site 31 are specifically addressed in Sections 4.4.2 and 6.4.2 of the text, respectively; Section 4.4.2 of the text was revised to evaluate additional receptors. In addition, the toxicity assessment and exposure scenarios evaluated in the BRA were conservative in nature and are considered to provide reasonable, upper-bound estimates of potential health risks from long-term, continuous exposure. As the Uncertainty Analysis in Section 8.0 indicates, it is expected that the results of the BRA overestimate, rather than underestimate, potential health risks.

Comment 3: **Site Conceptual Models: Diagrams of the conceptual models for exposure at each site would be most helpful. Descriptions are provided in text, but the large numbers of tables are difficult to follow without a diagram. Conceptual models provide a clear picture of what is being assessed and not assessed. We strongly recommend their use.**

Response: See the response to EPA General Comment 2.

Comment 4: **Hexavalent Chromium: We found many references in the document to samples being analyzed for hexavalent chromium, but we were unable to locate results of these analyses in any volume of the draft RI/FS. Where are these data? If they cannot be located, we will not be able to approve of treating total chromium as trivalent chromium.**

Response: See the response to EPA General Comment 4.

Comment 5: **Zinc: We are puzzled by the treatment of zinc as an essential nutrient in Appendix B. *Risk Assessment Guidance for Superfund, Part A* (RAGS Part A) (USEPA, 1989) allows five specified essential nutrients to be eliminated as chemicals of potential concern, but zinc is not among them. In general, we reject the approach for zinc presented in Appendix B as being outside guidelines. However, zinc was not selected as a chemical of concern in any medium at any site using the approach in Appendix B and this result would have been the same if the more conventional approach had been used based on toxicity (i.e., hazard quotient less than or 0.01). Because the results of this risk assessment would be unaltered, we will not require the Army to recalculate all the screening values for zinc, but we will reject in the future the method of screening any metals as essential nutrients other than the five specifically mentioned in RAGS Part A.**

Response: The comment is acknowledged. The document was not changed in response to this comment.

Specific Comments

A. Chapter 2, Methods

Comment 1: **Duplicate Data, Sec. 2.1.1.5, p. 6: The last sentence in this sentence is unclear. Does this indicate that some samples received double weighting in calculating means? Please give us example.**

Response: Samples for which duplicate analyses (using the same method) were performed for quality control did not receive double weighting in the statistical analyses. The results from only one of the duplicate analyses were included in the risk assessment dataset; the results from the samples identified as duplicates were excluded from the dataset.

The results from analyses of the same sample using different methods with common analytes, e.g., BTEX analyzed using EPA Methods 8020 and 8240, were both included in the dataset analyzed to avoid underestimating exposure point concentrations. This occurred infrequently, and in all cases, the chemical was detected by only one of the analyses. No changes were made in the document in response to this comment.

Comment 2: **Background Concentrations, Table 2.2: Please expand Table 2.2 to show for each metal: numbers of samples assayed, ranges of detection limits or reporting limits, ranges of detected concentrations, means, standard and deviations. It would be useful to present these data for both relevant types of soils. Also, please give a definition in the text in statistical terms for the background threshold concentration.**

Response: See the response to EPA Specific Comment 5.

Comment 3: **Quantification of Risks and Hazards in Background, Appendix A: In its *Supplemental Guidance for Human Health Multimedia Risk Assessments at Hazardous Waste Sites and Permitted Facilities* (DTSC, 1992), the Department permits subtracting estimated background cancer risks from the total risks at release sites. This allows quantification of incremental cancer risks due to site-related activities. Because all does of carcinogens are thought to be associated with some amount of incremental risk, remedial alternatives lower the total risk at a release site by a finite amount. Risk managers may then choose the remedial alternative which reduces total cancer risk by the desired amount. If background cancer risks constitute the great bulk of the total risk, the risk manager might not find it justifiable to remediate to remove a small fraction of the cancer risk.**

On the other hand, the Department disagrees with the practice of subtracting background for non-cancer health effects, based on the toxicological principle of the existence of threshold doses for non-cancer toxicity. It is generally assumed that a hazard quotient or summed hazard index greater than unity suggests that exposure to environmental concentrations of chemicals might yield doses which exceed the threshold for toxic effects. Subtracting background concentrations could thus lead to erroneous conclusions about whether threshold for toxicity have been exceeded. A decision to remediate a site based on reduction of the threat of a non-cancer toxic effect must be based on lowering the total dose below the threshold. The site-related fraction of a greater-than-threshold dose is immaterial.

In the current risk assessment, total cancer risk and hazard are expressed for each group of receptors. We strongly urge that the Army not mix risk management decisions into the risk assessment by expressing the relevant risk as one with background subtracted. It is our experience that such mixing confuses both the risk managers and the public. Let the risk assessors quantify risks and hazards for release sites and for background in the baseline risk assessment. If background risks and hazards are to be compared to risks, let that occur when remedial alternatives are compared as part of a feasibility study.

Response: The exposure point concentrations used in Sections 3.4.4, 4.4.4, 5.4.4 and 6.4.4 to estimate possible site-related exposures represent detected concentrations, with no subtraction of background concentrations. The health risks associated with background chemical concentrations were evaluated separately in Appendix A to provide a context for risk management. Discussion of background components of noncancer hazard indices was deleted from the text in Sections 3.6.1, 4.6.1, 5.6.1, and 6.6.1.

Comment 4. **Lead, Appendix A, Table A1: Please do not create a hazard quotient for lead nor include lead in a summed hazard index. The hazards of lead are assessed in a manner so fundamentally different from that used for other chemicals with non-cancer endpoints that results of the two types of assessment must not be combined.**

Response: Table A1 and the text of Appendix A were revised as recommended.

Comment 5. **Soil to Skin Adherence Factor, Sec. 2.2.5.3, p. 13: The Department recommends 1 mg/cm² as a default for the adherence of soil to skin in the case of the reasonable maximum exposure (RME). We base this on *Dermal Exposure Assessment: Principles and Practice* (USEPA, 1992). On pages 8-16 and 8-17 of this guidance, USEPA summarizes available studies as showing that values range from 0.2 to 1.5 mg/cm². USEPA goes on to recommend quite clearly that 1.0 mg/cm² is an reasonable upper bound of the range of these studies. The highest value, 1.5 mg/cm², is taken from the study of Driver et al. (1989), who used "humans" as test subjects. We do not understand why the Army asserts that the value of 1.5 mg/cm² is characteristic of children. The Department favors USEPA's recommendation in this regard; we reject the default value of 0.4 mg/cm² suggested by the Army, because it does not conform to Department guidance. We have expressed this comment to the Army on previous occasions.**

Response: See the response to EPA Specific Comment 2.

Comment 6 **Dermal Absorption of Dioxins, Sec. 2.2.6, p. 16: The Department recommends 3% as a default for dermal absorption of chlorinated dibenzo-p-dioxins (CDD) and chlorinated dibenzofurans (CDF), based on *Dermal Exposure Assessment: Principals and Practice* (USEPA, 1992). The extended quotation given by the Army on page 16 lists three values for dermal absorption of 2,3,7,8-tetraCDD (TCDD) derived from the rat but "corrected" for humans: 0.2%, 1.0%, and 2.5%. [In reality, the value 0.2% is a miscalculation: 1.08% x 2.42 / 7.74 = 0.33%.] The next two sentences after the quotation selected by the Army read as follows:**

> **"The percents absorbed, corrected to reflect absorption in vivo in humans, range from 0.1% to 2.5%. The recommended percent of applied dose absorbed for TCDD is 0.1 to 3%."**

The Department takes this last sentence to be a clear statement that USEPA recommends 3% as the dermal absorption factors for TCDD for the RME. The Department favors USEPA's recommendation in this regard; we adopted it in the PEA guidance manual. We reject the default value of 1% suggested by the Army. We have expressed this comment to the Army on previous occasions.

Response: The Army believes that the information presented in *Dermal Exposure Assessment: Principles and Applications* (*EPA, 1992m*) clearly indicates that a 1 percent dermal absorption factor (DAF) used to estimate uptake of dioxin from soils at Fort Ord is a reasonable, conservative value. The EPA's (*1992m*) document presents four DAF estimates based on the findings of three separate studies evaluating dermal uptake of dioxins from soil:

Value (percent)	Basis

2.5	A 1991 EPA rat study using *in vivo* administration, corrected to reflect differences between dermal absorption *in vivo* in rats and humans observed in the same study
0.2	A 1988 rat study by Shu et al., using *in vivo* administration, corrected to reflect differences between dermal absorption *in vivo* in rats and humans observed in the 1991 EPA study. The Cal/EPA DTSC comment points out that the calculation presented by EPA (*1992m*) indicates this value should be 0.33 percent
1	A 1980 rat study by Poiger and Schlatter using *in vivo* administration, corrected to reflect differences between dermal absorption *in vivo* in rats and humans observed in the 1991 EPA study
0.45	The 1991 EPA study which used *in vitro* administration to (human) cadaver skin, corrected to reflect differences between dermal absorption *in vitro* in rats and humans observed the same study
1	Average of the four values above (using either 0.2 or 0.33 percent for the data from Shu et al.)

The four experimentally-derived DAF values presented above were all based on soil with low organic carbon content, consistent with the conditions at Fort Ord. All are less than the 3 percent DAF value suggested for use. The values presented for each of the three studies were based on conservative interpretations of the data, for example:

- The values from the 1991 EPA study include TCDD retained in the skin as part of the absorbed fraction; this dioxin is likely to be lost by epidermal exfoliation without systemic uptake

- The 1988 Poiger and Schlatter study used soil dioxin concentrations in the 350 to 1300 mg/kg range but also shows that the fraction absorbed is higher at higher dioxin concentrations; this indicates that absorption from soil with lower concentrations, such as those measured at Fort Ord, would be lower

- The value from the 1988 study by Shu et al. included a 30 percent correction for digestive tract absorption, which was not used in the slope factor development

The average value of 1 percent presented above is based on soils representative of conditions at Fort Ord and is within the 0.1 to 3 percent range recommended by EPA (*1992m*). The DAF value of 3 percent recommended by Cal/EPA DTSC is outside the range of values derived from experimental observations. The 1 percent DAF value is also consistent with a value of 0.5 percent predicted by McCone (*1990*) using a dermal fugacity model for TCDD and the range described by the probability distribution developed by Copeland et al. (*1993*).

The DAF value is intended for use in estimating reasonable maximum exposure (RME) that may occur. RME is intended to be reasonable, and therefore need not use numerous bounding estimates that compound each other to present an unnecessarily conservative analysis. The exposure assessment uses conservative assumptions and bounding values for exposure point concentration, exposure frequency and duration, adherence factor, and exposed body surface area. The use of a DAF value greater than 1 percent is not necessary to estimate RME.

Based on the analysis provided above, no changes were made in the document in response to this comment.

Comment 7: **Calculation of Toxicity Equivalency Factors (TEFs) for CDDs and CDFs, Sec. 2.2.7, p. 16: In a previous memorandum we recommended a more stringent procedure for calculating TEFs. After consulting with USEPA, we accept the method proposed by the Army. Specifically, TEFs may be calculated using data from those congeners detected, ignoring those not detected.**

Response: This comment is acknowledged. The document was not changed in response to this comment.

Comment 8: **Toxicity Equivalency Factors for Polycyclic Aromatic Hydrocarbons (PAH), Sec. 2.2.7, p. 17: Please correct the text at the top of the right hand column on page 17 to reflect that Table 2.8 refers to PAH, not B(a)P.**

Response: The text of Section 2.2.7 was revised to correct this typographical error.

Comment 9: **Methods for LEADSPREAD, Sec. 2.2.9.2, p. 18: In the Department's *Supplemental Guidance* (DTSC, 1992), we recommend that plant uptake in LEADSPREAD be set to "YES" for residential exposures. We note in all the spreadsheets presented in Appendix F that lead uptake into plants is set to "NO". We do not find Section 2.2.9.2 or in the sections specific for the individual sites any justification for the assumptions that lead will not be taken up into plants or that longer term residents will not use local soils for home-grown produce. The Army should either follow Department guidance or present adequate justification for exclusion of the pathway.**

Response: The LEADSPREAD modeling has been modified to include the plant uptake analysis for Site 12, which may be used for residential property in the future. As indicated in the response to Cal/EPA DTSC General Comment 2, the future residential land use at Sites 16 and 17 is not expected. Potential lead exposures from ingestion of garden vegetables at Sites 16 and 17 were therefore not considered likely, and plant uptake analysis was not conducted for Sites 16 and 17. The Site 12 changes are reflected in Tables F3 and F4, Sections 3.4.2.2, 3.6.3, 4.4.3, and Appendix F.

Comment 10: **Toxicity Values, Sec. 2.3.1, p. 20, and Table 2.9: The oral reference dose (RfD) for 1,1-dichloroethene was used for the inhalation route as well, but the text on page 20 refers to 1,2-dichloroethane, for which no RfD is available. Please correct this.**

The Department recommends the use of surrogate chemicals when toxicity criteria are not available from the customary sources. We approve of the use of the RfD for pyrene as a substitute for the non-cancer toxicity of PAHs with no published RfD. However, all the holes in Table 2.9 should be filled in rather than ignore the presence of a chemical altogether. A provisional RfD of

7E-03 mg/kg-day has been available for over two years from the Environmental Criteria and Assessment Office of USEPA's Office of Research and Development; the Department recommends use of this value for the non-cancer effects of trichloroethene. For other substances, we recommend that risk assessors for the Army consult with their counterparts in USEPA and the Department to gain consensus on appropriate surrogate chemicals.

Response: See the response to EPA Specific Comment 1. The revisions include using the provisional reference dose for trichloroethene as recommended.

Comment 11: Target Risk, Sec. 2.4.2, p. 21: The upper bound of the "decision range" of cancer risks is one in ten thousand, not one in one hundred thousand.

Response: The text of Section 2.4.2 has been modified to correct this typographical error.

Comment 12: Exposure Pathways, Table 2.3: We do not understand how utility or construction workers can become exposed to soils at 2 to 10 ft below ground surface without becoming exposed to the top 2 ft as well. Why are surface soils not included for these receptors? For the resident at Sites 16 and 17, please include inhalation of volatile chemicals as a result of domestic use of groundwater. For Site 31, "worker housing" is mentioned in the reuse plan on page 9. This scenario could yield greater exposures than a trespasser, but it is not included. Why not?

Response: The exposure analysis for construction workers and utility workers has been revised to assess exposure to soils from 0 to 10 feet below ground surface. These changes are reflected in Table 2.3 and others.

The analysis for the student resident receptors at Sites 16 and 17 has been revised to include household exposure to volatile chemicals in groundwater from domestic use of groundwater. These changes are reflected in Section 3.4 and the corresponding tables.

As discussed in a meeting between the Army, EPA, Cal/EPA DTSC, and HLA on October 5, 1994, residential development on the north and south slopes of Site 31 is not expected; the trespasser receptor considered at Site 31 addresses potential residential exposure.

Comment 13: Default Values for the RME, Table 2.5: Both the utility worker and the construction worker seem to resemble closely the "excavation scenario" described in the memorandum, "Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors" (USEPA, 1991). The Department agrees with the recommendation of USEPA that the ingestion rate for soil for excavation workers should be 480 mg/day, not 100 mg/day.

Response: The analysis has been revised using an RME soil ingestion rate of 480 mg/day for utility and construction workers. These changes are reflected in Section 2.2.5.1 and Table 2.5.

Comment 14: Dermal Absorption Values, Table 2.6: In its *Preliminary Endangerment Assessment Guidance Manual* (PEA) (DTSC, 1994), the Department recommends several less conservative values for dermal absorption than those shown in Table 2.6.

Response: Table 2.6 and the exposure analysis for all of the sites has been revised to incorporate less-conservative values for dermal absorption presented in the *Preliminary Endangerment Assessment (PEA) Guidance Manual.*

B. Chapter 3, Sites 2 and 12

Comment 15. **95% UCL vs. C_{max} in Soils, Sec. p. 24, and Tables 3.1-3.3: In general, the Department approves of the use of the lower of the maximum concentration detected (C_{max}) or the 95% upper confidence level (95% UCL) on the arithmetic mean concentration to represent exposure point concentrations. In Tables 3.1 through 3.3 we note that the two values do not differ greatly for most chemicals. However, we are disturbed by the number of instances in which C_{max} is less than one-half of the 95% UCL. In some cases, C_{max} is less than one-tenth of the 95% UCL. In those instances associated with a low frequency of detection, it seems likely that the 95% UCL has been driven up by one or more non-detects in samples with elevated reporting limits. Elevated reporting limits are usually caused by high quantities of one or more contaminants in the sample. In samples contaminated enough to elevate the reporting limit, concentrations higher than C_{max} could be masked.**

We show below the instances at Sites 2 and 12 in which C_{max} is less than one-half the 95% UCL. Frequencies of detection are also given. Please present a discussion of the likelihood of having erroneously eliminated chemicals of potential concern due to high detection limits in these instances.

Table	Chemical	FOD	95% UCL (ppm)	C_{max} (ppm)
3.1c:	Acetone	5 / 14	3.30E+03	4.50E+01
3.2a:	4,4'-DDT	1 / 8	3.30E-02	1.50E-02
	Diethylphthalate	1 / 13	1.68E+00	4.10E-02
	Trichloroethene	1 / 30	6.67E-03	2.40E-03
3.2b:	Antimony	3 / 58	4.32E+00	1.90E+00
3.2c:	Antimony	1 / 71	3.81E+00	4.10E-01
	Diethylpthalate	3 / 22	4.88E-01	9.40E-02
	Pentachlorophenol	2 / 22	2.34E+00	3.60E-02
3.3:	1,1-Dichloroethane	1 / 27	3.25E-03	6.30E-04
	Pentachlorophenol	1 / 4	4.18E-02	2.00E-03

Response: The anomalies noted are not expected to substantially affect risk estimation or, in most cases, COPC selection. The acetone 95 percent UCL was reported in micrograms per kilogram and should have been reported as 3.3E+00 mg/kg, eliminating the observed inconsistency. Table 3.1c has been revised to reflect this correction. For DDT, the highest reporting limit of any sample from the site (0.074 mg/kg) corresponds to a cancer risk of 1 x 10^{-8} in the toxicity screen, indicating that risk estimation was not substantially affected. For diethylphthalate (DEP), the highest reported concentration was less than the lowest reporting limit, contributing to the observed anomaly. For DEP, toxicity screening using the highest reporting limit (5.2 mg/kg) would eliminate DEP as a COPC. For TCE, toxicity screening using the highest reporting limit (0.026 mg/kg) would eliminate TCE as a COPC. For antimony, toxicity screening using the highest reporting limit corresponds to a hazard index of 0.02, indicating that risk estimation was not substantially affected. Pentachlorophenol was detected infrequently in soil and only at depths greater than 10 feet; risk estimation was not affected because no complete exposure pathways were identified for chemicals in these deep soils. Toxicity screening for 1,1-dichloroethane using the highest detection limit (0.05 mg/l) provides a hazard index of 0.014, indicating that risk estimation was not substantially affected. The pentachlorophenol in water was selected as a COPC. The document was not changed in response to this comment.

Comment 16: **Screening for Selection of Chemicals of Concern, Sec. 3.3, pp. 25 ff., and Tables 3.5-3.8: Chloride, sulfate, magnesium, potassium, and sodium are eliminated as chemicals of concern for Sites 2 and 12. The Department does not disagree that these essential nutrients may be eliminated (per RAGS Part A, Sec. 5.9, USEPA 1989), but the basis given by the Army is not valid. Text on page 26 indicates that a toxicity screen was performed. However, no toxicity values are shown in Table 2.9 and no hazard quotients are calculated in Tables 3.5 through 3.8. Please alter the text to indicate that no toxicity screen was performed. Also, please supply references in the text to the specific tables in Appendix C which support Tables 3.5 through 3.8. These same comments apply equally to in Sections 4 and 5. Regarding the screen for essential nutrients in Tables 3.5 through 3.8, please show the value screened against, so the reader need not refer repeatedly to Appendix B.**

Response: The text of Appendix B has been revised to clarify the approach used in the BRA to evaluate essential nutrients. Estimated daily doses of essential nutrients were compared to Recommended Daily Allowances (RDA); details of the analysis are presented in Appendix B. Section 3.3 has been revised to indicate the analysis is described in Appendix B. Footnotes in Tables 3.5 through 3.8 identify the RDAs used.

Comment 17: **Risk Characterization, Sec. 3.6, p. 29 ff., and Tables 3.13-3.16: Please add to the text references to the specific tables in Appendix E which support the summed risks and hazards shown in Tables 3.13 though 3.16. It is inappropriate to subtract background when characterizing the probability of non-cancer toxicity. Analysis at Site 12 suggests that a child might receive a dose of arsenic in excess of the threshold for toxicity. The presentation in this section seems to suggest erroneously that exposure of children to arsenic in soils at Site 12 will not give rise to a dose associated with a hazard quotient greater than one, because the contribution of background somehow does not count. This estimate can lead to the erroneous conclusion that people exposed at hazard indices greater than 1 are not at risk. Regardless of the fact that some fraction of that dose arises from background arsenic, risk managers need to know whether adverse health effects might occur.**

Table 3.14 shows a summed hazard index of 3.1 for all receptors. It seems to us that for a threshold toxic effect this sum ought not to be calculated across the receptors shown. Please either eliminate this sum or provide an interpretation.

The first paragraph on page 31 is very difficult to understand. A table of data would greatly assist this explanation. The Army might want to show more than one calculation of cancer risk due to PAHs for purposes of clarification.

Response: Tables 3.13 through 3.16 have been revised to reference information from Appendix G, where appropriate. In addition, the text has been revised to remove references to non-cancer effects from background concentrations of chemicals. Table 3.14 has been revised; the HIs for all receptors are no longer summed. The first paragraph on page 31 of the Draft BRA has been revised to clarify the approach used. The PAH data analyzed using EPA Method 8270 have been added into the existing dataset for this site, at the request of the EPA.

Comment 18: **Lead, Sec. 3.6.3, p. 31: As discussed in the general comments above, lead exposures for residential scenarios have been underestimated here. Rerun LEADSPREAD with plant uptake set to "yes".**

Response: Please see response to Cal/EPA DTSC Specific Comment 9.

Comment 19: **Uncertainly Analysis, Sec. 3.7, p. 31: This presentation is wholly unacceptable. First, possible future remediation of groundwater has no bearing whatever on computation of baseline risk. If this pathway will become complete in the future, now is the time to assess it. Second, if it is the Army's intention to review recent literature on the distribution of ingestion rates for tap water, then make the presentation.**

Unsupported assertions are of no value. Third, the "other factors" referred to in the last sentence all seem to lead to overestimation of risk. It would be useful to state this if that is why these factors were included here.

Response: The presentation of Section 3.7 and other uncertainty analysis text has been revised to remove unsupported assertions and discussions of impacts of possible future remedial actions.

Comment 20: **Summary, Sec. 3.8, p. 32: The first sentence in the last paragraph in the left hand column is incorrect. Summed hazard indices for arsenic are greater than 1.0 and it is not appropriate to subtract background. The last sentence of this section is unsupported and should be removed.**

Response: The text of Section 3.8 has been modified to address the following changes: (1) the hazard index calculation method was changed, as described in the response to EPA Specific Comment 28, and (2) the contribution of background chemical concentrations to potential non-cancer health effects is no longer discussed in the Draft Final BRA.

C. Chapter 4, Sites 16 and 17

Comment 21: **95% UCL vs. C_{max} in Soils, Sec. 3.2, p. 24, and Tables 4.1a-4.4c: See Specific Comment 15 above. We note below the instances in Tables 4.1a through 4.4c the instances where the maximum concentration detected is less than one-half the 95% UCL, apparently the combined result of a low frequency of detection and evaluated reporting limits. In samples contaminated enough to elevate the reporting limit, concentrations higher than C_{max} could be masked. Please present a discussion of the likelihood of having erroneously eliminated chemicals of potential concern due to high detection limits in these instances.**

Table	Chemical	FOD	95% UCL	C_{max}

4.1a:	Di-*n*-butylphthalate	1 / 9	2.37E+00	9.50E-02
	Dibenzofuran	1 / 9	2.09E+00	4.10E-01
4.3a:	Bis(2-ethylhexyl)-phthalate	1 / 6	2.09E-01	9.60E-02
4.3b:	Bis(2-ethylhexyl)-phthalate	2 / 4	2.54E-01	7.70E-02
	Pentachlorophenol	1 / 4	1.44E+00	8.80E-02
4.4a:	Antimony	2 / 9	3.56E+00	7.20E-01
4.4b:	Bis(2-ethylhexyl)-phthalate	1 / 13	1.21E+00	1.30E-01
4.4c:	Antimony	1 / 20	1.10E-02	5.00E-03

Response: Elevated reporting limits introduce uncertainties into the COPC selection and risk assessment process but do not erroneously eliminate COPCs. Chemicals for which the evaluated reporting limits might have interfered with COPC selection are not expected to substantially affect risk estimates. For di-*n*-butylphthalate and dibenzofuran, toxicity screening using the highest reporting limit ranged (5000 mg/kg) would eliminate these chemicals as COPCs. For antimony in soil (Table 4.4a) , toxicity screening using the highest reporting limit (8.3 mg/kg) provides a hazard index of 0.023, indicating that risk estimation was not substantially affected. Antimony was selected as a COPC for groundwater (Table 4.4c). For bis(2-ethylhexyl)phthalate, toxicity screening using the highest reporting limit (5 mg/kg) produces a cancer risk estimate of 4×10^{-8} , indicating that risk estimation was not substantially affected. For pentachlorophenol, toxicity screening using the highest reporting limit (22 mg/kg) produces a cancer risk estimate of 2×10^{-6}. However, chemical analysis of environmental samples may not be able to detect biologically significant concentrations of all chemicals in all samples. Accordingly, analytical detection limits represent one of the limitations of this or any investigation that relies on chemical analyses. Additional sampling and analysis would be similarly constrained. The maximum detected pentachlorophenol concentration was eliminated as a COPC using the toxicity screen, and pentachlorophenol was not selected as a COPC. The document was not changed in response to this comment.

Comment 22: Groundwater Data, Sec. 4.2.6, p. 37: This paragraph is not clear. Which years were used for carbon tetrachloride? for perchloroethene?

Response: The text of Section 4.2.6 has been modified to clarify which data were used in the analysis.

Comment 23: Sec. 4.4, p. 42: The second sentence of this section seems to have an extra "of".

Response: The text has been revised to correct this typographical error.

Comment 24: Dust and Stormwater, Secs. 4.4.1.2 and 4.4.1.3, p. 43: It is inconsistent to assume the absence of pavement for estimation of exposure to dust while assuming pavement is present to prevent runoff of stormwater. By definition, the same receptor cannot be exposed to both conditions. Please use one or the other.

Response: The text of Section 4.4.1.2 and 4.4.1.3 has been revised to clarify the pathway analysis.

Comment 25: Pete's Pond and Pete's Pond Extension, Secs. 4.4.2.2 and 4.4.2.3, pp. 44-45: We do not understand how the size of these parcels has any bearing on the likelihood of their being developed in the future. Outfalls for storm drains can be moved, reuse maps can be altered. If the sites are small and adjoining sites with the same intended reuse are being assessed, then assessment of this site should combine data from the adjoining parcels and use a single residential scenario for the combined parcel.

Response: The expected future land use for Pete's Pond and Pete's Pond Extension are different than that expected for Site 17. See also the response to EPA Specific Comment 19 and Cal/EPA General Comment 2. The text of Sections 4.4.2.2 and 4.4.2.3 has been revised to more clearly describe the expected land uses in, and exposure scenarios for, the different areas on Sites 16 and 17.

Comment 26: Student Resident at Site 17, Sec. 4.4.2.4, p. 45: Use of the student resident scenario underestimates risk at this site. A conventional residential scenario should be used. It is stated in Section 4.1.3 that Site 17 Disposal is slated for future use as housing for students <u>and faculty</u>. A residential setting for faculty would result in exposure duration's much longer than the three to five years assumed for student residents. We believe that faculty residents do not differ from the conventional resident described in USEPA and Cal/EPA guidance.

Response: See the response to EPA Specific Comment 19 and Cal/EPA General Comment 2.

Comment 27: Groundwater, Sec. 4.4.2.5, p. 46: The last paragraph on page 46 is very confusing. We do not understand why the aquifers are evaluated separately. If a domestic well were to be sunk, no one can predict where it might be screened. Therefore, no distinction between the aquifers can be made. Dissection of this hypothetical future exposure setting requires a high degree of certainty about future conditions. We believe future exposures are uncertain and regulatory guidelines and default factors should be used.

Response: The aquifers were evaluated separately because: 1) they are distinct water-bearing formations and might be utilized separately, 2) each has different COPCs at different concentrations, 3) potential exposure to both aquifers was evaluated, 4) the final evaluation considered the aquifer associated with greater health risks, and 5) combining the data would result in more dilute EPC estimates and possible underestimation of health risks. The text of Section 4.4.2.5 has been revised to clarify the methods used.

Comment 28: Student Resident, Sec. 4.4.3.1, p. 47-48, and Table 4.14: In the last paragraph on page 47, 2.5 hr/day is accounted for, but not the other 22.5 hr/day. Where will these student residents get the other 90% of the air they breathe? The authors have chosen to dissect the hypothetical future residential setting into fractions of the day at Pete's Pond, Pete's Pond Extension, and Site 17 Disposal Area (Table 4.14). We do not believe the reuse plan is so finely textured that such a construct can be predicted with any degree of certainty. In addition, "fraction of intake" shown in Table 4.14 for the RME adds up to various numbers. Where are these justified?

Response: Section 4.4.3.1 and Table 4.1.4 have been revised to evaluate additional data using a student receptor assumed to reside at the Site 17 Disposal Area. The exposure time for the student resident receptor was assumed to be 20.5 hours. Potential exposure at Sites 16 and 17 are not dissected, RME exposures at each location were conservatively considered to be additive instead of evaluating locations separately. Section 4.4.3.1 was revised to clarify the basis for the exposure time and fraction of intake value assumptions.

Comment 29: Utility and Construction Workers, Sec. 4.4.3.2 and 4.4.3.3, p. 48-49: Workers exposed to soils 2 to 10 ft bgs cannot have failed to have been exposed to soils 0 to 2 ft bgs. Combine data from 0 to 10 ft bgs to derive concentration terms. Also, we find 45 days to be too short an exposure duration for the RME for the construction worker. Please use 1 yr.

Response: The risk assessment was revised to incorporate the recommended changes. The text of Section 4.4.3.2 and 4.4.3.3 and associated tables have been revised to reflect this change.

Comment 30: Risk Characterization, Sec. 4.6, p. 50-51: The student resident scenario underestimates risk for the faculty by a wide margin, perhaps tenfold or more. Therefore, the risks of interests for Sites 16 and 17 are not yet characterized.

Response: See the response to EPA Specific Comment 19 and Cal/EPA General Comment 2. The risk assessment was not changed in response to this comment.

Comment 31: Lead, Tables 4.24 and F5-F10: When LEADSPREAD is used for a residential scenario, plant uptake should be set to "ON" or "1". this will increase the estimates of blood lead levels for the student resident. Please recalculate these when calculations are added for the faculty resident.

Response: See the response to EPA Specific Comment 19 and Cal/EPA General Comment 2. Although the student resident receptor was assumed to live onsite, the consumption of fruits and/or vegetables grown at the site by those receptors was considered unlikely. The risk assessment was not changed in response to this comment.

D. Chapter 5, Site 3

Comment 32: Weighted Average, Sec. 5.2, p. 55: We do not understand the explanation of the weighted average given in the text. Please rewrite this. Perhaps an example calculation would help to clarify.

Response: The risk assessment analysis approach was revised in response to this and other regulatory agency comments; the text of Section 5.2 has been revised to reflect those changes.

Comment 33: Chemicals of Concern, Sec. 5.3, pp. 55-56: In general we concur with the selection of COPC. However, we find no mention of assay for hexavalent chromium. See also General Comment 4 above.

Response: See the response to EPA General Comment 4.

Comment 34: Potential Receptors, Sec. 5.4.2, pp. 57 ff.: We concur with the estimates of

exposure parameters for park rangers and visitors. However, the greatest exposure and possible risks might arise for future construction or utility workers at Site 3. Such workers will be exposed intensively to soils during construction of boardwalks, parking lots, underground telephone lines, and the like. Please assess this group of receptors using analytical data from soils 0 to 10 ft bgs. It might be useful to develop three assessments for excavation workers, one for each type of area with spent ammunition.

Response: The risk assessment was revised to separately evaluate the three types of areas with spent ammunition. EPCs estimated using the analytical data from 0 to 10 feet below ground surface (bgs) for those areas were substantially lower than the EPCs used to evaluate park ranger receptors and visitors. A construction worker receptor, used to evaluate possible exposure to subsurface soils, was therefore not evaluated separately.

Comment 35: Inhalation Toxicity of Antimony, Sec. 5.5, p. 59: Rather than leave out the inhalation route altogether, please use cross-route extrapolation from the oral RfD to derive a toxicity criterion for antimony. This is much preferable to assuming a toxicity of zero.

Response: See the response to EPA Specific Comment 1.

Comment 36: Risk Characterization, Sec. 5.6.1, p. 59, and Tables 5.7-5.8: It is not appropriate to sum HIs for the three age groups shown unless the toxic effect is known to be cumulative. Please correct this.

Response: Section 5.6.1 and Tables 5.7 and 5.8 have been revised as recommended. See also the response to EPA Specific Comment 28.

Comment 37: Lead, Sec. 5.6.3, p. 60, and Table 5.9: Utility and construction workers will certainly show a greater effect of lead than park visitors, when one recalls that the recommended default for soil ingestion for an excavation worker is 480 mg/day. The potential health effects of lead are underestimated for Site 3. This is not surprising, since this site has many tons of lead lying at the surface and no risk of adverse health effects was predicted by the Army. This does not pass reality check.

Response: See the responses to Cal/EPA DTSC Specific Comments 32 and 34, and EPA Specific Comment 28.

E. Chapter 6, Site 31

Comment 38: 95% UCL vs. C_{max} in Soils, Sec. 6.2, pp. 63 ff., and Tables 6.1a + 6.2b: See Specific Comment 15 above. We note below the instances in Tables 6.1a and 6.2b the instances where the maximum concentration detected is less than one-half the 95% UCL, apparently the combined result of a low frequency of detection and elevated reporting limits. In samples contaminated enough to elevate the reporting limit, concentrations higher than C_{max} could be masked. Please present a discussion of the likelihood of having erroneously eliminated chemicals of potential concern due to high detection limits in these instances.

Table	Chemical	FOD	95% UCL	C_{max}