RISK ASSESSMENT SPECIALISTS

FINAL BASELINE HUMAN HEALTH RISK ASSESSMENT

LIBERTY INDUSTRIAL FINISHING SITE
FARMINGDALE, NEW YORK

Prepared for

The Liberty Group

Prepared by

Eileen Mahoney Associates, Inc.

Under subcontract to
Dames & Moore
Job No. 35550-001

July 2000 13748.02

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LIST OF ACRONYMNS

ABS:	Absorption Fraction
ADD:	Average Daily Dose
ARAR:	Applicable or Relevant and Appropriate Requirements
BHHRA:	Baseline Human Health Risk Assessment
BKSF:	Biokinetic Slope Factor
BRA:	Baseline Risk Assessment
BRAA:	Baseline Risk Assessment Addendum
CLP:	Contract Laboratory Program
CNS:	Central Nervous System
COPC:	Constituent of Potential Concern
CRI:	Continued Remedial Investigation
CSM:	Conceptual Site Exposure Model
CTE:	Central Tendency Exposure
DAD:	Dermally Absorbed Dose
EPA:	U.S. Environmental Protection Agency
EPC:	Exposure Point Concentration
ERTC:	Environmental Response Team Center
FWD:	Farmingdale Water District
HEAST:	Health Effects Assessment Summary Tables
HI:	Hazard index
HQ:	Hazard Quotient
IEUBK:	Integrated Exposure Uptake-Biokinetic Model
IRIS:	Integrated Risk Information System
K_{ow}:	Organic Carbon Partition Coefficient
LADD:	Lifetime Average Daily Dose
LOAEL:	Lowest Observable Adverse Effects Level
msl:	Mean Sea Level
MW:	Molecular Weight
MWD:	Massapequa Water District
NCDOH:	Nassau County Department of Health
NCEA:	National Center for Environmental Assessment
NCP:	National Oil and Hazardous Substances Contingency Plan
NHANES:	National Health and Nutrition Examination Survey
NOEAL:	No Observable Adverse Effects Level
NYSDEC:	New York State Department of Environmental Conservation
OSWER:	Office of Solid Waste and Emergency Response
PAH:	Polynuclear Aromatic Hydrocarbon
PCB:	Polychlorinated Biphenyl
QA/QC:	Quality Assurance/Quality Control
RAGS:	Risk Assessment Guidance for Superfund

RBC:	Risk-Based Concentration
RfC:	Reference Concentration
RfD:	Reference Dose
RI:	Remedial Investigation
RME:	Reasonable Maximum Exposure
SF:	Cancer Slope Factor
SFWD:	South Farmingdale Water District
SSL:	Soil Screening Level
SVOC:	Semivolatile Organic Compound
TAGM:	Technical and Administrative Guidance Memorandum
TIC:	Tentatively Identified Compound
UCL:	Upper Confidence Limit
USGS:	U.S. Geological Survey
VOC:	Volatile Organic Compound

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This report presents the results of the Final Baseline Human Health Risk Assessment (BHHRA) for the Liberty Industrial Finishing Site (Site), located in Farmingdale, New York. The BHHRA has been prepared by Eileen Mahoney Associates, Inc. under subcontract to Dames & Moore, as an update to the May 31, 2000 *Draft Final Baseline Human Health Risk Assessment* (Mahoney Associates), and the December 21, 1999 *Draft Baseline Human Health Risk Assessment Update* (Dames & Moore). The information presented in this BHHRA is one of the components in a phased approach that links data collection, risk analysis and ultimately feasibility evaluation of potential remedies for the Site.

Data Evaluation

In selecting analytical data to be included in the risk assessment, the objective was to characterize as accurately as possible the extent to which site-related constituents impact the site and off-site areas. Data used in the BHHRA include the following:

- November 1991 - July 1992 data collected by Weston as part of the Remedial Investigation;
- Data collected during a supplemental soil sampling investigation from January 21 through 23, 1997 conducted by the Environmental Protection Agency (EPA); and
- 1997 data and 1998 soil grid sampling data collected by Dames & Moore as part of the Continued Remedial Investigation.

Data for the Site were separated into data sets representing potential exposure areas. The exposure areas are as follows: 1) western parcel of the Site (includes on-site impacted groundwater); 2) eastern parcel of the Site (includes features containing solid and liquid wastes); 3) off-site residential areas (includes Ellsworth Allen Park and Woodward Parkway School); and 4) Massapequa Preserve.

Each data set was screened individually for selection of constituents of potential concern (COPCs). Screening for selection of COPCs was conducted utilizing the maximum detected concentration for each chemical in the data sets. The following COPC selection criteria were applied sequentially to each analyte:

- Not an essential nutrient;
- Positively detected in at least 5% of samples;
- Positively detected in at least one sample above the background concentration; and
- Positively detected in at least one sample above applicable risk-based screening levels or applicable or relevant and appropriate requirements (ARARs).

Exposure Assessment

Current and future land uses, groundwater uses and surface water uses are detailed in the exposure assessment, and result in the following assumptions:

- The only on-site current receptors are trespassers and commercial/industrial workers in the currently occupied building
- Zoning of the property calls for current and future industrial and commercial land use at the Site and potential recreational use of the western parcel only.
- No current or future use of on-site groundwater is expected. However exposures to commercial workers are assessed as a conservative measure.
- Although it is unlikely that public or private water supply wells drawing from impacted groundwater or potentially impacted groundwater would be allowed by the County in the future, this BHHRA assumes groundwater from the impacted portion of the Magothy aquifer could be used for potable water supplies in the future. Risks from potential future exposures to ground water from the Upper Glacial Aquifer are also assessed for off-site residents.

Based on these assumptions, the potentially complete exposure pathways evaluated in the BHHRA are:

Western Parcel		
Current Use	Trespasser	Surface Soil - Ingestion, dermal, inhalation Surface/Subsurface Soil – Inhalation Groundwater (Upper Glacial) - Inhalation
Future Use	Commercial/Industrial Worker	Surface/Subsurface Soil – Ingestion, dermal, inhalation Groundwater (Upper Glacial/Magothy Aquifers) – Ingestion, Inhalation
	Construction Worker	Surface/Subsurface Soil - Ingestion, dermal, inhalation Groundwater (Upper Glacial) - Inhalation
	Recreational User	Surface/Subsurface Soil- Ingestion, dermal, inhalation Groundwater (Upper Glacial) - Inhalation
Eastern Parcel		
Current Use	Trespasser	Solid Waste - Inhalation Liquid Waste - Inhalation
	Commercial/Industrial Worker	Solid Waste - Inhalation
Future Use	Commercial/Industrial Worker	Surface/Subsurface Soil - Ingestion, dermal, inhalation Solid Waste - Inhalation Liquid Waste- Inhalation
	Construction Worker	Surface/Subsurface Soil- Ingestion, dermal, inhalation Solid Waste- Ingestion, dermal, inhalation Liquid Waste - Dermal, inhalation
Off-site Residential Areas		
Current Use	Resident	Groundwater (Upper Glacial) - Inhalation
	School Child	Groundwater (Upper Glacial) - Inhalation
	School Employee	Groundwater (Upper Glacial) - Inhalation
Future Use	Resident	Groundwater(UpperGlacial/Magothy)

		Ingestion, Dermal, Inhalation
Massapequa Preserve		
Current Use	Swimmer	Surface Water – Ingestion, dermal contact Sediment – Ingestion, dermal contact
	Fisher	Fish Tissue – Ingestion

COPC intakes (*e.g.,* doses) for the potentially exposed populations and exposure pathways were calculated based on the exposure point concentrations and exposure assumptions. The 95 percent upper confidence limit (95% UCL) on the mean concentration for each COPC in each data set was used as the exposure point concentration. EPA considers the 95% UCL to be a reasonable estimate of the COPC concentration likely to be contacted over time. Air exposure point concentrations of particulates and volatiles were estimated *via* emission modeling. The exposure assumptions used to calculate doses for each receptor and pathway were derived following EPA guidance for calculating reasonable maximum exposure (RME) estimates. The goal of the RME is to combine upper-bound and mid-range exposure factors so that the result represents an exposure scenario that is upper-bound but not outside the realm of possibility.

Toxicity Assessment

Chemical toxicity is divided into two categories, carcinogenic and non-carcinogenic, based on the type of adverse health effect exerted. Non-cancer risks were calculated using reference doses (RfDs) developed by EPA. A RfD is an estimate of the daily lifetime exposure level to humans, including sensitive subgroups, that is likely to be without appreciable risk of deleterious effects. In contrast to non-carcinogenic effects, EPA typically assumes that there is no threshold for carcinogenic responses; that is, any dose of a carcinogen is considered to pose some finite risk of cancer. The slope of the extrapolated dose-response curve is used to calculate the cancer slope factor (SF), which defines the incremental lifetime cancer risk per unit of carcinogen.

Risk Characterization

Cancer risk is expressed as a lifetime excess cancer risk. This is the probability of an individual contracting cancer as a result of a defined exposure to site-related COPCs. Under the National Oil and Hazardous Substances Contingency Plan (NCP), excess cancer risk values of one in ten thousand (1×10^{-4}) to one in one million (1×10^{-6}) represent acceptable levels of cancer risk for exposure to environmental constituents, depending on site-specific factors such as the potential for exposure, technical limitations to remediation and data uncertainties. The NCP designates an excess cancer risk of 1×10^{-6} as a "point of departure" for establishing remedial goals. An April 1991 OSWER directive further clarified the acceptable risk range by stating that when reasonable maximum exposures for both current and future land use result in cancer risks less than 1×10^{-4}, action is generally not warranted.

The potential for chronic non-carcinogenic health effects can be evaluated by comparing the estimated intake of a chemical to its RfD. The ratio of the estimated intake for a COPC to its RfD is called a hazard quotient. If the estimated daily intake for any single COPC is greater than its reference dose, the hazard quotient will exceed unity. A hazard index, developed by summing hazard quotients for all relevant exposure pathways, exceeding 1.0 is evaluated further by summing hazard quotients for each COPC associated with the same toxic effect endpoint or target organ. The hazard index for each target organ should not exceed 1.0.

Because the NCP establishes an excess cancer risk of 1×10^{-6} as a "point of departure" for establishing remedial goals, cumulative cancer risks which exceed 1×10^{-6} are shown below.

Western Parcel

The receptors whose cumulative cancer risks exceed the point of departure are current trespasser (1.6×10^{-6}, Table 10.1RME) and future commercial/industrial worker (7.7×10^{-5}, Table 10.2RME). However, the cumulative risks for each of these receptors are still within the acceptable risk range of 1×10^{-4} to 1×10^{-6}.

The only receptor whose cumulative HI exceeds the point of departure is the future commercial/industrial worker. The HI for this receptor equals 8.9 (Table 10.2RME). This is driven by risks from ingestion of groundwater from the Upper Glacial Aquifer. Target organ HIs exceed 1.0 for kidney effects and are driven by cadmium.

Eastern Parcel

The receptors whose cumulative cancer risks exceed the point of departure are the future commercial/industrial worker (2.3×10^{-6}, Table 10.7RME) and the future construction worker (1.0×10^{-3}, Table 10.8RME). The cumulative risk for the future commercial/industrial worker is within the acceptable risk range of 1×10^{-4} to 1×10^{-6}. The risk for the construction worker is greater than the upper boundary of the acceptable cancer risks. This risk level is driven by exposure to liquid wastes in the eastern parcel.

The only receptor whose cumulative HI exceeds 1.0 is the future construction worker (31, Table 10.8RME). The only target organ HIs exceeding 1.0 were immune system and growth which were driven by Aroclor 1260 in liquid waste.

Off-site Residential Areas

The receptors whose cumulative risk exceeds the point of departure are the current off-site resident (Table 10.9RME), current school employee (Table 10.12) and future off-site resident (Table 10.10RME). The current off-site resident cumulative risk is 3.0×10^{-3}, which is driven by ingestion of Upper Glacial groundwater. The primary contributor to these risks is vinyl chloride (1.7×10^{-3}). The current school child cumulative cancer risk is $4.8 \times 10\text{-}^{6}$ (Table 10.11RME) which is driven by inhalation of groundwater and is within the acceptable risk range. The current school employee cumulative cancer risk is 2.0×10^{-5} (Table 10.12RME), which is driven by inhalation of groundwater and is within the acceptable risk range. The future off-site resident cumulative risk is 4.9×10^{-4} (Table 10.10RME). This is driven by ingestion of Magothy groundwater. The primary contributor to these risks is trichloroethene.

The receptors whose cumulative HIs exceed 1.0 is the current off-site resident(Upper Glacial Aquifer), whose HI is 95 for the child resident and 26 for the adult resident (Table 10.9RME), and future off-site resident (Magothy Aquifer, 7.3 for child, Table 10.10RME). These risks are all attributable to ingestion of groundwater. Target organ HIs for the Upper Glacial Aquifer exceed 1.0 for kidney, driven by cadmium, CNS driven by manganese, and liver, driven by vinyl chloride. Target organ HIs exceed 1.0 for the Magothy Aquifer for CNS, driven by manganese.

Massapequa Preserve

The receptor whose cumulative HI exceeded 1.0 is the child fisher (Table 10.14RME). However, there were no individual target organs with HIs that exceeded 1.0. There is considerable uncertainty associated with the fish ingestion rates utilized in this BHHRA. For the adult fisher (Section 6.5.5.2), the fish ingestion rate is 32 g/day, which is the 90th percentile value for adult recreational fishers in New York State. This ingestion rate is associated with 51 one-half pound meals per year (EPA, 1997a). The evaluation of the fish ingestion pathway for the child fisher (Section 6.5.5.1) is an adjustment to the adult fisher ingestion rate. The child fish ingestion rate is estimated at 11 g/day. These values for fish ingestion rates are used at the specific request of the EPA Region I Toxicologist, (personal communication) and are overly conservative. The USEPA has published national guidance which recommends the use of 6.6 g/day for the general population, and 8 g/day (50th percentile) for freshwater anglers. The USEPA 95th percentile value published for freshwater anglers is 25 g/day for adults (USEPA, 1997). The value used in this document exceeds this 95th percentile value. Furthermore, the Massapequa Preserve cannot support this level of fish consumption for the local population. Therefore, the fish ingestion rates utilized herein are overly conservative and overestimate actual risks for fish ingestion at the site.

Ellsworth Allen Park

None of the cancer risks or hazard indices exceed point of departure levels.

RISK CHARACTERIZATION OF LEAD

Lead in site-related media does not appear to present a hazard to commercial/industrial workers, trespassers, recreational users, or swimmers. Lead in solid waste at the Site exceeds the residential screening level and the site-specific soil lead objective. Construction workers could be at risk handling solid waste in on-site features; however, precautions against exposure during construction or removal activities can significantly reduce this risk. Lead in fish does not appear to present a hazard to fishers based on blood lead modeling conducted with the adult lead model or the IEUBK model.

Chromium and Contact Dermatitis

Although the exposure point concentrations for chromium are below the levels which might cause contact dermatitis, it should be noted that significant exposure to areas at the Site that exceed these levels could result in an increased risk of contact dermatitis. The following areas should be addressed: 1) western parcel surface samples in the northwest disposal area (B-07-01) and in the southern portion of the disposal basins (TP-54E); 2) western parcel subsurface soil located in or near the disposal basins (SB-2, TP-50, TP-51C, TP-54E, TP-55A), northwest disposal area (SB-41, B-07-02), and the ramp excavation pile on the Building N foundation; and 3) eastern parcel subsurface soil located in the Building B basement (TP-69).

Uncertainty Analysis

The uncertainty analysis details uncertainties in the BHHRA, especially in the areas of natural variability, lack of knowledge about basic physical, chemical, and biological properties and processes, assumptions in the models used to estimate key inputs and measurement error.

Conclusions

Cancer Risks: The only exposure pathways which may be associated with excess cancer risks greater than the 1×10^{-6} to 1×10^{-4} acceptable risk range identified in the NCP are:

- Future construction worker exposed to liquid waste in the eastern parcel;
- Current off-site resident using the Upper Glacial aquifer as a potable water supply; and

- Future off-site resident using the Magothy aquifer as a potable water supply.

The potential for construction worker exposure can be limited or eliminated through the use of skin protection while removing liquid wastes. Development of the impacted portion of the Magothy Aquifer for drinking water is unlikely due to existing County ordinances.

Non-cancer Hazards: The only exposure pathways which may be associated with target organ-specific hazard indices greater than 1.0 are future commercial worker ingestion of Upper Glacial groundwater, future construction worker exposures to liquid waste, current off-site resident exposures to Upper Glacial aquifer as potable water source, and the future off-site resident using the Magothy aquifer as a potable water supply.

Construction workers could also be at risk for effects from lead during handling of solid waste in on-site features; however, precautions against exposure during construction or removal activities would significantly reduce this risk.

Some isolated locations in the surface and subsurface soil should be considered a potential hazard to receptors that may have direct contact with the soil due to the potential for contact dermatitis caused by chromium. Any future plans for the Site should incorporate exposure controls or spot removal of the soil in these areas.

TEXT

1. INTRODUCTION

1.1 OVERVIEW

This report presents the results of the Final Baseline Human Health Risk Assessment (BHHRA) for the Liberty Industrial Finishing Site (the Site) located in Farmingdale, New York. The BHHRA has been prepared by Eileen Mahoney Associates, Inc. under subcontract to Dames & Moore as an update to the May 31, 2000 *Draft Final Baseline Human Health Risk Assessment* (Mahoney Associates) and the December 21, 1999 *Draft Baseline Human Health Risk Assessment Update* (Dames & Moore). The information presented in this BHHRA is one of the components in a phased approach that links data collection, risk analysis and ultimately feasibility evaluation of potential remedies for the Site.

The Site is currently on the U.S. Environmental Protection Agency's (EPA's) National Priorities List (NPL). The Site has been used for manufacturing activities, particularly of aircraft-related equipment, since 1934. Soil at the Site is impacted with a variety of metals and organic constituents associated with plating and other activities, including chromium and solvents. Groundwater at the Site and downgradient of the Site is impacted with chromium, cadmium and chlorinated volatile organic compounds (VOCs), as well as other constituents. Surface water and sediment in Massapequa Preserve, downgradient from the Site, has been impacted by discharge of impacted groundwater.

Weston conducted a Remedial Investigation (RI) and a BRA of the Site (Weston, 1994). Subsequently, EPA prepared an addendum to the human health portion of the BRA (BRAA) (EPA Region II, 1995) based on a supplemental investigation conducted by EPA. A Continued Remedial Investigation (CRI) was conducted by Dames & Moore (Dames & Moore, 2000) to further document the nature and extent of potential impacts and to provide the analytical data necessary to complete a comprehensive update to the BRA. This BHHRA is based on the data collected by Weston, EPA and Dames & Moore.

In accordance with the National Oil and Hazardous Substances Contingency Plan (NCP), a baseline risk assessment should evaluate the potential human health impacts associated with a site in the absence of corrective action (*i.e.*, a no-action alternative). Therefore, the primary objective of this BHHRA is to determine whether constituents of potential concern (COPCs) associated with previous activities at the Site pose a current or future risk to human health in the absence of any remedial action.

This BHHRA has been prepared in accordance with EPA guidelines for the preparation of baseline risk assessments, including *Risk Assessment Guidance for Superfund: Volume I Human*

Health Evaluation Manual (Part A), Interim Final (RAGS) (EPA, 1989a). Numerous other guidance documents are cited throughout the text of the BHHRA.

1.2 RISK ASSESSMENT PROCESS

The human health risk assessment process synthesizes available data on exposure of specified receptors to site-related constituents and the toxicity of those constituents in order to estimate the associated potential risk to human receptors. It is important to emphasize that risk assessment is not itself a science but rather a decision-making support tool that is informed, guided, and limited by current scientific knowledge. Policy considerations also play a major role in risk assessment, and these must be clearly distinguished from scientifically based elements if risk management is to be effective.

The human health risk assessment process typically involves five basic elements:

- ***Data Review and Evaluation:*** Available data is reviewed to characterize the Site and its associated constituents, define the nature and magnitude of constituent releases to environmental media (soil, air and water), identify site-related COPCs, which are defined as hazardous constituents clearly associated with the Site that are present at concentrations higher than background levels.

- ***Exposure Assessment***: The exposure assessment defines the amount, frequency, duration, and routes of receptor exposure to site-related COPCs. The exposure assessment considers both current and likely future site uses, and is based on complete exposure pathways to actual or probable human receptors (*i.e.*, the people that could come in contact with site-related COPCs). Exposure point concentrations and doses for each exposure pathway are estimated which are representative of upper-bound exposure conditions.

- ***Toxicity Assessment***: The toxicity assessment serves to 1) identify the nature and degree of toxicity of each COPC, and 2) characterize the dose-response relationship (the relationship between magnitude of exposure and magnitude of adverse health effects) for each COPC. EPA has developed toxicity criteria for many of the COPCs at the Site. Two kinds of effects are recognized: non-carcinogenic effects and carcinogenic effects. The same constituent may exert both kinds of effects.

- ***Risk Characterization:*** In risk characterization, exposure and toxicity data are combined to estimate the nature and magnitude of potential risks to defined receptor populations. Non-cancer risks to human receptors are quantified by the hazard quotient (HQ), the ratio of COPC concentration in site media to the corresponding non-cancer risk-based level. Cancer risks are quantified by multiplying the COPC concentration in site media by a cancer slope factor.

- *Uncertainty Analysis*: Like any other form of modeling, risk assessment relies on a set of assumptions and estimates, each of which has some element of uncertainty. Major sources of uncertainty in risk assessment include 1) natural variability (*e.g.*, differences in body weight in a group of people), 2) lack of knowledge about basic physical, chemical, and biological properties and processes (*e.g.*, the affinity of a constituent for soil, its solubility in water), 3) lack of accuracy in the models used to estimate key inputs (*e.g.*, dose-response models), and 4) measurement error. The uncertainty analysis accounts for both variability in and lack of knowledge about measured and estimated parameters, allowing decision makers to better evaluate risk estimates in the context of the assumptions and data used in the assessment.

1.3 CONCEPTUAL SITE MODEL

The Conceptual Site Model (CSM) represents our current understanding of the sources of COPCs, the means by which they are released and transported within and among media and the exposure pathways and routes by which they may contact identified human receptors.

The source of site-related constituents is the surface and subsurface soil in the western and eastern parcels. The soils were impacted by former industrial operations, waste deposition and material handling practices. Specifically, continuing source areas include the former recharge basins, the soils beneath some former process lines, the Building B basement, the northwest disposal area and the Building M floor pad. Groundwater also exists as a secondary source.

Solid and liquid wastes present in features (*i.e.,* sumps, drains, vaults, and leaching chambers) are also considered sources for the purposes of the BHHRA, although they are unlikely to be major contributors to groundwater impacts (Dames & Moore, 2000).

The potential human receptors for the site were identified based on current land use characteristics and reasonably anticipated future land use. The following receptor populations were evaluated:

- Trespassers;
- Commercial/industrial workers;
- Construction workers:
- Recreational users;
- Residents;
- School children;
- School employees;
- Swimmers (*e.g.*, waders); and
- Fishers.

The following routes of exposure may be associated with the site media:

- Ingestion of solid media: Ingestion of site constituents could occur through incidental ingestion due to hand-to-mouth behavior or deposition of inhaled particles in the mouth.
- Ingestion of groundwater: Groundwater ingestion is only expected to occur under a hypothetical future potable water scenario.
- Ingestion of surface water: Ingestion of site constituents could occur through incidental ingestion of surface waters during wading.
- Ingestion of fish: Ingestion of site-related constituents could occur if fishers eat fish caught in impacted areas.
- Dermal contact with ground water.
- Inhalation of suspended particulates: Suspended particles in ambient air may be inhaled by those persons near the source.
- Inhalation of vapors while bathing: Vapors could be inhaled by persons while bathing/showering.

The CSM is shown in Figure 1-1 and exposure pathways analyses for each area of expousre are presented in Tables 1-1 through 1-4. The CSM is discussed in more detail in Chapter 4.

1.4 ORGANIZATION OF THE RISK ASSESSMENT REPORT

The BHHRA consists of nine sections (Sections 1 through 9) and associated tables, figures, and appendices. The report is structured as follows:

- ***Section 1 (Introduction):*** This section is an introduction to the Site and the approach to the risk assessment.
- ***Section 2 (Site Background and Characteristics):*** Section 2 presents the relevant site history, nature and extent of impacts, and physical characteristics of the Site. Some of the information presented is adapted from the RI Report prepared by Weston in 1994 (Weston, 1994) and the CRI prepared by Dames & Moore (Dames & Moore, 2000).
- ***Section 3 (Data Evaluation):*** Section 3 presents the data used in the risk assessment, a rationale for the division of data into data sets representing exposure areas, and the methodology for selecting COPCs.
- ***Section 4 (Exposure Assessment):*** Section 4 presents a description of land and water uses, potentially exposed populations and exposure pathways, and presents the exposure pathways and conceptual site exposure model (CSM). This chapter also presents the methodology for conducting air emissions modeling and calculating exposure point concentrations and average daily doses.

- ***Section 5 (Toxicity Assessment)***: Section 5 presents the non-cancer reference doses and cancer slope factors for the COPCs and presents toxicological information for two special cases: lead and chromium.

- ***Section 6 (Risk Characterization):*** Section 6 integrates the exposure assessment with the toxicity assessment and presents cancer risks and non-cancer hazard indices by media and by receptor population. This chapter also evaluates lead and contact dermatitis due to chromium.

- ***Section 7 (Uncertainty Analysis):*** Section 7 presents the uncertainties associated with the data collection, data evaluation, exposure assessment, air emissions modeling, toxicity assessment and risk characterization. The uncertainty analysis also presents the central tendency (CTE) evaluation for the Site.

- ***Section 8 (Conclusions):*** Section 8 integrates the pertinent aspects of the data evaluation, exposure assessment, toxicity assessment, risk characterization and uncertainty analysis to provide a perspective on health issues pertaining to the Site.

- ***Section 9 (References):*** References are listed in Section 9.

1.5 TABLE FORMATS

In accordance with EPA's initiative to improve transparency, clarity, consistency, and reasonableness in risk assessment, standard tables specified in *Risk Assessment Guidance for Superfund: Volume I Part D* (RAGS Part D) (EPA, 1998a) are presented in the text. The numbering sequence of the RAGS D formatted tables is consistent with those presented in the Guidance. Although these tables are cited in the order in which they are numbered, the table numbers do not generally reflect the chapters in which they are cited. These tables are presented at the end of the report. Additional supporting tables which are not RAGS D formats are presented in Appendix A. The exposure and risk calculation tables are presented in RAGS D formats, but are presented in Appendices F and G.

2. SITE BACKGROUND AND CHARACTERISTICS

2.1 SITE LOCATION

The Site is located approximately one mile south of Bethpage State Park in the Town of Oyster Bay, Nassau County, New York.

The Site is approximately 30 acres and includes Lot 326 (herein referred to as the eastern parcel) and Lot 327 (herein referred to as the western parcel) of Block 518, Section 48, as recorded in the Nassau County Clerk's office. The site is bordered by the Long Island Railroad to the north, Motor Avenue to the south, Main Street to the east and Ellsworth Allen Park to the west. The surrounding area is primarily residential with several commercial establishments along the major roads. A site location map and current site conditions map are presented as Figures 2-1 and 2-2, respectively.

2.2 SITE DESCRIPTION

The Site may be divided into the western parcel, which is unpaved and inactive, and the eastern parcel, which is paved with limited activity. General site characteristics, the boundaries of the two parcels, and the locations of current and former site buildings are shown in Figure 2-2. The locations of other site structures, such as well vaults of former water supply wells, leaching chambers, and miscellaneous process area sumps and drains were described in the Weston RI Report (Weston, 1994), based on historical maps and the RI investigation.

2.2.1 Western Parcel

The western parcel is inactive and contains foundations of former buildings. The area between former Buildings M and N and the area west of former Building J were used by tenants for outdoor storage.

Of note on the western parcel are three excavated recharge basins that were previously used for the disposal of metal finishing wastewaters. A former disposal area is located in the northwest portion of the parcel. Elevated levels of some constituents have been measured in both of these areas. In addition, excavated materials from the Building B area (eastern parcel) have been deposited in the western parcel on the foundation of former Building N. Underground features, primarily leaching chambers, are present in the western half of the site; however, analytical data for these features were combined with soil data for the RI (Weston, 1994).

The western parcel is generally not paved and contains exposed soil, piles of soil and construction debris, and other debris and refuse. Approximately 75 percent of the western parcel is vegetated in various stages of ecological succession. This portion of the Site is secured by fences along the northern, western and southern property boundaries, which separate the site from Ellsworth Allen Park and residential areas to the north. However, the fence is cut in several locations and it is apparent that unknown individuals have used the site periodically for dumping of refuse and debris.

2.2.2 Eastern Parcel

The eastern parcel is developed and includes several large warehouses and the remains of past industrial operations, including foundations of former process buildings. Most of the previous process buildings are no longer standing, but the former building locations can generally be identified by the remains of concrete floor slabs. Until the end of 1998, the intact site buildings (Building A, Building E, Building F, Building H, Building I, Building K, Building U, and Building W) were used by tenants engaging in a variety of product storage and distribution activities. The former Buildings D and G foundations were also used by tenants for outdoor storage. Subsequent to an on-site fire in the fall of 1998, tenant occupancy of the Site was reduced sharply and as of January 1, 1999, the town of Oyster Bay mandated that site activities in the central part of the site (eastern parcel west of Building E) must cease. The only currently occupied building is Building H.

Of note on the eastern parcel are the remains of Building B, where elevated levels of some constituents have been detected. Various features are present in the subsurface of the eastern parcel, including various sumps, floor drains, underground tanks, leaching chambers, and other structures. In general, the vast majority of these features are self-contained sumps, chambers, or small holes in the ground, some of which have accumulated mud, leaves and surface drainage through time. These features are located both inside and outside of buildings.

Paving or building foundations, except for a few small isolated spots, covers the surface of the eastern parcel. The eastern parcel is secured by fencing.

2.3 SITE HISTORY

2.3.1 Site Ownership and Use

The RI Report (Weston, 1994) documented the history of the Site in detail, based on files compiled by the EPA and the New York State Department of Environmental Conservation (NYSDEC). A brief summary of the Site history is presented below (references are given in the RI Report).

Starting in 1934, Kirkham Engineering and Manufacturing Corporation (Kirkham) manufactured aircraft-related equipment at the site. In 1941, Liberty Aircraft (formerly Kirkham) sold approximately 6 acres of the site to the Defense Plant Corporation, a government-owned corporation, which established additional plant facilities and machinery for the manufacture of aircraft parts, and in turn, leased the parcel back to Liberty Aircraft. In 1943, the site included buildings on land owned by the Defense Plant Corporation for small parts assembly and storage (Buildings E and F); for wing and tail assembly, wing covering and painting (Building G); a boiler house and several minor buildings. Additional site buildings included a paint shop, mixing room and various machining operations (Building D and Buildings A and B). The sewage system consisted of septic tanks feeding to "leaching chambers" on the property. In 1949, Liberty Products Corporation (formerly Liberty Aircraft) began operating a chromium treatment system that was used for reduction of hexavalent chromium (chromium-VI) and precipitation of chromium hydroxide. Between 1955 and 1984, the site and its corporate owners were sold numerous times.

On September 11, 1978, Liberty Industrial Finishing Corporation signed a consent order with the NYSDEC for clean-up of the site to be initiated by October 1, 1978. The clean-up plan included, among other tasks, the removal of impacted soil from the basins and sludge drying bed. In April 1984, Liberty Finishing II, Four J's, Colt Industries, Inc., and Liberty Associates joined in NYSDEC's administrative enforcement proceeding. A consent order to conduct a Remedial Investigation/Feasibility Study was executed by NYSDEC and Four J's in April 1985. A report was submitted by Lockwood, Kessler, and Bartlett on behalf of Four J's to NYSDEC in November 1985. In July 1986, Four J's submitted a Site Operations Plan to the NYSDEC.

In 1986, the ownership of the site again changed several times. A partnership named 55 Motor Avenue Company was formed in 1987 to manage the site. In March 1987, NYSDEC entered into a second Order of Consent with 55 Motor Avenue Company for an interim action involving the removal of impacted soils from the disposal basins. In May 1986, the site was placed on the National Priorities List of federal hazardous substance sites.

2.3.2 Summary of Previous Investigations

This summary of previous investigations is based on information contained in the RI Report (with the exception of those activities conducted between 1992 and 1997).

USGS Investigation and Report (1970): A 1970 U.S. Geological Survey (USGS) report documented the extent of cadmium and chromium-VI in groundwater downgradient of the Site. The USGS report provided data from four different periods between 1949 and 1964. By 1962, chromium migrating from the site was estimated to have a length of 4,300 feet, a width of up to 1,000 feet, and a thickness of as much as 70 feet.

NCDOH Inspection (1978): The NCDOH inspected the Site to document interconnections between the facility and the stormwater drainage system. The resulting report indicated that the stormwater basin (Basin 3) was connected to the overall stormwater drainage system. A break in the berm that separates Basin 1 and 3 was also noted. Water samples collected from storm drains located along Motor Avenue revealed a similar chemical composition as the samples collected from the recharge basins.

Cleanup of Basins 1 and 2 and the Sludge Drying Bed (1978 - 1979): Under a NYSDEC consent order No. 1-0203, remedial activities were reportedly limited to removing 1.5 feet of soil from the bottom of Basin 1, removing 6 inches of soil from the walls of Basin 1, and removing an unknown volume of soil from the bottom of Basin 2. A NCDOH inspection report also noted that 5-10 feet of soil was scraped from the Basin 2 walls and was apparently used as fill to replace the excavated soils. In May 1979, Liberty Finishing II retained Donnelly Engineering to formulate a plan for the remaining site clean-up. The areas identified as requiring clean-up included: the three basins; the sludge drying bed; numerous 55-gallon drums scattered across the site; the aboveground treatment plant tanks; and interior, concrete-lined, below-grade sumps previously used to contain and support the process tanks.

NCDOH Inspection (1979): On October 25, 1979, NCDOH conducted a site inspection to investigate the source of oil impacts in the stormwater recharge basin (Basin 3). The field inspection report noted oil-soaked soils around a waste oil tank fill pipe due north of the recharge basins, open 55-gallon drums containing waste oil, and various other housekeeping issues involving waste oil and fuel oil.

NCDOH Fire Investigation and Soil Cleanup (1980): A NCDOH letter, dated May 19, 1980, summarized the sampling results of pooled water at the location of an on-site fire. Toluene, xylenes, acetone, dichloromethane and traces of other organic chemicals were detected. The NCDOH requested cleanup of the area, and Fiberglass Resources agreed to clean up a 40 feet by 40 feet area around the fire location. Follow-up NCDOH inspection reports documented the area of excavation and the removal of 20 cubic yards of apparently impacted soil from the site.

NCDOH Investigation (1980): In June 1980, NCDOH analyzed soil and sludge samples from Basin 1, Basin 2, and the sludge drying bed area, using the RCRA extraction procedure (EP) toxicity test. In Basin 1, samples collected from 6 inches below the bottom and from one foot into the side walls at three locations had cadmium concentrations slightly less than the RCRA standards. Cadmium concentrations in the EP toxicity test leachate for samples from Basin 2 and the sludge drying bed exceeded the 1 mg/L RCRA standard. Also in Basin 2, a layer of waste was found between 4 feet and 5.5 feet below grade at several locations. The sludge drying bed surface and subsurface samples were also found to contain concentrations above the RCRA leachate standard. In general, the sidewall soil samples from the basins were found to contain lesser concentrations of metals than samples from the basin floors.

Lockwood, Kessler, and Bartlett Focused Site Investigation (1985): In 1985, Lockwood, Kessler, and Bartlett conducted a focused site investigation with NYSDEC oversight on behalf of the Four J's Company. The investigation included soil borings, installation of monitoring wells and surface water sampling. The results of the investigation were summarized in a RI report. According to the RI Report, Basins 2 and 3 and the sludge drying bed contained waste material considered hazardous by characteristic (metals). It was concluded that the "hazardous waste" extended from 1 foot to 6 feet below grade in an estimated 1,600 square foot area of Basin No. 2. It was also concluded that "hazardous" sludge extended from 0 to 6 feet below grade of the sludge drying bed. In contrast, Basin 1 revealed no "hazardous" concentrations of metals, however, organic analysis of a Basin 1 ramp wall sample indicated that tetrachloroethene and dichloroethene were present. Groundwater analyses indicated elevated concentrations of cadmium, chromium, methylene chloride, dichloroethene, and trichloroethene on-site and downgradient near Massapequa Creek. The concentrations were much lower than those reported in the USGS Report. A surface water sample from Massapequa Creek did not have any detectable concentrations of chromium or cadmium.

Interim Removal Action (1987): Removal activities at Basins 2 and 3 and the sludge drying bed were conducted by Four J's during the summer of 1987. Approximately 4,000 tons of soil was excavated and disposed of as hazardous waste. Lockwood, Kessler, and Bartlett submitted analytical results to NYSDEC in correspondence dated November 5, 1987, for one sample collected from the bottom of each of the two basins and the sludge drying bed after remediation. This documentation indicated that the levels of cyanide, cadmium, and chromium in the samples were below the RCRA hazardous waste criteria. A NYSDEC inspection report indicated that, at the time of the inspection, the sludge drying bed had apparently been backfilled upon removal of the impacted soils.

Remedial Investigation (1991-1992): The EPA authorized Weston on September 28, 1990 to conduct a Remedial Investigation/Feasibility Study of the Site. During the RI, numerous test pits and soil borings were advanced to characterize potential on-site source areas, such as recharge basins, sumps, drains, and leaching chambers. A formerly "disturbed" area located in Ellsworth Allen Park adjacent to the Site boundary was also sampled. In addition, on-site and off-site monitoring wells were installed and sampled. Sediment and surface water samples from

Massapequa Creek were also collected. The results of the RI effort were used to develop a detailed site history and to provide a framework for the extent of on-site and off-site impacts. A baseline human health and ecological risk assessment was prepared (Weston, 1994).

The RI identified several on-property areas that may act as continuing sources of site-related constituents such as cadmium, chromium, and organic solvents. These areas included the former recharge basins, the soils beneath some former process lines, the Building B basement, the Northwest Disposal Area, the Building M floor pad, various sanitary leaching chambers, and underground storage tanks.

Metals and organic solvents were detected in on-site and off-site monitoring wells, including the only well that was completed into the Magothy aquifer. The source and extent of these concentrations were not determined during the RI effort. The observed extent of metals (cadmium, chromium) concentrations in off-site groundwater implied the presence of a detached plume segment approximately 4,000 feet downgradient of the site. Unlike the organic solvents, it appeared that these metal constituents had not impacted the Magothy aquifer. A survey of water supply wells operating in the vicinity of the Site showed that heavy metals or organic solvents had not impacted these wells.

Surface water and sediment samples from the eastern branch of Massapequa Creek showed cadmium, lead, mercury, and zinc concentrations above NYSDEC screening levels. Of these, only cadmium was assumed to be related to historic site activities. The highest concentrations of cadmium were reported at the stream segment where the shallow groundwater was inferred to discharge into Massapequa Creek.

The results of the RI warranted that a continued RI be performed to complete the delineation of potential on-site source areas, to further investigate the nature and extent of off-site groundwater concentrations, and to further evaluate the ecosystem along Massapequa Creek and Ponds. A site-wide Feasibility Study would be prepared upon completion of the CRI.

Interim Removal Activities (1995): Following the issuance of administrative orders by the EPA in August 1994, the contents of eight underground storage tanks were removed and transported off-site for disposal and approximately 400 tons of polychlorinated biphenyl (PCB) impacted soil were removed from PCB Areas 1, 2 and 4, and disposed of in a Toxic Substances Control Act chemical waste landfill. A total of five transformers and six drums of PCB-contaminated transformer oils were removed.

Supplemental Soil Investigation (1997): The EPA Environmental Response Team Center (ERTC) conducted a supplemental soil sampling investigation at the Site from January 21 through 23, 1997 (Weston, 1997). Soil samples were collected from the Northwest Disposal Area, the Basin Area and at several randomly situated locations from the western portion of the site. Ash from the base of three on-site exhaust stacks was also sampled. The supplemental soil investigation confirmed the presence of cadmium and chromium in the western portion of the Northwest Disposal Area and in the floor of the former recharge basins. All samples that were analyzed for VOCs had very low concentrations that did not exceed approximately 0.2 mg/kg total VOCs. The report of this investigation presented estimates of soil volumes above a set of proposed remediation goals. It was determined that approximately 2,840 cubic yards in the Northwest Disposal Area exceeded the proposed remediation goals for cadmium and/or chromium, and approximately 3,200 cubic yards in Basins 1 and 2 exceeded these proposed remediation goals. Samples from Basin 3 did not exceed any of the proposed remediation goals.

Continued Remedial Investigation (1997-1999): Dames & Moore conducted a CRI at the Site on behalf of potentially responsible parties (Dames & Moore, 2000) to further document the nature and extent of potential impacts to on-site and off-site soil and groundwater and off-site sediment and surface water. In addition, the CRI developed the necessary field and analytical data to complete a comprehensive update to the human health risk assessment. The CRI included sampling of: subsurface features and county storm drains; surface and subsurface soil; groundwater from new and existing monitoring wells; sediment, surface water, and fish from Massapequa Preserve; and soil on a grid layout (supplemental soil investigation). The CRI concluded the following:

- Subsurface features investigated are very unlikely to represent significant continuing sources of either VOCs or metals to groundwater and the cumulative volume of material present in these features is very small.

- With the exception of two soil samples collected near Building B and one soil sample collected on the Building G floor slab, none of the soil samples had VOC concentrations that exceeded site-specific criteria for the protection of groundwater.

- The groundwater sampling program successfully delineated the extent of dissolved concentrations of trichloroethene and breakdown products, cadmium, and chromium. In addition, the groundwater plume, as compared to that recognized more than 50 years ago, had not significantly increased in length or width.

- On-site groundwater VOC impacts are limited to the upper portion of the Upper Glacial aquifer. On-site groundwater metal impacts were observed throughout the Upper Glacial aquifer, but not in the Magothy aquifer.

- Off-site groundwater VOC impacts were observed throughout the Upper Glacial aquifer and into the upper portion of the Magothy aquifer between Fallwood Parkway and the Woodward Parkway Elementary School. South of the elementary school, VOC impacts are limited to the Upper Glacial aquifer. Site-related VOC impacts do not extend south of the Southern State Parkway.

- Off-site groundwater metals impacts are limited to the Upper Glacial aquifer except near well cluster MW-29 where low concentrations of chromium are present in the upper most portion of the Magothy aquifer. The cadmium plume appears to be continuous between the Site and north of the Southern State Parkway. The chromium plume appears to be more segmented and exists as two detached volumes of on-site and off-site impacts.

- Surface water north of Pond A had cadmium and chromium-VI that exceeded ambient surface water criteria. Only trace concentrations of VOCs were detected in surface water.

- Metals concentrations in stream and pond sediments were measured from north of Pond A as far south as Massapequa Lake, with the highest concentrations occurring in Pond A and Pond 1. The in-stream concentrations were observed to be lower (by about two orders of magnitude) than the pond concentrations.

2.4 PHYSICAL SETTING

Many of the physical characteristics of the Site and the site vicinity were discussed in detail in the RI Report (Weston, 1994).

2.4.1 Demographics

The total population within a three-mile radius of the Site has been estimated to be approximately 200,000 people. According to the 1990 census, Nassau County has a total population of 1,287,348 people. Eight percent of the population is six years or under, 16% of the population is 7-18 years old, 61% of the population is 19-65 years old, and 15% of the population is over 65 years old. The population is somewhat more homogeneous than the national population. The racial breakdown of the Nassau County population is as follows:

- Non-Hispanic White: 83% (national population = 75.8%)
- Non-Hispanic Black: 8% (national population = 11.8%)
- Hispanic: 6% (national population = 8.8%)
- Other Racial Groups: 3% (national population = 3.6%)

Eighty percent of the housing units in the county are owner-occupied units, and the remaining 20% are rental units. The median 1990 family income was $60,619 compared with the national median family income of $35,225. The 1990 per capita income was $23,352 compared with the national median per capita income of $14,420.

2.4.2 Climate

Long Island MacArthur Airport in Islip, Long Island, Suffolk County, New York is the nearest National Weather Service Station to the Site. According to the National Climate Data Center, the annual average temperature (derived from 1961-1990 normals) for Islip, New York is 51.3° F. July is recorded as the warmest month with an average temperature of 73.0° F, and January is recorded as the coldest month with an average temperature of 28.8° F. The average annual rainfall for Farmingdale, New York is 46.3 inches, with November being the month with the most precipitation (4.9 inches) and February the month with the least (2.7 inches). These averages were recorded at the Farmingdale 2 NE, New York, NCDC Cooperative Station from 1931 to 1956. According to the Nassau County Department of Commerce and Industry, the region records approximately 110 sunny days, 139 partly sunny days and 116 cloudy days per year. The prevailing wind direction is northwest.

2.4.3 Topography

The Site is located in a slightly dissected glacial outwash plain with a grade of about 20 feet per mile to the south. The surface topography slopes from approximately 70 feet above mean sea level (msl) just north of the site to approximately 20 feet above msl at Sunrise Highway to the south. The on-site terrain is generally flat with an average site elevation of approximately 64 to 65 feet msl. Consequently, stormwater drainage is slow and rainwater pools readily on-site during or after precipitation events, as there are no on-site streams or drainage ditches. Massapequa Creek originates to the south within one-half mile of the Site.

2.4.4 Soil Type

The Site is located in a relatively flat area within the Atlantic Coastal Plain physiographic province. Soils in the Site vicinity are primarily urban land soils. The soil mapping units according to the Soil Conservation Service of the U.S. Department of Agriculture are as follows:

- Urban Land: 85% of the soil surface is covered with asphalt, concrete, or other impervious building material. Typical land use includes parking lots, shopping centers, industrial parks or institutional sites in cities and villages. Interspersed are small areas of unaltered soils including Riverhead, Hempstead, or Enfield soils.

- Urban Land - Riverhead Complex: 0-3% slopes. Urban areas and very deep, well drained soils; 65% urbanized, 20% Riverhead soils, and 15% other soils.

2.4.5 Storm Water

No surface water bodies exist on-site. The paved areas of the Site drain into storm drains located throughout the site, although site drainage is generally very poor. Historically, the storm drainage system has emptied into Basin 3, and an overflow from Basin 3 formerly was connected to the county storm drain located along Motor Avenue. According to the RI Report, the overflow to the county storm drain is severed.

2.4.6 Surface Water

The headwaters of Massapequa Creek are located approximately one-half mile south of the Site. The construction of culverts, storm sewers and a series of detention ponds have altered the creek from its natural state. The headwaters of Massapequa Creek consist of an east and west branch. The two branches merge just north of the Southern State Parkway. The flow of Massapequa Creek is sustained by groundwater discharge from the upper portion of the Upper Glacial aquifer. The flow volume of Massapequa Creek and the length of its channel showing flow vary substantially between seasons. Stream-flow generally begins at an elevation corresponding to the seasonal water table elevation. During the spring and early summer months of 1997 and 1998, stream-flow was observed as far north as First Avenue. However, as the water table dropped during the summer and fall months of 1998, stream-flow was not observed at all north of the Southern State Parkway. During storm events, ephemeral flow occurs throughout the length of Massapequa Creek and is fed by numerous stormwater runoff sewers from the surrounding residential areas.

Several sedimentation ponds exist along the main stream course. From north to south, these ponds are referred to as Pond A (north of the Southern State Parkway), Pond 1, Pond 2, Pond 3, Pond 4 (also referred to as Massapequa Reservoir) south of Sunrise Highway, and Pond 5 (also referred to as Massapequa Lake) north of Merrick Road. These ponds are about 1 to 4 feet deep and were constructed to control localized flooding and silting of the streambed. These ponds have accumulated some (approx. 0.5 to 2.0 feet) but not excessive amounts of fine-grained sediment (generally fine sands and silt). Pond 1 appears to be cut off intentionally from the main stream course and has been allowed to silt-up and is now almost completely overgrown by reeds and cattails. Massapequa Creek empties into South Oyster Bay about 5 miles south of the Site.

2.4.7 Site Geology

The site is underlain by unconsolidated sediments, which include Cretaceous fluvial and delta deposits, and Pleistocene glacial and interglacial marine deposits. The units underlying the site are described below.

- ***Upper Pleistocene Deposits - Upper Glacial Aquifer:*** The Upper Pleistocene units were deposited during various stages of the Wisconsin-age glaciation. These collectively comprise the Upper Glacial aquifer. In the site vicinity, the Upper Glacial aquifer is between 60 and 90 feet thick and is comprised of tan to orange-brown, fine to coarse sand and gravel. The lower portion of the Upper Glacial aquifer is frequently characterized by finer-grained sands and silts, which may contain minor lignite and clay. This unit was recognizable during the CRI and may correlate with the "20-foot clay" described in the regional geologic literature.

- ***Magothy Formation:*** The Magothy Formation is reported to consist of non-marine, interlayered sand, silt, and clay deposits of Cretaceous age, which range from approximately 30 to 1,000 feet thick in southern Nassau County. The sandy portions of the Magothy Formation consist of gray or light tan, fine to medium sand and gravel that comprise the Magothy aquifer. The silt and clay deposits in the vicinity of the site were dark-gray to tan and contained locally abundant lignite.

- ***Raritan Formation:*** The Raritan Formation underlies the Magothy Formation and directly overlies the crystalline bedrock. The Raritan Formation comprises the Lloyd Sand Member and the Raritan clay member. Although present beneath the site, none of the borings or wells installed during the RI or CRI encountered the Raritan Formation.

2.4.8 Site Hydrogeology

The principal aquifers beneath the Site are the Upper Glacial aquifer and the Magothy aquifer. The Magothy aquifer is used for public water supply. The groundwater in the Upper Glacial aquifer exists under unconfined conditions. Partially confined conditions may exist in the Magothy aquifer where clay deposits are present. The direction of groundwater flow is to the south, towards the south shore bays and Atlantic Ocean.

- ***Upper Glacial aquifer:*** The deposits of the Upper Glacial aquifer are very permeable and contain large quantities of water. Aquifer tests conducted within the Upper Glacial aquifer reported the average hydraulic conductivity of the outwash deposits to be 2,000 gallons per day per square foot and the storage coefficient to be 0.24. The porosity of the sand and gravel of the Upper Glacial aquifer is reported to be on the order of 30 percent. Recharge to the shallow groundwater system occurs primarily from precipitation, which averages 45 inches per year, and subsurface inflow from upgradient areas of the aquifer. The RI Report suggested that the average hydraulic conductivity for the Upper Glacial aquifer is approximately 270 feet/day in the horizontal direction and approximately 27 feet/day in the vertical direction. Slug tests conducted during the RI and CRI suggest a somewhat lower hydraulic conductivity of about 180 feet/day. The average groundwater flow velocity in the Upper Glacial aquifer was calculated to be approximately 1.6 feet/day.

- ***Magothy Aquifer:*** The permeable portion of the Magothy Formation is the main aquifer of use for public water supply in Nassau County. The porosity is estimated to be approximately 25 percent and aquifer tests have placed the average hydraulic conductivity (horizontal) of the Magothy at approximately 400 gallons per day per square foot. The RI Report suggested that the average hydraulic conductivity for the Magothy aquifer is approximately 50 feet/day in the horizontal direction and approximately 1.4 feet/day in the vertical direction. The RI Report calculated the average groundwater flow velocity in the Magothy aquifer to be approximately 0.22 feet/day. Hydraulic data presented in the CRI Report place the average flow velocity at approximately 0.17 feet/day.

3. DATA EVALUATION

The purpose of the data evaluation is to: 1) summarize the data used in the risk assessment; 2) describe the criteria used for selecting COPCs; and 3) present the COPCs selected for quantitative evaluation in the risk assessment. Upon completion of the data evaluation process, a medium-specific list of COPCs was selected for each exposure area based on sequential application of the selection criteria discussed in this section.

3.1 DATA USED IN RISK ASSESSMENT

3.1.1 Selection of Analytical Data

In selecting analytical data to be included in the risk assessment, the objective was to characterize as accurately as possible the extent to which site-related constituents impact the site and off-site areas. Most of the samples used in the BHHRA were analyzed according to EPA's Contract Laboratory Program (CLP) and subject to Level I quality assurance/quality control. However, some non-CLP soil data are included to provide additional coverage (1998 soil grid sampling data, chromium, cadmium only Draft CRI Report) (Dames & Moore 2000). Data used in the BHHRA include the following:

- Validated November 1991 - July 1992 data collected by Weston as part of RI (Weston, 1994);
- Data collected during the EPA ERTC supplemental soil sampling investigation from January 21 through 23, 1997 (Weston, 1997); and
- Validated 1997 data and 1998 soil grid sampling data collected by Dames & Moore as part of the CRI (Dames & Moore, 2000).

Data collected prior to the 1991–1992 Weston RI were not included in the BHHRA because of the variations in sampling methods, analytical methods, detection limits, and study protocols. In addition, the data were relatively old (1987 and earlier) and therefore may not be reflective of current conditions.

All relevant media were included in the sampling programs used in the BHHRA, including surface soil, subsurface soil, solid waste, liquid waste, Upper Glacial aquifer groundwater, Magothy aquifer groundwater, surface water, sediment, and fish tissue. The following figures show sampling locations:

- Figures 3-1 and 3-2: on-site and off-site soil sample locations;
- Figure 3-3: subsurface feature sample locations;

- Figure 3-4: on-site and background groundwater sample locations;
- Figure 3-5: off-site (downgradient) groundwater sample locations; and
- Figure 3-6: Massapequa Preserve surface water, sediment, and fish sampling locations.

In general, samples were analyzed for inorganics (metals and cyanide), pesticides and PCBs, semivolatile organic compounds (SVOCs) including polynuclear aromatic hydrocarbons (PAHs) and VOCs. Detailed descriptions of these sampling programs, including sampling locations and media, sampling methods, and QA/QC methods and the complete data tables, can be found in the referenced reports. While there were some variations in methods and protocols, they were sufficiently similar to allow use of the data in the BHHRA. Appendix B contains a tabulation of all data as used in the risk assessment.

The following data collected during the above-listed sampling programs were excluded from consideration in the BHHRA as inappropriate for evaluation of potential risks:

- Screening-level groundwater data (an adequate number of validated groundwater data was available to characterize groundwater quality);
- Leachate data;
- Soil gas data;
- Air monitoring data (air monitoring data was temporally and spatially limited, and included only a limited number of inorganic constituents);
- Dissolved metals in groundwater data (all metals data used in the risk assessment are for total metals); and
- Data from the remediated transformer pad collected prior to remediation (*i.e.*, TP-26-8.5, SB-28, SB-16, and SB-23).

3.1.2 Treatment of Analytical Data

The following sections describe how data were treated for selecting COPCs. The approaches are consistent with EPA's guidelines for data evaluation specified in RAGS and *Guidance for Data Usability in Risk Assessment* (EPA, 1992b).

3.1.2.1 Non-Detects

If a chemical was not positively identified in any sample from a given medium, either because it was reported as a non-detect ("U") or because it was qualified due to its presence in blanks, that chemical was not considered for that medium.

If a chemical detected in a particular medium was reported as non-detect ("U") in a sample, it was assumed to be present in that sample at one-half the detection limit for statistical analysis and calculation of exposure point concentrations (Section 4.4).

3.1.2.2 Use of Qualified Data

An "R" qualifier indicates that the data are unusable due to quality control deficiencies. Data qualified with an "R" designation were eliminated from the BHHRA analysis. All other data, including those qualified as "estimated" (*i.e.*, "J"), were considered useable for the BHHRA. Although using estimated concentrations adds uncertainty to the analysis, eliminating them could result in a significant underestimation of risks.

3.1.2.3 Duplicate Samples

Duplicate sample results were averaged prior to inclusion in the data sets for COPC screening. Data from replicate analyses in the 1998 grid sampling were not included in the data sets[1]. When only one of the samples had a detected concentration, the detected concentration was used for the average. When both samples of a duplicate pair were non-detect, the higher of the detection limits was used.

3.1.2.4 Multiple Groundwater Sampling Rounds

For COPC selection, data collected over time from the same monitoring well were not averaged. Data from all sampling rounds were treated as individual data points. Time averaging was conducted for determining exposure point concentrations (Section 4.4).

3.1.2.5 Speciation of Chromium

Chromium data were evaluated to account for variations in the toxicity of different valence states: Chromium-VI is an inhalation carcinogen, while trivalent chromium is not. Some data reported only total chromium, while other data reported chromium-VI as well. Following is a discussion of how chromium data was treated in each media:

Soil: Most of the data collected from subsurface soil and all of the data collected for surface soil contained results for total chromium but not chromium-VI. Based on historic sampling data from soil at the Site and the results of the Dames & Moore CRI (Dames & Moore, 2000),

[1] Replicate samples are a second analysis on the same sample extract and, therefore, indicate the reproducibility of the analytical method. Duplicates are separate physical samples from the same sampling interval that were collected in the field alongside the original sample, and indicate the reproducibility of the sampling methodology and homogeneity of sample medium.

chromium-VI comprises from 12-20% of the total chromium in the soil. Virtually all samples indicate chromium-VI comprises less than 25% of the total chromium. Therefore, where speciation was not available, total chromium results were split into 75% trivalent chromium and 25% chromium-VI. For those data where both total chromium and chromium-VI were reported, trivalent chromium concentrations were obtained by subtracting the chromium-VI results from the total chromium results.

Groundwater: Virtually all of the groundwater data contained results for total chromium and chromium-VI. Therefore, trivalent chromium concentrations were obtained by subtracting the chromium-VI results from the total chromium results. When chromium VI results were not reported, all chromium was assumed to be in the form of chromium VI.

Surface Water and Sediment: For surface water and sediment samples, approximately 50% of the samples reported both total chromium and chromium-VI. For these samples, trivalent chromium concentrations were obtained by subtracting the chromium-VI results from the total chromium results. For the samples with no chromium-VI analyses, a conservative approach was taken and the total chromium results were assigned to both trivalent chromium and chromium-VI (*i.e.,* it was assumed that the total chromium could represent either 100% trivalent chromium or 100% chromium-VI). This is the most conservative approach because it "double counts" chromium.

Solid and Liquid Wastes in Features: Data for solid and liquid waste in features contained only total chromium. As the typical ratio of trivalent chromium to chromium-VI in solid and liquid wastes was unknown, the total chromium results were assigned to both trivalent chromium and chromium-VI (*i.e.*, it was assumed that the total chromium could represent either 100% trivalent chromium or 100% chromium-VI). Again, this is the most conservative approach that can be taken.

Fish: All the chromium in fish was assumed to be chromium VI.

For all of the media described above, several rules were applied when total chromium and/or chromium-VI was reported as not detected. Most of these rules were applied to account for the assumption that chromium-VI levels can not exceed total chromium levels:

- If both chromium and chromium-VI were reported as not detected, then the detection limit for the total chromium was used for the trivalent chromium detection limit, and the lower of the detection limits for total chromium and chromium-VI was used for the chromium-VI detection limit.

- If only total chromium was reported, and it was reported as not detected, then both trivalent chromium and chromium-VI were considered not detected at the detection limit for total chromium.
- If both total chromium and chromium-VI were reported, and chromium-VI was reported as not detected at a higher detection limit than the total chromium concentration, then the total chromium result was used for both trivalent chromium and chromium-VI.
- If both total chromium and chromium-VI were reported, and chromium-VI was reported as not detected at a lower detection limit than the total chromium concentration or detection limit, then the total chromium result was used for trivalent chromium and the chromium-VI result was used for chromium-VI.

3.2 SEGREGATION OF DATA INTO EXPOSURE AREAS

Data for the Site were separated into data sets representing potential exposure areas. This segregation of data facilitated the handling of a large amount of data and allows for a clearer presentation of potential risks for receptors. The exposure areas are as follows:

- Western parcel of the site;
- Eastern parcel of the site;
- Off-site residential areas (including Ellsworth Allen Park and Woodward Parkway School); and
- Massapequa Preserve.

The Site itself was divided along parcel lines for the following reasons:

- Current exposure characteristics are different for the two parcels. The western parcel is unpaved and primarily undeveloped, and trespassers may have direct contact with the soil. The eastern parcel is developed and paved, and therefore trespassers are unlikely to have direct contact with the soil. In addition, current industrial activities only occur on the eastern parcel.
- Future land use for the two parcels may be different. The western parcel could potentially be used for recreational purposes (Cashin, 1998) while the eastern parcel is unlikely to be used for recreational purposes. Reporting of risks associated with each parcel may provide for separate remediation strategies for the two parcels depending on post-remediation land use.
- Exposure media differ on the two parcels: (1) Impacted groundwater is located primarily on the western parcel and therefore is included in the risk analysis for the western parcel but not for the eastern parcel. As the direction of groundwater flow is (approximately) from north to south, any current or future potential receptors would be located downgradient of the groundwater plume (i.e., south of the western parcel); (2) Data for solid and liquid waste in features were collected from the eastern parcel only, and therefore are included in the risk analysis for the eastern parcel but not for the western parcel.

- Most of the potential source areas associated with significantly elevated COPC concentrations in soil are located in the western parcel. Some impacted areas (*e.g.* Building B) are located in the western half of the eastern parcel, but the majority of the eastern parcel has not been significantly impacted. In addition, there are many more soil sample data points for the western parcel than for the eastern parcel. Calculating exposure point concentrations based on site-wide averages could result in an overestimation of risk for the eastern parcel and an underestimation of risk for the western parcel.

Exposure and land use characteristics of the site are discussed in detail in Section 4.0. Data sets for each exposure area are described below.

3.2.1 Western Parcel

The western parcel exposure area includes surface soil, surface/subsurface soil, and on-site groundwater from the Upper Glacial and Magothy aquifers.

Surface Soil: Surface soil samples were addressed separately for the western parcel to allow for the characterization of current risks to trespassers. The surface soil samples encompass the 0-1 foot interval. EPA guidance (EPA, 1992b) indicates that surface soils comprise the top 0-6 inches of the soil column. As there were an insufficient number of samples collected from the top six inches at the site, the 0-1 foot interval was used instead. The number of valid data points for each chemical ranged from 4 to 77. Samples included in the western parcel surface soil data set are listed in Table A 3-1. See Table A 3-2 for a key to TP sample numbers and Figures 3-1 and 3-2 for sample locations.

Surface/Subsurface Soil: Surface soil and subsurface soil samples were combined to represent potential future exposures. It is assumed that development of the site will result in some mixing of subsurface and surface soils during excavation, as well as redistribution of subsurface soil as surface soil, so that potential future receptors could have direct contact with what is currently subsurface soil. Surface and subsurface soil were also combined for estimates of current exposure due to volatilization from soil. The number of valid data points for each chemical ranged from 2 to 409. Samples included in the western parcel surface/subsurface soil data set are listed in Table A 3-3. See Table A 3-2 for a key to TP sample numbers and Figures 3-1 and 3-2 for sample locations.

Groundwater (Upper Glacial Aquifer): Groundwater data for the Upper Glacial aquifer taken from on-site monitoring wells within the impacted groundwater area were combined for the western parcel. Figure 3-7 shows a generalized depiction of the groundwater plume. Groundwater from outside of the impacted area was not included to assure a conservative estimate of on-site air emissions. The number of valid data points for each chemical ranged from

2 to 30. Sample locations included in the western parcel groundwater data set are listed in Table A 3-4. See Figure 3-5 for sample locations.

Groundwater (Magothy Aquifer): Groundwater data for the Magothy aquifer taken from the two on-site monitoring wells within the impacted groundwater area were combined for the western parcel. Figure 3-7 shows a generalized depiction of the groundwater plume. Groundwater from outside of the impacted area was not included to assure a conservative estimate of EPCs. The number of valid data points for each chemical ranged from 0 to 4, depending on the constituent. Sample locations included in the western parcel groundwater data set are listed in Table A 3-4. See Figure 3-5 for sample locations.

3.2.2 Eastern Parcel

The eastern parcel exposure area includes surface and subsurface soil, solid waste and liquid waste. Surface soils from the eastern parcel were not evaluated separately due to pavement, foundations, and other covering in the eastern parcel which effectively limit current direct contact exposure. Groundwater was also not included in the eastern parcel because the majority of impacted groundwater is in the western parcel of the site.

Surface/Subsurface Soil: Surface soil and subsurface soil samples were combined to represent potential future exposures, as discussed in Section 3.2.1. The number of valid data points for each chemical ranged from 11 to 135. Samples included in the eastern parcel soil data set are listed in Table A 3-5. See Table A 3-2 for a key to TP sample numbers and Figures 3-1 and 3-2 for sample locations.

Solid Wastes: All solid waste data were collected from the eastern parcel and are used for the future exposure scenarios and for current exposure to trespassers. The number of valid data points for each chemical for this data set ranged from 24 to 30. Those data collected from Building H are also used for current exposure to commercial industrial workers. The number of valid data points for each chemical for the current indoor data set was 4. See Section 4.0 for exposure information. Sample locations included in the eastern parcel solid waste data sets are listed in Table A 3-6. See Figure 3-3 for sample locations.

Liquid Wastes: All liquid waste data was collected from the eastern parcel and are used for the future exposure scenarios and for current exposure to trespassers. The number of valid data points for each chemical for this data set ranged from 14 to 15. Those data collected from Building H are also used for current exposure to commercial industrial workers. The number of valid data points for each chemical for the current indoor data set was 5. See Section 4.0 for exposure information. Sample locations included in the eastern parcel liquid waste data sets are listed in Table A 3-6. See Figure 3-3 for sample locations.

3.2.3 Off-site Residential Areas

The off-site residential areas include surface and subsurface soil in Ellsworth Allen Park, off-site groundwater in the Upper Glacial aquifer, and off-site groundwater in the Magothy aquifer.

***Surface/Subsurface Soil*:** Soil samples collected in Ellsworth Allen Park were evaluated for future exposures. The number of valid data points for each chemical was 10. Sample locations included in the Ellsworth Allen Park soil data set are listed in Table A 3-7. See Figure 3-1 for sample locations

Groundwater in Upper Glacial Aquifer: Groundwater data for the Upper Glacial aquifer taken from off-site monitoring wells within and near the impacted groundwater area were evaluated for several exposure scenarios. Figure 3-8 shows a generalized depiction of the off-site groundwater plume. Groundwater collected from wells outside of the impacted area or from wells that are located within a non-site related groundwater plume (see CRI Report, Dames & Moore, 2000) was not included. The number of valid data points for each chemical ranged from 4 to 38. Groundwater sample locations included in the off-site residential area data sets are listed in Table A 3-8. See Figure 3-5 for sample locations.

Groundwater in Magothy Aquifer: Groundwater data for the Magothy aquifer taken from off-site monitoring wells within the impacted groundwater area were evaluated for the future drinking water scenario. Groundwater from outside of the impacted area was not included. The number of valid data points for each chemical ranged from 2 to 22. Groundwater sample locations included in the off-site residential area data sets are listed in Table A 3-8. See Figure 3-5 for sample locations.

3.2.4 Massapequa Preserve.

Data sets for surface water, sediment, and fish tissue collected from Massapequa Preserve were evaluated. The number of valid data points for each chemical ranged from 7 to18 for surface water, 13 to 45 for sediment, and 8 for fish. All samples collected in these media are included in these data sets. See Figure 3-6 for sample locations.

3.3 SELECTION OF CONSTITUENTS OF POTENTIAL CONCERN

3.3.1 General Approach for COPC Selection

Each data set was screened individually for selection of COPCs. The results are shown in Tables 2.1 through 2.24. These tables provide summary information about the data sets, including minimum detected concentrations, maximum detected concentrations, locations of the maximum detected concentrations, frequency of detection, detection limits, and data qualifiers. Screening for selection of COPCs was conducted utilizing the maximum detected concentration for each chemical in the data sets identified in Section 3.2.

The following COPC selection criteria were applied sequentially to each analyte:

- Not an essential nutrient;
- Positively detected in at least 5% of samples;
- Positively detected in at least one sample above the background concentration defined in Section 3.3.1.3, and
- Positively detected in at least one sample above risk-based screening levels or applicable or relevant and appropriate requirements (ARARs) (see Section 3.3.1.4).

The decision process is discussed in more detail below.

3.3.1.1 Essential Nutrients

The following essential nutrients were eliminated as COPCs: calcium, magnesium, potassium and sodium. Iron was eliminated if site-specific concentrations indicate that it is not present at concentrations which could pose unacceptable risks at the site.

3.3.1.2 Frequency of Detection

Constituents with detection frequencies of five percent or less in a given data set were eliminated from further consideration in that data set (EPA, 1989a). A minimum of 20 samples is required for this evaluation; thus, no chemicals with fewer than 20 samples in a medium were eliminated based on frequency of detection.

3.3.1.3 Comparison with Background

The purpose of the BHHRA is to evaluate the risks associated with site-related constituents. Constituents occurring in environmental media at and near the site at levels consistent with background concentrations should not be considered "site-related." In order to eliminate non-site-related constituents from the evaluation of risks associated with the Site, analytical data were compared with background concentrations. If the maximum detected concentration was below the defined background concentration, then that constituent was eliminated from further consideration as a COPC for that media. Table A 3-9 lists the samples used to determine background concentrations. Background concentrations for each medium are discussed below.

Surface Soil, Subsurface Soil and Solid Wastes: Site-specific background levels for soil were not available. Samples collected previously by Weston to represent background were located on-site and therefore may not be appropriate for use as background samples. Typical soil background concentrations presented in NYSDEC's "Proposed Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels" (TAGM), Appendix A (NYDEC, 1995) were used instead of site-specific background to determine site-relatedness. Background concentrations used for COPC screening are listed in Table A 3-10.

Groundwater: Background concentrations in upgradient, non-impacted monitoring wells were used to determine background groundwater concentrations for the Upper Glacial aquifer. Only screening-level data were available for determining background groundwater concentrations for the Magothy aquifer. Because samples from the screening boring were sometimes turbid, concentrations of inorganic constituents detected can not be considered representative of the dissolved phase. Therefore, no background levels for inorganic constituents in the Magothy aquifer were used in the COPC screening. Background concentrations used for COPC screening are detailed in Table A 3-10. Locations of groundwater background samples are shown in Figure 3-4.

Surface Water and Sediment: Background levels for surface water and sediment were selected from the available data collected in the West Branch of Massapequa Creek. There is no indication that the West Branch has been impacted by site constituents: the current groundwater plume does not intersect the West Branch, nor is there a known route for surface or storm sewer migration of constituents from the site to the West Branch. (Dames & Moore, 2000) Constituent levels detected in the West Branch can be considered representative of typical surface water in the area. Background concentrations used for COPC screening are detailed in Table A 3-10. Locations of surface water and sediment background samples are shown in Figure 3-6.

Fish: Background fish tissue levels were determined by sampling fish in one off-site reference location. The reference location was in Mill Pond, located in Millpond Park, north of Merrick Road in Bellmore, New York, approximately four miles west of the Massapequa Preserve. Background concentrations used for COPC screening are detailed in Table A 3-10.

3.3.1.4 Comparison with Risk-Based COPC Screening Levels and ARARs

Risk-based screening levels for each data set were identified for use in the COPC selection process. ARARs were also selected as screening levels when appropriate. If the maximum detected concentration in a data set was below the selected risk-based screening level or ARAR, then that constituent was eliminated from further consideration as a COPC in that data set.

EPA supports the use of risk-based screening levels for selecting COPCs. EPA Region III's "Selecting Exposure Routes and Constituents of Concern by Risk-Based Screening" (EPA Region III, 1993) indicates that "(w)hile EPA considers it necessary to gather information on many constituents, very little of this data actually influences the overall quantitative assessment of health risk. For most sites, baseline risk assessments are dominated by a few constituents and a few routes of exposure. The remaining tens, or hundreds, of detected constituents have a minimal influence on total risk. This small impact is lost by rounding. Entire environmental media may contain not a single contaminant at a concentration which could adversely affect public health. Quantitative risk calculations using data from such "risk-free" media have no effect on the overall risk estimate for the site." Use of the risk-based screening levels facilitates identifying and focusing on dominant constituents of concern and exposure routes at the earliest feasible point without loss of protectiveness.

Selection of Risk-Based COPC Screening Levels: Two types of risk-based screening levels were used: EPA Region III Risk-Based Concentrations (RBCs) and EPA Soil Screening Levels (SSLs) for the volatile inhalation pathways. In all cases the RBC or SSL value was used to screen for carcinogens and 1/10th the RBCor SSL value was used to screen for non-carcinogens. In cases where the 0.1RBC for non-carcinogenic effects was lower than the RBC for cancer effects, the 0.1 non-cancer RBC was used as the screening value. These and ARARs are discussed below.

EPA Region III RBCs (EPA Region III, 1999) are medium-specific chemical concentrations, corresponding to EPA-approved toxicity criteria and conservative default exposure rates, that are not expected to cause adverse health effects (*i.e.*, cancer risk greater than one in one-million, or a non-cancer HQ greater than one) under a default residential exposure scenario.

EPA SSLs (EPA, 1996c) for inhalation are also chemical concentrations, corresponding to EPA-approved toxicity criteria and exposure rates, that are not expected to cause adverse health effects *(i.e.*, cancer risk greater than one in one-million, or a non-cancer HQ greater than one) under a default residential exposure scenario. These values are highly conservative in that they assume both residential exposure and an infinite source of contamination. Because the model used to calculate vapor emissions does not apply above saturation concentrations, the soil saturation concentration is used in place of the SSL whenever it is lower than the calculated SSL (EPA, 1996c).

ARARs used in the screening process are the New York State Ambient Water Quality Standards or Guidance Values (NYSDEC, 1998). NYSDEC Standards and Guidance Values are based on a variety of assumptions and methods.

Because the exposure rates expected for most site-specific exposures are substantially less than those assumed in the default residential scenario used in the calculation of the RBCs scenarios (see Section 4.5.2), constituents present at levels below the RBCs are not expected to contribute appreciably to overall risk. Thus, it is appropriate to use these conservative screening levels to distinguish those COPCs that are significant contributors to potential risks from those that have minimal impact. Use of ARARs in addition to RBCs for drinking water add to the conservatism of the screening process.

COPC Screening Criteria Used for Each Media: Following is a more detailed discussion of COPC screening criteria used for each media:

- Surface Soil, Subsurface Soil, Solid Waste and Sediment: For constituents detected in these media, risk-based COPC screening levels are equal to EPA Region III RBCs for carcinogens and $1/10^{th}$ RBC for non-carcinogens for residential soil (EPA Region III, 1999), which are based on soil ingestion. EPA SSLs for particulate inhalation were also examined for constituents detected in soil and solid waste since particulate inhalation is a relevant pathway for these media. However, all RBCs for residential soil were lower (more protective) than particulate inhalation SSLs. The RBCs are expected to be particularly conservative with respect to screening COPCs in solid waste because actual exposure to solid waste materials is expected to be minimal.
- Volatiles in Surface and Subsurface Soil and Solid Waste: For volatile constituents in surface and subsurface soil, risk-based COPC screening criteria are equal to EPA SSLs for carcinogens(EPA, 1996c) or 0.1 SSL for non-carcinogens based on inhalation or soil saturation concentrations, whichever is lower. Only those constituents considered volatile (*i.e.*, with a Henry's Law Constant greater than 1×10^{-5} atm-m^3/mol and a molecular weight less than 200 Daltons) were included in the screening. Identification of volatile constituents by these criteria is presented in Table A 3-11.

- Groundwater, Surface Water and Liquid Wastes: For constituents in groundwater and surface water, risk-based COPC screening criteria are equal to the lower of EPA Region III residential tap water RBCs for carcinogens and 1/10th RBCs for non-carcinogens(EPA Region III, 1999), which are based on ingestion and inhalation during showering, and New York State Ambient Water Quality Standards or Guidance Values (NYSDEC, 1998). As these drinking water ARARs are not applicable to liquid waste, Region III residential tap water RBCs are used for screening liquid wastes.
- Fish: For constituents detected in fish muscle tissue, risk-based COPC screening criteria are equal to EPA Region III RBCs for carcinogens and 1/10th RBCs for non-carcinogens for fish (EPA Region III, 1999). The RBCs, which assume a daily fish intake of 54 grams, are expected to be particularly conservative with respect to screening COPCs at this location because Massapequa Preserve is not likely to provide a daily diet of fish for recreational users.

Risk-Based COPC Screening Criteria for Special Cases:

A number of constituents detected in site media lacked published RBCs or were complicated by multiple forms of the same chemical. For these constituents, RBCs for surrogate chemicals were used or conservative choices made as noted below:

- Hexavalent chromum (Cr^{+6}) was used as a conservative surrogate for total chromium.
- Mercury was assumed to be in the form of methylmercury and screened based on the methyl mercury RBC.
- The RBC for chlordane was used for both alpha-chlordane and gamma-chlordane.
- The RBC for endosulfan was used for endosulfan II and endosulfan sulfate.
- The RBC for endrin was used for endrin aldehyde and endrin ketone.
- The RBC for alpha-BHC has been used for delta-BHC.
- The RBC for pyrene has been used for acenaphthylene, benzo(ghi)perylene and phenanthrene.
- The Region 9 Preliminary Remediation Goal (PRG) was used for 2-nitroanaline due to the absence of a Region 3 RBC (USEPA Region 9 PRG October 1999).
- For chemicals on the Region 3 RBC table with a "!" (1/10th of the noncancer RBC is less than the reported cancer RBC), 1/10th of the noncancer RBC has been calculated and used as the screening value. Applicable chemicals were chloroform in tapwater and residential soil, and Aroclor 1254 and trichloroethene in residential soil.

Lead: The EPA has deemed it inappropriate to develop toxicological criteria for inorganic lead compounds. Thus, no RBCs can be calculated for inorganic lead compounds. Using an integrated exposure uptake-biokinetic (IEUBK) model, EPA has calculated an average soil lead concentration of 400 mg/kg for soil as a residential screening level corresponding to the target blood lead level for children of 10 ug/dl (EPA, 1994a and 1994b). This level was used for screening solid media. The EPA has established an action level for lead in drinking water of 15 µg/L (EPA, 1991a). Because it is lower than the NYSDEC Standard of 25 µg/L (NYSDEC, 1998), the action level was used for screening aqueous media. No screening criteria for lead in fish are available; therefore, lead was retained as a COPC for the fish ingestion pathway.

RBCs or SSLs were calculated for the following constituents:

- A residential soil RBC for 2-nitroaniline was calculated by extrapolating the inhalation reference dose (RfD) to the oral route and applying the appropriate equations in "EPA Region III Risk-Based Concentration Table Technical Background Information" (EPA Region III, October, 1999);
- Volatile inhalation SSLs and/or soil saturation concentrations were calculated using the appropriate standard equations in "Soil Screening Guidance: User's Guide" (EPA, 1996c) for: 1,3-dichlorobenzene, 1,4-dichlorobenzene, dibenzofuran, acenaphthene, acenaphthylene, anthracene, phenanthrene, fluorene, naphthalene, 2-mehtylnaphthalene, 2-butanone, 2-hexanone, 4-methyl-2-pentanone, MTBE, hexachlorobutadiene, chloroethane, chloromethane, dibromochloromethane. The default VF was not used for these modeling efforts, rather, the Q/C value for Philadelphia was used, assuming a source of 10 acres.
- Particulate inhalation SSLs were calculated using the appropriate standard equations parameters in "Soil Screening Guidance: User's Guide" (EPA, 1996c) for aluminum and manganese. The default PEF was not used for these modeling efforts, rather, the Q/C value for Philadelphia was used, assuming a source of 10 acres.

3.3.1.5 Evaluation of Class A Carcinogens

Consistent with the process outlined in RAGS Part A, chemicals identified as Class A (known human) carcinogens were evaluated with consideration for frequency of detection, magnitude of exceedance of the screening toxicity value/ARAR, information on background concentrations, location and date of the maximum detected concentration, and recent sampling data.

3.3.2 Western Parcel COPCs

Tables 2.1 through 2.7 provide lists of COPCs selected for the western parcel based on the selection criteria detailed. The rationales for chemical selection or deletion are also provided in these tables.

Surface Soil: COPCs for this data set include eleven metals (aluminum, antimony, arsenic, cadmium, chromium, copper, cyanide, lead, nickel, thallium, and zinc), two PCBs (Aroclor 1254 and Aroclor 1260), and one VOC (Tetrachloroethene) (Table 2.1).

Surface/Subsurface Soil: COPCs for this data set include thirteen metals (aluminum, antimony, arsenic, cadmium, chromium, chromium-VI, copper, cyanide, lead, mercury, nickel, silver, and zinc), three PCBs (Aroclor 1248, Aroclor 1254, Aroclor 1260), 1 PAH (Benzo(a)pyrene), and one VOCs (tetrachloroethene) (Table 2.2).

For the volatilization pathway, COPCs include 3 VOCs (Tetrachloroethene, toluene, and trichloroethene) (Table 2.3).

Groundwater (Upper Glacial Aquifer): COPCs for this data set include nine metals (aluminum, arsenic, cadmium, chromium, copper, cyanide, manganese, nickel, and thallium), nine VOCs (1,1,1-trichloroethane, 1,1-dichloroethane, 1,2-dichlorooethene (total), acetone, chloroform, cis-1,2-dichloroethene, tetrachloroethene, trans-1,2-dichloroethene, trichloroethene), and alpha chlordane, dieldrin, gamma chlordane, bis(2-ethylhexyl)phthalate, chrysene, and pentachlorophenol (Table 2.4).

For the volatilization pathway nine VOCs (1,1,1-trichloroethane, 1,1-dichloroethane, 1,2-dichloroethene (total), acetone, chloroform, cis-and trans-dichloroethene, tetrachloroethene, and trichloroethene) were selected as COPCs(Table 2.5).

Groundwater (Magothy Aquifer): COPCs for this medium include manganese (Table 2.6). No vapor COPC were identified for the Magothy Aquifer (Table 2.7).

3.3.3 Eastern Parcel COPCs

Tables 2.8 through 2.15 provide lists of COPCs selected for the eastern parcel based on the selection criteria detailed in Section 3.3.1. The rationales for chemical selection or deletion are also provided in these tables.

Surface/Subsurface Soil: COPCs for this data set include twelve metals (antimony, arsenic, cadmium, copper, chromium, chromium VI, cyanide, lead, mercury, nickel, vanadium, and zinc), three PAHs (benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene), and two VOCs (1,2-dichloroethene (total), and trichloroethene) (Table 2.8).

For the soil volatilization pathway, COPCs include two VOCs (trichloroethene and 1,2-dichloroethene(total)) (Table 2.9).

Solid Waste: COPCs for this data set include thirteen metals (aluminum, antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, thallium, vanadium, and zinc), three pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT), three PCBs (Aroclor 1248, Aroclor 1254, Aroclor 1260), ten PAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, and pyrene) and three SVOC (bis(2-ethylhexyl)phthalate, carbazole, and di-n-octylphthalate) (Table 2.10).

For the solid waste volatilization pathway, (indoor and outdoors) COPCs include 3 PAHs (2-methylnaphthalene, anthracene, phenanthrene) (Table 2.11). COPCs for solid waste in currently occupied buildings also include three PAHs (2-methylnaphthalene, anthracene, phenanthrene) (Table 2.12).

Liquid Waste: COPCs for this data set include 14 metals (aluminum, antimony, arsenic, barium, cadmium, chromium, copper, lead, manganese, mercury, nickel, thallium, vanadium, and zinc), five pesticides (4,4'-DDD, 4,4'-DDE, 4,4'-DDT, endrin aldelyde, heptachlor epoxide), one PCB (Aroclor 1260), 10 PAHs (benz(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, and pyrene), five SVOCs (bis-(2-ethylhexyl)phthalate, carbazole, 4-methylphenol, pentachlorophenol, dibenzofuran) and nine VOCs (acetone, benzene, chloroethane, ethyl benzene, methylene chloride, toluene, trichloroethene, vinyl chloride, and xylene) (Table 2.13).

For the liquid waste volatilization indoors and outdoors pathway, COPCs include 13 VOC (acetone, benzene, chloroethane, 1,4-dichlorobenzene, dibenzofuran, ethylbenzene, methylene chloride, naphthalene, phenanthrene, toluene, trichloroethene, vinyl chloride, total xylenes) (Table 2.14).

There are no COPCs for liquid waste vapors in currently occupied buildings (Table 2.15).

3.3.4 Off-site Residential Areas COPCs

Tables 2.16 through 2.21 provides lists of COPCs selected for off-site residential areas based on the selection criteria detailed. The rationale for chemical selection or deletion is also provided in these tables.

Surface/Subsurface Soil: The only COPC for soil in Ellsworth Allen Park is chromium (Tables 2.16). There are no COPCs for volatilization (Table 2.17)

Groundwater (Upper Glacial Aquifer): COPCs for this data set include six metals(aluminum, arsenic, cadmium, chromium, chromium VI, manganese), nine VOCs (1,1,1-trichloroethane, 1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethene (total), chlorobenzene, cis-1,2-dichloroethene, tetrachloroethene, trichloroethene, vinyl chloride), dieldrin, heptachlor epoxide, bis(2-ethylhexyl)phthalate, and phenol (Table 2.18).

For the volatilization pathway, COPCs include nine VOCs (1,1,1-trichloroethane, 1,1-dichloroethene, 1,1-dichloroethane, 1,2-dichloroethene (total), chlorobenzene, tetrachloroethene, cis-1,2-dichloroethene, trichloroethene, vinyl chloride) (Table 2.19).

Groundwater (Magothy Aquifer): COPCs for this data set include four metals (arsenic, chromium, chromium-VI, manganese) and 11 VOCs (1,1-dicloroethane, 1,1-dichloroethene, 1,2-dichloroethane, 1,2-dichloroethene (total), benzene, carbon tetrachloride, tetrachloroethene, toluene, cis-1,2 dichloroethene, trans-1,2-dichloroethene, trichloroethene) (Table 2.20).

For the volatilization pathway there were 11 VOCs (1,1-dicloroethane, 1,1-dichloroethene, 1,2-dichloroethane, 1,2-dichloroethene, benzene, carbon tetrachloride, tetrachloroethene, toluene, cis-1,2 dichloroethene, trans-1,2-dichloroethene, trichloroethene) selected as COPCs (Table 2.21).

3.3.5 Massapequa Preserve COPCs

Tables 2.22 through 2.24 provide lists of COPCs selected for Massapequa Preserve based on the selection criteria detailed. The rationale for chemical selection or deletion is also provided in these tables.

Surface Water: COPCs for this data set include four metals (arsenic, cadmium, chromium, chromium-VI) and four VOCs (chloroform, dibromochloromethane, tetrachloroethene, trichloroethene) (Table 2.22).

Sediment: COPCs for this data set include six metals (aluminum, arsenic, cadmium, chromium, chromium-VI, lead, manganese, mercury, and vanadium) (Table 2.23).

Fish Tissue: COPCs for this data set include three metals (cadmium, chromium, and lead) (Table 2.24).

3.4 SUMMARY OF CHEMICALS OF POTENTIAL CONCERN

Based on the screening procedure, COPCs were selected for risk evaluation in the BHHRA. Tables 2.1 through 2.24 list the COPCs for each exposure area. When no COPCs were selected for a data set, that data set was eliminated from further evaluation. The following data set was eliminated from the BHHRA due to a lack of COPCs:

- Groundwater vapors for the Magothy Aquifer in the Eastern Parcel
- Liquid waste vapors in the Eastern Parcel
- Surface/subsurface soil vapors in Ellsworth Allen Park.

4. EXPOSURE ASSESSMENT

An exposure assessment defines the amount, frequency, duration, and routes of receptor exposure to site-related COPCs. The exposure assessment considers both current and likely future site uses, and is based on complete exposure pathways to actual or probable human receptors.

4.1 LAND AND WATER USES

4.1.1 Current Land Use

As of 1994, the Site was zoned Class H Light Industrial according to the Town of Oyster Bay Building Zone Map (revised March 1990). As of January 1, 1999, the Town of Oyster Bay mandated that site activities in the central part of the site (eastern parcel west of Building E) must cease. Building H is the only currently occupied building and is used for warehousing operations. The western parcel is not in use; however, there is evidence of trespassing at the Site.

The surrounding land use is predominantly residential with several business corridors located at main road intersections, such as Motor Avenue and Merritt Road, Motor Avenue and Main Street, and Motor Avenue and Woodward Parkway. The residential area south of the site is comprised of small homes (medium density occupancy) built between 1946 and 1962. The density and residential use of the land has been reported as stable since the initial period of development.

The surrounding area includes several public schools. The school closest to the Site is the Woodward Parkway Elementary School between Spielman Street and Tomes Street. This school is also located within the VOC-impacted plume in the Upper Glacial aquifer. Farmingdale High School, located further south of the site, is apparently not within the site-related plume.

Immediately adjacent to the western property boundary is Ellsworth Allen Park. Facilities at Ellsworth Allen Park include baseball and soccer fields, tennis courts, a bathroom/changing facility, and parking lots. One of the ballfields is located adjacent to the western site boundary, and is the location of the "former disturbed area" which was sampled and screened for COPCs (see Section 3.3.4). This area is currently grass-covered.

Based on current land use, the only onsite current receptors are trespassers and commercial/industrial workers in Building H.

4.1.2 Future Land Use

The future use of the site affects the types of exposures and the frequency of exposures to any residual contamination remaining on the site in the future. The future land use assumptions used in the BHHRA are consistent with the reasonably anticipated future land uses of the site. The selection of future land use was conducted in accordance with EPA's Office of Solid Waste and Emergency Response (OSWER) Directive 9355.7-04, "Land Use in the CERCLA Remedy Selection Process" (EPA, 1995).

The primary reasonably anticipated future use of the Site is commercial or industrial. Residential land use for the site is not considered to be "reasonably anticipated" because the site has been zoned for industrial use since the 1920's and has been used in that manner to the present day. The Site was used for industrial activities until the mid-1980s. Since that time, light industrial uses of the site have included trucking, warehousing, automobile parts salvaging operations, and product distribution. There is no comprehensive master land use plan for the area indicating that the majority of the property would be used for purposes other than commercial or industrial uses.

The Town of Oyster Bay has completed a preliminary assessment of the feasibility of using a portion of the western parcel for park and recreational purposes (Cashin, 1998). This area would be an expansion of the adjacent Ellsworth Allen Park. While the exact nature of recreational activities at this location was not presented in the preliminary assessment, it is assumed that activities would be similar to those in Ellsworth Allen Park and probably would not include exceptionally high soil-contact facilities such as sandboxes, without prevention of exposure to impacted soils (*i.e.,* physical barriers, etc.)

The Town of Oyster Bay indicated during ROD development mediation processes that consideration of any application for a zoning change or variance would depend on the extent of contamination remaining at the site, and would require careful review by the Town's health and environmental departments (EPA Region II, 1997). Additional institutional controls such as deed restriction may be required to ensure that the Site is redeveloped in a manner that is protective of human health and the environment.

This BHHRA has been prepared on the assumption that future land use at the Site would be commercial/industrial or recreational (western parcel only), with construction occurring in either case.

4.1.3 Groundwater Use

4.1.3.1 Local Ordinances

State use designation of the Upper Glacial and Magothy aquifers is Class GA (i.e source of drinking water). (6 NYCRR Part 701) Nassau County Board of Health Ordinance, Article IV, prohibits the installation of private water system wells in those areas served by a public water system. This ordinance prohibits new private water systems but does not require existing private water systems in owner occupied residences to be connected to public supplies. However, the stated policy of this article is "...to require, insofar as possible, that all drinking water used by the public be provided by a public water system..." The ordinance also does not prohibit the installation of non-drinking water supply wells, such as irrigation or process water wells.

Nassau County Board of Health Ordinance, Article VI, regulates public drinking water supplies to assure the quality of drinking water. This article requires County Board of Health approval for the installation or use of any public water supply well, and requires the control of all potential sources of groundwater impacts within a 100 foot radius of the well.

Based on these regulations, it is unlikely that public or private water supply wells drawing from impacted groundwater or potentially impacted groundwater would be allowed by the County in the future. The ordinances are included in Appendix C.

4.1.3.2 Groundwater

There is no current use of groundwater at the Site. However the Magothy aquifer is currently used as a potable water supply for Nassau County and the aquifer is designated by the State as a drinking water aquifer. Therefore, risks from potential future ingestion of groundwater by future onsite commercial/industrial workers is assessed quantitatively. Offsite residents are also assessed quantitatively. There are three production wells located onsite that are currently not in use. Two of these wells are completed in the Magothy aquifer (172 to 268 feet bgs), and one well is completed in the Upper Glacial aquifer (78 feet bgs). It is not anticipated that these wells would be used in the future.

4.1.3.3 Upper Glacial Aquifer

Groundwater in the Upper Glacial aquifer is not used for potable purposes and the aquifer is not considered a use-aquifer by the local water purveyor. However, as a conservative measure and at the request of EPA Region II, ingestion of groundwater by future onsite commercial workers and ingestion, dermal contact with and inhalation of vapors while showering is assessed for offsite residents quantitatively.

The Farmingdale High School operates an irrigation well that is completed in the Upper Glacial aquifer to a depth of 70 feet bgs; however, the ground water flow model and the data presented in the Draft CRI Report (Dames & Moore, 2000) indicate that this well has not been impacted by site-related constituents (*i.e.,* it is located side-gradient and is separated from the groundwater plume) and therefore is not evaluated in the BHHRA.

4.1.3.4 Magothy Aquifer

This BHHRA assumes that, although unlikely, groundwater from impacted portion of the Magothy aquifer could be used for potable water supplies in the future. The Magothy aquifer is the primary aquifer utilized for public water supply. The water districts closest to the Site include the Farmingdale Water District (FWD), the South Farmingdale Water District (SFWD), and the Massapequa Water District (MWD). The closest municipal water supply wells are located immediately to the northwest of the site. Other water districts within a few miles of the site include the Bethpage Water District, the Plainview Water District, and the New York Water Service District.

The CRI report (Dames & Moore, 2000) details the location, owner, well identification, construction details, and status of wells in the site vicinity as recorded by the Nassau Country Department of Public Works. All the wells in the vicinity of the site are public supply wells. The FWD operates three wells (depths of 222 to 387 feet bgs) for public water supply. Eight wells (depths between 219 and 758 feet bgs) are operated by the SFWD. One well operated by the SFWD (depth of 758 feet bgs) is operated only on a seasonal basis. MWD operates four water supply wells (depths range from 268 to 850 feet bgs). All active supply wells of the FWD, SFWD, and MWD are completed in the Magothy aquifer. The locations of active wells in relation to the Site are shown in Figure 4-1.

The residents, schools, and commercial establishments in the area are on public water supplies drawn from the Magothy aquifer. There are no water supply wells located within the site-related groundwater plume. The water districts and the Nassau County Department of Public Works operate a network of observation wells that monitor the groundwater quality near the active supply wells. In addition, four deep sentinel wells were installed during the CRI activities. There is no indication from recent sampling of these sentinel wells that site-related constituents have impacted groundwater quality in the vicinity of the supply wells.

4.1.4 Surface Water Use

Approximately one mile south of the Site and adjacent to Woodward Parkway School is the origin of the east branch of Massapequa Creek. The site-related groundwater plume intersects the Creek approximately ¾ mile from the site. Massapequa Creek feeds several shallow ponds within the Massapequa Preserve. Paved trails for hiking, biking, and jogging surround the Creek and ponds. Wading in these ponds is possible; however, because the ponds are shallow, muddy and filled with snapping turtles, swimming activities are likely to be limited.

The downstream portions of Massapequa Creek are stocked with game fish including trout and also are inhabited by carp. Ponds A through 5 are used for fishing, and it is possible that people consume fish from these ponds. A warning sign at Pond 4 indicates that a NYSDOH health advisory is in effect for fish and wildlife from this water body based on the presence of chlordane. Chlordane is not a site-related constituent.

The Massapequa Preserve (comprising the stream, ponds, and a corridor of wetland and upland vegetation on either side of the stream) is designated as a protected area and is maintained by the Nassau County Department of Parks and Recreation for open space and recreational purposes. Massapequa Creek from Merrick Road north to its headwaters is classified by the NYSDEC as C (t)-trout water, and trout are annually stocked in Massapequa Creek.

Based on the above discussion, current receptors at Massapequa Creek are waders and fishers.

4.2 CONCEPTUAL SITE EXPOSURE MODEL

The potential exposure scenarios to be considered in the BHHRA are illustrated schematically in the CSM, Figure1-1 and listed in Tables 1.1 through 1.4. Each exposure pathway is discussed in detail in Section 4.3. The CSM represents our current understanding of the sources of COPCs, the means by which they are released and transported within and among media and the exposure pathways and routes by which they may contact identified human receptors. The CSM includes:

- Known or potential sources of constituents;
- Environmental media that may be affected by site-related constituents;
- Primary and secondary transport mechanisms that may be associated with each affected medium;
- Routes of exposure for human receptors, based on collected data or expected pathways; and
- Potential human receptor populations.

The CSM provides the framework for the evaluation of risks associated with each COPC, exposure pathway, and receptor. The components of the CSM are discussed briefly below.

4.2.1 Sources

For the CSM, the source of site-related constituents is the surface and subsurface soil in the western and eastern parcels. The soils were impacted by former industrial operations, waste deposition and material handling practices. Specifically, continuing source areas include the former recharge basins, the soils beneath some former process lines, the Building B basement, the northwest disposal area and the Building M floor pad.

Solid and liquid wastes present in features (*i.e.,* sumps, drains, vaults, and leaching chambers) are also considered sources for the purposes of the BHHRA, although they are unlikely to be major contributors to groundwater impacts (Dames & Moore, 2000).

4.2.2 Fate and Transport Mechanisms

The potential for COPCs to migrate from source media to points of exposure depends on their concentration and distribution, climatic conditions, and physical and chemical properties of the constituents, soil, and groundwater. Their fate and transport in environmental media may be affected by one or more of the following mechanisms:

- Suspension of Particles: Particulates may become suspended in the ambient air due to wind erosion. Exposed soil and exposed solid wastes may generate suspended particulates. See Section 4.4.2 and Appendix D for air emissions modeling.
- Volatilization: COPCs may volatilize from subsurface soil, solid waste, liquid waste and groundwater, enter the soil gas, and then enter the ambient air through advective transport. Advective and convective transport through building foundations may allow volatile COPCs to enter onsite buildings. See Section 4.4.2 and Appendix D for air emissions modeling.
- Desorption and Leaching: COPCs in soil may desorb from soil or solid waste and enter the Upper Glacial aquifer groundwater. The presence of COPCs in groundwater indicates that this process has occurred, and likely has been occurring over many years. Continuing desorption from residual soil sources continues (Dames & Moore, 2000).
- Vertical Transport: Dissolved COPCs may be transported vertically from the Upper Glacial aquifer to the Magothy aquifer. Analytical data shows that VOCs have been transported to the Magothy aquifer.
- Transport to Surface Water: Transport of dissolved COPCs in groundwater and subsequent discharge to surface water through seeps and springs may occur. The presence of site-related COPCs in surface water in Massapequa Creek indicates that this process has occurred.

- Accumulation in Sediment: COPCs that have entered the surface water may accumulate in sediment. This process will be particularly important for metals and lipophilic compounds. The presence of site-related metals in Massapequa Preserve creeks and ponds indicates that this process has occurred.
- Surface Transport to Surface Water: Transport of COPCs adsorbed to soil particles to surface water bodies *via* surface water runoff can occur at some sites. Surface runoff to storm sewers is not believed to be a significant migration pathway for the Site: storm water tends to pool onsite or run into the basins, which are no longer connected to the storm sewer. At this time, there is no evidence that features are connected to the storm sewer, with the exception of the features in Buildings H and U (Dames & Moore, 2000).
- Attenuation: Attenuation of COPCs in groundwater by dispersion, biodegradation, and other processes will occur over time. The grain-size, mineralogical, and permeability characteristics of the subsurface and the characteristics of the COPC affect the potential for attenuation within a soil or groundwater unit. For example, the transitional unit between the Upper Glacial and Magothy Aquifers is expected to create somewhat different attenuation patterns for dissolved VOCs and dissolved metals. The greatest potential for attenuation in this unit exists for dissolved inorganic cationic constituents (e.g., cadmium) via sorption reactions. These sorption reactions may include precipitation as a molecular coating on the surface of soil particles, adsorption onto the surface of soil particles, adsorption into the structure of the minerals making up the soil and partitioning into organic matter. The attenuation of dissolved VOCs is primarily dependent on the biogeochemical conditions in the subsurface and the abundance of organic matter. Conditions amenable to promote attenuation are likely to exist in the aquifer beneath the site (Dames & Moore, 2000).
- Biological and Chemical Transformation: Metals are transformed in the soil and groundwater by biological and geochemical process, resulting in the formation of alternate species and complexes. Organic constituents are also transformed and degraded in the soil and groundwater. For example, the presence of degradation products (e.g., cis-1,2-dichloroethene) indicates that the primary organic COPC (trichloroethene) undergoes reductive dechlorination reactions. These reactions are generally biologically mediated, but can also occur abiotically. The rate of reductive dechlorination in the Upper Glacial aquifer is expected to be quite slow, due to the preponderance of oxidizing conditions. However, during the CRI activities the redox conditions in the Magothy aquifer were observed to be more reducing, and therefore more amenable to promote these reactions (Dames & Moore, 2000).
- Uptake and Trophic Transfer: Aquatic organisms may absorb or ingest COPCs and transfer through the food chain can occur. Analytical results for fish tissue indicates that some inorganic COPCs were detected in fish tissue. The potential for bioaccumulation and bioconcentration is addressed in the ecological risk assessment for this site.

Site-specific fate and transport mechanisms are discussed in more detail in the Weston RI (Weston, 1994) and the Dames & Moore CRI (Dames & Moore, 2000).

4.2.3 Receptor Populations

The potential human receptors for the site were identified based on current land use characteristics and reasonably anticipated future land use. The following receptor populations were evaluated:

- Trespassers;
- Commercial/industrial workers;
- Construction workers:
- Recreational users;
- Offsite residents;
- School children;
- School employees;
- Swimmers *(e.g.*, waders); and
- Fishers.

4.2.4 Routes of Exposure

The following routes of exposure may be associated with the site media:

- Ingestion of solid media: Ingestion of site constituents could occur through incidental ingestion due to hand-to-mouth behavior or deposition of inhaled particles in the mouth.
- Ingestion of groundwater: Groundwater ingestion is only expected to occur under a hypothetical future potable water scenario.
- Ingestion of surface water: Ingestion of site constituents could occur through incidental ingestion of surface waters during wading.
- Ingestion of fish: Ingestion of site-related constituents could occur if fishers eat fish caught in impacted areas.
- Inhalation of suspended particulates: Suspended particles in ambient air may be inhaled by those persons near the source.
- Inhalation of vapors while bathing: Vapors could be inhaled by persons while bathing/showering.
- Inhalation of vapors: COPCs volatilizing from site media could be inhaled by receptors. Vapor inhalation could occur both outdoors and indoors if vapors infiltrate buildings.
- Dermal absorption from solid media: If receptors have direct contact with solid media, absorption of the chemicals through the skin could occur.
- Dermal absorption from ground water: If receptors have direct contact with ground water while bathing, absorption through the skin could occur.
- Dermal absorption from liquid media: If receptors have direct contact with liquid media, absorption through the skin could occur.

4.3 IDENTIFICATION OF POTENTIALLY COMPLETE EXPOSURE PATHWAYS

In order for an exposure pathway to be complete, the following four elements must be present:

- A source and mechanism of constituent release to the environment;
- An environmental transport medium (*e.g.*, leaching to groundwater, fugitive dust emissions) for the released constituent;
- A point of potential receptor contact with the affected medium; and
- A route of entry into receptors (*e.g.*, inhalation, ingestion, dermal contact).

If any of these components is missing, then the pathway is incomplete and does not contribute to receptor exposure. Pathways that are currently complete or may be reasonably anticipated to be complete in the future are quantitatively evaluated in the BHHRA, while incomplete pathways were eliminated from further consideration.

Tables 1.1 through 1.4 were designed to accompany the CSM. These tables present 1) current and reasonably foreseeable future receptors, exposure routes, and exposure pathways associated with the site, and 2) the rationale for selection or exclusion of each potential exposure pathway. All exposure pathways that are likely to be complete under current and/or future conditions are evaluated in the BHHRA. These are presented in Tables 1.1 through 1.4.

For each exposure area, the following sections outline in detail the complete or potentially complete exposure pathways for each exposure time frame, media, population and exposure route.

4.3.1 Western Parcel

Table 1.1 illustrates the selection of exposure pathways for the western parcel.

4.3.1.1 Current Use – Surface Soil

Trespassers: There is evidence of trespassing on the western parcel of the Site. It appears that the western parcel is used as a short cut between Ellsworth Allen Park and surrounding residential and commercial areas. Also, there are a few alcoholic beverage containers scattered across the western parcel, particularly on the northern portion of the site, indicating use of the site for social gatherings. As this portion of the site is unpaved, direct contact with impacted surface soil by trespassers is likely. Direct contact with site constituents could occur through the incidental ingestion of and dermal contact with surface soil impacted by COPCs, particularly during social gatherings where individuals may sit on the bare ground. Suspended particulates originating from surface soil may be present in the ambient air and inhaled during trespassing activities. The following exposure routes are complete for trespassers exposed to surface soil:

- Ingestion
- Dermal contact
- Inhalation of particulates

4.3.1.2 Current Use - Surface/Subsurface Soil

Trespassers: It is not anticipated that trespassers would have direct contact with subsurface soil. However, trespassers could be exposed to volatile constituents originating from subsurface soil. COPCs in ambient air which have volatilized from subsurface soil could be inhaled by current trespassers. The following exposure route is complete for trespassers exposed to surface/subsurface soil:

- Inhalation of volatiles (outdoors)

4.3.1.3 Current Use - Groundwater (Upper Glacial)

Trespasser: It is not anticipated that trespassers would have direct contact with groundwater. However, trespassers could be exposed to volatile constituents originating from impacted groundwater. Only the Upper Glacial aquifer is considered for this pathway because: 1) inhalation of volatiles emitted from the groundwater is the only exposure pathway for groundwater onsite, 2) air emissions from the Magothy aquifer would likely be insignificant when compared with emissions from the Upper Glacial aquifer due to its greater depth (allowing for increased attenuation before entering the atmosphere), 3) VOC concentrations are generally lower in the Magothy aquifer than in the Upper Glacial aquifer, and 4) volatilizing chemicals from Magothy groundwater would have to pass through the Upper Glacial groundwater before entering the atmosphere, and the effects of this phenomenon on the emission rate from groundwater are not measurable give the available emissions models. The following exposure route is complete for trespassers exposed to groundwater:

- Inhalation of volatiles (outdoors)

4.3.1.4 Future Use - Surface/Subsurface Soil

Commercial/Industrial Worker: The primary anticipated future use of the Site is commercial/industrial. It is assumed that mixing could occur during development activities and that current subsurface soil, as well as current surface soil, could be present at the surface after future development. Therefore, the future commercial/industrial worker could be exposed at the surface to what is currently surface or subsurface soil. Direct contact of COPCs in soil by commercial/industrial workers could occur during outdoor activities such as maintenance, landscaping, or other activities. In addition, dust inside commercial/industrial buildings may contain fine soil materials from the site. Inhalation of particulates and volatiles in the ambient air could occur during outdoor activities, and volatiles could infiltrate onsite buildings and be inhaled by workers. The following exposure routes are complete for commercial/industrial workers exposed to surface/subsurface soil:

- Ingestion
- Dermal contact
- Inhalation of particulates
- Inhalation of volatiles (indoors)
- Inhalation of volatiles (outdoors)

Construction Worker: The future construction worker is assumed to be exposed to site constituents during construction activities, whether development is commercial/industrial or recreational. Direct contact with soil and incidental ingestion of the soil during construction activities through hand-to-mouth contact or settling of dust in the oral and nasal cavities, is likely. Construction activities often result in particulate emissions, particularly during excavation and grading. Construction workers may inhale these suspended particulates, or may inhale volatile constituents emanating from soil. The following exposure routes are complete for construction workers exposed to surface/subsurface soil:

- Ingestion
- Dermal contact
- Inhalation of particulates
- Inhalation of volatiles (outdoors)

Recreational User: Should the Site be developed for recreational purposes, recreational users could be exposed through the following routes during recreational activities such as organized sports:

- Ingestion
- Dermal contact
- Inhalation of particulates
- Inhalation of volatiles (outdoors)

4.3.1.5 Future Use - Groundwater (Upper Glacial)

Commercial/Industrial Worker: Currently there is no drinking water use of groundwater at the site. However it is possible that the aquifers could be used for drinking water in the future. Volatiles in groundwater could be emitted. The following exposure routes are assumed complete for commercial/industrial workers exposed to groundwater in the Upper Glacial and Magathy aquifers:

- Ingestion of ground water
- Inhalation of volatiles (indoors)
- Inhalation of volatiles (outdoors)

Construction Worker: The only contact a construction worker is likely to have to COPCs in groundwater is to volatilized constituents. The following exposure route is complete for construction workers exposed to groundwater in the Upper Glacial aquifer:

- Inhalation of volatiles (outdoors)

Recreational User: Should the Site be developed for recreational purposes, the following groundwater exposure route is possible:

- Inhalation of volatiles (outdoors)

4.3.2 Eastern Parcel

Table 1.2 illustrates the selection of exposure pathways for the eastern parcel.

4.3.2.1 Current Use - Solid Waste

Trespasser: Although no evidence of trespassing on the eastern parcel is present, this parcel is not secured by fencing, and therefore it is possible that trespassers could enter this portion of the site. Because the eastern parcel is generally paved or covered with building foundations, there is no exposure to soils. Features in the eastern parcel are generally covered by manhole and steel grates, and therefore direct contact with wastes in the features is not likely. The only potential exposure route for features is through volatilization through grated covers. The following exposure route is complete for trespassers exposed to solid wastes:

- Inhalation of volatiles (outdoors)

Commercial/Industrial Worker: Building H is the only currently occupied building in the eastern parcel. This building is being used for warehousing and no evidence of outdoor activities was observed. As verified by 1992 soil gas survey results, there is an insignificant level of volatiles in soil of the currently occupied portions of the Site. However, several waste-containing features are present in Building H. The only likely complete exposure route for commercial/industrial workers to solid wastes is:

- Inhalation of volatiles (indoors)

4.3.2.2 Current Use - Liquid Waste

Trespasser: As with solid wastes, trespassers could be exposed to liquid wastes in features through the following potentially complete exposure route:

- Inhalation of volatiles (outdoors)

4.3.2.3 Future Use - Surface/Subsurface Soil

Commercial/Industrial Worker: Future commercial/industrial use is assumed for the eastern parcel. It is assumed that development of the eastern parcel would result in excavation and redistribution of soil, resulting in the potential for exposure to current surface and subsurface soils at the surface. Direct contact of COPCs in soil by commercial/industrial workers could occur during outdoor activities such as maintenance, landscaping, or other activities. In addition, dust inside commercial/industrial buildings may contain fine soil materials from the site. Inhalation of particulates and volatiles in the ambient air could occur during outdoor activities, and volatiles could infiltrate onsite buildings and be inhaled by workers. The following exposure routes are complete for commercial/industrial workers exposed to surface/subsurface soil:

- Ingestion
- Dermal contact
- Inhalation of particulates
- Inhalation of volatiles (indoors)
- Inhalation of volatiles (outdoors)

Construction Worker: The future construction worker is assumed to be exposed to site constituents during construction activities. Direct contact with soil and incidental ingestion of the soil during construction activities through hand-to-mouth contact or settling of dust in the oral and nasal cavities is likely. Construction activities often result in particulate emissions, particularly during excavation and grading. Construction workers may inhale these suspended particulates, or may inhale volatile constituents emanating from soil. The following exposure routes are complete for construction workers exposed to surface/subsurface soil:

- Ingestion
- Dermal contact
- Inhalation of particulates
- Inhalation of volatiles (outdoors)

4.3.2.4 Future Use - Solid Waste

Commercial/Industrial Worker: For future use, it is assumed that commercial/industrial buildings could be built on top of features, or existing buildings could be used in the future. Volatilization of COPCs in waste materials in the features could result in indoor exposures through inhalation. Workers could also be exposed to volatilized COPCs from solid waste in the ambient environment. Commercial/industrial workers are not expected to have direct contact with solid wastes in enclosed features. The following exposure routes are complete for commercial/industrial workers exposed to solid waste in features:

- Inhalation of volatiles (indoors)
- Inhalation of volatiles (outdoors)

Construction Worker: The future construction worker may be exposed to solid waste in features during activities that include the removal of wastes from the features or removal of features from the site. The following exposure routes are complete for construction workers exposed to solid waste in features:

- Ingestion
- Dermal contact
- Inhalation of particulates
- Inhalation of volatiles (outdoors)

4.3.2.5 Future Use - Liquid Waste

Commercial/Industrial Worker: The future commercial/industrial workers may be exposed to liquid wastes in the same way as solid wastes:

- Inhalation of volatiles (indoors)
- Inhalation of volatiles (outdoors)

Construction Worker: Construction workers may be exposed to liquid wastes through dermal contact or inhalation of volatiles emanating from the liquid wastes. Ingestion is not expected to be a realistic exposure route for liquid wastes. The following exposure routes are potentially complete for construction workers exposed to liquid wastes:

- Dermal contact
- Inhalation of volatiles (outdoors)

4.3.3 Offsite Residential Areas

Table 1.3 illustrates the selection of exposure pathways for the offsite residential areas.

4.3.3.1 Current Use - Groundwater (Upper Glacial)

Offsite Resident (child and adult): There is no current use of the Upper Glacial aquifer groundwater for potable purposes. However, offsite residents living in homes over the impacted portion of the Upper Glacial aquifer downgradient of the site could be exposed to volatiles emitted from the groundwater into residences or into the ambient environment. It is also assumed as a conservative measure and at the request of EPA Region that at some future time residents could ingest this groundwater. The following exposure routes are potentially complete for offsite residents downgradient of the site:

- Inhalation of volatiles (indoors)
- Inhalation of volatiles (outdoors)
- Ingestion of ground water

School Child: Volatile constituents are present in the groundwater beneath Woodward Parkway School. The volatile COPCs could infiltrate the school building and be inhaled by school children. The following exposure route is potentially complete for the school child downgradient of the site:

- Inhalation of volatiles (indoors)

School Employee: As with the school child, the employees of Woodward Parkway School could be exposed to volatilized constituents originating from groundwater in the Upper Glacial aquifer. The following exposure route is potentially complete for the school employee downgradient of the site:

- Inhalation of volatiles (indoors)

4.3.3.2 Future Use - Groundwater (Magothy)

Offsite Resident (child and adult): Although unlikely to be used in the future, the Magothy aquifer is evaluated because New York State classifies it as a potable water source. For this potential future use, the potentially complete exposure routes for the offsite resident are:

- Ingestion
- Dermal contact
- Inhalation of volatiles while bathing

4.3.4 Massapequa Preserve

Table 1.4 illustrates the selection of exposure pathways for the Massapequa Preserve.

4.3.4.1 Current and Future Use - Surface Water

Swimmer: Wading in the Massapequa Preserve streams or ponds is possible; however, because the ponds are shallow, muddy and filled with snapping turtles, swimming activities are likely to be limited. Future use of the Preserve is expected to remain the same. Should wading occur, the following exposure routes are potentially complete for the swimmer (*e.g.*, wader):

- Ingestion
- Dermal contact

4.3.4.2 Current and Future Use - Sediment

Swimmer: As with the surface water, the swimmer could be exposed to sediment through the following exposure routes:

- Ingestion
- Dermal contact

4.3.4.3 Current and Future Use - Fish Tissue

Fisher: The creeks of Massapequa Preserve are stocked with game fish including trout and also are inhabited by carp. Ponds A through 5 are used for fishing, and it is possible that people consume fish from these ponds. Therefore, the following exposure route is potentially complete for fishers:

- Ingestion

4.4 CALCULATION OF EXPOSURE CONCENTRATIONS

Due to the uncertainty associated with any estimate of exposure point concentration (EPC), the 95 percent upper confidence limit (95% UCL) on the arithmetic average concentration for each COPC in each data set was used as the EPC. The 95% UCL is a reasonable maximum estimate of contaminant concentration likely to be contacted over time. Consistent with EPA guidance, concentrations of COPCs that were reported as less than the detection limit were assumed to be present at one-half of the detection limit for calculating the 95% UCL concentration (EPA, 1989a).

4.4.1 Statistical Analysis

4.4.1.1 Data Synthesis and Summary

This first step of the statistical evaluation was to construct a database that can be readily queried and amended with future data. Only COPCs for each data set were included in the database. Summary statistics for each data set were generated for each COPC. Summary statistics are provided in Tables 3.1 through 3.24.

4.4.1.2 Calculation of Exposure Concentrations

Exposure concentrations were calculated for each COPC in a data set using the database described above. If the sample size for a given medium was less than 10 samples, the maximum detected concentration was used (*i.e.*, no distribution fit was performed). For sample sets equal to or greater than 10, the EPC was the lesser of the maximum detected concentration or the 95% UCL of the mean.

The 95% UCL was calculated, as presented below, based on the distribution of the data. SPSS® Base 7.5 software package was used to perform the statistical testing. For sample sizes of 10 to 50, the Shapiro-Wilks W-test was used to determine the distribution. For sample sizes greater than 50, the Kolmogorov-Smirnov test with the Lilliefors significance correction (Zar, 1984) was used to determine the distribution.

The K-S test is a widely accepted and used statistical test with a high power which is found in most commercial software packages. The D'Agostino test is sometimes used for sample sets greater than 50 in lieu of the K-S test, however, both tests can detect very small deviations in fit for the assumed distribution (i.e., have very high power) and therefore, there should be virtually no difference between the results of the two tests.

Distribution plots and skewness calculations were also made to confirm the distribution tests. Distribution plots were used to visually observe the distribution and to aid the identification of unusual characteristics of the data set. Unusual characteristics of environmental data may include outliers and effects of non-detect samples. Skewness indicates to what degree the data are asymmetric with respect to the mean. Normally distributed data have skewness near zero. However, environmental quality data are inherently non-negative (concentrations are greater than zero). Therefore, some degree of skewness is expected. In general, skewness less than one indicates a data set is approximately normal.

Distribution testing was conducted on both the log-transformed and untransformed data to test for log-normal and normal distributions. For data sets that did not fit either normal or log-normal models, a log-normal distribution was conservatively assumed.

For data sets that are normally distributed, the 95% UCL was estimated using the following equation (Gilbert, 1987):

$$95\%\ UCL = x + t_{1-\alpha,n-1}\frac{s}{\sqrt{n}}$$

where:

x	=	the arithmetic mean of the untransformed data set
s	=	the standard deviation of the untransformed data set
$t_{1-\alpha,n-1}$	=	the critical value for n-1 degrees of freedom at the 95% level of confidence (*i.e.*, $\alpha = 0.05$)
n	=	number of samples

For data sets that are log-normally distributed or assumed to be log-normal, the 95% UCL was estimated using (Gilbert 1987):

$$95\%\ UCL = e^{\left(y + 0.5s_y^2 + \frac{s_y H_{1-\alpha}}{\sqrt{n-1}}\right)}$$

where:

e	=	constant (base of the natural log)
y	=	the arithmetic mean of the transformed data set
s_y	=	the standard deviation of the transformed data set
$H_{1-\alpha}$	=	the critical value for n-1 degrees of freedom at the 95% level of confidence (*i.e.*, $\alpha = 0.05$)
n	=	number of samples

EPCs, method of distribution testing, and distribution of each COPC by exposure area and media are presented in Tables 3.1 through 3.24.

4.4.2 Air Emissions Modeling

Air emissions modeling was conducted to determine EPCs for air for the particulate and volatile inhalation exposure pathways. The modeling was based on EPCs derived in site media (see Section 4.4.1). Inputs to the models were derived from EPA or American Society of Testing and Materials guidance documents, or site-specific information when available. Input values taken from guidance documents are intended to be conservative (upper-bound) estimates that are consistent with Superfund's reasonable maximum exposure (RME).

The modeling approaches and their sources are shown in Table A 4-1 for each medium. Appendix D presents the air emissions modeling, including methods, equations, inputs and spreadsheets used.

4.5 QUANTIFICATION OF INTAKE

4.5.1 Intake Equations

This section describes the methods for calculating chemical intakes (*e.g.,* doses) for the potentially exposed populations and exposure pathways selected for the HHBRA. The oral and inhalation doses are expressed as the amount of chemical at the exchange boundary (*e.g.* gastrointestinal tract, lung) and available for absorption (*e.g.*, average daily dose [ADD] or lifetime average daily dose [LADD]). Dermal exposure is expressed as dermally absorbed dose (DAD), and takes into account the permeability of the skin and the ability of a particular compound to cross the skin barrier. The dose is expressed as a rate normalized to body mass with units of mg/kg-day. Table A 4-2 shows the equations used to calculate exposure and Table A 4-3 shows the equations used to calculate dose absorbed per event from aqueous media.

The calculations used to estimate dose or absorbed dose have the same general components: 1) a variable representing chemical concentration, 2) variables describing the characteristics of the exposed population, and 3) an assessment-determined variable that defines the time frame over which exposure occurs (*i.e.,* averaging time).

The averaging time is either a 70-year averaging period used to assess lifetime cancer risks, or the expected exposure duration (ED) used to assess non-cancer effects. Appendix F contains the dose and risk calculations for the RME. Appendix G contains the dose and risk calculations for the CTE.

4.5.2 Exposure Assumptions

The exposure assumptions for each receptor and pathway were derived following EPA guidance for calculating RME estimates. The goal of the RME is to combine upper-bound and mid-range exposure factors so that the result represents an exposure scenario upper-bound but is not beyond the realm of possibility; the RME is not intended to represent the worst possible case (EPA, 1989a).

The exposure assumptions are derived primarily from EPA's "Supplemental Guidance for RAGS: Standard Default Exposure Factors" (EPA, 1991b) and *Exposure Factors Handbook* (EPA, 1997a). Professional judgment and EPA Region II policy were used in those cases where values were not available, and are intended to be conservative estimates.

Exposure assumptions for each scenario are detailed in Tables 4.1 through 4.57.

Body weight for each receptor scenario was taken from the Supplemental Guidance for RAGS, Standard Default Exposure Factors (EPA, 1991) and from the *Exposure Factors Handbook* (EPA, 1997a). Skin surface area (SA) derivations were derived using the new EPA draft dermal guidance document (EPA, 1999). The adherence factor (AF), or the amount of soil that adheres to the skin per unit of surface area, the skin surface area and the exposure durations for dermal pathways were also taken from the new EPA draft dermal guidance document (EPA, 1999). All inhalation rates are mean rates obtained from the *Exposure Factors Handbook* (EPA, 1997a).

4.5.2.1 Trespasser

The trespasser is assumed to be a 10 to 18 year old who is onsite for two hours. The 10 to 18 year old range was chosen to represent those children who 1) are not generally supervised continually by adults; 2) are likely to frequent Ellsworth Allen Park for organized sports and could use the Site as a short cut to the park; and 3) represents the national 50th percentile estimate of the time spent at one residence. Two hours per day of exposure is reasonably conservative for short cutting and socializing activities. The trespasser is likely to have higher exposure in the warmer months and less or no exposure in the colder months. Therefore, trespassers were assumed to visit four times per week for 13 summer weeks, twice per week for spring and fall months and once per week during the winter for a total of 130 days for the RME scenario. For the CTE scenario, trespassers were assumed to visit three times per week for 13 summer weeks and once per week for spring and fall for a total of 65 days.

Fifty percent of the trespasser's daily soil ingestion is assumed to occur at the site (50 mg/day). The inhalation rate is for heavy activity for the RME scenario. The trespasser is assumed to have exposed head, arms, hands and legs that could have dermal contact with soil during activities similar to a soccer player. This skin exposure would be typical for a warmer month when trespassers are wearing short sleeves, shorts, and shoes.

4.5.2.2 Commercial/Industrial Worker

The commercial/industrial worker is assumed to be an adult who is onsite for eight hours per day, five days per week, 250 days per year for 25 years. These are standard default exposure factors recommended by EPA (EPA, 1991b). The worker is assumed to spend two hours per day outdoors. Two hours per day would be a typical value for a commercial/industrial worker who may be engaging in activities such as maintenance, transportation of materials, and other activities that would require time outdoors.

The worker ingests 50 mg/day of soil, whether indoors or outdoors. This is also a standard default exposure factor for adults. The inhalation rate is for heavy outdoor activity, assuming that some labor-intensive maintenance activities may be required. The commercial/industrial worker is assumed to have exposed arms, hands and head that could have dermal contact with soil during activities. The arms, hands and head are typically exposed during commercial/industrial activities requiring contact with soil. It is unlikely that such a worker would wear shorts that would expose the legs.

4.5.2.3 Construction Worker

The construction worker is assumed to be an adult who is onsite for five days per week for six months. Given the size of each parcel at the Site, a six-month construction project is reasonable for the creation of recreational facilities or additional site buildings. The construction worker is assumed to have contact with solid media for eight hours per day, so that exposure to soil or solid waste is continual. The construction worker is also assumed to have contact with liquid wastes for two hours per day. It is unlikely that additional direct contact with liquid wastes would occur.

The construction worker is assumed to ingest 480 mg/day of soil. 480 mg/day is an estimate derived in one study for the amount of soil ingested by adults engaged in outdoor activities. No supporting measurements were made in this study. The inhalation rate is for heavy outdoor activity, assuming that construction activities are relatively strenuous. The construction worker is assumed to have exposed arms, hands and face that could have dermal contact with soil during construction activities. Construction workers are unlikely to expose legs during such activities.

4.5.2.4 Recreational User

The recreational user of the site is assumed to be a 6 to 18 year old who is onsite for two hours, twice per week for 10 months of the year. The 6 to 18 year old age range was chosen to represent school-aged children from first through 12th grade who could participate in regular organized sports activities. Two hours per day of exposure is reasonably conservative for organized sports. The recreational user is likely to have higher exposure in the warmer months and less or no exposure in the colder months. Therefore, twice per week for 10 months is a reasonably conservative average over the year.

Fifty percent of the recreational user's daily soil ingestion is assumed to occur at the site (50 mg/day). The inhalation rate is for heavy activity, assuming that the child is actively engaged during the full two hours at the site. The recreational user is assumed to have exposed arms, hands and legs that could have dermal contact with soil during activities similar to a soccer player. This skin exposure is possible during the warmer months where soccer players and informal recreational users may wear short sleeves and shorts, but may be conservative for the typical baseball uniform, as much of the leg would be covered.

4.5.2.5 Offsite Resident – Child

The child offsite resident is 1 to 6 years old and is exposed seven days per week for 350 days per year. These are standard default exposure factors recommended by EPA (EPA, 1991b). The child spends an average of 18.4 hours per day inside the home and 5.6 hours per day outdoors (EPA, 1997a). A 95th percentile time for bathing of one hour per day was assumed (EPA, 1997a).

A child tap water ingestion rate of 2 liters of tap water per day was chosen for the RME (EPA, 1997a). The inhalation rate is for moderate activity was selected for the RME. The indoor activities throughout the day include sleeping, eating, watching television and other non-active activities, and therefore, overall, an assumption of light activity is appropriate for the CTE. Outdoors, activities would be both inactive and active, and therefore an assumption of moderate activity is appropriate.

4.5.2.6 Offsite Resident - Adult

The adult offsite resident is greater than six years old and also is exposed seven days per week for 350 days per year. The adult exposure frequency for the RME is 5.3 hours based on the 90th percentile and the CTE is 1.5 hour based on the 50th percentile. The adult also spends about 35 minutes per day showering (95th percentile value from EPA, 1997a).

The adult ingests 2 liters of tap water per day (standard default exposure factors in EPA, 1991b). The inhalation rate is for light activity indoors and moderate activity outdoors, for the same reasons as described for the child resident.

4.5.2.7 School Child

The school child is 6 to 12 years old and is exposed six hours per day for 182 days per year. Woodward Parkway school is a primary school serving the 6 to 12 year old age group. The school day is typically six hours per day, and school is in session for 182 days per year (Woodward Parkway School, 1999).

The inhalation rate is for two hours of heavy activity and four hours of sedentary activities. This assumption was made to account for lunch hours, recess, and physical education classes, which may involve heavy activities, while the remainder of the school day generally consists of sitting in classrooms.

4.5.2.8 School Employee

The school employee is exposed eight hours per day, 250 days per year for 25 years (standard default exposure factors for workers in EPA, 1991b). It is assumed that an employee would be on school grounds year round whether teaching or not. The inhalation rate is for light activities.

4.5.2.9 Swimmer

The swimmer is assumed to be a 6 to 12 year old who wades in Massapequa Preserve surface water for three hours, 12 times per year. The 6 to 12 year old age group was chosen to correspond to 1) the attendees at Woodward Parkway School which is very close to Massapequa streams, and 2) the typical age range that might wade and play in a stream or pond.

The swimmer ingests 50-mg sediment and 50-ml of water per event. Professional judgement was used to estimate this incidental ingestion which might occur during wading events. Because full body swimming is not expected in the Massapequa ponds due to the shallow and muddy quality of the ponds and the presence of snapping turtles, the swimmer is assumed to have exposed arms, hands, legs and feet which could have dermal contact with impacted media during wading.

4.5.2.10 Fisher

It was conservatively assumed that fish with site exposure are ingested 350 days per year by an adult and by a child fisher. For the adult fisher (Section 6.5.5.2), the fish ingestion rate is 32 g/day, which is the 90th percentile value for adult recreational fishers in New York State. This ingestion rate is associated with 51 one-half pound meals per year (EPA, 1997a). The evaluation of the fish ingestion pathway for the child fisher (Section 6.5.5.1) is an adjustment to the adult fisher ingestion rate. The child fish ingestion rate is estimated at 11 g/day. These values for fish ingestion rates are used at the specific request of the EPA Region I Toxicologist, (personal communication) and are overly conservative. The USEPA has published national guidance which recommends the use of 6.6 g/day for the general population, and 8 g/day (50th percentile) for freshwater anglers. The USEPA 95th percentile value published for freshwater anglers is 25 g/day for adults (USEPA, 1997). The value used in this document exceeds this 95th percentile value. Furthermore, the Massapequa Preserve cannot support this level of fish consumption for the local population. Therefore, the fish ingestion rates utilized herein are overly conservative and overestimate actual risks for fish ingestion at the site.

5. TOXICITY ASSESSMENT

The toxicity assessment determines the relationship between the magnitude of exposure to a COPC and the nature and magnitude of adverse health effects that may result from such exposure. Detailed toxicological profiles for the COPCs are provided in Appendix E.

5.1 TOXICITY CRITERIA

Chemical toxicity is divided into two categories, carcinogenic and non-carcinogenic, based on the type of adverse health effect exerted. Health risks are calculated differently for these two types of effects because their toxicity criteria are based on different mechanistic assumptions and expressed in different units. The two approaches are discussed below.

5.1.1 Non-carcinogenic Effects

Non-cancer risks were calculated using reference doses (RfDs) developed by EPA. A RfD is an estimate of the daily lifetime exposure level to humans (expressed in units of mg of chemical/kg of body weight per day), including sensitive subgroups, that is likely to be without appreciable risk of deleterious effects (EPA, 1989a). RfDs are usually derived from oral exposure studies with the most sensitive species, strain and sex of experimental animal known, the assumption being that humans are as sensitive as the most sensitive organism tested. They are based on the assumption that thresholds (exposure levels below which no adverse effect is expected) exist for non-carcinogenic effects, and incorporate uncertainty factors to account for the required extrapolations from animal studies and to ensure protection of sensitive human sub-populations.

For oral exposures, oral RfDs were used. For dermal exposures, dermal RfDs were developed based on oral RfDs (see Section 5.1.3). For inhalation exposures, inhalation RfDs were derived from inhalation reference concentrations (RfCs) reported in mg/m^3. Tables 5.1 and 5.2 illustrate these conversions.

EPA defines chronic exposure as exposure periods between seven years and a lifetime (EPA, 1989a). For any exposure pathways where the exposure duration is seven years or more, chronic RfDs were used. For adult exposures lasting less than seven years, sub-chronic RfDs were used. While it should be noted that EPA's methodologies for developing RfDs are designed to protect sensitive populations (EPA 1997c), it is also evident that very young children may be more or less sensitive than adults, and in many cases their responses are substantially different from those exhibited by adults due to differences in pharmacokinetics, pharmacodynamics, body composition, and maturity of biochemical and physiological functions (EPA, 1997d). Therefore, for early childhood exposures (from birth to six years old), the chronic RfD was used even if the exposure duration was less than seven years. As a result, sub-chronic RfDs were only used for the construction worker scenarios.

Oral and dermal RfDs for COPCs are presented in Table 5.1 . RfCs and inhalation RfDs are presented in Table 5.2. RfDs for constituents considered in the risk assessment were obtained, whenever possible, from either EPA's *Integrated Risk Information System* (IRIS) or Health Effects Assessment Summary Tables (HEAST). Sub-chronic RfDs were obtained from HEAST. If there was no published subchronic toxicity value for a COPC, there was no quantitative assessment of subchronic risks conducted. Provisional toxicity data provided by EPA Region II from NCEA are shown in Tables 5.1 and 5.2.

5.1.2 Carcinogenic Effects

In contrast to non-carcinogenic effects, EPA typically assumes that there is no threshold for carcinogenic responses; that is, any dose of a carcinogen is considered to pose some finite risk of cancer. The evidence for human carcinogenicity of a chemical is derived from two sources: chronic studies with laboratory animals, and human epidemiological studies where an increased incidence of cancer is associated with exposure to the chemical. As with the non-cancer toxicity studies, the most sensitive laboratory species is generally used in cancer protocols.

Since risks at the low levels of exposure usually encountered by humans are difficult to quantify directly by either animal or epidemiological studies, mathematical models are used to extrapolate from high experimental to low environmental doses. The slope of the extrapolated dose-response curve is used to calculate the cancer slope factor (SF), which defines the incremental lifetime cancer risk per unit of carcinogen (in units of risk per mg/kg-day). The linearized multi-stage model for low-dose extrapolation most often used by EPA (EPA, 1986) is one of the most conservative available, and leads to an upper-bound estimate of risk (the upper 95% confidence limit on the modeled animal dose-response slope). The probability that the true risk is higher than that estimated is thus only 5%. Actual risk is likely to be lower, and could even be zero (EPA, 1986).

Each tested chemical is assigned a weight-of-evidence classification that expresses its potential for human carcinogenicity. The EPA's weight-of-evidence classification system is shown below:

EPA's Weight-of-Evidence Carcinogenicity Classification System

Group	Description
A	Human carcinogen
B1	Probable human carcinogen – limited human data are available
B2	Probable human carcinogen – sufficient evidence in animals and inadequate or no evidence in humans
C	Possible human carcinogen
D	Not classifiable as to human carcinogenicity
E	Evidence of non-carcinogenicity for humans

EPA recommends that the weight-of-evidence classification be presented for each potential carcinogen to indicate the strength of evidence that it may be a human carcinogen (EPA, 1986; EPA, 1989a). Tables 6.1 and 6.2 list the COPCs that are classified as A, B and C carcinogens, along with their classification.

Oral and dermal SFs for COPCs are presented in Table 6.1. URFs and inhalation SFs are shown in Table 6.2. SFs for constituents considered in the risk assessment were obtained, whenever possible, from either IRIS or HEAST. Where none were published in IRIS or HEAST USEPA Region II provided values from NCEA. These are shown in Tables 6.1 and 6.2.

For oral exposures, oral SFs were used. For dermal exposures, dermal SFs were developed based on oral SFs. For inhalation exposures, inhalation SFs were derived from inhalation unit risk factors (URFs) reported in ug/m^3. Tables 6.1 and 6.2 illustrate these conversions.

5.1.3 Oral to Dermal Extrapolation

No dermal RfDs or SFs are available for the COPCs. Most oral RfDs and SFs are expressed as an administered dose, whereas exposure estimates for the dermal route of exposure are expressed as absorbed doses. Therefore, it is necessary to adjust the oral RfDs and SFs from an administered dose to an absorbed dose (EPA, 1989a) in order to use them to assess dermal risks. Modification is accomplished by multiplying the oral RfD, or dividing the SF, by a chemical-specific gastrointestinal absorption efficiency ("oral to dermal adjustment factor").

Oral to dermal adjustment factors were obtained from EPA Region II (USEPA, 2000) and reflect USEPA's working draft of *Draft RAGS Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim Guidance* (not yet published) (Working Draft). Oral to dermal adjustment factors are listed in Tables 5.1 and 6.1. If no oral to dermal adjustment factor was given in the Working Draft a default value of 1.0 was used. Dermal absorption factors are listed in Table A 5-1 along with Kp values. Tables A 5-2 and A 5-3 present calculations of Kp's for those COPCs for which Kp values were not published in EPA's 1992 Dermal Guidance.

5.2 LEAD

EPA has deemed it inappropriate to develop either a RfD or SF for inorganic lead compounds. However, lead does present special risks to target populations and therefore is evaluated in the risk characterization section using alternate methodology.

The following summary of toxicological information for lead was obtained primarily from the Agency for Toxic Substances and Disease Registry's *Toxicological Profile for Lead* (ATSDR, 1993). A summary of toxicity data for lead is shown in Table A 5-4. Human exposure to lead occurs through a combination of inhalation and oral exposure, with inhalation generally contributing a greater proportion of the dose for occupationally exposed groups, and the oral route generally contributing a greater proportion of the dose for the general population. Lead is well absorbed when inhaled. Although gastrointestinal absorption is less efficient and more variable, significant amounts can enter the blood stream through the oral route, particularly in children. Dermal absorption of lead is minimal, except for organic lead compounds.

Lead is distributed primarily to the soft tissues, such as the liver, kidneys, lungs, brain, spleen, muscles, and heart. After several weeks much of the lead moves into the skeletal system and teeth. In adults, about 94% of the total amount of lead in the body is stored in the bones and teeth. In children, however, about 73% of the lead is stored in the bones while the remaining 27% is stored in soft tissues and blood.

The developing fetus is at particular risk from maternal lead exposure, which may cause premature birth, low birth weight and slowed postnatal neurobehavioral development. Young children (less than six years old) are also at risk from lead due to increased exposure due to mouthing activities, higher absorption, and greater sensitivity to lead's effects. Young children have immature detoxification enzyme systems, resulting in increased retention and body burdens of lead, and frequently have a greater prevalence of nutrient deficiency that may exacerbate some of the toxic effects of lead. Lead exposure in young children results in slowed cognitive development and reduced growth rate. Children have been documented to have lower blood thresholds for the hematological and neurological effects induced by lead exposure, and as result, these effects tend to be much more severe in children than adults.

In adults, lead exposure may result in effects on the blood, central nervous system (CNS), blood pressure, kidneys, and Vitamin D metabolism. Reproductive effects, such as decreased sperm count in men and spontaneous abortions in women, have also been associated with lead exposure. Human studies are inconclusive regarding lead exposure and cancer, while animal studies have seen an increase in kidney cancer from lead exposure by the oral route. EPA has classified lead as Group B2, probable human carcinogen.

The effects of lead are correlated with internal exposure as blood lead levels. For this reason, lead exposure and risk are often evaluated in terms of modeled blood lead levels in micrograms lead per deciliter blood (μg/dL). Blood lead levels as low as 30-70 μg/dL may be associated with hematological effects and changes in peripheral nerve function in adults. In children, blood lead levels of 15 μg/dL, and perhaps lower, may result in neurobehavioral effects on children. The U.S. Centers for Disease Control has determined that blood lead levels greater than 10 μg/dL should be considered elevated.

5.3 CHROMIUM AND CONTACT DERMATITIS

The following discussion was taken from "Baseline Risk Assessment Addendum, Liberty Industrial Finishing Site, Farmingdale, New York" (EPA Region II, 1995). A summary of chomium III toxicity is shown in Table A 5-4.

The potent skin allergenicity of chromium compounds has been well documented in the literature, and chromium compounds have been reported to be among the most frequent sensitizing agents in humans (Bagdon, 1991). Allergic contact dermatitis caused by chromium and other compounds can occur at extremely low doses in sensitized individuals. Chromium-induced contact dermatitis has been described as a 4-step cell-mediated immune response (Haines, 1988). In the first phase, chromium penetrates the skin and forms conjugates with epidermal proteins. The chromium hapten conjugate interacts with T-lymphocytes in the second (induction) phase. The T-lymphocytes are transformed into immunoblasts in the lymph nodes producing memory and effector cells. In the third (elicitation) phase, the effector cells are activated by a second chromium challenge, resulting in the release of a cascade of mediators that produce skin inflammation. The fourth (persistence) phase is characterized by continuing skin inflammation with recognition of the chromium conjugates by effector lymphocytes.

The induction and elicitation phases of the delayed hypersensitivity reaction are particularly of interest with regard to health impacts at the Site. The dose of chromium required for the induction phase is considerably greater than that required to elicit contact dermatitis in previously induced individuals (Kligman, 1966). The prevalence of individuals who have been induced for chromium hypersensitivity in the general population has been estimated as 1-2% (Peltonen, 1983). Given the low prevalence of sensitized individuals in the general population and the interest of the EPA in addressing the RME case in risk assessment efforts, induction of chromium sensitization has the most relevance to health risks at the Site.

Studies of Kligman (1966) suggest that the induction threshold for dermally applied chromium-VI salts is less than 20,000 ppm. This conclusion is based on the observation that all subjects exposed to 2% potassium dichromate (20,000 ppm chromium-VI salt) became sensitized to chromium (Kligman, 1966). Kligman (1966) also reported the induction of sensitivity in individuals dermally exposed to trivalent chromium salts. 57% of individuals exposed to chromium trioxide at a concentration of 30,000 ppm (3% chromium trioxide) and 48% of individuals exposed to chromium sulfate at a concentration 250,000 ppm (25% chromium sulfate) developed sensitivity. 30,000 ppm of chromium trioxide salt corresponds to 20,500 ppm of trivalent chromium, while 250,000-ppm chromium sulfate salt corresponds to 66,300 ppm trivalent chromium. Assuming that chromium-VI is present as 15% of total chromium at the Site, the results using trivalent chromium represents the lowest-observed-adverse-effect level (LOAEL) for the induction of contact dermatitis by trivalent and chromium-VI compounds. On the basis of these studies, the LOAEL for induction of sensitization to trivalent chromium in human subjects is between 20,500 ppm and 66,300 ppm, with a composite value of approximately 43,000-ppm.

It should be noted that a margin of safety is inherent in the above-referenced studies in that the chromium was applied to the skin in solution *via* a patch test, rather than in a soil matrix. Such a solution is likely to significantly increase the bioavailability of chromium applied to the skin. In the absence of studies that demonstrate a no-observed-adverse-effect level (NOAEL), RAGS recommends the use of a 10-fold safety factor to extrapolate from a LOAEL to a NOAEL (EPA 1989a). Application of a 10-fold safety factor to the chromium III data yields adjusted values of 2,050 and 6,630 for chromium trioxide and chromium sulfate, respectively. A composite value based on these compounds is approximately 4,300 ppm. This concentration of chromium III can be used as a comparison value to assess the potential for induction of chromium contact dermatitis following contact with impacted soils.

6. RISK CHARACTERIZATION

6.1 APPROACH TO RISK CHARACTERIZATION

The risk characterization provides a quantitative description of the magnitude of potential cancer and non-cancer risks associated with COPCs at the site. The risk characterization combines the results of the exposure assessment and toxicity assessment to provide numerical estimates of health risk for each exposure pathway for the RME exposure.

6.1.1 Cancer Risk

Cancer risk is expressed as a lifetime excess cancer risk above and beyond background cancer risks. This is the probability of an individual contracting cancer as a result of the estimated exposure to site-related COPCs. The cancer risk associated with the total lifetime average daily dose can be calculated from:

$$Cancer\ Risk = (LADD\ or\ DAD)\ x\ SF$$

where:

LADD = Lifetime average daily dose (mg/kg-day)
DAD = Dermally absorbed dose (mg/kg-day)
SF = Cancer slope factor $(\text{mg/kg-day})^{-1}$

Dames & Moore calculated the potential risks to the receptors within the exposure areas based on calculated LADDs or DADs. Spreadsheets showing the calculation of risks are included in Appendix F.

6.1.2 Non-cancer Hazard

The potential for chronic non-carcinogenic health effects can be evaluated by comparing the estimated intake of a chemical to its RfD. As described in Section 5.1.1, RfDs are average daily doses that are not expected to produce adverse effects. The ratio of the estimated intake for a COPC to its RfD is called a HQ, and is calculated as follows:

$$Hazard\ Quotient = \frac{ADD\ or\ DAD}{RfD}$$

where:

ADD = Average daily dose (mg/kg-day)

DAD = Dermally absorbed dose (mg/kg-day)
RfD = Reference dose (mg/kg-day)

If the estimated daily intake for any single COPC is greater than its RfD, the HQ will exceed unity. The sum of all HQs across an exposure route or exposure pathway is called a hazard index (HI). Spreadsheets showing the calculation of HQs and HIs are included in Appendix F.

6.1.3 Acceptable Cancer Risks and Hazard Indices

Under the NCP, excess cancer risk values of one in ten thousand (1×10^{-4}) to one in one million (1×10^{-6}) represent acceptable levels of cancer risk for exposure to environmental constituents, depending on site-specific factors such as the potential for exposure, technical limitations to remediation and data uncertainties. These risk levels represent the probability, within an infinite population, that one individual out of ten thousand or one million persons will develop cancer from exposure to a particular chemical over and above the background cancer rate. The NCP designates an excess cancer risk of 1×10^{-6} as a "point of departure" for establishing remedial goals and that estimates lower than 1×10^{-6} are not usually of regulatory concern. An April 1991 OSWER directive (9355.0-30) further clarified the acceptable risk range by stating that when reasonable maximum exposures for both current and future land use result in cancer risks less than 1×10^{-4}, action is generally not warranted.

The hazard indices are not mathematical predictions of incidence of effects or severity of those effects, but rather an indication of whether there is a potential for non-carcinogenic health effects under the defined exposure conditions. However, the degree to which the HI exceeds unity does provide some measure of the likelihood of an adverse effect. For instance a HI of 100 would suggest a greater concern than a HI of 5. A HI, developed by summing all relevant exposure pathways, exceeding 1.0 is evaluated further by summing HQs for each COPC associated with the same toxic effect endpoint or target organ. The HI for each target organ should not exceed 1.0.

6.1.4 Alternate Approaches

Two special cases are evaluated in this Section: 1) the effects of exposure to lead in site media; and 2) contact dermatitis caused by dermal exposure to chromium. These cases are discussed in Sections 6.5 and 6.6, respectively.

6.2 CANCER RISKS AND HAZARD INDICES BY RECEPTOR

The cancer risks and hazard indices for each medium within each exposure area are detailed in Tables 9.1 through 9.15.

6.2.1 Western Parcel

Risks and hazards for the western parcel are shown in Tables 9.1 through 9.4.

6.2.1.1 Current Trespasser

Total risks for trespassers are shown in Tables 9.1 RME and 9.1 CTE. Total HIs for this receptor across all media and exposure points were 0.4 for RME and 0.2 for CTE. Total cancer risks across all media and all exposure routes were 2.1×10^{-6} for RME and 9.9×10^{-7} for CTE.

6.2.1.2 Future Commercial/Industrial Worker

Total risks for future commercial/industrial worker are shown in Tables 9.2 RME and 9.2 CTE. Total HIs for this receptor across all media and exposure points were 12 for RME and 12 for CTE. Total cancer risks across all media and all exposure routes were 7.9×10^{-5} for RME and 2×10^{-5} for CTE.

6.2.1.3 Future Construction Worker

Total risks for future construction worker are shown in Tables 9.3 RME and 9.3 CTE. Total HIs for this receptor across all media and exposure points were 0.5 for RME and 0.16 for CTE. Total cancer risks across all media and all exposure routes were 6.4×10^{-7} for RME and 1.6×10^{-7} for CTE.

6.2.1.4 Future Recreational Adult

Total risks for future recreational adult are shown in Tables 9.4 RME and 9.4 CTE. Total HIs for this receptor across all media and exposure points were 0.12 for RME and 0.09 for CTE. Total cancer risks across all media and all exposure routes were 1.6×10^{-6} for RME and 6.0×10^{-7} for CTE.

6.2.2 Eastern Parcel

Risks and hazards for the eastern parcel are shown in Tables 9.5 through 9.8.

6.2.2.1 Current Adolescent Trespasser

Total risks for current adolescent trespasser are shown in Tables 9.5 RME and 9.5 CTE. Total HIs for this receptor across all media and exposure points were 0.0004 for RME and 0.00006 for CTE. Total cancer risks across all media and all exposure routes were $3.4x10^{-19}$ for RME and $1.1x10^{-19}$ for CTE.

6.2.2.2 Current Commercial Worker

Total risks for current commercial worker are shown in Tables 9.6 RME and 9.6 CTE. Total HIs for this receptor across all media and exposure points were 0.0001 for RME and 0.00008 for CTE. There were no carcinogens identified as COPCs for this receptor.

6.2.2.3 Future Commercial Worker

Total risks for future commercial worker are shown in Tables 9.7 RME and 9.7 CTE. Total HIs for this receptor across all media and exposure points were 0.5 for RME and 0.3 for CTE. Total cancer risks across all media and all exposure routes were $3.8x10^{-6}$ for RME and $5.0x10^{-7}$ for CTE.

6.2.2.4 Future Construction Worker

Total risks for future construction worker are shown in Tables 9.8 RME and 9.8 CTE. Total HIs for this receptor across all media and exposure points were 34 for RME and 33 for CTE. Total cancer risks across all media and all exposure routes were $1.0x10^{-3}$ for RME and $1.0x10^{-3}$ for CTE. These risks are due primarily to exposures to liquid wastes and solid wastes. Total HI across the soil pathways is 0.07 for RME. Cancer risks across the soil pathways is 4.6×10^{-7} for RME.

6.2.3 Off-site Residential Areas

Risks and hazards for the off-site residential areas are shown in Table 9.9 through 9.15.

6.2.3.1 Current Resident Adult and Child (Upper Glacial)

Total risks for current off-site residents (Upper Glacial) are shown in Tables 9.9 RME and 9.9 CTE. Total HIs for resident child across all media and exposure points were 98 for RME and 46 for CTE. Total HIs for resident adult were 27 for RME and 18 for CTE. Total cancer risks across all media and all exposure routes were 2.5×10^{-3} for RME and $1.1x10^{-3}$ for CTE. These risks are primarily resulting from residential ingestion of groundwater. Risks are driven by cadmium, manganese, and vinyl chloride. Individual target organ HIs exceed 1.0 for liver and kidney.

6.2.3.2 Future Resident Adult and Child (Magothy)

Total risks for future off-site residents (Magothy) are shown in Tables 9.10 RME and 9.10 CTE. Total HIs for the resident child across all media and exposure points were 9.7 for RME and 3.6 for CTE. Total HI for residential adults were 2.2 for RME and 1.4 for CTE. Total cancer risks across all media and all exposure routes were 4.9×10^{-4} for RME and 1.2×10^{-4} for CTE. These risks were driven by chromium, manganese, and trichloroethene. Individual target organ HIs exceed 1.0 for blood and CNS.

6.2.3.3 Current School Child

Total risks for current off-site school child are shown in Tables 9.11 RME and 9.11 CTE. Total HIs for this receptor across all media and exposure points were 0.0004 for RME and 0.0003 for CTE. Total cancer risks across all media and all exposure routes were 5.1×10^{-6} for RME and 3.6×10^{-6} for CTE.

6.2.3.4 Current School Employee

Total risks for current off-site school employee are shown in Tables 9.12 RME and 9.12 CTE. Total HIs for this receptor across all media and exposure points were 0.0004 for RME and 0.0004 for CTE. Total cancer risks across all media and all exposure routes were 2.0×10^{-5} for RME and 5.4×10^{-6} for CTE.

6.2.4 Massapequa Preserve

Risks and hazards for Massapequa Preserve are shown in Tables 9.13.

6.2.4.1 Current Swimmer

Total risks for current off-site swimmer at the Massapequa Preserve are shown in Tables 9.13 RME and 9.13 CTE. Total HIs for this receptor across all media and exposure points were 0.09 for RME and 0.09 for CTE. Total cancer risks across all media and all exposure routes were 1.3×10^{-7} for RME and 1.2×10^{-7} for CTE.

6.2.4.2 Current Fisher

Total risks for current off-site fisher at the Massapequa Preserve are shown in Tables 9.14 RME and 9.14 CTE. Total HIs for the residential child across all media and exposure points were 1.1 for RME and 0.31 for CTE. However, there were no H1s for individual target organs which exceeded 1.0. Total HIs for resident adult were 0.7 under RME and 0.13 under CTE.

6.2.5 Ellsworth Allen Park

Risks for Ellsworth Allen Park are shown in Table 9.15.

6.2.5.1 Future Resident (Adult and Child)

Total risks for future residents at Ellsworth Allen Park are shown in Tables 9.15 RME and 9.15 CTE. Total HIs for this receptor across all media and exposure points were 0.001 for RME and 0.0003 for CTE. Total cancer risks across all media and all exposure routes were 1.2×10^{-9} for RME and 3.9×10^{-10} for CTE.

6.3 RECEPTORS EXCEEDING CANCER RISK OF 1 X 10^{-6} OR HAZARD INDEX OF 1.0

Because the NCP establishes an excess cancer risk of 1×10^{-6} as a "point of departure" for establishing remedial goals, this section details those cumulative cancer risks which exceed 1×10^{-6}. These are shown in Tables 10.1 through 10.14. However, it should be noted that EPA policy indicates when reasonable maximum exposures for both current and future land use result in cancer risks less than 1×10^{-4}, action is generally not warranted (OSWER Directive 9355.0-30). This section and Table 10.1 through 10.14 also detail cumulative non-cancer hazard indices exceeding 1.0, and Tables 10.s provide a target organ analysis for those exceedances.

6.3.1 Western Parcel

Tables 10.1 through 10.4 show only those individual COPC risks where the cumulative cancer risks for a receptor in the western parcel exceed 1×10^{-6} or HI of 1.0. The receptors whose cumulative cancer risks exceed the point of departure are current trespasser (1.6×10^{-6}, Table 10.1RME) and future commercial/industrial worker (7.7×10^{-5}, Table 10.2RME). However, the cumulative risks for each of these receptors are still within the acceptable risk range of 1×10^{-4} to 1×10^{-6}.

The only receptor whose cumulative HI exceeds the point of departure is the future commercial/industrial worker. The HI for this receptor equals 8.9 (Table 10.2RME). This is driven by risks from ingestion of groundwater from the Upper Glacial Aquifer. Target organ HIs exceed 1.0 for kidney effects and are driven by cadmium.

6.3.2 Eastern Parcel

Tables 10.5 through 10.8 show only those individual COPC risks where the cumulative cancer risks for a receptor exceed 1×10^{-6} or an HI of 1.0. The receptors whose cumulative cancer risks exceed the point of departure are the future commercial/industrial worker (2.3×10^{-6}, Table 10.7RME) and the future construction worker (1.0×10^{-3}, Table 10.8RME). The cumulative risk for the future commercial/industrial worker is within the acceptable risk range of 1×10^{-4} to 1×10^{-6}. The risk for the construction worker is greater than the upper boundary of the acceptable cancer risks. This risk level is driven by exposure to liquid wastes in the eastern parcel.

The only receptor whose cumulative HI exceeds 1.0 is the future construction worker (31, Table 10.8RME). The only target organ HIs exceeding 1.0 were immune system and growth which were driven by Aroclor 1260 in liquid waste.

6.3.3 Off-site Residential Areas

Tables 10.9 through 10.12 shows only those individual COPC risks where the cumulative cancer risks for a receptor exceed 1×10^{-6} or HI of 1.0. The receptors whose cumulative risk exceeds the point of departure are the current off-site resident (Table 10.9RME), current school child (Table 10.11), current school employee (Table 10.12) and future off-site resident (Table 10.10RME). The current off-site resident cumulative risk is 3.0×10^{-3}, which is driven by ingestion of Upper Glacial groundwater. The primary contributor to these risks is vinyl chloride (1.7×10^{-3}). The current school child cumulative cancer risk is 4.8×10^{-6} (Table 10.11RME), which is driven by inhalation of groundwater. This is within the acceptable risk range. The current school employee cumulative cancer risk is 2.0×10^{-5} (Table 10.12RME), which is driven by inhalation of groundwater and is within the acceptable risk range. The future off-site resident cumulative risk is 4.9×10^{-4} (Table 10.10RME). This is driven by ingestion of Magothy groundwater. The primary contributor to these risks is trichloroethene.

The receptors whose cumulative HIs exceed 1.0 is the current off-site resident(Upper Glacial Aquifer), whose HI is 95 for the child resident and 26 for the adult resident (Table 10.9RME), and future off-site resident (Magothy Aquifer, 7.3 for child, Table 10.10RME). These risks are all attributable to ingestion of groundwater. Target organ HIs for the Upper Glacial Aquifer exceed 1.0 for kidney, driven by cadmium, CNS, driven by manganese, and liver, driven by vinyl chloride. Target organ HIs exceed 1.0 for the Magothy Aquifer for CNS driven by manganese.

6.3.4 Massapequa Preserve

Tables 10.13RME and 10.14RME show only those individual COPC risks where the cumulative cancer risks for a receptor exceed 1 x 10^{-6} or HI of 1.0. Cancer risks and hazard indices do not exceed point of departure levels for the swimmer. The child fisher (Table 10.14RME) has a cumulative HI that exceeds 1.0. However, there were no individual target organs with HIs that exceeded 1.0.

6.3.5 Ellsworth Allen Park

Table 10.15RME shows that none of the cancer risks or hazard indices exceed point of departure levels.

6.4 RISK CHARACTERIZATION OF LEAD

EPA has not established a RfD or a RfC for lead, and therefore cancer and non-cancer risks for lead can not be quantified. However, lead does present special risks to target populations. Alternate approaches are necessary to evaluate the risk associated with lead at the site. All spreadsheets used for this section are included in Appendix H.

Site EPCs of lead can be screened by comparing with standardized criteria for soil, air, and drinking water. EPA's recommended screening level for soil at residential sites in OSWER Directive 9355.4-12 (EPA, 1994b) is 400 mg/kg. This screening level was developed using the IEUBK (EPA, 1994a) and is intended to assure that a typical child less than seven years old exposed to lead would have a risk of no more than 5% of exceeding a blood lead level of 10 µg/dl. IEUBK predicts blood lead levels given exposure to lead through soil, dust, water, air, and food. Because soil, solid waste, and sediment exposures at the Site are non-residential, this screening level is useful only as a preliminary tool for screening out those media which have EPC concentrations that pose little or no risk.

EPA has also developed an approach for assessing risks associated with adult, non-residential, exposures to lead in soil (EPA, 1996b). This approach focuses on estimating fetal blood lead levels in pregnant women exposed to lead impacted soils. While this approach can be used for the commercial/industrial worker scenarios, it may not be appropriate in its default form for evaluation of the construction worker, trespasser and recreational user scenarios[1]. Using this model with all default inputs, the screening level for lead in soil at commercial and industrial sites is 778 mg/kg to 1,354 mg/kg (see Appendix H). The lower end of this range can be used as a tool for screening out those media which pose little or no risk to commercial/industrial workers (EPA, 1999a).

The National Ambient Air Quality Standard for lead is 1.5 μg/m^3 (40 CRF 50.12). Modeled site air concentrations can be compared with the NAAQS to determine if the inhalation pathway at the site may be of concern.

Table A 6-1 lists the EPCs and compares these concentrations with conservative residential or lifetime exposure criteria. For non-adult and construction worker oral exposure pathways, EPCs are compared with the recommended residential cleanup criteria of 400 mg/kg (USEPA, 1994b). For commercial/industrial oral exposure pathways, EPCs are compared with the default screening level of 778 mg/kg. For inhalation, the modeled air concentrations are compared with the National Ambient Air Quality Standard for lead.

As illustrated in Table A 6-1, none of the commercial/industrial worker, trespasser, recreational user or residential scenarios exceed the appropriate screening levels. For the construction worker, only the EPC for solid waste in features exceeds the screening level. There is no screening level for fish tissue that can be used to evaluate fish tissue concentrations. Therefore, lead risks are further evaluated for solid waste and fish only. These analyses are discussed further below.

6.4.1 Solid Waste in Features

The EPC for solid waste in features is greater than the residential screening level at 692 mg/kg. However, the only reasonably foreseeable exposure to this material is by a future construction worker. The adult lead model was used to develop a receptor-specific screening level for the construction worker scenario, based on soil ingestion. The equation used in this model is:

$$PRG = \frac{\left(\frac{AT \times PbB_{fetal,0.95}}{R \times GSD_i} - AT \times PbB_0\right)}{BKSF \times IR_s \times AF_s \times EF_s}$$

[1] The adult lead model can be used to evaluate risks to alternate receptors provided certain default parameters are adjusted.

where:

$PbB_{fetal,\,0.95}$ = 95th percentile blood lead level in fetus = 10 μg/dl (default)
R = Fetal/maternal blood lead level ratio = 0.9 (default)
GSD_i = Geometric standard deviation blood lead level = 2.0 (estimated based on demographics)
PbB_0 = Baseline blood lead level = 2.0 μg/dl (default)
AT = Averaging time = 182 days/year (6 month period of construction)
BKSF = Biokinetic slope factor = 0.4 μg/dl per μg/day (default)
IR_s = Soil ingestion rate = 0.100 g/day (average construction worker ingestion rate)
AF_s = Absorption fraction = 0.12 (default)
EF_s = Exposure frequency = 125 days/year (construction worker exposure frequency)

The GSDi was selected to be 2.0, which is within the recommended range of 1.8 to 2.1, and is based on the 1990 census data which indicates that the population of Nassau County is slightly less heterogeneous than the U.S. population with respect to racial factors.

The averaging time is six months. Construction workers are assumed to work five days per week over a period of six months (125 days over a 182 day period). According to the Technical Review Workgroup for Lead, "if exposures are expected to occur over a shorter time interval [than 365 days], then EF should not be prorated over the entire year" (EPA, 1999a). Instead the actual exposure period is used as the averaging time.

For this analysis of lead risk, a construction soil ingestion rate of 100 mg/day was used. While this is less than the ingestion rate used in the dose calculations for other COPCs, it is the recommended ingestion rate for lead analysis: OSWER guidance recommends an upper-bound value of 480 mg/day, however "given more recent soil adherence data and the fact that central tendency values should be used as inputs to the adult lead model, a plausible range for the ingestion rate is 50-200 mg/kg. An appropriate default value for contact intensive scenarios is 100 mg/kg" (EPA, 1999a).

The construction worker soil screening level (Appendix H) based on this equation is 471 mg/kg (Table A 6-2). This screening level is designed to protect the fetus of a pregnant worker. The EPC for solid waste exceeds the construction worker screening level (Table A 6-2). However, the soil ingestion rate and exposure frequency used in the calculation of the screening level for soil is likely to be significantly over-conservative when applied to solid waste because contact with solid waste in features is likely to be of short duration (*i.e.*, contact would only occur during removal of a feature). In addition, there is a low likelihood of a construction worker removing features being a pregnant female. Recalculation of the model based on a target blood lead level of 10 μg/dl in the construction worker (benchmark for hypertension in adults), and a baseline blood lead level of 2.6 μg/dl (NHANES III geometric mean for ages 20-49 [Brody, 1994]), results in a screening level of 2,245 mg/kg (Table A 6-2 and Appendix H).

Worker protection can be used to significantly reduce exposure during construction activities involving features. Precautions against exposure can include gloves, washing facilities, and dust suppression techniques.

6.4.2 Fish in Massapequa Preserve

Although it is believed that lead is not a site-related constituent (Dames & Moore, 1999), levels of lead in fish are evaluated in this section.

The EPC (average concentration) for lead in fish tissue is 0.8 mg/kg. Fish tissue lead concentrations may be compared with typical lead concentrations in edible fish. While this approach does not address the health concerns of lead at the site, it does indicate whether exposures through site fish may be elevated above typical U.S. exposures through fish ingestion. The typical lead concentrations reported in fish and seafood are 0.2-2.5 mg/kg (IARC, 1980). In addition, as part of the National Contaminant Biomonitoring Program, freshwater fish were collected from 112 stations located throughout the U.S. The geometric mean lead concentration in 1978-79 was 0.19 mg/kg with a range of 0.10-6.73 mg/kg, and for 1980-81 was 0.17 mg/kg with a range of 0.10-1.94 mg/kg (Lowe, 1985). Massapequa fish concentrations are within the typical range measured between 1978 and 1981.

The site-specific level of lead present in fish in Massapequa Preserve is not expected to have a significant impact on blood lead levels of adults or child, as discussed below.

6.4.2.1 Child Fisher

The IEUBK was used to evaluate the impact of fish ingestion on a typical child's blood lead level. IEUBK predicts blood lead levels given exposure to lead through soil, dust, water, air, and food. Because actual (site-specific) lead concentrations in drinking water, residential soil, and air were unknown, the model was run first in the default mode to determine a typical blood lead level using default inputs. The model was then run with the addition of an alternate dietary source of lead (site-specific concentrations of lead in fish tissue). This approach was supported by an example provided to the risk assessor by the Technical Review Workgroup for Lead, which uses IEUBK for less than full-time exposures. Model inputs are shown in Appendix H.

Recreational fish ingestion was set at the recommended average value of 10% of all meat (EPA, 1994a), with a lead concentration of 0.8 mg/kg (the EPC for fish). Table A 6-3 shows a comparison of blood lead levels using default values and with the addition of site-specific recreational fish lead concentrations. Blood lead levels, assuming Massapequa Preserve fish ingestion, remain below the acceptable 10 μg/dl level throughout the age range evaluated (0-7 years old), and peak at 5.6 μg/dl at the 1-2 year age interval. The 1-2 year old and 2-3 year old age groups have "peak" geometric mean blood lead levels below 10 μg/dl. Based on probability density plots of these age groups, 8 to 10 percent of the child population have blood lead levels greater than the 10 μg/dl threshold. It should be noted that the assumption that a 0-7 year old eats 10% of his meat as recreational fish may be very conservative, given the typical diet of a young child. In addition, should the actual residential exposure to lead in soil, air and other media be significantly different from the defaults used in the model, the risk of exceeding 10 μg/dl blood lead levels due to fish ingestion may be higher or lower than estimated in this screening level assessment.

6.4.2.2 Adult Fisher

According to EPA (1999a), the adult lead model can be modified to evaluate fish ingestion. The equation for fish ingestion is:

$$PbB_{adult,\,central} = PbB_{adult,0} + \frac{BKSF \times PbF \times IF_F \times AF_F \times EF}{AT}$$

where:

$PbB_{adult,central}$ = Central estimate of blood lead concentration in adults (μg/dl)
$PbB_{adult,0}$ = Baseline blood lead level = 2.0 μg/dl (default)
BKSF = Biokinetic Slope Factor = 0.4 μg/dL per μg/day (default)
PbF = Fish lead concentration = 0.8 μg/g (EPC)
IF_F = Intake rate of fish = 6 g/day (average intake rate)
AF_F = Absolute gastrointestinal absorption fraction for ingested lead in fish = 0.10 (conservative estimate)
EF = Exposure frequency = 365 days/year (IF is averaged over a year)
AT = Averaging time = 365 days/year

Since fish are likely to be eaten at mealtime, the bioavailability of lead in the fish would probably be in the 3-10% range based on empirical data on lead absorption with meals in adults

(EPA, 1999a). 10% is used as a conservative estimate. The fish lead concentration is the EPC of 0.8 µg/g (average lead concentration). The estimated intake rate of fish is 6 g/day, which is the average intake rate for freshwater anglers in Table 1-2 of the *Exposure Factors Handbook* (EPA, 1997a).

Based on this equation, the central estimate of adult blood lead levels would increase from 2.0 (baseline blood level) to 2.19 µg/dl due to ingestion of Massapequa Preserve fish. This blood lead level in a pregnant woman would result in a blood lead level in the fetus of 6.2 µg/dl, estimated as follows:

$$PbB_{fetal,0.95} = PbB_{adultcentr\ al}\ x\ GSD_{i,adult}^{1.645}\ x\ R_{fetal/maternal}$$

where:

$PbB_{fetal,0.95}$ = 95th percentile blood lead level in a fetus (µg/dl)
$PbB_{adult,central}$ = Central estimate of blood lead concentration in adults = 2.19 µg/dl
$GSD_{i,adult}^{1.645}$ = GSD_i = Geometric standard deviation blood lead level = 2.0 (estimated based on demographics)
$R_{fetal/maternal}$ = Constant of proportionality between fetal blood lead concentration at birth and maternal blood lead concentration = 0.9 (default)

Based on this screening level analysis, ingestion of Massapequa Preserve fish in adults should have an insignificant impact on blood lead levels in the adult or developing fetus.

6.4.3 Conclusions of Lead Analysis

Lead in site-related media does not appear to present a hazard to commercial/industrial workers, trespassers, recreational users, or swimmers. Lead in solid waste at the Site exceeds the residential screening level and the site-specific soil lead objective. Construction workers could be at risk handling solid waste in on-site features; however, precautions against exposure during construction or removal activities can significantly reduce this risk. Lead in fish does not appear to present a hazard to fishers based on blood lead modeling conducted with the adult lead model or the IEUBK model.

6.5 CHROMIUM AND CONTACT DERMATITIS

As discussed in Section 5.3, chromium is a skin allergen that can cause allergic contact dermatitis. A NOAEL for chromium III contact dermatitis is approximately 4,300 ppm. This concentration of chromium III can be used as a comparison value to assess the potential for induction of chromium contact dermatitis following contact with impacted soils. At the Site, the highest RME EPC for chromium III is 1,610 mg/kg in the western parcel surface soil. This concentration is below the NOAEL, indicating that chromium in site soil is not likely to cause contact dermatitis in receptors.

Although the EPCs are below the NOAEL, it should be noted that significant exposure to areas at the Site that exceed the EPC and NOAEL could result in an increased risk of contact dermatitis. In order to determine whether there are extensive areas with concentrations exceeding the NOAEL, the percent of samples exceeding the NOAEL was determined for each solid exposure medium. This information is summarized below and in Table A 6-4.

- Surface soil in the western parcel has 3%, or two samples, exceeding 4,300 mg/kg. These samples are located in the northwest disposal area (B-07-01) and in the southern portion of the disposal basins (TP-54E).

- Surface and subsurface soil in the western parcel has 2%, or six samples, exceeding 4,300 mg/kg. These samples are located in or near the disposal basins (SB-2, TP-50, TP-51C, TP-54E, TP-55A), northwest disposal area (SB-41, B-07-02), and the ramp excavation pile on the Building N foundation.

- Surface and subsurface soil in the eastern parcel has 1%, or one sample, exceeding 4,300 mg/kg. This sample is located in the Building B basement (TP-69).

These isolated locations should be considered a potential hazard to receptors who may have direct contact with the soil. Any future plans for the site should incorporate exposure controls or spot removal of the soil in these areas.

7. UNCERTAINTY ANALYSIS

The BHHRA was conducted in accordance with EPA guidance. However, like all modeling efforts, its results rely on a set of assumptions and estimates with varying degrees of certainty and variability. Major sources of uncertainty in risk assessment include:

- Natural variability (*e.g.*, differences in body weight in a population);
- Lack of knowledge about basic physical, chemical, and biological properties and processes (*e.g.*, the affinity of a chemical for soil);
- Assumptions in the models used to estimate key inputs (*e.g.*, dose-response models); and
- Measurement error.

Perhaps the greatest single source of uncertainty in risk assessments is the COPCs' dose-response relationships, particularly cancer SFs. Additional uncertainty may also be associated with analytical data, which are subject to both systematic error (bias) and random error (imprecision). Other major sources of uncertainty include computation of representative concentrations using statistical analysis and/or conservative fate and transport assumptions, and estimation of dose rate *via* default exposure assumptions. These and other sources of uncertainty and their anticipated effect in estimated risks associated with the Site are discussed in the following sections.

7.1 UNCERTAINTIES IN DATA ANALYSIS

Most of the soil samples collected for this site are biased samples taken at suspected impacted locations and "hot spots". Biased sampling tends to result in an estimated EPC greater than the actual average concentration over the site. Grid samples collected in the western parcel and the western portion of the eastern parcel contribute unbiased samples to the data sets. However, especially for the eastern parcel, which has large, and presumably non-impacted and unsampled areas, the overall data set is biased towards impacted sample locations, potentially resulting in an overestimation of risk.

It has been assumed for the BHHRA that constituents detected in soil, groundwater, surface water and sediment are related to operations at the Site. However, this assumption may not always be valid. For example, lead detected in sediment and fish may be related to numerous point-source discharges from the urban development surrounding Massapequa Preserve instead of originating from the Site (Dames & Moore, 2000). Including non-site-related constituents as COPCs may overestimate the risks associated with the Site.

The inherent variability in laboratory analysis results in uncertainties in the sample analytical results. Rigorous QA/QC procedures help to clarify these uncertainties by qualifying data. For this BHHRA, data qualified as rejected was removed from the data set. This may result in an underestimation of EPCs if the rejected samples actually contained COPCs. Treatment of other qualifiers as well could impact the risk results.

Risks and hazards were evaluated separately for chromium III and chromium VI. While some samples had analytical data for both total chromium and chromium VI, others did not. In these cases, the distribution of chromium III and chromium VI was estimated based on typical ratios. This estimation may result in either an over- or underestimation of risk.

Many detection limits were elevated in site samples. If a constituent was listed as undetected at an elevated detection limit, two uncertainties result: 1) the constituent may be eliminated as a COPC if there are no positive detections in the media, even if the detection limit was elevated and 2) for COPCs, the constituent is assumed to be present in the sample at ½ the detection limit for calculating EPCs. In the first case, the risks may be underestimated. In the second case, the risks may be overestimated if the COPC is present at concentrations far less than ½ the elevated detection limit, or underestimated if the actual concentrations were closer to the detection limit.

The selection of COPCs was accomplished, in part, by comparing sample results with background concentrations. For the Site, it was determined that no appropriate background soil samples were available. Comparison with site-specific background samples instead of regional background concentrations can reduce uncertainty.

7.2 UNCERTAINTIES IN EXPOSURE ASSESSMENT

Use of the RME scenario includes assumptions regarding the types of exposure that may occur, the frequency and duration of those exposures, and the concentrations of COPCs at the points of exposure. These are meant to be conservative exposure assumptions and, as such, are intended to provide a conservative estimate of intake, more likely to overestimate than to underestimate potential exposure and risk.

The exposure assessment evaluated potential exposure pathways to determine which are or could potentially be complete. Every effort was made to identify those pathways most likely to be complete given the anticipated future use of the Site. Some potential pathways or receptors could have been omitted; however, it is believed that the receptors selected for assessment were the maximally exposed receptors and the pathways selected were the pathways of potentially highest exposure. Any other receptors or pathways that were omitted are likely to have a lower risk than the pathways evaluated in the BHHRA.

There is considerable uncertainty associated with the fish ingestion rates utilized in this BHHRA. For the adult fisher (Section 6.5.5.2), the fish ingestion rate is 32 g/day, which is the 90th percentile value for adult recreational fishers in New York State. This ingestion rate is associated with 51 one-half pound meals per year (EPA, 1997a). The evaluation of the fish ingestion pathway for the child fisher (Section 6.5.5.1) is an adjustment to the adult fisher ingestion rate. The child fish ingestion rate is estimated at 11 g/day. These values for fish ingestion rates are used at the specific request of the EPA Region I Toxicologist, (personal communication) and are overly conservative. The USEPA has published national guidance which recommends the use of 6.6 g/day for the general population, and 8 g/day (50th percentile) for freshwater anglers. The USEPA 95th percentile value published for freshwater anglers is 25 g/day for adults (USEPA, 1997). The value used in this document exceeds this 95th percentile value. Furthermore, the Massapequa Preserve cannot support this level of fish consumption for the local population. Therefore, the fish ingestion rates utilized herein are overly conservative and overestimate actual risks for fish ingestion at the site.

The exposure assessment assumes that the specified receptor is exposed equally to the entire site or exposure medium. This is why a confidence limit on the mean concentration is used to represent EPCs. However, a receptor may actually be exposed to only a small portion of the media in question. For example, a future commercial/industrial worker may never leave the confines of his work building, and therefore may only be exposed to the soil in the immediate vicinity of that building. This receptor's actual EPC could be lower or higher than the BHHRA EPC depending on whether the building is located on a relatively unimpacted area such as the eastern portion of the eastern parcel, or a relatively impacted area such as the location of the former disposal basins, Building B, or Northwest Disposal Area.

When an insufficient number of samples were available to calculate a statistically derived 95% UCL concentration, the maximum detected concentration was used as the EPC. Use of the maximum concentration to represent an entire medium and exposure area may overestimate the actual average EPC. In addition, for data sets that did not fit either normal or log-normal distribution models, a log-normal distribution was assumed. This assumption is likely to result in an overestimation of EPCs if the distribution is in fact normal.

Use of a statistically derived EPC to estimate intakes over time also does not take into account the environmental fate and potential attenuation of COPC concentrations over the exposure period. Not considering the environmental fate of COPCs over time could lead to an overestimation of risks if concentrations decrease, or an underestimation of risk if more toxic degradation products are generated.

When one sample contains significantly higher COPC concentrations than the rest of the samples, the EPC will be skewed high. These unusually high sample results may be due to sampling methodology or heterogeneity in chemical concentrations, or may simply be statistical outliers. For example, the high concentrations measured in SF-AQ-33 significantly elevated the EPCs for liquid wastes. Because this sample was highly turbid, the analytical results may not be representative of the liquid waste but rather the suspended sediment. If this sample were removed from the data set, associated risks and hazards for liquid wastes may be significantly lower.

Significant uncertainty can be introduced when fate and transport modeling is required to estimate EPCs. Conservative air emissions models were used to estimate EPCs. Appendix D discusses the key assumptions inherent in each of these models. The air emissions models assume uniform concentrations of COPCs in the site media and do not consider attenuation effects such as biodegradation over time. These assumptions result in an overestimation of the average air concentrations over time. In addition, assumptions about soil characteristics, chemical characteristics, building characteristics, and meteorological conditions all add to the uncertainty of estimating air EPCs.

7.3 UNCERTAINTIES IN TOXICITY ASSESSMENT

Sources of uncertainty in the toxicity assessment include using the dose response information from:

- Effects observed at high doses to predict the adverse health effects that may occur following exposure to the low levels expected from human contact with the chemical in the environment;
- Short-term exposure studies to predict the effects of long-term exposures, and vice-versa;
- Animal studies to predict effects in humans; and
- Homogeneous animal populations or healthy human populations to predict the effects likely to be observed in the general population consisting of individuals with a wide range of sensitivities.

The use of toxicity criteria intentionally designed to be conservative is likely to overestimate the COPCs' toxic potency. For example, the extrapolation of animal carcinogen bioassay results to human risk at much lower levels of exposure involves a number of assumptions regarding effect threshold, interspecific extrapolation, high- to low-dose extrapolation, and route-to-route extrapolation. The scientific validity of these assumptions is uncertain; because each of the individual extrapolations are designed to prevent underestimation of risk, in concert they result in unquantifiable but potentially very significant overestimation of risk. Specifically, the extrapolation of cancer potency from laboratory animals to humans, which forms the basis for the cancer risk estimates, may be associated with uncertainties ranging from as much as three to five orders of magnitude (1,000 to 100,000-fold) for selected chemicals.

In cases where no subchronic toxicity values are published by USEPA, subchronic risks were not quantified. This may result in underestimation of subchronic risks at the site.

The extrapolation of oral SFs or RfDs to derive dermal toxicity criteria introduces uncertainty due to the variability and uncertainty in absorption through the gastrointestinal tract. The use of default gastrointestinal absorption factors where experimental values were not available may have resulted in either under- or overestimation of risk through the dermal route.

In cases where no dermal absorption factors are published by USEPA, dermal risks were not quantified. This may result in underestimation of dermal risks.

There were several COPCs for which toxicity data are not available for one or more routes of exposure or for subchronic exposures. In these cases, risks were not quantified for exposures to these COPCs by these pathways. Although this may result in an underestimation of risks it is unlikely to have a substantive impact on the conclusions drawn from the BHHRA. There are many conservative assumptions made in the toxicity assessment and exposure assessment which are intended to be protective of the population. There were no toxicity values available for di-n-octylphthalate or endrin aldehyde, therefore risks were not quantified for these COPCs. However, di-n-octylphthalate was selected as a COPC in solid waste only. When the RME EPC (443 mg/kg) is compared for the Region 3 RBC for residential soils (1600 mg/kg) it is clear that this COPC is unlikely to pose any significant risk to receptors at the site. Likewise endrin aldehyde was selected as a COPC in liquid waste only. The RME EPC (0.69 ugl) is well below the residential Region 3 RBC (1.1 ug/l) which assumes ingestion. There is no residential ingestion of liquid wastes expected at the site. Therefore, this COPC is highly unlikely to pose a threat to the health of receptors at the site under current or future use conditions.

7.4 UNCERTAINTIES IN RISK CHARACTERIZATION

This BHHRA assumes that the risk from multiple COPCs and multiple sources of exposure are additive. The actual effect of multiple chemical exposures may be additive, synergistic or antagonistic. Uncertainties associated with the assumption of additivity could lead to either under- or overestimation of the actual risks.

The BHHRA does not include a likelihood evaluation. For example, it is unlikely that the same construction worker will be exposed to surface/subsurface soil, solid waste and liquid waste on the eastern parcel continually for six months, or even to liquid wastes alone continually for six months. Thus, the actual risk for this scenario is likely to be lower than estimated in this BHHRA.

Volatile TICs could not be quantitatively evaluated in the BHHRA. This could represent a significant source of uncertainty, depending on the actual toxicity of the organic compounds represented by the TIC designation.

8. CONCLUSIONS

8.1 CONCLUSIONS BY EXPOSURE AREA

The following section summarizes the potential cancer risks and non-cancer hazards associated with the site. Because the NCP establishes an excess cancer risk of 1×10^{-6} as a "point of departure" for establishing remedial goals, this section details those cumulative cancer risks which exceed 1×10^{-6}. These are shown in Tables 10.1 through 10.15. However, it should be noted that EPA policy indicates when reasonable maximum exposures for both current and future land use result in cancer risks less than 1×10^{-4}, action is generally not warranted (OSWER Directive 9355.0-30). This section and Table 10.1 through 10.14 also detail cumulative non-cancer hazard indices exceeding 1.0, and Tables 10s provide a target organ analysis for those exceedances.

8.1.1 Western Parcel

The receptors whose cumulative cancer risks exceed the point of departure are current trespasser (1.6×10^{-6}, Table 10.1RME) and future commercial/industrial worker (7.7×10^{-5}, Table 10.2RME). However, the cumulative risks for each of these receptors are still within the acceptable risk range of 1×10^{-4} to 1×10^{-6}.

The only receptor whose cumulative HI exceeds the point of departure is the future commercial/industrial worker. The HI for this receptor equals 8.9 (Table 10.2RME). This is driven by risks from ingestion of groundwater from the Upper Glacial Aquifer. Target organ HIs exceed 1.0 for kidney effects and are driven by cadmium.

8.1.2 Eastern Parcel

The receptors whose cumulative cancer risks exceed the point of departure are the future commercial/industrial worker (2.3×10^{-6}, Table 10.7RME) and the future construction worker (1.0×10^{-3}, Table 10.8RME). The cumulative risk for the future commercial/industrial worker is within the acceptable risk range of 1×10^{-4} to 1×10^{-6}. The risk for the construction worker is greater than the upper boundary of the acceptable cancer risks. This risk level is driven by exposure to liquid wastes in the eastern parcel.

The only receptor whose cumulative HI exceeds 1.0 is the future construction worker (31, Table 10.8RME). The only target organ HIs exceeding 1.0 were immune system and growth which were driven by Aroclor 1260 in liquid waste.

8.1.3 Off-site Residential Areas

The receptors whose cumulative risk exceeds the point of departure are the current off-site resident (Table 10.9RME), current school child (Table 10.11), current school employee (Table 10.12) and future off-site resident (Table 10.10RME). The current off-site resident cumulative risk is 3.0 x 10^{-3}, which is driven by ingestion of Upper Glacial groundwater. The primary contributor to these risks is vinyl chloride (1.7 x 10^{-3}). The current school child cumulative cancer risk is 4.8x10^{-6} (Table 10.11RME), which is driven by inhalation of groundwater and is within the acceptable risk range. The current school employee cumulative cancer risk is 2.0 x 10^{-5} (Table 10.12RME), which is driven by inhalation of groundwater and is within the acceptable risk range. The future off-site resident cumulative risk is 4.9 x 10^{-4} (Table 10.10RME). This is driven by ingestion of Magothy groundwater. The primary contributor to these risks is trichloroethene.

The receptors whose cumulative HIs exceed 1.0 is the current off-site resident (Upper Glacial Aquifer), whose HI is 95 for the child resident and 26 for the adult resident (Table 10.9RME), and future off-site resident (Magothy Aquifer, 7.3 for child, Table 10.10RME). These risks are all attributable to ingestion of groundwater. Target organ HIs for the Upper Glacial Aquifer exceed 1.0 for kidney, driven by cadmium, CNS, driven by manganese, and liver, driven by vinyl chloride. Target organ HIs exceed 1.0 for the Magothy Aquifer for CNS driven by manganese.

8.1.4 Massapequa Preserve

The receptor whose cumulative HI exceeded 1.0 is the child fisher (Table 10.14RME). However, there were no individual target organs with HIs that exceeded 1.0. There is considerable uncertainty associated with the fish ingestion rates utilized in this BHHRA. For the adult fisher (Section 6.5.5.2), the fish ingestion rate is 32 g/day, which is the 90th percentile value for adult recreational fishers in New York State. This ingestion rate is associated with 51 one-half pound meals per year (EPA, 1997a). The evaluation of the fish ingestion pathway for the child fisher (Section 6.5.5.1) is an adjustment to the adult fisher ingestion rate. The child fish ingestion rate is estimated at 11 g/day. These values for fish ingestion rates are used at the specific request of the EPA Region I Toxicologist, (personal communication) and are overly conservative. The USEPA has published national guidance which recommends the use of 6.6 g/day for the general population, and 8 g/day (50th percentile) for freshwater anglers. The USEPA 95th percentile value published for freshwater anglers is 25 g/day for adults (USEPA, 1997). The value used in this document exceeds this 95th percentile value. Furthermore, the Massapequa Preserve cannot support this level of fish consumption for the local population.

Therefore, the fish ingestion rates utilized herein are overly conservative and overestimate actual risks for fish ingestion at the site.

8.1.5 Ellsworth Allen Park

None of the cancer risks or hazard indices exceed point of departure levels.

8.2 RISK CHARACTERIZATION OF LEAD

Lead in site-related media does not appear to present a hazard to commercial/industrial workers, trespassers, recreational users, or swimmers. Lead in solid waste at the Site exceeds the residential screening level and the site-specific soil lead objective. Construction workers could be at risk handling solid waste in on-site features; however, precautions against exposure during construction or removal activities can significantly reduce this risk. Lead in fish does not appear to present a hazard to fishers based on blood lead modeling conducted with the adult lead model or the IEUBK model.

8.3 CHROMIUM AND CONTACT DERMATITIS

Although the EPCs for chromium are below the levels which might cause contact dermatitis, it should be noted that significant exposure to areas at the Site that exceed these levels could result in an increased risk of contact dermatitis. The following areas should be addressed: 1) western parcel surface samples in the northwest disposal area (B-07-01) and in the southern portion of the disposal basins (TP-54E); 2) western parcel subsurface soil located in or near the disposal basins (SB-2, TP-50, TP-51C, TP-54E, TP-55A), northwest disposal area (SB-41, B-07-02), and the ramp excavation pile on the Building N foundation; and 3) eastern parcel subsurface soil located in the Building B basement (TP-69).

8.4 RISKS AND HAZARDS OF CONCERN

The only exposure pathways which may be associated with excess cancer risks greater than the 1 x 10^{-6} to 1 x 10^{-4} acceptable risk range identified in the NCP are:

- Future construction worker exposed to liquid waste in the eastern parcel;
- Current off-site resident using the Upper Glacial aquifer as a potable water supply; and
- Future off-site resident using the Magothy aquifer as a potable water supply.

The construction worker exposure can be limited or eliminated through the use of skin protection while removing liquid wastes.

The only exposure pathways which may be associated with target organ-specific hazard indices greater than 1.0 are future commercial worker ingestion of Upper Glacial groundwater, future construction worker exposures to liquid waste, current off-site resident exposures to Upper Glacial aquifer as potable water source, and the future off-site resident using the Magothy aquifer as a potable water supply.

Pregnant construction workers could also be at risk for effects from lead during handling of solid waste in on-site features; however, precautions against exposure during construction or removal activities can significantly reduce this risk.

Some isolated locations in the surface and subsurface soil should be considered a potential hazard to receptors who may have direct contact with the soil due to the potential for contact dermatitis caused by chromium. Any future plans for the Site should incorporate exposure controls or spot removal of the soil in these areas.

9. REFERENCES

Agency for Toxic Substances and Disease Registry (ATSDR), 1993. *Toxicological Profile for Lead.* National Institutes of Health.

American Society for Testing and Materials (ASTM), 1995. "Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites." E 1739-95.

Bagdon, R.E. and R.E. Hazen, 1991. Environmental Health Perspectives 92:111-119.

Brody, Debra J., et. Al., 1994. "Blood Lead Levels in the US Population, Phase 1 of the Third National Health and Nutrition Examination Survey (NHANES III, 1988 to 1991)," in *Journal of the American Medical Association*, Vol. 272, No. 4, 277-283. July 27, 1994.

Cashin Associates, P.C. (Cashin). 1998. "Preliminary Assessment of the Feasibility of Utilizing the Western Portions of the Liberty Industrial Finishing Site for Park Land, Farmingdale, New York." Prepared for the Town of Oyster Bay, May 7, 1998.

Dames & Moore, 1999. "Draft Baseline Human Health Risk Assessment Update Liberty Industrial Finishing Site Farmingdale, New York", December 21, 1999.

Dames & Moore, 2000. "Draft Continued Remedial Investigation Report, Liberty Industrial Finishing Site", June 5, 2000.

Gilbert, R.O., 1987. *Statistical Methods for Environmental Pollution Monitoring*. Van Nostrand Reinhold, New York.

Haines, A.T. and Niebor, E. "Chromium Sensitivity" in "Chromium in the Natural and Human Environments." *Adv. in Env. Sci. and Tech.* Vol. 20 (J.O. Nriagu and E. Niebor, Eds.), John Wiley and Sons, N.Y., 1988, pp. 497-532.

International Agency for Research on Cancer (IARC), 1980. *Monograph: Some Metals and Metallic Compounds*. 23: 325-415.

Kligman, A.M. 1966. J. Invest. Dermatology 47 (5): 393-405.

Lowe T.P., 1985. *Arch Environ Contam Toxicol*, 14: 363-88.

National Library of Medicine, 1999. Hazardous Substances Data Bank (HSDB).

New York State Department of Conservation (NYSDEC), 1995. "Proposed Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels" (TAGM), Appendix A.

____, 1998. "Ambient Water Quality Standards and Guidance Values." Division of Water Technical and Operational Guidance Series (1.1.1). Reissued June 1998.

Peltonen, L., and Fraki, J, 1983. *Contact Dermatitis* 9:190-194.

Seidinari, S, Manzini, B.M., Danese, P. and Motolese A. 1990. *Contact Dermatitis* 23:162-167.

Sivak, M. Personnel Communication from Draft RAGS Part E Guidance. April 19, 2000

U.S. Environmental Protection Agency (EPA). 1986. "Guidelines for Carcinogen Risk Assessment." Federal Register 51:33992-34003.

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

____, 1989b. *Hazardous Waste Treatment, Storage and Disposal Facilities (TSDF) - Air Emissions Models*. OAQPS, November 1989.

____, 1991a. "Maximum Contaminant Level Goals and National Primary Drinking Water Regulations for Lead and Copper." *Federal Register* **56:** 26461-26564.

____, 1991b. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final." OSWER Directive 9285.6-03.

____, 1992a. *Dermal Exposure Assessment: Principles and Applications, Interim Report*. Office of Research and Development, EPA/600/8-91/011B.

____, 1992b. *Guidance for Data Useability in Risk Assessment (Part A)*. Office of Emergency and Remedial Response. Publication 9285.7-09A.

____, 1993. *Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons*. Office of Research and Development, EPA/600/R-93/089.

____, 1994a. *Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children*. Office of Solid Waste and Emergency Response. EPA/540/R-93/081.

____, 1994b. "Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities." Office of Solid Waste and Emergency Response, Washington, D.C., OSWER Directive #9355.4-12.

____, 1995. "Land Use in the CERCLA Remedy Selection Process." OSWER Directive No. 9355.7-04.

____, 1996a. *PCBs: Cancer Dose-Response Assessment and Application to Environmental Mixtures*. Office of Research and Development, EPA/600/P-96/001F.

____, 1996b. *Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil.* Technical Review Workgroup for Lead, December 1996.

____, 1996c. *Soil Screening Level Guidance: Technical Background Document.* Office of Solid Waste and Emergency Response. Washington, D.C. EPA/540-R-96/018.

____, 1997a. *Exposure Factors Handbook.* Office of Research and Development, EPA/600/P-95/002F.

____, 1997b. *User's Guide for the Johnson and Ettinger (1991) Model for Subsurface Vapor Intrusion into Buildings.* OERR, September 1997.

____, 1997c. "Guidance for Risk Characterization." Science Policy Council, February, 1995.

____, 1997d. "Policy on Evaluating Health Risks to Children." Office of Research and Development, September 9, 1997.

____, 1998a. *Risk Assessment Guidance for Superfund: Volume I Part D* (RAGS Part D). Office of Emergency and Remedial Response, Publication 9285.7-01D.

____, 1999a. "Frequently Asked Questions (FAQs) on the Adult Lead Model." Technical Review Workgroup for Lead. Guidance Document, April 1999, Rev. 0.

____, 1999b. *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessmen) Interim Guidance* (Working Draft). (RAGS Part E).

U.S. Environmental Protection Agency Region II (EPA Region II), 1995. "Baseline Risk Assessment Addendum, Liberty Industrial Finishing Site, Farmingdale, New York."

____, 1997. "Superfund Proposed Plan, Liberty Industrial Finishing Site, Town of Oyster Bay, Nassau County, New York." July 1997.

____, 2000. Personal communication Michael Sivak, May 17, 2000.

U.S. Environmental Protection Agency Region III (EPA Region III), 1993. "Selecting Exposure Routes and Contaminants of Concern by Risk-Based Screening." U.S. EPA Region III Technical Guidance Manual. EPA/903/R-93-001.

____, 1999. U.S. EPA Region III Risk-Based Concentration Table. October 1999.

____, 1997. "Final Report, Soil Sampling Investigation, Liberty Industrial Finishing Site, Farmingdale, New York, May 1997."

Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study, Final Remedial Investigation Report." January 20, 1994.

Woodward Parkway School, 1999. Personal communication with Janice McKee, Dames & Moore on March 2, 1999.

Zar, J.H., 1984. *Biostatistical Analysis,* 2nd Edition, Prentice Hall International.

FIGURES

EXPLANATION:

- SB-06 SOIL BORING LOCATION (DAMES & MOORE) } CRI (1997-98)
- SOIL BORING LOCATION OF 1998-99 SUPPLEMENTAL SOIL INVESTIGATION ARE SHOWN IN FIGURE 3-2
- ●SS-16 SOIL BORING OR MISCELLANEOUS SAMPLE LOCATION
- ○HA30 HAND AUGER SAMPLE LOCATION } SUPPLEMENTAL SOIL INVESTIGATION (1997)
- ▲S-1 SMOKE STACK SAMPLE LOCATION
- ⊕SB-06 SOIL BORING LOCATION (WESTON)
- ⊞TP-56 TEST PIT LOCATION } RI (1991-92)
- ■TP-66 TEST PIT LOCATION WHERE SOIL SAMPLES WERE TAKEN
- EXISTING BUILDING LOCATION
- FORMER BUILDING LOCATION
- RIM OF CURRENT BASIN AREA
- SITE PARCEL BOUNDARY FOR HUMAN HEALTH RISK ASSESSMENT

0 50 100 150 200 FEET

GRAPHIC SCALE

TITLE	ON-SITE AND OFF-SITE SOIL SAMPLING LOCATIONS		
PROJECT	LIBERTY INDUSTRIAL FINISHING SITE FARMINGDALE, NEW YORK		
	URS Dames & Moore		
SCALE AS SHOWN	DWN. BY R.G.B.	JOB NO. 35550-001	
DATE 7/18/00	APPR. BY M.O.	FIG. NO. 3-1	

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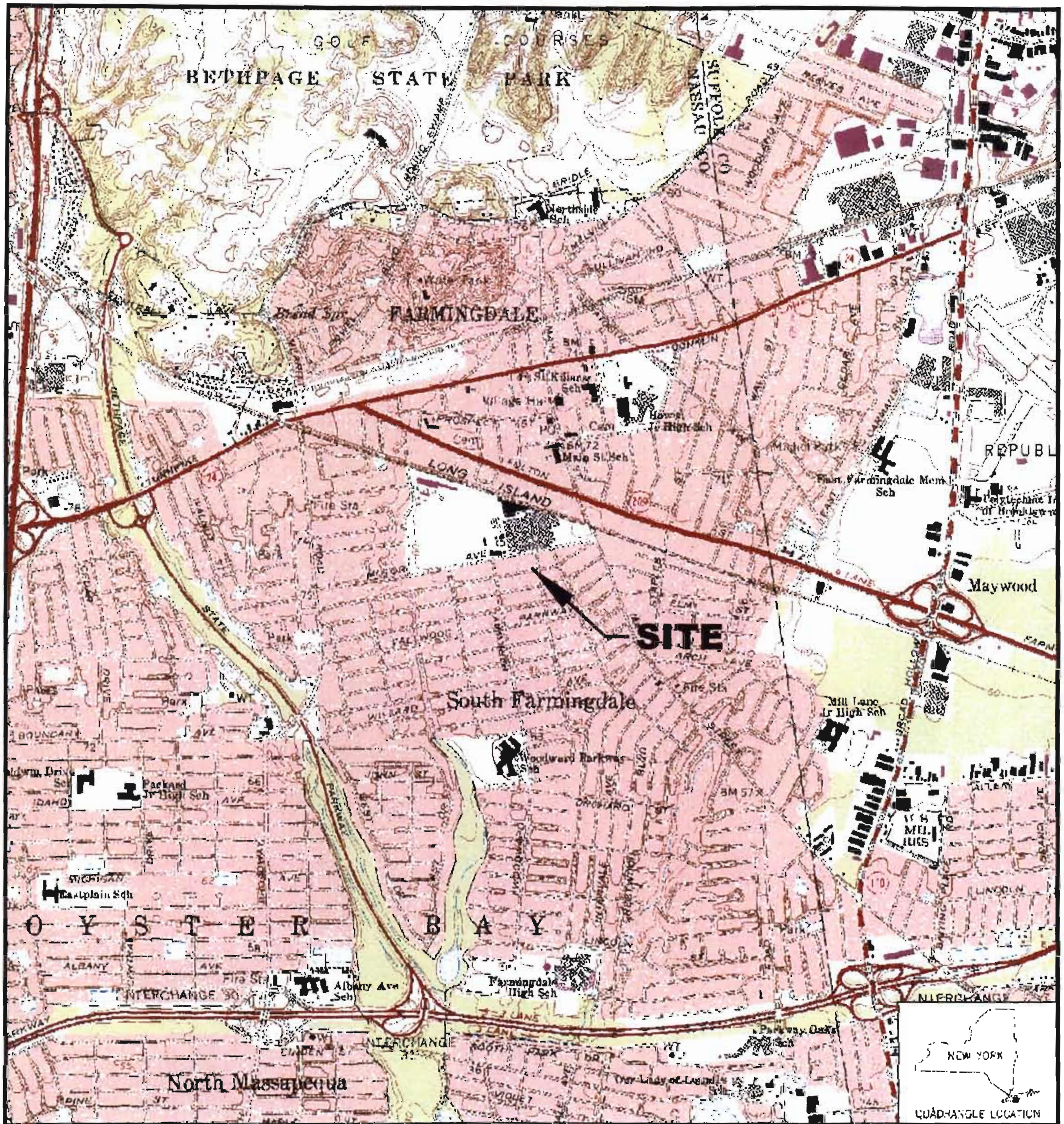


0 1200 2400 3600 FEET

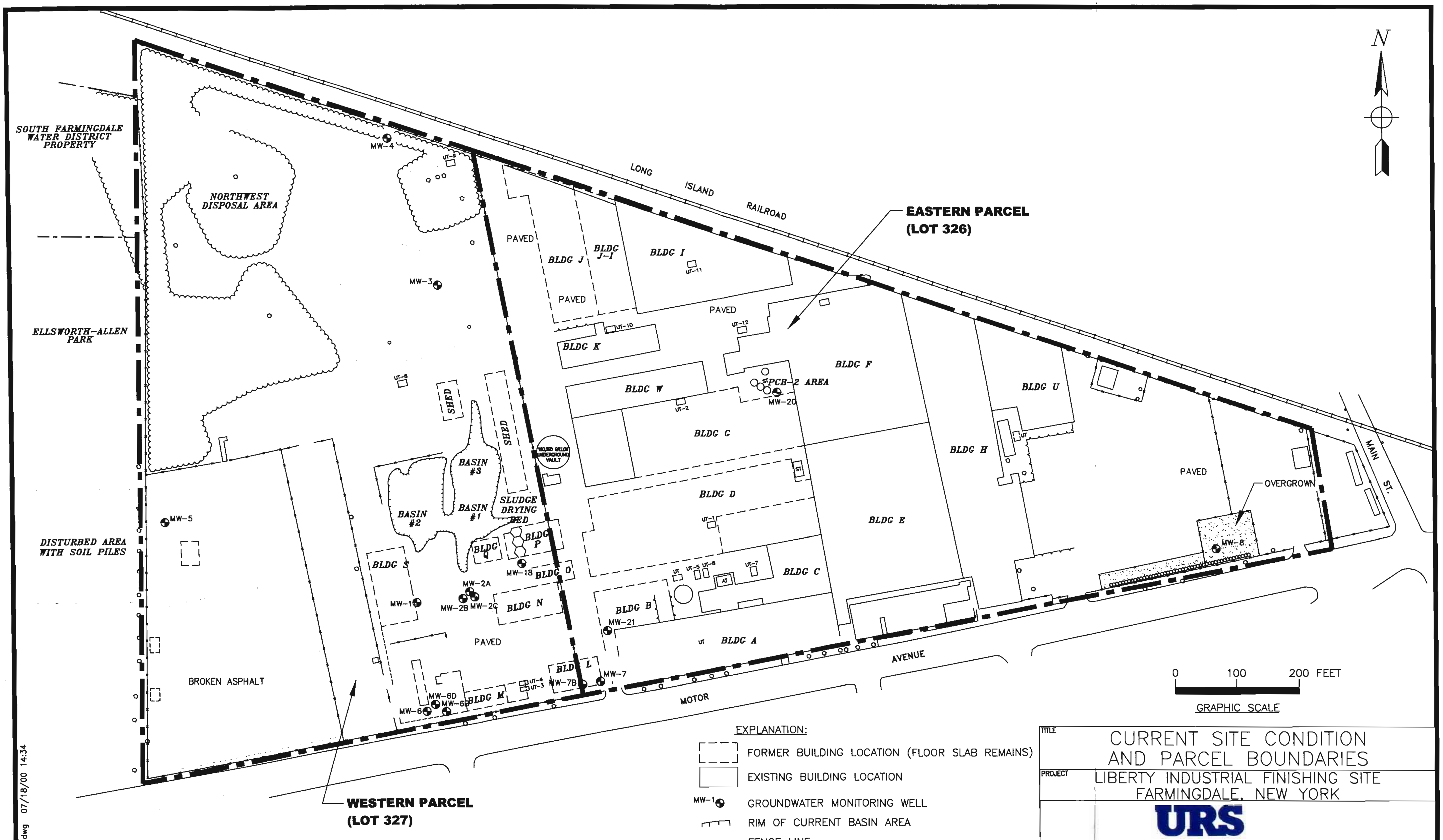
GRAPHIC SCALE

CONTOUR INTERVAL = 20 FEET

REFERENCE:
A PORTION OF USGS 7.5 MINUTE TOPOGRAPHIC MAP; AMITYVILLE QUADRANGLE, NEW JERSEY; 1969, PHOTOREVISED 1979.

(1) 00718-02.dwg 07/18/00 14:28

TITLE	SITE VICINITY MAP		
PROJECT	LIBERTY INDUSTRIAL FINISHING SITE FARMINGDALE, NEW YORK		
	URS Dames & Moore		
SCALE: AS SHOWN	DWN. BY: A.W.	JOB NO.: 35550-001	
DATE: 7/18/00	APPR. BY: M.O.	FIG. NO.: 2-1	



EXPLANATION:

- FORMER BUILDING LOCATION (FLOOR SLAB REMAINS)
- EXISTING BUILDING LOCATION
- MW-1 GROUNDWATER MONITORING WELL
- RIM OF CURRENT BASIN AREA
- FENCE LINE
- SITE PARCEL BOUNDARY FOR HUMAN HEALTH RISK ASSESSMENT

TITLE	CURRENT SITE CONDITION AND PARCEL BOUNDARIES
PROJECT	LIBERTY INDUSTRIAL FINISHING SITE FARMINGDALE, NEW YORK
	URS Dames & Moore

SCALE	AS SHOWN	DWN. BY	R.G.B.	JOB NO.	35550-001
DATE	7/18/00	APPR. BY	M.O.	FIG. NO.	2-2

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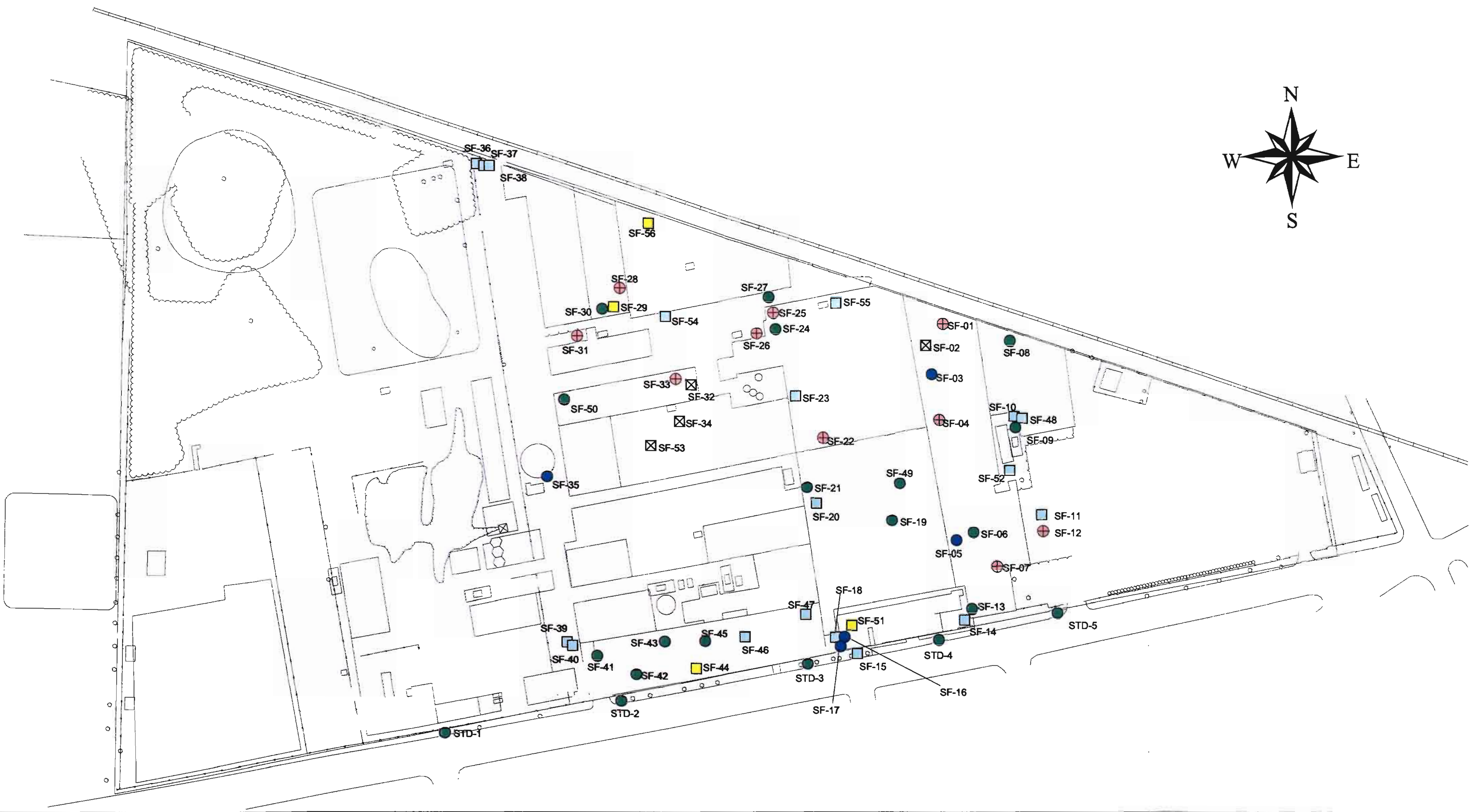
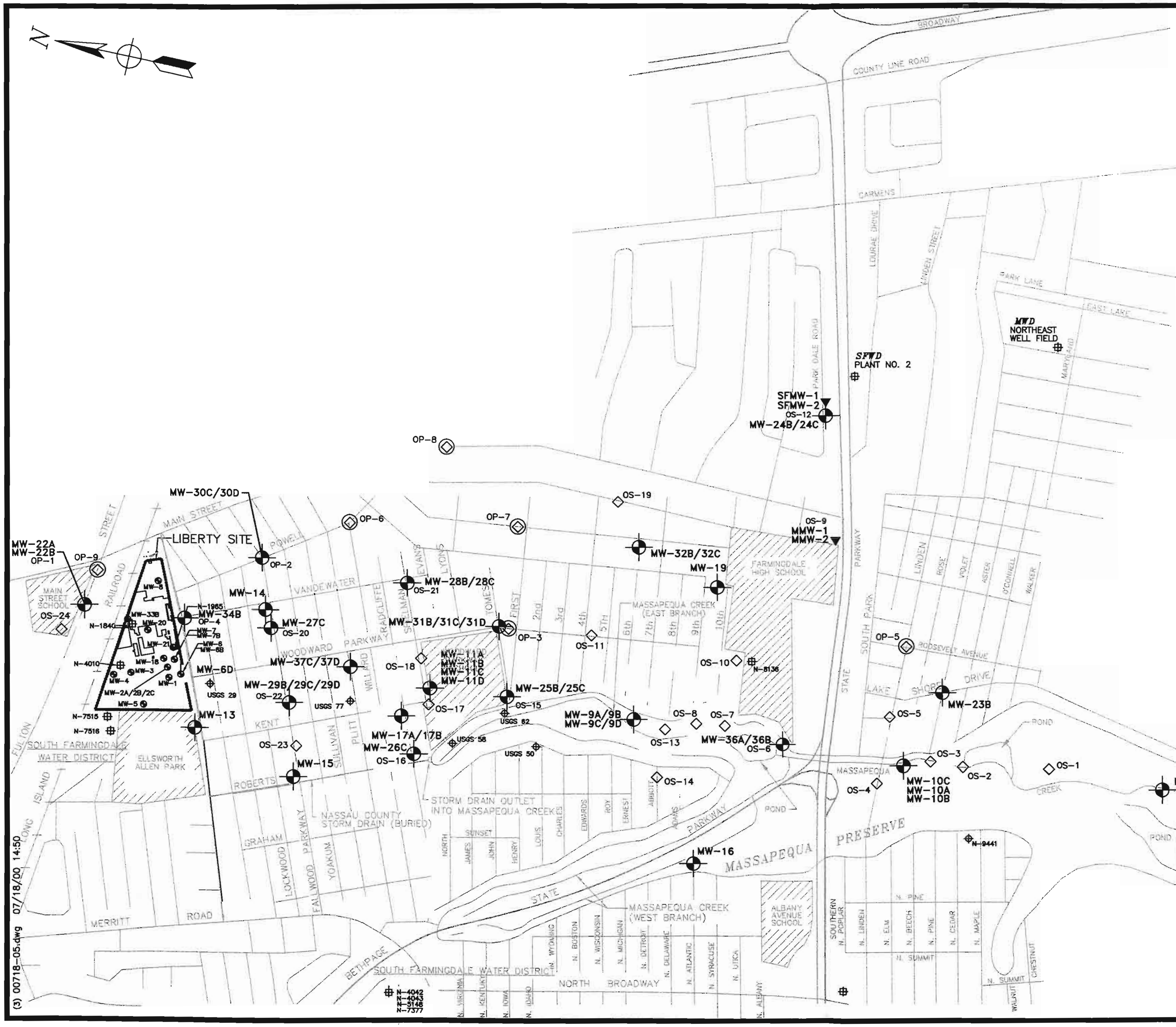


Feature Not Located
Feature Not Sampled
Feature Not Accessed
Aqueous Sample Collected
Solid Sample Collected
Aqueous and Solid Sample Collected

TITLE	Subsurface Feature Locations
PROJECT	LIBERTY INDUSTRIAL FINISHING SITE FARMINGDALE, NEW YORK

URS/Dames & Moore

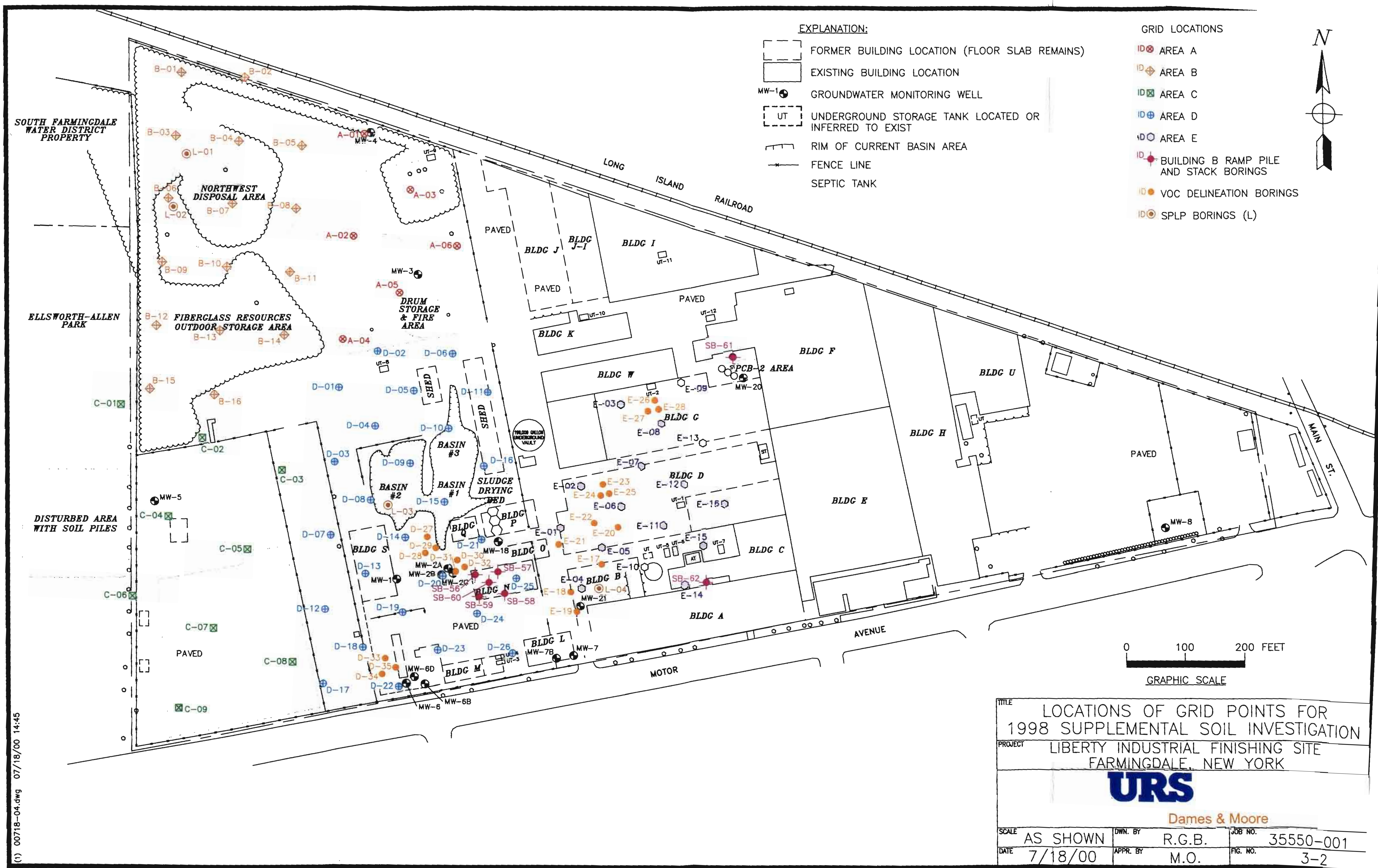
SCALE	AS SHOWN	DWN. BY	M.O.	JOB NO.	35550-001
DATE	7/19/00	APPR. BY	M.O.	FIG. NO.	3-3



EXPLANATION:

MW-22 / OP-1	MONITORING WELL LOCATION OR GROUNDWATER SCREENING LOCATION (CRI)
SFMW-1 / MMW-1	OUTPOST SENTINEL WELLS
USGS50	USGS OR NCDPW MONITORING WELL
N-4042	WATER SUPPLY WELL *MWD* – MASSAPEQUA WATER DISTRICT *SFWD* – SOUTH FARMINGDALE WATER DISTRICT
OS-14	GROUNDWATER SCREENING LOCATION (CRI)
OP-1	OPTIONAL GROUNDWATER SCREENING LOCATION (CRI)

TITLE	OFF-SITE GROUNDWATER SAMPLING LOCATIONS		
PROJECT	LIBERTY INDUSTRIAL FINISHING SITE FARMINGDALE, NEW YORK		
	URS Dames & Moore		
SCALE AS SHOWN	DWN. BY R.G.B.	JOB NO. 35550-001	
DATE 7/18/00	APPR. BY M.O.	FIG. NO. 3-5	

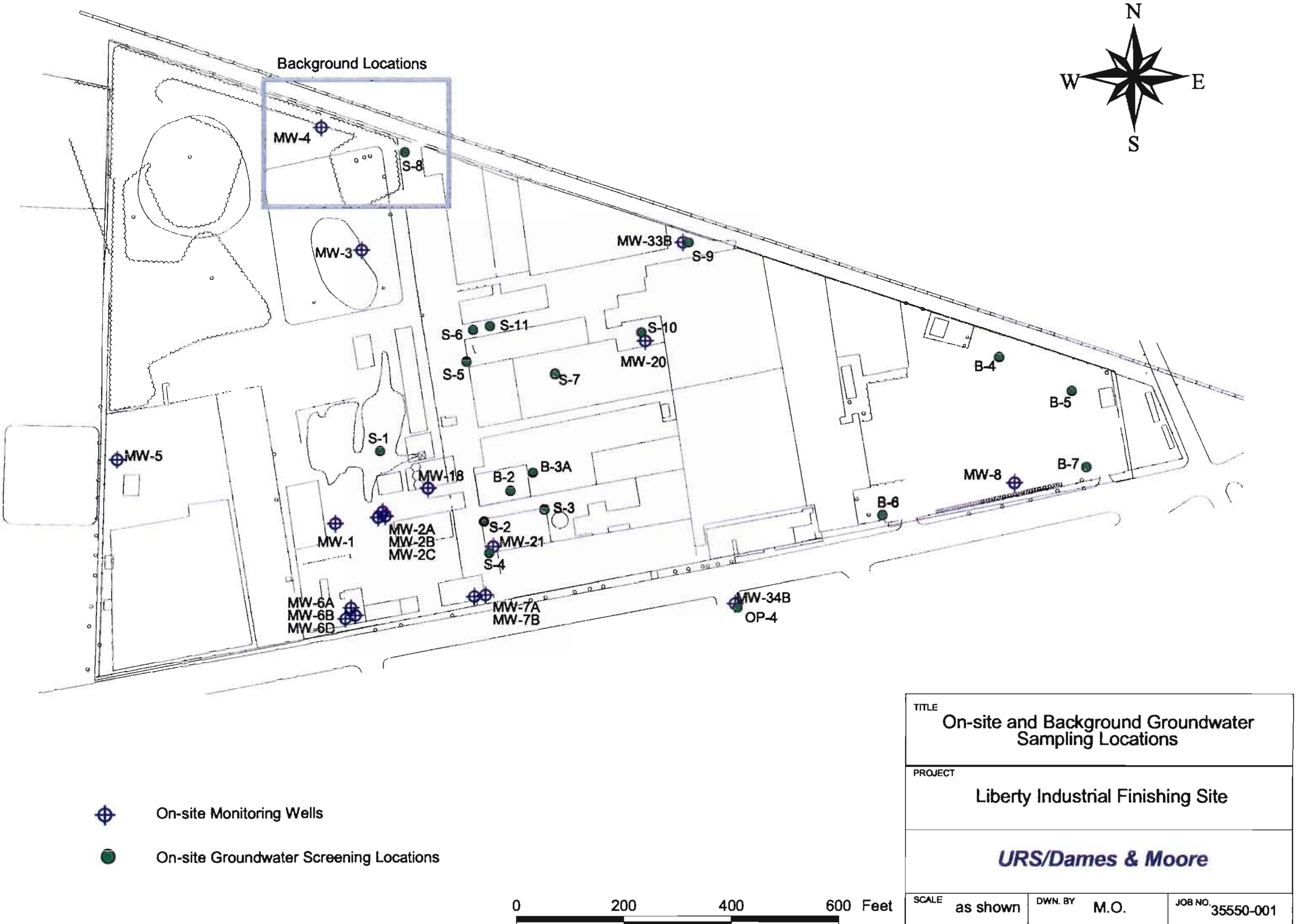


(1) 00718-04.dwg 07/18/00 14:45

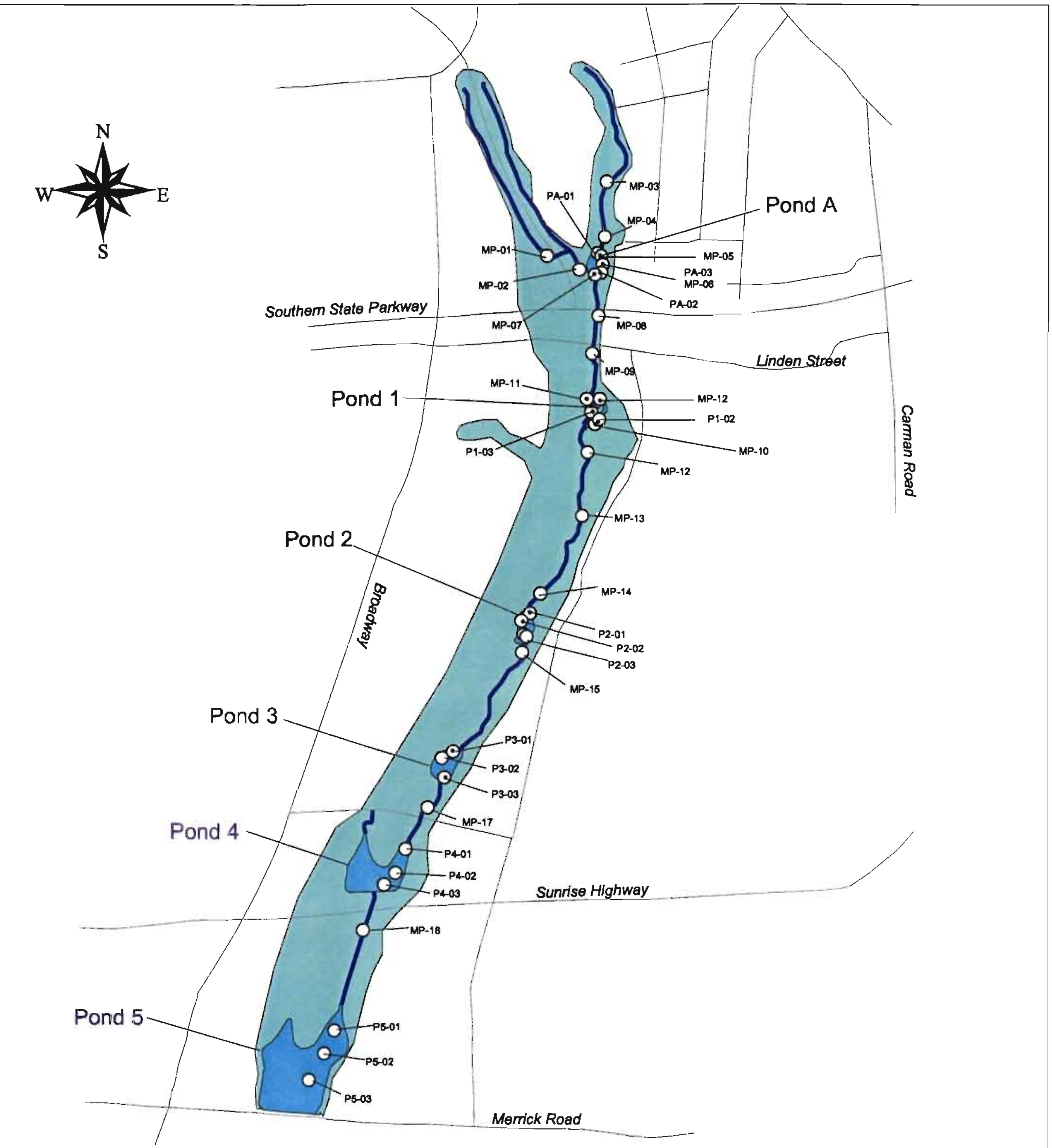
TITLE	LOCATIONS OF GRID POINTS FOR 1998 SUPPLEMENTAL SOIL INVESTIGATION
PROJECT	LIBERTY INDUSTRIAL FINISHING SITE FARMINGDALE, NEW YORK

URS Dames & Moore

SCALE	AS SHOWN	DWN. BY	R.G.B.	JOB NO.	35550-001
DATE	7/18/00	APPR. BY	M.O.	FIG. NO.	3-2



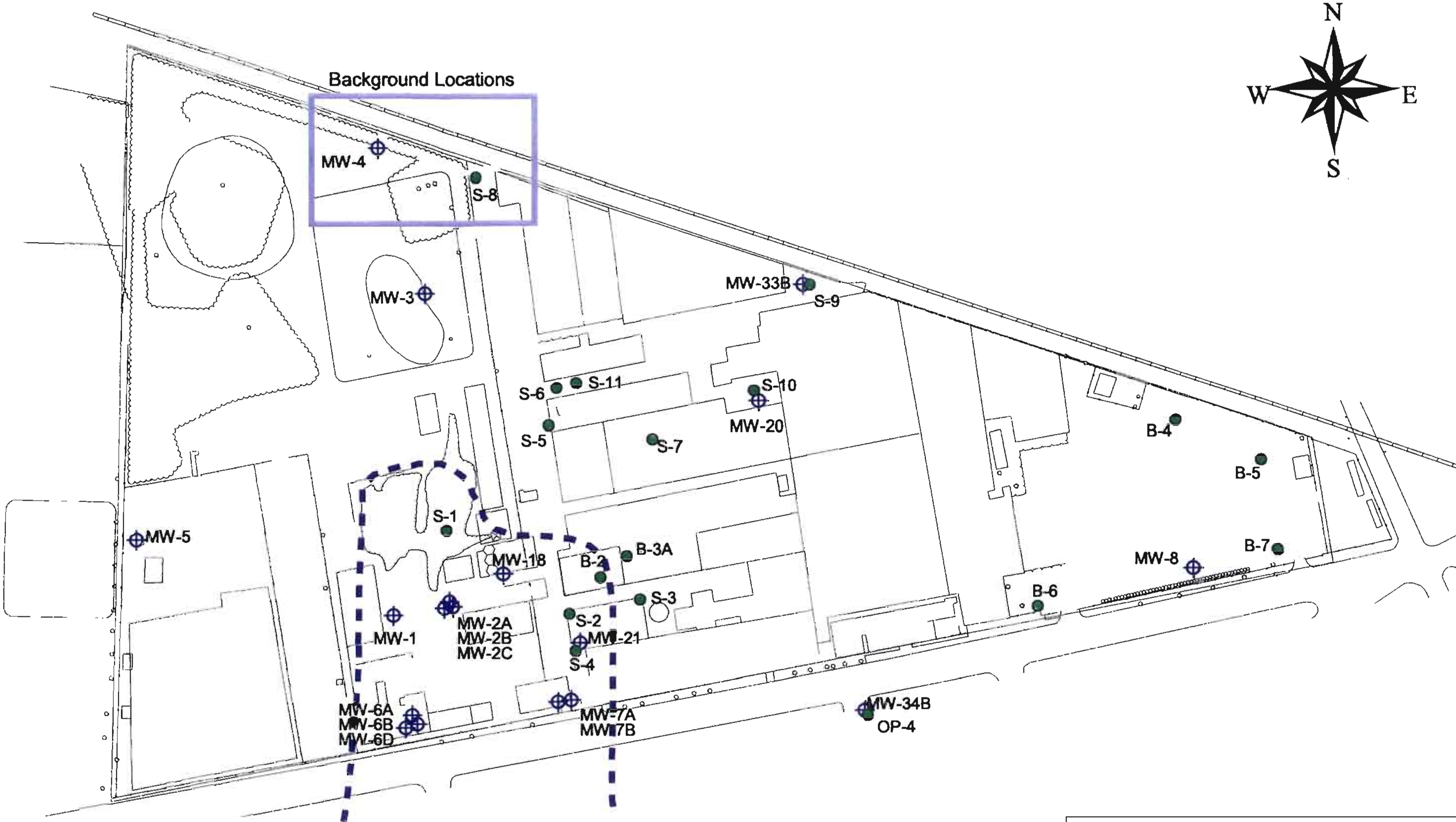
TITLE On-site and Background Groundwater Sampling Locations		
PROJECT Liberty Industrial Finishing Site		
URS/Dames & Moore		
SCALE as shown	DWN. BY M.O.	JOB NO. 35550-001
DATE 7/19/00	APPR. BY M.O.	FIG. NO. 3-4



○ Sampling Location

0 0.5 1 Miles

Massapequa Preserve Surface Water, Sediment, and Fish Tissue Sampling Locations		
LIBERTY INDUSTRIAL FINISHING SITE FARMINGDALE, NEW YORK		
URS/Dames & Moore		
AS SHOWN	M.O.	35550-001
7/19/00	M.O.	3-6



On-site Monitoring Wells

On-site Groundwater Screening Locations

Generalized Extent of On-site Groundwater Plume

0 200 400 600 Feet

TITLE Extent of On-site Groundwater Plume		
PROJECT Liberty Industrial Finishing Site		
URS/Dames & Moore		
SCALE as shown	DWN. BY M.O.	JOB NO. 35550-001
DATE 7/19/00	APPR. BY M.O.	FIG. NO. 3-7

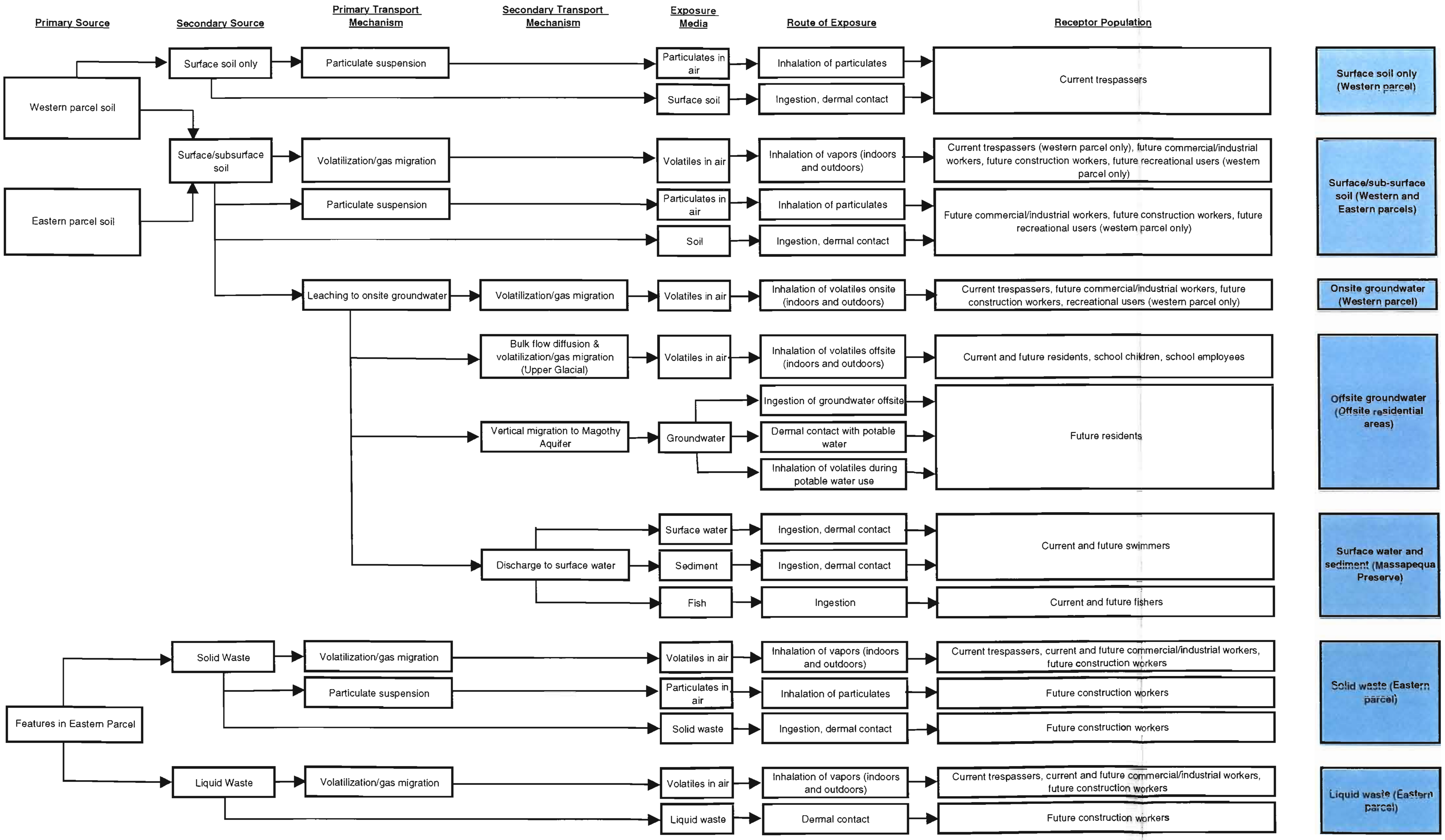
TITLE
GENERALIZED GROUNDWATER PLUME (OFF-SITE)

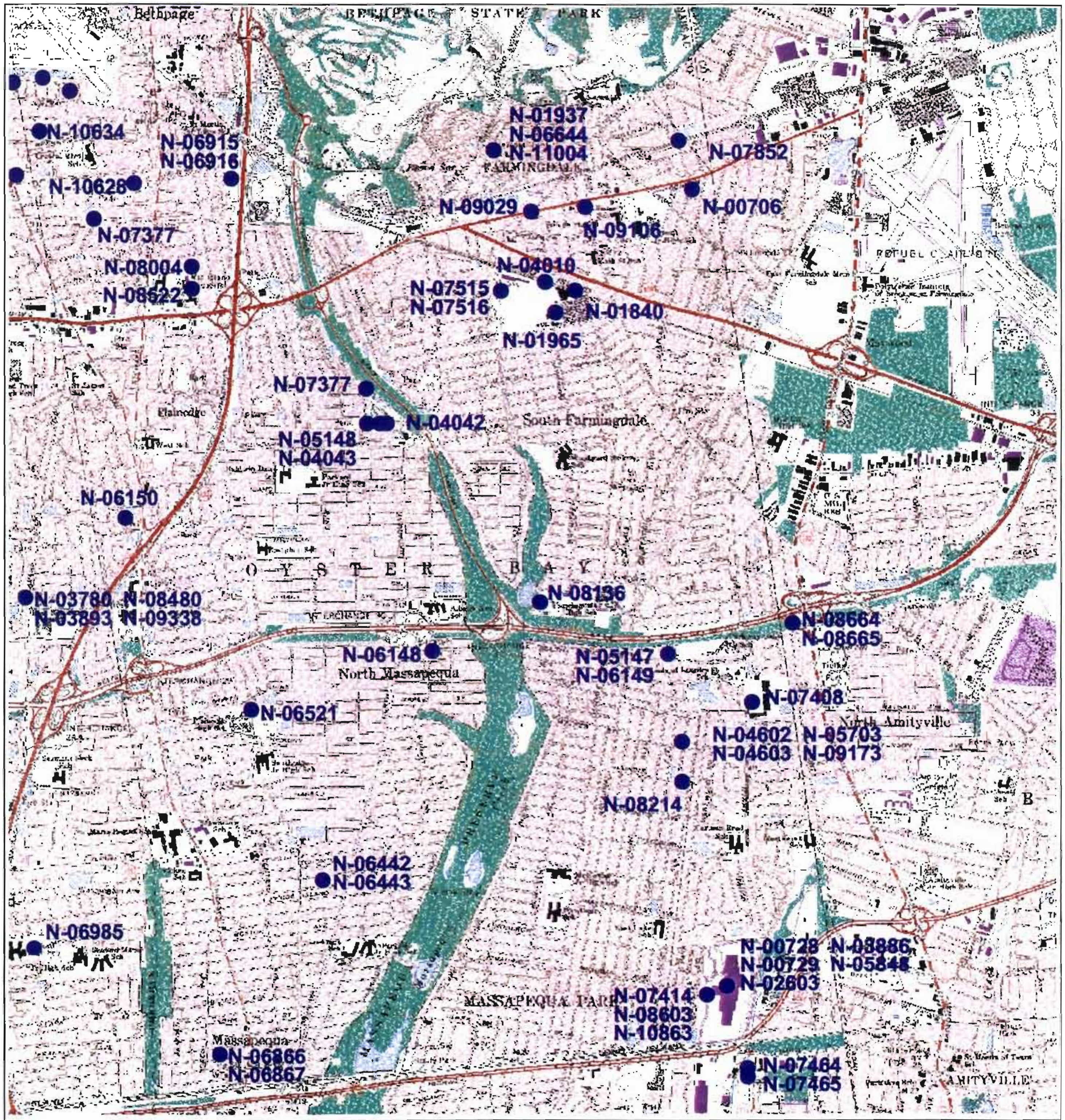
PROJECT
LIBERTY INDUSTRIAL FINISHING SITE
FARMINGDALE, NEW YORK

URS
Dames & Moore

SCALE	AS SHOWN	DWN. BY	R.G.B.	JOB NO.	35550-001
DATE	7/18/00	APPR. BY	M.O.	FIG. NO.	3-8

FIGURE 4-2
CONCEPTUAL SITE EXPOSURE MODEL
LIBERTY INDUSTRIAL FINISHING SITE





2000 0 2000 4000 Feet

N W E S

Reference:
A Portion of USGS 7.5-Minute Topographic Map
Amityville Quadrangle, New York, 1969
Photorevised 1979

TITLE	Supply Wells in Site Vicinity
PROJECT	LIBERTY INDUSTRIAL FINISHING SITE FARMINGDALE, NEW YORK
	URS / Dames & Moore

SCALE	AS SHOWN	DWN. BY	M.O.	JOB NO.	35550-001
DATE	7/18/00	APPR. BY	M.O.	FIG. NO.	4-1

RAGS TABLE 1s

TABLE 1.1
SELECTION OF EXPOSURE PATHWAYS - WESTERN PARCEL
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Surface soil only	Soil	Western parcel	Trespasser	Adolescent (10-18)	Ingestion	On-site	Quant	Trespassers evident at site.
						Dermal contact	On-site	Quant	Trespassers evident at site.
		Particulates	Western parcel	Trespasser	Adolescent (10-18)	Inhalation	On-site	Quant	Trespassers evident at site. Exposure could occur in western parcel.
	Surface/subsurface soil	Soil	Western parcel	Trespasser	Adolescent (10-18)	Ingestion	On-site	None	No direct contact with subsurface soil expected.
					Adolescent (10-18)	Dermal contact	On-site	None	No direct contact with subsurface soil expected.
		Particulates	Western parcel	Trespasser	Adolescent (10-18)	Inhalation	On-site	None	No direct contact with subsurface soil expected.
		Vapors	Western parcel (outdoors)	Trespasser	Adolescent (10-18)	Inhalation	On-site	Quant	Trespassers evident at site. Exposure could occur on western parcel. Exposure is not expected on Eastern parcel due to the presence of pavement, buildings, and building foundations.
	Groundwater (Upper Glacial)	Vapors	Western parcel (outdoors)	Trespasser	Adolescent (10-18)	Inhalation	On-site	Quant	Trespassers evident at site. Exposure could occur.
	Groundwater (Magothy)	Vapors	Western parcel (outdoors)	Trespasser	Adolescent (10-18)	Inhalation	On-site	None	Vapors from Magothy Aquifer insignificant as compared with vapors from Upper Glacial Aquifer.

TABLE 1.1
SELECTION OF EXPOSURE PATHWAYS - WESTERN PARCEL
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface/subsurface soil	Soil	Western parcel	Commercial/industrial worker	Adult	Ingestion	On-site	Quant	Future site workers could be exposed to constituents in soil.
						Dermal contact	On-site	Quant	Future site workers could be exposed to constituents in soil.
				Construction worker	Adult	Ingestion	On-site	Quant	Future construction workers could be exposed to constituents in soil.
						Dermal contact	On-site	Quant	Future construction workers could be exposed to constituents in soil.
				Other recreational user	Pre-adolescent (6-18)	Ingestion	On-site	Quant	Future recreational development of western parcel could result in exposure
						Dermal contact	On-site	Quant	Future recreational development of western parcel could result in exposure
		Particulates	Western parcel	Commercial/industrial worker	Adult	Inhalation	On-site	Quant	Future site workers could be exposed to particulates from onsite soil.
				Construction worker	Adult	Inhalation	On-site	Quant	Future construction workers could be exposed to particulates
				Other recreational user	Pre-adolescent (6-18)	Inhalation	On-site	Quant	Future recreational development of western parcel could result in exposure
		Vapors	Western parcel (indoors)	Commercial /industrial worker	Adult	Inhalation	On-site	Quant	Future site workers could be exposed to volatiles emanating from soil into buildings.
			Western parcel (outdoors)	Commercial/industrial worker	Adult	Inhalation	On-site	Quant	Future site workers could be exposed to volatiles emanating from soil.
				Construction worker	Adult	Inhalation	On-site	Quant	Future construction workers could be exposed to vapors
				Other recreational user	Pre-adolescent (6-18)	Inhalation	On-site	Quant	Future recreational development of western parcel could result in exposure
	Groundwater (Upper Glacial)	Groundwater	Western parcel (tap)	Commercial/industrial worker	Adult	Ingestion	On-site	Quant	Under foreseeable future conditions, groundwater will not be used onsite as a potable water supply. In addition, Nassau County Public Health Ordinance (Article IV) prevents the installation and use of private water system wells. However, because aquifer is designated as a potable supply by the state, this pathway is evaluated.
		Vapors	Western parcel (tap)	Commercial/industrial worker	Adult	Inhalation	On-site	Quant	Under foreseeable future conditions, groundwater will not be used onsite as a potable water supply. In addition, Nassau County Public Health Ordinance (Article IV) prevents the installation and use of private water system wells. However, because aquifer is designated as a potable supply by the state, this pathway is evaluated.
			Western parcel (indoors)	Commercial/industrial worker	Adult	Inhalation	On-site	Quant	Vapors from groundwater could infiltrate onsite buildings.
			Western parcel (outdoors)	Commercial/industrial worker	Adult	Inhalation	On-site	Quant	Vapors from groundwater could be emitted to ambient air onsite.
				Construction worker	Adult	Inhalation	On-site	Quant	Vapors from groundwater could be emitted to ambient air onsite.
				Other recreational user	Pre-adolescent (6-18)	Inhalation	On-site	Quant	Future recreational development of western parcel could result in exposure
	Groundwater (Magothy)	Groundwater	Western parcel (tap)	Commercial/industrial worker	Adult	Ingestion	On-site	Quant	Under foreseeable future conditions, groundwater will not be used onsite as a potable water supply. In addition, Nassau County Public Health Ordinance (Article IV) prevents the installation and use of private water system wells. However, because aquifer is designated as a potable supply by the state, this pathway is evaluated.
		Vapors	Western parcel (tap)	Commercial/industrial worker	Adult	Inhalation	On-site	Quant	Under foreseeable future conditions, groundwater will not be used onsite as a potable water supply. In addition, Nassau County Public Health Ordinance (Article IV) prevents the installation and use of private water system wells. However, because aquifer is designated as a potable supply by the state, this pathway is evaluated.

TABLE 1.1
SELECTION OF EXPOSURE PATHWAYS - WESTERN PARCEL
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
			Western parcel (indoors)	Commercial/industrial worker	Adult	Inhalation	On-site	None	Vapors from Magothy Aquifer insignificant as compared with vapors from Upper Glacial Aquifer.
			Western parcel (outdoors)	Commercial/industrial worker	Adult	Inhalation	On-site	None	Vapors from Magothy Aquifer insignificant as compared with vapors from Upper Glacial Aquifer.
				Construction worker	Adult	Inhalation	On-site	None	Vapors from Magothy Aquifer insignificant as compared with vapors from Upper Glacial Aquifer.
				Other recreational user	Pre-adolescent (6-18)	Inhalation	On-site	None	Vapors from Magothy Aquifer insignificant as compared with vapors from Upper Glacial Aquifer.

Quant = Evaluated quantitatively
Qual = Evalauted qualitatively

TABLE 1.2
SELECTION OF EXPOSURE PATHWAYS - EASTERN PARCEL
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Surface/subsurface soil	Soil	Eastern parcel	Trespasser	Adolescent (10-18)	Ingestion	On-site	None	No direct contact with subsurface soil expected.
						Dermal contact	On-site	None	No direct contact with subsurface soil expected.
				Commercial/industrial worker	Adult	Ingestion	On-site	None	No direct contact with subsurface soil expected.
						Dermal contact	On-site	None	No direct contact with subsurface soil expected.
		Particulates	Eastern parcel	Trespasser	Adolescent (10-18)	Inhalation	On-site	None	No direct contact with subsurface soil expected.
				Commercial/industrial worker	Adult	Inhalation	On-site	None	No direct contact with subsurface soil expected.
		Vapors	Eastern parcel (indoors)	Commercial/industrial worker	Adult	Inhalation	On-site	None	As verified by 1992 soil gas survey results, there is an insignificant level of volatiles in currently occupied portions of site (east of Building E).
			Easten parcel (outdoors)	Trespasser	Adolescent (10-18)	Inhalation	On-site	None	Exposure is not expected on Eastern parcel due to the presence of pavement, buildings, and building foundations.
				Commercial/industrial worker	Adult	Inhalation	On-site	None	As verified by 1992 soil gas survey results, there is an insignificant level of volatiles in currently occupied portions of site (east of Building E).
	Solid waste	Solid Waste	Eastern parcel	Commercial/industrial worker	Adult	Ingestion	On-site	None	All features are enclosed. No exposure expected.
						Dermal contact	On-site	None	All features are enclosed. No exposure expected.
		Particulates	Eastern parcel	Commercial/industrial worker	Adult	Inhalation	On-site	None	All features are enclosed. No exposure expected.
		Vapors	Eastern parcel (indoors)	Commercial/industrial worker	Adult	Inhalation	On-site	Quant	Site workers could inhale volatiles from features located inside buildings
			Eastern parcel (outdoors)	Trespasser	Adolescent (10-18)	Inhalation	On-site	Quant	Trespassers could inhale volatiles from outdoor features.
				Commercial/industrial worker	Adult	Inhalation	On-site	None	Site is used for warehousing only. Site workers do not work outdoors.
	Liquid waste	Liquid Waste	Eastern parcel	Commercial/industrial worker	Adult	Ingestion	On-site	None	All features are enclosed. No exposure expected.
						Dermal contact	On-site	None	All features are enclosed. No exposure expected.
		Vapors	Eastern parcel (outdoors)	Trespasser	Adolescent (10-18)	Inhalation	On-site	Quant	Trespassers could inhale volatiles from outdoor features.
				Commercial/industrial worker	Adult	Inhalation	On-site	None	Site is used for warehousing only. Site workers do not work outdoors.

TABLE 1.2
SELECTION OF EXPOSURE PATHWAYS - EASTERN PARCEL
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Surface/subsurface soil	Soil	Eastern parcel	Commercial/industrial worker	Adult	Ingestion	On-site	Quant	Future site workers could be exposed to constituents in soil.
						Dermal contact	On-site	Quant	Future site workers could be exposed to constituents in soil.
				Construction worker	Adult	Ingestion	On-site	Quant	Future construction workers could be exposed to constituents in soil.
						Dermal contact	On-site	Quant	Future construction workers could be exposed to constituents in soil.
		Particulates	Eastern parcel	Commercial/industrial worker	Adult	Inhalation	On-site	Quant	Future site workers could be exposed to particulates from onsite soil.
				Construction worker	Adult	Inhalation	On-site	Quant	Future construction workers could be exposed to particulates
		Vapors	Eastern parcel (indoors)	Commercial /industrial worker	Adult	Inhalation	On-site	Quant	Future site workers could be exposed to volatiles emanating from soil into buildings.
			Eastern parcel (outdoors)	Commercial/industrial worker	Adult	Inhalation	On-site	Quant	Future site workers could be exposed to volatiles emanating from soil.
				Construction worker	Adult	Inhalation	On-site	Quant	Future construction workers could be exposed to vapors
	Solid waste	Solid Waste	Eastern parcel	Commercial/industrial worker	Adult	Ingestion	On-site	None	All features are enclosed. No exposure expected.
						Dermal contact	On-site	None	All features are enclosed. No exposure expected.
				Construction worker	Adult	Ingestion	On-site	Quant	Construction workers could come in contact with materials during construction.
						Dermal contact	On-site	Quant	Construction workers could come in contact with materials during construction.
		Particulates	Eastern parcel	Commercial/industrial worker	Adult	Inhalation	On-site	None	All features are enclosed. No exposure expected.
				Construction worker	Adult	Inhalation	On-site	Quant	Construction workers could come in contact with materials during construction.
		Vapors	Eastern parcel (indoors)	Commercial/industrial worker	Adult	Inhalation	On-site	Quant	Site workers could inhale volatiles from features located inside buildings
			Eastern parcel (outdoors)	Commercial/industrial worker	Adult	Inhalation	On-site	Quant	Site workers could inhele volatiles from features located outside.
				Construction worker	Adult	Inhalation	On-site	Quant	Construction workers could come in contact with materials during construction.
	Liquid waste	Liquid waste	Eastern parcel	Commercial/industrial worker	Adult	Ingestion	On-site	None	All features are enclosed. No exposure expected.
						Dermal contact	On-site	None	All features are enclosed. No exposure expected.
				Construction worker	Adult	Ingestion	On-site	None	Ingestion exposure expected to be insignificant.
						Dermal contact	On-site	Quant	Construction workers could come in contact with materials during construction.
		Vapors	Eastern parcel (indoors)	Commercial/industrial worker	Adult	Inhalation	On-site	Quant	Site workers could inhale volatiles from features located inside buildings
			Eastern parcel (outdoors)	Commercial/industrial worker	Adult	Inhalation	On-site	Quant	Site workers could inhale volatiles from features located outside.
				Construction worker	Adult	Inhalation	On-site	Quant	Construction workers could come in contact with materials during construction.

Quant = Evaluated quantitatively
Qual = Evalauted qualitatively

TABLE 1.3
SELECTION OF EXPOSURE PATHWAYS - OFFSITE RESIDENTIAL AREAS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationala for Selection or Exclusion of Exposure Pathway
Current	Subsurface soil	Soil	Ellsworth Allen Park	Other Recreational User	Pre-adolescent (6-18)	Ingestion	Off-site	None	No current exposura to subsurface soil
						Dermal contact	Off-site	None	No current exposure to subsurface soil
		Particulates	Ellsworth Allen Park	Other Recreational User	Pre-adolescent (6-18)	Inahaltion	Off-site	None	No current exposure to subsurface soil
	Groundwater (Upper Glacial)	Groundwater	Offsite residential areas (tap)	Resident	Child/Adult	Ingestion	Off-site	None	No current use of groundwater within Upper Glacial aquifer.
		Vapors	Offsite residential areas (tap)	Resident	Child/Adult	Inhalation	Off-site	None	No current use of groundwater within Upper Glacial aquifer.
			Offsite residential areas (indoors)	Resident	Child/Adult	Inhalation	Off-site	Quant	Volatiles are present in groundwater beneath homes.
				School child	Pre-adolescent (6-12)	Inhalation	Off-site	Quant	Volatiles are present in groundwater beneath a school. School children could be exposed.
				School employee	Adult	Inhalation	Off-site	Quant	Volatiles are present in groundwater beneath a school. School employees could be exposed.
			Offsite residential areas (outdoors)	Resident	Child/Adult	Inhalation	Off-site	Quant	Volatiles are present in groundwater beneath homes.
	Groundwater (Magothy)	Groundwater	Offsite residential areas (tap)	Resident	Child/Adult	Ingestion	Off-site	None	No current use of groundwater within impacted area.
						Dermal contact	Off-site	None	No current use of groundwater within impacted area.
		Vapors	Offsite residential areas (tap)	Resident	Child/Adult	Inhalation	Off-site	None	No current use of groundwater within impacted area.
			Offsite residential areas (indoors)	Resident	Child/Adult	Inhalation	Off-site	None	Vapors from Magothy Aquifer insignificant as compared with vapors from Upper Glacial Aquifer.
				School child	Pre-adolescent (6-12)	Inhalation	Off-site	None	Vapors from Magothy Aquifer insignificant as compared with vapors from Upper Glacial Aquifer.
				School employee	Adult	Inhalation	Off-site	None	Vapors from Magothy Aquifer insignificant as compared with vapors from Upper Glacial Aquifer.
			Offsite residential areas (outdoors)	Resident	Child/Adult	Inhalation	Off-site	None	Vapors from Magothy Aquifer insignificant as compared with vapors from Upper Glacial Aquifer.

TABLE 1.3
SELECTION OF EXPOSURE PATHWAYS - OFFSITE RESIDENTIAL AREAS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future	Subsurface soil	Soil	Ellsworth Allen Park	Other Recreational User	Pre-adolescent (6-18)	Ingestion	Off-site	Quant	If subsurface soil is brought to the surface, exposure could occur during recreational activities
						Dermal contact	Off-site	Quant	If subsurface soil is brought to the surface, exposure could occur during recreational activities
		Particulates	Ellsworth Allen Park	Other Recreational User	Pre-adolescent (6-18)	Inahaltion	Off-site	Quant	If subsurface soil is brought to the surface, exposure could occur during recreational activities
	Groundwater (Upper Glacial)	Groundwater	Offsite residential areas (tap)	Resident	Child/Adult	Ingestion	Off-site	Quant	Although unlikely, groundwater in the Upper Glacial Aquifer in the impacted area could potentially be used as a public potable water supply in the future. Nassau County Public Health Ordinance (Article IV) prevents the installation and use of new private water system wells.
		Vapors	Offsite residential areas (tap)	Resident	Child/Adult	Inhalation	Off-site	Quant	Although unlikely, groundwater in the Upper Glacial Aquifer in the impacted area could potentially be used as a public potable water supply in the future. Nassau County Public Health Ordinance (Article IV) prevents the installation and use of new private water system wells.
	Groundwater (Magothy)	Groundwater	Offsite residential areas (tap)	Resident	Child/adult	Ingestion	Off-site	Quant	Although unlikely, groundwater in the Magothy Aquifer in the impacted area could potentially be used as a public potable water supply in the future. Nassau County Public Health Ordinance (Article IV) prevents the installation and use of new private water system wells.
						Dermal contact	Off-site	Quant	Although unlikely, groundwater in the Magothy Aquifer in the impacted area could potentially be used as a public potable water supply in the future. Nassau County Public Health Ordinance (Article IV) prevents the installation and use of new private water system wells.
		Vapors	Offsite residential areas (tap)	Resident	Child/adult	Inhalation	Off-site	Quant	Although unlikely, groundwater in the Magothy Aquifer in the impacted area could potentially be used as a public potable water supply in the future. Nassau County Public Health Ordinance (Article IV) prevents the installation and use of new private water system wells.

Quant = Evaluated quantitatively
Qual = Evalauted qualitatively

TABLE 1.4
SELECTION OF EXPOSURE PATHWAYS - MASSAPEQUA PRESERVE
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	On-Site/ Off-Site	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Surface water	Surface water	Massapequa Preserve	Swimmer	Pre-adolescent (6-12	Ingestion	Off-site	Quant	Users of creeks and ponds could have incidental ingestion of impacted surface water.
						Dermal contact	Off-site	Quant	Users of creeks and ponds could have contact with impacted surface water.
	Sediment	Sediment	Massapequa Preserve	Swimmer	Pre-adolescent (6-12	Ingestion	Off-site	Quant	Users of creeks and ponds could have incidental ingestion of impacted sediments.
						Dermal contact	Off-site	Quant	Users of creeks and ponds could have contact with impacted sediments.
	Other	Animal tissue	Massapequa Preserve	Fisher	Child/Adult	Ingestion	Off-site	Qual	Fishers could ingest fish from impacted creek or ponds. Because only lead was selected as a COPC, pathway will be evaluated qualitatively

Quant = Evaluated quantitatively
Qual = Evalauted qualitatively

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TABLE 2.4
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Upper Glacial)
Exposure Medium: Groundwater
Exposure Point: Western Parcel (Tap)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
57125	Cyanide	31.1		540		ug/l	MW-2 11/8/91	13/30	2-10	540		7.3E+01 N	200	NY DEC 703	YES	ASL
14790558	Nitrate	0.0013		0.0045		ug/l	MW-2B 4/7/98	2/2	0-0	0.0045		5.8E+03 N	10000	NY DEC 703	NO	BSL
7429905	Aluminum	55	B2N*J	7060		ug/l	MW-18-02 7/27/92	13/24	38-66.9	7060	451	3.7E+03 N			YES	ASL
7440382	Arsenic	1	B2	4.5	B2	ug/l	MW-6-01 3/27/92	6/26	1-3.5	4.5		4.5E-02 C	25	NY DEC 703	YES	ASL
7440393	Barium	5	B2	80	B2	ug/l	MW-7B-01 3/27/92	28/28	0-0	80	30	2.6E+02 N	1000	NY DEC 703	NO	BSL
7440417	Beryllium	0.78	BJ	0.78	BJ	ug/l	MW-6B-02 7/31/92	1/28	0.2-1	0.78		7.3E+00 N	3	NY DEC 703	NO	IFD
7440439	Cadmium	4.3	B2	609		ug/l	MW-2-02 7/27/92	28/29	4-4	609		3.7E+00 N	5	NY DEC 703	YES	ASL
7440702	Calcium	14200		61300		ug/l	MW-7A 4/7/98	28/28	0-0	61300	18400				NO	NUT
7440473	Chromium	8.4	B	888		ug/l	MW-18-02 7/27/92	29/29	0-0	888	14	1.1E+01 N	50	NY DEC 703	YES	ASL
18540299	Chromium VI	37.25		6.3	J	ug/l	MW-6-01 3/27/92	12/16	10-1	6.3		1.1E+01 N	50	NY DEC 703	NO	BSL
7440484	Cobalt	1.7	B	8	B	ug/l	MW-7A 4/7/98	8/28	1.5-4	8	1.4	2.2E+02 N			NO	BSL
7440508	Copper	3.2	B	149		ug/l	MW-18-02 7/27/92	19/28	2.9-8	149		1.5E+02 N	200	NY DEC 703	YES	ASL
7439896	Iron	58.2	B	7690		ug/l	MW-6-01 3/27/92	24/28	47.1-47.5	7690	821	1.1E+03 N	300	NY DEC 703	NO	NUT
7439921	Lead	1.9	B2WJ	9.3		ug/l	MW-2-02 7/27/92	12/23	2-2.9	9.3		1.5E+01	25	NY DEC 703	NO	BSL
7439954	Magnesium	1280	B	5090		ug/l	MW-2-02 7/27/92	28/28	0-0	5090	2520		35000	NY DEC 703	NO	NUT
7439965	Manganese	1.8	B	2890	J	ug/l	MW-7B-02 7/31/92	26/28	1.6-4.4	2890	17.1	7.3E+01 N	300	NY DEC 703	YES	ASL
7439976	Mercury	0.2		0.2		ug/l	MW-18-02 7/27/92	1/26	0.1-0.2	0.2		3.7E-01 N			NO	IFD
7440020	Nickel	3.8	B	141		ug/l	MW-2-02 7/27/92	23/28	3.9-7	141	11.6	7.3E+01 N	100	NY DEC 703	YES	ASL
7440097	Potassium	1720	B	26000	J	ug/l	MW-6-01 3/27/92	28/28	0-0	26000	2360				NO	NUT
7782492	Selenium	1	B2WJ	2.5	B2WJ	ug/l	MW-1-01 3/30/92	2/28	1-4.7	2.5		1.8E+01 N	10	NY DEC 703	NO	BSL
7440235	Sodium	2420	B	40400	J	ug/l	MW-7B-02 7/31/92	28/28	0-0	40400	26700		20000	NY DEC 703	NO	NUT
7440280	Thallium	4.6	B2JN	40.6	B2JNM	ug/l	MW-7B 1/10/92	2/28	1-16	40.6		2.6E-01 N	0.5	NY DEC 703	YES	ASL
7440622	Vanadium	2.7	B	13.5	B	ug/l	MW-18-02 7/27/92	6/28	1.6-5	13.5		2.6E+01 N			NO	BSL
7440666	Zinc	7.1	BJ	456		ug/l	MW-2-02 7/27/92	26/27	11-11	456	30.2	1.1E+03 N	2000	NY DEC 703	NO	BSL
72559	4,4'-DDE	0.0052	J	0.0052	J	ug/l	MW-6-02 7/31/92	1/14	0.1-0.12	0.0052		2.0E-01 C	0.3	NY DEC 703	NO	BSL
309002	Aldrin	0.002	JN	0.002	JN	ug/l	MW-6B-02 7/31/92	1/13	0.05-0.062	0.002		3.9E-03 C			NO	BSL
5103719	alpha-Chlordane	0.05	J	0.05	J	ug/l	MW-6-02 7/31/92	1/14	0.05-0.062	0.05		1.9E-01 C	0.05	NY DEC 703	YES	ASL
60571	Dieldrin	0.004	J	0.0056	JN	ug/l	MW-1-02 7/27/92	2/13	0.1-0.12	0.0056		4.2E-03 C	0.004	NY DEC 703	YES	ASL
1031078	Endosulfan sulfate	0.0035	J	0.0035	J	ug/l	MW-2-02 7/27/92	1/13	0.1-0.12	0.0035		2.2E+01 N			NO	BSL
5103742	gamma-Chlordane	0.05	JN	0.05	JN	ug/l	MW-6-02 7/31/92	1/14	0.05-0.062	0.05		1.9E-01 C	0.05	NY DEC 703	YES	ASL
117817	bis(2-Ethylhexyl)phthalate	0.6	J	400	J	ug/l	MW-18-02 7/27/92	6/14	10-12	400		4.8E+00 C	5	NY DEC 703	YES	ASL
218019	Chrysene	0.8	J	3	J	ug/l	MW-6-02 7/31/92	2/14	10-12	3		9.2E+00 C	0.002	NY DEC 703	YES	ASL
84742	Di-n-butyl phthalate	1	J	3	J	ug/l	MW-6-02 7/31/92	3/14	10-12	3		3.7E+02 N	50	NY DEC 703	NO	BSL
84662	Diethyl phthalate	1	J	1	J	ug/l	MW-6B-02 7/31/92	1/14	10-12	1		2.9E+03 N	50	NY DEC 703	NO	BSL
87865	Pentachlorophenol	3	J	3	J	ug/l	MW-6-02 7/31/92	1/14	25-31	3		5.6E-01 C	1	NY DEC 703	YES	ASL
129000	Pyrene	1	J	1	J	ug/l	MW-6-02 7/31/92	1/14	10-12	1		1.8E+01 N	50	NY DEC 703	NO	BSL
71556	1,1,1-Trichloroethane	0.2	J	180	J	ug/L	MW-7-02 7/30/92	13/30	0.3-100	180		5.4E+01 N	5	NY DEC 703	YES	ASL
75343	1,1-Dichloroethane	0.2	J	58	J	ug/L	MW-7-02 7/30/92	9/30	0.2-100	58		79.84375 N	5	NY DEC 703	YES	ASL
540590	1,2-Dichloroethene (total)	4	J	1800	D	ug/l	MW-2 11/8/91	10/20	10-10	1800		6.5E+00 N	5	NY DEC 703	YES	ASL

TABLE 2.4
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Upper Glacial)
Exposure Medium: Groundwater
Exposure Point: Western Parcel (Tap)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
591786	2-Hexanone	10	J	10	J	ug/L	MW-1-01 3/30/92	3/30	1-120	10		1.5E+02	N	50	NY DEC 703	NO	BSL
67641	Acetone	8	JN	310		ug/l	MW-7A 8/19/98	2/30	0.8-100	310		6.1E+01	N	80	NY DEC 703	YES	ASL
71432	Benzene	2	J	2	J	ug/l	MW-6-01 3/27/92	1/30	0.3-100	2		3.6E-01	C	1	NY DEC 703	NO	IFD
56235	Carbon tetrachloride	1		1		ug/l	MW-2B 4/7/98	1/30	0.2-100	1		1.6E-01	C	5	NY DEC 703	NO	IFD
67663	Chloroform	0.3	J	0.7		ug/l	MW-2B 4/7/98	2/30	0.3-100	0.7	0.6	6.3E-02	N	7	NY DEC 703	YES	ASL
156592	cis-1,2-Dichloroethene	0.2	J	810		ug/l	MW-2A 4/7/98	7/10	0.3-1	610		6.1E+00	N	5	NY DEC 703	YES	ASL
75092	Methylene chloride	0.2	J	1	JB	ug/l	MW-18 4/14/98	2/30	0.4-100	1		4.1E+00	C	5	NY DEC 703	NO	BSL
1634044	MTBE	7	NJ	19		ug/l	MW-2B 4/7/98	2/6	5-100	19		6.3E+02	N			NO	BSL
127184	Tetrachloroethene	8.7		21	J	ug/l	MW-6-02 7/31/92	11/30	0.2-100	21	0.3	1.1E+00	C	5	NY DEC 703	YES	ASL
156605	trans-1,2-Dichloroethene	7	J	7	J	ug/l	MW-2A 4/7/98	1/10	0.3-29	7		1.2E+01	N	5	NY DEC 703	YES	ASL
79016	Trichloroethene	0.2	J	1700	J	ug/l	MW-7-02 7/30/92	22/30	10-10	1700		1.6E+00	C	5	NY DEC 703	YES	ASL

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) U.S. EPA Region III Risk-Based Concentrations for tap water (10/98)
For chromium, used the RBC for chromium VI
For lead, used Drinking Water Regulations and Health Advisories Action Level
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin ketone, used endrin RBC
For endosulfan II and endosulfan sulfate used RBC for endosulfan
For acenaphthylene, benzo(g,h,i)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethene used most RBC for most toxic of cis- and trans- isomers
For 2-nitroanaline used Region 9 PRG.
(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
The iron concentration does not pose an adverse effect at the site
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions: COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.5
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current & Future
Medium: Groundwater (Upper Glacial)
Exposure Medium: Vapors
Exposure Point: Western Parcel (Indoors and Outdoors)

CAS Number	Chemical	(1) Minimum Concentration	Minimum Qualifier	(1) Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	(2) Background Value	(3) Screening Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	(4) Rationale for Contaminant Deletion or Selection
57125	Cyanide	31.1		540		ug/l	MW-2 11/8/91	13/30	2-10	540		Not Volatile	200	NY DEC 703	NO	NV
14790558	Nitrate	0.0013		0.0045		ug/l	MW-2B 4/7/98	2/2	0-0	0.0045		Not Volatile	10000	NY DEC 703	NO	NV
7429905	Aluminum	85	B2N*J	7060		ug/l	MW-18-02 7/27/92	13/24	36-86.9	7060	451	Not Volatile			NO	NV
7440382	Arsenic	1	B2	4.5	B2	ug/l	MW-6-01 3/27/92	5/25	1-3.5	4.5		Not Volatile	25	NY DEC 703	NO	NV
7440393	Barium	5	B2	80	B2	ug/l	MW-7B-01 3/27/92	28/28	0-0	80	30	Not Volatile	1000	NY DEC 703	NO	NV
7440417	Beryllium	0.78	BJ	0.78	BJ	ug/l	MW-6B-02 7/31/92	1/28	0.2-1	0.78		Not Volatile	3	NY DEC 703	NO	NV
7440439	Cadmium	4.3	B2	609		ug/l	MW-2-02 7/27/92	28/29	4-4	609		Not Volatile	5	NY DEC 703	NO	NV
7440702	Calcium	14200		61300		ug/l	MW-7A 4/7/98	28/28	0-0	61300	18400	Not Volatile			NO	NV
7440473	Chromium	5.4	B	888		ug/l	MW-18-02 7/27/92	29/29	0-0	888	14	Not Volatile	50	NY DEC 703	NO	NV
18540299	Chromium VI	37.25		8.3	J	ug/l	MW-6-01 3/27/92	12/16	10-1	6.3		Not Volatile	50	NY DEC 703	NO	NV
7440484	Cobalt	1.7	B	8	B	ug/l	MW-7A 4/7/98	8/28	1.5-4	8	1.4	Not Volatile			NO	NV
7440508	Copper	3.2	B	149		ug/l	MW-18-02 7/27/92	19/28	2.9-8	149		Not Volatile	200	NY DEC 703	NO	NV
7439896	Iron	58.2	B	7690		ug/l	MW-6-01 3/27/92	24/28	47.1-47.5	7690	821	Not Volatile	300	NY DEC 703	NO	NV
7439921	Lead	1.9	B2WJ	9.3		ug/l	MW-2-02 7/27/92	12/23	2-2.9	9.3		Not Volatile	25	NY DEC 703	NO	NV
7439954	Magnesium	1280	B	5090		ug/l	MW-2-02 7/27/92	28/28	0-0	5090	2520	Not Volatile	35000	NY DEC 703	NO	NV
7439965	Manganese	1.8	B	2890	J	ug/l	MW-7B-02 7/31/92	26/28	1.8-4.4	2890	17.1	Not Volatile	300	NY DEC 703	NO	NV
7439976	Mercury	0.2		0.2		ug/l	MW-18-02 7/27/92	1/26	0.1-0.2	0.2		Not Volatile			NO	NV
7440020	Nickel	3.8	B	141		ug/l	MW-2-02 7/27/92	23/28	3.9-7	141	11.5	Not Volatile	100	NY DEC 703	NO	NV
7440097	Potassium	1720	B	26000	J	ug/l	MW-6-01 3/27/92	28/28	0-0	26000	2360	Not Volatile			NO	NV
7782492	Selenium	1	B2WJ	2.5	B2WJ	ug/l	MW-1-01 3/30/92	2/28	1-4.7	2.5		Not Volatile	10	NY DEC 703	NO	NV
7440235	Sodium	2420	B	40400	J	ug/l	MW-7B-02 7/31/92	28/28	0-0	40400	26700	Not Volatile	20000	NY DEC 703	NO	NV
7440280	Thallium	4.5	B2JN	40.5	B2JNM	ug/l	MW-7B 1/10/92	2/28	1-15	40.5		Not Volatile	0.5	NY DEC 703	NO	NV
7440622	Vanadium	2.7	B	13.5	B	ug/l	MW-18-02 7/27/92	8/28	1.6-5	13.5		Not Volatile			NO	NV
7440666	Zinc	7.1	BJ	456		ug/l	MW-2-02 7/27/92	26/27	11-11	456	30.2	Not Volatile	2000	NY DEC 703	NO	NV
72559	4,4'-DDE	0.0052	J	0.0052	J	ug/l	MW-6-02 7/31/92	1/14	0.1-0.12	0.0052		Not Volatile	0.3	NY DEC 703	NO	NV
309002	Aldrin	0.002	JN	0.002	JN	ug/l	MW-6B-02 7/31/92	1/13	0.05-0.062	0.002		Not Volatile			NO	NV
5103719	alpha-Chlordane	0.05	J	0.05	J	ug/l	MW-6-02 7/31/92	1/14	0.05-0.062	0.05		Not Volatile	0.05	NY DEC 703	NO	NV
60571	Dieldrin	0.004	J	0.0056	JN	ug/l	MW-1-02 7/27/92	2/13	0.1-0.12	0.0056		Not Volatile	0.004	NY DEC 703	NO	NV
1031078	Endosulfan sulfate	0.0035	J	0.0035	J	ug/l	MW-2-02 7/27/92	1/13	0.1-0.12	0.0035		Not Volatile			NO	NV
5103742	gamma-Chlordane	0.05	JN	0.05	JN	ug/l	MW-6-02 7/31/92	1/14	0.05-0.062	0.05		Not Volatile	0.05	NY DEC 703	NO	NV
117817	bis(2-Ethylhexyl)phthalate	0.6	J	400	J	ug/l	MW-18-02 7/27/92	6/14	10-12	400		Not Volatile	5	NY DEC 703	NO	NV
218019	Chrysene	0.8	J	3	J	ug/l	MW-6-02 7/31/92	2/14	10-12	3		Not Volatile	0.002	NY DEC 703	NO	NV

TABLE 2.5
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current & Future
Medium: Groundwater (Upper Glacial)
Exposure Medium: Vapors
Exposure Point: Western Parcel (Indoors and Outdoors)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
84742	Di-n-butyl phthalate	1	J	3	J	ug/l	MW-6-02 7/31/92	3/14	10-12	3		Not Volatile		50	NY DEC 703	NO	NV
84662	Diethyl phthalate	1	J	1	J	ug/l	MW-6B-02 7/31/92	1/14	10-12	1		Not Volatile		50	NY DEC 703	NO	NV
87865	Pentachlorophenol	3	J	3	J	ug/l	MW-6-02 7/31/92	1/14	25-31	3		Not Volatile		1	NY DEC 703	NO	NV
129000	Pyrene	1	J	1	J	ug/l	MW-6-02 7/31/92	1/14	10-12	1		Not Volatile		50	NY DEC 703	NO	NV
71556	1,1,1-Trichloroethane	0.2	J	180	J	ug/L	MW-7-02 7/30/92	13/30	0.3-100	180		5.4E+01	N	5	NY DEC 703	YES	ASL
75343	1,1-Dichloroethane	0.2	J	58	J	ug/L	MW-7-02 7/30/92	9/30	0.2-100	58		8.0E+01	N	5	NY DEC 703	YES	ASL
540590	1,2-Dichloroethene (total)	4	J	1800	D	ug/l	MW-2 11/8/91	10/20	10-10	1800		5.5E+00	N	5	NY DEC 703	YES	ASL
591786	2-Hexanone	10	J	10	J	ug/L	MW-1-01 3/30/92	3/30	1-120	10		1.5E+02	N	50	NY DEC 703	NO	BSL
67641	Acetone	5	JN	310		ug/l	MW-7A 8/19/98	2/30	0.8-100	310		6.1E+01	N	50	NY DEC 703	YES	ASL
71432	Benzene	2	J	2	J	ug/l	MW-6-01 3/27/92	1/30	0.3-100	2		3.6E-01	C	1	NY DEC 703	NO	IFD
56235	Carbon tetrachloride	1		1		ug/l	MW-2B 4/7/98	1/30	0.2-100	1		1.6E-01	C	5	NY DEC 703	NO	IFD
67663	Chloroform	0.3	J	0.7		ug/l	MW-2B 4/7/98	2/30	0.3-100	0.7	0.6	6.3E-02	N	7	NY DEC 703	YES	ASL
156592	cis-1,2-Dichloroethene	0.2	J	810		ug/l	MW-2A 4/7/98	7/10	0.3-1	810		6.1E+00	N	5	NY DEC 703	YES	ASL
75092	Methylene chloride	0.2	J	1	JB	ug/l	MW-18 4/14/98	2/30	0.4-100	1		4.1E+00	C	5	NY DEC 703	NO	BSL
1634044	MTBE	7	NJ	19		ug/l	MW-2B 4/7/98	2/6	5-100	19		6.3E+02	N			NO	BSL
127184	Tetrachloroethene	0.7		21	J	ug/l	MW-6-02 7/31/92	11/30	0.2-100	21	0.3	1.1E+00	C	5	NY DEC 703	YES	ASL
156605	trans-1,2-Dichloroethene	7	J	7	J	ug/l	MW-2A 4/7/98	1/10	0.3-29	7		1.2E+01	N	5	NY DEC 703	YES	ASL
79016	Trichloroethene	0.2	J	1700	J	ug/l	MW-7-02 7/30/92	22/30	10-10	1700		1.6E+00	C	5	NY DEC 703	YES	ASL

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) U.S. EPA Region III Risk-Based Concentrations for tap water (10/98)
For chromium, used the RBC for chromium VI
For lead, used Drinking Water Regulations and Health Advisories Action Level
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin ketone, used endrin RBC
For endosulfan II and endosulfan sulfate used RBC for endosulfan
For acenaphthylene, benzo(g,h,i)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethene used most RBC for most toxic of cis- and trans- isomers
For 2-nitroanaline used Region 9 PRG.
(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions:
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2 6
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Magothy)
Exposure Medium: Groundwater
Exposure Point: Western Parcel (Tap)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
14790558	Nitrate	0.0038		0.0046		ug/l	MW-2C 4/7/98	2/2	0-0	0.0046		5.8E+03	N	10000	NY DEC 703	NO	BSL
7429905	Aluminum	274		686		ug/l	MW-2C 4/7/98	4/4	0-0	688		3.7E+03	N			NO	BSL
7440393	Barium	27.2	B	34.7	B	ug/l	MW-2C 4/7/98	4/4	0-0	34.7		2.6E+02	N	1000	NY DEC 703	NO	BSL
7440702	Calcium	2350	B	3430	B	ug/l	MW-2C 4/7/98	4/4	0-0	3430						NO	NUT
7440473	Chromium	1.6	B	10.2		ug/l	MW-2C 4/7/98	4/4	0-0	10.2		1.1E+01	N	50	NY DEC 703	NO	BSL
7440484	Cobalt	1.9	B	8.4	B	ug/l	MW-6D 4/14/98	4/4	0-0	6.4		2.2E+02	N			NO	IFD
7440508	Copper	3	B	3	B	ug/l	MW-2C 4/7/98	1/4	2.9-5	3		1.5E+02	N	200	NY DEC 703	NO	BSL
7439896	Iron	215		812		ug/l	MW-2C 4/7/98	4/4	0-0	812		1.1E+03	N	300	NY DEC 703	NO	NUT
7439954	Magnesium	1240	B	1580	B	ug/l	MW-2C 4/7/98	4/4	0-0	1580				35000	NY DEC 703	NO	NUT
7439965	Manganese	83		99.7		ug/l	MW-6D 8/18/98	4/4	0-0	99.7		7.3E+01	N	300	NY DEC 703	YES	ASL
7440020	Nickel	9	B	14.1	B	ug/l	MW-6D 8/18/98	4/4	0-0	14.1		7.3E+01	N	100	NY DEC 703	NO	BSL
7440097	Potassium	1050	B	1310	B	ug/l	MW-2C 4/7/98	4/4	0-0	1310						NO	NUT
7440235	Sodium	7770		11000	J	ug/l	MW-2C 8/18/96	4/4	0-0	11000				20000	NY DEC 703	NO	NUT
7440622	Vanadium	2.7	B	3.5	B	ug/l	MW-2C 4/7/98	2/4	1.6-1.6	3.5		2.6E+01	N			NO	BSL
7440666	Zinc	20.2		22.1		ug/l	MW-2C 4/7/98	4/4	0-0	22.1		1.1E+03	N	2000	NY DEC 703	NO	BSL
71556	1,1,1-Trichloroethane	0.2	J	0.3		ug/L	MW-2C 4/7/98	4/4	0-0	0.3		5.4E+01	N	5	NY DEC 703	NO	BSL
75343	1,1-Dichloroethane	0.3		0.4		ug/L	MW-2C 4/7/98	4/4	0-0	0.4		8.0E+01	N	5	NY DEC 703	NO	IFD
67663	Chloroform	0.1	J	0.2	J	ug/l	MW-2C 4/7/98	4/4	0-0	0.2	0.72	6.3E-02	N	7	NY DEC 703	NO	BKG
156592	cis-1,2-Dichloroethene	0.1	J	0.1	J	ug/l	MW-2C 8/18/98	1/4	0.3-0.3	0.1		6.1E+00	N	5	NY DEC 703	NO	BSL
79016	Trichloroethene	0.1	J	1		ug/l	MW-2C 8/18/98	4/4	0-0	1		1.6E+00	C	5	NY DEC 703	NO	BSL

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) U.S. EPA Region III Risk-Based Concentrations for tap water (10/98)
For chromium, used the RBC for chromium VI
For lead, used Drinking Water Regulations and Health Advisories Action Level
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin ketone, used endrin RBC
For endosulfan II and endosulfan sulfate used RBC for endosulfan
For acenaphthylene, benzo(g,h,i)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethene used most RBC for most toxic of cis- and trans- isomers
For 2-nitroanaline used Region 9 PRG.

(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
The iron concentration does not pose an adverse effect at the site
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions: COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.7
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Magothy)
Exposure Medium: Vapors
Exposure Point: Western Parcel (Tap)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
14790558	Nitrate	0.0038		0.0046		ug/l	MW-2C 4/7/98	2/2	0-0	0.0046		Not Volatile N	10000	NY DEC 703	NO	NV
7429905	Aluminum	274		888		ug/l	MW-2C 4/7/98	4/4	0-0	688		Not Volatile N			NO	NV
7440393	Barium	27.2	B	34.7	B	ug/l	MW-2C 4/7/98	4/4	0-0	34.7		Not Volatile N	1000	NY DEC 703	NO	NV
7440702	Calcium	2350	B	3430	B	ug/l	MW-2C 4/7/98	4/4	0-0	3430		Not Volatile			NO	NV
7440473	Chromium	1.6	B	10.2		ug/l	MW-2C 4/7/98	4/4	0-0	10.2		Not Volatile N	50	NY DEC 703	NO	NV
7440484	Cobalt	1.9	B	6.4	B	ug/l	MW-6D 4/14/98	4/4	0-0	6.4		Not Volatile N			NO	NV
7440508	Copper	3	B	3	B	ug/l	MW-2C 4/7/98	1/4	2.9-5	3		Not Volatile	200	NY DEC 703	NO	NV
7439896	Iron	215		812		ug/l	MW-2C 4/7/98	4/4	0-0	812		Not Volatile	300	NY DEC 703	NO	NUT
7439954	Magnesium	1240	B	1580	B	ug/l	MW-2C 4/7/98	4/4	0-0	1580		Not Volatile	35000	NY DEC 703	NO	NV
7439965	Manganese	53		89.7		ug/l	MW-6D 8/18/98	4/4	0-0	89.7		Not Volatile	300	NY DEC 703	NO	NV
7440020	Nickel	9	B	14.1	B	ug/l	MW-6D 8/18/98	4/4	0-0	14.1		Not Volatile	100	NY DEC 703	NO	NV
7440097	Potassium	1050	B	1310	B	ug/l	MW-2C 4/7/98	4/4	0-0	1310		Not Volatile			NO	NV
7440235	Sodium	7770		11000	J	ug/l	MW-2C 8/18/98	4/4	0-0	11000		Not Volatile	20000	NY DEC 703	NO	NV
7440622	Vanadium	2.7	B	3.5	B	ug/l	MW-2C 4/7/98	2/4	1.6-1.6	3.5		Not Volatile			NO	NV
7440666	Zinc	20.2		22.1		ug/l	MW-2C 4/7/98	4/4	0-0	22.1		Not Volatile	2000	NY DEC 703	NO	NV
71556	1,1,1-Trichloroethane	0.2	J	0.3		ug/L	MW-2C 4/7/98	4/4	0-0	0.3		5.4E+01 N	5	NY DEC 703	NO	BSL
75343	1,1-Dichloroethane	0.3		0.4		ug/L	MW-2C 4/7/98	4/4	0-0	0.4		8 0E+01 N	5	NY DEC 703	NO	IFD
67663	Chloroform	0.1	J	0.2	J	ug/l	MW-2C 4/7/98	4/4	0-0	0.2	0.72	6.3E-02 N	7	NY DEC 703	NO	BKG
156592	cis-1,2-Dichloroethene	0.1	J	0.1	J	ug/l	MW-2C 8/18/98	1/4	0.3-0.3	0.1		6 1E+00 N	5	NY DEC 703	NO	BSL
79016	Trichloroethene	0.1	J	1		ug/l	MW-2C 8/18/98	4/4	0-0	1		1.6E+00 C	5	NY DEC 703	NO	BSL

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) U.S. EPA Region III Risk-Based Concentrations for tap water (10/98)
For chromium, used the RBC for chromium VI
For lead, used Drinking Water Regulations and Health Advisories Action Level
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin ketone, used endrin RBC
For endosulfan II and endosulfan sulfate used RBC for endosulfan
For acenaphthylene, benzo(g,h,i)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethene used most RBC for most toxic of cis- end trans- Isomers
For 2-nitroanaline used Region 9 PRG.

Definitions:
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.7
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Magothy)
Exposure Medium: Vapors
Exposure Point: Western Parcel (Tap)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)

(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
The Iron concentration does not pose an adverse effect at the site

(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

TABLE 2.8
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Soil & Particulates
Exposure Point: Eastern Parcel

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
57125	Cyanide	1.1		967	*	mg/kg	TP-54-7-7_5 02/04/92	10/59	0.51-23.6	967		1.6E+02 N			YES	ASL
7429905	Aluminum	465	*	32900		mg/kg	SB-12-1-1_7 01/13/92	59/59	0-0	32900	33000	7.8E+03 N			NO	BKG
7440360	Antimony	0.62		22.8		mg/kg	SB-35-5_5-10 02/20/92	12/59	0.44-28.2	22.8		3.1E+00 N			YES	ASL
7440382	Arsenic	0.41	BNJ	17	JN*	mg/kg	SB-33-11-14 01/27/92	39/53	0.41-0.46	17	7.5	4.3E-02 C			YES	ASL
7440393	Barium	0.62	B2	281		mg/kg	SB-35-8_5-10 02/20/92	58/59	0.19-0.19	281	300	5.5E+02 N			NO	BKG
7440417	Beryllium	0.04		0.7	B2	mg/kg	SB-12-1-1_7 01/13/92	28/59	0.04-0.91	0.7	0.16	1.6E+01 N			NO	BSL
7440439	Cadmium	0.08		4300		mg/kg	SB-2 0.0838	87/133	0.06-0.34	4300	1	7.8E+00 N			YES	ASL
7440702	Calcium	36.7	B2	67500		mg/kg	SB-12-1-1_7 01/13/92	59/59	0-0	67500	35000				NO	NUT
7440473	Chromium	1.19		97000		mg/kg	SB-2 0.0838	135/138	0-0	97000	40	2.3E+01 N			YES	ASL
18540299	Chromium VI	2.1		41.8		mg/kg	SL-04_0_5-1_0 5/22/97	8/11	2-2	41.8		2.3E+01 N			YES	ASL
7440484	Cobalt	0.29		11.1	B2	mg/kg	SB-33-11-14 01/27/92	51/59	0.58-0.66	11.1	30	4.7E+02 N			NO	BKG
7440508	Copper	1.2		1850	JN*	mg/kg	SB-33-11-14 01/27/92	82/56	0.58-3.1	1950	25	3.1E+02 N			YES	ASL
7439896	Iron	1070		17800		mg/kg	SB-33-11-14 01/27/92	58/58	0-0	17800	2000	2.3E+03 N			NO	NUT
7439921	Lead	0.56	BNJ	1220	S*	mg/kg	SB-35-5_5-10 02/20/92	57/58	0.43-0.43	1220	400	4.0E+02			YES	ASL
7439954	Magnesium	69.4		1620		mg/kg	TP-54-7-7_5 02/04/92	59/59	0-0	1620	5000				NO	NUT
7439965	Manganese	5.5		218		mg/kg	B-02-SL_4-8 5/9/97	53/53	0-0	218	5000	1.6E+02 N			NO	BKG
7439976	Mercury	0.12		3.2		mg/kg	SB-33-11-14 01/27/92	13/89	0.05-0.87	3.2	0.1	7.8E-01 N			YES	ASL
7440020	Nickel	0.99	B2JN*	708	NJ	mg/kg	TP-53-3_5-8 02/04/92	57/89	0.78-0.88	708	13	1.6E+02 N			YES	ASL
7440097	Potassium	61.9		1040	B	mg/kg	TP-54-7-7_5 02/04/92	59/59	0-0	1040	43000				NO	NUT
7782492	Selenium	0.78	J	8.8	JN	mg/kg	SB-33-11-14 01/27/92	2/50	0.19-6.4	8.8	2	3.9E+01 N			NO	IFD
7440224	Silver	0.39		10.9		mg/kg	SB-33-11-14 01/27/92	14/59	0.2-1.2	10.9		3.9E+01 N			NO	BSL
7440235	Sodium	6.5	B2	1870		mg/kg	SB-12-1-1_7 01/13/92	50/51	6.8-6.8	1870	8000				NO	NUT
7440280	Thallium	0.87		1.1		mg/kg	S-02-SL-6-10 5/16/97	2/59	0.38-1.9	1.1		5.5E-01 N			NO	IFD
7440622	Vanadium	0.89		178		mg/kg	SB-33-11-14 01/27/92	89/89	0-0	178	150	8.5E+01 N			YES	ASL
7440666	Zinc	2.8	B2*	5060		mg/kg	SB-33-11-14 01/27/92	84/84	0-0	5060	20	2.3E+03 N			YES	ASL
72548	4,4'-DDD	0.0099	J	0.014	J	mg/kg	SL-04_0_5-1_0 5/22/97	2/25	0.0033-0.0038	0.014		2.7E+00 C			NO	BSL
72559	4,4'-DDE	0.0045	J	0.17	J	mg/kg	SL-02_0_75-1_25 5/22/97	4/25	0.0033-0.0037	0.17		1.9E+00 C			NO	BSL
50293	4,4'-DDT	0.02	J	0.061	J	mg/kg	SL-04_0_5-1_0 5/22/97	3/24	0.0033-0.0037	0.061		1.9E+00 C			NO	BSL
5103719	alpha-Chlordane	0.012	J	0.018	J	mg/kg	SL-02_0_75-1_25 5/22/97	3/25	0.0017-0.0019	0.018		1.8E+00 C			NO	BSL
12672296	Aroclor-1248	0.48	J	0.48	J	mg/kg	SB-33-11-14 01/27/92	1/25	0.033-0.07	0.48		3.2E-01 C			NO	IFD
11096825	Aroclor-1260	0.11		0.29		mg/kg	SL-04_0_5-1_0 5/22/97	3/25	0.033-0.07	0.29		3.2E-01 C			NO	BSL
319868	delta-BHC	0.0023	J	0.0023	J	mg/kg	SL-03_0_75-1_25 5/22/97	1/26	0.0017-0.0019	0.0023		1.0E-01 C			NO	IFD
1031078	Endosulfan sulfate	0.0004	JN	0.0036	J	mg/kg	TP-21-10-11 01/16/92	2/25	0.0033-0.0037	0.0036		4.7E+01 N			NO	BSL
72208	Endrin	0.0023	JP	0.0084		mg/kg	SL-02_0_75-1_25 5/22/97	3/26	0.0033-0.0038	0.0084		2.3E+00 N			NO	BSL
7421934	Endrin aldehyde	0.0063		0.0082	J	mg/kg	SL-03_0_75-1_25 5/22/97	2/24	0.0033-0.0038	0.0082		2.3E+00 N			NO	BSL
5103742	gamma-Chlordane	0.0042	J	0.013	J	mg/kg	SL-04_0_5-1_0 5/22/97	4/25	0.0017-0.0019	0.013		1.8E+00 C			NO	BSL
1024573	Heptachlor epoxide	0.0032		0.0094	J	mg/kg	SL-02_0_75-1_25 5/22/97	2/25	0.0017-0.0019	0.0094		7.0E-02 C			NO	BSL

TABLE 2.8
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Soil & Particulates
Exposure Point: Eastern Parcel

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
72435	Methoxychlor	0.027		0.027		mg/kg	TP-54-7-7_5 02/04/92	1/24	0.017-0.019	0.027		3.9E+01 N			NO	IFD
95501	1,2-Dichlorobenzene	1.08		1.08		mg/kg	SB-33-11-14 01/27/92	1/25	0.33-6.9	1.08		7.0E+02 N			NO	IFD
541731	1,3-Dichlorobenzene	0.016	J	0.016	J	mg/kg	SB-33-11-14 01/27/92	1/25	0.33-6.9	0.016		7.0E+00 N			NO	IFD
106467	1,4-Dichlorobenzene	0.26	J	0.26	J	mg/kg	SB-33-11-14 01/27/92	1/25	0.33-6.9	0.26		2.7E+01 C			NO	IFD
91576	2-Methylnaphthalene	0.01	J	0.036	J	mg/kg	SL-02_0_75-1_25 5/22/97	4/25	0.34-6.9	0.036		1.6E+02 N			NO	BSL
106445	4-Methylphenol	0.027	J	0.027	J	mg/kg	SL-04_0_5-1_0 5/22/97	1/25	0.33-6.9	0.027		3.9E+01 N			NO	IFD
83329	Acenaphthene	0.004	J	0.042	J	mg/kg	SL-04_0_5-1_0 5/22/97	5/25	0.34-6.9	0.042		4.7E+02 N			NO	BSL
208968	Acenaphthylene	0.004	J	0.36	J	mg/kg	SL-04_0_5-1_0 5/22/97	4/25	0.33-6.9	0.36		2.3E+02 N			NO	BSL
120127	Anthracene	0.007	J	0.23	J	mg/kg	SL-04_0_5-1_0 5/22/97	6/25	0.34-6.9	0.23		2.3E+03 N			NO	BSL
56553	Benz(a)anthracene	0.004	J	0.61	J	mg/kg	SL-04_0_5-1_0 5/22/97	6/25	0.34-6.9	0.61		8.7E-01 C			NO	BSL
50328	Benzo(a)pyrene	0.004	J	0.78	J	mg/kg	SL-04_0_5-1_0 5/22/97	6/24	0.34-6.9	0.78		8.7E-02 C			YES	ASL
205992	Benzo(b)fluoranthene	0.006	J	1.8	J	mg/kg	SL-04_0_5-1_0 5/22/97	6/24	0.34-6.9	1.8		8.7E-01 C			YES	ASL
191242	Benzo(g,h,i)perylene	0.013	J	0.32	J	mg/kg	SL-04_0_5-1_0 5/22/97	5/25	0.34-6.9	0.32		2.3E+02 N			NO	BSL
207089	Benzo(k)fluoranthene	0.003	J	0.56	J	mg/kg	SL-04_0_5-1_0 5/22/97	6/25	0.34-6.9	0.56		8.7E+00 C			NO	BSL
117817	bis(2-Ethylhexyl)phthalate	0.036	J	2.1		mg/kg	SL-04_0_5-1_0 5/22/97	10/25	0.33-6.9	2.1		4.6E+01 C			NO	BSL
86748	Carbazole	0.047	J	0.16	J	mg/kg	SL-04_0_5-1_0 5/22/97	3/24	0.33-6.9	0.16		3.2E+01 C			NO	BSL
218019	Chrysene	0.004	J	0.95	J	mg/kg	SL-04_0_5-1_0 5/22/97	6/25	0.34-6.9	0.95		8.7E+01 C			NO	BSL
84742	Di-n-butyl phthalate	0.57	J	0.57	J	mg/kg	SL-04_0_5-1_0 5/22/97	1/25	0.33-6.9	0.57		7.8E+02 N			NO	IFD
53703	Dibenz(a,h)anthracene	0.007	J	0.1	J	mg/kg	SL-04_0_5-1_0 5/22/97	4/24	0.33-6.9	0.1		8.7E-02 C			YES	ASL
132649	Dibenzofuran	0.007	J	0.037	J	mg/kg	SL-04_0_5-1_0 5/22/97	4/25	0.33-6.9	0.037		3.1E+01 N			NO	BSL
206440	Fluoranthene	0.021	J	1.8	J	mg/kg	SL-04_0_5-1_0 5/22/97	7/25	0.34-6.9	1.8		3.1E+02 N			NO	BSL
86737	Fluorene	0.007	J	0.063	J	mg/kg	SL-04_0_5-1_0 5/22/97	6/25	0.34-6.9	0.063		3.1E+02 N			NO	BSL
193395	Indeno(1,2,3-cd)pyrene	0.011	J	0.36	J	mg/kg	SL-04_0_5-1_0 5/22/97	5/25	0.34-6.9	0.36		8.7E-01 C			NO	BSL
78591	Isophorone	0.003	J	0.003	J	mg/kg	S-05-SL_5-7 5/14/97	1/26	0.33-6.9	0.003		6.7E+02 C			NO	IFD
91203	Naphthalene	0.004	J	0.039	J	mg/kg	SL-02_0_75-1_25 5/22/97	5/25	0.34-6.9	0.039		1.6E+02 N			NO	BSL
85018	Phenanthrene	0.009	J	0.98	J	mg/kg	SL-04_0_5-1_0 5/22/97	7/25	0.34-6.9	0.98		2.3E+02 N			NO	BSL
108952	Phenol	0.066	J	0.066	J	mg/kg	SL-04_0_5-1_0 5/22/97	1/25	0.33-6.9	0.066		4.7E+03 N			NO	IFD
129000	Pyrene	0.02	J	1.6	J	mg/kg	SL-04_0_5-1_0 5/22/97	7/25	0.34-6.9	1.6		2.3E+02 N			NO	BSL
71556	1,1,1-Trichloroethane	0.001	J	56	J	mg/kg	SB-35-8_5-10 02/20/92	5/119	0.01-640	56		1.6E+02 N			NO	IFD
75343	1,1-Dichloroethane	12	J	12	J	mg/kg	SB-35-8_5-10 02/20/92	1/119	0.01-640	12		7.8E+02 N			NO	IFD
540590	1,2-Dichloroethene (total)	0.0003	J	1100	J	mg/kg	SB-30-1_5-4_5 01/21/92	7/118	0.0095-21	1100		7.0E+01 N			YES	ASL
78933	2-Butanone	0.004	J	0.21	J	mg/kg	SB-33-11-14 01/27/92	4/59	0.01-640	0.21		4.7E+03 N			NO	BSL
591786	2-Hexanone	0.002	J	0.002	J	mg/kg	TP-53-3_5-5 02/04/92	1/59	0.01-640	0.002		3.1E+02 N			NO	IFD
108101	4-Methyl-2-pentanone	0.002	J	0.002	J	mg/kg	TP-53-3_5-5 02/04/92	1/59	0.01-640	0.002		6.3E+02 N			NO	IFD
67641	Acetone	0.005	J	16		mg/kg	SB-37-12-13_5 02/21/92	23/59	0.01-640	16		7.8E+02 N			NO	BSL
71432	Benzene	0.078		6.1	J	mg/kg	SB-25-7-9 01/20/92	2/119	0.002-640	6.1		2.2E+01 C			NO	IFD
108907	Chlorobenzene	1.9	J	430	J	mg/kg	SB-25-7-9 01/20/92	2/119	0.0099-640	430		1.6E+02 N			NO	IFD
67663	Chloroform	0.002	J	0.002	J	mg/kg	SB-7-6-9 01/09/92	1/119	0.0068-640	0.002		7.8E+01 N			NO	IFD
100414	Ethylbenzene	0.041	J	6100	J	mg/kg	SB-30-1_5-4_5 01/21/92	4/119	0.004-21	6100		7.8E+02 N			NO	IFD

TABLE 2.8
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Soil & Particulates
Exposure Point: Eastern Parcel

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
75092	Methylene chloride	0.0009	JB	0.011	J	mg/kg	SB-15-9-10_5 01/14/92	9/118	0.01-640	0.011		8.5E+01	C			NO	BSL
100425	Styrene	0.47	J	2200	J	mg/kg	SB-30-1_5-4_5 01/21/92	2/59	0.01-21	2200		1.6E+03	N			NO	IFD
127184	Tetrachloroethene	0.0002	J	7.8	J	mg/kg	SB-35-8_5-10 02/20/92	6/119	0.0072-640	7.8		1.2E+01	C			NO	BSL
108883	Toluene	0.002	J	24	J	mg/kg	SB-35-8_5-10 02/20/92	5/119	0.001-640	24		1.6E+03	N			NO	IFD
79016	Trichloroethene	0.001	J	1700	J	mg/kg	SB-30-1_6-4_6 01/21/92	28/119	0.01-21	1700		4.7E+01	N			YES	ASL
1330207	Xylene (total)	0.12	J	2.8	J	mg/kg	SB-25-7-9 01/20/92	3/118	0.0095-640	2.8		1.6E+04	N			NO	IFD

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Region III Risk-Based Concentrations (RBC) for residential soil (10/99)
For chromium, used RBC for Chromium VI.
For lead, used 400 mg/kg, from "Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities" (USEPA, 1994).
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin ketone, used endrin RBC
For endosulfan II and endosulfan sulfate used RBC for endosulfan
For acenaphthylene, benzo(g,h,i)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethene used most RBC for most toxic of cis- and trans- isomers
For 2-nitroanaline used Region 9 PRG.
(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
The iron concentration does not pose an adverse effect at the site
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions:
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2 9
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current & Future
Medium: Surface/Subsurface Soil
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors and Outdoors)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
57125	Cyanide	1.1		967	*	mg/kg	TP-54-7-7_5 02/04/92	10/59	0.51-23.6	967		Not Volatile			NO	NV
7429905	Aluminum	465	*	32900		mg/kg	SB-12-1-1_7 01/13/92	59/59	0-0	32900	33000	Not Volatile			NO	NV
7440360	Antimony	0.62		22.5		mg/kg	SB-35-8_5-10 02/20/92	12/59	0.44-28.2	22.5		Not Volatile			NO	NV
7440382	Arsenic	0.41	BNJ	17	JN*	mg/kg	SB-33-11-14 01/27/92	39/53	0.41-0.46	17	7.5	Not Volatile			NO	NV
7440393	Barium	0.82	B2	281		mg/kg	SB-35-8_5-10 02/20/92	58/59	0.19-0.19	281	300	Not Volatile			NO	NV
7440417	Beryllium	0.04		0.7	B2	mg/kg	SB-12-1-1_7 01/13/92	28/59	0.04-0.91	0.7	0.16	Not Volatile			NO	NV
7440439	Cadmium	0.08		4300		mg/kg	SB-2 0.0835	67/133	0.06-0.34	4300	1	Not Volatile			NO	NV
7440702	Calcium	36.7	B2	87500		mg/kg	SB-12-1-1_7 01/13/92	59/59	0-0	67500	35000	Not Volatile			NO	NV
7440473	Chromium	1.19		97000		mg/kg	SB-2 0.0835	135/135	0-0	97000	40	Not Volatile			NO	NV
18540299	Chromium VI	2.1		41.8		mg/kg	SL-04_0_5-1_0 5/22/97	8/11	2-2	41 8		Not Volatile			NO	NV
7440484	Cobalt	0.29		11.1	B2	mg/kg	SB-33-11-14 01/27/92	51/59	0.58-0.66	11.1	30	Not Volatile			NO	NV
7440508	Copper	1.2		1950	JN*	mg/kg	SB-33-11-14 01/27/92	52/56	0.58-3.1	1950	25	Not Volatile			NO	NV
7439896	Iron	1070		17800		mg/kg	SB-33-11-14 01/27/92	58/58	0-0	17800	2000	Not Volatile			NO	NV
7439921	Lead	0.58	BNJ	1220	S*	mg/kg	SB-35-8_5-10 02/20/92	57/58	0.43-0.43	1220	400	Not Volatile			NO	NV
7439954	Magnesium	89.4		1620		mg/kg	TP-54-7-7_5 02/04/92	59/59	0-0	1620	5000	Not Volatile			NO	NV
7439965	Manganese	5 5		218		mg/kg	B-02-SL_4-8 5/9/97	53/53	0-0	218	5000	Not Volatile			NO	NV
7439976	Mercury	0.12		3.2		mg/kg	SB-33-11-14 01/27/92	13/59	0.05-0.67	3.2	0.1	Not Volatile			NO	NV
7440020	Nickel	0.89	B2JN*	705	NJ	mg/kg	TP-53-3_5-5 02/04/92	57/59	0.78-0.88	705	13	Not Volatile			NO	NV
7440097	Potassium	61.9		1040	B	mg/kg	TP-54-7-7_5 02/04/92	59/59	0-0	1040	43000	Not Volatile			NO	NV
7782492	Selenium	0.78	J	8.8	JN	mg/kg	SB-33-11-14 01/27/92	2/50	0.19-6.4	8.8	2	Not Volatile			NO	NV
7440224	Silver	0.39		10.9		mg/kg	SB-33-11-14 01/27/92	14/59	0.2-1.2	10 9		Not Volatile			NO	NV
7440235	Sodium	8.5	B2	1870		mg/kg	SB-12-1-1_7 01/13/92	50/51	6.8-6.8	1870	8000	Not Volatile			NO	NV
7440280	Thallium	0.87		1.1		mg/kg	S-02-SL-6-10 5/16/97	2/59	0.38-1.9	1.1		Not Volatile			NO	NV
7440622	Vanadium	0.89		178		mg/kg	SB-33-11-14 01/27/92	59/59	0-0	178	150	Not Volatile			NO	NV
7440666	Zinc	2.6	B2*	5060		mg/kg	SB-33-11-14 01/27/92	54/54	0-0	5060	20	Not Volatile			NO	NV
72548	4,4'-DDD	0.0099	J	0.014	J	mg/kg	SL-04_0_5-1_0 5/22/97	2/25	0.0033-0.0038	0.014		Not Volatile			NO	NV
72559	4,4'-DDE	0.0045	J	0.17	J	mg/kg	SL-02_0_75-1_25 5/22/97	4/25	0.0033-0.0037	0.17		Not Volatile			NO	NV
50293	4,4'-DDT	0.02	J	0.061	J	mg/kg	SL-04_0_5-1_0 5/22/97	3/24	0.0033-0.0037	0.061		Not Volatile			NO	NV
5103719	alpha-Chlordane	0.012	J	0 018	J	mg/kg	SL-02_0_75-1_25 5/22/97	3/25	0.0017-0.0019	0.018		Not Volatile			NO	NV
12672296	Aroclor-1248	0.48	J	0.48	J	mg/kg	SB-33-11-14 01/27/92	1/25	0.033-0.07	0.48		Not Volatile			NO	NV
11096825	Aroclor-1260	0.11		0.29		mg/kg	SL-04_0_5-1_0 5/22/97	3/25	0.033-0.07	0.29		Not Volatile			NO	NV
319868	delta-BHC	0.0023	J	0.0023	J	mg/kg	SL-03_0_75-1_25 5/22/97	1/26	0.0017-0.0019	0.0023		Not Volatile			NO	NV
1031078	Endosulfan sulfate	0.0004	JN	0.0036	J	mg/kg	TP-21-10-11 01/16/92	2/25	0.0033-0.0037	0.0036		Not Volatile			NO	NV
72208	Endrin	0.0023	JP	0.0084		mg/kg	SL-02_0_75-1_25 5/22/97	3/26	0.0033-0.0038	0.0084		Not Volatile			NO	NV
7421934	Endrin aldehyde	0.0063		0.0082	J	mg/kg	SL-03_0_75-1_25 5/22/97	2/24	0.0033-0.0038	0.0082		Not Volatile			NO	NV
5103742	gamma-Chlordane	0.0042	J	0.013	J	mg/kg	SL-04_0_5-1_0 5/22/97	4/25	0.0017-0.0019	0.013		Not Volatile			NO	NV
1024573	Heptachlor epoxide	0.0032		0 0094	J	mg/kg	SL-02_0_75-1_25 5/22/97	2/25	0.0017-0.0019	0.0094		Not Volatile			NO	NV

TABLE 2.9
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current & Future
Medium: Surface/Subsurface Soil
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors and Outdoors)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
72435	Methoxychlor	0.027		0.027		mg/kg	TP-54-7-7_5 02/04/92	1/24	0.017-0.019	0.027		Not Volatile			NO	NV
95501	1,2-Dichlorobenzene	1.08		1.08		mg/kg	SB-33-11-14 01/27/92	1/25	0.33-6.9	1.08		5.6E+02 S			NO	IFD
541731	1,3-Dichlorobenzene	0.016	J	0.016	J	mg/kg	SB-33-11-14 01/27/92	1/25	0.33-6.9	0.016		3 7E+02 S			NO	IFD
106467	1,4-Dichlorobenzene	0.26	J	0.26	J	mg/kg	SB-33-11-14 01/27/92	1/25	0.33-6.9	0.26		4 9E+00 C			NO	IFD
91576	2-Methylnaphthalene	0.01	J	0.036	J	mg/kg	SL-02_0_75-1_25 5/22/97	4/25	0.34-6.9	0 036		4.8E+00 S			NO	BSL
106445	4-Methylphenol	0.027	J	0.027	J	mg/kg	SL-04_0_5-1_0 5/22/97	1/25	0.33-6.9	0 027		Not Volatile			NO	NV
83329	Acenaphthene	0.004	J	0.042	J	mg/kg	SL-04_0_5-1_0 5/22/97	5/25	0.34-6.9	0.042		1.3E+02 S			NO	BSL
208968	Acenaphthylene	0.004	J	0.36	J	mg/kg	SL-04_0_5-1_0 5/22/97	4/25	0.33-6.9	0.36		2.9E+02 S			NO	BSL
120127	Anthracene	0.007	J	0.23	J	mg/kg	SL-04_0_5-1_0 5/22/97	6/25	0.34-6.9	0.23		6 1E+00 S			NO	BSL
56553	Benz(a)anthracene	0.004	J	0.61	J	mg/kg	SL-04_0_5-1_0 5/22/97	6/25	0.34-6.9	0.61		Not Volatile			NO	NV
50328	Benzo(a)pyrene	0.004	J	0.75	J	mg/kg	SL-04_0_5-1_0 5/22/97	6/24	0.34-6.9	0.75		Not Volatile			NO	NV
205992	Benzo(b)fluoranthene	0.006	J	1.5	J	mg/kg	SL-04_0_5-1_0 5/22/97	6/24	0.34-6.9	1.5		Not Volatile			NO	NV
191242	Benzo(g,h,i)perylene	0.013	J	0.32	J	mg/kg	SL-04_0_5-1_0 5/22/97	5/25	0.34-6.9	0 32		Not Volatile			NO	NV
207089	Benzo(k)fluoranthene	0.003	J	0.56	J	mg/kg	SL-04_0_5-1_0 5/22/97	6/25	0.34-6.9	0.56		Not Volatile			NO	NV
117817	bis(2-Ethylhexyl)phthalate	0.036	J	2.1		mg/kg	SL-04_0_5-1_0 5/22/97	10/25	0.33-6.9	2.1		Not Volatile			NO	NV
86748	Carbazole	0.047	J	0.16	J	mg/kg	SL-04_0_5-1_0 5/22/97	3/24	0.33-6.9	0.16		Not Volatile			NO	NV
218019	Chrysene	0.004	J	0.95	J	mg/kg	SL-04_0_5-1_0 5/22/97	6/25	0.34-6.9	0.95		Not Volatile			NO	NV
84742	Di-n-butyl phthalate	0 57	J	0.57	J	mg/kg	SL-04_0_5-1_0 5/22/97	1/25	0.33-6.9	0.57		Not Volatile			NO	NV
53703	Dibenz(a,h)anthracene	0.007	J	0.1	J	mg/kg	SL-04_0_5-1_0 5/22/97	4/24	0.33-6.9	0.1		Not Volatile			NO	NV
132649	Dibenzofuran	0.007	J	0.037	J	mg/kg	SL-04_0_5-1_0 5/22/97	4/25	0.33-6.9	0.037		1.4E+02 S			NO	BSL
206440	Fluoranthene	0.021	J	1.8	J	mg/kg	SL-04_0_5-1_0 5/22/97	7/25	0.34-6.9	1.8		Not Volatile			NO	NV
86737	Fluorene	0.007	J	0.063	J	mg/kg	SL-04_0_5-1_0 5/22/97	6/25	0.34-6.9	0.063		9 0E+01 S			NO	BSL
193395	Indeno(1,2,3-cd)pyrene	0.011	J	0.36	J	mg/kg	SL-04_0_5-1_0 5/22/97	5/25	0.34-6.9	0.36		Not Volatile			NO	NV
78591	Isophorone	0.003	J	0.003	J	mg/kg	S-05-SL_5-7 5/14/97	1/26	0.33-6.9	0.003		Not Volatile			NO	NV
91203	Naphthalene	0.004	J	0.039	J	mg/kg	SL-02_0_75-1_25 5/22/97	5/25	0.34-6.9	0.039		1.4E+01 N			NO	BSL
85018	Phenanthrene	0.009	J	0.96	J	mg/kg	SL-04_0_5-1_0 5/22/97	7/25	0.34-6.9	0.98		9.3E+01 S			NO	BSL
108952	Phenol	0.066	J	0.066	J	mg/kg	SL-04_0_5-1_0 5/22/97	1/25	0.33-6.9	0.066		Not Volatile			NO	NV
129000	Pyrene	0.02	J	1.8	J	mg/kg	SL-04_0_5-1_0 5/22/97	7/25	0.34-6.9	1.6		Not Volatile			NO	NV
71556	1,1,1-Trichloroethane	0.001	J	56	J	mg/kg	SB-35-8_5-10 02/20/92	5/119	0.01-640	56		2 4E+02 N			NO	IFD
75343	1,1-Dichloroethane	12	J	12	J	mg/kg	SB-35-8_5-10 02/20/92	1/119	0.01-640	12		1.3E+02 N			NO	IFD
540590	1,2-Dichloroethene (total)	0.0003	J	1100	J	mg/kg	SB-30-1_5-4_5 01/21/92	7/118	0.0095-21	1100		1.2E+02 N			YES	ASL
78933	2-Butanone	0.004	J	0.21	J	mg/kg	SB-33-11-14 01/27/92	4/59	0.01-640	0.21		2 0E+03 N			NO	BSL
591786	2-Hexanone	0.002	J	0.002	J	mg/kg	TP-53-3_5-5 02/04/92	1/59	0.01-640	0 002		1.5E+01 N			NO	IFD
108101	4-Methyl-2-pentanone	0 002	J	0.002	J	mg/kg	TP-53-3_5-5 02/04/92	1/59	0.01-640	0.002		1 8E+02 N			NO	IFD
67641	Acetone	0.005	J	16		mg/kg	SB-37-12-13_5 02/21/92	23/59	0.01-640	16		1 0E+05 S			NO	BSL
71432	Benzene	0 078		6.1	J	mg/kg	SB-25-7-9 01/20/92	2/119	0.002-640	8.1		8 0E-01 C			NO	IFD
108907	Chlorobenzene	1.9	J	430	J	mg/kg	SB-25-7-9 01/20/92	2/119	0.0099-640	430		1.3E+01 N			NO	IFD
67663	Chloroform	0.002	J	0.002	J	mg/kg	SB-7-6-9 01/09/92	1/119	0.0068-640	0 002		9 0E-02 N			NO	IFD
100414	Ethylbenzene	0.041	J	6100	J	mg/kg	SB-30-1_5-4_5 01/21/92	4/119	0.004-21	6100		4 0E+02 S			NO	IFD

TABLE 2.9
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current & Future
Medium: Surface/Subsurface Soil
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors and Outdoors)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
75092	Methylene chloride	0.0009	JB	0.011	J	mg/kg	SB-15-9-10_5 01/14/92	9/118	0.01-640	0.011		1.3E+01	C			NO	BSL
100425	Styrene	0.47	J	2200	J	mg/kg	SB-30-1_5-4_5 01/21/92	2/59	0.01-21	2200		1.5E+03	N			NO	IFD
127184	Tetrachloroethene	0.0002	J	7.8	J	mg/kg	SB-35-8_5-10 02/20/92	6/119	0.0072-640	7.8		1.1E+01	C			NO	BSL
108883	Toluene	0.002	J	24	J	mg/kg	SB-35-8_5-10 02/20/92	5/119	0.001-640	24		1.4E+02	N			NO	IFD
79016	Trichloroethene	0.001	J	1700	J	mg/kg	SB-30-1_5-4_5 01/21/92	28/119	0.01-21	1700		5.0E+00	C			YES	ASL
1330207	Xylene (total)	0.12	J	2.8	J	mg/kg	SB-25-7-9 01/20/92	3/118	0.0095-640	2.8		4.1E+01	N			NO	IFD

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Soil Screening Guidance Level (SSL) for Inhalation of Volatiles (5/96)
(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)

Definitions: COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

NOTE: 1,1,1-Trichloroethane screening toxicity value based on 1/10th the calculated noncancer SSL. The cancer-based listed SSL (1,200mg/kg) exceeds this concentration.

TABLE 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Soil & Particulates
Exposure Point: Western Parcel

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
57125	Cyanide	11.8	*	243	*	mg/kg	TP-24-0_5-1 01/17/92	6/14	0.61-6.9	243		1.6E+02	N			YES	ASL
7429905	Aluminum	591		130000		mg/kg	TP-15-0_5-1 01/13/92	14/14	0-0	130000	33000	7.8E+03	N			YES	ASL
7440360	Antimony	2.6	B	146	JN	mg/kg	TP-15-0_5-1 01/13/92	4/14	0.54-7.3	146		3.1E+00	N			YES	ASL
7440382	Arsenic	1.6	B2S	26		mg/kg	TP-35-0_5-1_5 01/24/92	14/14	0-0	26	7.8	4.3E-02	C			YES	ASL
7440393	Barium	11.9	B2	500		mg/kg	TP-15-0_5-1 01/13/92	12/12	0-0	500	300	5.5E+02	N			NO	BSL
7440417	Beryllium	0.24	B	0.67	B	mg/kg	TP-9-0_75-1_5 01/08/92	10/14	0.2-0.28	0.67	0 16	1.6E+01	N			NO	BSL
7440439	Cadmium	0.21	B	2510		mg/kg	B-07-01 0.5-1	55/78	0.07-0.39	2510	1	7.8E+00	N			YES	ASL
7440702	Calcium	181	B2*	4260		mg/kg	TP-15-0_5-1 01/13/92	14/14	0-0	4260	35000					NO	NUT
7440473	Chromium	2.58		17200		mg/kg	B-07-01 0.5-1	77/77	0-0	17200	40	2.3E+01	N			YES	ASL
7440484	Cobalt	0.73	B2	8.4	B	mg/kg	TP-15-0_5-1 01/13/92	14/14	0-0	8.4	30	4.7E+02	N			NO	BKG
7440508	Copper	5	B	4720	*	mg/kg	TP-15-0_5-1 01/13/92	14/14	0-0	4720	25	3.1E+02	N			YES	ASL
7439896	Iron	3120		29500	*	mg/kg	TP-35-0_5-1_5 01/24/92	14/14	0-0	29500	2000	2 3E+03	N			NO	NUT
7439921	Lead	3.9	J*	2670		mg/kg	TP-35-0_5-1_5 01/24/92	13/13	0-0	2670	400	4.0E+02				YES	ASL
7439954	Magnesium	81.9	B	2240		mg/kg	SL-01_0_5-1_25 5/21/97	14/14	0-0	2240	5000					NO	NUT
7439965	Manganese	1.8	B	274	*	mg/kg	TP-35-0_5-1_5 01/24/92	13/13	0-0	274	5000	1.6E+02	N			NO	BKG
7439976	Mercury	0.13		0.36		mg/kg	TP-46-0-0_5 01/31/92	7/14	0.06-0.11	0.36	0.1	7.8E-01	N			NO	BSL
7440020	Nickel	3.7	B	240	JN*	mg/kg	TP-15-0_5-1 01/13/92	14/14	0-0	240	13	1.6E+02	N			YES	ASL
7440097	Potassium	132	B2	560	B	mg/kg	TP-35-0_5-1_5 01/24/92	14/14	0-0	560	43000					NO	NUT
7782492	Selenium	1.1	BJN	3	+J	mg/kg	TP-6-0-1_5 12/19/91	4/11	0.85-5.9	3	2	3.9E+01	N			NO	BSL
7440224	Silver	1.2	B2J	9.6		mg/kg	TP-15-0_5-1 01/13/92	3/14	0.24-1.2	9.6		3.9E+01	N			NO	BSL
7440235	Sodium	28	B2	427	B	mg/kg	TP-15-0_5-1 01/13/92	14/14	0-0	427	8000					NO	NUT
7440280	Thallium	0.5	BWJ	1.1	B	mg/kg	TP-46-0-0_5 01/31/92	4/14	0.39-0.86	1.1		6.6E-01	N			YES	ASL
7440622	Vanadium	8.7	B	63.8	J	mg/kg	TP-35-0_5-1_5 01/24/92	14/14	0-0	63.6	150	5.5E+01	N			NO	BKG
7440666	Zinc	9.1	J	7500		mg/kg	TP-15-0_5-1 01/13/92	13/13	0-0	7500	20	2.3E+03	N			YES	ASL
72559	4,4'-DDE	0.027	P	0.027	P	mg/kg	TP-46-0-0_5 01/31/92	1/3	0.004-0.015	0.027		1 9E+00	C			NO	BSL
50293	4,4'-DDT	0.25	JP	0.25	JP	mg/kg	TP-46-0-0_5 01/31/92	1/3	0.004-0.015	0.25		1.9E+00	C			NO	BSL
11097691	Aroclor-1254	0.16	J	0.99	JN	mg/kg	TP-46-0-0_5 01/31/92	2/4	0.04-0.16	0.99		1.6E-01	N			YES	ASL
11096825	Aroclor-1260	0.44	JN	0.44	JN	mg/kg	TP-46-0-0_5 01/31/92	1/4	0.04-0.16	0.44		3.2E-01	C			YES	ASL
319857	beta-BHC	0.0071	JN	0.0071	JN	mg/kg	TP-46-0-0_5 01/31/92	1/4	0.002-0.0076	0.0071		3.5E-01	C			NO	BSL
33213659	Endosulfan II	0.0015	J	0.017	JN	mg/kg	TP-46-0-0_5 01/31/92	2/4	0.004-0.015	0.017		4.7E+01	N			NO	BSL
72208	Endrin	0.0031	J	0.048	JP	mg/kg	TP-46-0-0_5 01/31/92	2/4	0.004-0.015	0.048		2 3E+00	N			NO	BSL
53494705	Endrin ketone	0.0011	J	0.019	J	mg/kg	TP-46-0-0_5 01/31/92	2/4	0.004-0.015	0.019		2 3E+00	N			NO	BSL
95501	1,2-Dichlorobenzene	0.084	J	0.084	J	mg/kg	TP-46-0-0_5 01/31/92	1/4	0.39-11	0.084		7.0E+02	N			NO	BSL

TABLE 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Soil & Particulates
Exposure Point: Western Parcel

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
91576	2-Methylnaphthalene	0.04	J	0.69	J	mg/kg	TP-6-0-1_5 12/19/91	3/4	0.4-0.4	0.69		1.6E+02	N			NO	BSL
120127	Anthracene	0.045	J	0.15	J	mg/kg	TP-48-0-0_5 01/31/92	2/4	0.4-11	0.15		2.3E+03	N			NO	BSL
205992	Benzo(b)fluoranthene	0.005	J	0.005	J	mg/kg	SL-01_0_5-1_25 5/21/97	1/4	0.39-11	0.005		8.7E-01	C			NO	BSL
117817	bis(2-Ethylhexyl)phthalate	0.39	J	0.39	J	mg/kg	SL-01_0_5-1_25 5/21/97	1/4	0.39-11	0.39		4.8E+01	C			NO	BSL
84742	Di-n-butyl phthalate	0.029	J	0.067	J	mg/kg	TP-41-0-0_5 01/30/92	2/4	0.4-11	0.067		7.6E+02	N			NO	BSL
117840	Di-n-octyl phthalate	0.081	J	0.081	J	mg/kg	SL-01_0_5-1_25 5/21/97	1/4	0.39-11	0.081		1.6E+02	N			NO	BSL
132649	Dibenzofuran	0.043	J	0.043	J	mg/kg	TP-48-0-0_5 01/31/92	1/4	0.39-11	0.043		3.1E+01	N			NO	BSL
206440	Fluoranthene	0.006	J	0.006	J	mg/kg	SL-01_0_5-1_25 5/21/97	1/4	0.39-11	0.006		3.1E+02	N			NO	BSL
91203	Naphthalene	0.022	J	0.12	J	mg/kg	TP-48-0-0_5 01/31/92	2/4	0.4-11	0.12		1.6E+02	N			NO	BSL
85018	Phenanthrene	0.005	J	0.005	J	mg/kg	SL-01_0_5-1_25 5/21/97	1/4	0.39-11	0.005		2.3E+02	N			NO	BSL
129000	Pyrene	0.005	J	0.005	J	mg/kg	SL-01_0_5-1_25 5/21/97	1/4	0.39-11	0.005		2.3E+02	N			NO	BSL
71556	1,1,1-Trichloroethane	0.005	J	0.011	J	mg/kg	TP-35-0_5-1_5 01/24/92	2/22	0.011-0.048	0.011		1.6E+02	N			NO	BSL
75343	1,1-Dichloroethane	0.004	J	0.004	J	mg/kg	SL-01_0_5-1_25 5/21/97	1/22	0.011-0.063	0.004		7.8E+02	N			NO	IFD
107062	1,2-Dichloroethane	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/22	0.011-0.028	0.063		7.0E+00	C			NO	IFD
540590	1,2-Dichloroethene (total)	0.005	J	15	J	mg/kg	TP-35-0_5-1_5 01/24/92	4/24	0.005-0.023	15		7.0E+01	N			NO	BSL
78875	1,2-Dichloropropane	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/22	0.011-0.023	0.063		9.4E+00	C			NO	IFD
78933	2-Butanone	0.002	J	0.036	D	mg/kg	TP-42-0_6-1_5 01/30/92	4/13	0.011-0.025	0.036		4.7E+03	N			NO	BSL
591786	2-Hexanone	0.37	J	0.37	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/13	0.011-0.023	0.37		3.1E+02	N			NO	BSL
108101	4-Methyl-2-pentanone	0.046	J	0.046	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/13	0.011-0.023	0.046		6.3E+02	N			NO	BSL
67641	Acetone	0.039		0.62	J	mg/kg	TP-35-0_5-1_5 01/24/92	4/13	0.011-0.2	0.62		7.8E+02	N			NO	BSL
75274	Bromodichloromethane	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/22	0.0054-0.023	0.063		1.0E+01	C			NO	IFD
56235	Carbon tetrachloride	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/22	0.011-0.023	0.063		4.9E+00	C			NO	IFD
108907	Chlorobenzene	0.001	J	0.006	J	mg/kg	TP-42-0_6-1_5 01/30/92	2/22	0.011-0.063	0.006		1.6E+02	N			NO	BSL
67663	Chloroform	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/22	0.0073-0.023	0.063		7.8E+01	N			NO	IFD
10061015	cis-1,3-Dichloropropene	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/22	0.011-0.023	0.063		2.4E+00	N			NO	IFD
100414	Ethylbenzene	0.002	J	0.57	J	mg/kg	TP-35-0_5-1_5 01/24/92	3/21	0.004-0.023	0.57		7.8E+02	N			NO	BSL
75092	Methylene chloride	0.002	J	0.066	J	mg/kg	TP-35-0_5-1_5 01/24/92	2/22	0.011-0.051	0.066		8.5E+01	C			NO	BSL
100425	Styrene	0.004	J	0.004	J	mg/kg	SL-01_0_5-1_25 5/21/97	1/13	0.011-0.063	0.004		1.6E+03	N			NO	BSL
127184	Tetrachloroethene	0.001		18	J	mg/kg	TP-35-0_5-1_5 01/24/92	8/24	0.005-0.025	18		1.2E+01	C			YES	ASL
108883	Toluene	0.001	J	6.7	J	mg/kg	TP-35-0_5-1_5 01/24/92	5/21	0.001-0.023	8.7		1.6E+03	N			NO	BSL
79016	Trichloroethene	0.001		6.3	J	mg/kg	TP-35-0_5-1_5 01/24/92	14/25	0.005-0.023	6.3		4.7E+01	N			NO	BSL
75014	Vinyl chloride	0.14	J	0.14	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/22	0.011-0.0606	0.14		3.4E-01	C			NO	IFD
1330207	Xylene (total)	0.008	JD	13	J	mg/kg	TP-35-0_5-1_5 01/24/92	4/21	0.01-0.016	13		1.6E+04	N			NO	BSL

TABLE 2.1
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Region III Risk-Based Concentrations (RBC) for residential soil (10/99)
For chromium, used RBC for Chromium VI.
For lead, used 400 mg/kg, from "Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities" (USEPA, 1994).
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin ketone, used endrin RBC
For endosulfan II and endosulfan sulfate used RBC for endosulfan
For acenaphthylene, benzo(g,h,i)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethene used most RBC for most toxic of cis- and trans- isomers
For 2-nitroanaline used Region 9 PRG.
(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
The iron concentration does not pose an adverse effect at the site
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions:
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Soil & Particulates
Exposure Point: Western Parcel

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
57125	Cyanide	5.1		1220	*	mg/kg	TP-22-1-2 01/17/92	38/95	0.52-10	1220		1.6E+02	N			YES	ASL
7429905	Aluminum	73.4		297000	J	mg/kg	TP-73-4-6 02/19/92	96/96	0-0	297000	33000	7.8E+03	N			YES	ASL
7440360	Antimony	0.69		709		mg/kg	TP-29-1_6-3 01/22/92	16/96	0.46-8.7	709		3.1E+00	N			YES	ASL
7440382	Arsenic	0.46	B	42.9	S	mg/kg	TP-16-1_6-2 01/13/92	65/66	0-0.46	42.9	7.5	4.3E-02	C			YES	ASL
7440393	Barium	1.4	B	500		mg/kg	TP-15-0_5-1 01/13/92	93/93	0-0	500	300	5.5E+02	N			NO	BSL
7440417	Beryllium	0.09		1.9		mg/kg	TP-73-4-6 02/19/92	47/96	0.04-0.31	1.9	0.16	1.6E+01	N			NO	BSL
7440439	Cadmium	0.1		4300		mg/kg	SB-2 0.0635	218/403	0.06-7.09	4300	1	7.8E+00	N			YES	ASL
7440702	Calcium	38.7	B2*	99700		mg/kg	TP-28-1_5-2 01/21/92	96/96	0-0	99700	35000					NO	NUT
7440473	Chromium	0.832		97000		mg/kg	SB-2 0.0635	393/409	0-1.64	97000	40	2.3E+01	N			YES	ASL
18540299	Chromium VI	98.7		223		mg/kg	S-01-SL_1_5-2_8 8/14/97	2/2	0-0	223		2.3E+01	N			YES	ASL
7440484	Cobalt	0.33		14.4	J	mg/kg	TP-73-11-11_5 02/19/92	75/96	0.24-0.67	14.4	30	4.7E+02	N			NO	BKG
7440508	Copper	0.66		9120		mg/kg	TP-73-4-6 02/19/92	87/90	0-0.82	9120	25	3.1E+02	N			YES	ASL
7439896	Iron	99.9		255000	*	mg/kg	TP-16-1_5-2 01/13/92	96/96	0-0	255000	2000	2.3E+03	N			NO	NUT
7439921	Lead	0.75	J	2670		mg/kg	TP-35-0_5-1_8 01/24/92	91/91	0-0	2670	400	4.0E+02				YES	ASL
7439954	Magnesium	32.2	B	3390		mg/kg	TP-73-4-6 02/19/92	95/96	0-13.6	3390	5000					NO	NUT
7439965	Manganese	0.7	B	2530		mg/kg	TP-73-4-8 02/19/92	86/86	0-0	2530	5000	1.6E+02	N			NO	BKG
7439976	Mercury	0.09		1.5		mg/kg	SB-2-1_6-3 01/07/92	32/96	0.05-0.19	1.5	0.1	7.8E-01	N			YES	ASL
7440020	Nickel	0.81	B2	793		mg/kg	TP-45-1-1_5 01/30/92	88/96	0-0.91	793	13	1.6E+02	N			YES	ASL
7440097	Potassium	37.7	B	22400		mg/kg	TP-16-1_5-2 01/13/92	96/96	0-0	22400	43000					NO	NUT
7782492	Selenium	0.76		3	+J	mg/kg	TP-6-0-1_5 12/19/91	5/68	0.66-5.9	3	2	3.9E+01	N			NO	BSL
7440224	Silver	1.1		48.3		mg/kg	TP-16-1_6-2 01/13/92	20/96	0.21-1.6	48.3		3.9E+01	N			YES	ASL
7440235	Sodium	7.5	B2	1330	B	mg/kg	TP-16-1_5-2 01/13/92	91/94	0-6.8	1330	8000					NO	NUT
7440280	Thallium	0.6	BWJ	1.1	B	mg/kg	TP-48-0-0_5 01/31/92	4/96	0.38-0.79	1.1		5.5E-01	N			NO	IFD
7440622	Vanadium	1.1	B2	104		mg/kg	TP-45-1-1_5 01/30/92	94/96	0-0.59	104	150	5.5E+01	N			NO	BKG
7440666	Zinc	3.3	BJ	187000		mg/kg	TP-75-1-1_4 02/19/92	87/87	0-0	187000	20	2.3E+03	N			YES	ASL
72548	4,4'-DDD	0.0029	JN	0.005	J	mg/kg	S-01-SL 5/12/97	2/19	0.0034-0.26	0.005		2.7E+00	C			NO	BSL
72559	4,4'-DDE	0.0026	JP	0.027	P	mg/kg	TP-46-0-0_5 01/31/92	3/22	0.0034-0.26	0.027		1.9E+00	C			NO	BSL
50293	4,4'-DDT	0.0069	JP	0.25	JP	mg/kg	TP-46-0-0_5 01/31/92	2/18	0.0034-0.26	0.25		1.9E+00	C			NO	BSL
5103719	alpha-Chlordane	0.00031	J	0.0019	J	mg/kg	SB-34-10_5-12 01/27/92	2/23	0.0018-0.13	0.0019		1.8E+00	C			NO	BSL
53469219	Aroclor-1242	1.3	J	1.3	J	mg/kg	TP-38-1-4 01/29/92	1/24	0.034-2.6	1.3		3.2E-01	C			NO	IFD
12672296	Aroclor-1248	2.2		2.8	J	mg/kg	TP-4-11_3-11_8 12/18/91	2/24	0.034-0.16	2.8		3.2E-01	C			YES	ASL
11097691	Aroclor-1254	0.11	J	2.2	J	mg/kg	TP-4-11_3-11_8 12/18/91	11/24	0.034-0.16	2.2		1.6E-01	N			YES	ASL
11096825	Aroclor-1260	0.17		9		mg/kg	TP-4-11_3-11_8 12/18/91	6/24	0.034-0.15	9		3.2E-01	C			YES	ASL
319857	beta-BHC	0.0071	JN	0.0071	JN	mg/kg	TP-46-0-0_5 01/31/92	1/24	0.0018-0.13	0.0071		3.5E-01	C			NO	IFD
33213659	Endosulfan II	0.0015	J	0.017	JN	mg/kg	TP-46-0-0_5 01/31/92	2/19	0.0034-0.26	0.017		4.7E+01	N			NO	BSL

TABLE 2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Soil & Particulates
Exposure Point: Western Parcel

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
1031078	Endosulfan sulfate	0.0019	JN	0.0019	JN	mg/kg	SB-8-7_5-9_5 01/10/92	1/23	0.0034-0.26	0.0019		4.7E+01 N			NO	IFD
72208	Endrin	0.0031	J	0.048	JP	mg/kg	TP-46-0-0_5 01/31/92	4/21	0.0034-0.26	0.048		2.3E+00 N			NO	BSL
7421934	Endrin aldehyde	0.0076	J	0.017	J	mg/kg	S-01-SL_1_5-2_5 5/14/97	2/22	0.002-0.26	0.017		2.3E+00 N			NO	BSL
53494705	Endrin ketone	0.00071	JPN	0.019	J	mg/kg	TP-46-0-0_5 01/31/92	4/22	0.0034-0.26	0.019		2.3E+00 N			NO	BSL
58899	gamma-BHC	0.0063	J	0.0063	J	mg/kg	TP-73-4-6 02/19/92	1/23	0.0018-0.13	0.0063		4.9E-01 C			NO	IFD
5103742	gamma-Chlordane	0.00097	JN	0.047	JNP	mg/kg	SB-17-1_5-3 01/15/92	3/22	0.0018-0.13	0.047		1.8E+00 C			NO	BSL
72435	Methoxychlor	0.0052	J	0.075		mg/kg	TP-25-4-4_5 01/17/92	3/20	0.018-1.3	0.075		3.9E+01 N			NO	BSL
120821	1,2,4-Trichlorobenzene	0.012	J	0.012	J	mg/kg	S-01-SL_1_5-2_5 5/14/97	1/23	0.34-11	0.012		7.8E+01 N			NO	IFD
95501	1,2-Dichlorobenzene	0.004	J	0.19	J	mg/kg	S-01-SL_1_5-2_5 5/14/97	4/23	0.34-11	0.19		7.0E+02 N			NO	BSL
541731	1,3-Dichlorobenzene	0.018	J	0.018	J	mg/kg	S-01-SL_1_5-2_5 5/14/97	1/23	0.34-11	0.018		7.0E+00 N			NO	IFD
106467	1,4-Dichlorobenzene	0.005	J	0.074	J	mg/kg	TP-4-11_3-11_8 12/18/91	4/23	0.34-11	0.074		2.7E+01 C			NO	BSL
105679	2,4-Dimethylphenol	0.01	J	0.07	J	mg/kg	TP-4-11_3-11_8 12/18/91	2/23	0.34-11	0.07		1.6E+02 N			NO	BSL
606202	2,6-Dinitrotoluene	0.008	J	0.008	J	mg/kg	S-01-SL_1_5-2_5 5/14/97	1/23	0.34-11	0.008		7.8E+00 N			NO	IFD
91576	2-Methylnaphthalene	0.036	J	2.6	J	mg/kg	TP-10-4_5-5 01/09/92	9/23	0.34-5	2.6		1.6E+02 N			NO	BSL
95487	2-Methylphenol	0.068	J	0.068	J	mg/kg	TP-4-11_3-11_8 12/18/91	1/23	0.34-11	0.068		3.9E+02 N			NO	IFD
106445	4-Methylphenol	0.062	J	0.062	J	mg/kg	S-01-SL_1_5-2_5 5/14/97	1/23	0.34-11	0.062		3.9E+01 N			NO	IFD
83329	Acenaphthene	0.006	J	0.38	J	mg/kg	TP-10-4_5-5 01/09/92	5/23	0.34-11	0.38		4.7E+02 N			NO	BSL
208968	Acenaphthylene	0.004	J	0.015	J	mg/kg	S-01-SL_1_5-2_5 5/14/97	4/23	0.34-11	0.015		2.3E+02 N			NO	BSL
120127	Anthracene	0.01	J	0.55	J	mg/kg	TP-10-4_5-5 01/09/92	7/22	0.34-11	0.55		2.3E+03 N			NO	BSL
56553	Benz(a)anthracene	0.009	J	0.252	J	mg/kg	06-SL_5-7 6/26/97 (avg of du	6/23	0.34-11	0.252		8.7E-01 C			NO	BSL
50328	Benzo(a)pyrene	0.007	J	0.238	J	mg/kg	06-SL_5-7 6/26/97 (avg of du	8/23	0.34-11	0.238		8.7E-02 C			YES	ASL
205992	Benzo(b)fluoranthene	0.005	J	0.36	J	mg/kg	SB-17-1_5-3 01/15/92	6/23	0.34-11	0.36		8.7E-01 C			NO	BSL
191242	Benzo(g,h,i)perylene	0.004	J	0.1275	J	mg/kg	06-SL_5-7 6/26/97 (avg of du	5/22	0.34-11	0.1275		2.3E+02 N			NO	BSL
207089	Benzo(k)fluoranthene	0.004	J	0.14	J	mg/kg	SB-17-1_5-3 01/15/92	5/23	0.34-11	0.14		8.7E+00 C			NO	BSL
117817	bis(2-Ethylhexyl)phthalate	0.056	J	2.8	J	mg/kg	TP-22-1-2 01/17/92	10/23	0.34-11	2.8		4.6E+01 C			NO	BSL
86748	Carbazole	0.01	J	0.038	J	mg/kg	06-SL_5-7 6/26/97 (avg of du	2/22	0.34-11	0.038		3.2E+01 C			NO	BSL
218019	Chrysene	0.007	J	0.24	J	mg/kg	SB-17-1_5-3 01/15/92	8/23	0.34-11	0.24		8.7E+01 C			NO	BSL
84742	Di-n-butyl phthalate	0.029	J	0.067	J	mg/kg	TP-41-0-0_5 01/30/92	5/22	0.14-11	0.067		7.8E+02 N			NO	BSL
117840	Di-n-octyl phthalate	0.059	J	0.28	J	mg/kg	SB-39-11_5-14_5 02/21/92	4/22	0.29-11	0.28		1.6E+02 N			NO	BSL
53703	Dibenz(a,h)anthracene	0.011	J	0.038	J	mg/kg	06-SL_5-7 6/26/97 (avg of du	3/22	0.34-11	0.038		8.7E-02 C			NO	BSL
132649	Dibenzofuran	0.005	J	0.043	J	mg/kg	TP-46-0-0_5 01/31/92	4/23	0.34-11	0.043		3.1E+01 N			NO	BSL
206440	Fluoranthene	0.006	J	0.5	J	mg/kg	06-SL_5-7 6/26/97 (avg of du	8/23	0-11	0.5		3.1E+02 N			NO	BSL
86737	Fluorene	0.009	J	0.5	J	mg/kg	TP-10-4_5-5 01/09/92	5/23	0.34-11	0.5		3.1E+02 N			NO	BSL
193395	Indeno(1,2,3-cd)pyrene	0.004	J	0.1415	J	mg/kg	06-SL_5-7 6/26/97 (avg of du	5/22	0.34-11	0.1415		8.7E-01 C			NO	BSL
91203	Naphthalene	0.009	J	0.63	J	mg/kg	TP-10-4_5-5 01/09/92	9/23	0.34-11	0.63		1.6E+02 N			NO	BSL
85018	Phenanthrene	0.005	J	1.2	J	mg/kg	TP-10-4_5-5 01/09/92	9/22	0-11	1.2		2.3E+02 N			NO	BSL

TABLE 2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Soil & Particulates
Exposure Point: Western Parcel

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
108952	Phenol	0.017	J	0.3	J	mg/kg	TP-4-11_3-11_8 12/18/91	2/23	0.34-11	0.3		4.7E+03 N			NO	BSL
129000	Pyrene	0.005	J	0.5	J	mg/kg	TP-10-4_5-5 01/09/92	9/23	0-11	0.5		2.3E+02 N			NO	BSL
71556	1,1,1-Trichloroethane	0.001		0.011	J	mg/kg	TP-35-0_5-1_5 01/24/92	5/174	0.01-1.7	0.011		1.6E+02 N			NO	IFD
75343	1,1-Dichloroethane	0.004	J	0.013		mg/kg	TP-13-2_5-3_5 01/13/92	2/174	0.01-1.7	0.013		7.8E+02 N			NO	IFD
107062	1,2-Dichloroethane	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/174	0.01-1.7	0.063		7.0E+00 C			NO	IFD
540590	1,2-Dichloroethene (total)	0.001	J	15	J	mg/kg	TP-35-0_5-1_5 01/24/92	18/208	0.005-1.7	15		7.0E+01 N			NO	BSL
78875	1,2-Dichloropropane	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/174	0.01-1.7	0.063		9.4E+00 C			NO	IFD
78933	2-Butanone	0.002	J	0.99	J	mg/kg	SB-34-10_5-12 02/19/92	13/94	0.01-1.7	0.99		4.7E+03 N			NO	BSL
591786	2-Hexanone	0.37	J	0.37	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/94	0.01-1.7	0.37		3.1E+02 N			NO	IFD
108101	4-Methyl-2-pentanone	0.046	J	0.046	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/94	0.01-1.7	0.046		6.3E+02 N			NO	IFD
87641	Acetone	0.007	J	18	DJ	mg/kg	SB-21-1_5-3 01/16/92	39/94	0.01-3.5	18		7.8E+02 N			NO	BSL
75274	Bromodichloromethane	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/174	0.005-1.7	0.063		1.0E+01 C			NO	IFD
56235	Carbon tetrachloride	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/174	0.01-1.7	0.063		4.9E+00 C			NO	IFD
108907	Chlorobenzene	0.001	J	0.26	D	mg/kg	TP-43-1-1_4 01/30/92	6/174	0.01-1.7	0.26		1.6E+02 N			NO	IFD
67663	Chloroform	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/174	0.0068-1.7	0.063		7.8E+01 N			NO	IFD
10061015	cis-1,3-Dichloropropene	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/174	0.01-1.7	0.063		2.4E+00 N			NO	IFD
100414	Ethylbenzene	0.001	J	4.7		mg/kg	SB-40-4_5-6 02/21/92	12/135	0.004-1.4	4.7		7.8E+02 N			NO	BSL
75092	Methylene chloride	0.0007	JB	0.8	J	mg/kg	SB-34-10_5-12 02/19/92	10/174	0.01-3	0.8		8.5E+01 C			NO	BSL
100425	Styrene	0.004	J	0.004	J	mg/kg	SL-01_0_5-1_25 5/21/97	1/94	0.01-1.7	0.004		1.6E+03 N			NO	IFD
127184	Tetrachloroethene	0.0002	J	15	J	mg/kg	TP-35-0_5-1_5 01/24/92	27/208	0.008-1.7	15		1.2E+01 C			YES	ASL
108883	Toluene	0.0006	J	180	J	mg/kg	TP-12-11-12 01/10/92	15/135	0.001-1.4	180		1.6E+03 N			NO	BSL
79016	Trichloroethene	0.0005	J	18	J	mg/kg	TP-12-11-12 01/10/92	55/209	0.005-1.3	18		4.7E+01 N			NO	BSL
75014	Vinyl chloride	0.14	J	0.14	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/174	0.01-1.7	0.14		3.4E-01 C			NO	IFD
1330207	Xylene (total)	0.005	J	13	J	mg/kg	TP-35-0_5-1_5 01/24/92	12/135	0.0096-1.4	13		1.6E+04 N			NO	BSL

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Region III Risk-Based Concentrations (RBC) for residential soil (10/99)
For chromium, used RBC for Chromium VI.
For lead, used 400 mg/kg, from "Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities" (USEPA, 1994).
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin ketone, used endrin RBC
For endosulfan II and endosulfan sulfate used RBC for endosulfan
For acenaphthylene, benzo(g,h,i)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethene used most RBC for most toxic of cis- and trans- isomers
For 2-nitroaneline used Region 9 PRG.

Definitions:
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.2
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Soil & Particulates
Exposure Point: Western Parcel

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)

(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
The iron concentration does not pose an adverse effect at the site

(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

TABLE 2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current & Future
Medium: Surface/Subsurface Soil
Exposure Medium: Vapors
Exposure Point: Western Parcel (Indoors and Outdoors)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
57125	Cyanide	5.1		1220	*	mg/kg	TP-22-1-2 01/17/92	38/95	0.52-10	1220		Not Volatile			NO	NV
7429905	Aluminum	73.4		297000	J	mg/kg	TP-73-4-6 02/19/92	96/96	0-0	297000	33000	Not Volatile			NO	NV
7440360	Antimony	0.69		709		mg/kg	TP-29-1_5-3 01/22/92	16/96	0.46-8.7	709		Not Volatile			NO	NV
7440382	Arsenic	0.46	B	42.9	S	mg/kg	TP-18-1_5-2 01/13/92	85/86	0-0.46	42.9	7.5	Not Volatile			NO	NV
7440393	Barium	1.4	B	500		mg/kg	TP-15-0_5-1 01/13/92	93/93	0-0	500	300	Not Volatile			NO	NV
7440417	Beryllium	0.09		1.9		mg/kg	TP-73-4-6 02/19/92	47/96	0.04-0.31	1.9	0.16	Not Volatile			NO	NV
7440439	Cadmium	0.1		4300		mg/kg	SB-2 0.0835	218/403	0.06-7.09	4300	1	Not Volatile			NO	NV
7440702	Calcium	38.7	B2*	99700		mg/kg	TP-28-1_5-2 01/21/92	96/96	0-0	99700	35000	Not Volatile			NO	NV
7440473	Chromium	0.832		97000		mg/kg	SB-2 0.0835	393/409	0-1.54	97000	40	Not Volatile			NO	NV
18540299	Chromium VI	98.7		223		mg/kg	S-01-SL_1_5-2_5 5/14/97	2/2	0-0	223		Not Volatile			NO	NV
7440484	Cobalt	0.33		14.4	J	mg/kg	TP-73-11-11_5 02/19/92	75/96	0.24-0.67	14.4	30	Not Volatile			NO	NV
7440508	Copper	0.66		9120		mg/kg	TP-73-4-6 02/19/92	87/90	0-0.62	9120	25	Not Volatile			NO	NV
7439896	Iron	99.9		255000	*	mg/kg	TP-16-1_5-2 01/13/92	96/96	0-0	255000	2000	Not Volatile			NO	NV
7439921	Lead	0.75	J	2670		mg/kg	TP-35-0_5-1_5 01/24/92	91/91	0-0	2670	400	Not Volatile			NO	NV
7439954	Magnesium	32.2	B	3390		mg/kg	TP-73-4-6 02/19/92	95/96	0-13.6	3390	5000	Not Volatile			NO	NV
7439965	Manganese	0.7	B	2530		mg/kg	TP-73-4-6 02/19/92	86/86	0-0	2530	5000	Not Volatile			NO	NV
7439976	Mercury	0.09		1.6		mg/kg	SB-2-1_5-3 01/07/92	32/96	0.05-0.19	1.6	0.1	Not Volatile			NO	NV
7440020	Nickel	0.81	B2	793		mg/kg	TP-45-1-1_5 01/30/92	88/96	0-0.91	793	13	Not Volatile			NO	NV
7440097	Potassium	37.7	B	22400		mg/kg	TP-16-1_5-2 01/13/92	96/96	0-0	22400	43000	Not Volatile			NO	NV
7782492	Selenium	0.76		3	+J	mg/kg	TP-6-0-1_5 12/19/91	5/68	0.66-5.9	3	2	Not Volatile			NO	NV
7440224	Silver	1.1		48.3		mg/kg	TP-16-1_5-2 01/13/92	20/96	0.21-1.6	48.3		Not Volatile			NO	NV
7440235	Sodium	7.5	B2	1330	B	mg/kg	TP-16-1_5-2 01/13/92	91/94	0-6.8	1330	8000	Not Volatile			NO	NV
7440280	Thallium	0.6	BWJ	1.1	B	mg/kg	TP-48-0-0_5 01/31/92	4/96	0.38-0.79	1.1		Not Volatile			NO	NV
7440622	Vanadium	1.1	B2	104		mg/kg	TP-45-1-1_5 01/30/92	94/96	0-0.59	104	150	Not Volatile			NO	NV
7440666	Zinc	3.3	BJ	187000		mg/kg	TP-76-1-1_4 02/19/92	87/87	0-0	187000	20	Not Volatile			NO	NV
72548	4,4'-DDD	0.0029	JN	0.005	J	mg/kg	S-01-SL 5/12/97	2/19	0.0034-0.26	0.005		Not Volatile			NO	NV
72559	4,4'-DDE	0.0026	JP	0.027	P	mg/kg	TP-46-0-0_5 01/31/92	3/22	0.0034-0.26	0.027		Not Volatile			NO	NV
50293	4,4'-DDT	0.0069	JP	0.25	JP	mg/kg	TP-46-0-0_5 01/31/92	2/18	0.0034-0.26	0.25		Not Volatile			NO	NV
5103719	alpha-Chlordane	0.00031	J	0.0019	J	mg/kg	SB-34-10_5-12 01/27/92	2/23	0.0018-0.13	0.0019		Not Volatile			NO	NV
53469219	Aroclor-1242	1.3	J	1.3	J	mg/kg	TP-38-1-4 01/29/92	1/24	0.034-2.6	1.3		Not Volatile			NO	NV
12672296	Aroclor-1248	2.2		2.6	J	mg/kg	TP-4-11_3-11_8 12/18/91	2/24	0.034-0.15	2.6		Not Volatile			NO	NV
11097691	Aroclor-1254	0.11	J	2.2	J	mg/kg	TP-4-11_3-11_8 12/18/91	11/24	0.034-0.15	2.2		Not Volatile			NO	NV
11096825	Aroclor-1260	0.17		9		mg/kg	TP-4-11_3-11_8 12/18/91	5/24	0.034-0.15	9		Not Volatile			NO	NV
319857	beta-BHC	0.0071	JN	0.0071	JN	mg/kg	TP-46-0-0_5 01/31/92	1/24	0.0018-0.13	0.0071		Not Volatile			NO	NV
33213659	Endosulfan II	0.0015	J	0.017	JN	mg/kg	TP-46-0-0_5 01/31/92	2/19	0.0034-0.26	0.017		Not Volatile			NO	NV
1031078	Endosulfan sulfate	0.0019	JN	0.0019	JN	mg/kg	SB-8-7_5-9_5 01/10/92	1/23	0.0034-0.26	0.0019		Not Volatile			NO	NV

TABLE 2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current & Future
Medium: Surface/Subsurface Soil
Exposure Medium: Vapors
Exposure Point: Western Parcel (Indoors and Outdoors)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
72208	Endrin	0.0031	J	0.048	JP	mg/kg	TP-46-0-0_5 01/31/92	4/21	0.0034-0.26	0.048		Not Volatile			NO	NV
7421934	Endrin aldehyde	0.0076	J	0.017	J	mg/kg	S-01-SL_1_5-2_5 5/14/97	2/22	0.002-0.26	0.017		Not Volatile			NO	NV
53494705	Endrin ketone	0.00071	JPN	0.019	J	mg/kg	TP-46-0-0_5 01/31/92	4/22	0.0034-0.26	0.019		Not Volatile			NO	NV
58899	gamma-BHC	0.0063	J	0.0063	J	mg/kg	TP-73-4-6 02/19/92	1/23	0.0018-0.13	0.0063		Not Volatile			NO	NV
5103742	gamma-Chlordane	0.00097	JN	0.047	JNP	mg/kg	SB-17-1_5-3 01/15/92	3/22	0.0018-0.13	0.047		Not Volatile			NO	NV
72435	Methoxychlor	0.0052	J	0.075		mg/kg	TP-25-4-4_5 01/17/92	3/20	0.018-1.3	0.075		Not Volatile			NO	NV
120821	1,2,4-Trichlorobenzene	0.012	J	0.012	J	mg/kg	S-01-SL_1_5-2_5 5/14/97	1/23	0.34-11	0.012		3.2E+02 N			NO	IFD
95501	1,2-Dichlorobenzene	0.004	J	0.19	J	mg/kg	S-01-SL_1_5-2_5 5/14/97	4/23	0.34-11	0.19		5.6E+02 S			NO	BSL
541731	1,3-Dichlorobenzene	0.018	J	0.018	J	mg/kg	S-01-SL_1_5-2_5 5/14/97	1/23	0.34-11	0.018		3.7E+02 S			NO	IFD
106467	1,4-Dichlorobenzene	0.005	J	0.074	J	mg/kg	TP-4-11_3-11_8 12/18/91	4/23	0.34-11	0.074		4.9E+00 C			NO	BSL
105679	2,4-Dimethylphenol	0.01	J	0.07	J	mg/kg	TP-4-11_3-11_8 12/18/91	2/23	0.34-11	0.07		Not Volatile			NO	NV
606202	2,6-Dinitrotoluene	0.008	J	0.008	J	mg/kg	S-01-SL_1_5-2_5 5/14/97	1/23	0.34-11	0.008		Not Volatile			NO	NV
91576	2-Methylnaphthalene	0.036	J	2.6	J	mg/kg	TP-10-4_5-5 01/09/92	9/23	0.34-5	2.6		4.8E+00 S			NO	BSL
95487	2-Methylphenol	0.068	J	0.068	J	mg/kg	TP-4-11_3-11_8 12/18/91	1/23	0.34-11	0.068		Not Volatile			NO	NV
106445	4-Methylphenol	0.062	J	0.062	J	mg/kg	S-01-SL_1_5-2_5 5/14/97	1/23	0.34-11	0.062		Not Volatile			NO	NV
83329	Acenaphthene	0.006	J	0.38	J	mg/kg	TP-10-4_5-5 01/09/92	5/23	0.34-11	0.38		1.3E+02 S			NO	BSL
208968	Acenaphthylene	0.004	J	0.015	J	mg/kg	S-01-SL_1_5-2_5 5/14/97	4/23	0.34-11	0.015		2.9E+02 S			NO	BSL
120127	Anthracene	0.01	J	0.55	J	mg/kg	TP-10-4_5-5 01/09/92	7/22	0.34-11	0.55		6.1E+00 S			NO	BSL
56553	Benz(a)anthracene	0.009	J	0.252	J	mg/kg	B-06-SL_5-7 6/26/97 (avg of dups	6/23	0.34-11	0.252		Not Volatile			NO	NV
50328	Benzo(a)pyrene	0.007	J	0.238	J	mg/kg	B-06-SL_5-7 6/26/97 (avg of dups	5/23	0.34-11	0.238		Not Volatile			NO	NV
205992	Benzo(b)fluoranthene	0.005	J	0.36	J	mg/kg	SB-17-1_5-3 01/15/92	6/23	0.34-11	0.36		Not Volatile			NO	NV
191242	Benzo(g,h,i)perylene	0.004	J	0.1275	J	mg/kg	B-06-SL_5-7 6/26/97 (avg of dups	5/22	0.34-11	0.1275		Not Volatile			NO	NV
207089	Benzo(k)fluoranthene	0.004	J	0.14	J	mg/kg	SB-17-1_5-3 01/15/92	5/23	0.34-11	0.14		Not Volatile			NO	NV
117817	bis(2-Ethylhexyl)phthalate	0.056	J	2.8	J	mg/kg	TP-22-1-2 01/17/92	10/23	0.34-11	2.8		Not Volatile			NO	NV
86748	Carbazole	0.01	J	0.038	J	mg/kg	B-06-SL_5-7 6/26/97 (avg of dups	2/22	0.34-11	0.038		Not Volatile			NO	NV
218019	Chrysene	0.007	J	0.24	J	mg/kg	SB-17-1_5-3 01/15/92	6/23	0.34-11	0.24		Not Volatile			NO	NV
84742	Di-n-butyl phthalate	0.029	J	0.067	J	mg/kg	TP-41-0-0_5 01/30/92	5/22	0.14-11	0.067		Not Volatile			NO	NV
117840	Di-n-octyl phthalate	0.059	J	0.28	J	mg/kg	SB-39-11_5-14_5 02/21/92	4/22	0.29-11	0.28		Not Volatile			NO	NV
53703	Dibenz(a,h)anthracene	0.011	J	0.036	J	mg/kg	B-06-SL_5-7 6/26/97 (avg of dups	3/22	0.34-11	0.036		Not Volatile			NO	NV
132649	Dibenzofuran	0.005	J	0.043	J	mg/kg	TP-46-0-0_5 01/31/92	4/23	0.34-11	0.043		1.4E+02 S			NO	BSL
206440	Fluoranthene	0.006	J	0.5	J	mg/kg	B-06-SL_5-7 6/26/97 (avg of dups	8/23	0-11	0.5		Not Volatile			NO	NV
86737	Fluorene	0.009	J	0.5	J	mg/kg	TP-10-4_5-5 01/09/92	5/23	0.34-11	0.5		9.0E+01 S			NO	BSL
193395	Indeno(1,2,3-cd)pyrene	0.004	J	0.1415	J	mg/kg	B-06-SL_5-7 6/26/97 (avg of dups	5/22	0.34-11	0.1415		Not Volatile			NO	NV
91203	Naphthalene	0.009	J	0.63	J	mg/kg	TP-10-4_5-5 01/09/92	9/23	0.34-11	0.63		1.4E+01 N			NO	BSL
85018	Phenanthrene	0.005	J	1.2	J	mg/kg	TP-10-4_5-5 01/09/92	9/22	0-11	1.2		9.3E+01 S			NO	BSL
108952	Phenol	0.017	J	0.3	J	mg/kg	TP-4-11_3-11_8 12/18/91	2/23	0.34-11	0.3		Not Volatile			NO	NV
129000	Pyrene	0.005	J	0.5	J	mg/kg	TP-10-4_5-5 01/09/92	9/23	0-11	0.5		Not Volatile			NO	NV

TABLE 2.3
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current & Future
Medium: Surface/Subsurface Soil
Exposure Medium: Vapors
Exposure Point: Western Parcel (Indoors and Outdoors)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
71556	1,1,1-Trichloroethane	0.001		0.011	J	mg/kg	TP-35-0_5-1_5 01/24/92	5/174	0.01-1.7	0.011		2.4E+02 N			NO	IFD
75343	1,1-Dichloroethane	0.004	J	0.013		mg/kg	TP-13-2_5-3_5 01/13/92	2/174	0.01-1.7	0.013		1.3E+02 N			NO	IFD
107062	1,2-Dichloroethane	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/174	0.01-1.7	0.063		4.0E-01 C			NO	IFD
540590	1,2-Dichloroethene (total)	0.001	J	15	J	mg/kg	TP-35-0_5-1_5 01/24/92	18/208	0.005-1.7	15		1.2E+02 N			NO	BSL
78875	1,2-Dichloropropane	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/174	0.01-1.7	0.063		1.5E+00 N			NO	IFD
78933	2-Butanone	0.002	J	0.99	J	mg/kg	SB-34-10_5-12 02/19/92	13/94	0.01-1.7	0.99		2.0E+03 N			NO	BSL
591786	2-Hexanone	0.37	J	0.37	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/94	0.01-1.7	0.37		1.5E+01 N			NO	IFD
108101	4-Methyl-2-pentanone	0.046	J	0.046	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/94	0.01-1.7	0.046		1.8E+02 N			NO	IFD
67641	Acetone	0.007	J	18	DJ	mg/kg	SB-21-1_5-3 01/16/92	39/94	0.01-3.5	18		1.0E+05 S			NO	BSL
75274	Bromodichloromethane	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/174	0.005-1.7	0.063		3.0E+03 S			NO	IFD
56235	Carbon tetrachloride	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/174	0.01-1.7	0.063		3.0E-01 C			NO	IFD
108907	Chlorobenzene	0.001	J	0.26	D	mg/kg	TP-43-1-1_4 01/30/92	6/174	0.01-1.7	0.26		1.3E+01 N			NO	IFD
67663	Chloroform	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/174	0.0068-1.7	0.063		9.0E-02 N			NO	IFD
10061015	cis-1,3-Dichloropropene	0.063	J	0.063	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/174	0.01-1.7	0.063		1.0E-01 C			NO	IFD
100414	Ethylbenzene	0.001	J	4.7		mg/kg	SB-40-4_5-6 02/21/92	12/135	0.004-1.4	4.7		4.0E+02 S			NO	BSL
75092	Methylene chloride	0.0007	JB	0.8	J	mg/kg	SB-34-10_5-12 02/19/92	10/174	0.01-3	0.8		1.3E+01 C			NO	BSL
100425	Styrene	0.004	J	0.004	J	mg/kg	SL-01_0_5-1_25 5/21/97	1/94	0.01-1.7	0.004		1.5E+03 N			NO	IFD
127184	Tetrachloroethene	0.0002	J	15	J	mg/kg	TP-35-0_5-1_5 01/24/92	27/208	0.005-1.7	15		1.1E+01 C			YES	ASL
108883	Toluene	0.0006	J	180	J	mg/kg	TP-12-11-12 01/10/92	15/135	0.001-1.4	180		1.4E+02 N			YES	ASL
79016	Trichloroethene	0.0008	J	18	J	mg/kg	TP-12-11-12 01/10/92	55/209	0.005-1.3	18		5.0E+00 C			YES	ASL
75014	Vinyl chloride	0.14	J	0.14	J	mg/kg	TP-35-0_5-1_5 01/24/92	1/174	0.01-1.7	0.14		3.0E-02 C			NO	IFD
1330207	Xylene (total)	0.005	J	13	J	mg/kg	TP-35-0_5-1_5 01/24/92	12/135	0.0096-1.4	13		4.1E+01 N			NO	BSL

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Soil Screening Guidance Level (SSL) for Inhalation of Volatiles (5/96)
(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples
NOTE: 1,1,1-Trichloroethane screening toxicity value based on 1/10th the calculated noncancer SSL. The cancer-based listed SSL (1,200mg/kg) exceeds this concentration.

Definitions:
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.10
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Solid Waste
Exposure Medium: Solid Waste & Particulates
Exposure Point: Eastern Parcel

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
57125	Cyanide	0.87	J	15.5	J	mg/kg	SF-SL-01 5/7/97	12/30	0.51-1.2	15.5		1.6E+02 N			NO	BSL
7429905	Aluminum	753		64500		mg/kg	SF-SL-24 5/6/97	30/30	0-0	64500	33000	7.8E+03 N			YES	ASL
7440360	Antimony	0.6	J	187.8		mg/kg	SF-SL-28 5/21/97 (avg of dups)	17/30	0.44-5	187.5		3.1E+00 N			YES	ASL
7440382	Arsenic	0.54		22.5		mg/kg	SF-SL-24 5/6/97	28/30	0.55-0.68	22.5	7.5	4.3E-02 C			YES	ASL
7440393	Barium	3.1		1720	J	mg/kg	SF-SL-04 5/6/97	30/30	0-0	1720	300	5.5E+02 N			YES	ASL
7440417	Beryllium	0.06	B	0.78	J	mg/kg	SF-SL-01 5/7/97	27/30	0.05-0.07	0.78	0.16	1.6E+01 N			NO	BSL
7440439	Cadmium	0.16		117		mg/kg	SF-SL-28 5/21/97 (avg of dups)	28/30	0.06-0.06	117	1	7.8E+00 N			YES	ASL
7440702	Calcium	37.4		40400	J	mg/kg	SF-SL-50 1/25/99	30/30	0-0	40400	35000				NO	NUT
7440473	Chromium	2.1		4090	J	mg/kg	SF-SL-33 1/25/99	30/30	0-0	4090	40	2.3E+01 N			YES	ASL
7440484	Cobalt	0.84		71.3		mg/kg	SF-SL-06 5/6/97	30/30	0-0	71.3	30	4.7E+02 N			NO	BSL
7440508	Copper	1.7		21600		mg/kg	SF-SL-24 5/6/97	30/30	0-0	21600	25	3.1E+02 N			YES	ASL
7439896	Iron	1850		376000		mg/kg	SF-SL-24 5/6/97	30/30	0-0	376000	2000	2.3E+03 N			NO	NUT
7439921	Lead	1.6	J	4280		mg/kg	SF-SL-21 5/6/97	30/30	0-0	4280	400	4.0E+02			YES	ASL
7439954	Magnesium	144		8950		mg/kg	STD-03 5/22/97	30/30	0-0	8950	5000				NO	NUT
7439965	Manganese	24.8		1340		mg/kg	SF-SL-24 5/6/97	30/30	0-0	1340	5000	1.6E+02 N			NO	BKG
7439976	Mercury	0.118		7.9		mg/kg	SF-SL-06 5/6/97	20/30	0.05-0.09	7.9	0.1	7.8E-01 N			YES	ASL
7440020	Nickel	1		518	J	mg/kg	SF-SL-04 5/6/97	30/30	0-0	518	13	1.6E+02 N			YES	ASL
7440097	Potassium	89.1		1100	J	mg/kg	SF-SL-24 5/6/97	29/30	101-101	1100	43000				NO	NUT
7782492	Selenium	0.57		5.9	J	mg/kg	SF-SL-04 5/6/97	12/30	0.33-1.2	5.9	2	3.9E+01 N			NO	BSL
7440224	Silver	0.46	J	10		mg/kg	SF-SL-06 5/6/97	17/30	0.2-0.36	10		3.9E+01 N			NO	BSL
7440235	Sodium	66.6		935		mg/kg	SF-SL-43 5/14/97	27/29	85-121	935	8000				NO	NUT
7440280	Thallium	0.78		0.77		mg/kg	SF-SL-43 5/14/97	2/30	0.63-3	0.77		6.5E-01 N			YES	ASL
7440622	Vanadium	2		259	J	mg/kg	SF-SL-01 5/7/97	30/30	0-0	259	150	5.5E+01 N			YES	ASL
7440666	Zinc	4.2		6110	J	mg/kg	SF-SL-04 5/6/97	30/30	0-0	6110	20	2.3E+03 N			YES	ASL
72548	4,4'-DDD	0.0057	J	32		mg/kg	SF-SL-07 5/7/97	18/25	0.0033-0.051	32		2.7E+00 C			YES	ASL
72559	4,4'-DDE	0.007		7.4	P	mg/kg	SF-SL-07 5/7/97	17/25	0.0033-0.0079	7.4		1.9E+00 C			YES	ASL
50293	4,4'-DDT	0.0081	P	5		mg/kg	SF-SL-01 5/7/97	18/25	0.0033-0.051	5		1.9E+00 C			YES	ASL
309002	Aldrin	0.00355	J	0.022		mg/kg	SF-SL-19 1/26/99	2/25	0.0017-0.026	0.022		3.8E-02 C			NO	BSL
319846	alpha-BHC	0.0039	J	0.0039	J	mg/kg	SF-SL-28 5/21/97 (avg of dups)	1/25	0.0017-0.18	0.0039		1.0E-01 C			NO	IFD
5103719	alpha-Chlordane	0.0037	J	0.029	J	mg/kg	SF-SL-09 5/7/97	8/25	0.0017-0.18	0.029		1.8E+00 C			NO	BSL
12672296	Aroclor-1248	0.19	J	0.85		mg/kg	SF-SL-50 1/25/99	2/25	0.033-3.4	0.85		3.2E-01 C			YES	ASL
11097691	Aroclor-1254	0.066		1.8	J	mg/kg	SF-SL-28 5/21/97 (avg of dups)	7/25	0.033-3.4	1.8		1.6E-01 N			YES	ASL
11096825	Aroclor-1260	0.058		4.35	J	mg/kg	SF-SL-28 5/21/97 (avg of dups)	5/25	0.033-3.4	4.35		3.2E-01 C			YES	ASL
319857	beta-BHC	0.0069	J	0.0069	J	mg/kg	SF-SL-50 1/25/99	1/25	0.0017-0.18	0.0069		3.5E-01 C			NO	IFD
60571	Dieldrin	0.061	J	0.35	J	mg/kg	SF-SL-27 1/26/99	2/25	0.0033-0.34	0.35		4.0E-02 C			YES	ASL
959988	Endosulfan I	0.026	J	0.026	J	mg/kg	SF-SL-19 1/26/99	1/25	0.0017-0.18	0.026		4.7E+01 N			NO	IFD
33213659	Endosulfan II	0.041		0.062	J	mg/kg	SF-SL-27 1/26/99	3/25	0.0033-0.34	0.062		4.7E+01 N			NO	BSL
72208	Endrin	0.0079	J	0.038		mg/kg	SF-SL-19 1/26/99	2/25	0.0033-0.34	0.038		2.3E+00 N			NO	BSL
7421934	Endrin aldehyde	0.0066		2.3	J	mg/kg	SF-SL-27 1/26/99	4/25	0.0033-0.34	2.3		2.3E+00 N			NO	BSL
53494705	Endrin ketone	0.051	P	0.051	P	mg/kg	SF-SL-06 5/6/97	1/25	0.0029-0.34	0.051		2.3E+00 N			NO	IFD
58899	gamma-BHC	0.0096		0.0096		mg/kg	SF-SL-19 1/26/99	1/25	0.0017-0.18	0.0096		4.9E-01 C			NO	IFD
5103742	gamma-Chlordane	0.01		0.082	J	mg/kg	SF-SL-19 1/26/99	4/24	0.0017-0.18	0.082		1.8E+00 C			NO	BSL
76448	Heptachlor	0.082	J	0.082	J	mg/kg	SF-SL-19 1/26/99	1/25	0.0017-0.18	0.082		1.4E-01 C			NO	IFD

TABLE 2.10
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Solid Waste
Exposure Medium: Solid Waste & Particulates
Exposure Point: Eastern Parcel

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
72435	Methoxychlor	0.27	J	0.27	J	mg/kg	SF-SL-19 1/26/99	1/25	0.003-1.8	0 27		3.9E+01 N			NO	IFD
120821	1,2,4-Trichlorobenzene	0.062	J	0.062	J	mg/kg	SF-SL-30 5/5/97	1/24	0.35-1000	0 062		7.8E+01 N			NO	IFD
95501	1,2-Dichlorobenzene	0.008	J	0.086	J	mg/kg	SF-SL-30 5/5/97	2/24	0.71-1000	0.086		7.0E+02 N			NO	BSL
91576	2-Methylnaphthalene	0.006	J	29	J	mg/kg	SF-SL-22 5/5/97 (avg of dups)	17/25	0.35-1000	29		1.6E+02 N			NO	BSL
95487	2-Methylphenol	0.37	J	0.37	J	mg/kg	SF-SL-45W 5/14/97	1/24	0.35-1000	0 37		3 9E+02 N			NO	IFD
88744	2-Nitroaniline	0.25	J	0.25	J	mg/kg	SF-SL-43 5/14/97	1/25	0.85-2400	0 25		3 5E-01 N			NO	IFD
59507	4-Chloro-3-methylphenol	0.009	J	0.009	J	mg/kg	SF-SL-45 5/14/97	1/25	0.35-1000	0 009					NO	IFD
106445	4-Methylphenol	0.66	J	1.5	J	mg/kg	SF-SL-07 5/7/97	2/24	0.35-1000	1.5		3 9E+01 N			NO	BSL
83329	Acenaphthene	0.024	J	41	J	mg/kg	SF-SL-01 5/7/97	11/24	0.35-1000	41		4.7E+02 N			NO	BSL
208968	Acenaphthylene	0.008	J	2.7	J	mg/kg	SF-SL-01 5/7/97	8/24	0.71-1000	2.7		2.3E+02 N			NO	BSL
120127	Anthracene	0.011	J	67	J	mg/kg	SF-SL-01 5/7/97	15/24	0.71-1000	67		2.3E+03 N			NO	BSL
56553	**Benz(a)anthracene**	**0.01**	**J**	**250**		**mg/kg**	**SF-SL-01 5/7/97**	**15/24**	**1.8-1000**	**250**		**8.7E-01 C**			**YES**	**ASL**
50328	**Benzo(a)pyrene**	**0.028**	**J**	**160**		**mg/kg**	**SF-SL-01 5/7/97**	**16/24**	**0.71-1000**	**160**		**8.7E-02 C**			**YES**	**ASL**
205992	**Benzo(b)fluoranthene**	**0.062**	**J**	**270**		**mg/kg**	**SF-SL-01 5/7/97**	**16/24**	**0.71-1000**	**270**		**8.7E-01 C**			**YES**	**ASL**
191242	Benzo(g,h,i)perylene	0.019	J	75	J	mg/kg	SF-SL-01 5/7/97	17/24	0.71-1000	75		2 3E+02 N			NO	BSL
207089	**Benzo(k)fluoranthene**	**0.019**	**J**	**100**	**J**	**mg/kg**	**SF-SL-01 5/7/97**	**16/24**	**0.71-1000**	**100**		**8.7E+00 C**			**YES**	**ASL**
117817	**bis(2-Ethylhexyl)phthalate**	**0.044**	**J**	**4650**		**mg/kg**	**SF-SL-28 5/21/97 (avg of dups)**	**19/26**	**0.35-170**	**4650**		**4.6E+01 C**			**YES**	**ASL**
86748	**Carbazole**	**0.007**	**J**	**52**	**J**	**mg/kg**	**SF-SL-01 5/7/97**	**12/24**	**0.71-1000**	**52**		**3.2E+01 C**			**YES**	**ASL**
218019	**Chrysene**	**0.007**	**J**	**250**		**mg/kg**	**SF-SL-01 5/7/97**	**17/24**	**1.8-1000**	**250**		**8.7E+01 C**			**YES**	**ASL**
84742	Di-n-butyl phthalate	0.19	J	1.3	J	mg/kg	SF-SL-43 5/14/97	2/25	0.35-1000	1.3		7 8E+02 N			NO	BSL
117840	**Di-n-octyl phthalate**	**0.13**	**J**	**945**	**J**	**mg/kg**	**SF-SL-28 5/21/97 (avg of dups)**	**5/24**	**0.35-170**	**945**		**1.6E+02 N**			**YES**	**ASL**
53703	**Dibenz(a,h)anthracene**	**0.022**	**J**	**26**	**J**	**mg/kg**	**SF-SL-01 5/7/97**	**11/24**	**0.71-1000**	**26**		**8.7E-02 C**			**YES**	**ASL**
132649	Dibenzofuran	0.047	J	25	J	mg/kg	SF-SL-01 5/7/97	10/24	0.35-1000	25		3 1E+01 N			NO	BSL
131113	Dimethyl phthalate	0.92		0.92		mg/kg	SF-SL-42 5/14/97	1/24	0.35-1000	0.92					NO	IFD
206440	**Fluoranthene**	**0.014**	**J**	**850**		**mg/kg**	**SF-SL-01 5/7/97**	**19/24**	**1.8-1000**	**850**		**3.1E+02 N**			**YES**	**ASL**
86737	Fluorene	0.008	J	38	J	mg/kg	SF-SL-01 5/7/97	14/24	0.35-1000	38		3 1E+02 N			NO	BSL
87683	Hexachlorobutadiene	0.099	J	0.099	J	mg/kg	SF-SL-30 5/5/97	1/24	0.35-1000	0.099		8 2E+00 C			NO	IFD
193395	**Indeno(1,2,3-cd)pyrene**	**0.018**	**J**	**94**	**J**	**mg/kg**	**SF-SL-01 5/7/97**	**16/24**	**0.71-1000**	**94**		**8.7E-01 C**			**YES**	**ASL**
78591	Isophorone	0.013	J	0.013	J	mg/kg	SF-SL-42 5/14/97	1/24	0.35-1000	0.013		6.7E+02 C			NO	IFD
91203	Naphthalene	0.012	J	12	J	mg/kg	SF-SL-01 5/7/97	18/25	0.35-1000	12		1 6E+02 N			NO	BSL
85018	**Phenanthrene**	**0.02**	**J**	**490**		**mg/kg**	**SF-SL-01 5/7/97**	**21/25**	**1.8-1000**	**490**		**2.3E+02 N**			**YES**	**ASL**
108952	Phenol	0 066	J	1.3	J	mg/kg	SF-SL-07 5/7/97	5/25	0.35-1000	1.3		4 7E+03 N			NO	BSL
129000	**Pyrene**	**0.012**	**J**	**500**		**mg/kg**	**SF-SL-01 5/7/97**	**19/24**	**1.8-1000**	**500**		**2.3E+02 N**			**YES**	**ASL**
71556	1,1,1-Trichloroethane	0.006	J	0.015	J	mg/kg	SF-SL-43 5/14/97	2/30	0 01-9.6	0.015		1.6E+02 N			NO	BSL
79345	1,1,2,2-Tetrachloroethane	0.0003	J	0.0003	J	mg/kg	SF-SL-24 5/6/97	1/30	0.01-9.6	0 0003		3 2E+00 C			NO	IFD
75343	1,1-Dichloroethane	0.0055	J	0.0055	J	mg/kg	SF-SL-28 5/21/97 (avg of dups)	1/30	0 01-9 6	0 0055		7 8E+02 N			NO	IFD
540590	1,2-Dichloroethene (total)	0.0007	J	0.005	J	mg/kg	SF-SL-26 5/8/97	4/30	0 01-9.6	0.005		7 0E+01 N			NO	BSL
78933	2-Butanone	0.004	J	0 094		mg/kg	SF-SL-24 5/6/97	6/30	0.01-9.6	0 094		4 7E+03 N			NO	BSL
591786	2-Hexanone	0.018	J	0 018	J	mg/kg	SF-SL-24 5/6/97	1/30	0.01-9.6	0 018		3 1E+02 N			NO	IFD
108101	4-Methyl-2-pentanone	0.004	J	0.004	J	mg/kg	SF-SL-24 5/6/97	1/30	0 01-9 6	0.004		6 3E+02 N			NO	IFD
67641	Acetone	0.006	J	0.39		mg/kg	SF-SL-24 5/6/97	12/30	0.011-9 6	0 39		7 8E+02 N			NO	BSL
71432	Benzene	0.002	J	0 002	J	mg/kg	SF-SL-01 5/7/97	4/30	0 01-9.6	0 002		2 2E+01 C			NO	BSL
56235	Carbon tetrachloride	0.008	J	0 008	J	mg/kg	SF-SL-06 5/6/97	1/30	0.01-9 6	0.008		4 9E+00 C			NO	IFD
75003	Chloroethane	0.001	J	0.001	J	mg/kg	SF-SL-28 5/21/97 (avg of dups)	1/30	0 01-9.6	0 001		2 2E+02 C			NO	IFD
67663	Chloroform	0 002	J	0 002	J	mg/kg	SF-SL-07 5/7/97	1/30	0 01-9 6	0 002		7 8E+01 N			NO	IFD
74873	Chloromethane	0 001	J	0.01	J	mg/kg	STD-02 5/22/97	2/30	0 01-9.6	0.01		4 9E+01 C			NO	BSL
10061015	cis-1,3-Dichloropropene	0.0005	J	0.0005	J	mg/kg	SF-SL-24 5/6/97	1/30	0 01-9 6	0 0005		2 4E+00 N			NO	IFD

TABLE 2.10
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Solid Waste
Exposure Medium: Solid Waste & Particulates
Exposure Point: Eastern Parcel

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
100414	Ethylbenzene	0.001	J	2.7	J	mg/kg	SF-SL-33 1/25/99	7/30	0.01-0.061	2.7		7.8E+02	N			NO	BSL
75092	Methylene chloride	0.11	J	0.11	J	mg/kg	SF-SL-22 5/5/97 (avg of dups)	1/30	0.01-9.6	0.11		8.5E+01	C			NO	IFD
100425	Styrene	0.004	J	0.019	J	mg/kg	SF-SL-26 5/8/97	3/30	0.01-9.6	0.019		1.6E+03	N			NO	BSL
127184	Tetrachloroethene	0.0005	J	0.098		mg/kg	SF-SL-43 5/14/97	9/30	0.011-9.6	0.098		1.2E+01	C			NO	BSL
108883	Toluene	0.0008	J	0.34	J	mg/kg	SF-SL-22 5/5/97 (avg of dups)	13/30	0.01-9.6	0.34		1.6E+03	N			NO	BSL
10061026	trans-1,3-Dichloropropene	0.0005	J	0.0005	J	mg/kg	SF-SL-24 5/6/97	1/30	0.01-9.6	0.0005		2.4E+00	N			NO	IFD
79016	Trichloroethene	0.0007	J	0.44		mg/kg	SF-SL-43 5/14/97	9/30	0.01-9.6	0.44		4.7E+01	N			NO	BSL
1330207	Xylene (total)	0.006	J	1.8	J	mg/kg	SF-SL-33 1/25/99	6/30	0.01-4.44	1.8		1.6E+04	N			NO	BSL

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Region III Risk-Based Concentrations (RBC) for residential soil (10/99)
For chromium, used RBC for Chromium VI.
For lead, used 400 mg/kg, from "Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities" (USEPA, 1994).
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin ketone, used endrin RBC
For endosulfan II and endosulfan sulfate used RBC for endosulfan
For acenaphthylene, benzo(g,h,i)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethene used most RBC for most toxic of cis- and trans- isomers
For 2-nitroanaline used Region 9 PRG.
(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
The iron concentration does not pose an adverse effect at the site
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions: COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.11
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current & Future
Medium: Solid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors and Outdoors)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
57125	Cyanide	0.87	J	15.5	J	mg/kg	SF-SL-01 5/7/97	12/30	0.51-1.2	15.5		Not Volatile			NO	NV
7429905	Aluminum	753		64500		mg/kg	SF-SL-24 5/6/97	30/30	0-0	64500	33000	Not Volatile			NO	NV
7440360	Antimony	0.6	J	187.5		mg/kg	SF-SL-28 5/21/97 (avg of dups)	17/30	0.44-5	187.5		Not Volatile			NO	NV
7440382	Arsenic	0.54		22.5		mg/kg	SF-SL-24 5/6/97	28/30	0.55-0.65	22.5	7.5	Not Volatile			NO	NV
7440393	Barium	3.1		1720	J	mg/kg	SF-SL-04 5/8/97	30/30	0-0	1720	300	Not Volatile			NO	NV
7440417	Beryllium	0.06	B	0.78	J	mg/kg	SF-SL-01 5/7/97	27/30	0.05-0.07	0.78	0.16	Not Volatile			NO	NV
7440439	Cadmium	0.16		117		mg/kg	SF-SL-28 5/21/97 (avg of dups)	28/30	0.06-0.06	117	1	Not Volatile			NO	NV
7440702	Calcium	37.4		40400	J	mg/kg	SF-SL-50 1/25/99	30/30	0-0	40400	35000	Not Volatile			NO	NV
7440473	Chromium	2.1		4090	J	mg/kg	SF-SL-33 1/25/99	30/30	0-0	4090	40	Not Volatile			NO	NV
7440484	Cobalt	0.84		71.3		mg/kg	SF-SL-06 5/6/97	30/30	0-0	71.3	30	Not Volatile			NO	NV
7440508	Copper	1.7		21600		mg/kg	SF-SL-24 5/6/97	30/30	0-0	21600	25	Not Volatile			NO	NV
7439896	Iron	1850		376000		mg/kg	SF-SL-24 5/6/97	30/30	0-0	376000	2000	Not Volatile			NO	NV
7439921	Lead	1.6	J	4280		mg/kg	SF-SL-21 5/8/97	30/30	0-0	4280	400	Not Volatile			NO	NV
7439954	Magnesium	144		8950		mg/kg	STD-03 5/22/97	30/30	0-0	8950	5000	Not Volatile			NO	NV
7439965	Manganese	24.8		1340		mg/kg	SF-SL-24 5/6/97	30/30	0-0	1340	5000	Not Volatile			NO	NV
7439976	Mercury	0.115		7.9		mg/kg	SF-SL-06 5/6/97	20/30	0.05-0.09	7.9	0.1	Not Volatile			NO	NV
7440020	Nickel	1		518	J	mg/kg	SF-SL-04 5/8/97	30/30	0-0	518	13	Not Volatile			NO	NV
7440097	Potassium	69.1		1100	J	mg/kg	SF-SL-24 5/6/97	29/30	101-101	1100	43000	Not Volatile			NO	NV
7782492	Selenium	0.57		5.9	J	mg/kg	SF-SL-04 5/8/97	12/30	0.33-1.2	5.9	2	Not Volatile			NO	NV
7440224	Silver	0.46	J	10		mg/kg	SF-SL-06 5/6/97	17/30	0.2-0.36	10		Not Volatile			NO	NV
7440235	Sodium	66.6		935		mg/kg	SF-SL-43 5/14/97	27/29	85-121	935	8000	Not Volatile			NO	NV
7440280	Thallium	0.75		0.77		mg/kg	SF-SL-43 5/14/97	2/30	0.63-3	0.77		Not Volatile			NO	NV
7440622	Vanadium	2		259	J	mg/kg	SF-SL-01 5/7/97	30/30	0-0	259	150	Not Volatile			NO	NV
7440666	Zinc	4.2		6110	J	mg/kg	SF-SL-04 5/8/97	30/30	0-0	6110	20	Not Volatile			NO	NV
72548	4,4'-DDD	0.0057	J	32		mg/kg	SF-SL-07 5/7/97	18/25	0.0033-0.051	32		Not Volatile			NO	NV
72559	4,4'-DDE	0.007		7.4	P	mg/kg	SF-SL-07 5/7/97	17/25	0.0033-0.0079	7.4		Not Volatile			NO	NV
50293	4,4'-DDT	0.0061	P	5		mg/kg	SF-SL-01 5/7/97	15/25	0.0033-0.051	5		Not Volatile			NO	NV
309002	Aldrin	0.00355	J	0.022		mg/kg	SF-SL-19 1/26/99	2/25	0.0017-0.026	0.022		Not Volatile			NO	NV
319846	alpha-BHC	0.0039	J	0.0039	J	mg/kg	SF-SL-28 5/21/97 (avg of dups)	1/25	0.0017-0.18	0.0039		Not Volatile			NO	NV
5103719	alpha-Chlordane	0.0037	J	0.029	J	mg/kg	SF-SL-09 5/7/97	8/25	0.0017-0.18	0.029		Not Volatile			NO	NV
12672296	Aroclor-1248	0.19	J	0.85		mg/kg	SF-SL-50 1/25/99	2/25	0.033-3.4	0.85		Not Volatile			NO	NV
11097691	Aroclor-1254	0.066		1.8	J	mg/kg	SF-SL-28 5/21/97 (avg of dups)	7/25	0.033-3.4	1.8		Not Volatile			NO	NV
11096825	Aroclor-1260	0.058		4.35	J	mg/kg	SF-SL-28 5/21/97 (avg of dups)	5/25	0.033-3.4	4.35		Not Volatile			NO	NV
319857	beta-BHC	0.0069	J	0.0069	J	mg/kg	SF-SL-50 1/25/99	1/25	0.0017-0.18	0.0069		Not Volatile			NO	NV
60571	Dieldrin	0.061	J	0.35	J	mg/kg	SF-SL-27 1/26/99	2/25	0.0033-0.34	0.35		Not Volatile			NO	NV
959988	Endosulfan I	0.026	J	0.026	J	mg/kg	SF-SL-19 1/26/99	1/25	0.0017-0.18	0.026		Not Volatile			NO	NV
33213659	Endosulfan II	0.041		0.062	J	mg/kg	SF-SL-27 1/26/99	3/25	0.0033-0.34	0.062		Not Volatile			NO	NV

TABLE 2.11
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current & Future
Medium: Solid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors and Outdoors)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
72208	Endrin	0.0079	J	0.038		mg/kg	SF-SL-19 1/26/99	2/25	0.0033-0.34	0.038		Not Volatile			NO	NV
7421934	Endrin aldehyde	0.0066		2.3	J	mg/kg	SF-SL-27 1/26/99	4/25	0.0033-0.34	2.3		Not Volatile			NO	NV
53494705	Endrin ketone	0.051	P	0.051	P	mg/kg	SF-SL-06 5/6/97	1/25	0.0029-0.34	0.051		Not Volatile			NO	NV
58899	gamma-BHC	0.0096		0.0096		mg/kg	SF-SL-19 1/26/99	1/25	0.0017-0.18	0.0096		Not Volatile			NO	NV
5103742	gamma-Chlordane	0.01		0.082	J	mg/kg	SF-SL-19 1/26/99	4/24	0.0017-0.18	0.082		Not Volatile			NO	NV
76448	Heptachlor	0.082	J	0.082	J	mg/kg	SF-SL-19 1/26/99	1/25	0.0017-0.18	0.082		Not Volatile			NO	NV
72435	Methoxychlor	0.27	J	0.27	J	mg/kg	SF-SL-19 1/26/99	1/25	0.003-1.8	0.27		Not Volatile			NO	NV
120821	1,2,4-Trichlorobenzene	0.062	J	0.062	J	mg/kg	SF-SL-30 5/5/97	1/24	0.35-1000	0.062		3.2E+02 N			NO	IFD
95501	1,2-Dichlorobenzene	0.008	J	0.086	J	mg/kg	SF-SL-30 5/5/97	2/24	0.71-1000	0.086		5.6E+02 S			NO	BSL
91576	2-Methylnaphthalene	0.008	J	29	J	mg/kg	SF-SL-22 5/5/97 (avg of dups)	17/25	0.35-1000	29		4.8E+00 S			YES	ASL
95487	2-Methylphenol	0.37	J	0.37	J	mg/kg	SF-SL-45W 5/14/97	1/24	0.35-1000	0.37		Not Volatile			NO	NV
88744	2-Nitroaniline	0.25	J	0.25	J	mg/kg	SF-SL-43 5/14/97	1/25	0.85-2400	0.25		Not Volatile			NO	NV
59507	4-Chloro-3-methylphenol	0.009	J	0.009	J	mg/kg	SF-SL-45 5/14/97	1/25	0.35-1000	0.009		Not Volatile			NO	NV
106445	4-Methylphenol	0.66	J	1.5	J	mg/kg	SF-SL-07 5/7/97	2/24	0.35-1000	1.5		Not Volatile			NO	NV
83329	Acenaphthene	0.024	J	41	J	mg/kg	SF-SL-01 5/7/97	11/24	0.35-1000	41		1.3E+02 S			NO	BSL
208968	Acenaphthylene	0.008	J	2.7	J	mg/kg	SF-SL-01 5/7/97	8/24	0.71-1000	2.7		2.9E+02 S			NO	BSL
120127	Anthracene	0.011	J	67	J	mg/kg	SF-SL-01 5/7/97	15/24	0.71-1000	67		6.1E+00 S			YES	ASL
56553	Benz(a)anthracene	0.01	J	250		mg/kg	SF-SL-01 5/7/97	15/24	1.8-1000	250		Not Volatile			NO	NV
50328	Benzo(a)pyrene	0.028	J	160		mg/kg	SF-SL-01 5/7/97	16/24	0.71-1000	160		Not Volatile			NO	NV
205992	Benzo(b)fluoranthene	0.052	J	270		mg/kg	SF-SL-01 5/7/97	16/24	0.71-1000	270		Not Volatile			NO	NV
191242	Benzo(g,h,i)perylene	0.019	J	75	J	mg/kg	SF-SL-01 5/7/97	17/24	0.71-1000	75		Not Volatile			NO	NV
207089	Benzo(k)fluoranthene	0.019	J	100	J	mg/kg	SF-SL-01 5/7/97	15/24	0.71-1000	100		Not Volatile			NO	NV
117817	bis(2-Ethylhexyl)phthalate	0.044	J	4650		mg/kg	SF-SL-28 5/21/97 (avg of dups)	19/26	0.35-170	4650		Not Volatile			NO	NV
86748	Carbazole	0.007	J	52	J	mg/kg	SF-SL-01 5/7/97	12/24	0.71-1000	52		Not Volatile			NO	NV
218019	Chrysene	0.007	J	250		mg/kg	SF-SL-01 5/7/97	17/24	1.8-1000	250		Not Volatile			NO	NV
84742	Di-n-butyl phthalate	0.19	J	1.3	J	mg/kg	SF-SL-43 5/14/97	2/25	0.35-1000	1.3		Not Volatile			NO	NV
117840	Di-n-octyl phthalate	0.13	J	945	J	mg/kg	SF-SL-28 5/21/97 (avg of dups)	5/24	0.35-170	945		Not Volatile			NO	NV
53703	Dibenz(a,h)anthracene	0.022	J	26	J	mg/kg	SF-SL-01 5/7/97	11/24	0.71-1000	26		Not Volatile			NO	NV
132649	Dibenzofuran	0.047	J	25	J	mg/kg	SF-SL-01 5/7/97	10/24	0.35-1000	25		1.4E+02 S			NO	BSL
131113	Dimethyl phthalate	0.92		0.92		mg/kg	SF-SL-42 5/14/97	1/24	0.35-1000	0.92		Not Volatile			NO	NV
206440	Fluoranthene	0.014	J	650		mg/kg	SF-SL-01 5/7/97	19/24	1.8-1000	650		Not Volatile			NO	NV
86737	Fluorene	0.008	J	38	J	mg/kg	SF-SL-01 5/7/97	14/24	0.35-1000	38		9.0E+01 S			NO	BSL
87683	Hexachlorobutadiene	0.099	J	0.099	J	mg/kg	SF-SL-30 5/5/97	1/24	0.35-1000	0.099		4.4E-01 C			NO	IFD
193395	Indeno(1,2,3-cd)pyrene	0.018	J	94	J	mg/kg	SF-SL-01 5/7/97	16/24	0.71-1000	94		Not Volatile			NO	NV
78591	Isophorone	0.013	J	0.013	J	mg/kg	SF-SL-42 5/14/97	1/24	0.35-1000	0.013		Not Volatile			NO	NV
91203	Naphthalene	0.012	J	12	J	mg/kg	SF-SL-01 5/7/97	18/25	0.35-1000	12		1.4E+01 N			NO	BSL

TABLE 2.11
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current & Future
Medium: Solid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors and Outdoors)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
85018	**Phenanthrene**	**0.02**	J	**490**		**mg/kg**	SF-SL-01 5/7/97	**21/25**	**1.8-1000**	**490**		**9.3E+01 S**			**YES**	**ASL**
108952	Phenol	0.066	J	1.3	J	mg/kg	SF-SL-07 5/7/97	5/25	0.35-1000	1.3		Not Volatile			NO	NV
129000	Pyrene	0.012	J	500		mg/kg	SF-SL-01 5/7/97	19/24	1.8-1000	500		Not Volatile			NO	NV
71556	1,1,1-Trichloroethane	0.006	J	0.015	J	mg/kg	SF-SL-43 5/14/97	2/30	0.01-9.6	0.015		2.4E+02 N			NO	BSL
79345	1,1,2,2-Tetrachloroethane	0.0003	J	0.0003	J	mg/kg	SF-SL-24 5/6/97	1/30	0.01-9.6	0.0003		6.0E-01 C			NO	IFD
75343	1,1-Dichloroethane	0.0055	J	0.0055	J	mg/kg	SF-SL-28 5/21/97 (avg of dups)	1/30	0.01-9.6	0.0055		1.3E+02 N			NO	IFD
540590	1,2-Dichloroethene (total)	0.0007	J	0.005	J	mg/kg	SF-SL-26 5/8/97	4/30	0.01-9.6	0.005		1.2E+02 N			NO	BSL
78933	2-Butanone	0.004	J	0.094		mg/kg	SF-SL-24 5/6/97	6/30	0.01-9.6	0.094		2.0E+03 N			NO	BSL
591786	2-Hexanone	0.018	J	0.018	J	mg/kg	SF-SL-24 5/6/97	1/30	0.01-9.6	0.016		1.5E+01 N			NO	IFD
108101	4-Methyl-2-pentanone	0.004	J	0.004	J	mg/kg	SF-SL-24 5/6/97	1/30	0.01-9.6	0.004		1.6E+02 N			NO	IFD
67641	Acetone	0.006	J	0.39		mg/kg	SF-SL-24 5/6/97	12/30	0.011-9.6	0.39		1.0E+05 S			NO	BSL
71432	Benzene	0.002	J	0.002	J	mg/kg	SF-SL-01 5/7/97	4/30	0.01-9.6	0.002		6.0E-01 C			NO	BSL
56235	Carbon tetrachloride	0.008	J	0.008	J	mg/kg	SF-SL-06 5/6/97	1/30	0.01-9.6	0.008		3.0E-01 C			NO	IFD
75003	Chloroethane	0.001	J	0.001	J	mg/kg	SF-SL-26 5/21/97 (avg of dups)	1/30	0.01-9.6	0.001		1.4E+03 N			NO	IFD
67663	Chloroform	0.002	J	0.002	J	mg/kg	SF-SL-07 5/7/97	1/30	0.01-9.6	0.002		9.0E-02 N			NO	IFD
74873	Chloromethane	0.001	J	0.01	J	mg/kg	STD-02 5/22/97	2/30	0.01-9.6	0.01		2.6E+00 C			NO	BSL
10061015	cis-1,3-Dichloropropene	0.0005	J	0.0005	J	mg/kg	SF-SL-24 5/6/97	1/30	0.01-9.6	0.0005		1.0E-01 C			NO	IFD
100414	Ethylbenzene	0.001	J	2.7	J	mg/kg	SF-SL-33 1/25/99	7/30	0.01-0.061	2.7		4.0E+02 S			NO	BSL
75092	Methylene chloride	0.11	J	0.11	J	mg/kg	SF-SL-22 5/5/97 (avg of dups)	1/30	0.01-9.6	0.11		1.3E+01 C			NO	IFD
100425	Styrene	0.004	J	0.019	J	mg/kg	SF-SL-26 5/8/97	3/30	0.01-9.6	0.019		1.5E+03 N			NO	BSL
127184	Tetrachloroethene	0.0005	J	0.098		mg/kg	SF-SL-43 5/14/97	9/30	0.011-9.6	0.098		1.1E+01 C			NO	BSL
108883	Toluene	0.0008	J	0.34	J	mg/kg	SF-SL-22 5/5/97 (avg of dups)	13/30	0.01-9.6	0.34		1.4E+02 N			NO	BSL
10061026	trans-1,3-Dichloropropene	0.0005	J	0.0005	J	mg/kg	SF-SL-24 5/6/97	1/30	0.01-9.6	0.0005		1.0E-01 C			NO	IFD
79016	Trichloroethene	0.0007	J	0.44		mg/kg	SF-SL-43 5/14/97	9/30	0.01-9.6	0.44		5.0E+00 C			NO	BSL
1330207	Xylene (total)	0.006	J	1.8	J	mg/kg	SF-SL-33 1/25/99	6/30	0.01-4.44	1.8		4.1E+01 N			NO	BSL

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Soil Screening Guidance Level (SSL) for Inhalation of Volatiles (5/96)
(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples
NOTE: 1,1,1-Trichloroethane screening toxicity value based on 1/10th the calculated noncancer SSL. The cancer-based listed SSL (1,200mg/kg) exceeds this concentrati

Definitions: COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration (used when lower than SSL)
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.12
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Solid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
57125	Cyanide	2	J	18	J	mg/kg	SF-SL-01 5/7/97	2/4	0.82-1.2	18		Not Volatile			NO	NV
7429905	Aluminum	11100	J	22900	J	mg/kg	SF-SL-04 5/8/97	4/4	0-0	22900	33000	Not Volatile			NO	NV
7440360	Antimony	0.93	J	41.9	J	mg/kg	SF-SL-06 5/6/97	4/4	0-0	41.9		Not Volatile			NO	NV
7440382	Arsenic	15		22.2	J	mg/kg	SF-SL-04 5/8/97	4/4	0-0	22.2	7.5	Not Volatile			NO	NV
7440393	Barium	234	J	1720	J	mg/kg	SF-SL-04 5/8/97	4/4	0-0	1720	300	Not Volatile			NO	NV
7440417	Beryllium	0.49		0.78	J	mg/kg	SF-SL-01 5/7/97	4/4	0-0	0.78	0.16	Not Volatile			NO	NV
7440439	Cadmium	12.7	J	53.3	J	mg/kg	SF-SL-01 5/7/97	4/4	0-0	53.3	1	Not Volatile			NO	NV
7440702	Calcium	3020	J	25000		mg/kg	SF-SL-06 5/6/97	4/4	0-0	25000	35000	Not Volatile			NO	NV
7440473	Chromium	344		1340	J	mg/kg	SF-SL-01 5/7/97	4/4	0-0	1340	40	Not Volatile			NO	NV
7440484	Cobalt	8	J	71.3		mg/kg	SF-SL-06 5/6/97	4/4	0-0	71.3	30	Not Volatile			NO	NV
7440508	Copper	889		1740	J	mg/kg	SF-SL-01 5/7/97	4/4	0-0	1740	25	Not Volatile			NO	NV
7439896	Iron	27500	J	60400		mg/kg	SF-SL-06 5/6/97	4/4	0-0	60400	2000	Not Volatile			NO	NV
7439921	Lead	811	J	3380		mg/kg	SF-SL-06 5/6/97	4/4	0-0	3380	400	Not Volatile			NO	NV
7439954	Magnesium	2710	J	3850	J	mg/kg	SF-SL-07 5/7/97	4/4	0-0	3850	5000	Not Volatile			NO	NV
7439965	Manganese	240	J	643		mg/kg	SF-SL-06 5/6/97	4/4	0-0	643	5000	Not Volatile			NO	NV
7439976	Mercury	0.91	J	7.9		mg/kg	SF-SL-06 5/6/97	4/4	0-0	7.9	0.1	Not Volatile			NO	NV
7440020	Nickel	74.2	J	518	J	mg/kg	SF-SL-04 5/8/97	4/4	0-0	518	13	Not Volatile			NO	NV
7440097	Potassium	278	J	607	J	mg/kg	SF-SL-01 5/7/97	4/4	0-0	607	43000	Not Volatile			NO	NV
7782492	Selenium	2.4		5.9	J	mg/kg	SF-SL-04 5/8/97	4/4	0-0	5.9	2	Not Volatile			NO	NV
7440224	Silver	2.9	J	10		mg/kg	SF-SL-06 5/6/97	4/4	0-0	10		Not Volatile			NO	NV
7440235	Sodium	173		322	J	mg/kg	SF-SL-01 5/7/97	4/4	0-0	322	8000	Not Volatile			NO	NV
7440622	Vanadium	105		259	J	mg/kg	SF-SL-01 5/7/97	4/4	0-0	259	150	Not Volatile			NO	NV
7440666	Zinc	944	J	6110	J	mg/kg	SF-SL-04 5/8/97	4/4	0-0	6110	20	Not Volatile			NO	NV
72548	4,4'-DDD	0.054		32		mg/kg	SF-SL-07 5/7/97	4/4	0-0	32		Not Volatile			NO	NV
72559	4,4'-DDE	0.14		7.4	P	mg/kg	SF-SL-07 5/7/97	3/4	0.0079-0.0079	7.4		Not Volatile			NO	NV
50293	4,4'-DDT	0.051	P	5		mg/kg	SF-SL-01 5/7/97	4/4	0-0	5		Not Volatile			NO	NV
11096825	Aroclor-1260	2.3		2.3		mg/kg	SF-SL-01 5/7/97	1/4	0.054-3.4	2.3		Not Volatile			NO	NV
53494705	Endrin ketone	0.051	P	0.051	P	mg/kg	SF-SL-06 5/6/97	1/4	0.013-0.34	0.051		Not Volatile			NO	NV
91576	**2-Methylnaphthalene**	**0.97**	**J**	**5.5**	**J**	**mg/kg**	**SF-SL-01 5/7/97**	**3/4**	**27-27**	**5.5**		**4.8E+00 S**			**YES**	**ASL**
106445	4-Methylphenol	1.5	J	1.5	J	mg/kg	SF-SL-07 5/7/97	1/4	27-130	1.5		Not Volatile			NO	NV
83329	Acenaphthene	0.45	J	41	J	mg/kg	SF-SL-01 5/7/97	4/4	0-0	41		1.3E+02 S			NO	BSL
208968	Acenaphthylene	0.45	J	2.7	J	mg/kg	SF-SL-01 5/7/97	3/4	27-27	2.7		2.9E+02 S			NO	BSL
120127	**Anthracene**	**1.2**	**J**	**67**	**J**	**mg/kg**	**SF-SL-01 5/7/97**	**4/4**	**0-0**	**67**		**6.1E+00 S**			**YES**	**ASL**
56553	Benz(a)anthracene	6.1	J	250		mg/kg	SF-SL-01 5/7/97	4/4	0-0	250		Not Volatile			NO	NV
50328	Benzo(a)pyrene	4.9	J	160		mg/kg	SF-SL-01 5/7/97	4/4	0-0	160		Not Volatile			NO	NV
205992	Benzo(b)fluoranthene	7.7	J	270		mg/kg	SF-SL-01 5/7/97	4/4	0-0	270		Not Volatile			NO	NV
191242	Benzo(g,h,i)perylene	2.6	J	75	J	mg/kg	SF-SL-01 5/7/97	4/4	0-0	75		Not Volatile			NO	NV
207089	Benzo(k)fluoranthene	3.5	J	100	J	mg/kg	SF-SL-01 5/7/97	4/4	0-0	100		Not Volatile			NO	NV
117817	bis(2-Ethylhexyl)phthalate	4.3	J	47		mg/kg	SF-SL-04 5/8/97	3/4	0-130	47		Not Volatile			NO	NV
86748	Carbazole	0.94	J	52	J	mg/kg	SF-SL-01 5/7/97	4/4	0-0	52		Not Volatile			NO	NV
218019	Chrysene	7	J	250		mg/kg	SF-SL-01 5/7/97	4/4	0-0	250		Not Volatile			NO	NV
53703	Dibenz(a,h)anthracene	0.77	J	26	J	mg/kg	SF-SL-01 5/7/97	4/4	0-0	26		Not Volatile			NO	NV
132649	Dibenzofuran	0.3	J	25	J	mg/kg	SF-SL-01 5/7/97	4/4	0-0	25		1.4E+02 S			NO	BSL

TABLE 2.12
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Solid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
206440	Fluoranthene	12	J	650		mg/kg	SF-SL-01 5/7/97	4/4	0-0	650		Not Volatile				NO	NV
86737	Fluorene	0.48	J	38	J	mg/kg	SF-SL-01 5/7/97	4/4	0-0	38		9.0E+01	S			NO	BSL
193395	Indeno(1,2,3-cd)pyrene	2.7	J	94	J	mg/kg	SF-SL-01 5/7/97	4/4	0-0	94		Not Volatile				NO	NV
91203	Naphthalene	0.32	J	12	J	mg/kg	SF-SL-01 5/7/97	4/4	0-0	12		1.4E+01	N			NO	BSL
85018	Phenanthrene	6.4	J	490		mg/kg	SF-SL-01 5/7/97	4/4	0-0	490		9.3E+01	S			YES	ASL
108952	Phenol	1.3	J	1.3	J	mg/kg	SF-SL-07 5/7/97	1/4	27-130	1.3		Not Volatile				NO	NV
129000	Pyrene	12	J	500		mg/kg	SF-SL-01 5/7/97	4/4	0-0	500		Not Volatile				NO	NV
78933	2-Butanone	0.012	J	0.09		mg/kg	SF-SL-07 5/7/97	2/4	0.024-0.04	0.09		2.0E+03	N			NO	BSL
67641	Acetone	0.019	J	0.019	J	mg/kg	SF-SL-04 5/8/97	1/4	0.016-0.11	0.019		1.0E+05	S			NO	BSL
71432	Benzene	0.002	J	0.002	J	mg/kg	SF-SL-01 5/7/97	2/4	0.021-0.024	0.002		8.0E-01	C			NO	BSL
56235	Carbon tetrachloride	0.008	J	0.008	J	mg/kg	SF-SL-06 5/6/97	1/4	0.021-0.04	0.008		3.0E-01	C			NO	BSL
67663	Chloroform	0.002	J	0.002	J	mg/kg	SF-SL-07 5/7/97	1/4	0.016-0.04	0.002		9.0E-02	N			NO	BSL
100414	Ethylbenzene	0.001	J	0.001	J	mg/kg	SF-SL-06 5/6/97	1/4	0.021-0.04	0.001		4.0E+02	S			NO	BSL
108883	Toluene	0.004	J	0.11		mg/kg	SF-SL-06 5/6/97	2/4	0.024-0.04	0.11		1.4E+02	N			NO	BSL
79016	Trichloroethene	0.003	J	0.003	J	mg/kg	SF-SL-01 5/7/97	1/4	0.016-0.024	0.003		5.0E+00	C			NO	BSL

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Soil Screening Guidance Level (SSL) for Inhalation of Volatiles (5/96)
(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions: COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.13
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Liquid Waste
Exposure Medium: Liquid Waste
Exposure Point: Eastern Parcel

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value	(3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
7429905	Aluminum	90	B	28000		ug/l	SF-AQ-33 1/25/99	11/15	48.5-48.5	28000		3.7E+03	N			YES	ASL
7429905	Antimony	5.4	B	271		ug/l	SF-AQ-28 5/21/97	4/15	2.2-2.2	271		1.5E+00	N			YES	ASL
7440360	Arsenic	2.8	B	74.6		ug/l	SF-AQ-33 1/25/99	15/15	0-0	74.6		4.5E-02	C			YES	ASL
7440382	Barium	2.9	B	824		ug/l	SF-AQ-22 5/5/97	15/15	0-0	824		2.6E+02	N			YES	ASL
7440393	Beryllium	0.24	B	1.1		ug/l	SF-AQ-33 1/25/99	12/15	0.2-0.2	1.1		7.3E+00	N			NO	BSL
7440417	Cadmium	0.58	B	136		ug/l	SF-AQ-28 5/21/97	11/15	0.3-0.3	136		3.7E+00	N			YES	ASL
7440439	Calcium	3500	B	94700		ug/l	SF-AQ-35 5/6/97	15/15	0-0	94700						NO	NUT
7440702	Chromium	1.4	B	11400		ug/l	SF-AQ-33 1/25/99	11/15	1.1-30	11400		1.1E+01	N			YES	ASL
7440473	Cobalt	1.1	B	17.8		ug/l	SF-AQ-33 1/25/99	10/15	1.1-1.1	17.8		2.2E+02	N			NO	BSL
18540299	Copper	4.9	B	5270		ug/l	SF-AQ-33 1/25/99	15/15	0-0	5270		1.5E+02	N			YES	ASL
7440484	Iron	105		94100		ug/l	SF-AQ-33 1/25/99	15/15	0-0	94100			N			NO	NUT
7440508	Lead	3.4	J	2700		ug/l	SF-AQ-33 1/25/99	13/15	2.1-2.1	2700		1.5E+01				YES	ASL
7439896	Magnesium	455	B	21200		ug/l	SF-AQ-22 5/5/97	15/15	0-0	21200						NO	NUT
7439921	Manganese	2.9	B	454		ug/l	SF-AQ-33 1/25/99	15/15	0-0	454		7.3E+01	N			YES	ASL
7439954	Mercury	0.1	B	1.6		ug/l	SF-AQ-33 1/25/99	7/15	0.1-0.1	1.6		3.7E-01	N			YES	ASL
7439965	Nickel	1.9	B	148		ug/l	SF-AQ-33 1/25/99	13/15	1.4-1.4	148		7.3E+01	N			YES	ASL
7439976	Potassium	258	B	32900	J	ug/l	SF-AQ-22 5/5/97	15/15	0-0	32900						NO	NUT
7440020	Selenium	3.7	B	3.7	B	ug/l	SF-AQ-26 5/8/97	1/15	3.2-4.2	3.7		1.8E+01	N			NO	BSL
7440097	Silver	1.2		13.7		ug/l	SF-AQ-33 1/25/99	4/15	1-1	13.7		1.8E+01	N			NO	BSL
7782492	Sodium	1440	B	32700	J	ug/l	SF-AQ-22 5/5/97	14/15	396-396	32700						NO	NUT
7440224	Thallium	4.7	B	6.4		ug/l	SF-AQ-04 5/8/97	2/15	3.1-4.7	6.4		2.6E-01	N			YES	ASL
7440235	Vanadium	0.98	B	509		ug/l	SF-AQ-33 1/25/99	13/15	0.8-0.8	509		2.6E+01	N			YES	ASL
7440280	Zinc	18.1	BJ	5500		ug/l	SF-AQ-33 1/25/99	15/15	0-0	5500		1.1E+03	N			YES	ASL
7440622	4,4'-DDD	0.13	J	24		ug/l	SF-AQ-07 5/7/97	4/14	0.1-0.1	24		2.8E-01	C			YES	ASL
7440666	4,4'-DDE	0.51		14		ug/l	SF-AQ-07 5/7/97	3/14	0.1-0.11	14		2.0E-01	C			YES	ASL
72548	4,4'-DDT	0.32		8.5		ug/l	SF-AQ-07 5/7/97	4/14	0.1-0.1	8.5		2.0E-01	C			YES	ASL
72559	Aroclor-1260	1.5		33	J	ug/l	SF-AQ-17 5/6/97	3/14	1-1.1	33		3.3E-02	C			YES	ASL
50293	Endrin aldehyde	0.2	J	1.2	J	ug/l	SF-AQ-17 5/6/97	3/14	0.1-2.5	1.2		1.1E+00	N			YES	ASL
5103719	Endrin ketone	0.4	J	0.4	J	ug/l	SF-AQ-25 5/7/97	1/14	0.1-2.5	0.4		1.1E+00	N			NO	BSL
12672296	gamma-Chlordane	0.066	J	0.11	J	ug/l	SF-AQ-25 5/7/97	2/14	0.05-0.054	0.11		1.9E-01	C			NO	BSL
11096825	Heptachlor epoxide	0.079	J	0.079	J	ug/l	SF-AQ-25 5/7/97	1/14	0.05-0.054	0.079		7.4E-03	C			YES	ASL
319868	Methoxychlor	0.71	J	16	J	ug/l	SF-AQ-07 5/7/97	3/14	0.5-0.54	16		1.8E+01	N			NO	BSL
1031078	1,2-Dichlorobenzene	0.1	J	0.6	J	ug/l	SF-AQ-17 5/6/97	3/15	10-260	0.6		5.5E+01	N			NO	BSL
72208	1,3-Dichlorobenzene	0.4	J	0.5	J	ug/l	SF-AQ-17 5/6/97	2/15	10-260	0.5		5.5E-01	N			NO	BSL
7421934	1,4-Dichlorobenzene	1	J	2	J	ug/l	SF-AQ-17 5/6/97	2/15	10-280	2		4.7E-01	C			YES	ASL
5103742	2-Methylnaphthalene	0.2	J	7	J	ug/l	SF-AQ-26 5/8/97	6/15	10-260	7		1.2E+01	N			NO	BSL
1024573	4-Methylphenol	0.1	J	48	J	ug/l	SF-AQ-22 5/5/97	5/15	10-100	48		1.8E+01	N			YES	ASL
72435	Acenaphthene	0.1	J	4	J	ug/l	SF-AQ-25 5/7/97	5/15	10-260	4		3.7E+01	N			NO	BSL
95501	Acenaphthylene	3	J	3	J	ug/l	SF-AQ-25 5/7/97	1/15	10-260	3		1.8E+01	N			NO	BSL
541731	Anthracene	0.1	J	13	J	ug/l	SF-AQ-25 5/7/97	8/15	10-200	13		1.8E+02	N			NO	BSL
106467	Benz(a)anthracene	0.1	J	45	J	ug/l	SF-AQ-25 5/7/97	10/15	10-100	45		9.2E-02	C			YES	ASL

TABLE 2.13
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

Scenario Timeframe: Future
Medium: Liquid Waste
Exposure Medium: Liquid Waste
Exposure Point: Eastern Parcel

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
91576	Benzo(a)pyrene	0.1	J	41	J	ug/l	SF-AQ-25 5/7/97	8/15	10-200	41		9.2E-03	C			YES	ASL
106445	Benzo(b)fluoranthene	0.2	J	66	J	ug/l	SF-AQ-25 5/7/97	10/15	10-200	66		9.2E-02	C			YES	ASL
83329	Benzo(g,h,i)perylene	0.3	J	21	J	ug/l	SF-AQ-25 5/7/97	8/15	10-200	21		1.8E+02	N			NO	BSL
208968	Benzo(k)fluoranthene	0.1	J	28	J	ug/l	SF-AQ-25 5/7/97	8/15	10-200	28		9.2E-01	C			YES	ASL
120127	bis(2-Ethylhexyl)phthalate	1	J	300		ug/l	SF-AQ-25 5/7/97	10/15	10-10	300		4.8E+00	C			YES	ASL
56553	Carbazole	0.1	J	11	J	ug/l	SF-AQ-25 5/7/97	8/15	10-280	11		3.3E+00	C			YES	ASL
50328	Chrysene	0.2	J	54	J	ug/l	SF-AQ-25 5/7/97	10/15	10-100	54		9.2E+00	C			YES	ASL
205992	Di-n-octyl phthalate	17	J	36	J	ug/l	SF-AQ-25 5/7/97	3/15	10-280	36		7.3E+01	N			NO	BSL
191242	Dibenz(a,h)anthracane	0.1	J	7	J	ug/l	SF-AQ-25 5/7/97	8/15	10-260	7		9.2E-03	C			YES	ASL
207089	Dibenzofuran	0.1	J	4	J	ug/l	SF-AQ-25 5/7/97	4/15	10-260	4		2.4E+00	N			YES	ASL
117817	Fluoranthene	0.3	J	91	J	ug/l	SF-AQ-25 5/7/97	9/15	10-200	91		1.5E+02	N			NO	BSL
86748	Fluorene	0.1	J	5	J	ug/l	SF-AQ-25 5/7/97	6/15	10-280	5		2.4E+01	N			NO	BSL
218019	Indeno(1,2,3-cd)pyrene	0.3	J	24	J	ug/l	SF-AQ-25 5/7/97	8/15	10-200	24		9.2E-02	C			YES	ASL
84742	Naphthalene	0.1	J	8	J	ug/l	SF-AQ-25 5/7/97	7/15	10-280	8		6.5E-01	N			YES	ASL
53703	Pentachlorophenol	13	J	13	J	ug/l	SF-AQ-25 5/7/97	1/15	25-640	13		5.6E-01	C			YES	ASL
132649	Phenanthrene	0.1	J	57	J	ug/l	SF-AQ-25 5/7/97	11/15	10-51	57		1.8E+01	N			YES	ASL
206440	Phenol	13	J	13	J	ug/l	SF-AQ-22 5/5/97	1/15	10-200	13		2.2E+03	N			NO	BSL
86737	Pyrene	0.2	J	80	J	ug/l	SF-AQ-25 5/7/97	10/15	10-100	80		1.8E+01	N			YES	ASL
193395	1,1,1-Trichloroethane	1	J	1	J	ug/l	SF-AQ-28 5/21/97	1/15	10-100	1		5.4E+01	N			NO	BSL
78591	1,2-Dichloroethene (total)	0.8	J	0.8	J	ug/l	SF-AQ-33 1/25/99	1/15	10-100	0.8		5.5E+00	N			NO	BSL
91203	2-Butanone	9	J	9	J	ug/l	SF-AQ-22 5/5/97	1/15	10-100	9		1.9E+02	N			NO	BSL
85018	4-Methyl-2-pentanone	1	J	1	J	ug/l	SF-AQ-28 5/21/97	1/15	10-100	1		1.4E+01	N			NO	BSL
108952	Acetone	39		88	J	ug/l	SF-AQ-28 5/8/97	3/15	10-10	88		8.1E+01	N			YES	ASL
129000	Benzene	60	J	60	J	ug/l	SF-AQ-28 5/8/97	1/15	10-10	60		3.6E-01	C			YES	ASL
71556	Chlorobenzene	1.5	J	8	J	ug/l	SF-AQ-17 5/6/97	2/15	10-100	8		1.1E+01	N			NO	BSL
75343	Chloroethane	9.5	J	40	J	ug/l	SF-AQ-17 5/6/97	2/15	10-100	40		3.6E+00	C			YES	ASL
540590	Ethylbenzene	31		160		ug/l	SF-AQ-26 5/8/97	2/15	10-10	160		1.3E+02	N			YES	ASL
78933	Methylene chloride	2	JB	24	JB	ug/l	SF-AQ-26 5/8/97	2/15	10-10	24		4.1E+00	C			YES	ASL
591786	Toluene	0.8	J	390		ug/l	SF-AQ-28 5/8/97	4/15	10-10	390		7.5E+01	N			YES	ASL
108101	Trichloroethene	2	J	2	J	ug/l	SF-AQ-33 1/25/99	1/15	10-100	2		1.6E+00	C			YES	ASL
67641	Vinyl chloride	0.8	J	0.8	J	ug/l	SF-AQ-17 5/8/97	1/15	10-100	0.8		1.9E-02	C			YES	ASL
71432	Xylene (total)	2	J	1400		ug/l	SF-AQ-28 5/8/97	2/15	10-10	1400		1.2E+03	N			YES	ASL

TABLE 2.13

OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN

(1) Minimum/maximum detected concentration.

(2) Refer to supporting information for background discussion.

(3) Based on U.S. EPA Region III Risk-Based Concentrations (RBC) for tap water (10/99)
For chromium, used the RBC for chromium VI
For lead, used Drinking Water Regulations and Health Advisories Action Level
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin ketone, used endrin RBC
For endosulfan II and endosulfan sulfate used RBC for endosulfan
For acenaphthylene, benzo(g,h,i)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethene used most RBC for most toxic of cis- and trans- isomers
For 2-nitroanaline used Region 9 PRG.

(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
The Iron concentration does not pose en adverse effect at the site

(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions:
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.14
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current and Future
Medium: Liquid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors and Outdoors)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
7429905	Aluminum	90	B	28000		ug/l	SF-AQ-33 1/25/99	11/15	48.5-48.5	28000		Not Volatile			NO	NV
7429905	Antimony	5.4	B	271		ug/l	SF-AQ-28 5/21/97	4/15	2.2-2.2	271		Not Volatile			NO	NV
7440360	Arsenic	2.6	B	74.6		ug/l	SP-AQ-33 1/25/99	15/15	0-0	74.6		Not Volatile			NO	NV
7440382	Barium	2.9	B	824		ug/l	SF-AQ-22 5/5/97	15/15	0-0	824		Not Volatile			NO	NV
7440393	Beryllium	0.24	B	1.1		ug/l	SF-AQ-33 1/25/99	12/15	0.2-0.2	1.1		Not Volatile			NO	NV
7440417	Cadmium	0.58	B	136		ug/l	SF-AQ-28 5/21/97	11/15	0.3-0.3	136		Not Volatile			NO	NV
7440439	Calcium	3500	B	94700		ug/l	SF-AQ-35 5/6/97	15/15	0-0	94700		Not Volatile			NO	NV
7440702	Chromium	1.4	B	11400		ug/l	SF-AQ-33 1/25/99	11/15	1.1-30	11400		Not Volatile			NO	NV
7440473	Cobalt	1.1	B	17.8		ug/l	SF-AQ-33 1/25/99	10/15	1.1-1.1	17.8		Not Volatile			NO	NV
18540299	Copper	4.9	B	5270		ug/l	SF-AQ-33 1/25/99	15/15	0-0	5270		Not Volatile			NO	NV
7440484	Iron	105		94100		ug/l	SF-AQ-33 1/25/99	15/15	0-0	94100		Not Volatile			NO	NV
7440508	Lead	3.4	J	2700		ug/l	SF-AQ-33 1/25/99	13/15	2.1-2.1	2700		Not Volatile			NO	NV
7439896	Magnesium	455	B	21200		ug/l	SF-AQ-22 5/5/97	15/15	0-0	21200		Not Volatile			NO	NV
7439921	Manganese	2.9	B	454		ug/l	SF-AQ-33 1/25/99	15/15	0-0	454		Not Volatile			NO	NV
7439954	Mercury	0.1	B	1.6		ug/l	SF-AQ-33 1/25/99	7/15	0.1-0.1	1 6		Not Volatile			NO	NV
7439965	Nickel	1.9	B	148		ug/l	SF-AQ-33 1/25/99	13/15	1.4-1.4	148		Not Volatile			NO	NV
7439976	Potassium	258	B	32900	J	ug/l	SF-AQ-22 5/5/97	15/15	0-0	32900		Not Volatile			NO	NV
7440020	Selenium	3.7	B	3.7	B	ug/l	SF-AQ-26 5/8/97	1/15	3.2-4.2	3.7		Not Volatile			NO	NV
7440097	Silver	1.2		13.7		ug/l	SF-AQ-33 1/25/99	4/15	1-1	13.7		Not Volatile			NO	NV
7782492	Sodium	1440	B	32700	J	ug/l	SF-AQ-22 5/5/97	14/15	396-396	32700		Not Volatile			NO	NV
7440224	Thallium	4.7	B	6.4		ug/l	SF-AQ-04 5/8/97	2/15	3.1-4.7	6.4		Not Volatile			NO	NV
7440235	Vanadium	0.98	B	509		ug/l	SF-AQ-33 1/25/99	13/15	0.8-0.8	509		Not Volatile			NO	NV
7440280	Zinc	18.1	BJ	5500		ug/l	SF-AQ-33 1/25/99	15/15	0-0	5500		Not Volatile			NO	NV
7440622	4,4'-DDD	0.13	J	24		ug/l	SF-AQ-07 5/7/97	4/14	0.1-0.1	24		Not Volatile			NO	NV
7440666	4,4'-DDE	0.51		14		ug/l	SF-AQ-07 5/7/97	3/14	0.1-0.11	14		Not Volatile			NO	NV
72548	4,4'-DDT	0.32		8.5		ug/l	SF-AQ-07 5/7/97	4/14	0.1-0.1	8 5		Not Volatile			NO	NV
72559	Aroclor-1260	1.5		33	J	ug/l	SF-AQ-17 5/6/97	3/14	1-1.1	33		Not Volatile			NO	NV
50293	Endrin aldehyde	0 2	J	1.2	J	ug/l	SF-AQ-17 5/6/97	3/14	0.1-2.5	1.2		Not Volatile			NO	NV
5103719	Endrin ketone	0.4	J	0.4	J	ug/l	SF-AQ-25 5/7/97	1/14	0.1-2.5	0 4		Not Volatile			NO	NV
12672296	gamma-Chlordane	0.066	J	0 11	J	ug/l	SF-AQ-25 5/7/97	2/14	0 05-0.054	0.11		Not Volatile			NO	NV
11096825	Heptachlor epoxide	0.079	J	0.079	J	ug/l	SF-AQ-25 5/7/97	1/14	0.05-0.054	0.079		Not Volatile			NO	NV
319868	Methoxychlor	0.71	J	16	J	ug/l	SF-AQ-07 5/7/97	3/14	0.5-0.54	16		Not Volatile			NO	NV
1031078	1,2-Dichlorobenzene	0.1	J	0.8	J	ug/l	SF-AQ-17 5/6/97	3/15	10-260	0.6		5 5E+01 N			NO	BSL
72208	1,3-Dichlorobenzene	0.4	J	0.5	J	ug/l	SF-AQ-17 5/6/97	2/15	10-260	0 5		5.5E-01 N			NO	BSL

TABLE 2.14
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current and Future
Medium: Liquid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors and Outdoors)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
7421934	1,4-Dichlorobenzene	1	J	2	J	ug/l	SF-AQ-17 5/8/97	2/15	10-260	2		4.7E-01 C			YES	ASL
5103742	2-Methylnaphthalene	0.2	J	7	J	ug/l	SF-AQ-26 5/8/97	6/15	10-260	7		1.2E+01 N			NO	BSL
1024573	4-Methylphenol	0.1	J	48	J	ug/l	SF-AQ-22 5/5/97	5/15	10-100	48		Not Volatile			NO	NV
72435	Acenaphthene	0.1	J	4	J	ug/l	SF-AQ-25 5/7/97	5/15	10-260	4		3.7E+01 N			NO	BSL
95501	Acenaphthylene	3	J	3	J	ug/l	SF-AQ-25 5/7/97	1/15	10-260	3		1.8E+01 N			NO	BSL
541731	Anthracene	0.1	J	13	J	ug/l	SF-AQ-25 5/7/97	8/15	10-200	13		1.8E+02 N			NO	BSL
108467	Benz(a)anthracene	0.1	J	45	J	ug/l	SF-AQ-25 5/7/97	10/15	10-100	45		Not Volatile			NO	NV
91576	Benzo(a)pyrene	0.1	J	41	J	ug/l	SF-AQ-25 5/7/97	8/15	10-200	41		Not Volatile			NO	NV
106445	Benzo(b)fluoranthene	0.2	J	66	J	ug/l	SF-AQ-25 5/7/97	10/15	10-200	66		Not Volatile			NO	NV
83329	Benzo(g,h,i)perylene	0.3	J	21	J	ug/l	SF-AQ-25 5/7/97	8/15	10-200	21		Not Volatile			NO	NV
208968	Benzo(k)fluoranthene	0.1	J	26	J	ug/l	SF-AQ-25 5/7/97	8/15	10-200	28		Not Volatile			NO	NV
120127	bis(2-Ethylhexyl)phthalate	1	J	300		ug/l	SF-AQ-25 5/7/97	10/15	10-10	300		Not Volatile			NO	NV
56553	Carbazole	0.1	J	11	J	ug/l	SF-AQ-25 5/7/97	6/15	10-260	11		Not Volatile			NO	NV
50328	Chrysene	0.2	J	54	J	ug/l	SF-AQ-25 5/7/97	10/15	10-100	54		Not Volatile			NO	NV
205992	Di-n-octyl phthalate	17	J	36	J	ug/l	SF-AQ-25 5/7/97	3/15	10-260	36		Not Volatile			NO	NV
191242	Dibenz(a,h)anthracene	0.1	J	7	J	ug/l	SF-AQ-25 5/7/97	6/15	10-260	7		Not Volatile			NO	NV
207089	Dibenzofuran	0.1	J	4	J	ug/l	SF-AQ-25 5/7/97	4/15	10-260	4		2.4E+00 N			YES	ASL
117817	Fluoranthene	0.3	J	91	J	ug/l	SF-AQ-25 5/7/97	9/15	10-200	91		Not Volatile			NO	NV
86748	Fluorene	0.1	J	5	J	ug/l	SF-AQ-25 5/7/97	6/15	10-260	5		2 4E+01 N			NO	BSL
218019	Indeno(1,2,3-cd)pyrene	0.3	J	24	J	ug/l	SF-AQ-25 5/7/97	8/15	10-200	24		Not Volatile			NO	NV
84742	Naphthalene	0.1	J	6	J	ug/l	SF-AQ-25 5/7/97	7/15	10-260	6		6.5E-01 N			YES	ASL
53703	Pentachlorophenol	13	J	13	J	ug/l	SF-AQ-25 5/7/97	1/15	25-640	13		Not Volatile			NO	NV
132649	Phenanthrene	0.1	J	57	J	ug/l	SF-AQ-25 5/7/97	11/15	10-51	57		1.8E+01 N			YES	ASL
206440	Phenol	13	J	13	J	ug/l	SF-AQ-22 5/5/97	1/15	10-200	13		Not Volatile			NO	NV
86737	Pyrene	0 2	J	80	J	ug/l	SF-AQ-25 5/7/97	10/15	10-100	80		Not Volatile			NO	NV
193395	1,1,1-Trichloroethane	1	J	1	J	ug/l	SF-AQ-28 5/21/97	1/15	10-100	1		5 4E+01 N			NO	BSL
78591	1,2-Dichloroethene (total)	0.8	J	0.8	J	ug/l	SF-AQ-33 1/25/99	1/15	10-100	0.8		5 5E+00 N			NO	BSL
91203	2-Butanone	9	J	9	J	ug/l	SF-AQ-22 5/5/97	1/15	10-100	9		1.9E+02 N			NO	BSL
85018	4-Methyl-2-pentanone	1	J	1	J	ug/l	SF-AQ-28 5/21/97	1/15	10-100	1		1.4E+01 N			NO	BSL
108952	Acetone	39		88	J	ug/l	SF-AQ-26 5/8/97	3/15	10-10	88		6.1E+01 N			YES	ASL
129000	Benzene	60	J	60	J	ug/l	SF-AQ-26 5/8/97	1/15	10-10	60		3.6E-01 C			YES	ASL
71556	Chlorobenzene	1.5	J	6	J	ug/l	SF-AQ-17 5/6/97	2/15	10-100	6		1 1E+01 N			NO	BSL
75343	Chloroethane	9.5	J	40	J	ug/l	SF-AQ-17 5/6/97	2/15	10-100	40		3.6E+00 C			YES	ASL
540590	Ethylbenzene	31		160		ug/l	SF-AQ-26 5/8/97	2/15	10-10	160		1.3E+02 N			YES	ASL
78933	Methylene chloride	2	JB	24	JB	ug/l	SF-AQ-26 5/8/97	2/15	10-10	24		4.1E+00 C			YES	ASL
591786	Toluene	0.6	J	390		ug/l	SF-AQ-26 5/8/97	4/15	10-10	390		7.5E+01 N			YES	ASL
108101	Trichloroethene	2	J	2	J	ug/l	SF-AQ-33 1/25/99	1/15	10-100	2		1.6E+00 C			YES	ASL
67641	Vinyl chloride	0.8	J	0.8	J	ug/l	SF-AQ-17 5/6/97	1/15	10-100	0.8		1.9E-02 C			YES	ASL
71432	Xylene (total)	2	J	1400		ug/l	SF-AQ-26 5/8/97	2/15	10-10	1400		1.2E+03 N			YES	ASL

TABLE 2.14
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Region III Risk-Based Concentrations (RBC) for tap water (10/99)
For chromium, used the RBC for chromium VI
For lead, used Drinking Water Regulations and Health Advisories Action Level
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin ketone, used endrin RBC
For endosulfan II and endosulfan sulfate used RBC for endosulfan
For acenaphthylene, benzo(g,h,l)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethene used most RBC for most toxic of cis- and trans- Isomers
For 2-nitroanaline used Region 9 PRG.
(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions:
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.15
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Liquid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
7429905	Aluminum	159	B	912		ug/l	SF-AQ-04 5/8/97	4/5	48.5-48.5	912		Not Volatile			NO	NV
7440382	Arsenic	2.9	B	5.1		ug/l	SF-AQ-04 5/8/97	5/5	0-0	5.1		Not Volatile			NO	NV
7440393	Barium	21.9	B	68.6		ug/l	SF-AQ-04 5/8/97	5/5	0-0	68.6		Not Volatile			NO	NV
7440417	Beryllium	0.26	B	0.3	B	ug/l	SF-AQ-07 5/7/97	4/5	0.2-0.2	0.3		Not Volatile			NO	NV
7440439	Cadmium	0.58	B	2.8	B	ug/l	SF-AQ-01 5/7/97	5/5	0-0	2.8		Not Volatile			NO	NV
7440702	Calcium	3500	B	11600		ug/l	SF-AQ-04 5/8/97	5/5	0-0	11600		Not Volatile			NO	NV
7440473	Chromium	6.3	B	72.9		ug/l	SF-AQ-01 5/7/97	4/5	30-30	72.9		Not Volatile			NO	NV
7440484	Cobalt	1.2	B	1.7	B	ug/l	SF-AQ-01 5/7/97	3/5	1.1-1.1	1.7		Not Volatile			NO	NV
7440508	Copper	16	B	216		ug/l	SF-AQ-04 5/8/97	5/5	0-0	216		Not Volatile			NO	NV
7439896	Iron	237		2570		ug/l	SF-AQ-07 5/7/97	5/5	0-0	2570		Not Volatile			NO	NV
7439921	Lead	8.1		115		ug/l	SF-AQ-04 5/8/97	5/5	0-0	115		Not Volatile			NO	NV
7439954	Magnesium	1160	B	3110		ug/l	SF-AQ-04 5/8/97	5/5	0-0	3110		Not Volatile			NO	NV
7439965	Manganese	19.4		112		ug/l	SF-AQ-05 5/6/97	5/5	0-0	112		Not Volatile			NO	NV
7439976	Mercury	0.17		0.17		ug/l	SF-AQ-04 5/8/97	1/5	0.1-0.1	0.17		Not Volatile			NO	NV
7440020	Nickel	3.7	B	8.2		ug/l	SF-AQ-04 5/8/97	5/5	0-0	8.2		Not Volatile			NO	NV
7440097	Potassium	258	B	467	B	ug/l	SF-AQ-07 5/7/97	5/5	0-0	467		Not Volatile			NO	NV
7440224	Silver	1.2		1.2		ug/l	SF-AQ-04 5/8/97	1/5	1-1	1.2		Not Volatile			NO	NV
7440235	Sodium	1760	B	2780	B	ug/l	SF-AQ-07 5/7/97	5/5	0-0	2780		Not Volatile			NO	NV
7440280	Thallium	6.4		6.4		ug/l	SF-AQ-04 5/8/97	1/5	3.1-3.1	6.4		Not Volatile			NO	NV
7440622	Vanadium	3.9	B	21.6		ug/l	SF-AQ-04 5/8/97	5/5	0-0	21.6		Not Volatile			NO	NV
7440666	Zinc	122	J	381		ug/l	SF-AQ-04 5/8/97	5/5	0-0	381		Not Volatile			NO	NV
72548	4,4'-DDD	0.13	J	24		ug/l	SF-AQ-07 5/7/97	2/5	0.1-0.1	24		Not Volatile			NO	NV
72559	4,4'-DDE	14		14		ug/l	SF-AQ-07 5/7/97	1/5	0.1-0.11	14		Not Volatile			NO	NV
50293	4,4'-DDT	0.32		8.5		ug/l	SF-AQ-07 5/7/97	2/5	0.1-0.1	8.5		Not Volatile			NO	NV
72435	Methoxychlor	16	J	16	J	ug/l	SF-AQ-07 5/7/97	1/5	0.5-0.54	16		Not Volatile			NO	NV
106445	4-Methylphenol	0.2	J	0.2	J	ug/l	SF-AQ-07 5/7/97	1/5	10-11	0.2		Not Volatile			NO	NV
83329	Acenaphthene	0.1	J	0.2	J	ug/l	SF-AQ-04 5/8/97	2/5	10-26	0.2		3.7E+01 N			NO	BSL
120127	Anthracene	0.1	J	0.6	J	ug/l	SF-AQ-04 5/8/97	4/5	10-10	0.6		1.8E+02 N			NO	BSL
56553	Benz(a)anthracene	0.1	J	3	J	ug/l	SF-AQ-04 5/8/97	5/5	0-0	3		Not Volatile			NO	NV
50328	Benzo(a)pyrene	0.1	J	4	J	ug/l	SF-AQ-04 5/8/97	5/5	0-0	4		Not Volatile			NO	NV
205992	Benzo(b)fluoranthene	0.2	J	7	J	ug/l	SF-AQ-04 5/8/97	5/5	0-0	7		Not Volatile			NO	NV
191242	Benzo(g,h,i)perylene	0.4	J	3	J	ug/l	SF-AQ-04 5/8/97	4/5	10-10	3		Not Volatile			NO	NV
207089	Benzo(k)fluoranthene	0.1	J	3	J	ug/l	SF-AQ-04 5/8/97	5/5	0-0	3		Not Volatile			NO	NV
117817	bis(2-Ethylhexyl)phthalate	1	J	2	J	ug/l	SF-AQ-04 5/8/97	3/5	10-10	2		Not Volatile			NO	NV
86748	Carbazole	0.1	J	0.8	J	ug/l	SF-AQ-04 5/8/97	4/5	10-10	0.8		Not Volatile			NO	NV

TABLE 2.15
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Liquid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
218019	Chrysene	0.2	J	5	J	ug/l	SF-AQ-04 5/8/97	5/5	0-0	5		Not Volatile			NO	NV
53703	Dibenz(a,h)anthracene	0.1	J	0.8	J	ug/l	SF-AQ-04 5/8/97	4/5	10-10	0.8		Not Volatile			NO	NV
132649	Dibenzofuran	0.1	J	0.2	J	ug/l	SF-AQ-04 5/8/97	2/5	10-10	0.2		2.4E+00 N			NO	BSL
206440	Fluoranthene	0.3	J	8	J	ug/l	SF-AQ-04 5/8/97	5/5	0-0	8		Not Volatile			NO	NV
86737	Fluorene	0.1	J	0.2	J	ug/l	SF-AQ-04 5/8/97	2/5	10-10	0.2		2.4E+01 N			NO	BSL
193395	Indeno(1,2,3-cd)pyrene	0.4	J	3	J	ug/l	SF-AQ-04 5/8/97	4/5	10-10	3		Not Volatile			NO	NV
91203	Naphthalene	0.1	J	0.3	J	ug/l	SF-AQ-04 5/8/97	2/5	10-10	0.3		6.5E-01 N			NO	BSL
85018	Phenanthrene	0.1	J	3	J	ug/l	SF-AQ-04 5/8/97	5/5	0-0	3		1.8E+01 N			NO	BSL
129000	Pyrene	0.2	J	7	J	ug/l	SF-AQ-04 5/8/97	5/5	0-0	7		Not Volatile			NO	NV
75092	Methylene chloride	2	JB	2	JB	ug/l	SF-AQ-04 5/8/97	1/5	10-10	2		4.1E+00 C			NO	BSL

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Region III Risk-Based Concentrations (RBC) for tap water (10/99)
For chromium, used the RBC for chromium VI
For lead, used Drinking Water Regulations and Health Advisories Action Level
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin ketone, used endrin RBC
For endosulfan II and endosulfan sulfate used RBC for endosulfan
For acenaphthylene, benzo(g,h,I)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethene used most RBC for most toxic of cis- and trans- Isomers
For 2-nitroanaline used Region 9 PRG.
(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions: COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.16
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Soil & Particulates
Exposure Point: Offsite Residential Areas (Ellsworth Allen Park)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
57125	Cyanide	0.21	B2	0.21	B2	mg/kg	HA-2-2_0-3_1 11/21/91	2/10	0.15-0.16	0.21		1.6E+02 N			NO	BSL
7429905	Aluminum	1160	N*	10100	N*	mg/kg	HA-4-1_0-2_0 11/21/91	10/10	0-0	10100	33000	7 8E+03 N			NO	BKG
7440382	Arsenic	0.82	B2M	6		mg/kg	HA-2-2_0-3_1 11/21/91	10/10	0-0	6	7 5	4.3E-02 C			NO	BKG
7440393	Barium	2.7	B2	23.3	B2	mg/kg	HA-4-1_0-2_0 11/21/91	10/10	0-0	23.3	300	5.5E+02 N			NO	BKG
7440417	Beryllium	0.23	B2	0.54	B2	mg/kg	HA-4-1_0-2_0 11/21/91	9/10	0.2-0.2	0.54	0.16	1.6E+01 N			NO	BSL
7440702	Calcium	28.1	B2	452	B2	mg/kg	HA-4-1_0-2_0 11/21/91	10/10	0-0	452	35000				NO	NUT
7440473	Chromium	1.5	B2	68.5		mg/kg	HA-8-2_0-2_8 11/22/91	10/10	0-0	68.5	40	2.3E+01 N			YES	ASL
7440484	Cobalt	0.84	B2	28.7		mg/kg	HA-2-2_0-3_1 11/21/91	9/10	0.82-0.82	28.7	30	4 7E+02 N			NO	BKG
7440508	Copper	2.5	B2	11.3		mg/kg	HA-8-2_0-2_8 11/22/91	10/10	0-0	11.3	25	3.1E+02 N			NO	BKG
7439896	Iron	2490	*	35300	*	mg/kg	HA-8-2_0-2_8 11/22/91	10/10	0-0	35300	2000	2.3E+03 N			NO	NUT
7439921	Lead	0.86	N*J	2.1	N*J	mg/kg	HA-9-2_0-3_5 11/22/91	10/10	0-0	2.1	400	4.0E+02			NO	BKG
7439954	Magnesium	154	B2	244	B2	mg/kg	HA-9-2_0-3_5 11/22/91	10/10	0-0	244	5000				NO	NUT
7440020	Nickel	4.9	B2	4.9	B2	mg/kg	HA-4-1_0-2_0 11/21/91	1/10	2.9-2.9	4.9	13	1.6E+02 N			NO	BKG
7440097	Potassium	102	B2	315	B2	mg/kg	HA-4-1_0-2_0 11/21/91	10/10	0-0	315	43000				NO	NUT
7782492	Selenium	0.44	B2	0.46	B2	mg/kg	HA-2-2_0-3_1 11/21/91	2/10	0.41-0.41	0.48	2	3.9E+01 N			NO	BKG
7440235	Sodium	40.5	B2	54.9	B2	mg/kg	HA-6-2_0-2_8 11/21/91	5/10	39.7-42.4	54.9	8000				NO	NUT
7440280	Thallium	0.27	B2	0.49	B2	mg/kg	HA-1-2_5-3_5 11/21/91	4/10	0.2-0.21	0.49		5.5E-01 N			NO	BSL
7440622	Vanadium	1.3	B2	19.9		mg/kg	HA-8-2_0-2_8 11/22/91	10/10	0-0	19.9	150	5 5E+01 N			NO	BKG
7440666	Zinc	3.5	B2	21.2		mg/kg	HA-4-1_0-2_0 11/21/91	10/10	0-0	21.2	20	2.3E+03 N			NO	BSL

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Region III Risk-Based Concentrations (RBC) for residential soil (10/99)
For chromium, used RBC for Chromium VI.
For lead, used 400 mg/kg, from "Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities" (USEPA, 1994).
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin ketone, used endrin RBC
For endosulfan II and endosulfan sulfate used RBC for endosulfan
For acenaphthylene, benzo(g,h,I)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethene used most RBC for most toxic of cis- and trans- isomers
For 2-nitroanaline used Region 9 PRG.
(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
The Iron concentration does not pose an adverse effect at the site
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions: COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.17
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Vapors
Exposure Point: Offsite Residential Areas (Ellsworth Allen Park)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
57125	Cyanide	0.21	B2	0.21	B2	mg/kg	HA-2-2_0-3_1 11/21/91	2/10	0.15-0.16	0.21		Not Volatile			NO	NV
7429905	Aluminum	1160	N*	10100	N*	mg/kg	HA-4-1_0-2_0 11/21/91	10/10	0-0	10100	33000	Not Volatile			NO	NV
7440382	Arsenic	0.82	B2M	6		mg/kg	HA-2-2_0-3_1 11/21/91	10/10	0-0	6	7.5	Not Volatile			NO	NV
7440393	Barium	2.7	B2	23.3	B2	mg/kg	HA-4-1_0-2_0 11/21/91	10/10	0-0	23.3	300	Not Volatile			NO	NV
7440417	Beryllium	0.23	B2	0.54	B2	mg/kg	HA-4-1_0-2_0 11/21/91	9/10	0.2-0.2	0.54	0.16	Not Volatile			NO	NV
7440702	Calcium	28.1	B2	452	B2	mg/kg	HA-4-1_0-2_0 11/21/91	10/10	0-0	452	35000	Not Volatile			NO	NV
7440473	Chromium	1.5	B2	68.5		mg/kg	HA-8-2_0-2_8 11/22/91	10/10	0-0	68.5	40	Not Volatile			NO	NV
7440484	Cobalt	0.84	B2	28.7		mg/kg	HA-2-2_0-3_1 11/21/91	9/10	0.82-0.82	28.7	30	Not Volatile			NO	NV
7440508	Copper	2.5	B2	11.3		mg/kg	HA-8-2_0-2_8 11/22/91	10/10	0-0	11.3	25	Not Volatile			NO	NV
7439896	Iron	2490	*	35300	*	mg/kg	HA-8-2_0-2_8 11/22/91	10/10	0-0	35300	2000	Not Volatile			NO	NV
7439921	Lead	0.86	N*J	2.1	N*J	mg/kg	HA-9-2_0-3_5 11/22/91	10/10	0-0	2.1	400	Not Volatile			NO	NV
7439954	Magnesium	154	B2	244	B2	mg/kg	HA-9-2_0-3_5 11/22/91	10/10	0-0	244	5000	Not Volatile			NO	NV
7440020	Nickel	4.9	B2	4.9	B2	mg/kg	HA-4-1_0-2_0 11/21/91	1/10	2.9-2.9	4.9	13	Not Volatile			NO	NV
7440097	Potassium	102	B2	315	B2	mg/kg	HA-4-1_0-2_0 11/21/91	10/10	0-0	315	43000	Not Volatile			NO	NV
7782492	Selenium	0.44	B2	0.48	B2	mg/kg	HA-2-2_0-3_1 11/21/91	2/10	0.41-0.41	0.48	2	Not Volatile			NO	NV
7440235	Sodium	40.5	B2	54.9	B2	mg/kg	HA-8-2_0-2_8 11/21/91	5/10	39.7-42.4	54.9	8000	Not Volatile			NO	NV
7440280	Thallium	0.27	B2	0.49	B2	mg/kg	HA-1-2_5-3_5 11/21/91	4/10	0.2-0.21	0.49		Not Volatile			NO	NV
7440622	Vanadium	1.3	B2	19.9		mg/kg	HA-8-2_0-2_8 11/22/91	10/10	0-0	19.9	150	Not Volatile			NO	NV
7440666	Zinc	3.5	B2	21.2		mg/kg	HA-4-1_0-2_0 11/21/91	10/10	0-0	21.2	20	Not Volatile			NO	NV

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Soil Screening Guidance Level (SSL) for Inhalation of Volatiles (5/96)
(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions:
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
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N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.18
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Groundwater (Upper Glacial)
Exposure Medium: Groundwater
Exposure Point: Offsite Residential Areas (Tap)

CAS Number	Chemical	(1) Minimum Concentration	Minimum Qualifier	(1) Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	(2) Background Value	(3) Screening Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	(4) Rationale for Contaminant Deletion or Selection
57125	Cyanide	12.1	NJ	12.1	NJ	ug/l	MW-9-02 7/28/92	1/38	2-10	12.1		7.3E+01 N	200	NY DEC 703	NO	IFD
14790558	Nitrate	0.71		4.6		mg/l	MW-9B 8/20/98	4/4	0-0	0.0046		5 8E+03 N	10000	NY DEC 703	NO	BSL
7429905	**Aluminum**	90.8	B	3990		ug/l	MW-11-01 3/28/92	18/23	38-86.9	3990	451	3.7E+03 N			YES	ASL
7440382	**Arsenic**	1	B2	3.7	B2	ug/l	MW-11 1/7/92	11/29	1-3.5	3.7		4.5E-02 C	25	NY DEC 703	YES	ASL
7440393	Barium	12	B	132	B2	ug/l	MW-10B-01 3/25/92	33/33	0-0	132	30	2 6E+02 N	1000	NY DEC 703	NO	BSL
7440417	Beryllium	0.79	BJ	1.3	B2J	ug/l	MW-11-01 3/26/92	5/33	0.2-1	1 3		7.3E+00 N	3	NY DEC 703	NO	BSL
7440439	**Cadmium**	1.6	B2	143	J	ug/l	MW-17B-02 7/29/92	23/38	0.4-5	143		3.7E+00 N	5	NY DEC 703	YES	ASL
7440702	Calcium	5690		28700		ug/l	MW-17-01 3/26/92	33/33	0-0	28700	18400				NO	NUT
7440473	**Chromium**	2.6	B	518		ug/l	MW-9B-02 7/28/92	25/38	1-10	518	14	1.1E+01 N	50	NY DEC 703	YES	ASL
18540299	**Chromium VI**	39.4		380	J	ug/l	MW-9B-01 3/25/92	8/18	10-1	380		1.1E+01 N	50	NY DEC 703	YES	ASL
7440484	Cobalt	2.1	B	5.1	B2	ug/l	MW-11 1/7/92	8/33	1-4	5.1	1 4	2 2E+02 N			NO	BSL
7440508	Copper	3.6	B	10.9	B2	ug/l	MW-17B-01 3/26/92	6/33	1.7-7	10 9		1.5E+02 N	200	NY DEC 703	NO	BSL
7439896	Iron	126		8020		ug/l	MW-17B-01 3/26/92	30/33	47.1-47.5	8020	821	1.1E+03 N	300	NY DEC 703	NO	NUT
7439921	Lead	1	B2J	14.2		ug/l	MW-10-02 7/28/92	15/28	1-2.9	14 2		1.5E+01	25	NY DEC 703	NO	BSL
7439954	Magnesium	1250	B	7610		ug/l	MW-10-02 7/28/92	33/33	0-0	7610	2520		35000	NY DEC 703	NO	NUT
7439965	**Manganese**	7.4	B2	8560		ug/l	MW-25B 4/13/98	32/32	0-0	8560	17.1	7.3E+01 N	300	NY DEC 703	YES	ASL
7440020	Nickel	3.4	B	8.4	B2	ug/l	MW-11 1/7/92	7/33	1.8-17	8 4	11 5	7.3E+01 N	100	NY DEC 703	NO	BKG
7440097	Potassium	913	B2	6140		ug/l	MW-10B-01 3/25/92	33/33	0-0	6140	2360				NO	NUT
7782492	Selenium	2.6	B2JNMW	3.7	B2JNS	ug/l	MW-11 1/7/92	2/33	1 3-4.7	3 7		1 8E+01 N	10	NY DEC 703	NO	BSL
7440235	Sodium	7930		146000		ug/l	MW-10B 4/8/98	33/33	0-0	146000	26700		20000	NY DEC 703	NO	NUT
7440622	Vanadium	3.7	B2	10.6	BJ	ug/l	MW-13-02 7/30/92	9/33	1.5-5	10 6		2 6E+01 N			NO	BSL
7440666	Zinc	6.2	B2*	25.8	J	ug/l	MW-17B-02 7/29/92	25/29	3.9-11	25 8	30 2	1.1E+03 N	2000	NY DEC 703	NO	BKG
72548	4,4'-DDD	0.012	J	0.012	J	ug/l	MW-11-02 7/29/92	1/18	0.01-0.13	0.012		2 8E-01 C	0 3	NY DEC 703	NO	BSL
5103719	alpha-Chlordane	0.0051	J	0.01	J	ug/l	MW-11-01 3/26/92	3/16	0.05-0 064	0.01		1.9E-01 C	0 05	NY DEC 703	NO	BSL
319857	beta-BHC	0.012	JN	0.012	JN	ug/l	MW-11-02 7/29/92	1/17	0.05-0 064	0 012		3.7E-02 C	5	NY DEC 703	NO	BSL
319868	delta-BHC	0.002	JN	0.002	JN	ug/l	MW-9B-02 7/28/92	1/18	0.05-0.064	0 002		1.1E-02 C	5	NY DEC 703	NO	BSL
60571	**Dieldrin**	0.004	JN	0.18	J	ug/l	MW-17-02 7/29/92	12/18	0.1-0.13	0.18		4.2E-03 C	0.004	NY DEC 703	YES	ASL
959988	Endosulfan I	0.006	JN	0.006	JN	ug/l	MW-11-02 7/29/92	1/18	0.05-0.064	0.006		2 2E+01 N			NO	BSL
53494705	Endrin ketone	0.005	JN	0.12	J	ug/l	MW-13-01 3/30/92	6/13	0.1-0.13	0.12		1.1E+00 N	5	NY DEC 703	NO	BSL
5103742	gamma-Chlordane	0.004	JN	0.004	JN	ug/l	MW-17B-02 7/29/92	1/17	0.05-0.064	0 004		1.9E-01 C	0 05	NY DEC 703	NO	BSL
1024573	**Heptachlor epoxide**	0.0078	J	0.048	J	ug/l	MW-11-02 7/29/92	2/15	0.05-0.064	0.048		7.4E-03 C	0.03	NY DEC 703	YES	ASL
95501	1,2-Dichlorobenzene	0.3		0.3		ug/L	MW-25B 8/20/98	1/28	0.3-11	0 3		5 5E+01 N	3	NY DEC 703	NO	IFD
117817	**bis(2-Ethylhexyl)phthalate**	1	J	19	B1J	ug/l	MW-11B-02 7/29/92	4/18	10-11	19		4.8E+00 C	5	NY DEC 703	YES	ASL
84742	Di-n-butyl phthalate	0 9	J	0 9	J	ug/l	MW-17B-01 3/26/92	1/18	10-11	0 9		3 7E+02 N	50	NY DEC 703	NO	BSL
108952	**Phenol**	1	J	3	J	ug/l	MW-10B-02 7/28/92	2/18	10-11	3		2.2E+03 N	1	NY DEC 703	YES	ASL
71556	**1,1,1-Trichloroethane**	0.2	J	22		ug/L	MW-11B-01 3/26/92	13/38	0.5-25	22		5.4E+01 N	5	NY DEC 703	YES	ASL
75343	**1,1-Dichloroethane**	0.3		8	J	ug/L	MW-11B-02 7/29/92	12/38	0.2-25	8		8.0E+01 N	5	NY DEC 703	YES	ASL
75354	**1,1-Dichloroethene**	0.1	J	5	J	ug/L	MW-11B-02 7/29/92	5/38	0.2-25	5		4.4E-02 C	5	NY DEC 703	YES	ASL
540590	**1,2-Dichloroethene (total)**	1	J	20		ug/l	MWE-4 11/7/91	5/28	10-25	20		5.5E+00 N	5	NY DEC 703	YES	ASL

TABLE 2.18
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Groundwater (Upper Glacial)
Exposure Medium: Groundwater
Exposure Point: Offsite Residential Areas (Tap)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
591786	2-Hexanone	10	J	10	J	ug/L	MW-13-01 3/30/92	1/38	1-25	10		1.5E+02	N	50	NY DEC 703	NO	IFD
67641	Acetone	5	J	10	J	ug/l	MW-17-02 7/29/92	2/38	0.8-25	10		6.1E+01	N	50	NY DEC 703	NO	IFD
71432	Benzene	25	J	25	J	ug/l	MW-11-02 7/29/92	1/38	0.3-10	25		3.6E-01	C	1	NY DEC 703	NO	IFD
56235	Carbon tetrachloride	0.2	J	0.2	J	ug/l	MW-29B 8/25/98	1/38	0.2-25	0.2		1.6E-01	C	5	NY DEC 703	NO	IFD
108907	Chlorobenzene	0.2	J	15		ug/l	MW-25B 4/13/98	5/38	0.2-25	15		1.1E+01	N	5	NY DEC 703	YES	ASL
67663	Chloroform	0.2	J	0.4	J	ug/l	MW-13-01 3/30/92	4/38	0.2-25	0.4	0.6	6.3E-02	N	7	NY DEC 703	NO	BKG
156592	cis-1,2-Dichloroethene	0.5		48		ug/l	MW-25B 4/13/98	8/10	0.3-0.6	48		6.1E+00	N	5	NY DEC 703	YES	ASL
75092	Methylene chloride	0.4	J	0.4	J	ug/l	MW-10B 4/8/98	1/38	0.2-25	0.4		4.1E+00	C	5	NY DEC 703	NO	IFD
1634044	MTBE	0.5	J	32		ug/l	MW-10B 4/8/98	5/6	20-20	32		6.3E+02	N			NO	BSL
127184	Tetrachloroethene	0.65		10	J	ug/l	MW-13-01 3/30/92	18/38	0.2-25	10	0.3	1.1E+00	C	5	NY DEC 703	YES	ASL
108883	Toluene	0.1	J	0.1	J	ug/l	MW-9B 04/08/98 (avg of dups)	1/38	0.2-25	0.1		7.5E+01	N	5	NY DEC 703	NO	IFD
79016	Trichloroethene	1		160		ug/l	MW-25B 4/13/98	23/38	0.7-10	160		1.6E+00	C	5	NY DEC 703	YES	ASL
75014	Vinyl chloride	1		72		ug/l	MWE-4 11/7/91	4/38	0.2-25	72		1.9E-02	C	2	NY DEC 703	YES	ASL

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Region III Risk-Based Concentrations (RBC) for tap water (10/99)
For chromium, used the RBC for chromium VI
For lead, used Drinking Water Regulations and Health Advisories Action Level
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin katone, used endrin RBC
For endosulfan II and andosulfan sulfate used RBC for andosulfan
For delta-BHC used RBC for alpha-BHC
For acenaphthylene, benzo(g,h,i)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethene used most RBC for most toxic of cis- and trans- isomers
For 2-nitroanaline used Region 9 PRG.
(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
The Iron concentration does not pose an adverse effect at the site
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions: COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.19
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Groundwater (Upper Glacial)
Exposure Medium: Vapors
Exposure Point: Offsite Residential Areas (Indoors and Outdoors and Tap)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
57125	Cyanide	12.1	NJ	12.1	NJ	ug/l	MW-9-02 7/28/92	1/38	2-10	12.1		Not Volatile	200	NY DEC 703	NO	NV
14790558	Nitrate	0.71		4.6		mg/l	MW-9B 8/20/98	4/4	0-0	0.0046		Not Volatile	10000	NY DEC 703	NO	NV
7429905	Aluminum	90.8	B	3990		ug/l	MW-11-01 3/26/92	18/23	38-86.9	3990	451	Not Volatile			NO	NV
7440382	Arsenic	1	B2	3.7	B2	ug/l	MW-11 1/7/92	11/29	1-3.5	3.7		Not Volatile	25	NY DEC 703	NO	NV
7440393	Barium	12	B	132	B2	ug/l	MW-10B-01 3/25/92	33/33	0-0	132	30	Not Volatile	1000	NY DEC 703	NO	NV
7440417	Beryllium	0.79	BJ	1.3	B2J	ug/l	MW-11-01 3/26/92	5/33	0.2-1	1.3		Not Volatile	3	NY DEC 703	NO	NV
7440439	Cadmium	1.6	B2	143	J	ug/l	MW-17B-02 7/29/92	23/38	0.4-5	143		Not Volatile	5	NY DEC 703	NO	NV
7440702	Calcium	5690		28700		ug/l	MW-17-01 3/26/92	33/33	0-0	28700	18400	Not Volatile			NO	NV
7440473	Chromium	2.6	B	518		ug/l	MW-9B-02 7/28/92	25/38	1-10	518	14	Not Volatile	50	NY DEC 703	NO	NV
18540299	Chromium VI	39.4		380	J	ug/l	MW-9B-01 3/25/92	8/16	10-1	380		Not Volatile	50	NY DEC 703	NO	NV
7440484	Cobalt	2.1	B	5.1	B2	ug/l	MW-11 1/7/92	8/33	1-4	5.1	1.4	Not Volatile			NO	NV
7440508	Copper	3.8	B	10.9	B2	ug/l	MW-17B-01 3/26/92	6/33	1.7-7	10.9		Not Volatile	200	NY DEC 703	NO	NV
7439896	Iron	126		8020		ug/l	MW-17B-01 3/26/92	30/33	47.1-47.5	8020	821	Not Volatile	300	NY DEC 703	NO	NV
7439921	Lead	1	B2J	14.2		ug/l	MW-10-02 7/28/92	15/28	1-2.9	14.2		Not Volatile	25	NY DEC 703	NO	NV
7439954	Magnesium	1250	B	7610		ug/l	MW-10-02 7/28/92	33/33	0-0	7610	2520	Not Volatile	35000	NY DEC 703	NO	NV
7439965	Manganese	7.4	B2	8560		ug/l	MW-25B 4/13/98	32/32	0-0	8560	17.1	Not Volatile	300	NY DEC 703	NO	NV
7440020	Nickel	3.4	B	8.4	B2	ug/l	MW-11 1/7/92	7/33	1.8-17	8.4	11.5	Not Volatile	100	NY DEC 703	NO	NV
7440097	Potassium	913	B2	6140		ug/l	MW-10B-01 3/25/92	33/33	0-0	6140	2360	Not Volatile			NO	NV
7782492	Selenium	2.6	B2JNMW	3.7	B2JNS	ug/l	MW-11 1/7/92	2/33	1.3-4.7	3.7		Not Volatile	10	NY DEC 703	NO	NV
7440235	Sodium	7930		146000		ug/l	MW-10B 4/8/98	33/33	0-0	146000	26700	Not Volatile	20000	NY DEC 703	NO	NV
7440622	Vanadium	3.7	B2	10.6	BJ	ug/l	MW-13-02 7/30/92	9/33	1.5-5	10.6		Not Volatile			NO	NV
7440666	Zinc	6.2	B2*	25.8	J	ug/l	MW-17B-02 7/29/92	25/29	3.9-11	25.8	30.2	Not Volatile	2000	NY DEC 703	NO	NV
72548	4,4'-DDD	0.012	J	0.012	J	ug/l	MW-11-02 7/29/92	1/18	0.01-0.13	0.012		Not Volatile	0.3	NY DEC 703	NO	NV
5103719	alpha-Chlordane	0.0051	J	0.01	J	ug/l	MW-11-01 3/26/92	3/16	0.05-0.064	0.01		Not Volatile	0.05	NY DEC 703	NO	NV
319857	beta-BHC	0.012	JN	0.012	JN	ug/l	MW-11-02 7/29/92	1/17	0.05-0.064	0.012		Not Volatile	5	NY DEC 703	NO	NV
319868	delta-BHC	0.002	JN	0.002	JN	ug/l	MW-9B-02 7/28/92	1/18	0.05-0.064	0.002		Not Volatile	5	NY DEC 703	NO	NV
60571	Dieldrin	0.004	JN	0.18	J	ug/l	MW-17-02 7/29/92	12/18	0.1-0.13	0.18		Not Volatile	0.004	NY DEC 703	NO	NV
959988	Endosulfan I	0.006	JN	0.006	JN	ug/l	MW-11-02 7/29/92	1/18	0.05-0.064	0.006		Not Volatile			NO	NV
53494705	Endrin ketone	0.005	JN	0.12	J	ug/l	MW-13-01 3/30/92	6/13	0.1-0.13	0.12		Not Volatile	5	NY DEC 703	NO	NV
5103742	gamma-Chlordane	0.004	JN	0.004	JN	ug/l	MW-17B-02 7/29/92	1/17	0.05-0.064	0.004		Not Volatile	0.05	NY DEC 703	NO	NV
1024573	Heptachlor epoxide	0.0078	J	0.048	J	ug/l	MW-11-02 7/29/92	2/15	0.05-0.064	0.048		Not Volatile	0.03	NY DEC 703	NO	NV
95501	1,2-Dichlorobenzene	0.3		0.3		ug/L	MW-25B 8/20/98	1/28	0.3-11	0.3		5.5E+01 N	3	NY DEC 703	NO	IFD
117817	bis(2-Ethylhexyl)phthalate	1	J	19	B1J	ug/l	MW-11B-02 7/29/92	4/18	10-11	19		Not Volatile	5	NY DEC 703	NO	NV
84742	Di-n-butyl phthalate	0.9	J	0.9	J	ug/l	MW-17B-01 3/26/92	1/18	10-11	0.9		Not Volatile	50	NY DEC 703	NO	NV
108952	Phenol	1	J	3	J	ug/l	MW-10B-02 7/28/92	2/18	10-11	3		Not Volatile	1	NY DEC 703	NO	NV
71556	1,1,1-Trichloroethane	0.2	J	22		ug/L	MW-11B-01 3/26/92	13/38	0.5-25	22		5.4E+01 N	5	NY DEC 703	YES	ASL

TABLE 2.19
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Groundwater (Upper Glacial)
Exposure Medium: Vapors
Exposure Point: Offsite Residential Areas (Indoors and Outdoors and Tap)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
75343	1,1-Dichloroethane	0.3		8	J	ug/L	MW-11B-02 7/29/92	12/38	0.2-25	8		8.0E+01 N	5	NY DEC 703	YES	ASL
75354	1,1-Dichloroethene	0.1	J	5	J	ug/L	MW-11B-02 7/29/92	5/38	0.2-25	5		4.4E-02 C	5	NY DEC 703	YES	ASL
540590	1,2-Dichloroethene (total)	1	J	20		ug/l	MWE-4 11/7/91	5/28	10-25	20		5.5E+00 N	5	NY DEC 703	YES	ASL
591786	2-Hexanone	10	J	10	J	ug/L	MW-13-01 3/30/92	1/38	1-25	10		1.5E+02 N	50	NY DEC 703	NO	IFD
67641	Acetone	5	J	10	J	ug/l	MW-17-02 7/29/92	2/38	0.8-25	10		6.1E+01 N	50	NY DEC 703	NO	IFD
71432	Benzene	25	J	25	J	ug/l	MW-11-02 7/29/92	1/38	0.3-10	25		3.6E-01 C	1	NY DEC 703	NO	IFD
56235	Carbon tetrachloride	0.2	J	0.2	J	ug/l	MW-29B 8/25/98	1/38	0.2-25	0.2		1.6E-01 C	5	NY DEC 703	NO	IFD
108907	Chlorobenzene	0.2	J	15		ug/l	MW-25B 4/13/98	5/38	0.2-25	15		1.1E+01 N	5	NY DEC 703	YES	ASL
67663	Chloroform	0.2	J	0.4	J	ug/l	MW-13-01 3/30/92	4/38	0.2-25	0.4	0.6	6.3E-02 N	7	NY DEC 703	NO	BKG
156592	cis-1,2-Dichloroethene	0.5		48		ug/l	MW-25B 4/13/98	8/10	0.3-0.8	48		6.1E+00 N	5	NY DEC 703	YES	ASL
75092	Methylene chloride	0.4	J	0.4	J	ug/l	MW-10B 4/8/98	1/38	0.2-25	0.4		4.1E+00 C	5	NY DEC 703	NO	IFD
1634044	MTBE	0.5	J	32		ug/l	MW-10B 4/8/98	5/6	20-20	32		6.3E+02 N			NO	BSL
127184	Tetrachloroethene	0.65		10	J	ug/l	MW-13-01 3/30/92	18/38	0.2-25	10	0.3	1.1E+00 C	5	NY DEC 703	YES	ASL
108883	Toluene	0.1	J	0.1	J	ug/l	MW-9B 04/08/98 (avg of dups)	1/38	0.2-25	0.1		7.5E+01 N	5	NY DEC 703	NO	IFD
79016	Trichloroethene	1		160		ug/l	MW-25B 4/13/98	23/38	0.7-10	160		1.6E+00 C	5	NY DEC 703	YES	ASL
75014	Vinyl chloride	1		72		ug/l	MWE-4 11/7/91	4/38	0.2-25	72		1.9E-02 C	2	NY DEC 703	YES	ASL

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Region III Risk-Based Concentrations (RBC) for tap water (10/99)
For chromium, used the RBC for chromium VI
For lead, used Drinking Water Regulations and Health Advisories Action Level
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin ketone, used endrin RBC
For endosulfan II and endosulfan sulfate used RBC for endosulfan
For acenaphthylene, benzo(g,h,i)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethane used most RBC for most toxic of cis- and trans- isomers
For 2-nitroanaline used Region 9 PRG.
(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions: COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.20
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Magothy)
Exposure Medium: Groundwater
Exposure Point: Offsite Residential Areas (Tap)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
14797558	Nitrate	0.0029		0.0036		mg/l	MW-29D 4/14/98	2/5	0.0001-0.0001	0.0036		5.8E+03	N	10000	NY DEC 703	NO	BSL
7429905	Aluminum	96.7	B	913		ug/l	MW-29D 8/25/98	20/21	86.9-86.9	913		3.7E+03	N			NO	
7440360	Antimony	5.9	B	5.9	B	ug/l	MW-37D 8/24/98	1/22	3.7-16.3	5.9		1.5E+00	N	3	NY DEC 703	NO	IFD
7440382	Arsenic	2.5	B2	5.4	B	ug/l	MW-26C 4/9/98	3/22	2.4-3.5	5.4		4.5E-02	C	25	NY DEC 703	YES	ASL
7440393	Barium	12.1	B	68	BJ	ug/l	MW-11C-02 7/29/92	22/22	0-0	68		2.6E+02	N	1000	NY DEC 703	NO	BSL
7440417	Beryllium	0.22	B	0.39	B	ug/l	MW-29D 8/25/96	2/22	0.2-1	0.39		7.3E+00	N	3	NY DEC 703	NO	BSL
7440439	Cadmium	0.785	B	0.97	B	ug/l	MW-29C 4/14/98	2/22	0.4-1.5	0.97		3.7E+00	N	5	NY DEC 703	NO	BSL
7440702	Calcium	5410		29100		ug/l	MW-26C 4/9/98	22/22	0-0	29100						NO	NUT
7440473	Chromium	1.9	B	63.5		ug/l	MW-29C 4/14/98	11/22	1.1-4.9	63.5		1.1E+01	N	50	NY DEC 703	YES	ASL
18540299	Chromium VI	51.8		56.9		ug/l	MW-29C 08/25/98 (avg of dups)	2/21	10-1	56.9		1.1E+01	N	50	NY DEC 703	YES	ASL
7440484	Cobalt	2.2	B	12.3	B	ug/l	MW-25C 4/13/98	20/22	1.5-1.5	12.3		2.2E+02	N			NO	
7440508	Copper	3	B	5.8	B2	ug/l	MW-11C-01 3/26/92	3/22	1.7-5	5.8		1.5E+02	N	200	NY DEC 703	NO	BSL
7439896	Iron	92.25	B	6000		ug/l	MW-37D 8/24/98	22/22	0-0	6000		1.1E+03	N	300	NY DEC 703	NO	NUT
7439921	Lead	3.8	J	3.8	J	ug/l	MW-11C-01 3/26/92	1/21	2-2.9	3.8		1.5E+01		25	NY DEC 703	NO	IFD
7439954	Magnesium	1690	B	6200		ug/l	MW-9C 4/6/98	22/22	0-0	6200				35000	NY DEC 703	NO	NUT
7439965	Manganese	81.5	J	1200		ug/l	MW-29C 08/25/98 (avg of dups)	22/22	0-0	1200		7.3E+01	N	300	NY DEC 703	YES	ASL
7439976	Mercury	0.25		0.25		ug/l	MW-11C-01 3/26/92	1/22	0.1-0.2	0.25		3.7E-01	N	0.7	NY DEC 703	NO	IFD
7440020	Nickel	2.6	B	19.7	B	ug/l	MW-11D 4/13/98	21/22	4-4	19.7		7.3E+01	N	100	NY DEC 703	NO	BSL
7440097	Potassium	864	B	27500	J	ug/l	MW-11C-01 3/26/92	22/22	0-0	27500						NO	NUT
7440224	Silver	1.4	B	1.4	B	ug/l	MW-9D 4/8/98	1/22	1-4.8	1.4		1.8E+01	N	50	NY DEC 703	NO	IFD
7440235	Sodium	9490		62300		ug/l	MW-11C-01 3/26/92	22/22	0-0	62300				20000	NY DEC 703	NO	NUT
7440280	Thallium	6.8	B	6.8	B	ug/l	MW-37D 8/24/98	1/22	4.1-10	6.8		2.6E-01	N	0.5	NY DEC 703	NO	IFD
7440622	Vanadium	1.6	B	6.4	B	ug/l	MW-25C 4/13/98	7/22	1.5-2.6	6.4		2.6E+01	N			NO	
7440666	Zinc	9.4	B	49.5		ug/l	MW-9D 4/8/98	21/21	0-0	49.5		1.1E+03	N	2000	NY DEC 703	NO	BSL
95501	1,2-Dichlorobenzene	0.7		0.7		ug/L	MW-29C 4/14/98	3/22	0.3-10	0.7		5.5E+01	N	3	NY DEC 703	NO	BSL
106467	1,4-Dichlorobenzene	0.2	J	0.4		ug/L	MW-29C 08/25/98 (avg of dups)	2/22	0.2-10	0.4		4.7E-01	C	3	NY DEC 703	NO	BSL
117817	bis(2-Ethylhexyl)phthalate	1	J	1	J	ug/l	MW-11C-01 3/26/92	1/2	10-10	1		4.8E+00	C	5	NY DEC 703	NO	BSL
71556	1,1,1-Trichloroethene	0.4		4		ug/L	MW-29D 4/14/98	7/22	0.3-71	4		5.4E+01	N	5	NY DEC 703	NO	BSL
79005	1,1,2-Trichloroethane	0.6		0.6		ug/L	MW-11C 8/20/98	1/22	0.3-71	0.6		1.9E-01	C	5	NY DEC 703	NO	IFD
75343	1,1-Dichloroethane	0.2	J	5	J	ug/L	MW-11C 4/13/98	14/22	0.2-71	5		8.0E+01	N	5	NY DEC 703	YES	ASL
75354	1,1-Dichloroethene	0.1	J	3	J	ug/L	MW-11C 4/13/98	8/22	0.2-71	3		4.4E-02	C	5	NY DEC 703	YES	ASL
107062	1,2-Dichloroethane	0.4		0.6		ug/L	MW-37D 8/24/98	2/22	0.3-71	0.6		1.2E-01	C	0.6	NY DEC 703	YES	ASL
540590	1,2-Dichloroethene (total)	69		120	J	ug/l	MW-11C-02 7/29/92	2/2	0-0	120		5.5E+00	N	5	NY DEC 703	YES	ASL
67641	Acetone	37	J	37	J	ug/l	MW-37C 8/24/98	1/22	0.6-71	37		6.1E+01	N	50	NY DEC 703	NO	IFD
71432	Benzene	0.1	J	0.6		ug/l	MW-37D 8/24/98	4/22	0.3-71	0.6		3.6E-01	C	1	NY DEC 703	YES	ASL
75274	Bromodichloromethane	0.2	J	0.2	J	ug/l	MW-29D 4/14/98	1/22	0.2-71	0.2		1.7E-01	C	50	NY DEC 703	NO	IFD
56235	Carbon tetrachloride	0.3		1	J	ug/l	MW-37C 8/24/98	8/22	0.2-71	1		1.6E-01	C	5	NY DEC 703	YES	ASL

TABLE 2.20
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Magothy)
Exposure Medium: Groundwater
Exposure Point: Offsite Residential Areas (Tap)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
108907	Chlorobenzene	12		12		ug/l	MW-37D 8/24/98	1/22	0.2-71	12		1.1E+01	N	5	NY DEC 703	NO	IFD
67663	Chloroform	0.1	J	0.7		ug/l	MW-29D 4/14/98	6/22	0.3-71	0.7	0.72	6.3E-02	N	7	NY DEC 703	NO	BKG
74873	Chloromethane	0.1	J	0.2	J	ug/l	MW-29D 8/25/98	2/22	0.3-71	0.2		2.1E+00	C	5	NY DEC 703	NO	BSL
156592	cis-1,2-Dichloroethene	0.45		24		ug/l	MW-11C 4/13/98	10/20	0.3-0.3	24		6.1E+00	N	5	NY DEC 703	YES	ASL
124481	Dibromochloromethane	0.3		0.3		ug/l	MW-29D 4/14/98	1/22	0.3-71	0.3	0.24	1.3E-01	C	50	NY DEC 703	NO	IFD
1634044	MTBE	5		6		ug/l	MW-26C 4/8/98	2/9	1-25	6		6.3E+02	N			NO	
127184	Tetrachloroethene	0.1	J	2.5		ug/l	MW-29C 08/25/98 (avg of dups)	6/22	0.2-71	2.5	0.81	1.1E+00	C	5	NY DEC 703	YES	ASL
108883	Toluene	0.1	J	15		ug/l	MW-37D 8/24/98	6/22	0.2-71	15	0.84	7.5E+01	N	5	NY DEC 703	YES	ASL
156605	trans-1,2-Dichloroethene	2	J	33		ug/l	MW-11C 4/13/98	5/20	0.3-0.3	33		1.2E+01	N	5	NY DEC 703	YES	ASL
79016	Trichloroethene	1		1300	J	ug/l	MW-11C-02 7/29/92	12/22	0.3-0.3	1300		1.6E+00	C	5	NY DEC 703	YES	ASL
75014	Vinyl chloride	0.4		0.4		ug/l	MW-11C 8/20/98	1/21	0.2-71	0.4		1.9E-02	C	2	NY DEC 703	NO	IFD

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Region III Risk-Based Concentrations (RBC) for tap water (10/99)
For chromium, used the RBC for chromium VI
For lead, used Drinking Water Regulations and Health Advisories Action Level
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin ketone, used endrin RBC
For endosulfan II and endosulfan sulfate used RBC for endosulfan
For acenaphthylene, benzo(g,h,I)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethene used most RBC for most toxic of cis- and trans- isomers
For 2-nitroanaline used Region 9 PRG.
(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
The Iron concentration does not pose an adverse effect at the site
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions: COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.21
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Magothy)
Exposure Medium: Vapors
Exposure Point: Offsite Residential Areas (Tap)

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
14797558	Nitrate	0.0029		0.0036		mg/l	MW-29D 4/14/98	2/5	0.0001-0.0001	0.0036		Not Volatile	10000	NY DEC 703	NO	NV
7429905	Aluminum	96.7	B	913		ug/l	MW-29D 8/25/98	20/21	86.9-86.9	913		Not Volatile			NO	NV
7440360	Antimony	5.9	B	5.9	B	ug/l	MW-37D 8/24/98	1/22	3.7-18.3	5.9		Not Volatile	3	NY DEC 703	NO	NV
7440382	Arsenic	2.5	B2	5.4	B	ug/l	MW-26C 4/9/98	3/22	2.4-3.5	5.4		Not Volatile	25	NY DEC 703	NO	NV
7440393	Barium	12.1	B	68	BJ	ug/l	MW-11C-02 7/29/92	22/22	0-0	68		Not Volatile	1000	NY DEC 703	NO	NV
7440417	Beryllium	0.22	B	0.39	B	ug/l	MW-29D 8/25/98	2/22	0.2-1	0.39		Not Volatile	3	NY DEC 703	NO	NV
7440439	Cadmium	0.785	B	0.97	B	ug/l	MW-29C 4/14/98	2/22	0.4-1.5	0.97		Not Volatile	5	NY DEC 703	NO	NV
7440702	Calcium	5410		29100		ug/l	MW-26C 4/9/98	22/22	0-0	29100		Not Volatile			NO	NV
7440473	Chromium	1.9	B	63.5		ug/l	MW-29C 4/14/98	11/22	1.1-4.9	63.5		Not Volatile	50	NY DEC 703	NO	NV
18540299	Chromium VI	51.8		56.9		ug/l	MW-29C 08/25/98 (avg of dups)	2/21	10-1	56.9		Not Volatile	50	NY DEC 703	NO	NV
7440484	Cobalt	2.2	B	12.3	B	ug/l	MW-25C 4/13/98	20/22	1.5-1.5	12.3		Not Volatile			NO	NV
7440508	Copper	3	B	5.8	B2	ug/l	MW-11C-01 3/26/92	3/22	1.7-5	5.8		Not Volatile	200	NY DEC 703	NO	NV
7439896	Iron	92.25	B	6000		ug/l	MW-37D 8/24/98	22/22	0-0	6000		Not Volatile	300	NY DEC 703	NO	NV
7439921	Lead	3.8	J	3.8	J	ug/l	MW-11C-01 3/26/92	1/21	2-2.9	3.8		Not Volatile	25	NY DEC 703	NO	NV
7439954	Magnesium	1690	B	6200		ug/l	MW-9C 4/8/98	22/22	0-0	6200		Not Volatile	35000	NY DEC 703	NO	NV
7439965	Manganese	81.5	J	1200		ug/l	MW-29C 08/25/98 (avg of dups)	22/22	0-0	1200		Not Volatile	300	NY DEC 703	NO	NV
7439976	Mercury	0.25		0.25		ug/l	MW-11C-01 3/26/92	1/22	0.1-0.2	0.25		Not Volatile			NO	NV
7440020	Nickel	2.6	B	19.7	B	ug/l	MW-11D 4/13/98	21/22	4-4	19.7		Not Volatile	100	NY DEC 703	NO	NV
7440097	Potassium	864	B	27500	J	ug/l	MW-11C-01 3/26/92	22/22	0-0	27500		Not Volatile			NO	NV
7440224	Silver	1.4	B	1.4	B	ug/l	MW-9D 4/8/98	1/22	1-4.8	1.4		Not Volatile	50	NY DEC 703	NO	NV
7440235	Sodium	9490		62300		ug/l	MW-11C-01 3/26/92	22/22	0-0	62300		Not Volatile	20000	NY DEC 703	NO	NV
7440280	Thallium	6.8	B	6.8	B	ug/l	MW-37D 8/24/98	1/22	4.1-10	6.8		Not Volatile	0.5	NY DEC 703	NO	NV
7440622	Vanadium	1.6	B	6.4	B	ug/l	MW-25C 4/13/98	7/22	1.5-2.6	6.4		Not Volatile			NO	NV
7440666	Zinc	9.4	B	49.5		ug/l	MW-9D 4/8/98	21/21	0-0	49.5		Not Volatile	2000	NY DEC 703	NO	NV
95501	1,2-Dichlorobenzene	0.7		0.7		ug/L	MW-29C 4/14/98	3/22	0.3-10	0.7		5.5E+01 N	3	NY DEC 703	NO	BSL
106467	1,4-Dichlorobenzene	0.2	J	0.4		ug/L	MW-29C 08/25/98 (avg of dups)	2/22	0.2-10	0.4		4.7E-01 C	3	NY DEC 703	NO	BSL
117817	bis(2-Ethylhexyl)phthalate	1	J	1	J	ug/l	MW-11C-01 3/26/92	1/2	10-10	1		Not Volatile	5	NY DEC 703	NO	NV
71556	1,1,1-Trichloroethane	0.4		4		ug/L	MW-29D 4/14/98	7/22	0.3-71	4		5.4E+01 N	5	NY DEC 703	NO	BSL
79005	1,1,2-Trichloroethane	0.6		0.8		ug/L	MW-11C 8/20/98	1/22	0.3-71	0.6		1.9E-01 C	5	NY DEC 703	NO	IFD
75343	1,1-Dichloroethane	0.2	J	5	J	ug/L	MW-11C 4/13/98	14/22	0.2-71	5		8.0E+01 N	5	NY DEC 703	YES	ASL
75354	1,1-Dichloroethene	0.1	J	3	J	ug/L	MW-11C 4/13/98	8/22	0.2-71	3		4.4E-02 C	5	NY DEC 703	YES	ASL
107062	1,2-Dichloroethane	0.4		0.6		ug/L	MW-37D 8/24/98	2/22	0.3-71	0.6		1.2E-01 C	0.6	NY DEC 703	YES	ASL
540590	1,2-Dichloroethene (total)	69		120	J	ug/l	MW-11C-02 7/29/92	2/2	0-0	120		5.5E+00 N	5	NY DEC 703	YES	ASL
67641	Acetone	37	J	37	J	ug/l	MW-37C 8/24/98	1/22	0.8-71	37		6.1E+01 N	50	NY DEC 703	NO	IFD
71432	Benzene	0.1	J	0.6		ug/l	MW-37D 8/24/98	4/22	0.3-71	0.6		3.6E-01 C	1	NY DEC 703	YES	ASL
75274	Bromodichloromethane	0.2	J	0.2	J	ug/l	MW-29D 4/14/98	1/22	0.2-71	0.2		1.7E-01 C	50	NY DEC 703	NO	IFD
56235	Carbon tetrachloride	0.3		1	J	ug/l	MW-37C 8/24/98	8/22	0.2-71	1		1.6E-01 C	5	NY DEC 703	YES	ASL
108907	Chlorobenzene	12		12		ug/l	MW-37D 8/24/98	1/22	0.2-71	12		1.1E+01 N	5	NY DEC 703	NO	IFD
67663	Chloroform	0.1	J	0.7		ug/l	MW-29D 4/14/98	6/22	0.3-71	0.7	0.72	6.3E-02 N	7	NY DEC 703	NO	BKG
74873	Chloromethane	0.1	J	0.2	J	ug/l	MW-29D 8/25/98	2/22	0.3-71	0.2		2.1E+00 C	5	NY DEC 703	NO	BSL
156592	cis-1,2-Dichloroethene	0.45		24		ug/l	MW-11C 4/13/98	10/20	0.3-0.3	24		6.1E+00 N	5	NY DEC 703	YES	ASL

TABLE 2.21
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Megothy)
Exposure Medium: Vapors
Exposure Point: Offsite Residential Areas (Tap)

CAS Number	Chemical	(1) Minimum Concentration	Minimum Qualifier	(1) Maximum Concentration	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	(2) Background Value	(3) Screening Toxicity Value	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	(4) Rationale for Contaminant Deletion or Selection
124481	Dibromochloromethane	0.3		0.3		ug/l	MW-29D 4/14/98	1/22	0.3-71	0.3	0.24	1.3E-01 C	50	NY DEC 703	NO	IFD
1834044	MTBE	5		6		ug/l	MW-26C 4/9/98	2/9	1-25	6		6.3E+02 N			NO	
127184	Tetrachloroethene	0.1	J	2.5		ug/l	MW-29C 08/25/98 (avg of dups)	6/22	0.2-71	2.5	0.81	1.1E+00 C	5	NY DEC 703	YES	ASL
108883	Toluene	0.1	J	15		ug/l	MW-37D 6/24/98	6/22	0.2-71	15	0.84	7.5E+01 N	5	NY DEC 703	YES	ASL
156605	trans-1,2-Dichloroethene	2	J	33		ug/l	MW-11C 4/13/98	5/20	0.3-0.3	33		1.2E+01 N	5	NY DEC 703	YES	ASL
79016	Trichloroethene	1		1300	J	ug/l	MW-11C-02 7/29/92	12/22	0.3-0.3	1300		1.6E+00 C	5	NY DEC 703	YES	ASL
75014	Vinyl chloride	0.4		0.4		ug/l	MW-11C 8/20/98	1/21	0.2-71	0.4		1.9E-02 C	2	NY DEC 703	NO	IFD

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Region III Risk-Based Concentrations (RBC) for tap water (10/99)
For chromium, used the RBC for chromium VI
For lead, used Drinking Water Regulations and Health Advisories Action Level
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin ketone, used endrin RBC
For endosulfan II and endosulfan sulfate used RBC for endosulfen
For acenaphthylene, benzo(g,h,i)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethene used most RBC for most toxic of cis- and trans- isomers
For 2-nitroanaline used Region 9 PRG.

(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)

(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions:
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.22
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Massapequa Preserve

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
7429905	Aluminum	89.5	B	417		ug/l	SW-01 04/01/92	13/18	84.1-84.1	417	201	3.7E+03 N			NO	
7440382	Arsenic	2.9	B	4	B	ug/l	MP-04-SW 4/7/98	6/18	1-2.8	4		4.5E-02 C	25	NY DEC 703	YES	ASL
7440393	Barium	3.9	B2	51.6	B	ug/l	MP-11-SW 4/7/98	18/18	0-0	51.6	44.6	2.6E+02 N	1000	NY DEC 703	NO	BSL
7440439	Cadmium	0.42	B	19.8		ug/l	MP-03-SW 4/7/98	12/18	0.4-4	19.8		3.7E+00 N	5	NY DEC 703	YES	ASL
7440702	Calcium	9310		20800		ug/l	SW-02 04/01/92	18/18	0-0	20800	16700				NO	NUT
7440473	Chromium	1.35	B	54.9		ug/l	MP-03-SW 4/7/98	12/18	1.1-7	54.9		1.1E+01 N	50	NY DEC 703	YES	ASL
18540299	Chromium VI	24.3		49.4		ug/l	MP-03-SW 4/7/98	2/11	10-10	49.4		1.1E+01 N	50	NY DEC 703	YES	ASL
7440484	Cobalt	5.1	B2	8.5	B2	ug/l	SW-05 04/01/92	2/18	1.3-4	6.5	5.1	2 2E+02 N			NO	
7440508	Copper	2.9	B	13	B2J	ug/l	SW-01 04/01/92	3/18	2.9-4	13		1.5E+02 N	200	NY DEC 703	NO	BSL
7439896	Iron	52.1	B	771		ug/l	SW-07 04/01/92	18/18	0-0	771	1590	1.1E+03 N	300	NY DEC 703	NO	BKG
7439921	Lead	1.4	B2	12		ug/l	SW-07 04/01/92	10/18	2-2	12	7	1.5E+01	25	NY DEC 703	NO	BSL
7439954	Magnesium	599	B2	3170	B	ug/l	MP-13-SW 4/7/98	18/18	0-0	3170	4810		35000	NY DEC 703	NO	NUT
7439965	Manganese	13.8	B2	584		ug/l	SW-07 04/01/92	18/18	0-0	584	567	7.3E+01 N	300	NY DEC 703	NO	BKG
7440020	Nickel	2.2	B	2.5	B	ug/l	MP-09-SW 4/7/98	3/18	2.1-17	2.5		7.3E+01 N	100	NY DEC 703	NO	BSL
7440097	Potassium	839	B2	2430	B2	ug/l	SW-07 04/01/92	16/18	620-620	2430	8280				NO	NUT
7440235	Sodium	7540		42400		ug/l	MP-11-SW 4/7/98	18/18	0-0	42400	52600		20000	NY DEC 703	NO	NUT
7440280	Thallium	4.7	B	6.3	B	ug/l	MP-09-SW 4/7/98	7/18	1-4.5	6.3	7.3	2.6E-01 N	0.5	NY DEC 703	NO	BKG
7440666	Zinc	7.1	B2	34.5		ug/l	MP-03-SW 4/7/98	17/18	5-5	34.5	110	1.1E+03 N	2000	NY DEC 703	NO	BKG
95501	1,2-Dichlorobenzene	0.3	B	0.3	B	ug/l	MP-14-SW 4/7/98 (avg of dups)	1/11	0.3-0.3	0.3		5 5E+01 N	3	NY DEC 703	NO	BSL
71556	1,1,1-Trichloroethane	0.1	J	0.5		ug/l	MP-04-SW 4/7/98	7/18	0.3-10	0.5		5 4E+01 N	5	NY DEC 703	NO	BSL
540590	1,2-Dichloroethene (total)	1	J	1	J	ug/l	SW-05 04/01/92	1/7	10-10	1		5 5E+00 N	5	NY DEC 703	NO	BSL
67663	Chloroform	0.1	J	0.3	J	ug/l	MP-03-SW 4/7/98	10/18	0.3-10	0.3	0.3	6.3E-02 N	7	NY DEC 703	YES	ASL
156592	cis-1,2-Dichloroethene	0.2	J	0.6		ug/l	MP-03-SW 4/7/98	8/11	0.3-0.3	0.6	0.1	6.1E+00 N	5	NY DEC 703	NO	BSL
124481	Dibromochloromethane	0.8	J	0.8	J	ug/l	SW-02 04/01/92	1/18	0.3-10	0.8		1.3E-01 C	50	NY DEC 703	YES	ASL
1634044	MTBE	0.6	J	24		ug/l	MP-06-SW 4/7/98	11/11	0-0	24	40	6.3E+02 N			NO	BKG
127184	Tetrachloroethene	0.1	J	2	J	ug/l	SW-05 04/01/92	12/18	0.2-10	2	1	1.1E+00 C	5	NY DEC 703	YES	ASL
79016	Trichloroethene	0.2	J	4	J	ug/l	SW-05 04/01/92	13/18	0.3-10	4		1.6E+00 C	5	NY DEC 703	YES	ASL

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TABLE 2.22
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Region III Risk-Based Concentrations (RBC) for tap water (10/99)
For chromium, used the RBC for chromium VI
For lead, used Drinking Water Regulations and Health Advisories Action Level
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin ketone, used endrin RBC
For endosulfan II and endosulfan sulfate used RBC for endosulfan
For acenaphthylene, benzo(g,h,l)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethene used most RBC for most toxic of cis- and trans- isomers
For 2-nitroanaline used Region 9 PRG.
(4) Rationale Codes
Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions:
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.23
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Massapequa Preserve

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)		Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
7429905	Aluminum	411		18400		mg/kg	P4-01 11/3/98	45/45	0-0	16400	8470	7.8E+03	N			YES	ASL
7440382	Arsenic	0.17	B2	13.5		mg/kg	MP-18 11/3/98	31/45	0-0	13.5	10.3	4.3E-02	C			YES	ASL
7440393	Barium	2.1	B2	250	B	mg/kg	P5-02 11/3/98	45/45	0.63-6.7	250	198	6.5E+02	N			NO	BSL
7440417	Beryllium	0.05	B	2.3	B	mg/kg	P4-01 11/3/98	35/45	0-0	2.3	0 93	1.6E+01	N			NO	BSL
7440439	Cadmium	0.46	B	248	J	mg/kg	MP-06-SE 4/8/98	41/45	0.05-0.3	248	7	7.8E+00	N			YES	ASL
7440702	Calcium	122	B	6590	B	mg/kg	P5-02 11/3/98	45/45	0.1-1.2	6590	5660					NO	NUT
7440473	Chromium	1.9	B	839	J	mg/kg	MP-06-SE 4/8/98	45/45	0-0	839	39.5	2.3E+01	N			YES	ASL
18540299	Chromium VI	2.6		136		mg/kg	MP-06-SE 4/8/98	10/13	0-0	136	4.6	2.3E+01	N			YES	ASL
7440484	Cobalt	0.31	B	21.3	B	mg/kg	P1-02 11/3/98	42/45	2-2	21.3	35.2	4.7E+02	N			NO	BKG
7440508	Copper	1.2	B	162	J	mg/kg	MP-06-SE 4/8/98	45/45	0.3-0.96	162	90	3.1E+02	N			NO	BSL
7439896	Iron	442		31200		mg/kg	P5-02 11/3/98	45/45	0-0	31200	31500	2.3E+03	N			NO	BKG
7439921	Lead	3.5		1860		mg/kg	P1-02 11/3/98	45/45	0-0	1860	485	4.0E+02				YES	ASL
7439954	Magnesium	43.2	B	2250	J	mg/kg	MP-06-SE 4/8/98	45/45	0-0	2250	1980					NO	NUT
7439965	Manganese	9.7		16600		mg/kg	P5-02 11/3/98	45/45	0-0	16600	4510	1.6E+02	N			YES	ASL
7439976	Mercury	0.19	B	0.82	B	mg/kg	P5-03 11/3/98	18/45	0-0	0.82	0.31	7.8E-01	N			YES	ASL
7440020	Nickel	0.76	B	47.4	B	mg/kg	P5-02 11/3/98	41/45	0.08-0.78	47.4	42.4	1 6E+02	N			NO	BSL
7440097	Potassium	67.9	B	575	J	mg/kg	MP-06-SE 4/8/98	28/45	4.1-4.4	575	570					NO	NUT
7782492	Selenium	0.14	B2	0.14	B2	mg/kg	SD-03 04/01/92	1/45	94.8-476	0.14	0 14	3.9E+01	N			NO	IFD
7440224	Silver	0.83	B	1.8	J	mg/kg	MP-06-SE 4/8/98	7/45	0.12-11.2	1.8		3.9E+01	N			NO	BSL
7440235	Sodium	23.2	B2	2030	B	mg/kg	P5-02 11/3/98	26/45	0.32-3	2030	338					NO	NUT
7440280	Thallium	2.7	B	2.7	B	mg/kg	PA-01-SE 6/26/98	1/45	109-672	2.7	0.32	5.5E-01	N			NO	IFD
7440622	Vanadium	0.78	B	67.6		mg/kg	P1-02 11/3/98	43/45	0.12-14	67.6	48.1	5.5E+01	N			YES	ASL
7440666	Zinc	6.5		801	J	mg/kg	MP-06-SE 4/8/98	45/45	0.59-1.2	801	528	2.3E+03	N			NO	BSL
71556	1,1,1-Trichloroethane	0.0009	J	0.009	J	mg/kg	MP-06-SE 4/8/98	7/20	0-0	0.009	0.0008	1.6E+02	N			NO	BSL
78933	2-Butanone	0.008	J	0.019	J	mg/kg	MP-06-SE 4/8/98	2/20	0.011-0.018	0.019		4 7E+03	N			NO	BSL
56235	Carbon tetrachloride	0.0009	J	0.0009	J	mg/kg	MP-10-SE 4/8/98	1/20	0.011-0.017	0.0009		4.9E+00	C			NO	IFD
127184	Tetrachloroethene	0 0002	J	0.007	J	mg/kg	MP-06-SE 4/8/98	8/20	0.011-0.034	0.007	0.003	1 2E+01	C			NO	BSL
108883	Toluene	0.005	J	0.062		mg/kg	SD-07 04/01/92	3/20	0.011-0.018	0.062		1 6E+03	N			NO	BSL
79016	Trichloroethene	0.0006	J	0.0006	J	mg/kg	MP-09-SE 4/8/98	1/20	0.011-0.034	0.0006		4 7E+01	N			NO	IFD

TABLE 2.23
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Region III Risk-Based Concentrations (RBC) for residential soil (10/99)
For chromium, used RBC for Chromium VI.
For lead, used 400 mg/kg, from "Revised Interim Soil Lead Guidance for CERCLA Sites and RCRA Corrective Action Facilities" (USEPA, 1994).
For mercury, used RBC for methylmercury
For endrin aldehyde and endrin ketone, used endrin RBC
For endosulfan II and endosulfan sulfate used RBC for endosulfan
For ecenaphthylene, benzo(g,h,i)perylene, and phenanthrene: pyrene was used as a surrogate.
For 1,2-dichloroethene used most RBC for most toxic of cis- and trans- isomers
For 2-nitroanaline used Region 9 PRG.
(4) Rationale Codes
Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions:
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

TABLE 2.24
OCCURRENCE, DISTRIBUTION AND SELECTION OF CHEMICALS OF POTENTIAL CONCERN
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Other
Exposure Medium: Animal Tissue
Exposure Point: Massapequa Preserve

CAS Number	Chemical	Minimum Concentration (1)	Minimum Qualifier	Maximum Concentration (1)	Maximum Qualifier	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits (5)	Concentration Used for Screening	Background Value (2)	Screening Toxicity Value (3)	Potential ARAR/TBC Value	Potential ARAR/TBC Source	COPC Flag	Rationale for Contaminant Deletion or Selection (4)
7440439	Cadmium	0.1		0.64		mgkg	PA-03 Carp	5/8	0.05-0.05	0.64		1.4E-02 N			YES	ASL
7440473	Chromium	0.27		2		mgkg	PA-03 Carp	3/8	0.27-0.27	2		4.1E-01 N			YES	ASL
7439921	Lead	0.39		2.5		mgkg	PA-03 Carp	7/8	0.23-0.23	2.5	0.47				YES	NSC

(1) Minimum/maximum detected concentration.
(2) Refer to supporting information for background discussion.
(3) Based on U.S. EPA Region III Risk-Based Concentrations for fish (10/99)
(4) Rationale Codes Selection Reason: Above Screening Level (ASL)
No Screening Criteria Available (NSC)
Deletion Reason: Infrequent Detection (IFD)
Below Background Level (BKG)
Essential Nutrient (NUT)
Below Screening Level (BSL)
Not Volatile (NV)
(5) Range of detection limits reported as "0-0" when constituent was detected in all samples

Definitions:
COPC = Chemical of Potential Concern
ARAR/TBC = Applicable or Relevant and Appropriate Requirement/To Be Considered
C = Carcinogenic
N = Non-Carcinogenic
S = Soil Saturation Concentration
See supporting documentation for definition of data qualifiers

RAGS TABLE 3s

TABLE 3.1
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Soil & Particulates
Exposure Point: Western Parcel

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value[1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Cyanide	mg/kg	4.88E+01	1.15E+03	2.43E+02	see Tables 2.1-2.24	mg/kg	2.43E+02	Max	S-W	2.43E+02	RME EPC	RME EPC
Aluminum	mg/kg	1.60E+04	3.18E+04	1.30E+05	see Tables 2.1-2.24	mg/kg	4.02E+04	95% UCL-T	S-W	4.02E+04	RME EPC	RME EPC
Antimony	mg/kg	1.51E+01	3.29E+01	1.45E+02	see Tables 2.1-2.24	mg/kg	4.25E+01	95% UCL-T	S-W	4.25E+01	RME EPC	RME EPC
Arsenic	mg/kg	8.61E+00	1.23E+01	2.60E+01	see Tables 2.1-2.24	mg/kg	1.73E+01	95% UCL-T	S-W	1.73E+01	RME EPC	RME EPC
Cadmium	mg/kg	6.39E+01	1.18E+02	2.51E+03	see Tables 2.1-2.24	mg/kg	2.04E+02	95% UCL-T	K-S	2.04E+02	RME EPC	RME EPC
Chromium III	mg/kg	6.33E+02	9.76E+02	1.29E+04	see Tables 2.1-2.24	mg/kg	1.61E+03	95% UCL-T	K-S	1.61E+03	RME EPC	RME EPC
Chromium VI	mg/kg	2.11E+02	3.25E+02	4.30E+03	see Tables 2.1-2.24	mg/kg	5.36E+02	95% UCL-T	K-S	5.36E+02	RME EPC	RME EPC
Copper	mg/kg	4.33E+02	1.02E+03	4.72E+03	see Tables 2.1-2.24	mg/kg	3.35E+03	95% UCL-T	S-W	3.35E+03	RME EPC	RME EPC
Lead	mg/kg	2.71E+02	6.31E+02	2.67E+03	see Tables 2.1-2.24	mg/kg	2.71E+02	Mean		2.71E+02		
Nickel	mg/kg	3.94E+01	9.96E+01	2.40E+02	see Tables 2.1-2.24	mg/kg	9.96E+01	95% UCL-T	S-W	9.96E+01	RME EPC	RME EPC
Thallium	mg/kg	4.20E-01	6.30E-01	1.10E+00	see Tables 2.1-2.24	mg/kg	6.30E-01	95% UCL-T	S-W	6.30E-01	RME EPC	RME EPC
Zinc	mg/kg	1.22E+03	2.33E+04	7.50E+03	see Tables 2.1-2.24	mg/kg	7.50E+03	Max	S-W	7.50E+03	RME EPC	RME EPC
Aroclor-1254	mg/kg	3.09E-01	NA	9.90E-01	see Tables 2.1-2.24	mg/kg	9.90E-01	Max	<5 samples	9.90E-01	RME EPC	RME EPC
Aroclor-1260	mg/kg	1.39E-01	NA	4.40E-01	see Tables 2.1-2.24	mg/kg	4.40E-01	Max	<5 samples	4.40E-01	RME EPC	RME EPC
Tetrachloroethene	mg/kg	6.32E-01	1.70E+00	1.50E+01	see Tables 2.1-2.24	mg/kg	1.54E-01	95% UCL-T	S-W	1.54E-01	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4
Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50
Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.2
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Soil & Particulates
Exposure Point: Western Parcel

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Cyanide	mg/kg	6.74E+01	7.77E+01	1.22E+03	see Tables 2.1-2.24	mg/kg	7.77E+01	95% UCL-T	K-S	7.77E+01	RME EPC	RME EPC
Aluminum	mg/kg	8.79E+03	1.36E+04	2.97E+05	see Tables 2.1-2.24	mg/kg	8.46E+03	95% UCL-T	K-S	8.46E+03	RME EPC	RME EPC
Antimony	mg/kg	1.19E+01	2.27E+01	7.09E+02	see Tables 2.1-2.24	mg/kg	5.94E+00	95% UCL-T	K-S	5.94E+00	RME EPC	RME EPC
Arsenic	mg/kg	4.30E+00	5.34E+00	4.29E+01	see Tables 2.1-2.24	mg/kg	5.06E+00	95% UCL-T	K-S	5.06E+00	RME EPC	RME EPC
Cadmium	mg/kg	3.88E+01	5.56E+01	4.30E+03	see Tables 2.1-2.24	mg/kg	2.98E+01	95% UCL-T	K-S	2.98E+01	RME EPC	RME EPC
Chromium III	mg/kg	5.93E+02	8.56E+02	7.28E+04	see Tables 2.1-2.24	mg/kg	5.40E+02	95% UCL-T	K-S	5.40E+02	RME EPC	RME EPC
Chromium VI	mg/kg	1.97E+02	2.84E+02	2.43E+04	see Tables 2.1-2.24	mg/kg	1.56E+02	95% UCL-T	K-S	1.56E+02	RME EPC	RME EPC
Copper	mg/kg	3.10E+02	4.86E+02	9.12E+03	see Tables 2.1-2.24	mg/kg	7.33E+02	95% UCL-T	K-S	7.33E+02	RME EPC	RME EPC
Lead	mg/kg	1.45E+02	2.00E+02	2.67E+03	see Tables 2.1-2.24	mg/kg	1.45E+02	Mean	K-S	1.45E+02	Mean	
Mercury	mg/kg	1.70E-01	1.80E-01	1.60E+00	see Tables 2.1-2.24	mg/kg	1.80E-01	95% UCL-T	K-S	1.80E-01	RME EPC	RME EPC
Nickel	mg/kg	4.79E+01	9.32E+01	7.93E+02	see Tables 2.1-2.24	mg/kg	9.32E+01	95% UCL-T	K-S	9.32E+01	RME EPC	RME EPC
Silver	mg/kg	1.64E+00	1.43E+00	4.83E+01	see Tables 2.1-2.24	mg/kg	1.43E+00	95% UCL-T	K-S	1.43E+00	RME EPC	RME EPC
Zinc	mg/kg	2.67E+03	5.90E+03	1.87E+05	see Tables 2.1-2.24	mg/kg	1.47E+03	95% UCL-T	K-S	1.47E+03	RME EPC	RME EPC
Aroclor-1248	mg/kg	2.20E-01	4.56E-01	2.60E+00	see Tables 2.1-2.24	mg/kg	1.91E-01	95% UCL-T	S-W	1.91E-01	RME EPC	RME EPC
Aroclor-1254	mg/kg	4.07E-01	6.33E-01	2.20E+00	see Tables 2.1-2.24	mg/kg	2.02E+00	95% UCL-T	S-W	2.02E+00	RME EPC	RME EPC
Aroclor-1260	mg/kg	4.68E-01	1.11E+00	9.00E+00	see Tables 2.1-2.24	mg/kg	5.36E-01	95% UCL-T	S-W	5.36E-01	RME EPC	RME EPC
Benzo(a)pyrene	mg/kg	5.18E-01	9.30E-01	2.38E-01	see Tables 2.1-2.24	mg/kg	2.38E-01	Max	S-W	2.38E-01	RME EPC	RME EPC
Tetrachloroethene	mg/kg	1.07E-01	2.02E-01	1.50E+01	see Tables 2.1-2.24	mg/kg	1.97E-02	95% UCL-T	K-S	1.97E-02	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4

Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50

Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.3
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current/Future
Medium: Surface/Subsurface Soil
Exposure Medium: Vapors
Exposure Point: Western Parcel

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Tetrachloroethene	mg/kg	1.07E-01	2.02E-01	1.50E+01	see Tables 2.1-2.24	mg/kg	1.97E-02	95% UCL-T	K-S	1.97E-02	RME EPC	RME EPC
Toluene	mg/kg	1.41E+00	3.68E-02	1.80E+02	see Tables 2.1-2.24	mg/kg	3.68E-02	95% UCL-T	K-S	3.68E-02	RME EPC	RME EPC
Trichloroethene	mg/kg	2.12E-01	3.56E-01	1.80E+01	see Tables 2.1-2.24	mg/kg	3.19E-02	95% UCL-T	K-S	3.19E-02	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4

Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50

Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.4
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Upper Glacial)
Exposure Medium: Groundwater
Exposure Point: Western Parcel (Tap)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Cyanide	ug/l	7.83E+01	1.62E+03	2.72E+02	see Tables 2.1-2.24	ug/l	2.72E+02	Max	S-W	2.72E+02	RME EPC	RME EPC
Aluminum	ug/l	8.46E+02	1.54E+04	3.41E+03	see Tables 2.1-2.24	ug/l	3.41E+03	Max	S-W	3.41E+03	RME EPC	RME EPC
Arsenic	ug/l	1.34E+00	1.65E+00	2.53E+00	see Tables 2.1-2.24	ug/l	1.65E+00	95% UCL-N	S-W	1.65E+00	RME EPC	RME EPC
Cadmium	ug/l	1.01E+02	6.34E+02	3.84E+02	see Tables 2.1-2.24	ug/l	3.84E+02	Max	S-W	3.84E+02	RME EPC	RME EPC
Chromium VI	ug/l	9.87E+01	6.38E+02	4.26E+02	see Tables 2.1-2.24	ug/l	4.26E+02	Max	S-W	4.26E+02	RME EPC	RME EPC
Chromium III	ug/l	8.84E+01	4.01E+02	3.90E+02	see Tables 2.1-2.24	ug/l	3.90E+02	Max	S-W	3.90E+02	RME EPC	RME EPC
Copper	ug/l	3.30E+01	4.18E+02	1.10E+02	see Tables 2.1-2.24	ug/l	1.10E+02	Max	S-W	1.10E+02	RME EPC	RME EPC
Manganese	ug/l	3.05E+02	2.96E+04	2.21E+03	see Tables 2.1-2.24	ug/l	2.21E+03	Max	S-W	2.21E+03	RME EPC	RME EPC
Nickel	ug/l	3.83E+01	2.66E+02	1.28E+02	see Tables 2.1-2.24	ug/l	1.28E+02	Max	S-W	1.28E+02	RME EPC	RME EPC
Thallium	ug/l	3.25E+00	7.69E+00	1.67E+01	see Tables 2.1-2.24	ug/l	7.69E+00	95% UCL-T	S-W	7.69E+00	RME EPC	RME EPC
alpha-Chlordane	ug/l	2.81E-02	3.15E-02	3.75E-02	see Tables 2.1-2.24	ug/l	3.15E-02	95% UCL-T	S-W	3.15E-02	RME EPC	RME EPC
Dieldrin	ug/l	4.57E-02	5.86E-02	3.28E-02	see Tables 2.1-2.24	ug/l	3.28E-02	Max	S-W	3.28E-02	RME EPC	RME EPC
gamma-Chlordane	ug/l	2.81E-02	3.15E-02	3.75E-02	see Tables 2.1-2.24	ug/l	3.15E-02	95% UCL-T	S-W	3.15E-02	RME EPC	RME EPC
bis(2-Ethylhexyl)phthalate	ug/l	3.80E+01	9.51E+02	2.03E+02	see Tables 2.1-2.24	ug/l	2.03E+02	Max	S-W	2.03E+02	RME EPC	RME EPC
Chrysene	ug/l	4.70E+00	6.82E+00	1.90E+00	see Tables 2.1-2.24	ug/l	1.90E+00	Max	S-W	1.90E+00	RME EPC	RME EPC
Pentachlorophenol	ug/l	1.23E+01	1.45E+01	7.75E+00	see Tables 2.1-2.24	ug/l	7.75E+00	Max	S-W	7.75E+00	RME EPC	RME EPC
1,1,1-Trichloroethane	ug/l	2.52E+01	7.23E+02	1.00E+02	see Tables 2.1-2.24	ug/l	1.00E+02	Max	S-W	1.00E+02	RME EPC	RME EPC
1,1-Dichloroethane	ug/l	8.22E+00	6.20E+01	2.27E+01	see Tables 2.1-2.24	ug/l	2.27E+01	Max	S-W	2.27E+01	RME EPC	RME EPC
Acetone	ug/l	2.54E+01	2.27E+02	1.65E+02	see Tables 2.1-2.24	ug/l	1.65E+02	Max	S-W	1.65E+02	RME EPC	RME EPC
Chloroform	ug/l	8.69E+00	1.23E+01	5.00E-01	see Tables 2.1-2.24	ug/l	5.00E-01	Max	S-W	5.00E-01	RME EPC	RME EPC
cis-1,2-Dichloroethene	ug/l	1.69E+02	9.92E+17	6.60E+02	see Tables 2.1-2.24	ug/l	6.60E+02	Max	S-W	6.60E+02	RME EPC	RME EPC
Tetrachloroethene	ug/l	8.26E+00	1.12E+01	1.90E+01	see Tables 2.1-2.24	ug/l	1.12E+01	95% UCL-N	S-W	1.12E+01	RME EPC	RME EPC
trans-1,2-Dichloroethene	ug/l	5.80E+00	4.46E+05	7.00E+00	see Tables 2.1-2.24	ug/l	7.00E+00	Max	S-W	7.00E+00	RME EPC	RME EPC
Trichloroethene	ug/l	4.11E+02	2.16E+06	1.16E+03	see Tables 2.1-2.24	ug/l	1.16E+03	Max	S-W	1.16E+03	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4
Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T);
Mean of Normal Data (Mean-N).
Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50
Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.5
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current/Future
Medium: Groundwater (Upper Glacial)
Exposure Medium: Vapors
Exposure Point: Western Parcel (Indoors and Outdoors)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
1,1,1-Trichloroethane	ug/l	2.52E+01	7.23E+02	1.00E+02	see Tables 2.1-2.24	ug/l	1.00E+02	Max	S-W	1.00E+02	RME EPC	RME EPC
1,1-Dichloroethane	ug/l	8.22E+00	6.20E+01	2.27E+01	see Tables 2.1-2.24	ug/l	2.27E+01	Max	S-W	2.27E+01	RME EPC	RME EPC
Acetone	ug/l	2.54E+01	2.27E+02	1.65E+02	see Tables 2.1-2.24	ug/l	1.65E+02	Max	S-W	1.65E+02	RME EPC	RME EPC
Chloroform	ug/l	8.69E+00	1.23E+01	5.00E-01	see Tables 2.1-2.24	ug/l	5.00E-01	Max	S-W	5.00E-01	RME EPC	RME EPC
cis-1,2-Dichloroethene	ug/l	1.69E+02	9.92E+17	6.60E+02	see Tables 2.1-2.24	ug/l	6.60E+02	Max	S-W	6.60E+02	RME EPC	RME EPC
Tetrachloroethene	ug/l	8.26E+00	1.12E+01	1.90E+01	see Tables 2.1-2.24	ug/l	1.12E+01	95% UCL-N	S-W	1.12E+01	RME EPC	RME EPC
trans-1,2-Dichloroethene	ug/l	5.80E+00	4.46E+05	7.00E+00	see Tables 2.1-2.24	ug/l	7.00E+00	Max	S-W	7.00E+00	RME EPC	RME EPC
Trichloroethene	ug/l	4.11E+02	2.16E+06	1.16E+03	see Tables 2.1-2.24	ug/l	1.16E+03	Max	S-W	1.16E+03	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4

Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50

Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.6
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Magothy)
Exposure Medium: Groundwater
Exposure Point: Western Parcel (Tap)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Manganese	ug/l	7.84E+01	NA	8.95E+01	see Tables 2.1-2.24	ug/l	8.95E+01	Max	<5 samples	8.95E+01	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4
Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50
Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3- 7
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Magothy)
Exposure Medium: Vapors
Exposure Point: Western Parcel (Tap)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4
Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T);
Mean of Normal Data (Mean-N).
Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50
Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.8
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Soil & Particulates
Exposure Point: Eastern Parcel

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Cyanide	mg/kg	2.45E+01	1.65E+01	9.7E+02	see Tables 2.1-2.24	mg/kg	1.65E+01	95% UCL-T	K-S	1.65E+01	RME EPC	RME EPC
Antimony	mg/kg	2.03E+00	3.03E+00	2.3E+01	see Tables 2.1-2.24	mg/kg	3.03E+00	95% UCL-T	K-S	3.03E+00	RME EPC	RME EPC
Arsenic	mg/kg	1.47E+00	2.02E+00	1.70E+01	see Tables 2.1-2.24	mg/kg	1.93E+00	95% UCL-T	K-S	1.93E+00	RME EPC	RME EPC
Cadmium	mg/kg	5.07E+01	9.39E+01	4.30E+03	see Tables 2.1-2.24	mg/kg	1.34E+01	95% UCL-T	K-S	1.34E+01	RME EPC	RME EPC
Chromium III	mg/kg	6.44E+02	1.34E+03	7.28E+04	see Tables 2.1-2.24	mg/kg	6.57E+01	95% UCL-T	K-S	6.57E+01	RME EPC	RME EPC
Chromium VI	mg/kg	2.15E+02	4.47E+02	2.43E+04	see Tables 2.1-2.24	mg/kg	2.16E+01	95% UCL-T	K-S	2.16E+01	RME EPC	RME EPC
Copper	mg/kg	5.62E+01	6.03E+01	1.95E+03	see Tables 2.1-2.24	mg/kg	6.03E+01	95% UCL-T	K-S	6.03E+01	RME EPC	RME EPC
Lead	mg/kg	6.34E+01	1.13E+02	1.22E+03	see Tables 2.1-2.24	mg/kg	6.34E+01	Mean	K-S	6.34E+01	Mean	
Mercury	mg/kg	1.50E-01	1.40E-01	3.20E+00	see Tables 2.1-2.24	mg/kg	1.40E-01	95% UCL-T	K-S	1.40E-01	RME EPC	RME EPC
Nickel	mg/kg	2.13E+01	1.48E+01	7.05E+02	see Tables 2.1-2.24	mg/kg	1.48E+01	95% UCL-T	K-S	1.48E+01	RME EPC	RME EPC
Vanadium	mg/kg	8.91E+00	8.73E+00	1.78E+02	see Tables 2.1-2.24	mg/kg	8.73E+00	95% UCL-T	K-S	8.73E+00	RME EPC	RME EPC
Zinc	mg/kg	1.43E+02	1.12E+02	5.06E+03	see Tables 2.1-2.24	mg/kg	1.12E+02	95% UCL-T	K-S	1.12E+02	RME EPC	RME EPC
Benzo(a)pyrene	mg/kg	3.30E-01	5.68E-01	7.50E-01	see Tables 2.1-2.24	mg/kg	6.50E-01	95% UCL-T	S-W	6.50E-01	RME EPC	RME EPC
Benzo(b)fluoranthene	mg/kg	3.77E-01	6.27E-01	1.50E+00	see Tables 2.1-2.24	mg/kg	7.10E-01	95% UCL-T	S-W	7.10E-01	RME EPC	RME EPC
Dibenz(a,h)anthracene	mg/kg	2.90E-01	5.26E-01	1.00E-01	see Tables 2.1-2.24	mg/kg	1.00E-01	Max	S-W	1.00E-01	RME EPC	RME EPC
1,2-Dichloroethene (tota	mg/kg	6.27E+00	2.26E-02	1.10E+03	see Tables 2.1-2.24	mg/kg	2.26E-02	95% UCL-T	K-S	2.26E-02	RME EPC	RME EPC
Trichloroethene	mg/kg	2.14E+01	4.19E+01	1.70E+03	see Tables 2.1-2.24	mg/kg	1.06E-01	95% UCL-T	K-S	1.06E-01	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4

Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50

Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.9
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors and Outdoors)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
1,2-Dichloroethene (total)	mg/kg	6.27E+00	2.26E-02	1.10E+03	see Tables 2.1-2.24	mg/kg	2.26E-02	95% UCL-T	K-S	2.26E-02	RME EPC	RME EPC
Trichloroethene	mg/kg	2.14E+01	4.19E+01	1.70E+03	see Tables 2.1-2.24	mg/kg	1.06E-01	95% UCL-T	K-S	1.06E-01	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4

Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50

Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.10
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current/Future
Medium: Solid Waste
Exposure Medium: Solid Waste & Particulates
Exposure Point: Eastern Parcel

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Aluminum	mg/kg	8.81E+03	1.42E+04	6.45E+04	see Tables 2.1-2.24	mg/kg	1.14E+05	95% UCL-T	S-W	1.14E+05	RME EPC	RME EPC
Antimony	mg/kg	9.72E+00	2.04E+01	1.88E+02	see Tables 2.1-2.24	mg/kg	1.53E+01	95% UCL-T	S-W	1.53E+01	RME EPC	RME EPC
Arsenic	mg/kg	8.54E+00	1.10E+01	2.25E+01	see Tables 2.1-2.24	mg/kg	2.25E+01	Max	S-W	2 25E+01	RME EPC	RME EPC
Barium	mg/kg	1.95E+02	4.88E+02	1.72E+03	see Tables 2.1-2.24	mg/kg	4.88E+02	95% UCL-T	S-W	4.88E+02	RME EPC	RME EPC
Cadmium	mg/kg	9.81E+00	1.33E+01	5.33E+01	see Tables 2.1-2.24	mg/kg	2.88E+01	95% UCL-T	S-W	2 88E+01	RME EPC	RME EPC
Chromium III	mg/kg	2.88E+02	5.26E+02	4.09E+03	see Tables 2.1-2.24	mg/kg	8.46E+02	95% UCL-T	S-W	8.46E+02	RME EPC	RME EPC
Chromium VI	mg/kg	2.88E+02	5.26E+02	4.09E+03	see Tables 2.1-2.24	mg/kg	8.46E+02	95% UCL-T	S-W	8 46E+02	RME EPC	RME EPC
Copper	mg/kg	1.33E+03	2.56E+03	2.16E+04	see Tables 2.1-2.24	mg/kg	1.19E+04	95% UCL-T	S-W	1.19E+04	RME EPC	RME EPC
Lead	mg/kg	6.92E+02	1.00E+03	4.26E+03	see Tables 2.1-2.24	mg/kg	6.92E+02	Mean		6.92E+02	Mean	
Mercury	mg/kg	8.80E-01	1.92E+00	7.90E+00	see Tables 2.1-2.24	mg/kg	1.92E+00	95% UCL-T	S-W	1.92E+00	RME EPC	RME EPC
Nickel	mg/kg	6.64E+01	1.73E+02	5.18E+02	see Tables 2.1-2.24	mg/kg	1.73E+02	95% UCL-T	S-W	1.73E+02	RME EPC	RME EPC
Thallium	mg/kg	5.90E-01	8.80E-01	7.70E-01	see Tables 2.1-2.24	mg/kg	6.80E-01	95% UCL-T	S-W	6.80E-01	RME EPC	RME EPC
Vanadium	mg/kg	5.64E+01	1.31E+02	2.59E+02	see Tables 2.1-2.24	mg/kg	1.31E+02	95% UCL-T	S-W	1 31E+02	RME EPC	RME EPC
Zinc	mg/kg	8.81E+02	3.83E+03	6.11E+03	see Tables 2.1-2.24	mg/kg	3.83E+03	95% UCL-T	S-W	3 83E+03	RME EPC	RME EPC
4,4'-DDD	mg/kg	1.56E+00	3.75E+00	3.20E+01	see Tables 2.1-2.24	mg/kg	1.93E+01	95% UCL-T	S-W	1.93E+01	RME EPC	RME EPC
4,4'-DDE	mg/kg	4.06E-01	9.09E-01	7.40E+00	see Tables 2.1-2.24	mg/kg	4.17E+00	95% UCL-T	S-W	4.17E+00	RME EPC	RME EPC
4,4'-DDT	mg/kg	5.45E-01	1.02E+00	5.00E+00	see Tables 2.1-2.24	mg/kg	5.00E+00	Max	S-W	5.00E+00	RME EPC	RME EPC
Aroclor-1248	mg/kg	1.49E-01	2.74E-01	8.50E-01	see Tables 2.1-2.24	mg/kg	2.17E-01	95% UCL-T	S-W	2.17E-01	RME EPC	RME EPC
Aroclor-1254	mg/kg	3.09E-01	4.90E-01	1.80E+00	see Tables 2.1-2.24	mg/kg	1.03E+00	95% UCL-T	S-W	1.03E+00	RME EPC	RME EPC
Aroclor-1260	mg/kg	4.07E-01	7.46E-01	4.35E+00	see Tables 2.1-2.24	mg/kg	1.02E+00	95% UCL-T	S-W	1.02E+00	RME EPC	RME EPC
Dieldrin	mg/kg	2.64E-02	5.24E-02	3.50E-01	see Tables 2.1-2.24	mg/kg	3.46E-02	95% UCL-T	S-W	3.46E-02	RME EPC	RME EPC
Benz(a)anthracene	mg/kg	4.50E+01	8.38E+01	2.50E+02	see Tables 2.1-2.24	mg/kg	2.50E+02	Max	S-W	2.50E+02	RME EPC	RME EPC
Benzo(a)pyrene	mg/kg	3.93E+01	7.60E+01	1.60E+02	see Tables 2.1-2.24	mg/kg	1.60E+02	Max	S-W	1.60E+02	RME EPC	RME EPC
Benzo(b)fluoranthene	mg/kg	4.69E+01	8.65E+01	2.70E+02	see Tables 2.1-2.24	mg/kg	2.70E+02	Max	S-W	2.70E+02	RME EPC	RME EPC
Benzo(k)fluoranthene	mg/kg	3.50E+01	7.09E+01	1.00E+02	see Tables 2.1-2.24	mg/kg	1.00E+02	Max	S-W	1.00E+02	RME EPC	RME EPC
bis(2-Ethylhexyl)phthalate	mg/kg	1.96E+02	5.01E+02	4.65E+03	see Tables 2.1-2.24	mg/kg	1.79E+03	95% UCL-T	S-W	1.79E+03	RME EPC	RME EPC
Carbazole	mg/kg	3.32E+01	6.88E+01	5.20E+01	see Tables 2.1-2.24	mg/kg	5.20E+01	Max	S-W	5.20E+01	RME EPC	RME EPC
Chrysene	mg/kg	4.54E+01	8.42E+01	2.50E+02	see Tables 2.1-2.24	mg/kg	2.50E+02	Max	S-W	2.50E+02	RME EPC	RME EPC
Di-n-octyl phthalate	mg/kg	5.41E+01	4.43E+02	9.45E+02	see Tables 2.1-2.24	mg/kg	4.43E+02	95% UCL-T	S-W	4.43E+02	RME EPC	RME EPC
Dibenz(a,h)anthracene	mg/kg	3.07E+01	8.83E+01	2.80E+01	see Tables 2.1-2.24	mg/kg	2.60E+01	Max	S-W	2.60E+01	RME EPC	RME EPC
Fluoranthene	mg/kg	6.85E+01	5.26E+03	6.50E+02	see Tables 2.1-2.24	mg/kg	6.50E+02	Max	S-W	6.50E+02	RME EPC	RME EPC
Indeno(1,2,3-cd)pyrene	mg/kg	3.47E+01	7.06E+01	9.40E+01	see Tables 2.1-2.24	mg/kg	9.40E+01	Max	S-W	9.40E+01	RME EPC	RME EPC
Phenanthrene	mg/kg	4.96E+01	9.85E+01	4.90E+02	see Tables 2.1-2.24	mg/kg	4.90E+02	Max	S-W	4 90E+02	RME EPC	RME EPC
Pyrene	mg/kg	5.82E+01	3.42E+03	5.00E+02	see Tables 2.1-2.24	mg/kg	5.00E+02	Max	S-W	5 00E+02	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4
Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0 05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50
Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.11
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current/Future
Medium: Solid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors & Outdoors)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
2-Methylnaphthalene	mg/kg	2.79E+01	5.61E+02	2.90E+01	see Tables 2.1-2.24	mg/kg	2.90E+01	Max	S-W	2.90E+01	RME EPC	RME EPC
Anthracene	mg/kg	3.24E+01	2.52E+01	6.70E+01	see Tables 2.1-2.24	mg/kg	6.70E+01	Max	S-W	6.70E+01	RME EPC	RME EPC
Phenanthrene	mg/kg	7.79E+01	3.56E-01	4.90E+02	see Tables 2.1-2.24	mg/kg	4.90E+02	Max	S-W	4.90E+02	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4
Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50
Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.12
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Solid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
2-Methylnaphthalene	mg/kg	5.82E+00	NA	5.50E+00	see Tables 2.1-2.24	mg/kg	5.50E+00	Max	<5 samples	5.50E+00	RME EPC	RME EPC
Anthracene	mg/kg	2.55E+01	NA	6.70E+01	see Tables 2.1-2.24	mg/kg	6.70E+01	Max	<5 samples	6.70E+01	RME EPC	RME EPC
Phenanthrene	mg/kg	1.73E+02	NA	4.90E+02	see Tables 2.1-2.24	mg/kg	4.90E+02	Max	<5 samples	4.90E+02	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4

Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50

Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.13
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Liquid Waste
Exposure Medium: Liquid Waste
Exposure Point. Eastern Parcel

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value 1,2	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Aluminum	ug/l	4.08E+03	3.84E+05	2.80E+04	see Tables 2.1-2.24	ug/l	2.80E+04	Max	S-W	2.80E+04	RME EPC	RME EPC
Antimony	ug/l	2.13E+01	5.28E+01	2.71E+02	see Tables 2.1-2.24	ug/l	4.67E+01	95% UCL-T	S-W	4.67E+01	RME EPC	RME EPC
Arsenic	ug/l	1.05E+01	1.89E+01	7.46E+01	see Tables 2.1-2.24	ug/l	1.65E+01	95% UCL-T	S-W	1.65E+01	RME EPC	RME EPC
Barium	ug/l	1.75E+02	1.61E+03	8.24E+02	see Tables 2.1-2.24	ug/l	8.24E+02	Max	S-W	8.24E+02	RME EPC	RME EPC
Cadmium	ug/l	2.11E+01	4.10E+01	1.36E+02	see Tables 2.1-2.24	ug/l	1.36E+02	Max	S-W	1.36E+02	RME EPC	RME EPC
Chromium III	ug/l	7.90E+02	2.12E+03	1.14E+04	see Tables 2.1-2.24	ug/l	1.14E+04	Max	S-W	1.14E+04	RME EPC	RME EPC
Chromium VI	ug/l	7.90E+02	2.12E+03	1.14E+04	see Tables 2.1-2.24	ug/l	1.14E+04	Max	S-W	1.14E+04	RME EPC	RME EPC
Copper	ug/l	4.81E+02	1.09E+03	5.27E+03	see Tables 2.1-2.24	ug/l	4.47E+03	95% UCL-T	S-W	4.47E+03	RME EPC	RME EPC
Lead	ug/l	3.42E+02	6.63E+02	2.70E+03	see Tables 2.1-2.24	ug/l	3.42E+02	Mean		3.42E+02	Mean	
Manganese	ug/l	1.37E+02	7.99E+02	4.54E+02	see Tables 2.1-2.24	ug/l	4.54E+02	Max	S-W	4.54E+02	RME EPC	RME EPC
Mercury	ug/l	2.90E-01	7.80E-01	1.60E+00	see Tables 2.1-2.24	ug/l	7.80E-01	95% UCL-T	S-W	7.80E-01	RME EPC	RME EPC
Nickel	ug/l	2.21E+01	1.20E+02	1.48E+02	see Tables 2.1-2.24	ug/l	1.20E+02	95% UCL-T	S-W	1.20E+02	RME EPC	RME EPC
Thallium	ug/l	2.14E+00	2.79E+00	6.40E+00	see Tables 2.1-2.24	ug/l	2.66E+00	95% UCL-T	S-W	2.66E+00	RME EPC	RME EPC
Vanadium	ug/l	5.53E+01	1.15E+02	5.09E+02	see Tables 2.1-2.24	ug/l	5.09E+02	Max	S-W	5.09E+02	RME EPC	RME EPC
Zinc	ug/l	7.79E+02	6.56E+03	5.50E+03	see Tables 2.1-2.24	ug/l	5.50E+03	Max	S-W	5.50E+03	RME EPC	RME EPC
4,4'-DDD	ug/l	1.84E+00	4.86E+00	2.40E+01	see Tables 2.1-2.24	ug/l	4.49E+00	95% UCL-T	S-W	4.49E+00	RME EPC	RME EPC
4,4'-DDE	ug/l	1.14E+00	2.89E+00	1.40E+01	see Tables 2.1-2.24	ug/l	2.96E+00	95% UCL-T	S-W	2.96E+00	RME EPC	RME EPC
4,4'-DDT	ug/l	8.24E-01	1.89E+00	8.50E+00	see Tables 2.1-2.24	ug/l	3.38E+00	95% UCL-T	S-W	3.38E+00	RME EPC	RME EPC
Aroclor-1260	ug/l	4.01E+00	8.41E+00	3.30E+01	see Tables 2.1-2.24	ug/l	9.49E+00	95% UCL-T	S-W	9.49E+00	RME EPC	RME EPC
Endrin aldehyde	ug/l	2.60E-01	6.90E-01	1.20E+00	see Tables 2.1-2.24	ug/l	6.90E-01	95% UCL-T	S-W	6.90E-01	RME EPC	RME EPC
Heptachlor epoxide	ug/l	2.98E-02	3.65E-02	7.90E-02	see Tables 2.1-2.24	ug/l	3.44E-02	95% UCL-T	S-W	3.44E-02	RME EPC	RME EPC
1,4-Dichlorobenzene	ug/l	2.69E+01	4.49E+01	2.00E+00	see Tables 2.1-2.24	ug/l	2.00E+00	Max	S-W	2.00E+00	RME EPC	RME EPC
4-Methylphenol	ug/l	1.16E+01	1.23E+02	4.80E+01	see Tables 2.1-2.24	ug/l	4.80E+01	Max	S-W	4.80E+01	RME EPC	RME EPC
Benz(a)anthracene	ug/l	1.05E+01	1.79E+01	4.50E+01	see Tables 2.1-2.24	ug/l	4.50E+01	Max	S-W	4.50E+01	RME EPC	RME EPC
Benzo(a)pyrene	ug/l	1.69E+01	2.95E+01	4.10E+01	see Tables 2.1-2.24	ug/l	4.10E+01	Max	S-W	4.10E+01	RME EPC	RME EPC
Benzo(b)fluoranthene	ug/l	1.54E+01	2.85E+01	6.60E+01	see Tables 2.1-2.24	ug/l	6.60E+01	Max	S-W	6.60E+01	RME EPC	RME EPC
Benzo(k)fluoranthene	ug/l	1.59E+01	2.83E+01	2.80E+01	see Tables 2.1-2.24	ug/l	2.80E+01	Max	S-W	2.80E+01	RME EPC	RME EPC
bis(2-Ethylhexyl)phthalate	ug/l	4.88E+01	8.79E+01	3.00E+02	see Tables 2.1-2.24	ug/l	3.00E+02	Max	S-W	3.00E+02	RME EPC	RME EPC
Carbazole	ug/l	2.32E+01	4.14E+01	1.10E+01	see Tables 2.1-2.24	ug/l	1.10E+01	Max	S-W	1.10E+01	RME EPC	RME EPC
Chrysene	ug/l	1.14E+01	1.94E+01	5.40E+01	see Tables 2.1-2.24	ug/l	5.40E+01	Max	S-W	5.40E+01	RME EPC	RME EPC
Dibenz(a,h)anthracene	ug/l	2.00E+01	3.80E+01	7.00E+00	see Tables 2.1-2.24	ug/l	7.00E+00	Max	S-W	7.00E+00	RME EPC	RME EPC
Dibenzofuran	ug/l	2.33E+01	8.03E+02	4.00E+00	see Tables 2.1-2.24	ug/l	4.00E+00	95% UCL-T	S-W	4.00E+00	RME EPC	RME EPC
Indeno(1,2,3-cd)pyrene	ug/l	1.27E+01	2.42E+01	2.40E+01	see Tables 2.1-2.24	ug/l	2.40E+01	Max	S-W	2.40E+01	RME EPC	RME EPC
Naphthalene	ug/l	1.34E+01	1.93E+02	6.00E+00	see Tables 2.1-2.24	ug/l	6.00E+00	Max	S-W	6.00E+00	RME EPC	RME EPC
Pentachlorophenol	ug/l	6.13E+01	1.05E+02	1.30E+01	see Tables 2.1-2.24	ug/l	1.30E+01	Max	S-W	1.30E+01	RME EPC	RME EPC
Phenanthrene	ug/l	8.41E+00	1.51E+01	5.70E+01	see Tables 2.1-2.24	ug/l	4.22E+01	95% UCL-T	S-W	4.22E+01	RME EPC	RME EPC
Pyrene	ug/l	1.51E+01	9.91E+01	8.00E+01	see Tables 2.1-2.24	ug/l	8.00E+01	Max	S-W	8.00E+01	RME EPC	RME EPC
Acetone	ug/l	1.70E+01	3.18E+01	8.80E+01	see Tables 2.1-2.24	ug/l	3.18E+01	95% UCL-T	S-W	3.18E+01	RME EPC	RME EPC
Benzene	ug/l	8.67E+00	1.51E+01	6.00E+01	see Tables 2.1-2.24	ug/l	1.06E+01	95% UCL-T	S-W	1.06E+01	RME EPC	RME EPC
Choroethane	ug/l	1.06E+01	1.71E+01	4.00E+01	see Tables 2.1-2.24	ug/l	1.55E+01	95% UCL-T	S-W	1.55E+01	RME EPC	RME EPC
Ethylbenzene	ug/l	1.71E+01	2.35E+01	1.60E+02	see Tables 2.1-2.24	ug/l	2.35E+01	95% UCL-T	S-W	2.35E+01	RME EPC	RME EPC

TABLE 3.13
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Liquid Waste
Exposure Medium: Liquid Waste
Exposure Point: Eastern Parcel

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value[1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Methylene Chloride	ug/l	6 07E+00	8.35E+00	2.40E+01	see Tables 2.1-2.24	ug/l	7.65E+00	95% UCL-T	S-W	7.65E+00	RME EPC	RME EPC
Toluene	ug/l	3.00E+01	4.15E+01	3.90E+02	see Tables 2.1-2.24	ug/l	4.15E+01	95% UCL-T	S-W	4 15E+01	RME EPC	RME EPC
Trichloroethene	ug/l	7.80E+00	1.31E+01	2.00E+00	see Tables 2.1-2.24	ug/l	2.00E+00	Max	S-W	2.00E+00	RME EPC	RME EPC
Vinyl Chloride	ug/l	7.72E+00	1.31E+01	8 00E-01	see Tables 2.1-2.24	ug/l	8.00E-01	Max	S-W	8 00E-01	RME EPC	RME EPC
Xylenes (total)	ug/l	9.78E+01	8.71E+01	1.40E+03	see Tables 2.1-2.24	ug/l	8.71E+01	95% UCL-T	S-W	8.71E+01	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4
Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50
Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.14
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current/Future
Medium: Liquid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors & Outdoors)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
1,4-Dichlorobenzene	ug/l	2.69E+01	4.49E+01	2.00E+00	see Tables 2.1-2.24	ug/l	2.00E+00	Max	S-W	2.00E+00	RME EPC	RME EPC
Dibenzofuran	ug/l	2.33E+01	6.03E+02	4.00E+00	see Tables 2.1-2.24	ug/l	4.00E+00	95% UCL-T	S-W	4.00E+00	RME EPC	RME EPC
Naphthalene	ug/l	1.34E+01	1.93E+02	6.00E+00	see Tables 2.1-2.24	ug/l	6.00E+00	Max	S-W	6.00E+00	RME EPC	RME EPC
Phenanthrene	ug/l	8.41E+00	1.51E+01	5.70E+01	see Tables 2.1-2.24	ug/l	4.22E+01	95% UCL-T	S-W	4.22E+01	RME EPC	RME EPC
Acetone	ug/l	1.70E+01	3.18E+01	8.80E+01	see Tables 2.1-2.24	ug/l	3.18E+01	95% UCL-T	S-W	3.18E+01	RME EPC	RME EPC
Benzene	ug/l	8.67E+00	1.51E+01	6.00E+01	see Tables 2.1-2.24	ug/l	1.06E+01	95% UCL-T	S-W	1.06E+01	RME EPC	RME EPC
Chloroethane	ug/l	1.06E+01	1.71E+01	4.00E+01	see Tables 2.1-2.24	ug/l	1.55E+01	95% UCL-T	S-W	1.55E+01	RME EPC	RME EPC
Ethylbenzene	ug/l	1.71E+01	2.35E+01	1.60E+02	see Tables 2.1-2.24	ug/l	2.35E+01	95% UCL-T	S-W	2.35E+01	RME EPC	RME EPC
Methylene Chloride	ug/l	6.07E+00	8.35E+00	2.40E+01	see Tables 2.1-2.24	ug/l	7.65E+00	95% UCL-T	S-W	7.65E+00	RME EPC	RME EPC
Toluene	ug/l	3.00E+01	4.15E+01	3.90E+02	see Tables 2.1-2.24	ug/l	4.15E+01	95% UCL-T	S-W	4.15E+01	RME EPC	RME EPC
Trichloroethene	ug/l	7.80E+00	1.31E+01	2.00E+00	see Tables 2.1-2.24	ug/l	2.00E+00	Max	S-W	2.00E+00	RME EPC	RME EPC
Vinyl Chloride	ug/l	7.72E+00	1.31E+01	8.00E-01	see Tables 2.1-2.24	ug/l	8.00E-01	Max	S-W	8.00E-01	RME EPC	RME EPC
Xylenes (total)	ug/l	9.78E+01	8.71E+01	1.40E+03	see Tables 2.1-2.24	ug/l	8.71E+01	95% UCL-T	S-W	8.71E+01	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4

Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50

Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.16
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Surface/Subsurface Soil
Exposure Medium: Soil & Particulates
Exposure Point: Offsite Residential Areas (Ellsworth Allen Park)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Chromium IIII	mg/kg	8.11E+00	2.04E+01	5.14E+01	see Tables 2.1-2.24	mg/kg	2.04E+01	95% UCL-T	S-W	2.04E+01	RME EPC	RME EPC
Chromium VI	mg/kg	2.70E+00	6.81E+00	1.71E+01	see Tables 2.1-2.24	mg/kg	6.81E+00	95% UCL-T	S-W	6.81E+00	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4

Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50

Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.18
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Groundwater (Upper Glacial)
Exposure Medium: Groundwater
Exposure Point: Offsite Residential Areas (Tap)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Aluminum	ug/l	1.15E+03	4.09E+03	3.99E+03	see Tables 2.1-2.24	ug/l	3.99E+03	Max	S-W	3.99E+03	RME EPC	RME EPC
Arsenic	ug/l	1.80E+00	2.11E+00	2.83E+00	see Tables 2.1-2.24	ug/l	2.11E+00	95% UCL-N	S-W	2.11E+00	RME EPC	RME EPC
Cadmium	ug/l	3.84E+01	7.98E+02	1.26E+02	see Tables 2.1-2.24	ug/l	1.26E+02	Max	S-W	1.26E+02	RME EPC	RME EPC
Chromium VI	ug/l	5.89E+01	5.86E+02	4.72E+02	see Tables 2.1-2.24	ug/l	4.72E+02	Max	S-W	4.72E+02	RME EPC	RME EPC
Chromium III	ug/l	4.61E+01	5.98E+02	2.82E+02	see Tables 2.1-2.24	ug/l	2.82E+02	Max	S-W	2.82E+02	RME EPC	RME EPC
Manganese	ug/l	1.53E+03	1.74E+04	8.53E+03	see Tables 2.1-2.24	ug/l	8.53E+03	Max	S-W	8.53E+03	RME EPC	RME EPC
Dieldrin	ug/l	5.54E-02	1.02E-01	1.60E-01	see Tables 2.1-2.24	ug/l	1.02E-01	95% UCL-T	S-W	1.02E-01	RME EPC	RME EPC
Heptachlor epoxide	ug/l	2.51E-02	3.62E-02	3.65E-02	see Tables 2.1-2.24	ug/l	3.62E-02	95% UCL-T	S-W	3.62E-02	RME EPC	RME EPC
bis(2-Ethylhexyl)phthalate	ug/l	5.14E+00	7.20E+00	1.20E+01	see Tables 2.1-2.24	ug/l	7.20E+00	95% UCL-T	S-W	7.20E+00	RME EPC	RME EPC
Phenol	ug/l	4.69E+00	5.32E+00	4.00E+00	see Tables 2.1-2.24	ug/l	4.00E+00	Max	S-W	4.00E+00	RME EPC	RME EPC
1,1,1-Trichloroethane	ug/l	4.86E+00	8.30E+00	1.63E+01	see Tables 2.1-2.24	ug/l	8.30E+00	95% UCL-T	S-W	8.30E+00	RME EPC	RME EPC
1,1-Dichloroethane	ug/l	4.31E+00	8.07E+00	8.00E+00	see Tables 2.1-2.24	ug/l	8.00E+00	Max	S-W	8.00E+00	RME EPC	RME EPC
1,1-Dichloroethene	ug/l	4.08E+00	1.83E+01	4.67E+00	see Tables 2.1-2.24	ug/l	4.67E+00	Max	S-W	4.67E+00	RME EPC	RME EPC
Chlorobenzene	ug/l	4.93E+00	2.18E+01	1.40E+01	see Tables 2.1-2.24	ug/l	1.40E+01	Max	S-W	1.40E+01	RME EPC	RME EPC
cis-1,2-Dichloroethene	ug/l	6.30E+00	8.09E+03	2.50E+01	see Tables 2.1-2.24	ug/l	2.50E+01	Max	S-W	2.50E+01	RME EPC	RME EPC
Tetrachloroethene	ug/l	4.61E+00	5.18E+00	6.67E+00	see Tables 2.1-2.24	ug/l	5.18E+00	95% UCL-N	S-W	5.18E+00	RME EPC	RME EPC
Trichloroethene	ug/l	1.59E+01	2.97E+01	8.60E+01	see Tables 2.1-2.24	ug/l	2.97E+01	95% UCL-T	S-W	2.97E+01	RME EPC	RME EPC
Vinyl chloride	ug/l	8.24E+00	4.23E+01	7.20E+01	see Tables 2.1-2.24	ug/l	4.23E+01	95% UCL-T	S-W	4.23E+01	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4

Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50

Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.19
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current and Future
Medium: Groundwater (Upper Glacial)
Exposure Medium: Vapors
Exposure Point: Offsite Residential Areas (Indoors & Outdoors)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
1,1,1-Trichloroethane	ug/l	4.86E+00	8.30E+00	1.63E+01	see Tables 2.1-2.24	ug/l	8.30E+00	95% UCL-T	S-W	8.30E+00	RME EPC	RME EPC
1,1-Dichloroethane	ug/l	4.31E+00	8.07E+00	8.00E+00	see Tables 2.1-2.24	ug/l	8.00E+00	Max	S-W	8.00E+00	RME EPC	RME EPC
1,1-Dichloroethene	ug/l	4.08E+00	1.83E+01	4.67E+00	see Tables 2.1-2.24	ug/l	4.67E+00	Max	S-W	4.67E+00	RME EPC	RME EPC
Chlorobenzene	ug/l	4.93E+00	2.18E+01	1.40E+01	see Tables 2.1-2.24	ug/l	1.40E+01	Max	S-W	1.40E+01	RME EPC	RME EPC
cis-1,2-Dichloroethene	ug/l	6.30E+00	8.09E+03	2.50E+01	see Tables 2.1-2.24	ug/l	2.50E+01	Max	S-W	2.50E+01	RME EPC	RME EPC
Tetrachloroethene	ug/l	4.61E+00	5.18E+00	6.67E+00	see Tables 2.1-2.24	ug/l	5.18E+00	95% UCL-N	S-W	5.18E+00	RME EPC	RME EPC
Trichloroethene	ug/l	1.59E+01	2.97E+01	8.60E+01	see Tables 2.1-2.24	ug/l	2.97E+01	95% UCL-T	S-W	2.97E+01	RME EPC	RME EPC
Vinyl chloride	ug/l	8.24E+00	4.23E+01	7.20E+01	see Tables 2.1-2.24	ug/l	4.23E+01	95% UCL-T	S-W	4.23E+01	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4

Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50

Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.20
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Groundwater (Magothy)
Exposure Medium: Groundwater
Exposure Point: Offsite Residential Areas (Tap)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Arsenic	ug/l	1.29E+00	1.79E+00	3.58E+00	see Tables 2.1-2.24	ug/l	1.87E+00	95% UCL-T	S-W	1.87E+00	RME EPC	RME EPC
Chromium III	ug/l	2.20E+00	3.59E+00	9.23E+00	see Tables 2.1-2.24	ug/l	8.15E+00	95% UCL-T	S-W	8.15E+00	RME EPC	RME EPC
Chromium VI	ug/l	6.26E+00	1.50E+01	5.43E+01	see Tables 2.1-2.24	ug/l	3.25E+01	95% UCL-T	S-W	3.25E+01	RME EPC	RME EPC
Manganese	ug/l	3.62E+02	5.16E+02	1.14E+03	see Tables 2.1-2.24	ug/l	5.39E+02	95% UCL-T	S-W	5.39E+02	RME EPC	RME EPC
1,1-Dichloroethane	ug/l	2.33E+00	4.49E+01	1.21E+01	see Tables 2.1-2.24	ug/l	1.21E+01	95% UCL-T	S-W	1.21E+01	RME EPC	RME EPC
1,1-Dichloroethene	ug/l	1.45E+00	3.24E+00	1.11E+01	see Tables 2.1-2.24	ug/l	1.11E+01	Max	S-W	1.11E+01	RME EPC	RME EPC
1,2-Dichloroethane	ug/l	1.26E+00	3.07E+00	1.12E+01	see Tables 2.1-2.24	ug/l	6.62E+00	95% UCL-T	S-W	8.62E+00	RME EPC	RME EPC
Benzene	ug/l	1.26E+00	3.04E+00	1.11E+01	see Tables 2.1-2.24	ug/l	7.97E+00	95% UCL-T	S-W	7.97E+00	RME EPC	RME EPC
Carbon Tetrachloride	ug/l	9.03E-01	1.74E+00	1.00E+00	see Tables 2.1-2.24	ug/l	1.00E+00	Max	S-W	1.00E+00	RME EPC	RME EPC
cis-1,2-Dichloroethene	ug/l	4.35E+00	8.50E+00	2.30E+01	see Tables 2.1-2.24	ug/l	2.30E+01	Max	S-W	2.30E+01	RME EPC	RME EPC
Tetrachloroethene	ug/l	1.55E+00	3.30E+00	1.09E+01	see Tables 2.1-2.24	ug/l	1.09E+01	Max	S-W	1.09E+01	RME EPC	RME EPC
Toluene	ug/l	2.49E+00	5.33E+00	1.50E+01	see Tables 2.1-2.24	ug/l	1.50E+01	Max	S-W	1.50E+01	RME EPC	RME EPC
trans-1,2-Dichloroethene	ug/l	4.42E+00	9.62E+00	2.85E+01	see Tables 2.1-2.24	ug/l	2.85E+01	Max	S-W	2.85E+01	RME EPC	RME EPC
Trichloroethene	ug/l	9.06E+01	2.11E+02	7.40E+02	see Tables 2.1-2.24	ug/l	7.40E+02	Max	S-W	7.40E+02	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4
Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).
Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50
Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.21
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Groundwater (Magothy)
Exposure Medium: Vapors
Exposure Point: Offsite Residential Areas (Tap)

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
1,1-Dichloroethane	ug/l	2.33E+00	4.49E+01	1.21E+01	see Tables 2.1-2.24	ug/l	1.21E+01	95% UCL-T	S-W	1.21E+01	RME EPC	RME EPC
1,1-Dichloroethene	ug/l	1.45E+00	3.24E+00	1.11E+01	see Tables 2.1-2.24	ug/l	1.11E+01	Max	S-W	1.11E+01	RME EPC	RME EPC
1,2-Dichloroethane	ug/l	1.26E+00	3.07E+00	1.12E+01	see Tables 2.1-2.24	ug/l	8.62E+00	95% UCL-T	S-W	8.62E+00	RME EPC	RME EPC
Benzene	ug/l	1.26E+00	3.04E+00	1.11E+01	see Tables 2.1-2.24	ug/l	7.97E+00	95% UCL-T	S-W	7.97E+00	RME EPC	RME EPC
Carbon Tetrachloride	ug/l	9.03E-01	1.74E+00	1.00E+00	see Tables 2.1-2.24	ug/l	1.00E+00	Max	S-W	1.00E+00	RME EPC	RME EPC
cis-1,2-Dichloroethene	ug/l	4.35E+00	8.50E+00	2.30E+01	see Tables 2.1-2.24	ug/l	2.30E+01	Max	S-W	2.30E+01	RME EPC	RME EPC
Tetrachloroethene	ug/l	1.55E+00	3.30E+00	1.09E+01	see Tables 2.1-2.24	ug/l	1.09E+01	Max	S-W	1.09E+01	RME EPC	RME EPC
Toluene	ug/l	2.49E+00	5.33E+00	1.50E+01	see Tables 2.1-2.24	ug/l	1.50E+01	Max	S-W	1.50E+01	RME EPC	RME EPC
trans-1,2-Dichloroethene	ug/l	4.42E+00	9.62E+00	2.85E+01	see Tables 2.1-2.24	ug/l	2.85E+01	Max	S-W	2.85E+01	RME EPC	RME EPC
Trichloroethene	ug/l	9.06E+01	2.11E+02	7.40E+02	see Tables 2.1-2.24	ug/l	7.40E+02	Max	S-W	7.40E+02	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4

Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50

Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.22
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Massapequa Preserve

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Arsenic	ug/l	1.71E+00	2.24E+00	4.20E+00	see Tables 2.1-2.24	ug/l	2.89E+00	95% UCL-T	S-W	2.89E+00	RME EPC	RME EPC
Cadmium	ug/l	3.72E+00	5.85E+00	1.98E+01	see Tables 2.1-2.24	ug/l	1.15E+01	95% UCL-T	S-W	1.15E+01	RME EPC	RME EPC
Chromium III	ug/l	8.83E+00	1.40E+01	4.49E+01	see Tables 2.1-2.24	ug/l	2.55E+01	95% UCL-T	S-W	2.55E+01	RME EPC	RME EPC
Chromium VI	ug/l	1.23E+01	1.88E+01	4.94E+01	see Tables 2.1-2.24	ug/l	4.94E+01	Max	S-W	4.94E+01	RME EPC	RME EPC
Chloroform	ug/l	2.03E+00	1.81E+01	3.00E-01	see Tables 2.1-2.24	ug/l	3.00E-01	Max	S-W	3.00E-01	RME EPC	RME EPC
Dibromochloromethane	ug/l	1.80E+00	2.76E+00	8.00E-01	see Tables 2.1-2.24	ug/l	8.00E-01	Max	S-W	8.00E-01	RME EPC	RME EPC
Tetrachloroethene	ug/l	1.50E+00	2.32E+00	2.00E+00	see Tables 2.1-2.24	ug/l	2.00E+00	Max	S-W	2.00E+00	RME EPC	RME EPC
Trichloroethene	ug/l	1.93E+00	2.75E+00	4.00E+00	see Tables 2.1-2.24	ug/l	4.00E+00	Max	S-W	4.00E+00	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4
Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T);
Mean of Normal Data (Mean-N).
Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50
Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.23
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Massapequa Preserve

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Aluminum	mg/kg	4.77E+03	8.21E+03	1.64E+04	see Tables 2.1-2.24	mg/kg	8.21E+03	95% UCL-T	S-W	8.21E+03	RME EPC	RME EPC
Arsenic	mg/kg	4.42E+00	5.48E+00	1.35E+01	see Tables 2.1-2.24	mg/kg	9.76E+00	95% UCL-T	S-W	9.76E+00	RME EPC	RME EPC
Cadmium	mg/kg	2.93E+01	4.08E+01	2.48E+02	see Tables 2.1-2.24	mg/kg	1.64E+02	95% UCL-T	S-W	1.64E+02	RME EPC	RME EPC
Chromium III	mg/kg	1.36E+02	1.83E+02	7.76E+02	see Tables 2.1-2.24	mg/kg	3.11E+02	95% UCL-T	S-W	3.11E+02	RME EPC	RME EPC
Chromium VI	mg/kg	1.22E+02	1.64E+02	7.76E+02	see Tables 2.1-2.24	mg/kg	4.20E+02	95% UCL-T	S-W	4.20E+02	RME EPC	RME EPC
Lead	mg/kg	3.85E+02	4.87E+02	1.86E+03	see Tables 2.1-2.24	mg/kg	3.85E+02	Mean		3.85E+02	Mean	
Manganese	mg/kg	9.83E+02	1.66E+03	1.66E+04	see Tables 2.1-2.24	mg/kg	2.09E+03	95% UCL-T	S-W	2.09E+03	RME EPC	RME EPC
Mercury	mg/kg	2.00E-01	3.10E-01	8.20E-01	see Tables 2.1-2.24	mg/kg	3.10E-01	95% UCL-T	S-W	3.10E-01	RME EPC	RME EPC
Vanadium	mg/kg	1.99E+01	4.70E+01	6.76E+01	see Tables 2.1-2.24	mg/kg	4.70E+01	95% UCL-T	S-W	4.70E+01	RME EPC	RME EPC

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4

Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T); Mean of Normal Data (Mean-N).

Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50

Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

TABLE 3.24
MEDIUM-SPECIFIC EXPOSURE POINT CONCENTRATION SUMMARY
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Other
Exposure Medium: Animal Tissue
Exposure Point: Massapequa Preserve

Chemical of Potential Concern	Units	Arithmetic Mean	95% UCL of Normal Data	Maximum Detected Concentration	Maximum Qualifier	EPC Units	Reasonable Maximum Exposure			Central Tendency		
							Medium EPC Value [1,2]	Medium EPC Statistic	Medium EPC Rationale	Medium EPC Value	Medium EPC Statistic	Medium EPC Rationale
Cadmium	mg/kg	1.80E-01	1.60E+00	6.40E-01	see Tables 2.1-2.24	mg/kg	6.40E-01	Max	S-W	6.40E-01	RME EPC	RME EPC
Chromium VI	mg/kg	3.60E-01	9.80E-01	1.50E+00	see Tables 2.1-2.24	mg/kg	9.80E-01	95% UCL-T	S-W	9.80E-01	RME EPC	RME EPC
Lead	mg/kg	7.56E-01	1.26E+00	2.50E+00	see Tables 2.1-2.24	mg/kg	7.56E-01	Mean		7.56E-01	Mean	

Notes:
EPC = Exposure Point Concentration
NA = Not available because too few samples
Methods for determining means and UCL concentrations detailed in Baseline Risk Assessment.
In calculating EPCs, duplicates were averaged prior to statistical analysis.
For groundwater, well concentrations were averaged over the monitoring period prior to conducting statistical analysis.
In calculating EPCs, 1/2 the detection limit was used for nondetects.
Distribution testing and statistical calculations were only conducted on sample sets greater than 4

Statistics:
Maximum Detected Value (Max); 95% UCL of Normal Data (95% UCL-N); 95% UCL of Log-transformed Data (95% UCL-T); Mean of Log-transformed Data (Mean-T);
Mean of Normal Data (Mean-N).

Rationale:
S-W: Shapiro-Wilks was used for sample sets equal or less than 50, where the significance level = 0.05
K-S: Kolmogorov-Smirnov with the Lilliefors significance correction was used for sample sets greater than 50

Footnotes:
[1] If UCL concentration is greater than the maximum concentration, the maximum concentration is used as the EPC.
[2] If sample distribution did not meet either normal or lognormal distribution criteria, a lognormal distribution was assumed for the calculation of the 95 percent UCL.

RAGS TABLE 4s

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil
Exposure Point: Western Parcel
Receptor Population: Trespasser
Receptor Age: Adolescent (10-18 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
	IR-S	Ingestion Rate of Soil	mg/day	50	(2) 100 mg/day (child >6 years) x 50% of the day's exposure at contaminated source	50	(2) 100 mg/day (child >6 years) x 50% of the day's exposure at contaminated source	
	EF	Exposure Frequency	days/year	130	(4) Four times/week for 13 summer weeks; twice/week for spring and fall; once/week for winter	65	(4) Three times/week for 13 summer weeks;once/week for spring and fall	
	ED	Exposure Duration	years	9	Adolescent 10-18 years old	9	Adolescent 10-18 years old	
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	BW	Body Weight	kg	53.1	(1) Table 7-3. Average of values for boys and girls aged 10 to 18	53.1	(1) Table 7-3. Average of values for boys and girls aged 10 to 18	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	3,285	ED x 365 days/year	3,285	ED x 365 days/year	
Dermal	CS	Chemical Concentration in Soil	mg/kg	chemical-specific	EPC	chemical-specific	EPC	DAD (mg/kg-day) = CS x AF x SA x ABS x ED x EF x CF1 x 1/BW x 1/AT
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	SA	Exposed Surface Area for soil/dust	cm2	9345	(3) 10-18 year old adolescent; head, hands, arms and legs	9345	(3) 10-18 year old adolescent; head, hands, arms and legs	
	AF	Adherence Factor	mg/cm2	0.07	(3) Adult Resident	0.01	(3) Adult Resident	
	ABS	Absorption Fraction	unitless	chemical-specific	(3)	chemical-specific	(3)	
	EF	Exposure Frequency	days/year	130	(4) Four times per week for 13 summer weeks, twice/week for spring and fall, once/week for winter	65	(4) Three times per week for 13 summer weeks, once/week for spring and fall	
	ED	Exposure Duration	years	9	Adolescent 10-18 years old	9	Adolescent 10-18 years old	
	BW	Body Weight	kg	53.1	(1) Table 7-3. Average of values for boys and girls aged 10 to 18	53.1	(1) Table 7-3. Average of values for boys and girls aged 10 to 18	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	3,285	ED x 365 days/year	3,285	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Particulates
Exposure Point: Western Parcel
Receptor Population: Trespasser
Receptor Age: Adolescent (10-18 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	1.9	(1) Table 5-23 (mean for children, heavy activity)	1.2	(1) Table 5-23 (mean for children, moderate activity)	
	ET	Exposure Time	hours/day	2	(4,5) High estimate of time onsite	1	(4) Average estimate of time onsite	
	EF	Exposure Frequency	days/year	130	(4) Four times/week for 13 summer weeks; twice/week for spring and fall; once/week for winter	65	(4) Three times/week for 13 summer weeks;once/week for spring and fall	
	ED	Exposure Duration	years	9	Adolescent 10-18 years old	9	Adolescent 10-18 years old	
	BW	Body Weight	kg	53.1	(1) Table 7-3. Average of values for boys and girls aged 10 to 18	53.1	(1) Table 7-3. Average of values for boys and girls aged 10 to 18	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	3,285	ED x 365 days/year	3,285	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.3
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Surface/Subsurface Soil
Exposure Medium: Vapors
Exposure Point: Western Parcel (Outdoors)
Receptor Population: Trespasser
Receptor Age: Adolescent (10-18 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	1.9	(1) Table 5-23 (mean for children, heavy activity)	1.2	(1) Table 5-23 (mean for children, moderate activity)	
	ET	Exposure Time	hours/day	2	(5)	1	(4)	
	EF	Exposure Frequency	days/year	130	(4) Four times/week for 13 summer weeks; twice/week for spring and fall; once/week for winter	65	(4) Three times/week for 13 summer weeks;once/week for spring and fall	
	ED	Exposure Duration	years	9	Adolescent 10-18 years old	9	Adolescent 10-18 years old	
	BW	Body Weight	kg	53.1	(1) Table 7-3. Average of values for boys and girls aged 10 to 18	53.1	(1) Table 7-3. Average of values for boys and girls aged 10 to 18	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	3,285	ED x 365 days/year	3,285	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.4

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Groundwater (Upper Glacial)
Exposure Medium: Vapors
Exposure Point: Western Parcel (Outdoors)
Receptor Population: Trespasser
Receptor Age: Adolescent (10-18 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	1.9	(1) Table 5-23 (mean for children, heavy activity)	1.2	(1) Table 5-23 (mean for children, moderate activity)	
	ET	Exposure Time	hours/day	2	(5)	1	(4)	
	EF	Exposure Frequency	days/year	130	(4) Four times/week for 13 summer weeks; twice/week for spring and fall; once/week for winter	65	(4) Three times/week for 13 summer weeks;once/week for spring and fall	
	ED	Exposure Duration	years	9	Adolescent 10-18 years old	9	Adolescent 10-18 years old	
	BW	Body Weight	kg	53.1	(1) Table 7-3. Average of values for boys and girls aged 10 to 18	53.1	(1) Table 7-3. Average of values for boys and girls aged 10 to 18	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	3,285	ED x 365 days/year	3,285	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Waston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.5
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Soil
Exposure Point: Western Parcel
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
	IR-S	Ingestion Rate of Soil	mg/day	50	(1) Table 1-2 (adults)	50	(1) Table 1-2 (adults)	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	
Dermal	CS	Chemical Concentration in Soil	mg/kg	chemical-specific	EPC	chemical-specific	EPC	DAD (mg/kg-day) = CS x AF x SA x ABS x ED x EF x CF1 x 1/BW x 1/AT
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	SA	Exposed Surface Area for soil/dust	cm2	3300	(3) Industrial worker; head, hands, and arms	3300	(3) Industrial worker; head, hands, and arms	
	AF	Adherence Factor	mg/cm2	0.2	(3) Worker	0.02	(3) Worker	
	ABS	Absorption Fraction	unitless	chemical-specific	(3)	chemical-specific	(3)	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.6
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Particulates
Exposure Point: Western Parcel
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hours/day	8	(2)	8	(2)	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidanca for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.7
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Vapors
Exposure Point: Western Parcel (Indoors)
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hour/day	8	(2)	8	(2)	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.8
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Vapors
Exposure Point: Western Parcel (Outdoors)
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equetion/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-dey) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hour/day	2	(4) estimated time outdoors during a workday	2	(4) estimated time outdoors during a workday	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.9
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Soil
Exposure Point: Western Parcel
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
	IR-S	Ingestion Rate of Soil	mg/day	480	(1) page 4-20	100	(1) upper range p-4-21	
	EF	Exposure Frequency	days/year	125	(4) six working months	125	(4) six working months	
	ED	Exposure Duration	years	1	(4)	1	(4)	
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	365	ED x 365 days/year	365	ED x 365 days/yeer	
Dermal	CS	Chemical Concentration in Soil	mg/kg	chemical-specific	EPC	chemical-specific	EPC	DAD (mg/kg-day) = CS x AF x SA x ABS x ED x EF x CF1 x 1/BW x 1/AT
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	SA	Exposed Surface Area for soil/dust	cm2	3300	(3) Industrial worker; head, hands, arms and legs	3300	(3) Industrial worker; head, hands, arms and legs	
	AF	Adherence Factor	mg/cm2	0.2	(3) Worker	0.02	(3) Worker	
	ABS	Absorption Fraction	unitless	chemical-specific	(3)	chemical-specific	(3)	
	EF	Exposure Frequency	days/year	125	(4) six working months	125	(4) six working months	
	ED	Exposure Duration	years	1	(4)	1	(4)	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	365	ED x 365 days/year	365	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.10
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Particulates
Exposure Point: Western Parcel
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hours/day	8	(2)	8	(2)	
	EF	Exposure Frequency	days/year	125	(4) six working months	125	(4) six working months	
	ED	Exposure Duration	years	1	(4)	1	(4)	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	365	ED x 365 days/year	365	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.11

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Vapors
Exposure Point: Western Parcel (Outdoors)
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hour/day	8	(2)	8	(2)	
	EF	Exposure Frequency	days/year	125	(4) six working months	125	(4) six working months	
	ED	Exposure Duration	years	1	(4)	1	(4)	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	365	ED x 365 days/year	365	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.12
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Soil
Exposure Point: Western Parcel
Receptor Population: Other Recreational User
Receptor Age: Pre-Adolescant/Adolescent (6-18 years)

Exposure Route	Parameter Code	Parameter Dafinition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
	IR-S	Ingestion Rate of Soil	mg/day	50	(2) 100 mg/day (child >6 years) x 50% of the day's exposure at contaminated source	50	(2) 100 mg/day (child >6 years) x 50% of the day's exposure at contaminated source	
	EF	Exposure Frequency	days/year	130	(4) Four times/week for 13 summer weeks; twice/week for spring and fall; once/week for winter	65	(4) Three times/week for 13 summer weeks;once/week for spring and fall	
	ED	Exposure Duration	years	13	Ages 6-18	13	Ages 6-18	
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	BW	Body Weight	kg	45.0	(1) Table 7-3 Average values for boys and girls aged 6 to 18.	45.0	(1) Table 7-3 Average values for boys and girls aged 6 to 18.	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	4,745	ED x 365 days/year	4,745	ED x 365 days/year	
Dermal	CS	Chemical Concentration in Soil	mg/kg	chemical-specific	EPC	chemical-specific	EPC	DAD (mg/kg-day) = CS x AF x SA x ABS x ED x EF x CF1 x 1/BW x 1/AT
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	SA	Exposed Surface Area for soil/dust	cm2/day	6430	(3) 6-18 year old adolescent; head, hands, arms and legs	6430	(3) 6-18 year old adolescent; head, hands, arms and legs	
	AF	Adherence Factor	mg/cm2	0.07	(3) Adult Resident	0.01	(3) Adult Resident	
	ABS	Absorption Fraction	unitless	chemical-specific	(3)	chemical-specific	(3)	
	EF	Exposure Frequency	days/year	80	(4) 1 day/week for 10 months	40	(4) 1 day/week for 10 months	
	ED	Exposure Duration	years	13	Ages 6-18	13	Ages 6-18	
	BW	Body Weight	kg	45.0	(1) Table 7-3 Average values for boys and girls aged 6 to 18.	45.0	(1) Table 7-3 Average values for boys and girls aged 6 to 18.	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	4,745	ED x 365 days/yaar	4,745	ED x 365 days/year	

(1) EPA, 1997. "Exposura Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidanca for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessmant Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.13
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Particulates
Exposure Point: Western Parcel
Receptor Population: Other Recreational User
Receptor Age: Pre-Adolescent/Adolescent (6-18 years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	1.9	(1) Table 5-23 (heavy activity)	1.2	(1) Table 5-23 (moderate activity)	
	ET	Exposure Time	hours/day	2	(4)	2	(4)	
	EF	Exposure Frequency	days/year	80	(4) Twice/week for 10 months	40	(4) 1 day/week for 10 months	
	ED	Exposure Duration	years	13	Ages 6-18	13	Ages 6-18	
	BW	Body Weight	kg	45.0	(1) Table 7-3 Average values for boys and girls aged 6 to 18.	45.0	(1) Table 7-3 Average values for boys and girls aged 6 to 18.	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	4,745	ED x 365 days/year	4,745	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.14
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Vapors
Exposure Point: Outdoors Onsite (Western Parcel)
Receptor Population: Other Recreational User
Receptor Age: Pre-Adolescent/Adolescent (6-18 years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Retionale/ Reference	Inteke Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	1.9	(1) Table 5-23 (heavy activity)	1.2	(1) Table 5-23 (moderate activity)	
	ET	Exposure Time	hours/day	2	(4)	2	(4)	
	EF	Exposure Frequency	days/year	80	(4) Twice/week for 10 months	40	(4) 1 day/week for 10 months	
	ED	Exposure Duration	years	13	Ages 6-18	13	Ages 6-18	
	BW	Body Weight	kg	45.0	(1) Table 7-3 Average values for boys and girls aged 6 to 18.	45.0	(1) Table 7-3 Average values for boys and girls aged 6 to 18.	
	AT-C	Averaging Time (Cencer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	4,745	ED x 365 days/year	4,745	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgament

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.15
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Upper Glacial)
Exposure Medium: Groundwater
Exposure Point: Western Parcel (Tap)
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	ug/l	chemical-specific	EPC	chemical-specific	Mean	ADD or LADD (mg/kg-day) = CW x IR-W x EF x ED x CF2 x 1/BW x 1/AT
	IR-W	Ingestion Rate of Water	liters/day	1	(2)	1	(2)	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	CF2	Conversion Factor 2	mg/ug	0.001	--	0.001	--	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.16

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Upper Glacial)
Exposure Medium: Vapors
Exposure Point: Western Parcel (Indoors)
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Exposure Route	Paramater Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hour/day	8	(2)	8	(2)	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.17
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Upper Glacial)
Exposure Medium: Vapors
Exposure Point: Western Parcel (Outdoors)
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hour/day	2	(4) estimated time outdoors during a workday	2	(4) estimated time outdoors during a workday	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Voluma I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.18

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Upper Glacial)
Exposure Medium: Vapors
Exposure Point: Western Parcel (Outdoors)
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hour/day	8	(2)	8	(2)	
	EF	Exposure Frequency	days/year	125	(4) six working months	125	(4) six working months	
	ED	Exposure Duration	years	1	(4)	1	(4)	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	365	ED x 365 days/year	365	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.19
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Upper Glacial)
Exposure Medium: Vapors
Exposure Point: Western Parcel (Outdoors)
Receptor Population: Other Recreational User
Receptor Age: Pre-Adolescent/Adolescent (6-18 years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationala/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	1.9	(1) Table 5-23 (heavy activity)	1.2	(1) Table 5-23 (moderate activity)	
	ET	Exposure Time	hours/day	2	(4)	2	(4)	
	EF	Exposure Frequency	days/year	80	(4) Twice/week for 10 months	40	(4) 1 day/week for 10 months	
	ED	Exposure Duration	years	13	Ages 6-18	13	Ages 6-18	
	BW	Body Weight	kg	45.0	(1) Table 7-3 Average values for boys and girls aged 6 to 18.	45.0	(1) Table 7-3 Average values for boys and girls aged 6 to 18.	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	4,745	ED x 365 days/year	4,745	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.20

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Magothy)
Exposure Medium: Groundwater
Exposure Point: Western Parcel (Tap)
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	ug/l	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CW x IR-W x EF x ED x CF2 x 1/BW x 1/AT
	IR-W	Ingestion Rate of Water	liters/day	1	(2)	1	(2)	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	CF2	Conversion Factor 2	mg/ug	0.001	--	0.001	--	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.21

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Solid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Outdoors)
Receptor Population: Trespasser
Receptor Age: Adolescent (10-18 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	1.9	(1) Table 5-23 (mean for children, heavy activity)	1.2	(1) Table 5-23 (mean for children, moderate activity)	
	ET	Exposure Time	hours/day	2	(5)	1	(4)	
	EF	Exposure Frequency	days/year	130	(4) Four times/week for 13 summer weeks; twice/week for spring and fall; once/week for winter	65	(4) Three times/week for 13 summer weeks;once/week for spring and fall	
	ED	Exposure Duration	years	9	Adolescent 10-18 years old	9	Adolescent 10-18 years old	
	BW	Body Weight	kg	53.1	(1) Table 7-3 Average values for boys and girls aged 6 to 18.	53.1	(1) Table 7-3 Average values for boys and girls aged 6 to 18.	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	3,285	ED x 365 days/year	3,285	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidanca for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Ramedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.22

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Solid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors)
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (heavy outdoor activity)	1.5	(1) Table 5-23 (moderate outdoor activity)	
	ET	Exposure Time	hours/day	8	(2)	8	(2)	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	yeers	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.23
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Liquid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Outdoors)
Receptor Population: Trespasser
Receptor Age: Adolescent (10-18 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	1.9	(1) Table 5-23 (mean for children, heavy activity)	1.2	(1) Table 5-23 (mean for children, moderate activity)	
	ET	Exposure Time	hours/day	2	(5)	1	(4)	
	EF	Exposure Frequency	days/year	80	(4) Twice/week for 10 months	40	(4) 1 day/week for 10 months	
	ED	Exposure Duration	years	9	Adolescent 10-18 years old	9	Adolescent 10-18 years old	
	BW	Body Weight	kg	53.1	(1)	53.1	(1)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	3,285	ED x 365 days/year	3,285	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Sita Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.24
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Soil
Exposure Point: Eastern Parcel
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
	IR-S	Ingestion Rate of Soil	mg/day	50	(1) Table 1-2 (adults)	50	(1) Table 1-2 (adults)	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	
Dermal	CS	Chemical Concentration in Soil	mg/kg	chemical-specific	EPC	chemical-specific	EPC	DAD (mg/kg-day) = CS x AF x SA x ABS x ED x EF x CF1 x 1/BW x 1/AT
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	SA	Exposed Surface Area for soil/dust	cm2	3300	(3) Industrial worker; head, hands, arms and legs	3300	(3) Industrial worker; head, hands, arms and legs	
	AF	Adherence Factor	mg/cm2	0.2	(3) Worker	0.02	(3) Worker	
	ABS	Absorption Fraction	unitless	Chemical-specific	(3)	Chemical-specific	(3)	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposura Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.25

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Particulates
Exposure Point: Eastern Parcel
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hours/day	8	(2)	8	(2)	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.26

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors)
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hour/day	8	(2)	8	(2)	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.27

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Outdoors)
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hour/day	2	(4) estimated time outdoors during a workday	2	(4) estimated time outdoors during a workday	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.28
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Soil
Exposure Point: Eastern Parcel
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
	IR-S	Ingestion Rate of Soil	mg/day	480	(1) page 4-20	100	(1) upper range p-4-21	
	EF	Exposure Frequency	days/year	125	(4) six working months	125	(4) six working months	
	ED	Exposure Duration	years	1	(4)	1	(4)	
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	365	ED x 365 days/year	365	ED x 365 days/year	
Dermal	CS	Chemical Concentration in Soil	mg/kg	chemical-specific	EPC	chemical-specific	EPC	DAD (mg/kg-day) = CS x AF x SA x ABS x ED x EF x CF1 x 1/BW x 1/AT
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	SA	Exposed Surface Area for soil/dust	cm2	3300	(3) Industrial worker; head, hands, arms and legs	3300	(3) Industrial worker; head, hands, arms and legs	
	AF	Adherence Factor	mg/cm2	0.2	(3) Worker	0.02	(3) Worker	
	ABS	Absorption Fraction	unitless	Chemical-specific	(3)	Chemical-specific	(3)	
	EF	Exposure Frequency	days/year	125	(4) six working months	125	(4) six working months	
	ED	Exposure Duration	years	1	(4)	1	(4)	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	365	ED x 365 days/year	365	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.29
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Particulates
Exposure Point: Eastern Parcel
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hours/day	8	(2)	8	(2)	
	EF	Exposure Frequency	days/year	125	(4) six working months	125	(4) six working months	
	ED	Exposure Duration	years	1	(4)	1	(4)	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	365	ED x 365 days/year	365	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.30
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Outdoors)
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hour/day	8	(2)	8	(2)	
	EF	Exposure Frequency	days/year	125	(4) six working months	125	(4) six working months	
	ED	Exposure Duration	years	1	(4)	1	(4)	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	365	ED x 365 days/year	365	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.31

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Solid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors)
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (heavy outdoor activity)	1.5	(1) Table 5-23 (moderate outdoor activity)	
	ET	Exposure Time	hours/day	8	(2)	8	(2)	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cencer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989 "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.32

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Solid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Outdoors)
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hours/day	2	(4) estimated time outdoors during a workday	2	(4) estimated time outdoors during a workday	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.33
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Solid Waste
Exposure Medium: Solid waste
Exposure Point: Eastern Parcel
Receptor Population: Construction Workers
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Inteke Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
	IR-S	Ingestion Rate of Soil	mg/day	480	(1) page 4-20	100	(1) upper range p-4-21	
	EF	Exposure Frequency	days/year	125	(4) six working months	125	(4) six working months	
	ED	Exposure Duration	years	1	(4)	1	(4)	
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	365	ED x 365 days/year	365	ED x 365 days/year	
Dermal	CS	Chemical Concentration in Soil	mg/kg	chemical-specific	EPC	chemical-specific	EPC	DAD (mg/kg-day) = CS x AF x SA x ABS x ED x EF x CF1 x 1/BW x 1/AT
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	SA	Exposed Surface Area for soil/dust	cm2	3300	(3) Industrial worker; head, arms, and hands	3300	(3) Industrial worker; head, arms, and hands	
	AF	Adherence Factor	mg/cm2	0.2	(3) Worker	0.02	(3) Worker	
	ABS	Absorption Fraction	unitless	chemical-specific	(3)	chemical-specific	(3)	
	EF	Exposure Frequency	days/year	125	(4) six working months	125	(4) six working months	
	ED	Exposure Duration	years	1	(4)	1	(4)	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	365	ED x 365 days/year	365	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessmant Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.34

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Solid Waste
Exposure Medium: Particulates
Exposure Point: Eastern Parcel
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hours/day	8	(2)	8	(2)	
	EF	Exposure Frequency	days/year	125	(4) six working months	125	(4) six working months	
	ED	Exposure Duration	years	1	(4)	1	(4)	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	365	ED x 365 days/year	365	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991 "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.35
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Solid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hours/day	8	(2)	8	(2)	
	EF	Exposure Frequency	days/year	125	(4) six working months	125	(4) six working months	
	ED	Exposure Duration	years	1	(4)	1	(4)	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	365	ED x 365 days/year	365	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.36

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Liquid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Indoors)
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hours/day	8	(2)	8	(2)	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.37
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Liquid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Outdoors)
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Neme
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (meen heavy outdoor activity)	1.5	(1) Table 5-23 (meen moderate outdoor activity)	
	ET	Exposure Time	hours/day	2	(4) estimated time outdoors during e workday	2	(4) estimeted time outdoors during e workdey	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Teble 1-2, Occupational tenure	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 deys/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.38
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Liquid Waste
Exposure Medium: Liquid Waste
Exposure Point: Eastern Parcel
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	DAevent	Absorbed Dose per event	mg/cm^2-event	Calculated	—	Calculated	—	DAD (mg/kg-day) = DAevent x EV x ED x EF x SA x 1/BW x 1/AT
	ET	Exposure Time per Event (used in Daevent calc)	hr/event	2	(4) Estimated time in contact with standing water	2	(4) Estimated time in contact with standing water	
	SA	Skin Surface Available for Contact	cm2	3300	(3) Industrial worker; head, arms, and hands	3300	(3) Industrial worker; head, arms, and hands	
	EV	Event Frequency	events/day	1	(4)	1	(4)	
	EF	Exposure Frequency	days/year	125	(4) six working months	125	(4) six working months	
	ED	Exposure Duration	years	1	(4)	1	(4)	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	365	ED x 365 days/year	365	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.39

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Liquid Waste
Exposure Medium: Vapors
Exposure Point: Eastern Parcel (Outdoors)
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	2.5	(1) Table 5-23 (mean heavy outdoor activity)	1.5	(1) Table 5-23 (mean moderate outdoor activity)	
	ET	Exposure Time	hours/day	8	(2)	8	(2)	
	EF	Exposure Frequency	days/year	125	(4) six working months	125	(4) six working months	
	ED	Exposure Duration	years	1	(4)	1	(4)	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	365	ED x 365 days/year	365	ED x 365 days/year	

(1) EPA, 1997. "Exposura Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. **Oswer Directive** 9285.6-03.
(3) EPA, 1992. "Dermal Exposure Assessment: Principles and Applications", EPA/600/8-91/011B.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.40
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Soil
Exposure Point: Offsite Residential Areas (Elworth Allen Park)
Receptor Population: Other Recreational User
Receptor Age: Pre-Adolescent/Adolescent (6-18 years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Soil	mg/kg	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
	IR-S	Ingestion Rate of Soil	mg/day	50	(2) 100 mg/day (child >6 years) x 50% of the day's exposure at contaminated source	50	(2) 100 mg/day (child >6 years) x 50% of the day's exposure at contaminated source	
	EF	Exposure Frequency	days/year	80	(4) Twice/week for 10 months	40	(4) 1 day/week for 10 months	
	ED	Exposure Duration	years	13	Ages 6-18	13	Ages 6-18	
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	BW	Body Weight	kg	45.0	(1) Table 7-3 Average values for boys and girls aged 6 to 18.	45.0	(1) Table 7-3 Average values for boys and girls aged 6 to 18.	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	4,745	ED x 365 days/year	4,745	ED x 365 days/year	
Dermal	CS	Chemical Concentration in Soil	mg/kg	chemical-specific	EPC	chemical-specific	Mean	DAD (mg/kg-day) = CS x AF x SA x ABS x ED x EF x CF1 x 1/BW x 1/AT
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	SA	Exposed Surface Area for soil/dust	cm2/day	6430	(3) 6-18 year old adolescent; head, hands, arms and legs	6430	(3) 6-18 year old adolescent; head, hands, arms and legs	
	AF	Adherence Factor	mg/cm2	0.07	(3) Adult Resident	0.01	(3) Adult Resident	
	ABS	Absorption Fraction	unitless	chemical-specific	(3)	chemical-specific	(3)	
	EF	Exposure Frequency	days/year	80	(4) Twice/week for 10 months	40	(4) 1 day/week for 10 months	
	ED	Exposure Duration	years	13	Ages 6-18	13	Ages 6-18	
	BW	Body Weight	kg	45.0	(1) Table 7-3 Average values for boys and girls aged 6 to 18.	45.0	(1) Table 7-3 Average values for boys and girls aged 6 to 18.	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	4,745	ED x 365 days/year	4,745	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.41
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Surface/Subsurface Soil
Exposure Medium: Particulates
Exposure Point: Offsite Residential Areas (Ellworth Allen Park)
Receptor Population: Other Recreational User
Receptor Age: Pre-Adolescent/Adolescent (6-18 years)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	1.9	(1) Table 5-23 (heavy activity)	1.2	(1) Table 5-23 (moderate activity)	
	ET	Exposure Time	hours/day	2	(4)	2	(4)	
	EF	Exposure Frequency	days/year	80	(4) Twice/week for 10 months	40	(4) 1 day/week for 10 months	
	ED	Exposure Duration	years	13	Ages 6-18	13	Ages 6-18	
	BW	Body Weight	kg	45.0	(1) Table 7-3 Average values for boys	45.0	(1) Table 7-3 Average values for	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	4,745	ED x 365 days/year	4,745	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.42

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Upper Glacial)
Exposure Medium: Groundwater
Exposure Point: Offsite Residential Areas (Tap)
Receptor Population: Resident
Receptor Age: Child (1-6 years old)

Exposure Route	Parameter Code	Paremeter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	ug/l	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CW x IR-W x EF x ED x CF2 x 1/BW x 1/AT
	IR-W	Ingestion Rate of Water	liters/day	2	(2)	0.74	(1) Table 3-30 (mean:1-10 yrs)	
	EF	Exposure Frequency	days/year	350	(2)	350	(2)	
	ED	Exposure Duration	years	6	Child 1-6 years	6	Child 1-6 years	
	CF2	Conversion Factor 2	mg/ug	0.001	--	0.001	--	
	BW	Body Weight	kg	15	(2)	15	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	ED x 365 days/year	2,190	ED x 365 days/year	
Dermal	DAevent	Absorbed Dose per event	mg/cm^2-event	Calculated	---	Calculated	---	DAD (mg/kg-day) = DAevent x EV x ED x EF x SA x 1/BW x 1/AT
	ET	Exposure Time per Event (used in Daevent calc)	hr/event	1	(1) Table 15-30 (95th% ages 1-11)	0.33	(1) Table 1-2 (median bathing)	
	SA	Skin Surface Available for Contact	cm2	7213	(1) See Table 4-21	7213	(1) See Table 4-21	
	EV	Event Frequency	events/day	1	(1) Table 1-2	1	(1) Table 1-2	
	EF	Exposure Frequency	days/year	350	(2)	350	(2)	
	ED	Exposure Duration	years	6	Child 1-6 years	6	Child 1-6 years	
	BW	Body Weight	kg	15	(2)	15	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetima	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	ED x 365 days/year	2,190	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.43

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Upper Glacial)
Exposure Medium: Groundwater
Exposure Point: Offsite Residential Areas (Tap)
Receptor Population: Resident
Receptor Age: Adult (>6 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	ug/l	chemical-specific	EPC	chemical-specific	Mean	ADD or LADD (mg/kg-day) = CW x IR-W x EF x ED x CF2 x 1/BW x 1/AT
	IR-W	Ingestion Rate of Water	liters/day	2	(2)	1.4	(6)	
	EF	Exposure Frequency	days/year	350	(2)	350	(2)	
	ED-n	Exposure Duration - Noncarcinogens	years	30	(1) Table 1-2 (95th% minus 6 years)	3	(1) Table 1-2 (mean [9 yrs] minus 6 yrs as a child)	
	ED-c	Exposure Duration - Carcinogens	years	24	(1) Table 1-2 (95th% minus 6 years)	3	(1) Table 1-2 (mean [9 yrs] minus 6 yrs es a child)	
	CF2	Conversion Factor 2	mg/ug	0.001	–	0.001	–	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	ED x 365 days/year	1,095	ED x 365 days/year	
Dermal	DAevent	Absorbed Dose per event	mg/cm^2-event	Calculated	—	Calculated	—	DAD (mg/kg-day) = DAevent x EV x ED x EF x SA x 1/BW x 1/AT
	ET	Exposure Time per Event (used in Daevent calc)	hr/event	0.58	(1) Table 1-2 (95th% shower)	0.25	(1) p. 15-16 (50th percentile)	
	SA	Skin Surface Available for Contact	cm2	18150	(1) See Table 4-21	18150	(1) See Table 4-21	
	EV	Event Frequency	events/day	1	(1) Table 1-2	1	(1) Table 1-2	
	EF	Exposure Frequency	days/yeer	350	(2)	350	(2)	
	ED-n	Exposure Duration - Noncarcinogens	years	30	(1) Table 1-2 (95th% minus 6 years)	3	(1) Table 1-2 (mean [9 yrs] minus 6 yrs as a child)	
	ED-c	Exposure Duration - Carcinogens	years	24	(1) Table 1-2 (95th% minus 6 years)	3	(1) Table 1-2 (mean [9 yrs] minus 6 yrs as a child)	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	ED x 365 days/year	1,095	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.44
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Groundwater (Upper Glacial)
Exposure Medium: Vapors
Exposure Point: Offsite Residential Areas (Indoors)
Receptor Population: Resident
Receptor Age: Child (1-6 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	TBD	EPC	TBD	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	1.2	(1) Table 5-23 (moderate activity)	1.0	(1) Table 5-23 (light activity)	
	ET	Exposure Time	hours/day	24	BPJ	24	BPJ	
	EF	Exposure Frequency	days/year	350	(2)	350	(2)	
	ED	Exposure Duration	years	6	Child 1-6 years	6	Child 1-6 years	
	BW	Body Weight	kg	15	(2)	15	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	ED x 365 days/year	2,190	ED x 365 days/year	

TBD - To Be Determined

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1992. "Dermal Exposure Assessment: Principles and Applications", EPA/600/8-91/011B.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.45

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Groundwater (Upper Glacial)
Exposure Medium: Vapors
Exposure Point: Offsite Residential Areas (Indoors)
Receptor Population: Resident
Receptor Age: Adult (>6 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	0.833	(1) Table 5-23 (light activity)	0.833	(1) Table 5-23 (light activity)	
	ET	Exposure Time	hours/day	24	BPJ	24	BPJ	
	EF	Exposure Frequency	days/year	350	(2)	350	(2)	
	EDn	Exposure Duration - Noncarcinogens	years	30	(1) Table 1-2	9	(1) Table 1-2	
	EDc	Exposure Duration - Carcinogens	years	24	(1) Table 1-2 (95th%-6 years)	3	(1) Table 1-2 (mean [9 yrs] minus 6 yrs as a child)	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	10,950	ED x 365 days/year	3,285	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1992. "Dermal Exposure Assessment: Principles and Applications", EPA/600/8-91/011B.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.46

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Groundwater (Upper Glacial)
Exposure Medium: Vapors
Exposure Point: Offsite Residential Areas (Outdoors)
Receptor Population: Resident
Receptor Age: Child (1-6 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	1.2	(1) Table 5-23 (moderate activity)	1.2	(1) Table 5-23 (moderate activity)	
	ET	Exposure Time	hour/day	5.57	(1) Table 1-2 (time-averaged)	2	(1) Table 1-2 (residential)	
	EF	Exposure Frequency	days/year	350	(2)	350	(2)	
	ED	Exposure Duration	years	6	Child 1-6 years	6	Child 1-6 years	
	BW	Body Weight	kg	15	(2)	15	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	ED x 365 days/year	2,190	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1992. "Dermal Exposure Assessment: Principles and Applications", EPA/600/8-91/011B.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.47

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Groundwater (Upper Glacial)
Exposure Madium: Vapors
Exposure Point: Offsite Residential Areas (Outdoors)
Receptor Population: Resident
Receptor Age: Adult (>6 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	1.6	(1) Table 5-23 (moderate activity)	1.6	(1) Table 5-23 (moderate activity)	
	ET	Exposure Time	hour/day	5.3	(1) Table 15-120 (90th percentile)	1.5	(1) Table 15-120 (50th percentile)	
	EF	Exposure Frequency	days/year	350	(2)	350	(2)	
	ED-n	Exposure Duration - Noncarcinogens	years	30	(1) Table 1-2 (95th%-6 years)	3	(1) Table 1-2 (mean [9 yrs] minus 6 yrs as a child)	
	ED-c	Exposure Duration - Carcinogens	years	24	(1) Table 1-2 (95th%-6 years)	3	(1) Table 1-2 (mean [9 yrs] minus 6 yrs as a child)	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	ED x 365 days/year	1,095	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directiva 9285.6-03.

(3) EPA, 1992. "Dermal Exposure Assessment: Principles and Applications", EPA/600/8-91/011B.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Voluma I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.48

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Groundwater (Upper Glacial)
Exposure Medium: Vapors
Exposure Point: Offsite Residential Areas (Woodward Parkway School)
Receptor Population: School Child
Receptor Age: Pre-Adolescent (6-12 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hr	0.9	(1) Table 5-23 (2 hr heavy activity and 4 hr sedentary activity)	0.65	(1) Table 5-23 (1 hr heavy activity and 5 hr sedentary activity)	
	ET	Exposure Time	hr/day	6	Contact with Woodward Parkway School	6	Contact with Woodward Parkway School	
	EF	Exposure Frequency	days/year	182	Contact with Woodward Parkway School	177	Total days minus estimated 5 days missed	
	ED	Exposure Duration	years	7	Grades K-6	7	Grades K-6	
	BW	Body Weight	kg	38.3	(1) Table 7.3 Average values for boys and girls aged 6 to 12	38.3	(1) Table 7.3 Average values for boys and girls aged 6 to 12	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	2,555	ED x 365 days/year	2,555	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1992. "Dermal Exposure Assessment: Principles and Applications", EPA/600/8-91/011B.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.49
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Groundwater (Upper Glacial)
Exposure Medium: Vapors
Exposure Point: Offsite Residential Areas (Woodward Parkway School)
Receptor Population: School Employee
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	1	(1) Table 5-23 (light activity)	1	(1) Table 5-23 (light activity)	
	ET	Exposure Time	hours/day	8	(2)	8	(2)	
	EF	Exposure Frequency	days/year	250	(2)	250	(2)	
	ED	Exposure Duration	years	25	(2)	6.6	(1) Table 1-2, Occupational tenure	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	9,125	ED x 365 days/year	2,409	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1992. "Dermal Exposure Assessment: Principles and Applications", EPA/600/8-91/011B.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.50
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Magothy)
Exposure Medium: Groundwater
Exposure Point: Offsite Residential Areas (Tap)
Receptor Population: Resident
Receptor Age: Child (1-6 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	ug/l	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CW x IR-W x EF x ED x CF2 x 1/BW x 1/AT
	IR-W	Ingestion Rate of Water	liters/day	2	(2)	0.74	(1) Table 3-30 (mean:1-10 yrs)	
	EF	Exposure Frequency	days/year	350	(2)	350	(2)	
	ED	Exposure Duration	years	6	Child 1-6 years	6	Child 1-6 years	
	CF2	Conversion Factor 2	mg/ug	0.001	–	0.001	–	
	BW	Body Weight	kg	15	(2)	15	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	ED x 365 days/year	2,190	ED x 365 days/year	
Dermal	DAevent	Absorbed Dose per event	mg/cm^2-event	Calculated	—	Calculated	—	DAD (mg/kg-day) = DAevent x EV x ED x EF x SA x 1/BW x 1/AT
	ET	Exposure Time per Event (used in Daevent calc)	hr/event	1	(1) Table 15-30 (95th% ages 1-11)	0.33	(1) Table 1-2 (median bathing)	
	SA	Skin Surface Available for Contact	cm2	6600	(3) Child resident; head, arms and hands	6600	(3) Child resident; head, arms and hands	
	EV	Event Frequency	events/day	1	(1) Table 1-2	1	(1) Table 1-2	
	EF	Exposure Frequency	days/year	350	(2)	350	(2)	
	ED	Exposure Duration	years	6	Child 1-6 years	6	Child 1-6 years	
	BW	Body Weight	kg	15	(2)	15	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	ED x 365 days/year	2,190	ED x 365 days/year	

(1) EPA, 1997. "Exposura Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.51

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Magothy)
Exposure Medium: Groundwater
Exposure Point: Offsite Residential Areas (Tap)
Receptor Population: Resident
Receptor Age: Adult (>6 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	ug/l	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CW x IR-W x EF x ED x CF2 x 1/BW x 1/AT
	IR-W	Ingestion Rate of Water	liters/day	2	(2)	1.4	(6)	
	EF	Exposure Frequency	days/year	350	(2)	350	(2)	
	ED	Exposure Duration	years	24	(1) Table 1-2 (95th% minus 6 years)	3	(1) Table 1-2 (mean [9 yrs] minus 6 yrs as a child)	
	CF2	Conversion Factor 2	mg/ug	0.001	--	0.001	--	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	ED x 365 days/year	1,095	ED x 365 days/year	
Dermal	DAevent	Absorbed Dose per event	mg/cm^2-event	Calculated	---	Calculated	—	DAD (mg/kg-day) = DAevent x EV x ED x EF x SA x 1/BW x 1/AT
	ET	Exposure Time per Event (used in Daevent calc)	hr/event	0.58	(1) Table 1-2 (95th% shower)	0.25	(1) p. 15-16 (50th percentile)	
	SA	Skin Surface Available for Contact	cm2	18000	(3) Showering/bathing	18000	(3) Showering/bathing	
	EV	Event Frequency	events/day	1	(1) Table 1-2	1	(1) Table 1-2	
	EF	Exposure Frequency	days/year	350	(2)	350	(2)	
	ED	Exposure Duration	years	24	(1) Table 1-2 (95th% minus 6 years)	3	(1) Table 1-2 (mean [9 yrs] minus 6 yrs as a child)	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	1,095	ED x 365 days/year	1,095	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1992. "Dermal Exposure Assessment: Principles and Applications", EPA/600/8-91/011B.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.52

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Magothy)
Exposure Medium: Vapors
Exposure Point: Offsite Residential Araas (Tap)
Receptor Population: Resident
Receptor Age: Child (1-6 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	1.2	(1) Table 5-23 (moderate activity)	1	(1) Table 5-23 (light activity)	
	ET	Exposure Time	hour/day	1	(1) Table 15-30 (95th% agas 1-11)	0.33	(1) Table 1-2 (median bathing)	
	EF	Exposure Frequency	days/year	350	(2)	350	(2)	
	ED	Exposure Duration	yaars	6	Child 1-6 years	6	Child 1-6 years	
	BW	Body Weight	kg	15	(2)	15	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	ED x 365 days/year	2,190	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposura Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1992. "Dermal Exposure Assessment: Principlas and Applications", EPA/600/8-91/011B.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.53
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Groundwater (Magothy)
Exposure Medium: Vapors
Exposure Point: Offsite Residential Areas (Tap)
Receptor Population: Resident
Receptor Age: Adult (>6 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	mg/m3	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CA x IR-A x ET x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m3/hour	0.833	(1) Table 5-23 (light activity)	0.833	(1) Table 5-23 (light activity)	
	ET	Exposure Time	hour/day	0.58	(1) Table 1-2 (95th% shower)	0.25	(1) p. 15-16 (50th percentile)	
	EF	Exposure Frequency	days/year	350	(2)	350	(2)	
	ED-n	Exposure Duration - Noncarcinogens	years	30	(1) Table 1-2 (95th%-6 years)	3	(1) Table 1-2 (mean [9 yrs] minus 6 yrs as a child)	
	ED-c	Exposure Duration - Carcinogens	years	24	(1) Table 1-2 (95th%-6 years)	3	(1) Table 1-2 (mean [9 yrs] minus 6 yrs as a child)	
	BW	Body Weight	kg	70	(2)	70	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	10,950	ED x 365 days/year	1,095	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1992. "Dermal Exposure Assessment: Principles and Applications", EPA/600/8-91/011B.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.54
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Surface Water
Exposure Medium: Surface Water
Exposure Point: Massapequa Preserve
Receptor Population: Swimmer
Receptor Age: Pre-Adolescent (6-12 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Water	ug/l	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CW x IR-W x EF x ED x CF2 x 1/BW x 1/AT
	IR-W	Ingestion Rate of Water	liters/event	0.05	(4)	0.05	(4)	
	EF	Exposure Frequency	events/year	12	(1) Table 1-2 (for swimming)	12	(1) Table 1-2 (for swimming)	
	ED	Exposure Duration	years	7	Ages 6-12	7	Ages 6-12	
	CF2	Conversion Factor 2	mg/ug	0.001	--	0.001	--	
	BW	Body Weight	kg	38.3	(1) Table 7.3 Average values for boys and girls aged 6 to 12	38.3	(1) Table 7.3 Average values for boys and girls aged 6 to 12	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	2,555	ED x 365 days/year	2,555	ED x 365 days/year	
Dermal	DAevent	Absorbed Dose per event	mg/cm^2-event	Calculated	---	Calculated	---	DAD (mg/kg-day) = DAevent x EV x ED x EF x SA x 1/BW x 1/AT
	ET	Exposure Time per Event (used in Daevent calc)	hr/event	3	(1) Table 1-2 (90th% for swimming)	1	(1) Table 1-2 (median for swimming)	
	SA	Skin Surface Available for Contact	cm2	10480	(1) 6-12 year old, whole body	10480	(1) 6-12 year old, whole body	
	EV	Event Frequency	events/day	1	(4)	1	(4)	
	EF	Exposure Frequency	days/year	12	(1) Table 1-2 (for swimming)	12	(1) Table 1-2 (for swimming)	
	ED	Exposure Duration	years	7	Ages 6-12	7	Ages 6-12	
	BW	Body Weight	kg	38.3	(1) Table 7.3 Average values for boys and girls aged 6 to 12	38.3	(1) Table 7.3 Average values for boys and girls aged 6 to 12	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	2,555	ED x 365 days/year	2,555	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.
(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.
(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplamental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.
(4) Professional Judgement
(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.
(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.55

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Sediment
Exposure Medium: Sediment
Exposure Point: Massapequa Preserve
Receptor Population: Swimmer
Receptor Age: Pre-Adolescent (6-12 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Sediment	mg/kg	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
	IR-S	Ingestion Rate of Sediment	mg/event	50	(4)	50	(4)	
	EF	Exposure Frequency	events/year	12	(1) Table 1-2 (for swimming)	12	(1) Tabla 1-2 (for swimming)	
	ED	Exposure Duration	years	7	Ages 6-12	7	Ages 6-12	
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	BW	Body Weight	kg	38.3	(1) Table 7.3 Average values for boys and girls aged 6 to 12	38.3	(1) Table 7.3 Average values for boys and girls aged 6 to 12	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	2,555	ED x 365 days/year	2,555	ED x 365 days/year	
Dermal	CS	Chemical Concentration in Soil	mg/kg	chemical-specific	EPC	chemical-specific	EPC	DAD (mg/kg-day) = CS x AF x SA x ABS x ED x EF x CF1 x 1/BW x 1/AT
	CF1	Conversion Factor 1	kg/mg	0.000001	--	0.000001	--	
	SA	Exposed Surface Area for soil/dust	cm2/day	2694	(1) 6-12 year old adolescent swimmer	2694	(1) 6-12 year old adolescent swimmer	
	AF	Adherence Factor	mg/cm2	0.07	(3) Adult Resident	0.01	(3) Adult Resident	
	ABS	Absorption Fraction	unitless	chemical-specific	(3)	chemical-specific	(3)	
	EF	Exposure Frequency	events/year	12	(1) Table 1-2 (for swimming)	12	(1) Table 1-2 (for swimming)	
	ED	Exposure Duration	years	7	Ages 6-12	7	Ages 6-12	
	BW	Body Weight	kg	38.3	(1) Table 7.3 Average values for boys and girls aged 6 to 12	38.3	(1) Table 7.3 Average values for boys and girls aged 6 to 12	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	2,555	ED x 365 days/year	2,555	ED x 365 days/year	

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) Professional Judgement

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.56
VALUES USED FOR DAILY INTAKE CALCULATIONS
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Fish
Exposure Medium: Fish
Exposure Point: Massapequa Preserve
Receptor Population: Fisher
Receptor Age: Child (1-6 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Fish	mg/kg	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
	IR-S	Ingestion Rate of Fish	g/day	11	(4)	3	(4)	
	EF	Exposure Frequency	days/year	350	BPJ	350	BPJ	
	ED	Exposure Duration	years	6	Child 1-6 years	6	Child 1-6 years	
	CF1	Conversion Factor 1	kg/g	0.001	--	0.001	--	
	BW	Body Weight	kg	15.0	(2)	15.0	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	2,190	ED x 365 days/year	2,190	ED x 365 days/year	

- To Be Determined

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) EPA, 2000. EPA Comments on the Draft Final Baseline Human Health Risk Assessment, Liberty Industrial Finishing Site, Farmingdale, NY.

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

TABLE 4.57

VALUES USED FOR DAILY INTAKE CALCULATIONS

LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Current
Medium: Fish
Exposure Medium: Fish
Exposure Point: Massapequa Preserve
Receptor Population: Fisher
Receptor Age: Adult (>6 years old)

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CS	Chemical Concentration in Fish	mg/kg	chemical-specific	EPC	chemical-specific	EPC	ADD or LADD (mg/kg-day) = CS x IR-S x EF x ED x CF1 x 1/BW x 1/AT
	IR-S	Ingestion Rate of Fish	g/day	32	(4)	6	(4)	
	EF	Exposure Frequency	days/year	350	BPJ	350	BPJ	
	ED	Exposure Duration	years	24	(1)	24	(1)	
	CF1	Conversion Factor 1	kg/g	0.001	--	0.001	--	
	BW	Body Weight	kg	70.0	(2)	70.0	(2)	
	AT-C	Averaging Time (Cancer)	days	25,550	(2) lifetime	25,550	(2) lifetime	
	AT-N	Averaging Time (Non-Cancer)	days	8,760	ED x 365 days/year	8,760	ED x 365 days/year	

- To Be Determined

(1) EPA, 1997. "Exposure Factors Handbook", EPA/600/P-95/002Fa.

(2) EPA, 1991. "Supplemental Guidance for RAGS, Standard Default Exposure Factors. Interim Final. Oswer Directive 9285.6-03.

(3) EPA, 1999. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)" EPA/540/R-99/005.

(4) EPA, 2000. EPA Comments on the Draft Final Baseline Human Health Risk Assessment, Liberty Industrial Finishing Site, Farmingdale, NY.

(5) Weston, 1994. "Liberty Industrial Finishing Site Remedial Investigation/Feasibility Study.

(6) EPA, 1989. "Risk Assessment Guidance for Superfund Volume I Human Health Evaluation Manual (Part A)," EPA/540/1-89/002.

RAGS TABLE 5s

TABLE 5.1
NON-CANCER SUBCHRONIC TOXICITY DATA -- ORAL/DERMAL
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD:	Dates of RfD: Target Organ (3) (MM/DD/YY)
1,1,1-Trichloroethane	Subchronic	2.80E+00	mg/kg-day	1	2.80E+00	mg/kg-day	liver	90	NCEA	08/04/99
1,1-Dichloroethane	Subchronic	1.00E+00	mg/kg-day	1	1.00E+00	mg/kg-day	NOEL	100	HEAST	05/01/95
1,1-Dichloroethene	Subchronic	9.00E-03	mg/kg-day	1	9.00E-03	mg/kg-day	liver	100	HEAST	1997
1,2-Dichloroethane	Subchronic	NA	NA	NA	NA	mg/kg-day	NA	NA	NA	NA
1,2-Dichloroethene (total)	Subchronic	9.00E-03	mg/kg-day	1	9.00E-03	mg/kg-day	liver	1000	HEAST	05/01/95
1,4-Dichlorobenzene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	Subchronic	4.00E-01	mg/kg-day	1	4.00E-01	mg/kg-day	NA	NA	NCEA	NA
2-Methylnaphthalene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	Subchronic	5.00E-04	mg/kg-day	1	5.00E-04	mg/kg-day	liver	100	HEAST	05/01/95
4-Methylphenol	Subchronic	5.00E-03	mg/kg-day	1	5.00E-03	mg/kg-day	CNS, respiratory	1000	HEAST	1994
Acetone	Subchronic	1.00E+00	mg/kg-day	1	1.00E+00	mg/kg-day	kidney, liver	100	HEAST	05/01/95
Aluminum	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	Subchronic	3.00E+00	mg/kg-day	1	3.00E+00	mg/kg-day	NOEL	300	HEAST	05/01/95
Antimony	Subchronic	4.00E-04	mg/kg-day	0.15	6.00E-05	mg/kg-day	blood	1000	HEAST	05/01/95
Aroclor-1248	Subchronic (8)	5.00E-05	mg/kg-day	1	5.00E-05	mg/kg-day	immune system	100	HEAST	05/01/95
Aroclor-1254	Subchronic	5.00E-05	mg/kg-day	1	5.00E-05	mg/kg-day	immune system	100	HEAST	05/01/95
Aroclor-1260	Subchronic (6)	5.00E-05	mg/kg-day	1	5.00E-05	mg/kg-day	immune system	100	HEAST	05/01/95
Arsenic	Subchronic	3.00E-04	mg/kg-day	1	3.00E-04	mg/kg-day	skin	3	HEAST	05/01/95
Barium	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	Subchronic	3.00E-02	mg/kg-day	1	3.00E-02	mg/kg-day	blood	100	NCEA	09/01/98
Benz(a)anthracene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	Subchronic (7)	3.00E-01	mg/kg-day	1	3.00E-01	mg/kg-day	kidney	300	HEAST	05/01/99
Benzo(k)fluoranthene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	Subchronic	5.00E-03	mg/kg-day	0.007	3.50E-05	mg/kg-day	NOEL	100	IRIS:NCEA	12/01/96
bis(2-Ethylhexyl)phthalate	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbazole	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	Subchronic	7.00E-03	mg/kg-day	1	7.00E-03	mg/kg-day	liver	100	NCEA	12/18/98
alpha-Chlordane	Subchronic	5.00E-04	mg/kg-day	1	5.00E-04	mg/kg-day	liver	300	NCEA	05/09/00
gamma-Chlordane	Subchronic	5.00E-04	mg/kg-day	1	5.00E-04	mg/kg-day	liver	300	NCEA	05/09/00
Chlorobenzene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 5.1
NON-CANCER SUBCHRONIC TOXICITY DATA -- ORAL/DERMAL
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD:	Dates of RfD: Target Organ (3) (MM/DD/YY)
Chloroethane	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	Subchronic	1.00E-02	mg/kg-day	1	1.00E-02	mg/kg-day	liver	1000	HEAST	05/01/95
Chromium III	Subchronic	1.00E+00	mg/kg-day	0.013	1.30E-02	mg/kg-day	NOEL	1000	HEAST	05/01/95
Chromium VI	Subchronic	2.00E-02	mg/kg-day	0.025	5.00E-04	mg/kg-day	NOEL	100	HEAST	05/01/95
Chrysene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	Subchronic	1.00E-01	mg/kg-day	1	1.00E-01	mg/kg-day	blood	300	HEAST	05/01/95
Copper	Subchronic (5)	4.00E-02	mg/kg-day	1	4.00E-02	mg/kg-day	gastrointestinal system	NA	HEAST	05/01/95
Cyanide	Subchronic	2.00E-02	mg/kg-day	1	2.00E-02	mg/kg-day	whole body	500	HEAST	05/01/99
Dibenz(a,h)anthracene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	Subchronic	2.00E-01	mg/kg-day	1	2.00E-01	mg/kg-day	liver	100	HEAST	05/01/95
Dieldrin	Subchronic	5.00E-05	mg/kg-day	1	5.00E-05	mg/kg-day	liver	100	HEAST	05/01/95
Di-n-octyl phthalate	Subchronic	2.00E-02	mg/kg-day	1	2.00E-02	mg/kg-day	kidney, liver	1000	HEAST	05/01/99
Endrin Aldehyde	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	Subchronic	1.00E-01	mg/kg-day	1	1.00E-01	mg/kg-day	kidney, liver	1000	IRIS	10/12/99
Fluoranthene	Subchronic	4.00E-01	mg/kg-day	1	4.00E-01	mg/kg-day	kidney, liver	300	HEAST	05/01/99
Heptachlor epoxide	Subchronic	1.30E-05	mg/kg-day	1	1.30E-05	mg/kg-day	Liver	1000	HEAST	05/01/95
Indeno(1,2,3-cd)pyrene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	Subchronic	3.00E-04	mg/kg-day	0.07	2.10E-05	mg/kg-day	CNS	30	HEAST	05/01/99
Methylene chloride	Subchronic	6.00E-02	mg/kg-day	1	6.00E-02	mg/kg-day	liver	100	HEAST	05/01/95
Naphthalene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	Subchronic	2.00E-02	mg/kg-day	0.04	8.00E-04	mg/kg-day	whole body	300	HEAST	05/01/99
Pentachlorophenol	Subchronic	3.00E-02	mg/kg-day	1	3.00E-02	mg/kg-day	fetus	100	HEAST	05/01/95
Phenanthrene	Subchronic	NA	NA	1	NA	NA	NA	NA	NA	NA
Phenol	Subchronic	6.00E-01	mg/kg-day	1	6.00E-01	mg/kg-day	fetus	100	HEAST	05/01/99
Polychlorinated Biphenyls (liquid)		(see individual aroclors)								
Polychlorinated Biphenyls (soil and particulate)		(see individual aroclors)								
Pyrene	Subchronic	3.00E-01	mg/kg-day	1	3.00E-01	mg/kg-day	kidney	300	HEAST	05/01/99
Silver	Subchronic	5.00E-03	mg/kg-day	0.04	2.00E-04	mg/kg-day	skin	3	HEAST	05/01/99
Tetrachloroethene	Subchronic	1.00E-01	mg/kg-day	1	1.00E-01	mg/kg-day	liver	100	HEAST	05/01/95
Thallium	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
TICs (volatile)	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 5.1
NON-CANCER SUBCHRONIC TOXICITY DATA -- ORAL/DERMAL
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD:	Dates of RfD: Target Organ (3) (MM/DD/YY)
Toluene	Subchronic	2.00E+00	mg/kg-day	1	2.00E+00	mg/kg-day	kidney,liver	100	HEAST	05/01/95
trans-1,2-Dichloroethene	Subchronic	2.00E-01	mg/kg-day	1	2.00E-01	mg/kg-day	blood	100	HEAST	05/01/95
Trichloroethene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	Subchronic	3.00E-01	mg/kg-day	1	3.00E-01	mg/kg-day	blood	3	HEAST	05/01/95

NA = Not available
CNS = Central nervous system
NOEL = No observed effects level
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment
EPA Region II = U.S. Environmental Protection Agency Region II personal communcation.
EPA, 1993 = "Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons," EPA/600/R-93/089.
EPA, 1996 = "PCB's: Cancer Dose-Response Assessment and Application to Environmental Mixtures," EPA/600/P-96/001F.

(1) Obtained from EPA, 1999. "Submission of Working Draft of Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim Guidance."
(2) Adjusted dermal RfD = Oral RfD x adjustment factor.
(3) For IRIS values, date IRIS was searched.
For HEAST values, date of HEAST.
For NCEA values, date of the article provided by NCEA.
(4) Based on oral equivalent dose.
(5) Based on drinking water standard.
(6) Based on Aroclor 1254.
(7) Based on Pyrene.

TABLE 5.1
NON-CANCER CHRONIC TOXICITY DATA -- ORAL/DERMAL
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD:	Dates of RfD: Target Organ (3) (MM/DD/YY)
1,1,1-Trichloroethane	Chronic	2.80E-01	mg/kg-day	1	2.80E-01	mg/kg-day	liver	90	EPA-NCEA	08/04/99
1,1-Dichloroethane	Chronic	1.00E-01	mg/kg-day	1	1.00E-01	mg/kg-day	NOEL	1000	HEAST	05/01/95
1,1-Dichloroethene	Chronic	9.00E-03	mg/kg-day	1	9.00E-03	mg/kg-day	liver	1000	IRIS	03/14/99
1,2-Dichloroethane	Chronic	3.00E-02	mg/kg-day	1	3.00E-02	mg/kg-day	gastrointestinal system	1000	EPA-NCEA	04/05/93
1,2-Dichloroethene (total)	Chronic	9.00E-03	mg/kg-day	1	9.00E-03	mg/kg-day	liver	1000	HEAST	05/01/95
1,4-Dichlorobenzene	Chronic	2.00E-01	mg/kg-day	1	2.00E-01	mg/kg-day	kidney	1000	EPA-NCEA	04/29/97
2-Hexanone	Chronic	4.00E-02	mg/kg-day	1	4.00E-02	mg/kg-day	NA	NA	NCEA	NA
2-Methylnaphthalene	Chronic (7)	2.00E-02	mg/kg-day	1	2.00E-02	mg/kg-day	NA	3000	IRIS	07/01/98
4,4'-DDD	Chronic	NA	NA	1	NA	NA	NA	NA	NA	NA
4,4'-DDE	Chronic	NA	NA	1	NA	NA	NA	NA	NA	NA
4,4'-DDT	Chronic	5.00E-04	mg/kg-day	1	5.00E-04	mg/kg-day	liver	100	IRIS	03/14/99
4-Methylphenol	Chronic	5.00E-03	mg/kg-day	1	5.00E-03	mg/kg-day	NA	NA	HEAST	05/01/95
Acetone	Chronic	1.00E-01	mg/kg-day	1	1.00E-01	mg/kg-day	kidney, liver	1000	IRIS	03/14/99
Aluminum	Chronic	1.00E+00	mg/kg-day	NA	NA	mg/kg-day	CNS	100	EPA-NCEA	08/13/99
Anthracene	Chronic	3.00E-01	mg/kg-day	1	3.00E-01	mg/kg-day	NOEL	3000	IRIS	03/14/99
Antimony	Chronic	4.00E-04	mg/kg-day	0.15	6.00E-05	mg/kg-day	blood	1000	IRIS	03/14/99
Aroclor-1248	Chronic (6)	5.00E-05	mg/kg-day	1	5.00E-05	mg/kg-day	immune system, growth	300	IRIS	03/14/99
Aroclor-1254	Chronic	5.00E-05	mg/kg-day	1	5.00E-05	mg/kg-day	immune system, growth	300	IRIS	03/14/99
Aroclor-1260	Chronic (6)	5.00E-05	mg/kg-day	1	5.00E-05	mg/kg-day	immune system, growth	300	IRIS	03/14/99
Arsenic	Chronic	3.00E-04	mg/kg-day	1	3.00E-04	mg/kg-day	skin, circulatory system	3	IRIS	03/14/99
Barium	Chronic	7.00E-02	mg/kg-day	0.07	4.90E-03	mg/kg-day	NA	3	IRIS	02/18/98
Benzene	Chronic (4)	3.00E-03	mg/kg-day	1	3.00E-03	mg/kg-day	blood	1000	NCEA	09/01/98
Benz(a)anthracene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	Chronic (8)	3.00E-02	mg/kg-day	1	3.00E-02	mg/kg-day	NA	3000	EPA Region II	03/31/00
Benzo(k)fluoranthene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	Chronic	2.00E-03	mg/kg-day	0.007	1.40E-05	mg/kg-day	NOEL	300	IRIS	05/22/00
bis(2-Ethylhexyl)phthalate	Chronic	2.00E-02	mg/kg-day	1	2.00E-02	mg/kg-day	liver	1000	IRIS	03/14/99
Cadmium	Chronic	5.00E-04	mg/kg-day	0.025	1.25E-05	mg/kg-day	kidney	10	IRIS	03/14/99
Carbazole	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	Chronic	7.00E-04	mg/kg-day	1	7.00E-04	mg/kg-day	liver	1000	IRIS	03/14/99
alpha-Chlordane	Chronic	5.00E-04	mg/kg-day	1	5.00E-04	mg/kg-day	NA	300	EPA-NCEA	05/09/00
gamma-Chlordane	Chronic	5.00E-04	mg/kg-day	1	5.00E-04	mg/kg-day	NA	300	EPA-NCEA	05/09/00
Chlorobenzene	Chronic	2.00E-02	mg/kg-day	1	2.00E-02	mg/kg-day	liver	1000	IRIS	03/14/99

TABLE 5.1
NON-CANCER CHRONIC TOXICITY DATA -- ORAL/DERMAL
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD:	Dates of RfD: Target Organ (3) (MM/DD/YY)
Chloroethane	Chronic	4.00E-01	mg/kg-day	1	4.00E-01	mg/kg-day	developmental	3000	EPA-NCEA	08/30/96
Chloroform	Chronic	1.00E-02	mg/kg-day	1	1.00E-02	mg/kg-day	liver	1000	IRIS	03/14/99
Chromium III	Chronic	1.50E+00	mg/kg-day	0.013	1.95E-02	mg/kg-day	NOEL	1000	IRIS	03/22/00
Chromium VI	Chronic	3.00E-03	mg/kg-day	0.025	7.50E-05	mg/kg-day	NOEL	500	IRIS	03/14/99
Chrysene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	Chronic	1.00E-02	mg/kg-day	1	1.00E-02	mg/kg-day	blood	3000	HEAST	05/01/95
Copper	Chronic (5)	4.00E-02	mg/kg-day	1	4.00E-02	mg/kg-day	gastrointestinal system	NA	HEAST	05/01/95
Cyanide	Chronic	2.00E-02	mg/kg-day	1	2.00E-02	mg/kg-day	NA	20	IRIS	05/22/00
Dibenz(a,h)anthracene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	Chronic	4.00E-03	mg/kg-day	1	4.00E-03	mg/kg-day	kidney	3000	EPA-NCEA	07/19/99
Dibromochloromethane	Chronic	2.00E-02	mg/kg-day	1	2.00E-02	mg/kg-day	liver	1000	IRIS	03/14/99
Dieldrin	Chronic	5.00E-05	mg/kg-day	1	5.00E-05	mg/kg-day	liver	100	IRIS	08/25/99
Di-n-octyl phthalate	Chronic	2.00E-02	mg/kg-day	1	2.00E-02	mg/kg-day	NA	NA	HEAST	05/01/95
Endrin Aldehyde	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	Chronic	1.00E-01	mg/kg-day	1	1.00E-01	mg/kg-day	kidney, liver	1000	IRIS	05/22/00
Fluoranthene	Chronic	4.00E-02	mg/kg-day	1	4.00E-02	mg/kg-day	liver	3000	IRIS	05/22/00
Heptachlor epoxide	Chronic	1.30E-05	mg/kg-day	1	1.30E-05	mg/kg-day	liver	1000	IRIS	03/14/99
Indeno(1,2,3-cd)pyrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	Chronic	3.00E-01	mg/kg-day	1	3.00E-01	mg/kg-day	NA	NA	NCEA	NA
Lead	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	Chronic	2.30E-02	mg/kg-day	0.04	9.20E-04	mg/kg-day	CNS	3	IRIS	03/22/00
Mercury	Chronic	3.00E-04	mg/kg-day	0.07	2.10E-05	mg/kg-day	CNS	30	IRIS	05/22/00
Methylene chloride	Chronic	6.00E-02	mg/kg-day	1	6.00E-02	mg/kg-day	liver	100	IRIS	03/14/99
Naphthalene	Chronic	2.00E-02	mg/kg-day	1	2.00E-02	mg/kg-day	NA	3000	IRIS	07/01/98
Nickel	Chronic	2.00E-02	mg/kg-day	0.04	8.00E-04	mg/kg-day	NA	3000	IRIS	07/16/87
Pentachlorophenol	Chronic	3.00E-02	mg/kg-day	1	3.00E-02	mg/kg-day	liver, kidney	100	IRIS	03/14/99
Phenanthrene	Chronic (8)	3.00E-02	mg/kg-day	1	3.00E-02	mg/kg-day	NA	NA	EPA Region II	03/31/00
Phenol	Chronic	8.00E-01	mg/kg-day	1	6.00E-01	mg/kg-day	NA	100	IRIS	11/16/88
Polychlorinated Biphenyls (liquid)	Chronic	(see individual aroclors)								
Polychlorinated Biphenyls (soil and particulate)	Chronic	(see individual aroclors)								
Pyrene	Chronic	3.00E-02	mg/kg-day	1	3.00E-02	mg/kg-day	kidney	3000	IRIS	11/15/89
Silver	Chronic	5.00E-03	mg/kg-day	0.04	2.00E-04	mg/kg-day	NA	3	IRIS	07/18/91
Tetrachloroethene	Chronic	1.00E-02	mg/kg-day	1	1.00E-02	mg/kg-day	liver	1000	IRIS	03/14/99
Thallium	Chronic	8.00E-05	mg/kg-day	1	8.00E-05	mg/kg-day	liver, blood, hair	NA	IRIS	10/01/98
TICs (volatile)	Chronic	NA	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 5.1
NON-CANCER CHRONIC TOXICITY DATA -- ORAL/DERMAL
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Chronic/ Subchronic	Oral RfD Value	Oral RfD Units	Oral to Dermal Adjustment Factor (1)	Adjusted Dermal RfD (2)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfD:	Dates of RfD: Target Organ (3) (MM/DD/YY)
Toluene	Chronic	2.00E-01	mg/kg-day	1	2.00E-01	mg/kg-day	kidney,liver	1000	IRIS	03/14/99
trans-1,2-Dichloroethene	Chronic	2.00E-02	mg/kg-day	1	2.00E-02	mg/kg-day	blood	1000	IRIS	03/14/99
Trichloroethene	Chronic	5.70E-02	mg/kg-day	1	5.70E-02	mg/kg-day	NA	NA	IRIS	10/01/98
Vanadium	Chronic	7.00E-03	mg/kg-day	0.026	1.82E-04	mg/kg-day	hair	100	HEAST	08/25/99
Vinyl chloride	Chronic	5.00E-03	mg/kg-day	1	5.00E-03	mg/kg-day	liver	NA	EPA Region II	05/01/99
Xylenes (total)	Chronic	2.00E+00	mg/kg-day	1 .	2.00E+00	mg/kg-day	NA	100	IRIS	03/19/87
Zinc	Chronic	3.00E-01	mg/kg-day	1	3.00E-01	mg/kg-day	blood	3	IRIS	03/14/99

NA = Not available
CNS = Central nervous system
NOEL = No observed effects level
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment
EPA Region II = U.S. Environmental Protection Agency Region II personal communication
EPA, 1993 = "Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons," EPA/600/R-93/089.
EPA, 1996 = "PCB's: Cancer Dose-Response Assessment and Application to Environmental Mixtures," EPA/600/P-96/001F.

(1) Obtained from EPA, 1999. "Submission of Working Draft of Risk Assessment Guidance for Superfund Volume I:
Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim Guidance."
(2) Adjusted dermal RfD = Oral RfD x adjustment factor.
(3) For IRIS values, date IRIS was searched.
For HEAST values, date of HEAST.
For NCEA values, date of the article provided by NCEA.
(4) Based on oral equivalent dose.
(5) Based on drinking water standard.
(6) Based on Aroclor 1254.
(7) Based on Naphthalene.
(8) Based on Pyrene.

TABLE 5.2
NON-CANCER SUBCHRONIC TOXICITY DATA -- INHALATION
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD:	Dates (2) (MM/DD/YY)
1,1,1-Trichloroethane	Subchronic	NA	NA	1.40E+01	mg/kg-day	liver	90	NCEA	08/04/99
1,1-Dichloroethane	Subchronic	3.5	mg/m3	1.00E+00	mg/kg-day	NOEL	100	HEAST	05/01/95
1,1-Dichloroethene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethene (total)	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	Subchronic	8.75	mg/m3	2.50E+00	mg/kg-day	weight	30	HEAST	05/01/95
2-Hexanone	Subchronic	0.049	mg/m3	1.40E-02	mg/kg-day	NA	NA	NCEA	NA
2-Methylnaphthalene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	Subchronic	NA	NA	NA	NA	NA	NA	NA	05/05/94
Acetone	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Aluminum	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	Subchronic	NA	NA	1.10E-04	mg/kg-day	lung	100	NCEA	07/26/99
Aroclor-1248	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Barium	Subchronic	0.005	mg/m3	1.43E-03	mg/kg-day	NA	100	HEAST	05/01/99
Benzene	Subchronic	0.09	mg/m3	2.50E-03	mg/kg-day	blood, immune system	100	NCEA	09/01/98
Benz(a)anthracene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	Subchronic	0.0009	mg/m3	2.60E-04	mg/kg-day	kidney	NA	NCEA	06/14/00
Carbazole	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	Subchronic	0.02	mg/m3	5.70E-03	mg/kg-day	liver	300	NCEA	12/18/98
alpha-Chlordane	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 5.2
NON-CANCER SUBCHRONIC TOXICITY DATA -- INHALATION
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD:	Dates (2) (MM/DD/YY)
gamma-Chlordane	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	Subchronic	0.6	mg/m3	1.70E-01	mg/kg-day	liver	1000	NCEA	09/18/98
Chloroethane	Subchronic	10	mg/m3	2.90E+00	mg/kg-day	development	300	HEAST	05/01/95
Chloroform	Subchronic	0.003	mg/m3	8.60E-04	mg/kg-day	respiratory, liver, kidney	100	NCEA	12/01/97
Chromium III	Subchronic	NA	NA	1.10E-06	mg/kg-day	respiratory	100	NCEA	05/14/93
Chromium VI	Subchronic	0.0001	mg/m3	1.10E-06	mg/kg-day	respiratory	100	NCEA	05/14/93
Chrysene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Copper	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octyl phthalate	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Endrin Aldehyde	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	Subchronic	NA	NA	2.86E-01	mg/kg-day	kidney, liver	300	IRIS	10/12/99
Fluoranthene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Iron	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Lead	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	Subchronic	0.003	mg/m3	8.60E-04	mg/kg-day	CNS	NA	IRIS	NA
Methylene chloride	Subchronic	3	mg/m3	8.60E-01	mg/kg-day	liver	100	HEAST	05/01/95
Naphthalene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls (liquid)	Subchronic	(see individual aroclors)							
Polychlorinated Biphenyls (soil and particulate)	Subchronic	(see individual aroclors)							
Pyrene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Silver	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 5.2
NON-CANCER SUBCHRONIC TOXICITY DATA -- INHALATION
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD:	Dates (2) (MM/DD/YY)
Tetrachloroethene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Thallium	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
TICs (volatile)	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes (total)	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	Subchronic	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not available
CNS = Central nervous system
NOEL = No observed effects level
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment
EPA Region III = U.S. Environmental Protection Agency Region III Risk-Based Concentration Tables
EPA, 1993 = "Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons," EPA/600/R-93/089.
EPA, 1996 = "PCB's: Cancer Dose-Response Assessment and Application to Environmental Mixtures," EPA/600/P-96/001F.

(1) Inhalation RfD = RfC x 20/70
(2) For IRIS values, date IRIS was searched.
For HEAST values, date of HEAST.
For NCEA values, date of the article provided by NCEA.

TABLE 5.2
NON-CANCER CHRONIC TOXICITY DATA -- INHALATION
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD:	Dates (2) (MM/DD/YY)
1,1,1-Trichloroethane	Chronic	1	mg/m3	1.4	mg/kg-day	Liver	90	NCEA	08/04/99
1,1-Dichloroethane	Chronic	0.35	mg/m3	0.14	mg/kg-day	NOEL	1000	HEAST	05/01/95
1,1-Dichloroethene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dichloroethane	Chronic	0.005	mg/m3	0.0014	mg/kg-day	GI	3000	NCEA	04/05/93
1,2-Dichloroethene (total)	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	Chronic	0.8	mg/m3	0.2	mg/kg-day	liver	100	IRIS	03/14/99
2-Hexanone	Chronic	0.0049	mg/m3	0.0014	mg/kg-day	NA	NA	NCEA	NA
2-Methylnaphthalene	Chronic (3)	0.003	mg/m3	0.0009	mg/kg-day	NA	3000	IRIS	05/07/00
4,4'-DDD	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	Chronic	NA	NA	NA	NA	NA	NA	NA	05/05/94
Acetone	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Aluminum	Chronic	0.005	mg/m3	0.014	mg/kg-day	CNS	300	NCEA	08/13/99
Anthracene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Barium	Chronic	0.0005	mg/m3	0.000142857	mg/kg-day	NA	1000	HEAST	05/01/99
Benzene	Chronic	0.009	mg/m3	0.002	mg/kg-day	blood, immune system	1000	NCEA	09/01/98
Benz(a)anthracene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium (soil)	Chronic	0.0002	mg/m3	0.0001	mg/kg-day	kidney	NA	NCEA	12/18/97
Cadmium (water)	Chronic	0.0002	mg/m3	0.0001	mg/kg-day	kidney	NA	NCEA	12/18/97
Carbazole	Chronic	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 5.2
NON-CANCER CHRONIC TOXICITY DATA -- INHALATION
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD:	Dates (2) (MM/DD/YY)
Carbon tetrachloride	Chronic	0.002	mg/m3	0.0006	mg/kg-day	liver	3000	NCEA	NA
alpha-Chlordane	Chronic	0.0007	mg/m3	0.0002	mg/kg-day	NA	1000	IRIS	11/03/97
gamma-Chlordane	Chronic	0.0007	mg/m3	0.0002	mg/kg-day	NA	1000	IRIS	11/03/97
Chlorobenzene	Chronic	0.06	mg/m3	0.017	mg/kg-day	liver	1000	NCEA	09/18/98
Chloroethane	Chronic	10	mg/m3	2.9	mg/kg-day	development	300	IRIS	03/14/99
Chloroform	Chronic	0.0003	mg/m3	8.60E-05	mg/kg-day	Respiratory, Liver, Kidney	1000	NCEA	12/01/97
Chromium III	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI	Chronic	0.0001	mg/m3	0.00003	mg/kg-day	lung	300	IRIS	03/14/99
Chrysene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-Dichloroethene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Copper	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Cyanide	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Di-n-octyl phthalate	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Endrin Aldehyde	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	Chronic	1	mg/m3	0.29	mg/kg-day	developmental toxicity	300	IRIS	03/01/99
Fluoranthene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Iron	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Lead	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	Chronic	0.00005	mg/m3	0.000014	mg/kg-day	CNS	1000	IRIS	03/14/99
Mercury	Chronic	0.0003	mg/m3	0.000086	mg/kg-day	CNS	30	IRIS	04/19/90
Methylene chloride	Chronic	3	mg/m3	0.9	mg/kg-day	Liver	100	HEAST	05/01/95
Naphthalene	Chronic	0.003	mg/m3	0.0009	mg/kg-day	NA	3000	IRIS	05/07/00
Nickel	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls (liquid)	Chronic	(see individual aroclors)							

TABLE 5.2
NON-CANCER CHRONIC TOXICITY DATA -- INHALATION
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Chronic/ Subchronic	Value Inhalation RfC	Units	Adjusted Inhalation RfD (1)	Units	Primary Target Organ	Combined Uncertainty/Modifying Factors	Sources of RfC:RfD:	Dates (2) (MM/DD/YY)
Polychlorinated Biphenyls (soil and particulate)	Chronic	(see individual aroclors)							
Pyrene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Silver	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	Chronic	0.6	mg/m3	0.1	mg/kg-day	liver, kidney, brain	30	NCEA	06/20/97
Thallium	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
TICs (volatile)	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	Chronic	0.4	mg/m3	0.1	mg/kg-day	CNS	300	IRIS	03/14/99
trans-1,2-Dichloroethene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	Chronic	NA	NA	NA	NA	NA	NA	EPA Region II	05/01/99
Xylenes (total)	Chronic	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	Chronic	NA	NA	NA	NA	NA	NA	NA	NA

NA = Not available

CNS = Central nervous system

NOEL = No observed effects level

IRIS = Integrated Risk Information System

HEAST = Health Effects Assessment Summary Tables

NCEA = National Center for Environmental Assessment

EPA Region II = U.S. Environmental Protection Agency Region II personal communication

EPA, 1993 = "Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons," EPA/600/R-93/089.

EPA, 1996 = "PCB's: Cancer Dose-Response Assessment and Application to Environmental Mixtures," EPA/600/P-96/001F.

(1) Inhalation RfD = RfC x 20/70

(2) For IRIS values, date IRIS was searched.
For HEAST values, date of HEAST.
For NCEA values, date of the article provided by NCEA.

(3) Naphthalene used as a surrogate.

RAGS TABLE 6s

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (3)	Adjusted Dermal Cancer Slope Factor (1)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (2) (MM/DD/YY)
1,1,1-Trichloroethane	NA	NA	NA	NA	D	IRIS	03/14/99
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	0.6	1	0.6	1/mg/kg-day	C	IRIS	03/14/99
1,2-Dichloroethane	0.091	1	0.091	1/mg/kg-day	B2	IRIS	03/14/99
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	0.024	1	0.024	1/mg/kg-day	C	HEAST	05/01/95
2-Hexanone	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	0.24	1	0.24	1/mg/kg-day	B2	IRIS	03/14/99
4,4'-DDE	0.34	1	0.34	1/mg/kg-day	B2	IRIS	03/14/99
4,4'-DDT	0.34	1	0.34	1/mg/kg-day	B2	IRIS	03/14/99
Acetone	NA	NA	NA	NA	D	IRIS	03/14/99
Aluminum	NA	NA	NA	NA	D	NCEA	06/20/97
Anthracene	NA	NA	NA	NA	D	IRIS	03/14/99
Antimony	NA	NA	NA	NA	NA	IRIS	03/14/99
Aroclor-1248	2	1	2	1/mg/kg-day	B2	IRIS	05/23/00
Aroclor-1254	2	1	2	1/mg/kg-day	B2	IRIS	05/23/00
Aroclor-1260	2	1	2	1/mg/kg-day	B2	IRIS	05/23/00
Arsenic	1.5	1	1.5	1/mg/kg-day	A	IRIS	03/14/99
Barium	NA	NA	NA	NA	D	IRIS	05/07/00
Benzene	0.055	1	0.055	1/mg/kg-day	A	IRIS	03/22/00
Benz(a)anthracene	0.73	1	0.73	1/mg/kg-day	B2	EPA, 1993	07/01/93
Benzo(a)pyrene	7.3	1	7.3	1/mg/kg-day	B2	IRIS	03/14/99
Benzo(b)fluoranthene	0.73	1	0.73	1/mg/kg-day	B2	EPA, 1993	07/01/93
Benzo(g,h,i)perylene	NA	NA	NA	NA	D	IRIS	05/23/00
Benzo(k)fluoranthene	0.073	1	0.073	1/mg/kg-day	B2	EPA, 1993	07/01/93
Beryllium	NA	NA	NA	NA	B2	IRIS	12/01/96
bis(2-Ethylhexyl)phthalate	0.014	1	0.014	1/mg/kg-day	B2	IRIS	03/14/99
Cadmium	NA	NA	NA	NA	B1	IRIS	03/14/99
Carbazole	2.00E-02	1	0.02	1/mg/kg-day	B2	HEAST	1997
Carbon tetrachloride	0.13	1	0.13	1/mg/kg-day	B2	IRIS	03/14/99

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (3)	Adjusted Dermal Cancer Slope Factor (1)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (2) (MM/DD/YY)
alpha-Chlordane	0.35	1	0.35	1/mg/kg-day	B2	IRIS	11/03/97
gamma-Chlordane	0.35	1	0.35	1/mg/kg-day	B2	IRIS	11/03/97
Chlorobenzene	NA	NA	NA	NA	D	IRIS	03/14/99
Chloroethane	0.0029	1	0.0029	1/mg/kg-day	B2	EPA-NCEA	04/05/93
Chloroform	0.0061	1	0.0061	1/mg/kg-day	B2	IRIS	03/14/99
Chromium III	NA	NA	NA	NA	NA	NA	NA
Chromium VI	NA	NA	NA	NA	D	IRIS	03/14/99
Chrysene	0.0073	1	0.0073	1/mg/kg-day	B2	EPA, 1993	07/01/93
cis-1,2-Dichloroethene	NA	NA	NA	NA	D	IRIS	03/14/99
Copper	NA	NA	NA	NA	D	IRIS	03/14/99
Cyanide	NA	NA	NA	NA	D	IRIS	05/23/00
Dibenz(a,h)anthracene	7.3	1	7.3	1/mg/kg-day	B2	EPA, 1993	07/01/93
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	0.084	1	0.084	1/mg/kg-day	C	IRIS	03/14/99
Dieldrin	16	1	16	1/mg/kg-day	B2	IRIS	08/25/99
Di-n-octyl phthalate	NA	NA	NA	NA	NA	HEAST	1997
Endrin aldehyde	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	D	IRIS	05/23/00
Fluoranthene	NA	NA	NA	NA	D	NA	NA
Heptachlor epoxide	9.1	1	9.1	1/mg/kg-day	B2	IRIS	03/14/99
Indeno(1,2,3-cd)pyrene	0.73	1	0.73	1/mg/kg-day	B2	EPA, 1993	07/01/93
Iron	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	B2	IRIS	03/22/00
Manganese	NA	0.04	NA	NA	D	IRIS	03/14/99
Mercury	NA	NA	NA	NA	D	IRIS	05/23/00
Methylene chloride	0.0075	1	0.0075	1/mg/kg-day	B2	IRIS	03/14/99
Naphthalene	NA	NA	NA	NA	C	IRIS	05/23/00
Nickel	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	0.12	1	0.12	1/mg/kg-day	B2	IRIS	03/14/99
Phenanthrene	NA	1	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	D	IRIS	05/23/00

TABLE 6.1
CANCER TOXICITY DATA -- ORAL/DERMAL
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Oral Cancer Slope Factor	Oral to Dermal Adjustment Factor (3)	Adjusted Dermal Cancer Slope Factor (1)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (2) (MM/DD/YY)
Polychlorinated Biphenyls (liquid)	see individual Aroclors						
Polychlorinated Biphenyls (soil and particulate)							
Pyrene	NA	NA	NA	NA	D	IRIS	05/23/00
Silver	NA	NA	NA	NA	D	IRIS	05/23/00
Tetrachloroethene	0.052	1	0.052	1/mg/kg-day	C-B2	EPA-NCEA	NA
Thallium	NA	1	NA	NA	NA	NA	NA
TICs (volatile)	NA	NA	NA	NA	NA	NA	NA
Toluene	NA	1	NA	NA	D	IRIS	03/14/99
trans-1,2-Dichloroethene	NA	1	NA	NA	NA	NA	NA
Trichloroethene	0.011	1	0.011	1/mg/kg-day	NA	EPA-NCEA	NA
Vanadium	NA	0.026	NA	NA	NA	IRIS	08/25/99
Vinyl chloride	1.9	1	1.9	1/mg/kg-day	A	HEAST	1997
Xylenes (total)	NA	NA	NA	NA	D	IRIS	05/23/00
Zinc	NA	1	NA	NA	D	IRIS	03/14/99

NA = Not available
CNS = Central nervous system
NOEL = No observed effects level
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment
EPA Region II = U.S. Environmental Protection Agency Region II personal communication
EPA, 1993 = "Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons," EPA/600/R-93/089.
EPA, 1996 = "PCB's: Cancer Dose-Response Assessment and Application to Environmental Mixtures," EPA/600/P-96/001F.

EPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Weight of Evidence:
Known/Likely
Cannot be Determined
Not Likely

(1) Adjusted dermal slope factor = Oral slope factor/adjustment factor.
(2) For IRIS values, date IRIS was searched.
For HEAST values, date of HEAST.
For NCEA values, date of the article provided by NCEA.
(3) Obtained from EPA, 1999. "Submission of Working Draft of Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim Guidance."

TABLE 6.2
CANCER TOXICITY DATA -- INHALATION
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Unit Risk	Units	Adjustment	Inhalation Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (1) (MM/DD/YY)
1,1,1-Trichloroethane	NA	NA	NA	NA	NA	D	IRIS	03/14/99
1,1-Dichloroethane	NA	NA	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	5.0E-05	1/ug/m3	3500	1.8E-01	1/mg/kg-day	C	IRIS	03/14/99
1,2-Dichloroethane	2.6E-05	1/ug/m3	3500	9.1E-02	1/mg/kg-day	B2	IRIS	03/14/99
1,2-Dichloroethene (total)	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	NA	NA	NA	2.2E-02	1/mg/kg-day	C-B2	EPA-NCEA	06/21/93
2-Hexanone	NA	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA	NA
4-Methylphenol	NA	NA	NA	NA	NA	NA	NA	NA
4,4'-DDD	NA	NA	NA	NA	NA	B2	IRIS	03/14/99
4,4'-DDE	NA	NA	NA	NA	NA	B2	IRIS	03/14/99
4,4'-DDT	9.7E-05	1/ug/m3	3500	3.4E-01	1/mg/kg-day	B2	IRIS	03/14/99
Acetone	NA	NA	NA	NA	NA	D	IRIS	03/14/99
Aluminum	NA	NA	NA	NA	NA	D	NCEA	06/20/97
Anthracene	NA	NA	NA	NA	NA	D	IRIS	03/14/99
Antimony	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248	5.7E-04	1/ug/m3	3500	2.0E+00	1/mg/kg-day	B2	EPA, 1996	09/01/96
Aroclor-1254	5.7E-04	1/ug/m3	3500	2.0E+00	1/mg/kg-day	B2	EPA, 1996	09/01/96
Aroclor-1260	5.7E-04	1/ug/m3	3500	2.0E+00	1/mg/kg-day	B2	EPA, 1996	09/01/96
Arsenic	4.3E-03	1/ug/m3	3500	1.5E+01	1/mg/kg-day	A	IRIS	03/14/99
Barium	NA	NA	NA	NA	NA	D	IRIS	05/23/00
Benzene	8.3E-06	1/ug/m3	3500	2.7E-02	1/mg/kg-day	A	Region II	NA
Benz(a)anthracene	NA	NA	NA	3.1E-01	1/mg/kg-day	B2	EPA, 1993	1993
Benzo(a)pyrene	8.9E-04	1/ug/m3	3500	3.1E+00	1/mg/kg-day	B2	EPA, 1993	1993
Benzo(b)fluoranthene	NA	NA	NA	3.1E-01	1/mg/kg-day	B2	EPA, 1993	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	D	IRIS	05/23/00
Benzo(k)fluoranthene	NA	NA	NA	3.1E-02	1/mg/kg-day	B2	EPA, 1993	1993
Beryllium	NA	NA	NA	8.4E+00	1/mg/kg-day	B1	HEAST	05/01/99
bis(2-Ethylhexyl)phthalate	NA	NA	NA	1.4E-02	1/mg/kg-day	B2	EPA-NCEA	09/20/95
Cadmium	1.8E-03	1/ug/m3	3500	6.3E+00	1/mg/kg-day	B1	IRIS	03/14/99
Carbazole	NA	NA	NA	NA	NA	D	IRIS	03/14/99
Carbon tetrachloride	1.5E-05	1/ug/m3	3500	5.3E-02	1/mg/kg-day	B2	IRIS	03/14/99
alpha-Chlordane	NA	NA	NA	3.5E-01	1/mg/kg-day	B2	IRIS	05/01/99
gamma-Chlordane	NA	NA	NA	3.5E-01	1/mg/kg-day	B2	IRIS	05/01/99
Chlorobenzene	NA	NA	NA	NA	NA	D	IRIS	03/14/99

TABLE 6.2
CANCER TOXICITY DATA -- INHALATION
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Unit Risk	Units	Adjustment	Inhalation Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (1) (MM/DD/YY)
Chloroethane	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	2.3E-05	1/ug/m3	3500	8.1E-02	1/mg/kg-day	B2	IRIS	03/14/99
Chromium III	NA	NA	NA	NA	NA	NA	NA	NA
Chromium VI	1.2E-02	1/ug/m3	3500	4.2E+01	1/mg/kg-day	A	IRIS	03/14/99
Chrysene	NA	NA	NA	3.1E-03	1/mg/kg-day	B2	EPA, 1993	1993
cis-1,2-Dichloroethene	NA	NA	NA	NA	NA	D	IRIS	03/14/99
Copper	NA	NA	NA	NA	NA	D	IRIS	03/14/99
Cyanide	NA	NA	NA	NA	NA	D	IRIS	05/23/00
Dibenz(a,h)anthracene	NA	NA	NA	3.1E+00	1/mg/kg-day	B2	EPA, 1993	1993
Dibenzofuran	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NA	NA	NA	NA	NA	C	IRIS	03/14/99
Dieldrin	4.8E-03	1/ug/m3	3500	1.6E+01	1/mg/kg-day	B2	IRIS	08/25/99
Di-n-octyl phthalate	NA	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	D	IRIS	03/14/99
Fluoranthene	NA	NA	NA	NA	NA	D	IRIS	05/23/00
Heptachlor epoxide	2.6E-03	1/ug/m3	3500	9.1E+00	1/mg/kg-day	B2	IRIS	03/14/99
Indeno(1,2,3-cd)pyrene	NA	NA	NA	3.1E-01	1/mg/kg-day	B2	EPA, 1993	1993
Iron	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	D	IRIS	03/14/99
Mercury	NA	NA	NA	NA	NA	D	IRIS	03/14/99
Methylene chloride	4.7E-07	1/ug/m3	3500	1.7E-03	1/mg/kg-day	B2	IRIS	03/14/99
Naphthalene	NA	NA	NA	NA	NA	C	IRIS	05/23/00
Nickel	NA	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	B2	IRIS	03/14/99
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	D	IRIS	05/23/00
Polychlorinated Biphenyls (liquid)	(not applicable)							
Polychlorinated Biphenyls (soil and particulate)	5.7E-04	1/ug/m3	3500	2.0E+00	1/mg/kg-day	NA	EPA, 1996	09/01/96
Pyrene	NA	NA	NA	NA	NA	D	IRIS	05/23/00
Silver	NA	NA	NA	NA	NA	D	IRIS	05/23/00
Tetrachloroethene	NA	NA	NA	2.0E-03	1/mg/kg-day	C-B2	EPA-NCEA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA	NA
TICs (volatile)	NA	NA	NA	NA	NA	NA	NA	NA

TABLE 6.2
CANCER TOXICITY DATA -- INHALATION
LIBERTY INDUSTRIAL FINISHING SITE

Chemical of Potential Concern	Unit Risk	Units	Adjustment	Inhalation Cancer Slope Factor (2)	Units	Weight of Evidence/ Cancer Guideline Description	Source	Date (1) (MM/DD/YY)
Toluene	NA	NA	NA	NA	NA	D	IRIS	03/14/99
trans-1,2-Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	1.7E-06	1/ug/m3	3500	6.0E-03	1/mg/kg-day	NA	EPA-NCEA	NA
Vanadium	NA	NA	NA	NA	NA	NA	IRIS	08/25/99
Vinyl chloride	NA	NA	NA	3.0E-01	1/mg/kg-day	A	HEAST	1997
Xylenes (total)	NA	NA	NA	NA	NA	D	IRIS	05/23/00
Zinc	NA	NA	NA	NA	NA	D	IRIS	03/14/99

NA = Not available
CNS = Central nervous system
NOEL = No observed effects level
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
NCEA = National Center for Environmental Assessment
EPA Region II = U.S. Environmental Protection Agency Region II personal communication

EPA, 1996 = "PCB's: Cancer Dose-Response Assessment and Application to Environmental Mixtures," EPA/600/P-96/001F.

EPA Group:
A - Human carcinogen
B1 - Probable human carcinogen - indicates that limited human data are available
B2 - Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C - Possible human carcinogen
D - Not classifiable as a human carcinogen
E - Evidence of noncarcinogenicity

Weight of Evidence:
Known/Likely
Cannot be Determined
Not Likely

(1) For IRIS values, date IRIS was searched.
For HEAST values, date of HEAST.
For NCEA values, date of the article provided by NCEA.
(2) Slope factor = unit risk x adjustment factor (70 x 1000/20)

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TABLE 9.1.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel

Scenario Timeframe: Current
Receptor Population: Trespassers
Receptor Age: 10-18 years

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Western Parcel											
			Aluminum	NA	---	NA	NA	Aluminum	CNS	1.3E-02	---	NA	1.3E-02
			Antimony	NA	---	NA	NA	Antimony	blood	3.6E-02	---	NA	3.6E-02
			Arsenic	1.1E-06	---	4.4E-07	1.6E-06	Arsenic	skin, circulatory system	1.9E-02	---	7.6E-03	2.7E-02
			Cadmium	NA	---	NA	NA	Cadmium	kidney	1.4E-01	---	7.1E-02	2.1E-01
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	3.6E-04	---	NA	3.6E-04
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	6.0E-02	---	NA	6.0E-02
			Copper	NA	---	NA	NA	Copper	gastrointestinal system	2.8E-02	---	NA	2.8E-02
			Cyanide	NA	---	NA	NA	Cyanide	NA	4.1E-03	---	NA	4.1E-03
			Nickel	NA	---	NA	NA	Nickel	NA	1.7E-03	---	NA	1.7E-03
			Thallium	NA	---	NA	NA	Thallium	liver, blood, hair	2.6E-03	---	NA	2.6E-03
			Zinc	NA	---	NA	NA	Zinc	blood	8.4E-03	---	NA	8.4E-03
			Aroclor-1254	8.5E-08	---	1.6E-07	2.4E-07	Aroclor-1254	immune system, growth	6.6E-03	---	1.2E-02	1.9E-02
			Aroclor-1260	3.8E-08	---	7.0E-08	1.1E-07	Aroclor-1260	immune system, growth	3.0E-03	---	5.4E-03	8.4E-03
			Tetrachloroethene	3.5E-10	---	NA	3.5E-10	Tetrachloroethene	liver	5.2E-06	---	NA	5.2E-06
			(Total)	1.2E-06	---	6.6E-07	1.9E-06		(Total)	3.2E-01	---	9.7E-02	4.2E-01
	Particulates	Western Parcel											
			Aluminum	---	NA	---	NA	Aluminum	CNS	---	1.9E-04	---	1.9E-04
			Antimony	---	NA	---	NA	Antimony	blood	---	NA	---	NA
			Arsenic	---	2.2E-09	---	2.2E-09	Arsenic	skin, circulatory system	---	NA	---	NA
			Cadmium	---	1.1E-08	---	1.1E-08	Cadmium	kidney	---	6.6E-05	---	6.6E-05
			Chromium III	---	NA	---	NA	Chromium III	NOEL	---	NA	---	NA
			Chromium VI	---	1.9E-07	---	1.9E-07	Chromium VI	NOEL	---	1.2E-03	---	1.2E-03
			Copper	---	NA	---	NA	Copper	gastrointestinal system	---	NA	---	NA
			Cyanide	---	NA	---	NA	Cyanide	NA	---	NA	---	NA
			Nickel	---	NA	---	NA	Nickel	NA	---	NA	---	NA
			Thallium	---	NA	---	NA	Thallium	liver, blood, hair	---	NA	---	NA
			Zinc	---	NA	---	NA	Zinc	blood	---	NA	---	NA
			Aroclor-1254	---	1.6E-11	---	1.6E-11	Aroclor-1254	immune system, growth	---	NA	---	NA
			Aroclor-1260	---	7.3E-12	---	7.3E-12	Aroclor-1260	immune system, growth	---	NA	---	NA
			Tetrachloroethene	---	2.6E-15	---	2.6E-15	Tetrachloroethene	liver	---	7.1E-11	---	7.1E-11
			(Total)	---	2.0E-07	---	2.0E-07		(Total)	---	1.4E-03	---	1.4E-03
				Total Risk Across Surface Soil			2.1E-06		Total Hazard Index Across Surface Soil				4.2E-01

TABLE 9.1.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel

Scenario Timeframe: Current
Receptor Population: Trespassers
Receptor Age: 10-18 years

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Vapors	Western Parcel (Outdoors)											
			Tetrachloroethene	---	1.1E-09	---	1.1E-09	Tetrachloroethene	liver	—	3.1E-05	---	3.1E-05
			Toluene	---	NA	---	NA	Toluene	kidney,liver	—	7.1E-05	---	7.1E-05
			Trichloroethene	---	5.4E-09	---	5.4E-09	Trichloroethene	NA	—	NA	---	NA
			(Total)	---	6.5E-09	---	6.5E-09		(Total)	—	1.0E-04	---	1.0E-04
			Total Risk Across Surface/Subsurface Soil				**6.5E-09**		**Total Hazard Index Across Surface/Subsurface Soil**				**1.0E-04**

TABLE 9.1.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Current
Receptor Population: Trespassers
Receptor Age: 10-18 years

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors	Western Parcel (Outdoors)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	6.8E-07	---	6.8E-07
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	6.3E-07	---	6.3E-07
			Acetone	---	NA	---	NA	Acetone	kidney, liver	---	NA	---	NA
			Chloroform	---	1.9E-11	---	1.9E-11	Chloroform	liver	---	2.1E-05	---	2.1E-05
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	2.7E-11	---	2.7E-11	Tetrachloroethene	liver	---	7.5E-07	---	7.5E-07
			trans-1,2-Dichloroethene	---	NA	---	NA	trans-1,2-Dichloroethene	blood	---	NA	---	NA
			Trichloroethene	---	5.6E-09	---	5.6E-09	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	5.7E-09	---	5.7E-09		(Total)	---	2.3E-05	---	2.3E-05
				Total Risk Across Groundwater			**5.7E-09**		**Total Hazard Index Across Groundwater**				**2.3E-05**
				Total Risk Across All Media and All Exposure Routes			**2.1E-06**		**Total Hazard Index Across All Media and All Exposure Routes**				**4.2E-01**

Total Blood HI =	**4.7E-02**
Total Skin HI =	**2.7E-02**
Total Circulatory System HI =	**2.7E-02**
Total Kidney HI =	**2.1E-01**
Total GI System HI =	**2.8E-02**
Total Immune System HI =	**2.7E-02**
Total Growth HI =	**2.7E-02**
Total Liver HI =	**2.8E-03**
Total CNS HI =	**1.4E-02**

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Western Parcel											
			Aluminum	NA	---	NA	NA	Aluminum	CNS	4.1E-03	---	NA	4.1E-03
			Antimony	NA	---	NA	NA	Antimony	blood	7.3E-03	---	NA	7.3E-03
			Arsenic	1.3E-06	---	5.3E-07	1.9E-06	Arsenic	skin, circulatory system	8.3E-03	---	3.3E-03	1.2E-02
			Cadmium	NA	---	NA	NA	Cadmium	kidney	2.9E-02	---	1.5E-02	4.5E-02
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	1.8E-04	---	NA	1.8E-04
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	2.5E-02	---	NA	2.5E-02
			Copper	NA	---	NA	NA	Copper	gastrointestinal system	9.0E-03	---	NA	9.0E-03
			Cyanide	NA	---	NA	NA	Cyanide	NA	1.9E-03	---	NA	1.9E-03
			Mercury	NA	---	NA	NA	Mercury	CNS	2.9E-04	---	NA	2.9E-04
			Nickel	NA	---	NA	NA	Nickel	NA	2.3E-03	---	NA	2.3E-03
			Silver	NA	---	NA	NA	Silver	NA	1.4E-04	---	NA	1.4E-04
			Zinc	NA	---	NA	NA	Zinc	blood	2.4E-03	---	NA	2.4E-03
			Aroclor-1248	6.7E-08	---	1.2E-07	1.9E-07	Aroclor-1248	immune system, growth	1.9E-03	---	3.4E-03	5.3E-03
			Aroclor-1254	7.0E-07	---	1.3E-06	2.0E-06	Aroclor-1254	immune system, growth	2.0E-02	---	3.6E-02	5.6E-02
			Aroclor-1260	1.9E-07	---	3.5E-07	5.3E-07	Aroclor-1260	immune system, growth	5.2E-03	---	9.7E-03	1.5E-02
			Benzo(a)pyrene	3.0E-07	---	5.2E-07	8.2E-07	Benzo(a)pyrene	NA	NA	---	NA	NA
			Tetrachloroethene	1.8E-10	---	NA	1.8E-10	Tetrachloroethene	liver	9.7E-07	---	NA	9.7E-07
			(Total)	2.6E-06	---	2.8E-06	5.4E-06		(Total)	1.2E-01	---	6.8E-02	1.9E-01

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Particulates	Western Parcel											
			Aluminum	---	NA	---	NA	Aluminum	CNS	---	1.5E-04	---	1.5E-04
			Antimony	---	NA	---	NA	Antimony	blood	---	NA	---	NA
			Arsenic	---	6.8E-09	---	6.8E-09	Arsenic	skin, circulatory system	---	NA	---	NA
			Cadmium	---	1.7E-08	---	1.7E-08	Cadmium	kidney	---	3.7E-05	---	3.7E-05
			Chromium III	---	NA	---	NA	Chromium III	NOEL	---	NA	---	NA
			Chromium VI	---	5.8E-07	---	5.8E-07	Chromium VI	NOEL	---	1.3E-03	---	1.3E-03
			Copper	---	NA	---	NA	Copper	gastrointestinal system	---	NA	---	NA
			Cyanide	---	NA	---	NA	Cyanide	NA	---	NA	---	NA
			Mercury	---	NA	---	NA	Mercury	CNS	---	5.2E-07	---	5.2E-07
			Nickel	---	NA	---	NA	Nickel	NA	---	NA	---	NA
			Silver	---	NA	---	NA	Silver	NA	---	NA	---	NA
			Zinc	---	NA	---	NA	Zinc	blood	---	NA	---	NA
			Aroclor-1248	---	3.4E-11	---	3.4E-11	Aroclor-1248	immune system, growth	---	NA	---	NA
			Aroclor-1254	---	3.6E-10	---	3.6E-10	Aroclor-1254	immune system, growth	---	NA	---	NA
			Aroclor-1260	---	9.5E-11	---	9.5E-11	Aroclor-1260	immune system, growth	---	NA	---	NA
			Benzo(a)pyrene	---	6.5E-11	---	6.5E-11	Benzo(a)pyrene	NA	---	NA	---	NA
			Tetrachloroethene	---	3.5E-15	---	3.5E-15	Tetrachloroethene	liver	---	3.5E-11	---	3.5E-11
			(Total)	---	6.0E-07	---	6.0E-07		(Total)	---	1.5E-03	---	1.5E-03
	Vapors	Western Parcel (Indoors)											
			Tetrachloroethene	---	7.6E-09	---	7.6E-09	Tetrachloroethene	liver	---	7.6E-05	---	7.6E-05
			Toluene	---	NA	---	NA	Toluene	kidney,liver	---	1.1E-04	---	1.1E-04
			Trichloroethene	---	3.4E-08	---	3.4E-08	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	4.2E-08	---	4.2E-08		(Total)	---	1.9E-04	---	1.9E-04
	Vapors	Western Parcel (Outdoors)											
			Tetrachloroethene	---	2.2E-08	---	2.2E-08	Tetrachloroethene	liver	---	2.2E-04	---	2.2E-04
			Toluene	---	NA	---	NA	Toluene	kidney,liver	---	5.0E-04	---	5.0E-04
			Trichloroethene	---	1.1E-07	---	1.1E-07	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	1.3E-07	---	1.3E-07		(Total)	---	7.2E-04	---	7.2E-04
			Total Risk Across Surface/Subsurface Soil				**6.2E-06**		**Total Hazard Index Across Surface/Subsurface Soil**				**1.9E-01**

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Groundwater Adult	Western Parcel											
			Aluminum	NA	---	---	NA	Aluminum	CNS	3.3E-02	---	---	3.3E-02
			Arsenic	8.6E-06	---	---	8.6E-06	Arsenic	skin, circulatory system	5.4E-02	---	---	5.4E-02
			Cadmium	NA	---	---	NA	Cadmium	kidney	7.5E+00	---	---	7.5E+00
			Chromium III	NA	---	---	NA	Chromium III	NOEL	2.5E-03	---	---	2.5E-03
			Chromium VI	NA	---	---	NA	Chromium VI	NOEL	1.4E+00	---	---	1.4E+00
			Copper	NA	---	---	NA	Copper	gastrointestinal system	2.7E-02	---	---	2.7E-02
			Cyanide	NA	---	---	NA	Cyanide	NA	1.3E-01	---	---	1.3E-01
			Manganese	NA	---	---	NA	Manganese	CNS	9.4E-01	---	---	9.4E-01
			Nickel	NA	---	---	NA	Nickel	NA	6.3E-02	---	---	6.3E-02
			Thallium	NA	---	---	NA	Thallium	liver, blood, hair	9.4E-01	---	---	9.4E-01
			alpha-Chlordane	3.8E-08	---	---	3.8E-08	alpha-Chlordane	NA	6.2E-04	---	---	6.2E-04
			Dieldrin	1.8E-06	---	---	1.8E-06	Dieldrin	liver	6.4E-03	---	---	6.4E-03
			gamma-Chlordane	3.8E-08	---	---	3.8E-08	gamma-Chlordane	NA	6.2E-04	---	---	6.2E-04
			bis(2-Ethylhexyl)phthalate	9.9E-06	---	---	9.9E-06	bis(2-Ethylhexyl)phthalate	liver	9.9E-02	---	---	9.9E-02
			Chrysene	4.8E-08	---	---	4.8E-08	Chrysene	NA	NA	---	---	NA
			Pentachlorophenol	3.2E-06	---	---	3.2E-06	Pentachlorophenol	liver, kidney	2.5E-03	---	---	2.5E-03
			1,1,1-Trichloroethane	NA	---	---	NA	1,1,1-Trichloroethane	liver	3.5E-03	---	---	3.5E-03
			1,1-Dichloroethane	NA	---	---	NA	1,1-Dichloroethane	NOEL	2.2E-03	---	---	2.2E-03
			Acetone	NA	---	---	NA	Acetone	kidney, liver	1.6E-02	---	---	1.6E-02
			Chloroform	1.1E-08	---	---	1.1E-08	Chloroform	liver	4.9E-04	---	---	4.9E-04
			cis-1,2-Dichloroethene	NA	---	---	NA	cis-1,2-Dichloroethene	blood	6.5E-01	---	---	6.5E-01
			Tetrachloroethene	2.0E-06	---	---	2.0E-06	Tetrachloroethene	liver	1.1E-02	---	---	1.1E-02
			trans-1,2-Dichloroethene	NA	---	---	NA	trans-1,2-Dichloroethene	blood	3.4E-03	---	---	3.4E-03
			Trichloroethene	4.5E-05	---	---	4.5E-05	Trichloroethene	NA	2.0E-01	---	---	2.0E-01
			(Total)	7.0E-05	---	---	7.0E-05		(Total)	1.2E+01	---	---	1.2E+01
	Vapors	Western Parcel (Indoors)											
			1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	1.3E-04	---	1.3E-04
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	9.7E-05	---	9.7E-05
			Acetone	---	NA	---	NA	Acetone	kidney, liver	---	NA	---	NA
			Chloroform	---	7.3E-09	---	7.3E-09	Chloroform	liver	---	3.0E-03	---	3.0E-03
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	1.3E-08	---	1.3E-08	Tetrachloroethene	liver	---	1.3E-04	---	1.3E-04
			trans-1,2-Dichloroethene	---	NA	---	NA	trans-1,2-Dichloroethene	blood	---	NA	---	NA
			Trichloroethene	---	2.6E-06	---	2.6E-06	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	2.7E-06	---	2.7E-06		(Total)	---	3.3E-03	---	3.3E-03

TABLE 9.2.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location. Western Parcel

Scenario Timeframe. Future
Receptor Population Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors	Western Parcel (Outdoors)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	5.2E-06	---	5.2E-06
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	4.8E-06	---	4.8E-06
			Acetone	---	NA	---	NA	Acetone	kidney, liver	---	NA	---	NA
			Chloroform	---	4.0E-10	---	4.0E-10	Chloroform	liver	---	1.6E-04	---	1.6E-04
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	5.7E-10	---	5.7E-10	Tetrachloroethene	liver	---	5.7E-06	---	5.7E-06
			trans-1,2-Dichloroethene	---	NA	---	NA	trans-1,2-Dichloroethene	blood	---	NA	---	NA
			Trichloroethene	---	1.2E-07	---	1.2E-07	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	1.2E-07	---	1.2E-07		(Total)	---	1.8E-04	---	1.8E-04
Groundwater (Magothy)	Groundwater Adult	Western Parcel	Manganese	NA	---	---	NA	Manganese	CNS	3.8E-02	---	---	3.8E-02
			(Total)	---	---	---	---		(Total)	3.8E-02	---	---	3.8E-02
			Total Risk Across Groundwater				7.3E-05		Total Hazard Index Across Groundwater				1.2E+01
			Total Risk Across All Media and All Exposure Routes				7.9E-05		Total Hazard Index Across All Media and All Exposure Routes				1.2E+01

Total Blood HI =	1.6E+00
Total Skin HI =	6.5E-02
Total Circulatory System HI =	6.5E-02
Total Kidney HI =	7.6E+00
Total GI System HI =	3.6E-02
Total Immune System HI =	7.6E-02
Total Growth HI =	7.6E-02
Total Liver HI =	1.1E+00
Total CNS HI =	1.0E+00

TABLE 9.3.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Western Parcel											
			Aluminum	NA	---	NA	NA	Aluminum	CNS	NA	---	NA	NA
			Antimony	NA	---	NA	NA	Antimony	blood	3.5E-02	---	NA	3.5E-02
			Arsenic	2.5E-07	---	1.1E-08	2.7E-07	Arsenic	skin, circulatory system	4.0E-02	---	1.6E-03	4.1E-02
			Cadmium	NA	---	NA	NA	Cadmium	kidney	NA	---	NA	NA
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	1.3E-03	---	NA	1.3E-03
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	1.8E-02	---	NA	1.8E-02
			Copper	NA	---	NA	NA	Copper	gastrointestinal system	4.3E-02	---	NA	4.3E-02
			Cyanide	NA	---	NA	NA	Cyanide	NA	9.1E-03	---	NA	9.1E-03
			Mercury	NA	---	NA	NA	Mercury	CNS	1.4E-03	---	NA	1.4E-03
			Nickel	NA	---	NA	NA	Nickel	NA	1.1E-02	---	NA	1.1E-02
			Silver	NA	---	NA	NA	Silver	NA	6.7E-04	---	NA	6.7E-04
			Zinc	NA	---	NA	NA	Zinc	blood	1.2E-02	---	NA	1.2E-02
			Aroclor-1248	1.3E-08	---	2.5E-09	1.5E-08	Aroclor-1248	immune system, growth	9.0E-03	---	1.7E-03	1.1E-02
			Aroclor-1254	1.4E-07	---	2.6E-08	1.6E-07	Aroclor-1254	immune system, growth	9.5E-02	---	1.8E-02	1.1E-01
			Aroclor-1260	3.6E-08	---	6.9E-09	4.3E-08	Aroclor-1260	immune system, growth	2.5E-02	---	4.8E-03	3.0E-02
			Benzo(a)pyrene	5.8E-08	---	1.0E-08	6.9E-08	Benzo(a)pyrene	NA	NA	---	NA	NA
			Tetrachloroethene	3.4E-11	---	NA	3.4E-11	Tetrachloroethene	liver	4.6E-07	---	NA	4.6E-07
			(Total)	5.0E-07	---	5.6E-08	5.5E-07		(Total)	3.0E-01	---	2.6E-02	3.3E-01
	Particulates	Western Parcel											
			Aluminum	---	NA	---	NA	Aluminum	CNS	---	NA	---	NA
			Antimony	---	NA	---	NA	Antimony	blood	---	1.3E-05	---	1.3E-05
			Arsenic	---	2.7E-10	---	2.7E-10	Arsenic	skin, circulatory system	---	NA	---	NA
			Cadmium	---	6.6E-10	---	6.6E-10	Cadmium	kidney	---	2.8E-05	---	2.8E-05
			Chromium III	---	NA	---	NA	Chromium III	NOEL	---	1.2E-01	---	1.2E-01
			Chromium VI	---	2.3E-08	---	2.3E-08	Chromium VI	NOEL	---	3.5E-02	---	3.5E-02
			Copper	---	NA	---	NA	Copper	gastrointestinal system	---	NA	---	NA
			Cyanide	---	NA	---	NA	Cyanide	NA	---	NA	---	NA
			Mercury	---	NA	---	NA	Mercury	CNS	---	5.2E-08	---	5.2E-08
			Nickel	---	NA	---	NA	Nickel	NA	---	NA	---	NA
			Silver	---	NA	---	NA	Silver	NA	---	NA	---	NA
			Zinc	---	NA	---	NA	Zinc	blood	---	NA	---	NA
			Aroclor-1248	---	1.3E-12	---	1.3E-12	Aroclor-1248	immune system, growth	---	NA	---	NA
			Aroclor-1254	---	1.4E-11	---	1.4E-11	Aroclor-1254	immune system, growth	---	NA	---	NA
			Aroclor-1260	---	3.8E-12	---	3.8E-12	Aroclor-1260	immune system, growth	---	NA	---	NA
			Benzo(a)pyrene	---	2.6E-12	---	2.6E-12	Benzo(a)pyrene	NA	---	NA	---	NA
			Tetrachloroethene	---	1.4E-16	---	1.4E-16	Tetrachloroethene	liver	---	NA	---	NA
			(Total)	---	2.4E-08	---	2.4E-08		(Total)	---	1.6E-01	---	1.6E-01

TABLE 9.3.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Vapors	Western Parcel (Outdoors)	Tetrachloroethene	---	1.1E-08	---	1.1E-08	Tetrachloroethene	liver	---	NA	---	NA
			Toluene	---	NA	---	NA	Toluene	kidney,liver	---	NA	---	NA
			Trichloroethene	---	5.3E-08	---	5.3E-08	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	6.4E-08	---	6.4E-08		(Total)	---	---	---	---
			Total Risk Across Surface/Subsurface Soil				6.4E-07		Total Hazard Index Across Surface/Subsurface Soil				4.8E-01
Groundwater (Upper Glacial)	Vapors	Western Parcel (Outdoors)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	2.6E-07	---	2.6E-07
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	3.4E-07	---	3.4E-07
			Acetone	---	NA	---	NA	Acetone	kidney, liver	---	NA	---	NA
			Chloroform	---	7.9E-12	---	7.9E-12	Chloroform	liver	---	8.0E-06	---	8.0E-06
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	1.1E-11	---	1.1E-11	Tetrachloroethene	liver	---	NA	---	NA
			trans-1,2-Dichloroethene	---	NA	---	NA	trans-1,2-Dichloroethene	blood	---	NA	---	NA
			Trichloroethene	---	2.4E-09	---	2.4E-09	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	2.4E-09	---	2.4E-09		(Total)	---	8.6E-06	---	8.6E-06
			Total Risk Across Groundwater				2.4E-09		Total Hazard Index Across Groundwater				8.6E-06
			Total Risk Across All Media and All Exposure Routes				6.4E-07		Total Hazard Index Across All Media and All Exposure Routes				4.8E-01

Total Blood HI =	4.6E-02
Total Skin HI =	4.1E-02
Total Circulatory System HI =	4.1E-02
Total Kidney HI =	2.8E-05
Total GI System HI =	4.3E-02
Total Immune System HI =	1.5E-01
Total Growth HI =	1.5E-01
Total Liver HI =	8.7E-06
Total CNS HI =	1.4E-03

TABLE 9.4 RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location. Western Parcel

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Pre-Adolescent/Adolescent (6-18 years old)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Western Parcel											
			Aluminum	NA	---	NA	NA	Aluminum	CNS	3.3E-03	---	NA	3.3E-03
			Antimony	NA	---	NA	NA	Antimony	blood	5.9E-03	---	NA	5.9E-03
			Arsenic	5.6E-07	---	9.3E-08	6.5E-07	Arsenic	skin, circulatory system	6.7E-03	---	1.1E-03	7.8E-03
			Cadmium	NA	---	NA	NA	Cadmium	kidney	2.4E-02	---	5.2E-03	2.9E-02
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	1.4E-04	---	NA	1.4E-04
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	2.1E-02	---	NA	2.1E-02
			Copper	NA	---	NA	NA	Copper	gastrointestinal system	7.3E-03	---	NA	7.3E-03
			Cyanide	NA	---	NA	NA	Cyanide	NA	1.5E-03	---	NA	1.5E-03
			Mercury	NA	---	NA	NA	Mercury	CNS	2.4E-04	---	NA	2.4E-04
			Nickel	NA	---	NA	NA	Nickel	NA	1.8E-03	---	NA	1.8E-03
			Silver	NA	---	NA	NA	Silver	NA	1.1E-04	---	NA	1.1E-04
			Zinc	NA	---	NA	NA	Zinc	blood	1.9E-03	---	NA	1.9E-03
			Aroclor-1248	2.8E-08	---	2.2E-08	5.0E-08	Aroclor-1248	immune system, growth	1.5E-03	---	1.2E-03	2.7E-03
			Aroclor-1254	3.0E-07	---	2.3E-07	5.3E-07	Aroclor-1254	immune system, growth	1.6E-02	---	1.2E-02	2.8E-02
			Aroclor-1260	7.9E-08	---	6.1E-08	1.4E-07	Aroclor-1260	immune system, growth	4.2E-03	---	3.3E-03	7.5E-03
			Benzo(a)pyrene	1.3E-07	---	9.2E-08	2.2E-07	Benzo(a)pyrene	NA	NA	---	NA	NA
			Tetrachloroethene	7.5E-11	---	NA	7.5E-11	Tetrachloroethene	liver	7.8E-07	---	NA	7.8E-07
			(Total)	1.1E-06	---	5.0E-07	1.6E-06		(Total)	9.5E-02	---	2.3E-02	1.2E-01
	Particulates	Western Parcel											
			Aluminum	---	NA	---	NA	Aluminum	CNS	---	1.4E-05	---	1.4E-05
			Antimony	---	NA	---	NA	Antimony	blood	---	NA	---	NA
			Arsenic	---	3.3E-10	---	3.3E-10	Arsenic	skin, circulatory system	---	NA	---	NA
			Cadmium	---	8.2E-10	---	8.2E-10	Cadmium	kidney	---	3.5E-06	---	3.5E-06
			Chromium III	---	NA	---	NA	Chromium III	NOEL	---	NA	---	NA
			Chromium VI	---	2.9E-08	---	2 9E-08	Chromium VI	NOEL	---	1.2E-04	---	1.2E-04
			Copper	---	NA	---	NA	Copper	gastrointestinal system	---	NA	---	NA
			Cyanide	---	NA	---	NA	Cyanide	NA	---	NA	---	NA
			Mercury	---	NA	---	NA	Mercury	CNS	---	4.9E-08	---	4.9E-08
			Nickel	---	NA	---	NA	Nickel	NA	---	NA	---	NA
			Silver	---	NA	---	NA	Silver	NA	---	NA	---	NA
			Zinc	---	NA	---	NA	Zinc	blood	---	NA	---	NA
			Aroclor-1248	---	1.7E-12	---	1.7E-12	Aroclor-1248	immune system, growth	---	NA	---	NA
			Aroclor-1254	---	1.8E-11	---	1.8E-11	Aroclor-1254	immune system, growth	---	NA	---	NA
			Aroclor-1260	---	4.7E-12	---	4.7E-12	Aroclor-1260	immune system, growth	---	NA	---	NA
			Benzo(a)pyrene	---	3 2E-12	---	3.2E-12	Benzo(a)pyrene	NA	---	NA	---	NA
			Tetrachloroethene	---	1.7E-16	---	1.7E-16	Tetrachloroethene	liver	---	3.3E-12	---	3.3E-12
			(Total)	---	3.0E-08	---	3.0E-08		(Total)	---	1.4E-04	---	1.4E-04

TABLE 9.4.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future Receptor Population: Recreational User Receptor Age: Pre-Adolescent/Adolescent (6-18 years old)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Vapors	Western Parcel (Outdoors)	Tetrachloroethene	---	2.1E-09	---	2.1E-09	Tetrachloroethene	liver	---	4.0E-05	---	4.0E-05
			Toluene	---	NA	---	NA	Toluene	kidney,liver	---	9.2E-05	---	9.2E-05
			Trichloroethene	---	1.0E-08	---	1.0E-08	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	1.2E-08	---	1.2E-08		(Total)	---	1.3E-04	---	1.3E-04
			Total Risk Across Surface/Subsurface Soil				**1.6E-06**		Total Hazard Index Across Surface/Subsurface Soil				**1.2E-01**
Groundwater (Upper Glacial)	Vapors	Western Parcel (Outdoors)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	4.9E-07	---	4.9E-07
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	4.6E-07	---	4.6E-07
			Acetone	---	NA	---	NA	Acetone	kidney, liver	---	NA	---	NA
			Chloroform	---	2.0E-11	---	2.0E-11	Chloroform	liver	---	1.5E-05	---	1.5E-05
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	2.8E-11	---	2.8E-11	Tetrachloroethene	liver	---	5.4E-07	---	5.4E-07
			trans-1,2-Dichloroethene	---	NA	---	NA	trans-1,2-Dichloroethene	blood	---	NA	---	NA
			Trichloroethene	---	5.9E-09	---	5.9E-09	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	5.9E-09	---	5.9E-09		(Total)	---	1.7E-05	---	1.7E-05
			Total Risk Across Groundwater				**5.9E-09**		Total Hazard Index Across Groundwater				**1.7E-05**
			Total Risk Across All Media and All Exposure Routes				**1.6E-06**		Total Hazard Index Across All Media and All Exposure Routes				**1.2E-01**

Total Blood HI =	**7.8E-03**
Total Skin HI =	**7.8E-03**
Total Circulatory System HI =	**7.8E-03**
Total Kidney HI =	**2.9E-02**
Total GI System HI =	**7.3E-03**
Total Immune System HI =	**3.9E-02**
Total Growth HI =	**3.9E-02**
Total Liver HI =	**1.5E-04**
Total CNS HI =	**3.6E-03**

TABLE 9.5.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Current
Receptor Population: Trespasser
Receptor Age: 10-18 years

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Solid Waste	Vapors	Eastern Parcel (Outdoors)	2-Methylnaphthalene	---	NA	---	NA	2-Methylnaphthalene	NA	—	3.6E-04	—	3.6E-04
			Anthracene	---	NA	---	NA	Anthracene	NOEL	—	NA	—	NA
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	—	NA	—	NA
			(Total)	---	—	---	—	(Total)	(Total)	—	3.65E-04	—	3.6E-04
				Total Risk Across Solid Waste			---		Total Hazard Index Across Solid Waste				3.6E-04
Liquid Waste	Vapors	Eastern Parcel (Outdoors)	1,4-Dichlorobenzene	---	2.5E-20	---	2.5E-20	1,4-Dichlorobenzene	kidney	—	3.9E-17	—	3.9E-17
			Dibenzofuran	---	NA	---	NA	Dibenzofuran	kidney	—	NA	—	NA
			Naphthalene	---	NA	---	NA	Naphthalene	NA	—	3.1E-14	—	3.1E-14
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	—	NA	—	NA
			Acetone	---	NA	---	NA	Acetone	kidney, liver	—	NA	—	NA
			Benzene	---	1.6E-19	---	1.6E-19	Benzene	blood	---	2.8E-14	---	2.8E-14
			Chloroethane	---	NA	---	NA	Chloroethane	developmental	---	2.4E-17	—	2.4E-17
			Ethylbenzene	---	NA	---	NA	Ethylbenzene	kidney, liver	—	3.6E-16	---	3.6E-16
			Methylene chloride	---	7.2E-21	---	7.2E-21	Methylene chloride	liver	---	3.9E-17	—	3.9E-17
			Toluene	---	NA	---	NA	Toluene	NA	—	1.6E-15	---	1.6E-15
			Trichloroethene	---	6.8E-21	---	6.8E-21	Trichloroethene	NA	---	NA	---	NA
			Vinyl chloride	---	1.4E-19	---	1.4E-19	Vinyl chloride	liver	---	NA	—	NA
			Xylenes (total)	---	NA	---	NA	Xylenes (total)	NA	—	NA	—	NA
			(Total)	---	3.4E-19	---	3.4E-19	(Total)	(Total)	—	6.1E-14	—	6.1E-14
				Total Risk Across Liquid Waste			3.4E-19		Total Hazard Index Across Liquid Waste				6.1E-14
				Total Risk Across All Media and All Exposure Routes			3.4E-19		Total Hazard Index Across All Media and All Exposure Routes				3.6E-04

Total Liver HI =	4.0E-16
Total Development HI =	2.4E-17
Total Blood HI =	2.8E-14
Total Kidney HI =	4.0E-16

TABLE 9.6 RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel

Scenario Timeframe: Current
Receptor Population. Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Solid Waste	Vapors	Eastern Parcel (Outdoors)											
			2-Methylnaphthalene	---	NA	---	NA	2-Methylnaphthalene	NA	—	1.3E-04	—	1.3E-04
			Anthracene	---	NA	---	NA	Anthracene	NOEL	—	NA	—	NA
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	---	NA	—	NA
			(Total)	---	---	---	---	(Total)	(Total)	—	1.32E-04	—	1.3E-04
				Total Risk Across Solid Waste			---		Total Hazard Index Across Solid Waste				1.3E-04
				Total Risk Across All Media and All Exposure Routes			---		Total Hazard Index Across All Media and All Exposure Routes				1.3E-04

TABLE 9.7.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Eastern Parcel	Antimony	NA	---	NA	NA	Antimony	blood	3.7E-03	---	NA	3.7E-03
			Arsenic	5.1E-07	---	2.0E-07	7.1E-07	Arsenic	skin, circulatory system	3.2E-03	---	1.2E-03	4.4E-03
			Cadmium	NA	---	NA	NA	Cadmium	kidney	1.3E-02	---	6.9E-03	2.0E-02
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	2.1E-05	---	NA	2.1E-05
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	3.5E-03	---	NA	3.5E-03
			Copper	NA	---	NA	NA	Copper	gastrointestinal system	7.4E-04	---	NA	7.4E-04
			Cyanide	NA	---	NA	NA	Cyanide	NA	4.0E-04	---	NA	4.0E-04
			Mercury	NA	---	NA	NA	Mercury	kidney	2.3E-04	---	1.2E-03	1.5E-03
			Nickel	NA	---	NA	NA	Nickel	NA	3.6E-04	---	6.9E-03	7.3E-03
			Vanadium	NA	---	NA	NA	Vanadium	kidney	6.1E-04	---	NA	6.1E-04
			Zinc	NA	---	NA	NA	Zinc	blood	1.8E-04	---	NA	1.8E-04
			Benzo(a)pyrene	8.3E-07	---	1.4E-06	2.3E-06	Benzo(a)pyrene	NA	NA	---	NA	NA
			Benzo(b)fluoranthene	9.1E-08	---	1.6E-07	2.5E-07	Benzo(b)fluoranthene	NA	NA	---	NA	NA
			Dibenz(a,h)anthracene	1.3E-07	---	2.2E-07	3.5E-07	Dibenz(a,h)anthracene	NA	NA	---	NA	NA
			1,2-Dichloroethene (total)	NA	---	NA	NA	1,2-Dichloroethene (total)	liver	1.2E-06	---	NA	1.2E-06
			Trichloroethene	2.0E-10	---	NA	2.0E-10	Trichloroethene	NA	9.1E-07	---	NA	9.1E-07
			(Total)	1.6E-06	---	2.0E-06	3.6E-06		(Total)	2.6E-02	---	1.6E-02	4.2E-02
	Particulates	Eastern Parcel	Antimony	---	NA	---	NA	Antimony	blood	---	NA	---	NA
			Arsenic	---	4.0E-09	---	4.0E-09	Arsenic	skin, circulatory system	---	NA	---	NA
			Cadmium	---	7.5E-09	---	7.5E-09	Cadmium	kidney	---	1.7E-05	---	1.7E-05
			Chromium III	---	NA	---	NA	Chromium III	NOEL	---	NA	---	NA
			Chromium VI	---	8.0E-08	---	8.0E-08	Chromium VI	NOEL	---	1.8E-04	---	1.8E-04
			Copper	---	NA	---	NA	Copper	gastrointestinal system	---	NA	---	NA
			Cyanide	---	NA	---	NA	Cyanide	NA	---	NA	---	NA
			Mercury	---	NA	---	NA	Mercury	kidney	---	4.0E-07	---	4.0E-07
			Nickel	---	NA	---	NA	Nickel	NA	---	NA	---	NA
			Vanadium	---	NA	---	NA	Vanadium	kidney	---	NA	---	NA
			Zinc	---	NA	---	NA	Zinc	blood	---	NA	---	NA
			Benzo(a)pyrene	---	1.8E-10	---	1.8E-10	Benzo(a)pyrene	NA	---	NA	---	NA
			Benzo(b)fluoranthene	---	1.9E-11	---	1.9E-11	Benzo(b)fluoranthene	NA	---	NA	---	NA
			Dibenz(a,h)anthracene	---	2.7E-11	---	2.7E-11	Dibenz(a,h)anthracene	NA	---	NA	---	NA
			1,2-Dichloroethene (total)	---	NA	---	NA	1,2-Dichloroethene (total)	liver	---	NA	---	NA
			Trichloroethene	---	5.6E-14	---	5.6E-14	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	9.2E-08	---	9.2E-08		(Total)	---	2.0E-04	---	2.0E-04

TABLE 9.7 RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel

Scenario Timeframe: Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Vapors	Eastern Parcel (Indoors)	1,2-Dichloroethene (total)	---	NA	---	NA	1,2-Dichloroethene (total)	liver	---	NA	---	NA
			Trichloroethene	---	7.9E-08	---	7.9E-08	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	7.9E-08	---	7.9E-08		(Total)	---	---	---	---
	Vapors	Eastern Parcel (Outdoors)	1,2-Dichloroethene (total)	---	NA	---	NA	1,2-Dichloroethene (total)	liver	---	NA	---	NA
			Trichloroethene	---	5.9E-08	---	5.9E-08	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	5.9E-08	---	5.9E-08		(Total)	---	---	---	---
			Total Risk Across Surface/Subsurface Soil				**3.8E-06**		**Total Hazard Index Across Surface/Subsurface Soil**				**4.3E-02**
Solid Waste	Vapors	Eastern Parcel (Indoors)	2-Methylnaphthalene	---	NA	---	NA	2-Methylnaphthalene	NA	---	4.5E-01	---	4.5E-01
			Anthracene	---	NA	---	NA	Anthracene	NOEL	---	NA	---	NA
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	---	NA	---	NA
			(Total)	---	---	---	---		(Total)	---	4.5E-01	---	4.5E-01
	Vapors	Eastern Parcel (Outdoors)	2-Methylnaphthalene	---	NA	---	NA	2-Methylnaphthalene	NA	---	2.5E-04	---	2.5E-04
			Anthracene	---	NA	---	NA	Anthracene	NOEL	---	NA	---	NA
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	---	NA	---	NA
			(Total)	---	---	---	---		(Total)	---	2.5E-04	---	2.5E-04
			Total Risk Across Solid Waste				**NA**		**Total Hazard Index Across Solid Waste**				**4.5E-01**

TABLE 9 7 RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Liquid Waste	Vapors	Eastern Parcel (Indoors)											
			1,4-Dichlorobenzene	---	1.4E-16	---	1.4E-16	1,4-Dichlorobenzene	kidney	---	7.7E-14	---	7.7E-14
			Dibenzofuran	---	NA	---	NA	Dibenzofuran	kidney	---	NA	---	NA
			Naphthalene	---	NA	---	NA	Naphthalene	NA	---	6.2E-11	---	6.2E-11
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	---	NA	---	NA
			Acetone	---	NA	---	NA	Acetone	kidney, liver	---	NA	---	NA
			Benzene	---	9.1E-16	---	9.1E-16	Benzene	blood	---	5.5E-11	---	5.5E-11
			Chloroethane	---	NA	---	NA	Chloroethane	developmental	---	4.7E-14	---	4.7E-14
			Ethylbenzene	---	NA	---	NA	Ethylbenzene	kidney, liver	---	7.2E-13	---	7.2E-13
			Methylene chloride	---	4.0E-17	---	4.0E-17	Methylene chloride	liver	---	7.9E-14	---	7.9E-14
			Toluene	---	NA	---	NA	Toluene	NA	---	3.2E-12	---	3.2E-12
			Trichloroethene	---	3.8E-17	---	3.8E-17	Trichloroethene	NA	---	NA	---	NA
			Vinyl chloride	---	7.6E-16	---	7.6E-16	Vinyl chloride	liver	---	NA	---	NA
			Xylenes (total)	---	NA	---	NA	Xylenes (total)	NA	---	NA	---	NA
			(Total)	---	1.9E-15	---	1.9E-15		(Total)	---	1.2E-10	---	1.2E-10
	Vapors	Eastern Parcel (Outdoors)											
			1,4-Dichlorobenzene	---	7.8E-20	---	7.8E-20	1,4-Dichlorobenzene	kidney	---	4.3E-17	---	4.3E-17
			Dibenzofuran	---	NA	---	NA	Dibenzofuran	kidney	---	NA	---	NA
			Naphthalene	---	NA	---	NA	Naphthalene	NA	---	3.5E-14	---	3.5E-14
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	---	NA	---	NA
			Acetone	---	NA	---	NA	Acetone	kidney, liver	---	NA	---	NA
			Benzene	---	5.1E-19	---	5.1E-19	Benzene	blood	---	3.1E-14	---	3.1E-14
			Chloroethane	---	NA	---	NA	Chloroethane	developmental	---	2.6E-17	---	2.6E-17
			Ethylbenzene	---	NA	---	NA	Ethylbenzene	kidney, liver	---	4.0E-16	---	4.0E-16
			Methylene chloride	---	2.2E-20	---	2.2E-20	Methylene chloride	liver	---	4.4E-17	---	4.4E-17
			Toluene	---	NA	---	NA	Toluene	NA	---	1.8E-15	---	1.8E-15
			Trichloroethene	---	2.1E-20	---	2.1E-20	Trichloroethene	NA	---	NA	---	NA
			Vinyl chloride	---	4.3E-19	---	4.3E-19	Vinyl chloride	liver	---	NA	---	NA
			Xylenes (total)	---	NA	---	NA	Xylenes (total)	NA	---	NA	---	NA
			(Total)	---	1.1E-18	---	1.1E-18		(Total)	---	6.8E-14	---	6.8E-14
			Total Risk Across Liquid Waste				1.9E-15	Total Hazard Index Across Liquid Waste					1.2E-10
			Total Risk Across All Media and All Exposure Routes				3.8E-06	Total Hazard Index Across All Media and All Exposure Routes					4.9E-01

Total Skin HI =	4.4E-03
Total Circulatory System HI =	4.4E-03
Total Kidney HI =	2.2E-02
Total Liver HI =	1.2E-06

TABLE 9.7.RME

SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs

REASONABLE MAXIMUM EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel

Scenario Timeframe: Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
												Total Development HI =	4.7E-14
												Total Blood HI =	3.9E-03

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Eastern Parcel											
			Antimony	NA	---	NA	NA	Antimony	blood	1.8E-02	---	NA	1.8E-02
			Arsenic	9.7E-08	---	4.0E-09	1.0E-07	Arsenic	skin, circulatory system	1.5E-02	---	6.2E-04	1.6E-02
			Cadmium	NA	---	NA	NA	Cadmium	kidney	NA	---	NA	NA
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	1.5E-04	---	NA	1.5E-04
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	2.5E-03	---	NA	2.5E-03
			Copper	NA	---	NA	NA	Copper	gastrointestinal system	3.5E-03	---	NA	3.5E-03
			Cyanide	NA	---	NA	NA	Cyanide	NA	1.9E-03	---	NA	1.9E-03
			Mercury	NA	---	NA	NA	Mercury	kidney	1.1E-03	---	NA	1.1E-03
			Nickel	NA	---	NA	NA	Nickel	NA	1.7E-03	---	NA	1.7E-03
			Vanadium	NA	---	NA	NA	Vanadium	kidney	NA	---	NA	NA
			Zinc	NA	---	NA	NA	Zinc	blood	8.8E-04	---	NA	8.8E-04
			Benzo(a)pyrene	1.6E-07	---	2.8E-08	1.9E-07	Benzo(a)pyrene	NA	NA	---	NA	NA
			Benzo(b)fluoranthene	1.7E-08	---	3.1E-09	2.1E-08	Benzo(b)fluoranthene	NA	NA	---	NA	NA
			Dibenz(a,h)anthracene	2.4E-08	---	4.4E-09	2.9E-08	Dibenz(a,h)anthracene	NA	NA	---	NA	NA
			1,2-Dichloroethene (total)	NA	---	NA	NA	1,2-Dichloroethene (total)	liver	5.9E-06	---	NA	5.9E-06
			Trichloroethene	3.9E-11	---	NA	3.9E-11	Trichloroethene	NA	NA	---	NA	NA
			(Total)	3.0E-07	---	4.0E-08	3.4E-07		(Total)	4.5E-02	---	6.2E-04	4.5E-02
	Particulates	Eastern Parcel											
			Antimony	---	NA	---	NA	Antimony	blood	---	6.8E-06	---	6.8E-06
			Arsenic	---	1.0E-10	---	1.0E-10	Arsenic	skin, circulatory system	---	NA	---	NA
			Cadmium	---	3.0E-10	---	3.0E-10	Cadmium	kidney	---	1.3E-05	---	1.3E-05
			Chromium III	---	NA	---	NA	Chromium III	NOEL	---	1.5E-02	---	1.5E-02
			Chromium VI	---	3.2E-09	---	3.2E-09	Chromium VI	NOEL	---	4.9E-03	---	4.9E-03
			Copper	---	NA	---	NA	Copper	gastrointestinal system	---	NA	---	NA
			Cyanide	---	NA	---	NA	Cyanide	NA	---	NA	---	NA
			Mercury	---	NA	---	NA	Mercury	kidney	---	4.0E-08	---	4.0E-08
			Nickel	---	NA	---	NA	Nickel	NA	---	NA	---	NA
			Vanadium	---	NA	---	NA	Vanadium	kidney	---	NA	---	NA
			Zinc	---	NA	---	NA	Zinc	blood	---	NA	---	NA
			Benzo(a)pyrene	---	7.1E-12	---	7.1E-12	Benzo(a)pyrene	NA	---	NA	---	NA
			Benzo(b)fluoranthene	---	7.8E-13	---	7.8E-13	Benzo(b)fluoranthene	NA	---	NA	---	NA
			Dibenz(a,h)anthracene	---	1.1E-12	---	1.1E-12	Dibenz(a,h)anthracene	NA	---	NA	---	NA
			1,2-Dichloroethene (total)	---	NA	---	NA	1,2-Dichloroethene (total)	liver	---	NA	---	NA
			Trichloroethene	---	2.3E-15	---	2.3E-15	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	3.6E-09	---	3.6E-09		(Total)	---	2.0E-02	---	2.0E-02

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Vapors	Eastern Parcel (Outdoors)	1,2-Dichloroethene (total)	---	NA	---	NA	1,2-Dichloroethene (total)	liver	---	NA	---	NA
			Trichloroethene	---	1.2E-07	---	1.2E-07	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	1.2E-07	---	1.2E-07		(Total)	---	---	---	---
			Total Risk Across Surface/Subsurface Soil				**4.6E-07**		**Total Hazard Index Across Surface/Subsurface Soil**				**6.5E-02**
Solid Waste	Solid Waste	Eastern Parcel	Aluminum	NA	---	NA	NA	Aluminum	CNS	NA	---	NA	NA
			Antimony	NA	---	NA	NA	Antimony	blood	9.0E-02	---	NA	9.0E-02
			Arsenic	1.1E-06	---	4.7E-08	1.2E-06	Arsenic	skin, circulatory system	1.8E-01	---	7.3E-03	1.8E-01
			Barium	NA	---	NA	NA	Barium	NA	NA	---	NA	NA
			Cadmium	NA	---	NA	NA	Cadmium	kidney	NA	---	NA	NA
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	2.0E-03	---	NA	2.0E-03
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	9.9E-02	---	NA	9.9E-02
			Copper	NA	---	NA	NA	Copper	gastrointestinal system	7.0E-01	---	NA	7.0E-01
			Mercury	NA	---	NA	NA	Mercury	CNS	1.5E-02	---	NA	1.5E-02
			Nickel	NA	---	NA	NA	Nickel	NA	2.0E-02	---	NA	2.0E-02
			Thallium	NA	---	NA	NA	Thallium	liver, blood, hair	NA	---	NA	NA
			Vanadium	NA	---	NA	NA	Vanadium	hair	NA	---	NA	NA
			Zinc	NA	---	NA	NA	Zinc	kidney	3.0E-02	---	NA	3.0E-02
			4,4'-DDD	1.6E-07	---	6.4E-09	1.6E-07	4,4'-DDD	NA	NA	---	NA	NA
			4,4'-DDE	4.8E-08	---	2.0E-09	5.0E-08	4,4'-DDE	NA	NA	---	NA	NA
			4,4'-DDT	5.7E-08	---	2.4E-09	5.9E-08	4,4'-DDT	liver	2.3E-02	---	9.7E-04	2.4E-02
			Aroclor-1248	1.5E-08	---	2.8E-09	1.7E-08	Aroclor-1248	immune system, growth	1.0E-02	---	2.0E-03	1.2E-02
			Aroclor-1254	6.9E-08	---	1.3E-08	8.2E-08	Aroclor-1254	immune system, growth	4.8E-02	---	9.3E-03	5.8E-02
			Aroclor-1260	6.8E-08	---	1.3E-08	8.1E-08	Aroclor-1260	immune system, growth	4.8E-02	---	9.2E-03	5.7E-02
			Dieldrin	1.9E-08	---	2.6E-09	2.1E-08	Dieldrin	liver	1.6E-03	---	2.2E-04	1.8E-03
			Benz(a)anthracene	6.1E-06	---	1.1E-06	7.2E-06	Benz(a)anthracene	NA	NA	---	NA	NA
			Benzo(a)pyrene	3.9E-05	---	7.0E-06	4.6E-05	Benzo(a)pyrene	NA	NA	---	NA	NA
			Benzo(b)fluoranthene	6.6E-06	---	1.2E-06	7.8E-06	Benzo(b)fluoranthene	NA	NA	---	NA	NA
			Benzo(k)fluoranthene	2.4E-07	---	4.4E-08	2.9E-07	Benzo(k)fluoranthene	NA	NA	---	NA	NA
			bis(2-Ethylhexyl)phthalate	8.4E-07	---	1.2E-07	9.5E-07	bis(2-Ethylhexyl)phthalate	liver	NA	---	NA	NA
			Carbazole	3.5E-08	---	4.8E-09	4.0E-08	Carbazole	NA	NA	---	NA	NA
			Chrysene	6.1E-08	---	1.1E-08	7.2E-08	Chrysene	NA	NA	---	NA	NA
			Di-n-octyl phthalate	NA	---	NA	NA	Di-n-octyl phthalate	NA	5.2E-02	---	7.2E-03	5.9E-02
			Dibenz(a,h)anthracene	6.4E-06	---	1.1E-06	7.5E-06	Dibenz(a,h)anthracene	NA	NA	---	NA	NA
			Fluoranthene	NA	---	NA	NA	Fluoranthene	liver	3.8E-03	---	6.8E-04	4.5E-03
			Indeno(1,2,3-cd)pyrene	2.3E-06	---	4.1E-07	2.7E-06	Indeno(1,2,3-cd)pyrene	NA	NA	---	NA	NA
			Phenanthrene	NA	---	NA	NA	Phenanthrene	NA	NA	---	NA	NA
			Pyrene	NA	---	NA	NA	Pyrene	kidney	3.9E-03	---	7.0E-04	4.6E-03
			(Total)	6.3E-05	---	1.1E-05	7.4E-05		(Total)	1.3E+00	---	3.7E-02	1.4E+00

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Solid Waste	Particulates	Eastern Parcel											
			Aluminum	---	NA	---	NA	Aluminum	CNS	---	NA	---	NA
			Antimony	---	NA	---	NA	Antimony	blood	---	3.5E-05	---	3.5E-05
			Arsenic	---	1.2E-09	---	1.2E-09	Arsenic	skin, circulatory system	---	NA	---	NA
			Barium	---	NA	---	NA	Barium	NA	---	8.5E-05	---	8.5E-05
			Cadmium	---	6.4E-10	---	6.4E-10	Cadmium	kidney	---	2.7E-05	---	2.7E-05
			Chromium III	---	NA	---	NA	Chromium III	NOEL	---	1.9E-01	---	1.9E-01
			Chromium VI	---	1.3E-07	---	1.3E-07	Chromium VI	NOEL	---	1.9E-01	---	1.9E-01
			Copper	---	NA	---	NA	Copper	gastrointestinal system	---	NA	---	NA
			Mercury	---	NA	---	NA	Mercury	CNS	---	5.5E-07	---	5.5E-07
			Nickel	---	NA	---	NA	Nickel	NA	---	NA	---	NA
			Thallium	---	NA	---	NA	Thallium	liver, blood, hair	---	NA	---	NA
			Vanadium	---	NA	---	NA	Vanadium	hair	---	NA	---	NA
			Zinc	---	NA	---	NA	Zinc	blood	---	NA	---	NA
			4,4'-DDD	---	NA	---	NA	4,4'-DDD	NA	---	NA	---	NA
			4,4'-DDE	---	NA	---	NA	4,4'-DDE	kidney	---	NA	---	NA
			4,4'-DDT	---	6.0E-12	---	6.0E-12	4,4'-DDT	liver	---	NA	---	NA
			Aroclor-1248	---	1.5E-12	---	1.5E-12	Aroclor-1248	immune system, growth	---	NA	---	NA
			Aroclor-1254	---	7.3E-12	---	7.3E-12	Aroclor-1254	immune system, growth	---	NA	---	NA
			Aroclor-1260	---	7.2E-12	---	7.2E-12	Aroclor-1260	immune system, growth	---	NA	---	NA
			Dieldrin	---	2.0E-12	---	2.0E-12	Dieldrin	liver	---	NA	---	NA
			Benz(a)anthracene	---	2.7E-10	---	2.7E-10	Benz(a)anthracene	NA	---	NA	---	NA
			Benzo(a)pyrene	---	1.8E-09	---	1.8E-09	Benzo(a)pyrene	NA	---	NA	---	NA
			Benzo(b)fluoranthene	---	3.0E-10	---	3.0E-10	Benzo(b)fluoranthene	NA	---	NA	---	NA
			Benzo(k)fluoranthene	---	1.1E-11	---	1.1E-11	Benzo(k)fluoranthene	NA	---	NA	---	NA
			bis(2-Ethylhexyl)phthalate	---	8.9E-11	---	8.9E-11	bis(2-Ethylhexyl)phthalate	liver	---	NA	---	NA
			Carbazole	---	NA	---	NA	Carbazole	NA	---	NA	---	NA
			Chrysene	---	2.7E-12	---	2.7E-12	Chrysene	NA	---	NA	---	NA
			Di-n-octyl phthalate	---	NA	---	NA	Di-n-octyl phthalate	NA	---	NA	---	NA
			Dibenz(a,h)anthracene	---	2.9E-10	---	2.9E-10	Dibenz(a,h)anthracene	NA	---	NA	---	NA
			Fluoranthene	---	NA	---	NA	Fluoranthene	liver	---	NA	---	NA
			Indeno(1,2,3-cd)pyrene	---	1.0E-10	---	1.0E-10	Indeno(1,2,3-cd)pyrene	NA	---	NA	---	NA
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	---	NA	---	NA
			Pyrene	---	NA	---	NA	Pyrene	kidney	---	NA	---	NA
			(Total)	---	1.3E-07	---	1.3E-07		(Total)	---	3.8E-01	---	3.8E-01
	Vapors	Eastern Parcel (Outdoors)											
			2-Methylnaphthalene	---	NA	---	NA	2-Methylnaphthalene	NA	---	NA	---	NA
			Anthracene	---	NA	---	NA	Anthracene	NOEL	---	NA	---	NA
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	---	NA	---	NA
			(Total)	---	---	---	---		(Total)	---	---	---	---

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future Receptor Population: Construction Worker Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
				Total Risk Across Solid Waste			7.5E-05		Total Hazard Index Across Solid Waste				1.7E+00

TABLE 9.8 RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Liquid Waste	Liquid Waste	Eastern Parcel											
			Aluminum	---	---	NA	NA	Aluminum	CNS	---	---	NA	NA
			Antimony	---	---	NA	NA	Antimony	blood	---	---	2.5E-02	2.5E-02
			Arsenic	---	---	1.1E-08	1.1E-08	Arsenic	skin, circulatory system	---	---	1.8E-03	1.8E-03
			Barium	---	---	NA	NA	Barium	NA	---	---	NA	NA
			Cadmium	---	---	NA	NA	Cadmium	kidney	---	---	NA	NA
			Chromium III	---	---	NA	NA	Chromium III	NOEL	---	---	2.8E-02	2.8E-02
			Chromium VI	---	---	NA	NA	Chromium VI	NOEL	---	---	1.5E+00	1.5E+00
			Copper	---	---	NA	NA	Copper	gastrointestinal system	---	---	3.6E-03	3.6E-03
			Manganese	---	---	NA	NA	Manganese	CNS	---	---	NA	NA
			Mercury	---	---	NA	NA	Mercury	CNS	---	---	1.2E-03	1.2E-03
			Nickel	---	---	NA	NA	Nickel	NA	---	---	4.8E-04	4.8E-04
			Thallium	---	---	NA	NA	Thallium	liver, blood, hair	---	---	NA	NA
			Vanadium	---	---	NA	NA	Vanadium	hair	---	---	NA	NA
			Zinc	---	---	NA	NA	Zinc	blood	---	---	3.6E-04	3.6E-04
			4,4'-DDD	---	---	6.9E-07	6.9E-07	4,4'-DDD	NA	---	---	NA	NA
			4,4'-DDE	---	---	5.5E-07	5.5E-07	4,4'-DDE	NA	---	---	NA	NA
			4,4'-DDT	---	---	1.4E-06	1.4E-06	4,4'-DDT	liver	---	---	5.9E-01	5.9E-01
			Aroclor-1260	---	---	4.3E-05	4.3E-05	Aroclor-1260	immune system, growth	---	---	3.0E+01	3.0E+01
			Endrin aldehyde	---	---	NA	NA	Endrin aldehyde	kidney	---	---	NA	NA
			Heptachlor epoxide	---	---	1.2E-08	1.2E-08	Heptachlor epoxide	liver	---	---	7.3E-03	7.3E-03
			1,4-Dichlorobenzene	---	---	2.3E-09	2.3E-09	1,4-Dichlorobenzene	kidney	---	---	NA	NA
			4-Methylphenol	---	---	NA	NA	4-Methylphenol	NA	---	---	3.5E-03	3.5E-03
			Benz(a)anthracene	---	---	NA	NA	Benz(a)anthracene	NA	---	---	NA	NA
			Benzo(a)pyrene	---	---	5.3E-04	5.3E-04	Benzo(a)pyrene	NA	---	---	NA	NA
			Benzo(b)fluoranthene	---	---	8.6E-05	8.6E-05	Benzo(b)fluoranthene	NA	---	---	NA	NA
			Benzo(k)fluoranthene	---	---	3.6E-06	3.6E-06	Benzo(k)fluoranthene	NA	---	---	NA	NA
			bis(2-Ethylhexyl)phthalate	---	---	3.0E-07	3.0E-07	bis(2-Ethylhexyl)phthalate	liver	---	---	NA	NA
			Carbazole	---	---	8.8E-09	8.8E-09	Carbazole	NA	---	---	NA	NA
			Chrysene	---	---	4.1E-07	4.1E-07	Chrysene	NA	---	---	NA	NA
			Dibenz(a,h)anthracene	---	---	2.4E-04	2.4E-04	Dibenz(a,h)anthracene	NA	---	---	NA	NA
			Dibenzofuran	---	---	NA	NA	Dibenzofuran	kidney	---	---	NA	NA
			Indeno(1,2,3-cd)pyrene	---	---	5.8E-05	5.8E-05	Indeno(1,2,3-cd)pyrene	NA	---	---	NA	NA
			Naphthalene	---	---	NA	NA	Naphthalene	NA	---	---	NA	NA
			Pentachlorophenol	---	---	1.7E-06	1.7E-06	Pentachlorophenol	liver, kidney	---	---	3.2E-02	3.2E-02
			Phenanthrene	---	---	NA	NA	Phenanthrene	NA	---	---	NA	NA
			Pyrene	---	---	NA	NA	Pyrene	kidney	---	---	6.2E-03	6.2E-03
			Acetone	---	---	NA	NA	Acetone	kidney, liver	---	---	6.5E-07	6.5E-07
			Benzene	---	---	7.1E-09	7.1E-09	Benzene	blood	---	---	3.0E-04	3.0E-04
			Chloroethane	---	---	2.0E-10	2.0E-10	Chloroethane	developmental	---	---	NA	NA
			Ethylbenzene	---	---	NA	NA	Ethylbenzene	kidney, liver	---	---	5.2E-04	5.2E-04

TABLE 9.8.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future Receptor Population: Construction Worker Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
			Methylene chloride	---	---	1.6E-10	1.6E-10	Methylene chloride	liver	---	---	2.4E-05	2.4E-05
Liquid Waste	Liquid Waste	Eastern Parcel	Toluene	---	---	NA	NA	Toluene	kidney,liver	---	---	3.9E-05	3.9E-05
			Trichloroethene	---	---	2.5E-10	2.5E-10	Trichloroethene	NA	---	---	NA	NA
			Vinyl chloride	---	---	6.3E-09	6.3E-09	Vinyl chloride	liver	---	---	NA	NA
			Xylenes (total)	---	---	NA	NA	Xylenes (total)	NA	---	---	NA	NA
			(Total)	---	---	9.7E-04	9.7E-04		(Total)	---	---	3.2E+01	3.2E+01
	Vapors	Eastern Parcel (Outdoors)	1,4-Dichlorobenzene	---	1.6E-19	---	1.6E-19	1,4-Dichlorobenzene	kidney	---	2.0E-16	---	2.0E-16
			Dibenzofuran	---	NA	---	NA	Dibenzofuran	kidney	---	NA	---	NA
			Naphthalene	---	NA	---	NA	Naphthalene	NA	---	NA	---	NA
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	---	NA	---	NA
			Acetone	---	NA	---	NA	Acetone	kidney, liver	---	NA	---	NA
			Benzene	---	1.0E-18	---	1.0E-18	Benzene	blood	---	1.1E-12	---	1.1E-12
			Chloroethane	---	NA	---	NA	Chloroethane	developmental	---	1.3E-15	---	1.3E-15
			Ethylbenzene	---	NA	---	NA	Ethylbenzene	kidney, liver	---	2.0E-14	---	2.0E-14
			Methylene chloride	---	4.5E-20	---	4.5E-20	Methylene chloride	liver	---	2.2E-15	---	2.2E-15
			Toluene	---	NA	---	NA	Toluene	NA	---	NA	---	NA
			Trichloroethene	---	4.3E-20	---	4.3E-20	Trichloroethene	NA	---	NA	---	NA
			Vinyl chloride	---	8.5E-19	---	8.5E-19	Vinyl chloride	liver	---	NA	---	NA
			Xylenes (total)	---	NA	---	NA	Xylenes (total)	NA	---	NA	---	NA
			(Total)	---	2.1E-18	---	2.1E-18		(Total)	---	1.1E-12	---	1.1E-12
				Total Risk Across Liquid Waste			9.7E-04		Total Hazard Index Across Liquid Waste				3.2E+01
				Total Risk Across All Media and All Exposure Routes			1.0E-03		Total Hazard Index Across All Media and All Exposure Routes				3.4E+01

Total Skin HI =	2.0E-01
Total Circulatory System HI =	2.0E-01
Total Kidney HI =	7.5E-02
Total Liver HI =	6.6E-01
Total Blood HI =	1.3E-01
Total GI System HI =	7.1E-01
Total Immune System HI =	3.0E+01
Total Growth HI =	3.0E+01
Total Hair HI =	NA
Total Development HI =	1.3E-15
Total CNS HI =	1.6E-02

TABLE 9.9.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas

Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Groundwater Child	Offsite Residential Area (Tap)	Aluminum	NA	---	NA	NA	Aluminum	CNS	5.10E-01	---	NA	5.1E-01
			Arsenic	3.46E-05	---	7.24E-08	3.5E-05	Arsenic	skin, circulatory system	8.98E-01	---	1.88E-03	9.0E-01
			Cadmium	NA	---	NA	NA	Cadmium	kidney	3.22E+01	---	2.70E+00	3.5E+01
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	2.40E-02	---	3.86E-03	2.8E-02
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	5.37E+00	---	3.36E+00	8.7E+00
			Manganese	NA	---	NA	NA	Manganese	CNS	4.74E+01	---	2.48E+00	5.0E+01
			Dieldrin	1.79E-05	---	8.23E-06	2.6E-05	Dieldrin	liver	2.61E-01	---	1.20E-01	3.8E-01
			Heptachlor epoxide	3.61E-06	---	1.20E-06	4.8E-06	Heptachlor epoxide	liver	3.56E-01	---	1.18E-01	4.7E-01
			bis(2-Ethylhexyl)phthalate	1.10E-06	---	6.71E-07	1.8E-06	bis(2-Ethylhexyl)phthalate	liver	4.60E-02	---	2.79E-02	7.4E-02
			Phenol	NA	---	NA	NA	Phenol	NA	8.52E-04	---	2.12E-05	8.7E-04
			1,1,1-Trichloroethane	NA	---	NA	NA	1,1,1-Trichloroethane	liver	3.79E-03	---	3.75E-04	4.2E-03
			1,1-Dichloroethane	NA	---	NA	NA	1,1-Dichloroethane	NOEL	1.02E-02	---	4.24E-04	1.1E-02
			1,1-Dichloroethene	3.07E-05	---	2.26E-06	3.3E-05	1,1-Dichloroethene	liver	6.63E-02	---	4.88E-03	7.1E-02
			Chlorobenzene	NA	---	NA	NA	Chlorobenzene	liver	8.95E-02	---	1.87E-02	1.1E-01
			cis-1,2-Dichloroethene	NA	---	NA	NA	cis-1,2-Dichloroethene	blood	3.20E-01	---	1.47E-02	3.3E-01
			Tetrachloroethene	2.95E-06	---	1.02E-06	4.0E-06	Tetrachloroethene	liver	6.62E-02	---	2.28E-02	8.9E-02
			Trichloroethene	3.58E-06	---	3.28E-07	3.9E-06	Trichloroethene	NA	6.65E-02	---	6.10E-03	7.3E-02
			Vinyl chloride	8.81E-04	---	2.44E-05	9.1E-04	Vinyl chloride	liver	1.08E+00	---	3.00E-02	1.1E+00
			(Total for Child)	9.8E-04	---	3.8E-05	1.0E-03		(Total for Child)	8.9E+01	---	8.9E+00	9.8E+01
	Groundwater Adult	Offsite Residential Area (Tap)	Aluminum	NA	---	NA	NA	Aluminum	CNS	1.09E-01	---	NA	1.1E-01
			Arsenic	2.97E-05	---	1.56E-07	3.0E-05	Arsenic	skin, circulatory system	1.92E-01	---	1.01E-03	1.9E-01
			Cadmium	NA	---	NA	NA	Cadmium	kidney	6.90E+00	---	1.45E+00	8.4E+00
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	5.14E-03	---	2.08E-03	7.2E-03
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	4.31E+00	---	1.81E+00	6.1E+00
			Manganese	NA	---	NA	NA	Manganese	CNS	1.02E+01	---	1.34E+00	1.1E+01
			Dieldrin	1.54E-05	---	1.78E-05	3.3E-05	Dieldrin	liver	5.60E-02	---	6.47E-02	1.2E-01
			Heptachlor epoxide	3.09E-06	---	2.59E-06	5.7E-06	Heptachlor epoxide	liver	7.62E-02	---	6.38E-02	1.4E-01
			bis(2-Ethylhexyl)phthalate	9.47E-07	---	1.45E-06	2.4E-06	bis(2-Ethylhexyl)phthalate	liver	9.86E-03	---	1.51E-02	2.5E-02
			Phenol	NA	---	NA	NA	Phenol	NA	1.83E-04	---	1.14E-05	1.9E-04
			1,1,1-Trichloroethane	NA	---	NA	NA	1,1,1-Trichloroethane	liver	8.12E-04	---	2.02E-04	1.0E-03
			1,1-Dichloroethane	NA	---	NA	NA	1,1-Dichloroethane	NOEL	2.19E-03	---	2.29E-04	2.4E-03
			1,1-Dichloroethene	2.63E-05	---	4.87E-06	3.1E-05	1,1-Dichloroethene	liver	1.42E-02	---	2.63E-03	1.7E-02
			Chlorobenzene	NA	---	NA	NA	Chlorobenzene	liver	1.92E-02	---	1.01E-02	2.9E-02
			cis-1,2-Dichloroethene	NA	---	NA	NA	cis-1,2-Dichloroethene	blood	6.85E-02	---	7.93E-03	7.6E-02
			Tetrachloroethene	2.53E-06	---	2.19E-06	4.7E-06	Tetrachloroethene	liver	1.42E-02	---	1.23E-02	2.6E-02
			Trichloroethene	3.06E-06	---	7.07E-07	3.8E-06	Trichloroethene	NA	1.43E-02	---	3.29E-03	1.8E-02
			Vinyl chloride	7.55E-04	---	5.26E-05	8.1E-04	Vinyl chloride	liver	2.32E-01	---	1.62E-02	2.5E-01
			(Total for Adult)	8.4E-04	---	8.2E-05	9.2E-04		(Total for Adult)	2.2E+01	---	4.8E+00	2.7E+01

TABLE 9.9.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas
Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Groundwater Adult+Child	Offsite Residential Area (Tap)	Aluminum	NA	---	NA	NA						
			Arsenic	6.4E-05	---	2.3E-07	6.5E-05						
			Barium	NA	---	NA	NA						
			Beryllium	NA	---	NA	NA						
			Cadmium	NA	---	NA	NA						
			Chromium III	NA	---	NA	NA						
			Chromium VI	NA	---	NA	NA						
			Manganese	NA	---	NA	NA						
			Dieldrin	3.3E-05	---	2.6E-05	5.9E-05						
			Heptachlor epoxide	6.7E-06	---	3.8E-06	1.0E-05						
			bis(2-Ethylhexyl)phthalate	2.1E-06	---	2.1E-06	4.2E-06						
			Phenol	NA	---	NA	NA						
			1,1,1-Trichloroethane	NA	---	NA	NA						
			1,1-Dichloroethane	NA	---	NA	NA						
			1,1-Dichloroethene	5.7E-05	---	7.1E-06	6.4E-05						
			Chlorobenzene	NA	---	NA	NA						
			cis-1,2-Dichloroethene	NA	---	NA	NA						
			Tetrachloroethene	5.5E-06	---	3.2E-06	8.7E-06						
			Trichloroethene	6.6E-06	---	1.0E-06	7.7E-06						
			Vinyl chloride	1.6E-03	---	7.7E-05	1.7E-03						
			(Total for Child + Adult)	1.8E-03	---	1.2E-04	1.9E-03	NA	NA	NA	NA	NA	NA
	Vapors Child	Offsite Residential Areas (Tap)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	1.9E-04	---	1.9E-04
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	1.8E-03	---	1.8E-03
			1,1-Dichloroethene	---	2.2E-06	---	2.2E-06	1,1-Dichloroethene	liver	---	NA	---	NA
			Chlorobenzene	---	NA	---	NA	Chlorobenzene	liver	---	2.6E-02	---	2.6E-02
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	2.8E-08	---	2.8E-08	Tetrachloroethene	liver	---	1.2E-03	---	1.2E-03
			Trichloroethene	---	4.9E-07	---	4.9E-07	Trichloroethene	NA	---	NA	---	NA
			Vinyl Chloride	---	3.5E-05	---	3.5E-05	Vinyl Chloride	liver	---	NA	---	NA
			(Total for Child)	---	3.8E-05	---	3.8E-05		(Total for Child)	---	3.0E-02	---	3.0E-02

TABLE 9.9.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas
Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors Adult	Offsite Residential Areas (Tap)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	—	2.4E-05	—	2.4E-05
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	—	2.3E-04	—	2.3E-04
			1,1-Dichloroethene	---	1.1E-06	---	1.1E-06	1,1-Dichloroethene	liver	—	NA	---	NA
			Chlorobenzene	---	NA	---	NA	Chlorobenzene	liver	—	3.3E-03	---	3.3E-03
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	—	NA	---	NA
			Tetrachloroethene	---	1.4E-08	---	1.4E-08	Tetrachloroethene	liver	—	1.5E-04	---	1.5E-04
			Trichloroethene	---	2.4E-07	---	2.4E-07	Trichloroethene	NA	—	NA	—	NA
			Vinyl Chloride	---	1.7E-05	---	1.7E-05	Vinyl Chloride	liver	—	NA	—	NA
			(Total for Adult)	---	1.9E-05	---	1.9E-05		(Total for Adult)	—	3.7E-03	—	3.7E-03
	Vapors Child + Adult	Offsite Residential Areas (Tap)	1,1,1-Trichloroethane	---	NA	—	NA						
			1,1-Dichloroethane	---	NA	—	NA						
			1,1-Dichloroethene	---	3.3E-06	---	3.3E-06						
			Chlorobenzene	---	NA	---	NA						
			cis-1,2-Dichloroethene	---	NA	---	NA						
			Tetrachloroethene	---	4.2E-08	---	4.2E-08						
			Trichloroethene	---	7.3E-07	—	7.3E-07						
			Vinyl Chloride	---	5.2E-05	---	5.2E-05						
			(Total for Child + Adult)	---	5.6E-05	---	5.6E-05	NA	NA	NA	NA	NA	NA

TABLE 9.9.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas
Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors Child	Offsite Residential Areas (Indoors)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	7.4E-04	---	7.4E-04
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	2.4E-03	---	2.4E-03
			1,1-Dichloroethene	---	1.6E-05	---	1.6E-05	1,1-Dichloroethene	liver	---	NA	---	NA
			Chlorobenzene	---	NA	---	NA	Chlorobenzene	liver	---	1.9E-02	---	1.9E-02
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	1.0E-07	---	1.0E-07	Tetrachloroethene	liver	---	4.2E-03	---	4.2E-03
			Trichloroethene	---	1.1E-06	---	1.1E-06	Trichloroethene	NA	---	NA	---	NA
			Vinyl Chloride	---	3.1E-04	---	3.1E-04	Vinyl Chloride	liver	---	NA	---	NA
			(Total for Child)	---	3.3E-04	---	3.3E-04		(Total for Child)	---	2.6E-02	---	2.6E-02
	Vapors Adult	Offsite Residential Areas (Indoors)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	8.9E-05	---	8.9E-05
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	2.8E-04	---	2.8E-04
			1,1-Dichloroethene	---	9.6E-06	---	9.6E-06	1,1-Dichloroethene	liver	---	NA	---	NA
			Chlorobenzene	---	NA	---	NA	Chlorobenzene	liver	---	2.2E-03	---	2.2E-03
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	5.9E-08	---	5.9E-08	Tetrachloroethene	liver	---	5.0E-04	---	5.0E-04
			Trichloroethene	---	6.5E-07	---	6.5E-07	Trichloroethene	NA	---	NA	---	NA
			Vinyl Chloride	---	1.9E-04	---	1.9E-04	Vinyl Chloride	liver	---	NA	---	NA
			(Total for Adult)	---	2.0E-04	---	2.0E-04		(Total for Adult)	---	3.1E-03	---	3.1E-03
	Vapors Child + Adult	Offsite Residential Areas (Indoors)	1,1,1-Trichloroethane	---	NA	---	NA						
			1,1-Dichloroethane	---	NA	---	NA						
			1,1-Dichloroethene	---	2.6E-05	---	2.6E-05						
			Chlorobenzene	---	NA	---	NA						
			cis-1,2-Dichloroethene	---	NA	---	NA						
			Tetrachloroethene	---	1.6E-07	---	1.6E-07						
			Trichloroethene	---	1.7E-06	---	1.7E-06						
			Vinyl Chloride	---	5.0E-04	---	5.0E-04						
			(Total for Child + Adult)	---	5.3E-04	---	5.3E-04	NA	NA	NA	NA	NA	NA

TABLE 9.9.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas
Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors Child	Offsite Residential Areas (Outdoors)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	1.1E-06	---	1.1E-06
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	4.6E-06	---	4.6E-06
			1,1-Dichloroethene	---	2.2E-08	---	2.2E-08	1,1-Dichloroethene	liver	---	NA	---	NA
			Chlorobenzene	---	NA	---	NA	Chlorobenzene	liver	---	4.7E-05	---	4.7E-05
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	1.6E-10	---	1.6E-10	Tetrachloroethene	liver	---	6.8E-06	---	6.8E-06
			Trichloroethene	---	1.9E-09	---	1.9E-09	Trichloroethene	NA	---	NA	---	NA
			Vinyl Chloride	---	3.7E-07	---	3.7E-07	Vinyl Chloride	liver	---	NA	---	NA
			(Total for Child)	---	4.0E-07	---	4.0E-07		(Total for Child)	---	6.0E-05	---	6.0E-05
	Vapors Adult	Offsite Residential Areas (Outdoors)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	3.0E-07	---	3.0E-07
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	1.3E-06	---	1.3E-06
			1,1-Dichloroethene	---	2.4E-08	---	2.4E-08	1,1-Dichloroethene	liver	---	NA	---	NA
			Chlorobenzene	---	NA	---	NA	Chlorobenzene	liver	---	1.3E-05	---	1.3E-05
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	1.8E-10	---	1.8E-10	Tetrachloroethene	liver	---	1.9E-06	---	1.9E-06
			Trichloroethene	---	2.1E-09	---	2.1E-09	Trichloroethene	NA	---	NA	---	NA
			Vinyl Chloride	---	4.1E-07	---	4.1E-07	Vinyl Chloride	liver	---	NA	---	NA
			(Total for Adult)	---	4.3E-07	---	4.3E-07		(Total for Adult)	---	1.6E-05	---	1.6E-05

TABLE 9.9.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas

Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors Child + Adult	Offsite Residential Areas (Outdoors)											
			1,1,1-Trichloroethane	---	NA	---	NA						
			1,1-Dichloroethane	---	NA	---	NA						
			1,1-Dichloroethene	---	4.6E-08	---	4.6E-08						
			Chlorobenzene	---	NA	---	NA						
			cis-1,2-Dichloroethene	---	NA	---	NA						
			Tetrachloroethene	---	3.4E-10	---	3.4E-10						
			Trichloroethene	---	4.0E-09	---	4.0E-09						
			Vinyl Chloride	---	7.8E-07	---	7.8E-07						
			(Total for Child + Adult)	---	8.3E-07	---	8.3E-07		Total Hazard Index Across Groundwater (Child)				9.8E+01
				Total Risk Across Groundwater			2.5E-03		Total Hazard Index Across Groundwater (Adult)				2.7E+01
			Total Risk Across All Media and All Exposure Routes				2.5E-03		Total Hazard Index Across All Media and All Exposure Routes (Child)				9.8E+01
									Total Hazard Index Across All Media and All Exposure Routes (Adult)				2.7E+01

Total Liver HI (child) =	2.4E+00
Total Liver HI (adult) =	6.1E-01
Total Blood HI (child) =	3.3E-01
Total Blood HI (adult) =	7.6E-02
Total Skin HI (child) =	9.0E-01
Total Skin HI (adult) =	1.9E-01
Total Kidney HI (child) =	3.5E+01
Total Kidney HI (adult) =	8.4E+00
Total Circulatory HI (child) =	9.0E-01
Total Circulatory HI (adult) =	1.9E-01

TABLE 9.10.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Tap)
Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Magothy)	Groundwater Child	Offsite Residential Areas											
			Arsenic	3.1E-05	---	1.0E-07	3.1E-05	Arsenic	skin, circulatory system	8.0E-01	---	2.6E-03	8.0E-01
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	6.9E-04	---	1.8E-04	8.7E-04
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	1.4E+00	---	3.7E-01	1.7E+00
			Manganese	NA	---	NA	NA	Manganese	CNS	3.0E+00	---	2.5E-01	3.2E+00
			1,1-Dichloroethane	NA	---	NA	NA	1,1-Dichloroethane	NOEL	1.6E-02	---	8.0E-04	1.6E-02
			1,1-Dichloroethene	7.3E-05	---	6.7E-06	8.0E-05	1,1-Dichloroethene	liver	1.6E-01	---	1.4E-02	1.7E-01
			1,2-Dichloroethane	8.6E-06	---	2.6E-07	8.9E-06	1,2-Dichloroethane	gastrointestinal system	3.7E-02	---	1.1E-03	3.8E-02
			Benzene	4.8E-06	---	5.2E-07	5.3E-06	Benzene	blood	3.4E-01	---	3.7E-02	3.8E-01
			Carbon tetrachloride	1.4E-06	---	2.5E-07	1.7E-06	Carbon tetrachloride	liver	1.8E-01	---	3.2E-02	2.1E-01
			cis-1,2-Dichloroethene	NA	---	NA	NA	cis-1,2-Dichloroethene	blood	2.9E-01	---	1.7E-02	3.1E-01
			Tetrachloroethene	6.2E-06	---	2.6E-06	8.8E-06	Tetrachloroethene	liver	1.4E-01	---	5.8E-02	2.0E-01
			Toluene	NA	---	NA	NA	Toluene	kidney,liver	9.6E-03	---	2.4E-03	1.2E-02
			trans-1,2-Dichloroethene	NA	---	NA	NA	trans-1,2-Dichloroethene	blood	1.8E-01	---	1.0E-02	1.9E-01
			Trichloroethene	8.9E-05	---	9.8E-06	9.9E-05	Trichloroethene	NA	1.7E+00	---	1.8E-01	1.8E+00
			(Total for Child)	2.1E-04	---	2.0E-05	2.3E-04		(Total for Child)	8.2E+00	---	9.7E-01	9.2E+00
	Groundwater Adult	Offsite Residential Areas											
			Arsenic	2.6E-05	---	1.4E-07	2.7E-05	Arsenic	skin, circulatory system	1.7E-01	---	8.9E-04	1.7E-01
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	1.5E-04	---	6.0E-05	2.1E-04
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	3.0E-01	---	1.2E-01	4.2E-01
			Manganese	NA	---	NA	NA	Manganese	CNS	6.4E-01	---	8.4E-02	7.3E-01
			1,1-Dichloroethane	NA	---	NA	NA	1,1-Dichloroethane	NOEL	3.3E-03	---	3.4E-04	3.7E-03
			1,1-Dichloroethene	6.3E-05	---	1.2E-05	7.4E-05	1,1-Dichloroethene	liver	3.4E-02	---	6.2E-03	4.0E-02
			1,2-Dichloroethane	7.4E-06	---	4.5E-07	7.8E-06	1,2-Dichloroethane	gastrointestinal system	7.9E-03	---	4.9E-04	8.4E-03
			Benzene	4.1E-06	---	8.8E-07	5.0E-06	Benzene	blood	7.3E-02	---	1.6E-02	8.8E-02
			Carbon tetrachloride	1.2E-06	---	4.5E-07	1.7E-06	Carbon tetrachloride	liver	3.9E-02	---	1.4E-02	5.3E-02
			cis-1,2-Dichloroethene	NA	---	NA	NA	cis-1,2-Dichloroethene	blood	6.3E-02	---	7.2E-03	7.0E-02
			Tetrachloroethene	5.3E-06	---	4.6E-06	9.9E-06	Tetrachloroethene	liver	3.0E-02	---	2.6E-02	5.6E-02
			Toluene	NA	---	NA	NA	Toluene	kidney,liver	2.1E-03	---	1.0E-03	3.1E-03
			trans-1,2-Dichloroethene	NA	---	NA	NA	trans-1,2-Dichloroethene	blood	3.9E-02	---	4.5E-03	4.4E-02
			Trichloroethene	7.6E-05	---	1.7E-05	9.4E-05	Trichloroethene	NA	3.6E-01	---	8.1E-02	4.4E-01
			(Total for Adult)	1.8E-04	---	3.5E-05	2.2E-04		(Total for Adult)	1.8E+00	---	3.7E-01	2.1E+00

TABLE 9 10.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Tap)
Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routas Total
Groundwater (Magothy)	Groundwater Child + Adult	Offsite Residential Areas (Tap)	Arsenic	5.7E-05	---	2.4E-07	5.7E-05						
			Chromium III	NA	---	NA	NA						
			Chromium VI	NA	---	NA	NA						
			Manganese	NA	---	NA	NA						
			1,1-Dichloroethane	NA	---	NA	NA						
			1,1-Dichloroethene	1.4E-04	---	1.8E-05	1.5E-04						
			1,2-Dichloroethane	1.6E-05	---	7.2E-07	1.7E-05						
			Benzene	8.9E-06	---	1.4E-06	1.0E-05						
			Carbon tetrachloride	2.6E-06	---	7.0E-07	3.3E-06						
			cis-1,2-Dichloroethene	NA	---	NA	NA						
			Tetrachloroethene	1.2E-05	---	7.1E-06	1.9E-05						
			Toluene	NA	---	NA	NA						
			trans-1,2-Dichloroethene	NA	---	NA	NA						
			Trichloroethene	1.7E-04	---	2.7E-05	1.9E-04						
			(Total for Child + Adult)	4.0E-04	---	5.6E-05	4.5E-04						
	Vapors Child	Offsite Residential Areas (Tap)	1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	3.3E-03	---	3.3E-03
			1,1-Dichloroethene	---	6.4E-06	---	6.4E-06	1,1-Dichloroethene	liver	---	NA	---	NA
			1,2-Dichloroethane	---	2.6E-06	---	2.6E-06	1,2-Dichloroethane	gastrointestinal system	---	2.4E-01	---	2.4E-01
			Benzene	---	7.1E-07	---	7.1E-07	Benzene	blood	---	1.8E-01	---	1.8E-01
			Carbon tetrachloride	---	1.7E-07	---	1.7E-07	Carbon tetrachloride	liver	---	6.7E-02	---	6.7E-02
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	7.2E-08	---	7.2E-08	Tetrachloroethene	liver	---	3.0E-03	---	3.0E-03
			Toluene	---	NA	---	NA	Toluene	kidney,liver	---	5.0E-03	---	5.0E-03
			trans-1,2-Dichloroethene	---	NA	---	NA	trans-1,2-Dichloroethene	blood	---	NA	---	NA
			Trichloroethene	---	1.5E-05	---	1.5E-05	Trichloroethene	NA	---	NA	---	NA
			(Total for Child)	---	2.5E-05	---	2.5E-05		(Total for Child)	---	4.9E-01	---	4.9E-01

TABLE 9.10.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Tap)
Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Magothy)	Vapors Adult	Offsite Residential Areas (Tap)	1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	2.9E-04	---	2.9E-04
			1,1-Dichloroethene	---	2.2E-06	---	2.2E-06	1,1-Dichloroethene	liver	---	NA	---	NA
			1,2-Dichloroethane	---	8.9E-07	---	8.9E-07	1,2-Dichloroethane	gastrointestinal system	---	2.0E-02	---	2.0E-02
			Benzene	---	2.4E-07	---	2.4E-07	Benzene	blood	---	1.6E-02	---	1.6E-02
			Carbon tetrachloride	---	6.0E-08	---	6.0E-08	Carbon tetrachloride	liver	---	5.8E-03	---	5.8E-03
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	2.5E-08	---	2.5E-08	Tetrachloroethene	liver	---	2.6E-04	---	2.6E-04
			TICs (volatile)	---	NA	---	NA	TICs (volatile)	NA	---	NA	---	NA
			Toluene	---	NA	---	NA	Toluene	kidney,liver	---	4.4E-04	---	4.4E-04
			trans-1,2-Dichloroethene	---	NA	---	NA	trans-1,2-Dichloroethene	blood	---	NA	---	NA
			Trichloroethene	---	5.0E-06	---	5.0E-06	Trichloroethene	NA	---	NA	---	NA
			(Total for Adult)	---	8.5E-06	---	8.5E-06		(Total for Adult)	---	4.3E-02	---	4.3E-02
	Vapors Child + Adult	Offsite Residential Areas (Tap)	1,1-Dichloroethane	---	NA	---	NA						
			1,1-Dichloroethene	---	8.6E-06	---	8.6E-06						
			1,2-Dichloroethane	---	3.5E-06	---	3.5E-06						
			Benzene	---	9.5E-07	---	9.5E-07						
			Carbon tetrachloride	---	2.3E-07	---	2.3E-07						
			cis-1,2-Dichloroethene	---	NA	---	NA						
			Tetrachloroethene	---	9.6E-08	---	9.6E-08						
			TICs (volatile)	---	NA	---	NA						
			Toluene	---	NA	---	NA						
			trans-1,2-Dichloroethene	---	NA	---	NA						
			Trichloroethene	---	2.0E-05	---	2.0E-05						
			(Total for Child + Adult)	---	3.3E-05	---	3.3E-05		Total Hazard Index Across Groundwater (Child)				9.7E+00
				Total Risk Across Groundwater			4.9E-04		Total Hazard Index Across Groundwater (Adult)				2.2E+00
Total Risk Across All Media and All Exposure Routes (Child + Adult)							4.9E-04		Total Hazard Index Across All Media and All Exposure Routes (Child)				9.7E+00
									Total Hazard Index Across All Media and All Exposure Routes (Adult)				2.2E+00

Total Blood HI (child) =	1.1E+00
Total Skin HI (child) =	8.0E-01
Total Circulatory System HI (child) =	8.0E-01
Total CNS HI (child) =	3.2E+00
Total Liver HI (child) =	6.7E-01
Total Kidney HI (child) =	1.7E-02
Total Gastrointestinal HI (child) =	2.7E-01

TABLE 9.10.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Tap)
Scenario Timeframe: Future Receptor Population: Resident Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
												Total Blood HI (adult) =	2.2E-01
												Total Skin HI (adult) =	1.7E-01
												Total Circulatory System HI (adult) =	1.7E-01
												Total CNS HI (adult) =	7.3E-01
												Total Liver HI (adult) =	1.6E-01
												Total Kidney HI (adult) =	3.5E-03
												Total Gastrointestinal HI (adult) =	2.9E-02

TABLE 9.11.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Woodward Parkway School)

Scenario Timeframe: Current
Receptor Population: School Child
Receptor Age: Pre-Adolescent (6-12 years old)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors	Offsite Residential Areas (Woodward Parkway School)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	1.0E-05	---	1.0E-05
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	3.2E-05	---	3.2E-05
			1,1-Dichloroethene	---	2.5E-07	---	2.5E-07	1,1-Dichloroethene	liver	---	NA	---	NA
			Chlorobenzene	---	NA	---	NA	Chlorobenzene	liver	---	2.5E-04	---	2.5E-04
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	1.6E-09	---	1.6E-09	Tetrachloroethene	liver	---	5.7E-05	---	5.7E-05
			Trichloroethene	---	1.7E-08	---	1.7E-08	Trichloroethene	NA	---	NA	---	NA
			Vinyl chloride	---	4.8E-06	---	4.8E-06	Vinyl chloride	liver	---	NA	---	NA
			(Total)	---	5.1E-06	---	5.1E-06		(Total)	---	3.5E-04	---	3.5E-04
				Total Risk Across Groundwater			**5.1E-06**		**Total Hazard Index Across Groundwater**				**3.5E-04**
				Total Risk Across All Media and All Exposure Routes			**5.1E-06**		**Total Hazard Index Across All Media and All Exposure Routes**				**3.5E-04**

Total Liver HI = 3.2E-04

TABLE 9.12.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Woodward Parkway School)

Scenario Timeframe: Current
Receptor Population: School Employee
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors	Offsite Residential Areas (Woodward Parkway School)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	1.1E-05	---	1.1E-05
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	3.6E-05	---	3.6E-05
			1,1-Dichloroethene	---	1.0E-06	---	1.0E-06	1,1-Dichloroethene	liver	---	NA	---	NA
			Chlorobenzene	---	NA	---	NA	Chlorobenzene	liver	---	2.8E-04	---	2.8E-04
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	6.3E-09	---	6.3E-09	Tetrachloroethene	liver	---	6.3E-05	---	6.3E-05
			Trichloroethene	---	6.9E-08	---	6.9E-08	Trichloroethene	NA	---	NA	---	NA
			Vinyl chloride	---	1.9E-05	---	1.9E-05	Vinyl chloride	liver	---	NA	---	NA
			(Total)	---	2.0E-05	---	2.0E-05		(Total)	---	3.9E-04	---	3.9E-04
				Total Risk Across Groundwater			**2.0E-05**		**Total Hazard Index Across Groundwater**				**3.9E-04**
			Total Risk Across All Media and All Exposure Routes				**2.0E-05**	**Total Hazard Index Across All Media and All Exposure Routes**					**3.9E-04**

Total Liver HI = 3.6E-04

TABLE 9.13.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Massapequa Preserve
Scenario Timeframe: Current
Receptor Population: Swimmer
Receptor Age: Pre-Adolescent (6-12 years old)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Massapequa Preserve	Arsenic	1.9E-08	---	1.2E-08	3.0E-08	Arsenic	skin, circulatory system	4.1E-04	---	2.6E-04	6.7E-04
			Cadmium	NA	---	NA	NA	Cadmium	kidney	9.8E-04	---	2.5E-02	2.6E-02
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	7.3E-07	---	3.5E-05	3.6E-05
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	7.1E-04	---	3.6E-02	3.6E-02
			Chloroform	7.9E-12	---	5.7E-11	6.5E-11	Chloroform	liver	1.3E-06	---	9.4E-06	1.1E-05
			Dibromochloromethane	2.9E-10	---	1.0E-09	1.3E-09	Dibromochloromethane	liver	1.7E-06	---	6.0E-06	7.7E-06
			Tetrachloroethene	4.5E-10	---	2.1E-08	2.1E-08	Tetrachloroethene	liver	8.6E-06	---	4.0E-04	4.1E-04
			Trichloroethene	1.9E-10	---	2.6E-09	2.8E-09	Trichloroethene	NA	3.0E-06	---	4.1E-05	4.4E-05
			(Total)	2.0E-08	---	3.6E-08	5.6E-08		(Total)	2.1E-03	---	6.1E-02	6.3E-02
				Total Risk Across Surface Water			**5.6E-08**		**Total Hazard Index Across Surface Water**				**6.3E-02**
Sediment	Sediment	Massapequa Preserve	Aluminum	NA	---	NA	NA	Aluminum	CNS	3.5E-04	---	NA	3.5E-04
			Arsenic	6.3E-08	---	7.1E-09	7.0E-08	Arsenic	skin, circulatory system	1.4E-03	---	1.6E-04	1.6E-03
			Cadmium	NA	---	NA	NA	Cadmium	kidney	1.4E-02	---	2.1E-03	1.6E-02
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	8.9E-06	---	NA	8.9E-06
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	6.0E-03	---	NA	6.0E-03
			Manganese	NA	---	NA	NA	Manganese	CNS	3.9E-03	---	NA	3.9E-03
			Mercury	NA	---	NA	NA	Mercury	CNS	4.4E-05	---	NA	4.4E-05
			Vanadium	NA	---	NA	NA	Vanadium	hair	2.9E-04	---	NA	2.9E-04
			(Total)	6.3E-08	---	7.1E-09	7.0E-08		(Total)	2.6E-02	---	2.3E-03	2.8E-02
				Total Risk Across Sediment			**7.0E-08**		**Total Hazard Index Across Sediment**				**2.8E-02**
				Total Risk Across All Media and All Exposure Routes			**1.3E-07**		**Total Hazard Index Across All Media and All Exposure Routes**				**9.2E-02**

Total Skin HI =	**2.2E-03**
Total Circulatory System HI =	**2.2E-03**
Total Kidney HI =	**4.2E-02**
Total Liver HI =	**4.3E-04**
Total Hair HI =	**2.9E-04**
Total CNS HI =	**4.3E-03**

TABLE 9.14.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Massapequa Preserve
Scenario Timeframe: Current
Receptor Population: Resident Fisher
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Fish Tissue (Child)	Massapequa Preserve	Cadmium	NA	—	---	NA	Cadmium	kidney	9.0E-01	—	---	9.0E-01
			Chromium VI	NA	—	---	NA	Chromium VI	NOEL	2.3E-01	—	---	2.3E-01
	(Child)		(Total Child)	---	—	—	---		(Total Child)	1.1E+00	—	—	1.1E+00
			Total Risk Across Fish Tissue (Child)				**---**		**Total Hazard Index Across Fish Tissue (Child)**				**1.1E+00**
Surface Water	Fish Tissue (Adult)	Massapequa Preserve	Cadmium	NA	—	---	NA	Cadmium	kidney	5.6E-01	—	---	5.6E-01
			Chromium VI	NA	—	—	NA	Chromium VI	NOEL	1.4E-01	—	---	1.4E-01
	(Adult)		(Total Adult)	---	—	—	—		(Total Adult)	7.0E-01	—	---	7.0E-01
			Total Risk Across Fish Tissue (Adult)				**---**		**Total Hazard Index Across Fish Tissue (Adult)**				**7.0E-01**
			Total Risk Across All Media and All Exposure Routes				**---**		**Total Hazard Index Across All Media and All Exposure Routes (Child)**				**1.1E+00**
									Total Hazard Index Across All Media and All Exposure Routes (Adult)				**7.0E-01**

Total Kidney HI (Child) = 9.0E-01
Total Kidney HI (Adult) = 5.6E-01

TABLE 9.15.RME
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Ellsworth Allen Park

Scenario Timeframe: Current
Receptor Population: Recreational User
Receptor Age: Pre-Adolescent/Adolescent (6-18 years old)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Subsurface Soil	Ellsworth Allen Park	Chromium III	NA	---	NA	NA	Chromium III	NOEL	3.3E-06	---	NA	3.3E-06
			Chromium VI	NA	---	NA	NA	Chromium VI	kidney	5.5E-04	---	NA	5.5E-04
			(Total)	---	---	---	---		(Total)	5.6E-04	---	---	5.6E-04
	Particulates	Ellsworth Allen Park	Chromium III	---	NA	---	NA	Chromium III	NOEL	---	4.4E-04	---	4.4E-04
			Chromium VI	---	1.2E-09	---	1.2E-09	Chromium VI	kidney	---	1.5E-04	---	1.5E-04
			(Total)	---	1.2E-09	---	1.2E-09		(Total)	---	5.8E-04	---	5.8E-04
			Total Risk Across Subsurface Soil				1.2E-09		Total Hazard Index Across Subsurface Soil				1.1E-03
			Total Risk Across All Media and All Exposure Routes				1.2E-09		Total Hazard Index Across All Media and All Exposure Routes				1.1E-03

Total Kidney HI = 7.0E-04

TABLE 9.1.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location. Western Parcel

Scenario Timeframe: Current
Receptor Population: Trespassers
Receptor Age: 10-18 years

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Western Parcel											
			Aluminum	NA	---	NA	NA	Aluminum	CNS	6.7E-03	---	NA	6.7E-03
			Antimony	NA	---	NA	NA	Antimony	blood	1.8E-02	---	NA	1.8E-02
			Arsenic	5.6E-07	---	2.2E-07	7.8E-07	Arsenic	skin, circulatory system	9.7E-03	---	3.8E-03	1.3E-02
			Cadmium	NA	---	NA	NA	Cadmium	kidney	6.8E-02	---	3.6E-02	1.0E-01
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	1.8E-04	---	NA	1.8E-04
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	3.0E-02	---	NA	3.0E-02
			Copper	NA	---	NA	NA	Copper	gastrointestinal system	1.4E-02	---	NA	1.4E-02
			Cyanide	NA	---	NA	NA	Cyanide	NA	2.0E-03	---	NA	2.0E-03
			Nickel	NA	---	NA	NA	Nickel	NA	8.3E-04	---	NA	8.3E-04
			Thallium	NA	---	NA	NA	Thallium	liver, blood, hair	1.3E-03	---	NA	1.3E-03
			Zinc	NA	---	NA	NA	Zinc	blood	4.2E-03	---	NA	4.2E-03
			Aroclor-1254	4.3E-08	---	7.8E-08	1.2E-07	Aroclor-1254	immune system, growth	3.3E-03	---	6.1E-03	9.4E-03
			Aroclor-1260	1.9E-08	---	3.5E-08	5.4E-08	Aroclor-1260	immune system, growth	1.5E-03	---	2.7E-03	4.2E-03
			Tetrachloroethene	1.7E-10	---	NA	1.7E-10	Tetrachloroethene	liver	2.6E-06	---	NA	2.6E-06
			(Total)	6.2E-07	---	3.3E-07	9.5E-07		(Total)	1.6E-01	---	4.8E-02	2.1E-01
	Particulates	Western Parcel											
			Aluminum	---	NA	---	NA	Aluminum	CNS	---	2.9E-05	---	2.9E-05
			Antimony	---	NA	---	NA	Antimony	blood	---	NA	---	NA
			Arsenic	---	3.4E-10	---	3.4E-10	Arsenic	skin, circulatory system	---	NA	---	NA
			Cadmium	---	1.7E-09	---	1.7E-09	Cadmium	kidney	---	1.0E-05	---	1.0E-05
			Chromium III	---	NA	---	NA	Chromium III	NOEL	---	NA	---	NA
			Chromium VI	---	2.9E-08	---	2.9E-08	Chromium VI	NOEL	---	1.8E-04	---	1.8E-04
			Copper	---	NA	---	NA	Copper	gastrointestinal system	---	NA	---	NA
			Cyanide	---	NA	---	NA	Cyanide	NA	---	NA	---	NA
			Nickel	---	NA	---	NA	Nickel	NA	---	NA	---	NA
			Thallium	---	NA	---	NA	Thallium	liver, blood, hair	---	NA	---	NA
			Zinc	---	NA	---	NA	Zinc	blood	---	NA	---	NA
			Aroclor-1254	---	2.6E-12	---	2.6E-12	Aroclor-1254	immune system, growth	---	NA	---	NA
			Aroclor-1260	---	1.2E-12	---	1.2E-12	Aroclor-1260	immune system, growth	---	NA	---	NA
			Tetrachloroethene	---	4.0E-16	---	4.0E-16	Tetrachloroethene	liver	---	1.1E-11	---	1.1E-11
			(Total)	---	3.2E-08	---	3.2E-08		(Total)	---	2.2E-04	---	2.2E-04
				Total Risk Across Surface Soil			9.9E-07		Total Hazard Index Across Surface Soil				2.1E-01

TABLE 9.1.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Current
Receptor Population: Trespassers
Receptor Age: 10-18 years

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Vapors	Western Parcel (Outdoors)	Tetrachloroethene	---	4.5E-10	---	4.5E-10	Tetrachloroethene	liver	---	1.3E-05	---	1.3E-05
			Toluene	---	NA	---	NA	Toluene	kidney,liver	---	2.9E-05	---	2.9E-05
			Trichloroethene	---	2.2E-09	---	2.2E-09	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	2.6E-09	---	2.6E-09		(Total)	---	4.1E-05	---	4.1E-05
			Total Risk Across Surface/Subsurface Soil				**2.6E-09**		**Total Hazard Index Across Surface/Subsurface Soil**				**4.1E-05**

TABLE 9.1.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Current Receptor Population: Trespassers Receptor Age: 10-18 years

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors	Western Parcel (Outdoors)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	1.1E-07	---	1.1E-07
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	9.9E-08	---	9.9E-08
			Acetone	---	NA	---	NA	Acetone	kidney, liver	---	NA	---	NA
			Chloroform	---	2.9E-12	---	2.9E-12	Chloroform	liver	---	3.3E-06	---	3.3E-06
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	4.3E-12	---	4.3E-12	Tetrachloroethene	liver	---	1.2E-07	---	1.2E-07
			trans-1,2-Dichloroethene	---	NA	---	NA	trans-1,2-Dichloroethene	blood	---	NA	---	NA
			Trichloroethene	---	8.9E-10	---	8.9E-10	Trichloroethene	NA	—	NA	---	NA
			(Total)	---	8.9E-10	---	8.9E-10		(Total)	---	3.6E-06	---	3.6E-06
				Total Risk Across Groundwater			**8.9E-10**		Total Hazard Index Across Groundwater				**3.6E-06**
				Total Risk Across All Media and All Exposure Routes			**9.9E-07**		Total Hazard Index Across All Media and All Exposure Routes				**2.1E-01**

Total Blood HI =	2.3E-02
Total Skin HI =	1.3E-02
Total Circulatory System HI =	1.3E-02
Total Kidney HI =	1.0E-01
Total GI System HI =	1.4E-02
Total Immune System HI =	1.4E-02
Total Growth HI =	1.4E-02
Total Liver HI =	1.4E-03

TABLE 9.2.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future Receptor Population: Commercial/Industrial Worker Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Western Parcel											
			Aluminum	NA	---	NA	NA	Aluminum	CNS	4.1E-03	---	NA	4.1E-03
			Antimony	NA	---	NA	NA	Antimony	blood	7.3E-03	---	NA	7.3E-03
			Arsenic	3.5E-07	---	1.4E-08	3.6E-07	Arsenic	skin, circulatory system	8.3E-03	---	3.3E-04	8.6E-03
			Cadmium	NA	---	NA	NA	Cadmium	kidney	2.9E-02	---	1.5E-03	3.1E-02
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	1.8E-04	---	NA	1.8E-04
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	2.5E-02	---	NA	2.5E-02
			Copper	NA	---	NA	NA	Copper	gastrointestinal system	9.0E-03	---	NA	9.0E-03
			Cyanide	NA	---	NA	NA	Cyanide	NA	1.9E-03	---	NA	1.9E-03
			Mercury	NA	---	NA	NA	Mercury	CNS	2.9E-04	---	NA	2.9E-04
			Nickel	NA	---	NA	NA	Nickel	NA	2.3E-03	---	NA	2.3E-03
			Silver	NA	---	NA	NA	Silver	NA	1.4E-04	---	NA	1.4E-04
			Zinc	NA	---	NA	NA	Zinc	blood	2.4E-03	---	NA	2.4E-03
			Aroclor-1248	1.8E-08	---	3.3E-09	2.1E-08	Aroclor-1248	immune system, growth	1.9E-03	---	3.4E-04	2.2E-03
			Aroclor-1254	1.9E-07	---	3.4E-08	2.2E-07	Aroclor-1254	immune system, growth	2.0E-02	---	3.6E-03	2.3E-02
			Aroclor-1260	4.9E-08	---	9.1E-09	5.9E-08	Aroclor-1260	immune system, growth	5.2E-03	---	9.7E-04	6.2E-03
			Benzo(a)pyrene	8.0E-08	---	1.4E-08	9.4E-08	Benzo(a)pyrene	NA	NA	---	NA	NA
			Tetrachloroethene	4.7E-11	---	NA	4.7E-11	Tetrachloroethene	liver	9.7E-07	---	NA	9.7E-07
			(Total)	6.8E-07	---	7.4E-08	7.6E-07		(Total)	1.2E-01	---	6.8E-03	1.2E-01
	Particulates	Western Parcel											
			Aluminum	---	NA	---	NA	Aluminum	CNS	---	9.0E-05	---	9.0E-05
			Antimony	---	NA	---	NA	Antimony	blood	---	NA	---	NA
			Arsenic	---	1.1E-09	---	1.1E-09	Arsenic	skin, circulatory system	---	NA	---	NA
			Cadmium	---	2.6E-09	---	2.6E-09	Cadmium	kidney	---	2.2E-05	---	2.2E-05
			Chromium III	---	NA	---	NA	Chromium III	NOEL	---	NA	---	NA
			Chromium VI	---	9.2E-08	---	9.2E-08	Chromium VI	NOEL	---	7.7E-04	---	7.7E-04
			Copper	---	NA	---	NA	Copper	gastrointestinal system	---	NA	---	NA
			Cyanide	---	NA	---	NA	Cyanide	NA	---	NA	---	NA
			Mercury	---	NA	---	NA	Mercury	CNS	---	3.1E-07	---	3.1E-07
			Nickel	---	NA	---	NA	Nickel	NA	---	NA	---	NA
			Silver	---	NA	---	NA	Silver	NA	---	NA	---	NA
			Zinc	---	NA	---	NA	Zinc	blood	---	NA	---	NA
			Aroclor-1248	---	5.3E-12	---	5.3E-12	Aroclor-1248	immune system, growth	---	NA	---	NA
			Aroclor-1254	---	5.7E-11	---	5.7E-11	Aroclor-1254	immune system, growth	---	NA	---	NA
			Aroclor-1260	---	1.5E-11	---	1.5E-11	Aroclor-1260	immune system, growth	---	NA	---	NA
			Benzo(a)pyrene	---	1.0E-11	---	1.0E-11	Benzo(a)pyrene	NA	---	NA	---	NA
			Tetrachloroethene	---	5.5E-16	---	5.5E-16	Tetrachloroethene	liver	---	2.1E-11	---	2.1E-11
			(Total)	---	9.6E-08	---	9.6E-08		(Total)	---	8.9E-04	---	8.9E-04

TABLE 9.2.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Vapors	Western Parcel (Indoors)	Tetrachloroethene	---	1.2E-09	---	1.2E-09	Tetrachloroethene	liver	---	4.6E-05	---	4.6E-05
			Toluene	---	NA	---	NA	Toluene	kidney,liver	---	6.7E-05	---	6.7E-05
			Trichloroethene	---	5.4E-09	---	5.4E-09	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	6.6E-09	---	6.6E-09		(Total)	---	1.1E-04	---	1.1E-04
	Vapors	Western Parcel (Outdoors)	Tetrachloroethene	---	8.7E-10	---	8.7E-10	Tetrachloroethene	liver	---	3.3E-05	---	3.3E-05
			Toluene	---	NA	---	NA	Toluene	kidney,liver	---	7.6E-05	---	7.6E-05
			Trichloroethene	---	4.2E-09	---	4.2E-09	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	5.1E-09	---	5.1E-09		(Total)	---	1.1E-04	---	1.1E-04
			Total Risk Across Surface/Subsurface Soil				**8.7E-07**		**Total Hazard Index Across Surface/Subsurface Soil**				**1.3E-01**

TABLE 9 2.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Groundwater Adult	Western Parcel	Cyanide	NA	---	---	NA	Cyanide	NA	1.3E-01	---	---	1.3E-01
			Aluminum	NA	---	---	NA	Aluminum	CNS	3.3E-02	---	---	3.3E-02
			Arsenic	2.3E-06	---	---	2 3E-06	Arsenic	skin, circulatory system	5.4E-02	---	---	5.4E-02
			Cadmium	NA	---	---	NA	Cadmium	kidney	7.5E+00	---	---	7.5E+00
			Chromium III	NA	---	---	NA	Chromium III	NOEL	2.8E-03	---	---	2.8E-03
			Chromium VI	NA	---	---	NA	Chromium VI	NOEL	1.3E+00	---	---	1.3E+00
			Copper	NA	---	---	NA	Copper	gastrointestinal system	2.7E-02	---	---	2.7E-02
			Manganese	NA	---	---	NA	Manganese	CNS	9.4E-01	---	---	9.4E-01
			Nickel	NA	---	---	NA	Nickel	NA	6.3E-02	---	---	6.3E-02
			Thallium	NA	---	---	NA	Thallium	liver, blood, hair	9.4E-01	---	---	9.4E-01
			alpha-Chlordane	1.0E-08	---	---	1 0E-08	alpha-Chlordane	NA	6.2E-04	---	---	6.2E-04
			dieldrin	4 8E-07	---	---	4 8E-07	dieldrin	liver	6.4E-03	---	---	6.4E-03
			gamma-Chlordane	1.0E-08	---	---	1 0E-08	gamma-Chlordane	NA	6.2E-04	---	---	6.2E-04
			bis(2-Ethylhexyl)phthalate	2 6E-06	---	---	2.6E-06	bis(2-Ethylhexyl)phthalate	liver	9.9E-02	---	---	9.9E-02
			Chrysene	1.3E-08	---	---	1.3E-08	Chrysene	NA	NA	---	---	NA
			Pentachlorophenol	8.6E-07	---	---	8 6E-07	Pentachlorophenol	liver, kidney	2.5E-03	---	---	2.5E-03
			1,1,1-Trichloroethane	NA	---	---	NA	1,1,1-Trichloroethane	liver	3.5E-03	---	---	3.5E-03
			1,1-Dichloroethane	NA	---	---	NA	1,1-Dichloroethane	NOEL	2.2E-03	---	---	2.2E-03
			Acetone	NA	---	---	NA	Acetone	kidney, liver	1.6E-02	---	---	1.6E-02
			Chloroform	2.8E-09	---	---	2.8E-09	Chloroform	liver	4.9E-04	---	---	4.9E-04
			cis-1,2-Dichloroethene	NA	---	---	NA	cis-1,2-Dichloroethene	blood	6.5E-01	---	---	6.5E-01
			Tetrachloroethene	5.4E-07	---	---	5.4E-07	Tetrachloroethene	liver	1.1E-02	---	---	1.1E-02
			trans-1,2-Dichloroethene	NA	---	---	NA	trans-1,2-Dichloroethene	blood	3.4E-03	---	---	3.4E-03
			Trichloroethene	1.2E-05	---	---	1.2E-05	Trichloroethene	NA	2.0E-01	---	---	2.0E-01
			(Total)	1 9E-05	---	---	1.9E-05		(Total)	1.2E+01	---	---	1.2E+01
	Vapors	Western Parcel (Indoors)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	7.9E-05	---	7.9E-05
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	5 9E-05	---	5.9E-05
			Acetone	---	NA	---	NA	Acetone	kidney, liver	---	NA	---	NA
			Chloroform	---	1.2E-09	---	1.2E-09	Chloroform	liver	---	1.8E-03	---	1.8E-03
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	2.0E-09	---	2 0E-09	Tetrachloroethene	liver	---	7.8E-05	---	7.8E-05
			trans-1,2-Dichloroethene	---	NA	---	NA	trans-1,2-Dichloroethene	blood	---	NA	---	NA
			Trichloroethene	---	4.2E-07	---	4.2E-07	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	4.2E-07	---	4.2E-07		(Total)	---	2.0E-03	---	2.0E-03

TABLE 9.2.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors	Western Parcel (Outdoors)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	7.8E-07	---	7.8E-07
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	7.2E-07	---	7.2E-07
			Acetone	---	NA	---	NA	Acetone	kidney, liver	---	NA	---	NA
			Chloroform	---	NA	---	NA	Chloroform	liver	---	2.4E-05	---	2.4E-05
			cis-1,2-Dichloroethene	---	1.6E-11	---	1.6E-11	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	NA	---	NA	Tetrachloroethene	liver	---	8.6E-07	---	8.6E-07
			trans-1,2-Dichloroethene	---	NA	---	NA	trans-1,2-Dichloroethene	blood	---	NA	---	NA
			Trichloroethene	---	NA	---	NA	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	3.8E-11	---	3.8E-11		(Total)	---	2.6E-05	---	2.6E-05
Groundwater (Magothy)	Groundwater Adult	Western Parcel	Manganese	NA	---	---	NA	Manganese	CNS	1.0E-02	---	---	1.0E-02
			(Total)	---	---	---	---		(Total)	1.0E-02	---	---	1.0E-02
				Total Risk Across Groundwater			1.9E-05		Total Hazard Index Across Groundwater				1.2E+01
			Total Risk Across All Media and All Exposure Routes				2.0E-05		Total Hazard Index Across All Media and All Exposure Routes				1.2E+01

Total Blood HI =	1.6E+00
Total Skin HI =	6.2E-02
Total Circulatory System HI =	6.2E-02
Total Kidney HI =	7.6E+00
Total GI System HI =	3.6E-02
Total Immune System HI =	3.2E-02
Total Growth HI =	3.2E-02
Total Liver HI =	1.1E+00
Total CNS HI =	9.9E-01

TABLE 9 3.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Western Parcel											
			Aluminum	NA	---	NA	NA	Aluminum	CNS	NA	---	NA	NA
			Antimony	NA	---	NA	NA	Antimony	blood	7.3E-03	---	NA	7.3E-03
			Arsenic	5.3E-08	---	1 1E-09	5.4E-08	Arsenic	skin, circulatory system	8.3E-03	---	1.6E-04	8.4E-03
			Cadmium	NA	---	NA	NA	Cadmium	kidney	NA	---	NA	NA
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	2.6E-04	---	NA	2.6E-04
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	3.8E-03	---	NA	3.8E-03
			Copper	NA	---	NA	NA	Copper	gastrointestinal system	9.0E-03	---	NA	9.0E-03
			Cyanide	NA	---	NA	NA	Cyanide	NA	1.9E-03	---	NA	1.9E-03
			Mercury	NA	---	NA	NA	Mercury	CNS	2.9E-04	---	NA	2.9E-04
			Nickel	NA	---	NA	NA	Nickel	NA	2.3E-03	---	NA	2.3E-03
			Silver	NA	---	NA	NA	Silver	NA	1.4E-04	---	NA	1.4E-04
			Zinc	NA	---	NA	NA	Zinc	blood	2.4E-03	---	NA	2.4E-03
			Aroclor-1248	2.7E-09	---	2 5E-10	2.9E-09	Aroclor-1248	immune system, growth	1.9E-03	---	1.7E-04	2.0E-03
			Aroclor-1254	2.8E-08	---	2 6E-09	3.1E-08	Aroclor-1254	immune system, growth	2.0E-02	---	1.8E-03	2.2E-02
			Aroclor-1260	7.5E-09	---	6.9E-10	8.2E-09	Aroclor-1260	immune system, growth	5.2E-03	---	4.8E-04	5.7E-03
			Benzo(a)pyrene	1.2E-08	---	1.0E-09	1.3E-08	Benzo(a)pyrene	NA	NA	---	NA	NA
			Tetrachloroethene	7.2E-12	---	NA	7.2E-12	Tetrachloroethene	liver	9.7E-08	---	NA	9.7E-08
			(Total)	1.0E-07	---	5.6E-09	1.1E-07		(Total)	6.2E-02	---	2.6E-03	6.5E-02
	Particulates	Western Parcel											
			Aluminum	---	NA	---	NA	Aluminum	CNS	---	NA	---	NA
			Antimony	---	NA	---	NA	Antimony	blood	---	8.0E-06	---	8.0E-06
			Arsenic	---	1.6E-10	---	1.6E-10	Arsenic	skin, circulatory system	---	NA	---	NA
			Cadmium	---	4 0E-10	---	4.0E-10	Cadmium	kidney	---	1.7E-05	---	1.7E-05
			Chromium III	---	NA	---	NA	Chromium III	NOEL	---	7.3E-02	---	7.3E-02
			Chromium VI	---	1.4E-08	---	1.4E-08	Chromium VI	NOEL	---	2.1E-02	---	2.1E-02
			Copper	---	NA	---	NA	Copper	gastrointestinal system	---	NA	---	NA
			Cyanide	---	NA	---	NA	Cyanide	NA	---	NA	---	NA
			Mercury	---	NA	---	NA	Mercury	CNS	---	3.1E-08	---	3 1E-08
			Nickel	---	NA	---	NA	Nickel	NA	---	NA	---	NA
			Silver	---	NA	---	NA	Silver	NA	---	NA	---	NA
			Zinc	---	NA	---	NA	Zinc	blood	---	NA	---	NA
			Aroclor-1248	---	8 1E-13	---	8.1E-13	Aroclor-1248	immune system, growth	---	NA	---	NA
			Aroclor-1254	---	8.6E-12	---	8.6E-12	Aroclor-1254	immune system, growth	---	NA	---	NA
			Aroclor-1260	---	2 3E-12	---	2.3E-12	Aroclor-1260	immune system, growth	---	NA	---	NA
			Benzo(a)pyrene	---	1.6E-12	---	1 6E-12	Benzo(a)pyrene	NA	---	NA	---	NA
			Tetrachloroethene	---	8.4E-17	---	8.4E-17	Tetrachloroethene	liver	---	NA	---	NA
			(Total)	---	1.4E-08	---	1.4E-08		(Total)	---	9.4E-02	---	9.4E-02

TABLE 9.3 CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Vapors	Western Parcel (Outdoors)	Tetrachloroethene	---	6.6E-09	---	6.6E-09	Tetrachloroethene	liver	---	NA	---	NA
			Toluene	---	NA	---	NA	Toluene	kidney,liver	---	NA	---	NA
			Trichloroethene	---	3.2E-08	---	3.2E-08	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	3.9E-08	---	3.9E-08		(Total)	---	---	---	---
			Total Risk Across Surface/Subsurface Soil				**1.6E-07**		Total Hazard Index Across Surface/Subsurface Soil				**1.6E-01**
Groundwater (Upper Glacial)	Vapors	Western Parcel (Outdoors)	1,1,1-Trichloroethane	---	1.2E-20	---	1.2E-20	1,1,1-Trichloroethane	liver	---	1.6E-07	---	1.6E-07
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	2.0E-07	---	2.0E-07
			Acetone	---	NA	---	NA	Acetone	kidney, liver	---	NA	---	NA
			Chloroform	---	8.1E-20	---	8.1E-20	Chloroform	liver	---	4.8E-06	---	4.8E-06
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	NA	---	NA	Tetrachloroethene	liver	---	NA	---	NA
			trans-1,2-Dichloroethene	---	NA	---	NA	trans-1,2-Dichloroethene	blood	---	NA	---	NA
			Trichloroethene	---	3.4E-21	---	3.4E-21	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	1.0E-19	---	1.0E-19		(Total)	---	5.1E-06	---	5.1E-06
			Total Risk Across Groundwater				**1.0E-19**		Total Hazard Index Across Groundwater				**5.1E-06**
			Total Risk Across All Media and All Exposure Routes				**1.6E-07**		Total Hazard Index Across All Media and All Exposure Routes				**1.6E-01**

Total Blood HI =	**9.7E-03**
Total Skin HI =	**8.4E-03**
Total Circulatory System HI =	**8.4E-03**
Total Kidney HI =	**1.7E-05**
Total GI System HI =	**9.0E-03**
Total Immune System HI =	**2.9E-02**
Total Growth HI =	**2.9E-02**
Total Liver HI =	**5.0E-06**
Total CNS HI =	**2.9E-04**

TABLE 9.4.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Pre-Adolescent/Adolescent (6-18 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Western Parcel											
			Aluminum	NA	---	NA	NA	Aluminum	CNS	1.7E-03	---	1.7E-03	3.3E-03
			Antimony	NA	---	NA	NA	Antimony	blood	2.9E-03	---	2.9E-03	5.9E-03
			Arsenic	2.8E-07	---	6.6E-09	2.9E-07	Arsenic	skin, circulatory system	3.3E-03	---	3.3E-03	6.7E-03
			Cadmium	NA	---	NA	NA	Cadmium	kidney	1.2E-02	---	1.2E-02	2.4E-02
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	7.1E-05	---	7.1E-05	1.4E-04
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	1.0E-02	---	1.0E-02	2.1E-02
			Copper	NA	---	NA	NA	Copper	gastrointestinal system	3.6E-03	---	3.6E-03	7.3E-03
			Cyanide	NA	---	NA	NA	Cyanide	NA	7.7E-04	---	7.7E-04	1.5E-03
			Mercury	NA	---	NA	NA	Mercury	CNS	1.2E-04	---	1.2E-04	2.4E-04
			Nickel	NA	---	NA	NA	Nickel	NA	9.2E-04	---	9.2E-04	1.8E-03
			Silver	NA	---	NA	NA	Silver	NA	5.7E-05	---	5.7E-05	1.1E-04
			Zinc	NA	---	NA	NA	Zinc	blood	9.7E-04	---	9.7E-04	1.9E-03
			Aroclor-1248	1.4E-08	---	1.6E-09	1.6E-08	Aroclor-1248	immune system, growth	7.5E-04	---	7.5E-04	1.5E-03
			Aroclor-1254	1.5E-07	---	1.6E-08	1.6E-07	Aroclor-1254	immune system, growth	8.0E-03	---	8.0E-03	1.6E-02
			Aroclor-1260	3.9E-08	---	4.4E-09	4.4E-08	Aroclor-1260	immune system, growth	2.1E-03	---	2.1E-03	4.2E-03
			Benzo(a)pyrene	6.4E-08	---	6.6E-09	7.0E-08	Benzo(a)pyrene	NA	NA	---	NA	NA
			Tetrachloroethene	3.8E-11	---	NA	3.8E-11	Tetrachloroethene	liver	3.9E-07	---	3.9E-07	7.8E-07
			(Total)	5.4E-07	---	3.6E-08	5.8E-07		(Total)	4.7E-02	---	4.7E-02	9.5E-02
	Particulates	Western Parcel											
			Aluminum	---	NA	---	NA	Aluminum	CNS	---	4.5E-06	---	4.5E-06
			Antimony	---	NA	---	NA	Antimony	blood	---	NA	---	NA
			Arsenic	---	1.0E-10	---	1.0E-10	Arsenic	skin, circulatory system	---	NA	---	NA
			Cadmium	---	2.6E-10	---	2.6E-10	Cadmium	kidney	---	1.1E-06	---	1.1E-06
			Chromium III	---	NA	---	NA	Chromium III	NOEL	---	NA	---	NA
			Chromium VI	---	9.0E-09	---	9.0E-09	Chromium VI	NOEL	---	3.8E-05	---	3.8E-05
			Copper	---	NA	---	NA	Copper	gastrointestinal system	---	NA	---	NA
			Cyanide	---	NA	---	NA	Cyanide	NA	---	NA	---	NA
			Mercury	---	NA	---	NA	Mercury	CNS	---	1.5E-08	---	1.5E-08
			Nickel	---	NA	---	NA	Nickel	NA	---	NA	---	NA
			Silver	---	NA	---	NA	Silver	NA	---	NA	---	NA
			Zinc	---	NA	---	NA	Zinc	blood	---	NA	---	NA
			Aroclor-1248	---	5.2E-13	---	5.2E-13	Aroclor-1248	immune system, growth	---	NA	---	NA
			Aroclor-1254	---	5.5E-12	---	5.5E-12	Aroclor-1254	immune system, growth	---	NA	---	NA
			Aroclor-1260	---	1.5E-12	---	1.5E-12	Aroclor-1260	immune system, growth	---	NA	---	NA
			Benzo(a)pyrene	---	1.0E-12	---	1.0E-12	Benzo(a)pyrene	NA	---	NA	---	NA
			Tetrachloroethene	---	5.4E-17	---	5.4E-17	Tetrachloroethene	liver	---	1.0E-12	---	1.0E-12
			(Total)	---	9.4E-09	---	9.4E-09		(Total)	---	4.4E-05	---	4.4E-05

TABLE 9.4.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Pre-Adolescent/Adolescent (6-18 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Vapors	Western Parcel (Outdoors)	Tetrachloroethene	---	6.6E-10	---	6.6E-10	Tetrachloroethene	liver	---	1.3E-05	---	1.3E-05
			Toluene	---	NA	---	NA	Toluene	kidney,liver	---	2.9E-05	---	2.9E-05
			Trichloroethene	---	3.2E-09	---	3.2E-09	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	3.8E-09	---	3.8E-09		(Total)	---	4.2E-05	---	4.2E-05
			Total Risk Across Surface/Subsurface Soil				**5.9E-07**		Total Hazard Index Across Surface/Subsurface Soil				**9.5E-02**
Groundwater (Upper Glacial)	Vapors	Western Parcel (Outdoors)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	1.6E-07	---	1.6E-07
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	1.4E-07	---	1.4E-07
			Acetone	---	NA	---	NA	Acetone	kidney, liver	---	NA	---	NA
			Chloroform	---	6.2E-12	---	6.2E-12	Chloroform	liver	---	4.8E-06	---	4.8E-06
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	8.9E-12	---	8.9E-12	Tetrachloroethene	liver	---	1.7E-07	---	1.7E-07
			trans-1,2-Dichloroethene	---	NA	---	NA	trans-1,2-Dichloroethene	blood	---	NA	---	NA
			Trichloroethene	---	1.9E-09	---	1.9E-09	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	1.9E-09	---	1.9E-09		(Total)	---	5.2E-06	---	5.2E-06
			Total Risk Across Groundwater				**1.9E-09**		Total Hazard Index Across Groundwater				**5.2E-06**
			Total Risk Across All Media and All Exposure Routes				**6.0E-07**		Total Hazard Index Across All Media and All Exposure Routes				**9.5E-02**

Total Blood HI =	**7.8E-03**
Total Skin HI =	**6.7E-03**
Total Circulatory System HI =	**6.7E-03**
Total Kidney HI =	**2.4E-02**
Total GI System HI =	**7.3E-03**
Total Immune System HI =	**2.2E-02**
Total Growth HI =	**2.2E-02**
Total Liver HI =	**4.7E-05**
Total CNS HI =	**3.6E-03**

TABLE 9.5 CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Current Receptor Population: Trespasser Receptor Age: 10-18 years

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Solid Waste	Vapors	Eastern Parcel (Outdoors)	2-Methylnaphthalene	---	NA	---	NA	2-Methylnaphthalene	NA	---	5.8E-05	---	5.8E-05
			Anthracene	---	NA	---	NA	Anthracene	NOEL	---	NA	---	NA
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	---	NA	---	NA
			(Total)	---	---	---	---	(Total)	(Total)	---	5.76E-05	---	5.8E-05
				Total Risk Across Solid Waste			---		**Total Hazard Index Across Solid Waste**				**5.8E-05**
Liquid Waste	Vapors	Eastern Parcel (Outdoors)	1,4-Dichlorobenzene	---	7.9E-21	---	7.9E-21	1,4-Dichlorobenzene	kidney	---	1.2E-17	---	1.2E-17
			Naphthalene	---	NA	---	NA	Naphthalene	NA	---	9.8E-15	---	9.8E-15
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	---	NA	---	NA
			Acetone	---	NA	---	NA	Acetone	kidney, liver	---	NA	---	NA
			Benzene	---	5.2E-20	---	5.2E-20	Benzene	blood	---	8.7E-15	---	8.7E-15
			Chloroethane	---	NA	---	NA	Chloroethane	developmental	---	7.5E-18	---	7.5E-18
			Ethylbenzene	---	NA	---	NA	Ethylbenzene	kidney, liver	---	1.1E-16	---	1.1E-16
			Methylene chloride	---	2.3E-21	---	2.3E-21	Methylene chloride	liver	---	1.2E-17	---	1.2E-17
			Toluene	---	NA	---	NA	Toluene	kidney,liver	---	5.1E-16	---	5.1E-16
			Trichloroethene	---	2.2E-21	---	2.2E-21	Trichloroethene	NA	---	NA	---	NA
			Vinyl chloride	---	4.3E-20	---	4.3E-20	Vinyl chloride	liver	---	NA	---	NA
			Xylenes (total)	---	NA	---	NA	Xylenes (total)	NA	---	NA	---	NA
			(Total)	---	1.1E-19	---	1.1E-19	(Total)	(Total)	---	1.9E-14	---	1.9E-14
				Total Risk Across Liquid Waste			**1.1E-19**		**Total Hazard Index Across Liquid Waste**				**1.9E-14**
			Total Risk Across All Media and All Exposure Routes				**1.1E-19**	**Total Hazard Index Across All Media and All Exposure Routes**					**5.8E-05**

Total Liver HI =	**6.3E-16**
Total Development HI =	**7.5E-18**
Total Blood HI =	**8.7E-15**
Total Kidney HI =	**6.3E-16**

TABLE 9.6.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel

Scenario Timeframe: Current
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Solid Waste	Vapors	Eastern Parcel (Indoors)											
			2-Methylnaphthalene	---	NA	---	NA	2-Methylnaphthalene	NA	---	7.9E-05	---	7.9E-05
			Anthracene	---	NA	---	NA	Anthracene	NOEL	---	NA	---	NA
			Phenanthrene	—	NA	---	NA	Phenanthrene	NA	---	NA	—	NA
			(Total)	—	---	---	---	(Total)	(Total)	—	7.92E-05	—	7.9E-05
				Total Risk Across Solid Waste			---		**Total Hazard Index Across Solid Waste**				**7.9E-05**
				Total Risk Across All Media and All Exposure Routes			---		**Total Hazard Index Across All Media and All Exposure Routes**				**7.9E-05**

TABLE 9 7.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel

Scenario Timeframe: Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Eastern Parcel											
			Antimony	NA	---	NA	NA	Antimony	blood	3.7E-03	---	NA	3.7E-03
			Arsenic	1.3E-07	---	5.3E-09	1.4E-07	Arsenic	skin, circulatory system	3.2E-03	---	1.2E-04	3.3E-03
			Cadmium	NA	---	NA	NA	Cadmium	kidney	1.3E-02	---	6.9E-04	1.4E-02
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	2.1E-05	---	NA	2.1E-05
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	3.5E-03	---	NA	3.5E-03
			Copper	NA	---	NA	NA	Copper	gastrointestinal system	7.4E-04	---	NA	7.4E-04
			Cyanide	NA	---	NA	NA	Cyanide	NA	4.0E-04	---	NA	4.0E-04
			Mercury	NA	---	NA	NA	Mercury	CNS	2.3E-04	---	NA	2.3E-04
			Nickel	NA	---	NA	NA	Nickel	NA	3.6E-04	---	NA	3.6E-04
			Vanadium	NA		NA	NA	Vanadium	hair	6.1E-04	---	NA	6.1E-04
			Zinc	NA	---	NA	NA	Zinc	blood	1.8E-04	---	NA	1.8E-04
			Benzo(a)pyrene	2.2E-07	---	3.8E-08	2.6E-07	Benzo(a)pyrene	NA	NA	---	NA	NA
			Benzo(b)fluoranthene	2.4E-08	---	4.1E-09	2.8E-08	Benzo(b)fluoranthene	NA	NA	---	NA	NA
			Dibenz(a,h)anthracene	3.4E-08	---	5.8E-09	3.9E-08	Dibenz(a,h)anthracene	NA	NA	---	NA	NA
			1,2-Dichloroethene (total)	NA	---	NA	NA	1,2-Dichloroethene (total)	liver	1.2E-06	---	NA	1.2E-06
			Trichloroethene	5.4E-11	---	NA	5.4E-11	Trichloroethene	NA	9.1E-07	---	NA	9.1E-07
			(Total)	4.1E-07	---	5.3E-08	4.6E-07		(Total)	2.6E-02	---	8.2E-04	2.7E-02
	Particulates	Eastern Parcel											
			Antimony	---	NA	---	NA	Antimony	blood	---	NA	---	NA
			Arsenic	---	4.1E-10	---	4.1E-10	Arsenic	skin, circulatory system	---	NA	---	NA
			Cadmium	---	1.2E-09	---	1.2E-09	Cadmium	kidney	---	1.0E-05	---	1.0E-05
			Chromium III	---	NA	---	NA	Chromium III	NOEL	---	NA	---	NA
			Chromium VI	---	1.3E-08	---	1.3E-08	Chromium VI	NOEL	---	1.1E-04	---	1.1E-04
			Copper	---	NA	---	NA	Copper	gastrointestinal system	---	NA	---	NA
			Cyanide	---	NA	---	NA	Cyanide	NA	---	NA	---	NA
			Mercury	---	NA	---	NA	Mercury	CNS	---	2.4E-07	---	2.4E-07
			Nickel	---	NA	---	NA	Nickel	NA	---	NA	---	NA
			Vanadium	---	NA	---	NA	Vanadium	hair	---	NA	---	NA
			Zinc	---	NA	---	NA	Zinc	blood	---	NA	---	NA
			Benzo(a)pyrene	---	2.8E-11	---	2.8E-11	Benzo(a)pyrene	NA	---	NA	---	NA
			Benzo(b)fluoranthene	---	3.1E-12	---	3.1E-12	Benzo(b)fluoranthene	NA	---	NA	---	NA
			Dibenz(a,h)anthracene	---	4.3E-12	---	4.3E-12	Dibenz(a,h)anthracene	NA	---	NA	---	NA
			1,2-Dichloroethene (total)	---	NA	---	NA	1,2-Dichloroethene (total)	liver	---	NA	---	NA
			Trichloroethene	---	NA	---	NA	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	1.4E-08	---	1.4E-08		(Total)	---	1.2E-04	---	1.2E-04

TABLE 9.7.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel

Scenario Timeframe: Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Vapors	Eastern Parcel (Indoors)	1,2-Dichloroethene (total)	---	NA	---	NA	1,2-Dichloroethene (total)	liver	---	NA	---	NA
			Trichloroethene	---	1.3E-08	---	1.3E-08	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	1.3E-08	---	1.3E-08		(Total)	---	---	---	---
	Vapors	Eastern Parcel (Outdoors)	1,2-Dichloroethene (total)	---	NA	---	NA	1,2-Dichloroethene (total)	liver	---	NA	---	NA
			Trichloroethene	---	9.4E-09	---	9.4E-09	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	9.4E-09	---	9.4E-09		(Total)	---	---	---	---
			Total Risk Across Surface/Subsurface Soil				5.0E-07		Total Hazard Index Across Surface/Subsurface Soil				2.7E-02
Solid Waste	Vapors	Eastern Parcel (Indoors)	2-Methylnaphthalene	---	NA	---	NA	2-Methylnaphthalene	NA	---	2.7E-01	---	2.7E-01
			Anthracene	---	NA	---	NA	Anthracene	NOEL	---	NA	---	NA
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	---	NA	---	NA
			(Total)	---	---	---	---		(Total)	---	2.7E-01	---	2.7E-01
	Vapors	Eastern Parcel (Outdoors)	2-Methylnaphthalene	---	NA	---	NA	2-Methylnaphthalene	NA	---	1.5E-04	---	1.5E-04
			Anthracene	---	NA	---	NA	Anthracene	NOEL	---	NA	---	NA
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	---	NA	---	NA
			(Total)	---	---	---	---		(Total)	---	1.5E-04	---	1.5E-04
			Total Risk Across Solid Waste				NA		Total Hazard Index Across Solid Waste				2.7E-01

TABLE 9.7.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location. Eastern Parcel
Scenario Timeframe: Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Liquid Waste	Vapors	Eastern Parcel (Indoors)	1,4-Dichlorobenzene	---	2.2E-17	---	2.2E-17	1,4-Dichlorobenzene	kidney	---	4.6E-14	---	4.6E-14
			Naphthalene	---	NA	---	NA	Naphthalene	NA	---	3.7E-11	---	3.7E-11
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	---	NA	---	NA
			Acetone	---	NA	---	NA	Acetone	kidney, liver	---	NA	---	NA
			Benzene	---	1.4E-16	---	1.4E-16	Benzene	blood	---	3.3E-11	---	3.3E-11
			Chloroethane	---	NA	---	NA	Chloroethane	developmental	---	2.8E-14	---	2.8E-14
			Ethylbenzene	---	NA	---	NA	Ethylbenzene	kidney, liver	---	4.3E-13	---	4.3E-13
			Methylene chloride	---	6.3E-18	---	6.3E-18	Methylene chloride	liver	---	4.7E-14	---	4.7E-14
			Toluene	---	NA	---	NA	Toluene	kidney,liver	---	1.9E-12	---	1.9E-12
			Trichloroethene	---	6.0E-18	---	6.0E-18	Trichloroethene	NA	---	NA	---	NA
			Vinyl chloride	---	1.2E-16	---	1 2E-16	Vinyl chloride	liver	---	NA	---	NA
			Xylenes (total)	—	NA	---	NA	Xylenes (total)	NA	---	NA	---	NA
			(Total)	---	3.0E-16	---	3.0E-16		(Total)	---	7.3E-11	—	7.3E-11
	Vapors	Eastern Parcel (Outdoors)	1,4-Dichlorobenzene	—	1.2E-20	—	1 2E-20	1,4-Dichlorobenzene	kidney	---	2.6E-17	---	2.6E-17
			Naphthalene	—	NA	—	NA	Naphthalene	NA	---	2.1E-14	---	2.1E-14
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	---	NA	---	NA
			Acetone	---	NA	---	NA	Acetone	kidney, liver	---	NA	---	NA
			Benzene	—	8.1E-20	---	8.1E-20	Benzene	blood	---	1.9E-14	—	1.9E-14
			Chloroethane	---	NA	---	NA	Chloroethane	developmental	---	1.6E-17	---	1.6E-17
			Ethylbenzene	---	NA	---	NA	Ethylbenzene	kidney, liver	---	2.4E-16	—	2.4E-16
			Methylene chloride	---	3.5E-21	---	3.5E-21	Methylene chloride	liver	---	2.7E-17	---	2.7E-17
			Toluene	---	NA	---	NA	Toluene	kidney,liver	---	1.1E-15	---	1.1E-15
			Trichloroethene	---	3.4E-21	---	3.4E-21	Trichloroethene	NA	---	NA	—	NA
			Vinyl chloride	---	6.7E-20	---	6.7E-20	Vinyl chloride	liver	---	NA	---	NA
			Xylenes (total)	---	NA	---	NA	Xylenes (total)	NA	---	NA	---	NA
			(Total)	---	1.7E-19	---	1.7E-19		(Total)	---	4.1E-14	—	4.1E-14
				Total Risk Across Liquid Waste			3.0E-16		Total Hazard Index Across Liquid Waste				7.3E-11
				Total Risk Across All Media and All Exposure Routes			5.0E-07		Total Hazard Index Across All Media and All Exposure Routes				3.0E-01

Total Skin HI =	3.3E-03
Total Circulatory System HI =	3.3E-03
Total Kidney HI =	1.4E-02
Total Liver HI =	1.2E-06
Total Development HI =	2.8E-14
Total Blood HI =	3.9E-03
Total CNS HI =	2.3E-04

TABLE 9.8.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Eastern Parcel											
			Antimony	NA	---	NA	NA	Antimony	blood	3.7E-03	---	NA	3.7E-03
			Arsenic	2.0E-08	---	4.0E-10	2.1E-08	Arsenic	skin, circulatory system	3.2E-03	---	6.2E-05	3.2E-03
			Cadmium	NA	---	NA	NA	Cadmium	kidney	NA	---	NA	NA
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	3.2E-05	---	NA	3.2E-05
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	5.3E-04	---	NA	5.3E-04
			Copper	NA	---	NA	NA	Copper	gastrointestinal system	7.4E-04	---	NA	7.4E-04
			Cyanide	NA	---	NA	NA	Cyanide	NA	4.0E-04	---	NA	4.0E-04
			Mercury	NA	---	NA	NA	Mercury	CNS	2.3E-04	---	NA	2.3E-04
			Nickel	NA	---	NA	NA	Nickel	NA	3.6E-04	---	NA	3.6E-04
			Vanadium	NA	---	NA	NA	Vanadium	hair	NA	---	NA	NA
			Zinc	NA	---	NA	NA	Zinc	blood	1.8E-04	---	NA	1.8E-04
			Benzo(a)pyrene	3.3E-08	---	2.8E-09	3.6E-08	Benzo(a)pyrene	NA	NA	---	NA	NA
			Benzo(b)fluoranthene	3.6E-09	---	3.1E-10	3.9E-09	Benzo(b)fluoranthene	NA	NA	---	NA	NA
			Dibenz(a,h)anthracene	5.1E-09	---	4.4E-10	5.5E-09	Dibenz(a,h)anthracene	NA	NA	---	NA	NA
			1,2-Dichloroethene (total)	NA	---	NA	NA	1,2-Dichloroethene (total)	liver	1.2E-06	---	NA	1.2E-06
			Trichloroethene	NA	---	NA	NA	Trichloroethene	NA	NA	---	NA	NA
			(Total)	6.2E-08	---	4.0E-09	6.6E-08		(Total)	9.3E-03	---	6.2E-05	9.4E-03
	Particulates	Eastern Parcel											
			Antimony	---	NA	---	NA	Antimony	blood	---	4.1E-06	---	4.1E-06
			Arsenic	---	6.2E-11	---	6.2E-11	Arsenic	skin, circulatory system	---	NA	---	NA
			Cadmium	---	1.8E-10	---	1.8E-10	Cadmium	kidney	---	7.7E-06	---	7.7E-06
			Chromium III	---	NA	---	NA	Chromium III	NOEL	---	8.9E-03	---	8.9E-03
			Chromium VI	---	1.9E-09	---	1.9E-09	Chromium VI	NOEL	---	2.9E-03	---	2.9E-03
			Copper	---	NA	---	NA	Copper	gastrointestinal system	---	NA	---	NA
			Cyanide	---	NA	---	NA	Cyanide	NA	---	NA	---	NA
			Mercury	---	NA	---	NA	Mercury	CNS	---	2.4E-08	---	2.4E-08
			Nickel	---	NA	---	NA	Nickel	NA	---	NA	---	NA
			Vanadium	---	NA	---	NA	Vanadium	hair	---	NA	---	NA
			Zinc	---	NA	---	NA	Zinc	blood	---	NA	---	NA
			Benzo(a)pyrene	---	4.3E-12	---	4.3E-12	Benzo(a)pyrene	NA	---	NA	---	NA
			Benzo(b)fluoranthene	---	4.7E-13	---	4.7E-13	Benzo(b)fluoranthene	NA	---	NA	---	NA
			Dibenz(a,h)anthracene	---	6.6E-13	---	6.6E-13	Dibenz(a,h)anthracene	NA	---	NA	---	NA
			1,2-Dichloroethene (total)	---	NA	---	NA	1,2-Dichloroethene (total)	liver	---	NA	---	NA
			Trichloroethene	---	NA	---	NA	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	2.2E-09	---	2.2E-09		(Total)	---	1.2E-02	---	1.2E-02

TABLE 9.8.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Vapors	Eastern Parcel (Outdoors)	1,2-Dichloroethene (total)	---	NA	---	NA	1,2-Dichloroethene (total)	liver	---	NA	---	NA
			Trichloroethene	---	7.1E-08	---	7.1E-08	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	7.1E-08	---	7.1E-08		(Total)	---	---	---	---
			Total Risk Across Surface/Subsurface Soil				**1.4E-07**		**Total Hazard Index Across Surface/Subsurface Soil**				**2.1E-02**

TABLE 9.8.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Solid Waste	Solid Waste	Eastern Parcel											
			Aluminum	NA	---	NA	NA	Aluminum	CNS	NA	---	NA	NA
			Antimony	NA	---	NA	NA	Antimony	blood	1.9E-02	---	NA	1.9E-02
			Arsenic	2.4E-07	---	4.7E-09	2.4E-07	Arsenic	skin, circulatory system	3.7E-02	---	7.3E-04	3.7E-02
			Barium	NA	---	NA	NA	Barium	NA	NA	---	NA	NA
			Cadmium	NA	---	NA	NA	Cadmium	kidney	NA	---	NA	NA
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	4.1E-04	---	NA	4.1E-04
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	2.1E-02	---	NA	2.1E-02
			Copper	NA	---	NA	NA	Copper	gastrointestinal system	1.5E-01	---	NA	1.5E-01
			Mercury	NA	---	NA	NA	Mercury	CNS	3.1E-03	---	NA	3.1E-03
			Nickel	NA	---	NA	NA	Nickel	NA	4.2E-03	---	NA	4.2E-03
			Thallium	NA	---	NA	NA	Thallium	liver, blood, hair	NA	---	NA	NA
			Vanadium	NA	---	NA	NA	Vanadium	hair	NA	---	NA	NA
			Zinc	NA	---	NA	NA	Zinc	blood	6.2E-03	---	NA	6.2E-03
			4,4'-DDD	3.2E-08	---	6.4E-10	3.3E-08	4,4'-DDD	NA	NA	---	NA	NA
			4,4'-DDE	9.9E-09	---	2.0E-10	1.0E-08	4,4'-DDE	NA	NA	---	NA	NA
			4,4'-DDT	1.2E-08	---	2.4E-10	1.2E-08	4,4'-DDT	liver	4.9E-03	---	9.7E-05	5.0E-03
			Aroclor-1248	3.0E-09	---	2.8E-10	3.3E-09	Aroclor-1248	immune system, growth	2.1E-03	---	2.0E-04	2.3E-03
			Aroclor-1254	1.4E-08	---	1.3E-09	1.6E-08	Aroclor-1254	immune system, growth	1.0E-02	---	9.3E-04	1.1E-02
			Aroclor-1260	1.4E-08	---	1.3E-09	1.6E-08	Aroclor-1260	immune system, growth	9.9E-03	---	9.2E-04	1.1E-02
			Dieldrin	3.9E-09	---	2.6E-10	4.1E-09	Dieldrin	liver	3.4E-04	---	2.2E-05	3.6E-04
			Benz(a)anthracene	1.3E-06	---	1.1E-07	1.4E-06	Benz(a)anthracene	NA	NA	---	NA	NA
			Benzo(a)pyrene	8.2E-06	---	7.0E-07	8.9E-06	Benzo(a)pyrene	NA	NA	---	NA	NA
			Benzo(b)fluoranthene	1.4E-06	---	1.2E-07	1.5E-06	Benzo(b)fluoranthene	NA	NA	---	NA	NA
			Benzo(g,h,l)perylene	NA	---	NA	NA	Benzo(g,h,l)perylene	NA	0.0E+00	---	0.0E+00	NA
			Benzo(k)fluoranthene	5.1E-08	---	4.4E-09	5.5E-08	Benzo(k)fluoranthene	NA	NA	---	NA	NA
			bis(2-Ethylhexyl)phthalate	1.7E-07	---	1.2E-08	1.9E-07	bis(2-Ethylhexyl)phthalate	liver	NA	---	NA	NA
			Carbazole	7.3E-09	---	4.8E-10	7.7E-09	Carbazole	NA	NA	---	NA	NA
			Chrysene	1.3E-08	---	1.1E-09	1.4E-08	Chrysene	NA	NA	---	NA	NA
			Di-n-octyl phthalate	NA	---	NA	NA	Di-n-octyl phthalate	NA	1.1E-02	---	7.2E-04	1.2E-02
			Dibenz(a,h)anthracene	1.3E-06	---	1.1E-07	1.4E-06	Dibenz(a,h)anthracene	NA	NA	---	NA	NA
			Fluoranthene	NA	---	NA	NA	Fluoranthene	liver	8.0E-04	---	6.8E-05	8.6E-04
			Indeno(1,2,3-cd)pyrene	4.8E-07	---	4.1E-08	5.2E-07	Indeno(1,2,3-cd)pyrene	NA	NA	---	NA	NA
			Phenanthrene	NA	---	NA	NA	Phenanthrene	NA	NA	---	NA	NA
			Pyrene	NA	---	NA	NA	Pyrene	kidney	8.2E-04	---	7.0E-05	8.9E-04
			(Total)	1.3E-05	---	1.1E-06	1.4E-05		(Total)	2.8E-01	---	3.7E-03	2.8E-01

TABLE 9.8.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Solid Waste	Particulates	Eastern Parcel											
			Aluminum	---	NA	---	NA	Aluminum	CNS	---	NA	---	NA
			Antimony	---	NA	---	NA	Antimony	blood	---	2.1E-05	---	2.1E-05
			Arsenic	---	7.2E-10	---	7.2E-10	Arsenic	skin, circulatory system	---	NA	---	NA
			Barium	---	NA	---	NA	Barium	NA	---	5.1E-05	---	5.1E-05
			Cadmium	---	3.9E-10	---	3.9E-10	Cadmium	kidney	---	1.6E-05	---	1.6E-05
			Chromium III	---	NA	---	NA	Chromium III	NOEL	---	1.1E-01	---	1.1E-01
			Chromium VI	---	7.5E-08	---	7.5E-08	Chromium VI	NOEL	---	1.1E-01	---	1.1E-01
			Copper	---	NA	---	NA	Copper	gastrointestinal system	---	NA	---	NA
			Iron	---	NA	---	NA	Iron	NA	---	NA	---	NA
			Lead	---	NA	---	NA	Lead	NA	---	NA	---	NA
			Mercury	---	NA	---	NA	Mercury	CNS	---	3.3E-07	---	3.3E-07
			Nickel	---	NA	---	NA	Nickel	NA	---	NA	---	NA
			Thallium	---	NA	---	NA	Thallium	liver, blood, hair	---	NA	---	NA
			Vanadium	---	NA	---	NA	Vanadium	hair	---	NA	---	NA
			Zinc	---	NA	---	NA	Zinc	blood	---	NA	---	NA
			4,4'-DDD	---	NA	---	NA	4,4'-DDD	NA	---	NA	---	NA
			4,4'-DDE	---	NA	---	NA	4,4'-DDE	NA	---	NA	---	NA
			4,4'-DDT	---	3.6E-12	---	3.6E-12	4,4'-DDT	liver	---	NA	---	NA
			Aroclor-1248	---	9.2E-13	---	9.2E-13	Aroclor-1248	immune system, growth	---	NA	---	NA
			Aroclor-1254	---	4.4E-12	---	4.4E-12	Aroclor-1254	immune system, growth	---	NA	---	NA
			Aroclor-1260	---	4.3E-12	---	4.3E-12	Aroclor-1260	immune system, growth	---	NA	---	NA
			Dieldrin	---	1.2E-12	---	1.2E-12	Dieldrin	liver	---	NA	---	NA
			Benz(a)anthracene	---	1.6E-10	---	1.6E-10	Benz(a)anthracene	NA	---	NA	---	NA
			Benzo(a)pyrene	---	1.1E-09	---	1.1E-09	Benzo(a)pyrene	NA	---	NA	---	NA
			Benzo(b)fluoranthene	---	1.8E-10	---	1.8E-10	Benzo(b)fluoranthene	NA	---	NA	---	NA
			Benzo(g,h,l)perylene	---	NA	---	NA	Benzo(g,h,l)perylene	NA	---	NA	---	NA
			Benzo(k)fluoranthene	---	6.6E-12	---	6.6E-12	Benzo(k)fluoranthene	NA	---	NA	---	NA
			bis(2-Ethylhexyl)phthalate	---	5.3E-11	---	5.3E-11	bis(2-Ethylhexyl)phthalate	liver	---	NA	---	NA
			Carbazole	---	NA	---	NA	Carbazole	NA	---	NA	---	NA
			Chrysene	---	1.6E-12	---	1.6E-12	Chrysene	NA	---	NA	---	NA
			Di-n-octyl phthalate	---	NA	---	NA	Di-n-octyl phthalate	NA	---	NA	---	NA
			Dibenz(a,h)anthracene	---	1.7E-10	---	1.7E-10	Dibenz(a,h)anthracene	NA	---	NA	---	NA
			Fluoranthene	---	NA	---	NA	Fluoranthene	liver	---	NA	---	NA
			Indeno(1,2,3-cd)pyrene	---	6.2E-11	---	6.2E-11	Indeno(1,2,3-cd)pyrene	NA	---	NA	---	NA
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	---	NA	---	NA
			Pyrene	---	NA	---	NA	Pyrene	kidney	---	NA	---	NA
			(Total)	---	7.8E-08	---	7.8E-08		(Total)	---	2.3E-01	---	2.3E-01

TABLE 9.8.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Solid Waste	Vapors	Eastern Parcel (Outdoors)	2-Methylnaphthalene	---	NA	---	NA	2-Methylnaphthalene	NA	---	NA	---	NA
			Anthracene	---	NA	---	NA	Anthracene	NOEL	---	NA	---	NA
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	---	NA	---	NA
			(Total)	---	---	---	---		(Total)	---	---	---	---
				Total Risk Across Solid Waste			1.4E-05		Total Hazard Index Across Solid Waste				5.1E-01

TABLE 9.8.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Liquid Waste	Liquid Waste	Eastern Parcel											
			Aluminum	---	---	NA	NA	Aluminum	CNS	---	---	NA	NA
			Antimony	---	---	NA	NA	Antimony	blood	---	---	2.5E-02	2.5E-02
			Arsenic	---	---	1.1E-08	1.1E-08	Arsenic	skin, circulatory system	---	---	1.8E-03	1.8E-03
			Barium	---	---	NA	NA	Barium	NA	---	---	NA	NA
			Cadmium	---	---	NA	NA	Cadmium	kidney	---	---	NA	NA
			Chromium III	---	---	NA	NA	Chromium III	NOEL	---	---	2.8E-02	2.8E-02
			Chromium VI	---	---	NA	NA	Chromium VI	NOEL	---	---	1.5E+00	1.5E+00
			Copper	---	---	NA	NA	Copper	gastrointestinal system	---	---	3.6E-03	3.6E-03
			Lead	---	---	NA	NA	Lead	NA	---	---	NA	NA
			Manganese	---	---	NA	NA	Manganese	CNS	---	---	NA	NA
			Mercury	---	---	NA	NA	Mercury	CNS	---	---	1.2E-03	1.2E-03
			Nickel	---	---	NA	NA	Nickel	NA	---	---	4.8E-04	4.8E-04
			Thallium	---	---	NA	NA	Thallium	liver, blood, hair	---	---	NA	NA
			Vanadium	---	---	NA	NA	Vanadium	hair	---	---	NA	NA
			Zinc	---	---	NA	NA	Zinc	blood	---	---	3.6E-04	3.6E-04
			4,4'-DDD	---	---	6.9E-07	6.9E-07	4,4'-DDD	NA	---	---	NA	NA
			4,4'-DDE	---	---	5.5E-07	5.5E-07	4,4'-DDE	NA	---	---	NA	NA
			4,4'-DDT	---	---	1.4E-06	1.4E-06	4,4'-DDT	liver	---	---	5.9E-01	5.9E-01
			Aroclor-1260	---	---	4.3E-05	4.3E-05	Aroclor-1260	immune system, growth	---	---	3.0E+01	3.0E+01
			Endrin aldehyde	---	---	NA	NA	Endrin aldehyde	NA	---	---	NA	NA
			Heptachlor epoxide	---	---	1.2E-08	1.2E-08	Heptachlor epoxide	liver	---	---	7.3E-03	7.3E-03
			1,4-Dichlorobenzene	---	---	2.3E-09	2.3E-09	1,4-Dichlorobenzene	kidney	---	---	NA	NA
			4-Methylphenol	---	---	NA	NA	4-Methylphenol	NA	---	---	3.5E-03	3.5E-03
			Benz(a)anthracene	---	---	3.4E-05	3.4E-05	Benz(a)anthracene	NA	---	---	NA	NA
			Benzo(a)pyrene	---	---	5.3E-04	5.3E-04	Benzo(a)pyrene	NA	---	---	NA	NA
			Benzo(b)fluoranthene	---	---	8.6E-05	8.6E-05	Benzo(b)fluoranthene	NA	---	---	NA	NA
			Benzo(k)fluoranthene	---	---	3.6E-06	3.6E-06	Benzo(k)fluoranthene	NA	---	---	NA	NA
			bis(2-Ethylhexyl)phthalate	---	---	3.0E-07	3.0E-07	bis(2-Ethylhexyl)phthalate	liver	---	---	NA	NA
			Carbazole	---	---	8.8E-09	8.8E-09	Carbazole	NA	---	---	NA	NA
			Chrysene	---	---	4.1E-07	4.1E-07	Chrysene	NA	---	---	NA	NA
			Dibenz(a,h)anthracene	---	---	2.4E-04	2.4E-04	Dibenz(a,h)anthracene	NA	---	---	NA	NA
			Dibenzofuran	---	---	NA	NA	Dibenzofuran	kidney	---	---	NA	NA
			Indeno(1,2,3-cd)pyrene	---	---	5.8E-05	5.8E-05	Indeno(1,2,3-cd)pyrene	NA	---	---	NA	NA
			Naphthalene	---	---	NA	NA	Naphthalene	NA	---	---	NA	NA
			Pentachlorophenol	---	---	1.7E-06	1.7E-06	Pentachlorophenol	liver, kidney	---	---	3.2E-02	3.2E-02
			Phenanthrene	---	---	NA	NA	Phenanthrene	NA	---	---	NA	NA
			Pyrene	---	---	NA	NA	Pyrene	kidney	---	---	6.2E-03	6.2E-03
			Acetone	---	---	NA	NA	Acetone	kidney, liver	---	---	6.5E-07	6.5E-07
			Benzene	---	---	7.1E-09	7.1E-09	Benzene	blood	---	---	3.0E-04	3.0E-04
			Chloroethane	---	---	2.0E-10	2.0E-10	Chloroethane	developmental	---	---	NA	NA

TABLE 9.8.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
.CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Liquid Waste	Liquid Waste	Eastern Parcel	Ethylbenzene	---	—	NA	NA	Ethylbenzene	kidney, liver	---	—	5.2E-04	5.2E-04
			Methylene chloride	---	—	1.6E-10	1.6E-10	Methylene chloride	liver	---	---	2.4E-05	2.4E-05
			Toluene	---	—	NA	NA	Toluene	NA	---	---	3.9E-05	3.9E-05
			Trichloroethene	---	---	2.5E-10	2.5E-10	Trichloroethene	NA	---	---	NA	NA
			Vinyl chloride	—	---	6.3E-09	6.3E-09	Vinyl chloride	liver	---	---	NA	NA
			Xylenes (total)	---	---	NA	NA	Xylenes (total)	NA	---	---	NA	NA
			(Total)	---	—	1.0E-03	1.0E-03		(Total)	---	---	3.2E+01	3.2E+01
	Vapors	Eastern Parcel (Outdoors)	1,4-Dichlorobenzene	---	9.4E-20	—	9.4E-20	1,4-Dichlorobenzene	kidney	---	1.2E-16	—	1.2E-16
			Naphthalene	---	NA	—	NA	Naphthalene	NA	---	NA	—	NA
			Phenanthrene	---	NA	---	NA	Phenanthrene	NA	---	NA	—	NA
			Acetone	---	NA	—	NA	Acetone	kidney, liver	---	NA	---	NA
			Benzene	---	6.1E-19	---	6.1E-19	Benzene	blood	---	6.3E-13	---	6.3E-13
			Chloroethane	---	NA	---	NA	Chloroethane	developmental	---	7.9E-16	---	7.9E-16
			Ethylbenzene	---	NA	---	NA	Ethylbenzene	kidney, liver	---	1.2E-14	—	1.2E-14
			Methylene chloride	---	2.7E-20	—	2.7E-20	Methylene chloride	liver	---	1.3E-15	—	1.3E-15
			Toluene	---	NA	—	NA	Toluene	kidney,liver	---	NA	---	NA
			Trichloroethene	---	2.6E-20	---	2.6E-20	Trichloroethene	NA	---	NA	—	NA
			Vinyl chloride	---	5.1E-19	---	5.1E-19	Vinyl chloride	liver	---	NA	—	NA
			Xylenes (total)	---	NA	—	NA	Xylenes (total)	NA	---	NA	—	NA
			(Total)	---	1.3E-18	—	1.3E-18		(Total)	---	6.5E-13	—	6.5E-13
				Total Risk Across Liquid Waste			1.0E-03		Total Hazard Index Across Liquid Waste				3.2E+01
				Total Risk Across All Media and All Exposure Routes			1.0E-03		Total Hazard Index Across All Media and All Exposure Routes				3.3E+01

Total Skin HI =	4.2E-02
Total Circulatory System HI =	4.2E-02
Total Kidney HI =	4.0E-02
Total Liver HI =	6.3E-01
Total Blood HI =	5.5E-02
Total GI System HI =	1.5E-01
Total Immune System HI =	3.0E+01
Total Growth HI =	3.0E+01
Total Hair HI =	NA
Total Development HI =	7.9E-16
Total CNS HI =	4.6E-03

TABLE 9.9.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas

Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Groundwater (Child)	Offsite Residential Area (Tap)											
			Aluminum	NA	---	NA	NA	Aluminum	CNS	1.89E-01	---	NA	1.9E-01
			Arsenic	1.28E-05	---	4.12E-08	1.3E-05	Arsenic	skin, circulatory system	3.32E-01	---	1.07E-03	3.3E-01
			Cadmium	NA	---	NA	NA	Cadmium	kidney	1.19E+01	---	1.53E+00	1.3E+01
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	8.88E-03	---	2.20E-03	1.1E-02
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	7.44E+00	---	1.91E+00	9.4E+00
			Manganese	NA	---	NA	NA	Manganese	CNS	1.75E+01	---	1.41E+00	1.9E+01
			Dieldrin	6.63E-06	---	6.21E-06	1.3E-05	Dieldrin	liver	9.67E-02	---	9.05E-02	1.9E-01
			Heptachlor epoxide	1.33E-06	---	9.05E-07	2.2E-06	Heptachlor epoxide	liver	1.32E-01	---	8.92E-02	2.2E-01
			bis(2-Ethylhexyl)phthalate	4 09E-07	---	5.06E-07	9.1E-07	bis(2-Ethylhexyl)phthalate	liver	1.70E-02	---	2.11E-02	3.8E-02
			Phenol	NA	---	NA	NA	Phenol	NA	3.15E-04	---	1.60E-05	3.3E-04
			1,1,1-Trichloroethane	NA	---	NA	NA	1,1,1-Trichloroethane	liver	1.40E-03	---	2.83E-04	1.7E-03
			1,1-Dichloroethane	NA	---	NA	NA	1,1-Dichloroethane	NOEL	3.78E-03	---	3.20E-04	4.1E-03
			1,1-Dichloroethene	1.14E-05	---	1.70E-06	1.3E-05	1,1-Dichloroethene	liver	2.45E-02	---	3.68E-03	2.8E-02
			Chlorobenzene	NA	---	NA	NA	Chlorobenzene	liver	3.31E-02	---	1.41E-02	4.7E-02
			cis-1,2-Dichloroethene	NA	---	NA	NA	cis-1,2-Dichloroethene	blood	1.18E-01	---	1.11E-02	1.3E-01
			Tetrachloroethene	1.09E-06	---	7.66E-07	1.9E-06	Tetrachloroethene	liver	2.45E-02	---	1.72E-02	4.2E-02
			Trichloroethene	1.32E-06	---	2.47E-07	1.6E-06	Trichloroethene	NA	2.46E-02	---	4.60E-03	2.9E-02
			Vinyl Chloride	3.26E-04	---	1.79E-05	3.4E-04	Vinyl Chloride	liver	4.00E-01	---	2.20E-02	4.2E-01
			Total (Child)	3.6E-04	---	2.8E-05	3.9E-04		Total (Child)	3.8E+01	---	5.1E+00	4.3E+01

TABLE 9.9.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas
Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Groundwater (Adult)	Offsite Residential Area (Tap)	Aluminum	NA	---	NA	NA	Aluminum	CNS	7.65E-02	---	NA	7.7E-02
			Arsenic	2.60E-06	---	8.42E-09	2.6E-06	Arsenic	skin, circulatory system	1.35E-01	---	4.37E-04	1.4E-01
			Cadmium	NA	---	NA	NA	Cadmium	kidney	4.83E+00	---	6.27E-01	5.5E+00
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	3.60E-03	---	8.98E-04	4.5E-03
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	3.02E+00	---	7.82E-01	3.8E+00
			Manganese	NA	---	NA	NA	Manganese	CNS	7.11E+00	---	5.76E-01	7.7E+00
			Dieldrin	1.34E-06	---	1.46E-06	2.8E-06	Dieldrin	liver	3.92E-02	---	4.25E-02	8.2E-02
			Heptachlor epoxide	2.71E-07	---	2.12E-07	4.8E-07	Heptachlor epoxide	liver	5.34E-02	---	4.19E-02	9.5E-02
			bis(2-Ethylhexyl)phthalate	8.28E-08	---	1.19E-07	2.0E-07	bis(2-Ethylhexyl)phthalate	liver	6.90E-03	---	9.89E-03	1.7E-02
			Phenol	NA	---	NA	NA	Phenol	NA	1.28E-04	---	7.49E-06	1.4E-04
			1,1,1-Trichloroethane	NA	---	NA	NA	1,1,1-Trichloroethane	liver	5.68E-04	---	1.33E-04	7.0E-04
			1,1-Dichloroethane	NA	---	NA	NA	1,1-Dichloroethane	NOEL	1.53E-03	---	1.50E-04	1.7E-03
			1,1-Dichloroethene	2.30E-06	---	4.00E-07	2.7E-06	1,1-Dichloroethene	liver	9.94E-03	---	1.73E-03	1.2E-02
			Chlorobenzene	NA	---	NA	NA	Chlorobenzene	liver	1.34E-02	---	6.63E-03	2.0E-02
			cis-1,2-Dichloroethene	NA	---	NA	NA	cis-1,2-Dichloroethene	blood	4.79E-02	---	5.21E-03	5.3E-02
			Tetrachloroethene	2.21E-07	---	1.80E-07	4.0E-07	Tetrachloroethene	liver	9.93E-03	---	8.07E-03	1.8E-02
			Trichloroethene	2.68E-07	---	5.80E-08	3.3E-07	Trichloroethene	NA	9.98E-03	---	2.16E-03	1.2E-02
			Vinyl Chloride	6.61E-05	---	4.21E-06	7.0E-05	Vinyl Chloride	liver	1.62E-01	---	1.03E-02	1.7E-01
			Total (Adult)	7.3E-05	---	6.6E-06	8.0E-05		Total (Adult)	1.6E+01	---	2.1E+00	1.8E+01
	Groundwater (Adult and Child)	Offsite Residential Area (Tap)	Aluminum	NA	---	NA	NA						
			Arsenic	1.5E-05	---	5.0E-08	1.5E-05						
			Cadmium	NA	---	NA	NA						
			Chromium III	NA	---	NA	NA						
			Chromium VI	NA	---	NA	NA						
			Manganese	NA	---	NA	NA						
			Dieldrin	8.0E-06	---	7.7E-06	1.6E-05						
			Heptachlor epoxide	1.6E-06	---	1.1E-06	2.7E-06						
			bis(2-Ethylhexyl)phthalate	4.9E-07	---	6.2E-07	1.1E-06						
			Phenol	NA	---	NA	NA						
			1,1,1-Trichloroethane	NA	---	NA	NA						
			1,1-Dichloroethane	NA	---	NA	NA						
			1,1-Dichloroethene	1.4E-05	---	2.1E-06	1.6E-05						
			Chlorobenzene	NA	---	NA	NA						
			cis-1,2-Dichloroethene	NA	---	NA	NA						
			Tetrachloroethene	1.3E-06	---	9.5E-07	2.3E-06						
			Trichloroethene	1.6E-06	---	3.1E-07	1.9E-06						
			Vinyl Chloride	3.9E-04	---	2.2E-05	4.1E-04						
			Total (Adult + Child)	4.3E-04	---	3.5E-05	4.7E-04						

TABLE 9.9.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas
Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors (Child)	Offsite Residential Area (Tap)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	4.50E-01	---	4.5E-01
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	5.35E-03	---	5.3E-03
			1,1-Dichloroethene	---	1.9E-04	---	1.9E-04	1,1-Dichloroethene	liver	---	NA	---	NA
			Chlorobenzene	---	NA	---	NA	Chlorobenzene	liver	---	1.40E+00	---	1.4E+00
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	5.1E-06	---	5.1E-06	Tetrachloroethene	liver	---	2.11E-01	---	2.1E-01
			Trichloroethene	---	1.2E-08	---	1.2E-08	Trichloroethene	NA	---	NA	---	NA
			Vinyl Chloride	---	9.3E-05	---	9.3E-05	Vinyl Chloride	liver	---	NA	---	NA
			Total (Child)	---	2.9E-04	---	2.9E-04		Total (Child)	---	2.1E+00	---	2.1E+00
	Vapors (Adult)	Offsite Residential Area (Tap)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	1.00E-02	---	1.0E-02
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	1.19E-04	---	1.2E-04
			1,1-Dichloroethene	---	2.1E-06	---	2.1E-06	1,1-Dichloroethene	liver	---	NA	---	NA
			Chlorobenzene	---	NA	---	NA	Chlorobenzene	liver	---	3.13E-02	---	3.1E-02
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	5.7E-08	---	5.7E-08	Tetrachloroethene	liver	---	4.71E-03	---	4.7E-03
			Trichloroethene	---	1.4E-10	---	1.4E-10	Trichloroethene	NA	---	NA	---	NA
			Vinyl Chloride	---	1.0E-06	---	1.0E-06	Vinyl Chloride	liver	---	NA	---	NA
			Total (Adult)	---	3.2E-06	---	3.2E-06		Total (Adult)	---	4.6E-02	---	4.6E-02
	Vapors (Adult and Child)	Offsite Residential Area (Tap)	1,1,1-Trichloroethane	---	NA	---	NA						
			1,1-Dichloroethane	---	NA	---	NA						
			1,1-Dichloroethene	---	1.9E-04	---	1.9E-04						
			Chlorobenzene	---	NA	---	NA						
			cis-1,2-Dichloroethene	---	NA	---	NA						
			Tetrachloroethene	---	5.1E-06	---	5.1E-06						
			Trichloroethene	---	1.2E-08	---	1.2E-08						
			Vinyl Chloride	---	9.4E-05	---	9.4E-05						
			Total (Adult + Child)	---	2.9E-04	---	2.9E-04						

TABLE 9.9.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas
Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors Child	Offsite Residential Areas (Indoors)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	7.1E-04	---	7.1E-04
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	2.3E-03	---	2.3E-03
			1,1-Dichloroethene	---	1.5E-05	---	1.5E-05	1,1-Dichloroethene	liver	---	NA	---	NA
			Chlorobenzene	---	NA	---	NA	Chlorobenzene	liver	---	1.8E-02	---	1.8E-02
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	9.6E-08	---	9.6E-08	Tetrachloroethene	liver	---	4.0E-03	---	4.0E-03
			Trichloroethene	---	1.0E-06	---	1.0E-06	Trichloroethene	NA	---	NA	---	NA
			Vinyl Chloride	---	3.0E-04	---	3.0E-04	Vinyl Chloride	liver	---	NA	---	NA
			(Total for Child)	---	3.1E-04	---	3.1E-04		(Total for Child)	---	2.5E-02	---	2.5E-02
	Vapors Adult	Offsite Residential Areas (Indoors)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	1.3E-06	---	1.3E-06
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	4.2E-06	---	4.2E-06
			1,1-Dichloroethene	---	1.4E-08	---	1.4E-08	1,1-Dichloroethene	liver	---	NA	---	NA
			Chlorobenzene	---	NA	---	NA	Chlorobenzene	liver	---	3.3E-05	---	3.3E-05
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	8.9E-11	---	8.9E-11	Tetrachloroethene	liver	---	7.4E-06	---	7.4E-06
			TICs (volatile)	---	NA	---	NA	TICs (volatile)	NA	---	NA	---	NA
			Trichloroethene	---	9.7E-10	---	9.7E-10	Trichloroethene	NA	---	NA	---	NA
			Vinyl Chloride	---	2.8E-07	---	2.8E-07	Vinyl Chloride	liver	---	NA	---	NA
			(Total for Adult)	---	2.9E-07	---	2.9E-07		(Total for Adult)	---	4.6E-05	---	4.6E-05
	Vapors Child + Adult	Offsite Residential Areas (Indoors)	1,1,1-Trichloroethane	---	NA	---	NA						
			1,1-Dichloroethane	---	NA	---	NA						
			1,1-Dichloroethene	---	1.5E-05	---	1.5E-05						
			Chlorobenzene	---	NA	---	NA						
			cis-1,2-Dichloroethene	---	NA	---	NA						
			Tetrachloroethene	---	9.6E-08	---	9.6E-08						
			TICs (volatile)	---	NA	---	NA						
			Trichloroethene	---	1.0E-06	---	1.0E-06						
			Vinyl Chloride	---	3.0E-04	---	3.0E-04						
			(Total for Child + Adult)	---	3.1E-04	---	3.1E-04						

TABLE 9.9.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Rasidential Areas

Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors Child	Offsite Residential Areas (Outdoors)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	4.0E-07	---	4.0E-07
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	1.7E-06	---	1.7E-06
			1,1-Dichloroethene	---	7.9E-09	---	7.9E-09	1,1-Dichloroethene	liver	---	NA	---	NA
			Chlorobenzene	---	NA	---	NA	Chlorobenzene	liver	---	1.7E-05	---	1.7E-05
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	5.9E-11	---	5.9E-11	Tetrachloroethene	liver	---	2.4E-06	---	2.4E-06
			Trichloroethene	---	6.9E-10	---	6.9E-10	Trichloroethene	NA	---	NA	---	NA
			Vinyl Chloride	---	1.3E-07	---	1.3E-07	Vinyl Chloride	liver	---	NA	---	NA
			(Total for Child)	---	1.4E-07	---	1.4E-07		(Total for Child)	---	2.1E-05	---	2.1E-05
	Vapors Adult	Offsite Residential Areas (Outdoors)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	8.6E-08	---	8.6E-08
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	3.6E-07	---	3.6E-07
			1,1-Dichloroethene	---	8.4E-10	---	8.4E-10	1,1-Dichloroethene	liver	---	NA	---	NA
			Chlorobenzene	---	NA	---	NA	Chlorobenzene	liver	---	3.6E-06	---	3.6E-06
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	6.3E-12	---	6.3E-12	Tetrachloroethene	liver	---	5.2E-07	---	5.2E-07
			Trichloroethene	---	7.4E-11	---	7.4E-11	Trichloroethene	NA	---	NA	---	NA
			Vinyl Chloride	---	1.4E-08	---	1.4E-08	Vinyl Chloride	liver	---	NA	---	NA
			(Total for Adult)	---	1.5E-08	---	1.5E-08		(Total for Adult)	---	4.6E-06	---	4.6E-06

TABLE 9.9.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas
Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors Child + Adult	Offsite Residential Areas (Outdoors)											
			1,1,1-Trichloroethane	---	NA	---	NA						
			1,1-Dichloroethane	---	NA	---	NA						
			1,1-Dichloroethene	---	8.7E-09	---	8.7E-09						
			Chlorobenzene	---	NA	---	NA						
			cis-1,2-Dichloroethene	---	NA	---	NA						
			Tetrachloroethene	---	6.5E-11	---	6.5E-11						
			Trichloroethene	---	7.6E-10	---	7.6E-10						
			Vinyl Chloride	---	1.5E-07	---	1.5E-07						
			(Total for Child + Adult)	---	1.6E-07	---	1.6E-07		Total Hazard Index Across Groundwater (Child)				4.6E+01
			Total Risk Across Groundwater				1.1E-03		Total Hazard Index Across Groundwater (Adult)				1.8E+01

Total Risk Across All Media and All Exposure Routes	1.1E-03
Total Hazard Index Across All Media and All Exposure Routes (Child)	4.6E+01
Total Hazard Index Across All Media and All Exposure Routes (Adult)	1.8E+01

Total Liver HI (child) =	3.1E+00
Total Blood HI (child) =	1.3E-01
Total Kidney HI (child) =	1.3E+01
Total Skin HI (child) =	3.3E-01
Total Circulatory HI (child) =	3.3E-01
Total CNS HI (child) =	1.9E+01
Total Liver HI (adult) =	4.6E-01
Total Blood HI (adult) =	5.3E-02
Total Kidney HI (adult) =	5.5E+00
Total Skin HI (adult) =	1.4E-01
Total Circulatory HI (adult) =	1.4E-01
Total CNS HI (adult) =	7.8E+00

TABLE 9.10.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Tap)

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Magothy)	Groundwater Child	Offsite Residential Areas (Tap)	Arsenic	1.1E-05	---	3.4E-08	1.1E-05	Arsenic	skin, circulatory system	3.0E-01	---	8.7E-04	3.0E-01
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	2.6E-04	---	5.8E-05	3.2E-04
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	5.1E-01	---	1.2E-01	6.3E-01
			Manganese	NA	---	NA	NA	Manganese	CNS	1.1E+00	---	8.2E-02	1.2E+00
			1,1-Dichloroethane	NA	---	NA	NA	1,1-Dichloroethane	NOEL	5.7E-03	---	4.4E-04	6.2E-03
			1,1-Dichloroethene	2.7E-05	---	3.7E-06	3.1E-05	1,1-Dichloroethene	liver	5.8E-02	---	8.0E-03	6.7E-02
			1,2-Dichloroethane	3.2E-06	---	1.5E-07	3.3E-06	1,2-Dichloroethane	gastrointestinal system	1.4E-02	---	6.3E-04	1.4E-02
			Benzene	1.8E-06	---	2.8E-07	2.1E-06	Benzene	blood	1.3E-01	---	2.0E-02	1.5E-01
			Carbon tetrachloride	5.3E-07	---	1.4E-07	6.7E-07	Carbon tetrachloride	liver	6.8E-02	---	1.8E-02	8.6E-02
			cis-1,2-Dichloroethene	NA	---	NA	NA	cis-1,2-Dichloroethene	blood	1.1E-01	---	9.3E-03	1.2E-01
			Tetrachloroethene	2.3E-06	---	1.5E-06	3.8E-06	Tetrachloroethene	liver	5.2E-02	---	3.3E-02	8.5E-02
			Toluene	NA	---	NA	NA	Toluene	kidney,liver	3.5E-03	---	1.3E-03	4.9E-03
			trans-1,2-Dichloroethene	NA	---	NA	NA	trans-1,2-Dichloroethene	blood	6.7E-02	---	5.8E-03	7.3E-02
			Trichloroethene	3.3E-05	---	5.6E-06	3.9E-05	Trichloroethene	NA	6.1E-01	---	1.1E-01	7.2E-01
			(Total for Child)	7.9E-05	---	1.1E-05	9.1E-05		(Total for Child)	3.0E+00	---	4.1E-01	3.4E+00
	Groundwater Adult	Offsite Residential Areas (Tap)	Arsenic	2.3E-06	---	7.4E-09	2.3E-06	Arsenic	skin, circulatory system	1.2E-01	---	3.8E-04	1.2E-01
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	1.0E-04	---	2.6E-05	1.3E-04
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	2.1E-01	---	5.3E-02	2.6E-01
			Manganese	NA	---	NA	NA	Manganese	CNS	4.5E-01	---	3.6E-02	4.9E-01
			1,1-Dichloroethane	NA	---	NA	NA	1,1-Dichloroethane	NOEL	2.3E-03	---	2.3E-04	2.6E-03
			1,1-Dichloroethene	5.5E-06	---	9.5E-07	6.4E-06	1,1-Dichloroethene	liver	2.4E-02	---	4.1E-03	2.8E-02
			1,2-Dichloroethane	6.4E-07	---	3.7E-08	6.8E-07	1,2-Dichloroethane	gastrointestinal system	5.5E-03	---	3.2E-04	5.8E-03
			Benzene	3.6E-07	---	7.2E-08	4.3E-07	Benzene	blood	5.1E-02	---	1.0E-02	6.1E-02
			Carbon tetrachloride	1.1E-07	---	3.7E-08	1.4E-07	Carbon tetrachloride	liver	2.7E-02	---	9.4E-03	3.7E-02
			cis-1,2-Dichloroethene	NA	---	NA	NA	cis-1,2-Dichloroethene	blood	4.4E-02	---	4.8E-03	4.9E-02
			Tetrachloroethene	4.7E-07	---	3.8E-07	8.4E-07	Tetrachloroethene	liver	2.1E-02	---	1.7E-02	3.8E-02
			Toluene	NA	---	NA	NA	Toluene	kidney,liver	1.4E-03	---	6.7E-04	2.1E-03
			trans-1,2-Dichloroethene	NA	---	NA	NA	trans-1,2-Dichloroethene	blood	2.7E-02	---	2.9E-03	3.0E-02
			Trichloroethene	6.7E-06	---	1.4E-06	8.1E-06	Trichloroethene	NA	2.5E-01	---	5.3E-02	3.0E-01
			(Total for Adult)	1.6E-05	---	2.9E-06	1.9E-05		(Total for Adult)	1.2E+00	---	1.9E-01	1.4E+00

TABLE 9.10.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Tap)

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Magothy)	Groundwater Child + Adult	Offsite Residential Areas (Tap)	Arsenic	1.4E-05	---	4.1E-08	1.4E-05						
			Chromium III	NA	---	NA	NA						
			Chromium VI	NA	---	NA	NA						
			Manganese	NA	---	NA	NA						
			1,1-Dichloroethane	NA	---	NA	NA						
			1,1-Dichloroethene	3.3E-05	---	4.7E-06	3.7E-05						
			1,2-Dichloroethane	3.8E-06	---	1.8E-07	4.0E-06						
			Benzene	2.1E-06	---	3.6E-07	2.5E-06						
			Carbon tetrachloride	6.3E-07	---	1.8E-07	8.1E-07						
			cis-1,2-Dichloroethene	NA	---	NA	NA						
			Tetrachloroethene	2.8E-06	---	1.9E-06	4.6E-06						
			Toluene	NA	---	NA	NA						
			trans-1,2-Dichloroethene	NA	---	NA	NA						
			Trichloroethene	4.0E-05	---	7.1E-06	4.7E-05						
			(Total for Child + Adult)	9.5E-05	---	1.4E-05	1.1E-04						

TABLE 9.10.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Tap)
Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Magothy)	Vapors Child	Offsite Residential Areas (Tap)	1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	9.1E-04	---	9.1E-04
			1,1-Dichloroethene	---	1.8E-06	---	1.8E-06	1,1-Dichloroethene	liver	---	NA	---	NA
			1,2-Dichloroethane	---	7.1E-07	---	7.1E-07	1,2-Dichloroethane	gastrointestinal system	---	6.5E-02	---	6.5E-02
			Benzene	---	1.9E-07	---	1.9E-07	Benzene	blood	---	4.9E-02	---	4.9E-02
			Carbon tetrachloride	---	4.8E-08	---	4.8E-08	Carbon tetrachloride	liver	---	1.9E-02	---	1.9E-02
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	2.0E-08	---	2.0E-08	Tetrachloroethene	liver	---	8.2E-04	---	8.2E-04
			Toluene	---	NA	---	NA	Toluene	kidney,liver	---	1.4E-03	---	1.4E-03
			trans-1,2-Dichloroethene	---	NA	---	NA	trans-1,2-Dichloroethene	blood	---	NA	---	NA
			Trichloroethene	---	4.0E-06	---	4.0E-06	Trichloroethene	NA	---	NA	---	NA
			(Total for Child)	---	6.7E-06	---	6.7E-06		(Total for Child)	---	1.4E-01	---	1.4E-01
	Vapors Adult	Offsite Residential Areas (Tap)	1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	1.5E-04	---	1.5E-04
			1,1-Dichloroethene	---	1.4E-07	---	1.4E-07	1,1-Dichloroethene	liver	---	NA	---	NA
			1,2-Dichloroethane	---	5.8E-08	---	5.8E-08	1,2-Dichloroethane	gastrointestinal system	---	1.1E-02	---	1.1E-02
			Benzene	---	1.6E-08	---	1.6E-08	Benzene	blood	---	8.0E-03	---	8.0E-03
			Carbon tetrachloride	---	3.9E-09	---	3.9E-09	Carbon tetrachloride	liver	---	3.0E-03	---	3.0E-03
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	1.6E-09	---	1.6E-09	Tetrachloroethene	liver	---	1.3E-04	---	1.3E-04
			Toluene	---	NA	---	NA	Toluene	kidney,liver	---	2.3E-04	---	2.3E-04
			trans-1,2-Dichloroethene	---	NA	---	NA	trans-1,2-Dichloroethene	blood	---	NA	---	NA
			Trichloroethene	---	3.3E-07	---	3.3E-07	Trichloroethene	NA	---	NA	---	NA
			(Total for Adult)	---	5.5E-07	---	5.5E-07		(Total for Adult)	---	2.2E-02	---	2.2E-02

TABLE 9.10.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Tap)
Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Magothy)	Vapors Child + Adult	Offsite Residential Areas (Tap)											
			1,1-Dichloroethane	---	NA	---	NA						
			1,1-Dichloroethene	---	1.9E-06	---	1.9E-06						
			1,2-Dichloroethane	---	7.7E-07	---	7.7E-07						
			Benzene	---	2.1E-07	---	2.1E-07						
			Carbon tetrachloride	---	5.2E-08	---	5.2E-08						
			cis-1,2-Dichloroethene	---	NA	---	NA						
			Tetrachloroethene	---	2.1E-08	---	2.1E-08						
			TICs (volatile)	---	NA	---	NA						
			Toluene	---	NA	---	NA						
			trans-1,2-Dichloroethene	---	NA	---	NA						
			Trichloroethene	---	4.3E-06	---	4.3E-06						
			(Total for Child + Adult)	---	7.3E-06	---	7.3E-06		Total Hazard Index Across Groundwater (child)				3.6E+00
			Total Risk Across Groundwater				1.2E-04		Total Hazard Index Across Groundwater (adult)				1.4E+00

Total Risk Across All Media and All Exposure Routes	**1.2E-04**
Total Hazard Index Across All Media and All Exposure Routes (Child)	**3.6E+00**
Total Hazard Index Across All Media and All Exposure Routes (Adult)	**1.4E+00**

Total Blood HI (child) =	**3.9E-01**
Total Skin HI (child) =	**3.0E-01**
Total Circulatory System HI (child) =	**3.0E-01**
Total CNS HI (child) =	**1.2E+00**
Total Liver HI (child) =	**2.6E-01**
Total GI HI (child) =	**7.9E-02**
Total Kidney HI (child) =	**6.3E-03**
Total Blood HI (adult) =	**1.5E-01**
Total Skin HI (adult) =	**1.2E-01**
Total Circulatory System HI (adult) =	**1.2E-01**
Total CNS HI (adult) =	**4.9E-01**
Total Liver HI (adult) =	**1.1E-01**
Total GI HI (adult) =	**1.6E-02**
Total Kidney HI (adult) =	**2.3E-03**

TABLE 9.11.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Woodward Parkway School)
Scenario Timeframe: Current
Receptor Population: School Child
Receptor Age: Pre-Adolescent (6-12 years old)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors	Offsite Residential Areas (Woodward Parkway School)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	7.1E-06	---	7.1E-06
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	2.3E-05	---	2.3E-05
			1,1-Dichloroethene	---	1.8E-07	---	1 8E-07	1,1-Dichloroethene	liver	---	NA	---	NA
			Chlorobenzene	---	NA	---	NA	Chlorobenzene	liver	---	1.8E-04	---	1.8E-04
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	1.1E-09	---	1.1E-09	Tetrachloroethene	liver	---	4.0E-05	---	4.0E-05
			Trichloroethene	---	1.2E-08	---	1.2E-08	Trichloroethene	NA	---	NA	---	NA
			Vinyl chloride	---	3.4E-06	---	3.4E-06	Vinyl chloride	liver	---	NA	---	NA
			(Total)	---	3.6E-06	---	3.6E-06		(Total)	---	2.5E-04	---	2.5E-04
				Total Risk Across Groundwater			3.6E-06		Total Hazard Index Across Groundwater				2.5E-04
			Total Risk Across All Media and All Exposure Routes				3.6E-06	Total Hazard Index Across All Media and All Exposure Routes					2.5E-04

Total Liver HI = 2.2E-04

TABLE 9.12.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Woodward Parkway School)
Scenario Timeframe: Current
Receptor Population: School Employee
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors	Offsite Residential Areas (Woodward Parkway School)	1,1,1-Trichloroethane	---	NA	---	NA	1,1,1-Trichloroethane	liver	---	1.1E-05	---	1.1E-05
			1,1-Dichloroethane	---	NA	---	NA	1,1-Dichloroethane	NOEL	---	3.6E-05	---	3.6E-05
			1,1-Dichloroethene	---	2.7E-07	---	2.7E-07	1,1-Dichloroethene	liver	---	NA	---	NA
			Chlorobenzene	---	NA	---	NA	Chlorobenzene	liver	---	2.8E-04	---	2.8E-04
			cis-1,2-Dichloroethene	---	NA	---	NA	cis-1,2-Dichloroethene	blood	---	NA	---	NA
			Tetrachloroethene	---	1.7E-09	---	1.7E-09	Tetrachloroethene	liver	---	6.3E-05	---	6.3E-05
			TICs (volatile)	---	NA	---	NA	TICs (volatile)	NA	---	NA	---	NA
			Trichloroethene	---	1.8E-08	---	1.8E-08	Trichloroethene	NA	---	NA	---	NA
			Vinyl chloride	---	5.1E-06	---	5.1E-06	Vinyl chloride	liver	---	NA	---	NA
			(Total)	---	5.4E-06	---	5.4E-06		(Total)	---	3.9E-04	---	3.9E-04
				Total Risk Across Groundwater			5.4E-06		Total Hazard Index Across Groundwater				3.9E-04
				Total Risk Across All Media and All Exposure Routes			5.4E-06		Total Hazard Index Across All Media and All Exposure Routes				3.9E-04

Total Liver HI = 3.6E-04

TABLE 9.13.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Massapequa Preserve
Scenario Timeframe: Current
Receptor Population: Swimmer
Receptor Age: Pre-Adolescent (6-12 years old)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Massapequa Preserve											
			Arsenic	1.9E-08	---	1.2E-08	3.0E-08	Arsenic	skin, circulatory system	4.1E-04	---	2.6E-04	6.7E-04
			Barium	NA	---	NA	NA	Barium	NA	0.0E+00	---	0.0E+00	NA
			Cadmium	NA	---	NA	NA	Cadmium	kidney	9.8E-04	---	2.5E-02	2.6E-02
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	7.3E-07	---	3.5E-05	3.6E-05
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	7.1E-04	---	3.6E-02	3.6E-02
			Chloroform	7.9E-12	---	5.7E-11	6.5E-11	Chloroform	liver	1.3E-06	---	9.4E-06	1.1E-05
			Dibromochloromethane	2.9E-10	---	1.0E-09	1.3E-09	Dibromochloromethane	liver	1.7E-06	---	6.0E-06	7.7E-06
			Tetrachloroethene	4.5E-10	---	2.1E-08	2.1E-08	Tetrachloroethene	liver	8.6E-06	---	4.0E-04	4.1E-04
			Trichloroethene	1.9E-10	---	2.6E-09	2.8E-09	Trichloroethene	NA	3.0E-06	---	4.1E-05	4.4E-05
			(Total)	2.0E-08	---	3.6E-08	5.6E-08		(Total)	2.1E-03	---	6.1E-02	6.3E-02
				Total Risk Across Surface Water			5.6E-08		Total Hazard Index Across Surface Water				6.3E-02
Sediment	Sediment	Massapequa Preserve											
			Aluminum	NA	---	NA	NA	Aluminum	CNS	3.5E-04	---	NA	3.5E-04
			Arsenic	6.3E-08	---	1.0E-09	6.4E-08	Arsenic	skin, circulatory system	1.4E-03	---	2.3E-05	1.4E-03
			Cadmium	NA	---	NA	NA	Cadmium	kidney	1.4E-02	---	3.0E-04	1.4E-02
			Chromium III	NA	---	NA	NA	Chromium III	NOEL	8.9E-06	---	NA	8.9E-06
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	6.0E-03	---	NA	6.0E-03
			Manganese	NA	---	NA	NA	Manganese	CNS	3.9E-03	---	NA	3.9E-03
			Mercury	NA	---	NA	NA	Mercury	CNS	4.4E-05	---	NA	4.4E-05
			Vanadium	NA	---	NA	NA	Vanadium	hair	2.9E-04	---	NA	2.9E-04
			(Total)	6.3E-08	---	1.0E-09	6.4E-08		(Total)	2.6E-02	---	3.3E-04	2.6E-02
				Total Risk Across Sediment			6.4E-08		Total Hazard Index Across Sediment				2.6E-02
			Total Risk Across All Media and All Exposure Routes				1.2E-07		Total Hazard Index Across All Media and All Exposure Routes				9.0E-02

Total Skin HI =	2.1E-03
Total Circulatory System HI =	2.1E-03
Total Kidney HI =	4.0E-02
Total Liver HI =	4.3E-04
Total Hair HI =	2.9E-04
Total CNS HI =	4.3E-03

TABLE 9.14.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Massapequa Preserve
Scenario Timeframe: Current
Receptor Population: Resident Fisher
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Fish Tissue (Child)	Massapequa Preserve	Cadmium	NA	---	---	NA	Cadmium	kidney	2.5E-01	---	---	2.5E-01
			Chromium VI	NA	---	---	NA	Chromium VI	NOEL	6.3E-02	---	---	6.3E-02
			Lead	NA	---	---	NA	Lead	NA	NA	---	---	NA
			(Total)	---	---	---	---		(Total)	3.1E-01	---	---	3.1E-01
				Total Risk Across Fish Tissue (Child)			**NA**		**Total Hazard Index Across Fish Tissue (Child)**				**3.1E-01**
Surface Water	Fish Tissue (Adult)	Massapequa Preserve	Cadmium	NA	---	---	NA	Cadmium	kidney	1.1E-01	---	---	1.1E-01
			Chromium VI	NA	---	---	NA	Chromium VI	NOEL	2.7E-02	---	---	2.7E-02
			Lead	NA	---	---	NA	Lead	NA	NA	---	---	NA
			(Total)	---	---	---	---		(Total)	1.3E-01	---	---	1.3E-01
				Total Risk Across Fish Tissue (Adult)			**NA**		**Total Hazard Index Across Fish Tissue (Adult)**				**1.3E-01**
				Total Risk Across All Media and All Exposure Routes			**NA**		**Total Hazard Index Across All Media and All Exposure Routes (Child)**				**3.1E-01**
									Total Hazard Index Across All Media and All Exposure Routes (Adult)				**1.3E-01**

Total Kidney HI (Child) = 2.5E-01
Total Kidney HI (Adult) = 1.1E-01

TABLE 9.15.CTE
SUMMARY OF RECEPTOR RISKS AND HAZARDS FOR COPCs
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Ellsworth Allen Park
Scenario Timeframe: Current
Receptor Population: Recreational User
Receptor Age: Pre-Adolescent/Adolescent (6-18 years old)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Subsurface Soil	Ellsworth Allen Park	Chromium III	NA	—	NA	NA	Chromium III	NOEL	1.7E-06	—	NA	1.7E-06
			Chromium VI	NA	—	NA	NA	Chromium VI	kidney	2.8E-04	—	NA	2.8E-04
			(Total)	—	—	—	—		(Total)	2.8E-04	—	—	2.8E-04
	Particulates	Ellsworth Allen Park	Chromium III	—	NA	—	NA	Chromium III	NOEL	—	NA	—	NA
			Chromium VI	—	3.9E-10	—	3.9E-10	Chromium VI	kidney	—	1.7E-06	—	1.7E-06
			(Total)	—	3.9E-10	—	3.9E-10		(Total)	—	1.7E-06	—	1.7E-06
			Total Risk Across Subsurface Soil				3.9E-10		Total Hazard Index Across Subsurface Soil				2.8E-04
			Total Risk Across All Media and All Exposure Routes				3.9E-10		Total Hazard Index Across All Media and All Exposure Routes				2.8E-04

Total Kidney HI = 2.8E-04

RAGS TABLE 10s

TABLE 10.1.RME

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

REASONABLE MAXIMUM EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Current Receptor Population: Trespassers Receptor Age: 10-18 years

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Western Parcel	Arsenic	1.1E-06	---	4.4E-07	1.6E-06	Arsenic	skin, circulatory system	NA	---	NA	NA
			(Total)	1.1E-06	---	4.4E-07	1.6E-06		(Total)	---	---	---	---
	Particulates	Western Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
				Total Risk Across Surface Soil			1.6E-06		Total Hazard Index Across Surface Soil				NA
Surface/Subsurface Soil	Vapors	Western Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Surface/Subsurface Soil				NA		Total Hazard Index Across Surface/Subsurface Soil				NA
Groundwater (Upper Glacial)	Vapors	Western Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
				Total Risk Across Groundwater			NA		Total Hazard Index Across Groundwater				NA
			Total Risk Across All Media and All Exposure Routes				1.6E-06	Total Hazard Index Across All Media and All Exposure Routes					NA

Total Blood HI =	NA
Total Skin HI =	NA
Total Circulatory System HI =	NA
Total Kidney HI =	NA
Total GI System HI =	NA
Total Immune System HI =	NA
Total Growth HI =	NA
Total Liver HI =	NA
Total CNS HI =	NA

TABLE 10.2.RME
RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Western Parcel	Arsenic	1.3E-06	---	5.3E-07	1.9E-06	Arsenic	skin, circulatory system	NA	---	NA	NA
			Aroclor-1254	7.0E-07	---	1.3E-06	2.0E-06	Aroclor-1254	immune system, growth	NA	---	NA	NA
			(Total)	2.0E-06	---	1.8E-06	3.9E-06		(Total)	---	---	---	---
	Particulates	Western Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Western Parcel (Indoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Western Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Surface/Subsurface Soil				3.9E-06		Total Hazard Index Across Surface/Subsurface Soil				NA

TABLE 10.2.RME

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

REASONABLE MAXIMUM EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future Receptor Population: Commercial/Industrial Worker Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Groundwater Adult	Western Parcel											
			Arsenic	8.6E-06	---	---	8.6E-06	Arsenic	skin, circulatory system	NA	---	---	NA
			Cadmium	NA	---	---	NA	Cadmium	kidney	7.5E+00	---	---	7.5E+00
			Chromium VI	NA	---	---	NA	Chromium VI	NOEL	1.4E+00	---	---	1.4E+00
			Dieldrin	1.8E-06	---	---	1.8E-06	Dieldrin	liver	NA	---	---	NA
			bis(2-Ethylhexyl)phthalate	9.9E-06	---	---	9.9E-06	bis(2-Ethylhexyl)phthalate	liver	NA	---	---	NA
			Pentachlorophenol	3.2E-06	---	---	3.2E-06	Pentachlorophenol	liver, kidney	NA	---	---	NA
			Tetrachloroethene	2.0E-06	---	---	2.0E-06	Tetrachloroethene	liver	NA	---	---	NA
			Trichloroethene	4.5E-05	---	---	4.5E-05	Trichloroethene	NA	NA	---	---	NA
			(Total)	7.0E-05	---	---	7.0E-05		(Total)	8.9E+00	---	---	8.9E+00
	Vapors	Western Parcel (Indoors)	Trichloroethene	---	2.6E-06	---	2.6E-06	Trichloroethene	NA	---	NA	---	NA
			(Total)	---	2.6E-06	---	2.6E-06		(Total)	---	---	---	---
	Vapors	Western Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
Groundwater (Magothy)	Groundwater Adult	Western Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
				Total Risk Across Groundwater			7.3E-05		Total Hazard Index Across Groundwater				8.9E+00
			Total Risk Across All Media and All Exposure Routes				7.7E-05		Total Hazard Index Across All Media and All Exposure Routes				8.9E+00

Total Blood HI =	NA
Total Skin HI =	NA
Total Circulatory System HI =	NA
Total Kidney HI =	7.5E+00
Total GI System HI =	NA
Total Immune System HI =	NA
Total Growth HI =	NA
Total Liver HI =	NA
Total CNS HI =	NA

TABLE 10.3.RME

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

REASONABLE MAXIMUM EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel

Scenario Timeframe: Future
Receptor Population: Construction Workers
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Western Parcel											
			(Total)	---	:--	—	---		(Total)	—	—	—	—
	Particulates	Western Parcel											
			(Total)	---	---	—	---		(Total)	—	—	—	—
	Vapors	Western Parcel (Outdoors)											
			(Total)	—	—	—	—		(Total)	—	—	—	—
			Total Risk Across Surface/Subsurface Soil				NA		Total Hazard Index Across Surface/Subsurface Soil				NA
Groundwater (Upper Glacial)	Vapors	Western Parcel (Outdoors)											
			(Total)	---	---	—	---		(Total)	—	—	—	—
			Total Risk Across Groundwater				NA		Total Hazard Index Across Groundwater				NA
			Total Risk Across All Media and All Exposure Routes				NA		Total Hazard Index Across All Media and All Exposure Routes				NA

Total Blood HI =	NA
Total Skin HI =	NA
Total Circulatory System HI =	NA
Total Kidney HI =	NA
Total GI System HI =	NA
Total Immune System HI =	NA
Total Growth HI =	NA
Total Liver HI =	NA
Total CNS HI =	NA

TABLE 10.4.RME

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1 0E-06 AND HAZARD INDICES EXCEEDING 1.0)

REASONABLE MAXIMUM EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Pre-Adolescent/Adolescent (6-18 years old)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Western Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Particulates	Western Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Western Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Surface/Subsurface Soil				NA		Total Hazard Index Across Surface/Subsurface Soil				NA
Groundwater (Upper Glacial)	Vapors	Western Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Groundwater				NA		Total Hazard Index Across Groundwater				NA
			Total Risk Across All Media and All Exposure Routes				NA		Total Hazard Index Across All Media and All Exposure Routes				NA

Total Blood HI =	NA
Total Skin HI =	NA
Total Circulatory System HI =	NA
Total Kidney HI =	NA
Total GI System HI =	NA
Total Immune System HI =	NA
Total Growth HI =	NA
Total Liver HI =	NA
Total CNS HI =	NA

TABLE 10.5.RME

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

REASONABLE MAXIMUM EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel

Scenario Timeframe: Current
Receptor Population: Trespasser
Receptor Age: 10-18 years

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Solid Waste	Vapors	Eastern Parcel (Outdoors)											
			(Total)	---	---	---	---	(Total)	(Total)	—	—	—	—
				Total Risk Across Solid Waste			NA		Total Hazard Index Across Solid Waste				NA
Liquid Waste	Vapors	Eastern Parcel (Outdoors)											
			(Total)	---	---	---	---	(Total)	(Total)	—	—	—	—
				Total Risk Across Liquid Waste			NA		Total Hazard Index Across Liquid Waste				NA
				Total Risk Across All Media and All Exposure Routes			NA		Total Hazard Index Across All Media and All Exposure Routes				NA

Total Liver HI =	NA
Total Development HI =	NA
Total Blood HI =	NA
Total Kidney HI =	NA

TABLE 10.6.RME

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

REASONABLE MAXIMUM EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Current Receptor Population: Commercial/Industrial Worker Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Solid Waste	Vapors	Eastern Parcel (Outdoors)											
			(Total)	---	---	---	---	(Total)	(Total)	---	---	---	---
						Total Risk Across Solid Waste	NA					Total Hazard Index Across Solid Waste	NA
						Total Risk Across All Media and All Exposure Routes	NA					Total Hazard Index Across All Media and All Exposure Routes	NA

TABLE 10.7.RME

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

REASONABLE MAXIMUM EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future Receptor Population: Commercial/Industrial Worker Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Eastern Parcel	Benzo(a)pyrene	8.3E-07	---	1.4E-06	2.3E-06	Benzo(a)pyrene	NA	NA	---	NA	NA
			(Total)	8 3E-07	---	1.4E-06	2.3E-06		(Total)	---	---	---	---
	Particulates	Eastern Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Eastern Parcel (Indoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Eastern Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Surface/Subsurface Soil				2.3E-06		Total Hazard Index Across Surface/Subsurface Soil				NA
Solid Waste	Vapors	Eastern Parcel (Indoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Eastern Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Solid Waste				NA		Total Hazard Index Across Solid Waste				NA
Liquid Waste	Vapors	Eastern Parcel (Indoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Eastern Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Liquid Waste				NA		Total Hazard Index Across Liquid Waste				NA
			Total Risk Across All Media and All Exposure Routes				2.3E-06		Total Hazard Index Across All Media and All Exposure Routes				NA

Total Skin HI =	NA
Total Circulatory System HI =	NA
Total Kidney HI =	NA
Total Liver HI =	NA
Total Development HI =	NA
Total Blood HI =	NA

TABLE 10.8.RME
RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Eastern Parcel											
			(Total)	---	---	---	---		(Total)	—	—	—	—
	Particulates	Eastern Parcel											
			(Total)	---	---	---	---		(Total)	—	—	—	—
	Vapors	Eastern Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	—	—	—	—
			Total Risk Across Surface/Subsurface Soil				NA		Total Hazard Index Across Surface/Subsurface Soil				NA
Solid Waste	Solid Waste	Eastern Parcel	Arsenic	1.1E-06	---	4.7E-08	1.2E-06	Arsenic	skin, circulatory system	NA	—	NA	NA
			Benz(a)anthracene	6.1E-06	---	1.1E-06	7.2E-06	Benz(a)anthracene	NA	NA	—	NA	NA
			Benzo(a)pyrene	3.9E-05	---	7.0E-06	4.6E-05	Benzo(a)pyrene	NA	NA	—	NA	NA
			Benzo(b)fluoranthene	6.6E-06	---	1.2E-06	7.8E-06	Benzo(b)fluoranthene	NA	NA	—	NA	NA
			Dibenz(a,h)anthracene	6.4E-06	---	1.1E-06	7.5E-06	Dibenz(a,h)anthracene	NA	NA	—	NA	NA
			Indeno(1,2,3-cd)pyrene	2.3E-06	---	4.1E-07	2.7E-06	Indeno(1,2,3-cd)pyrene	NA	NA	—	NA	NA
			(Total)	6.2E-05	---	1.1E-05	7.3E-05		(Total)	—	—	—	---
	Particulates	Eastern Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Eastern Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	—	---	---
			Total Risk Across Solid Waste				7.3E-05		Total Hazard Index Across Solid Waste				NA

TABLE 10.8.RME

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

REASONABLE MAXIMUM EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future Receptor Population: Construction Worker Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Liquid Waste	Liquid Waste	Eastern Parcel	Chromium VI	---	---	NA	NA	Chromium VI	NOEL	---	---	1.5E+00	1.5E+00
			4,4'-DDT	---	---	1.4E-06	1.4E-06	4,4'-DDT	liver	---	---	NA	NA
			Aroclor-1260	---	---	4.3E-05	4.3E-05	Aroclor-1260	immune system, growth	---	---	3.0E+01	3.0E+01
			Benzo(a)pyrene	---	---	5.3E-04	5.3E-04	Benzo(a)pyrene	NA	---	---	NA	NA
			Benzo(b)fluoranthene	---	---	8.6E-05	8.6E-05	Benzo(b)fluoranthene	NA	---	---	NA	NA
			Benzo(k)fluoranthene	---	---	3.6E-06	3.6E-06	Benzo(k)fluoranthene	NA	---	---	NA	NA
			Dibenz(a,h)anthracene	---	---	2.4E-04	2.4E-04	Dibenz(a,h)anthracene	NA	---	---	NA	NA
			Indeno(1,2,3-cd)pyrene	---	---	5.8E-05	5.8E-05	Indeno(1,2,3-cd)pyrene	NA	---	---	NA	NA
			Pentachlorophenol	---	---	1.7E-06	1.7E-06	Pentachlorophenol	liver, kidney	---	---	NA	NA
			(Total)	---	---	9.7E-04	9.7E-04		(Total)	---	---	3.1E+01	3.1E+01
	Vapors	Eastern Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
				Total Risk Across Liquid Waste			9.7E-04		Total Hazard Index Across Liquid Waste				3.1E+01
				Total Risk Across All Media and All Exposure Routes			1.0E-03		Total Hazard Index Across All Media and All Exposure Routes				3.1E+01

Total Skin HI =	NA
Total Circulatory System HI =	NA
Total Kidney HI =	NA
Total Liver HI =	NA
Total Blood HI =	NA
Total GI System HI =	NA
Total Immune System HI =	3.0E+01
Total Growth HI =	3.0E+01
Total Hair HI =	NA
Total Development HI =	NA
Total CNS HI =	NA

TABLE 10.9.RME
RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas
Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Groundwater Child	Offsite Residential Area (Tap)	Arsenic	3.46E-05	---	7.24E-08	3.5E-05	Arsenic	skin, circulatory system	NA	---	NA	NA
			Cadmium	NA	---	NA	NA	Cadmium	kidney	3.22E+01	---	2.70E+00	3.5E+01
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	5.37E+00	---	3.36E+00	8.7E+00
			Manganese	NA	---	NA	NA	Manganese	CNS	4.74E+01	---	2.48E+00	5.0E+01
			Dieldrin	1.79E-05	---	8.23E-06	2.6E-05	Dieldrin	liver	NA	---	NA	NA
			Heptachlor epoxide	3.61E-06	---	1.20E-06	4.8E-06	Heptachlor epoxide	liver	NA	---	NA	NA
			bis(2-Ethylhexyl)phthalate	1.10E-06	---	6.71E-07	1.8E-06	bis(2-Ethylhexyl)phthalate	liver	NA	---	NA	NA
			1,1-Dichloroethene	3 07E-05	---	2.26E-06	3.3E-05	1,1-Dichloroethene	liver	NA	---	NA	NA
			Tetrachloroethene	2.95E-06	---	1.02E-06	4.0E-06	Tetrachloroethene	liver	NA	---	NA	NA
			Trichloroethene	3.58E-06	---	3.28E-07	3.9E-06	Trichloroethene	NA	NA	---	NA	NA
			Vinyl chloride	8.81E-04	---	2.44E-05	9.1E-04	Vinyl chloride	liver	1.08E+00	---	3.00E-02	1.1E+00
			(Total for Child)	9.8E-04	---	3.8E-05	1.0E-03		(Total for Child)	8.6E+01	---	8.6E+00	9.5E+01
	Groundwater Adult	Offsite Residential Area (Tap)	Arsenic	2.97E-05	---	1.56E-07	3.0E-05	Arsenic	skin, circulatory system	NA	---	NA	NA
			Cadmium	NA	---	NA	NA	Cadmium	kidney	6.90E+00	---	1.45E+00	8.4E+00
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	4.31E+00	---	1.81E+00	6.1E+00
			Manganese	NA	---	NA	NA	Manganese	CNS	1.02E+01	---	1.34E+00	1.1E+01
			Dieldrin	1.54E-05	---	1.78E-05	3.3E-05	Dieldrin	liver	NA	---	NA	NA
			Heptachlor epoxide	3.09E-06	---	2.59E-06	5.7E-06	Heptachlor epoxide	liver	NA	---	NA	NA
			bis(2-Ethylhexyl)phthalate	9.47E-07	---	1.45E-06	2.4E-06	bis(2-Ethylhexyl)phthalate	liver	NA	---	NA	NA
			1,1-Dichloroethene	2.63E-05	---	4.87E-06	3.1E-05	1,1-Dichloroethene	liver	NA	---	NA	NA
			Tetrachloroethene	2.53E-06	---	2.19E-06	4.7E-06	Tetrachloroethene	liver	NA	---	NA	NA
			Trichloroethene	3.06E-06	---	7.07E-07	3.8E-06	Trichloroethene	NA	NA	---	NA	NA
			Vinyl chloride	7.55E-04	---	5.26E-05	8.1E-04	Vinyl chloride	liver	NA	---	NA	NA
			(Total for Adult)	8.4E-04	---	8.2E-05	9.2E-04		(Total for Adult)	2.1E+01	---	4.6E+00	2.6E+01
	Groundwater Child + Adult	Offsite Residential Area (Tap)	Arsenic	6.4E-05	---	2.3E-07	6.5E-05						
			Dieldrin	3.3E-05	---	2.6E-05	5.9E-05						
			Heptachlor epoxide	6.7E-06	---	3.8E-06	1.0E-05						
			bis(2-Ethylhexyl)phthalate	2 1E-06	---	2.1E-06	4.2E-06						
			1,1-Dichloroethene	5.7E-05	---	7.1E-06	6.4E-05						
			Tetrachloroethene	5.5E-06	---	3.2E-06	8.7E-06						
			Trichloroethene	6 6E-06	---	1.0E-06	7.7E-06						
			Vinyl chloride	1.6E-03	---	7.7E-05	1.7E-03						
			(Total for Child + Adult)	1.8E-03	---	1.2E-04	1.9E-03	NA	NA	NA	NA	NA	NA

TABLE 10.9.RME
RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas
Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors Child	Offsite Residential Areas (Tap)	1,1-Dichloroethene	---	2.2E-06	---	2.2E-06	1,1-Dichloroethene	liver	---	NA	---	NA
			Vinyl Chloride	---	3.5E-05	---	3.5E-05	Vinyl Chloride	liver	---	NA	---	NA
			(Total for Child)	---	3.7E-05	---	3.7E-05		(Total for Child)	---	---	---	---
	Vapors Adult	Offsite Residential Areas (Tap)	1,1-Dichloroethene	---	1.1E-06	---	1.1E-06	1,1-Dichloroethene	liver	---	NA	---	NA
			Vinyl Chloride	---	1.7E-05	---	1.7E-05	Vinyl Chloride	liver	---	NA	---	NA
			(Total for Adult)	---	1.8E-05	---	1.8E-05		(Total for Adult)	---	---	---	---
	Vapors Child + Adult	Offsite Residential Areas (Tap)	1,1-Dichloroethene	---	3.3E-06	---	3.3E-06						
			Vinyl Chloride	---	5.2E-05	---	5.2E-05						
			(Total for Child + Adult)	---	5.5E-05	---	5.5E-05	NA	NA	NA	NA	NA	NA
	Vapors Child	Offsite Residential Areas (Indoors)	1,1-Dichloroethene	---	1.6E-05	---	1.6E-05	1,1-Dichloroethene	liver	---	NA	---	NA
			Trichloroethene	---	1.1E-06	---	1.1E-06	Trichloroethene	NA	---	NA	---	NA
			Vinyl Chloride	---	3.1E-04	---	3.1E-04	Vinyl Chloride	liver	---	NA	---	NA
			(Total for Child)	---	3.3E-04	---	3.3E-04		(Total for Child)	---	---	---	---
	Vapors Adult	Offsite Residential Areas (Indoors)	1,1-Dichloroethene	---	9.6E-06	---	9.6E-06	1,1-Dichloroethene	liver	---	NA	---	NA
			Trichloroethene	---	6.5E-07	---	6.5E-07	Trichloroethene	NA	---	NA	---	NA
			Vinyl Chloride	---	1.9E-04	---	1.9E-04	Vinyl Chloride	liver	---	NA	---	NA
			(Total for Adult)	---	2.0E-04	---	2.0E-04		(Total for Adult)	---	---	---	---
	Vapors Child + Adult	Offsite Residential Areas (Indoors)	1,1-Dichloroethene	---	2.6E-05	---	2 6E-05						
			Trichloroethene	---	1.7E-06	---	1.7E-06						
			Vinyl Chloride	---	5.0E-04	---	5.0E-04						
			(Total for Child + Adult)	---	5.3E-04	---	5.3E-04	NA	NA	NA	NA	NA	NA

TABLE 10.9.RME

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

REASONABLE MAXIMUM EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas

Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors Child	Offsite Residential Areas (Outdoors)											
			(Total for Child)	---	---	---	---		(Total for Child)	---	---	---	---
	Vapors Adult	Offsite Residential Areas (Outdoors)											
			(Total for Adult)	---	---	---	---		(Total for Adult)	---	---	---	---
	Vapors Child + Adult	Offsite Residential Areas (Outdoors)											
			(Total for Child + Adult)	---	---	---	---		Total Hazard Index Across Groundwater (Child)				9.5E+01
			Total Risk Across Groundwater				3.0E-03		Total Hazard Index Across Groundwater (Adult)				2.6E+01
			Total Risk Across All Media and All Exposure Routes				3.0E-03		Total Hazard Index Across All Media and All Exposure Routes (Child)				9.5E+01
									Total Hazard Index Across All Media and All Exposure Routes (Adult)				2.6E+01

Total Liver HI (child) =	1.1E+00
Total Liver HI (adult) =	NA
Total CNS HI (child) =	5.0E+01
Total CNS HI (adult) =	1.1E+01
Total Skin HI (child) =	NA
Total Skin HI (adult) =	NA
Total Kidney HI (child) =	3.5E+01
Total Kidney HI (adult) =	8.4E+00
Total Circulatory HI (child) =	NA
Total Circulatory HI (adult) =	NA

TABLE 10.10.RME
RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Tap)
Scenario Timeframe: Future Receptor Population: Resident Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Magothy)	Groundwater Child	Offsite Residential Areas	Arsenic	3.1E-05	---	1.0E-07	3.1E-05	Arsenic	skin, circulatory system	NA	---	NA	NA
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	1.4E+00	---	3.7E-01	1.7E+00
			Manganese	NA	---	NA	NA	Manganese	CNS	3.0E+00	---	2.5E-01	3.2E+00
			1,1-Dichloroethene	7.3E-05	---	6.7E-06	8.0E-05	1,1-Dichloroethene	liver	NA	---	NA	NA
			1,2-Dichloroethane	8.6E-06	---	2.6E-07	8.9E-06	1,2-Dichloroethane	gastrointestinal system	NA	---	NA	NA
			Benzene	4.8E-06	---	5.2E-07	5.3E-06	Benzene	blood	NA	---	NA	NA
			Carbon tetrachloride	1.4E-06	---	2.5E-07	1.7E-06	Carbon tetrachloride	liver	NA	---	NA	NA
			Tetrachloroethene	6.2E-06	---	2.6E-06	8.8E-06	Tetrachloroethene	liver	NA	---	NA	NA
			Trichloroethene	8.9E-05	---	9.8E-06	9.9E-05	Trichloroethene	NA	1.7E+00	---	1.8E-01	1.8E+00
			(Total for Child)	2.1E-04	---	2.0E-05	2.3E-04		(Total for Child)	6.0E+00	---	8.0E-01	6.8E+00
	Groundwater Adult	Offsite Residential Areas	Arsenic	2.6E-05	---	1.4E-07	2.7E-05	Arsenic	skin, circulatory system	NA	---	NA	NA
			1,1-Dichloroethene	6.3E-05	---	1.2E-05	7.4E-05	1,1-Dichloroethene	liver	NA	---	NA	NA
			1,2-Dichloroethane	7.4E-06	---	4.5E-07	7.8E-06	1,2-Dichloroethane	gastrointestinal system	NA	---	NA	NA
			Benzene	4.1E-06	---	8.8E-07	5.0E-06	Benzene	blood	NA	---	NA	NA
			Carbon tetrachloride	1.2E-06	---	4.5E-07	1.7E-06	Carbon tetrachloride	liver	NA	---	NA	NA
			Tetrachloroethene	5.3E-06	---	4.6E-06	9.9E-06	Tetrachloroethene	liver	NA	---	NA	NA
			Trichloroethene	7.6E-05	---	1.7E-05	9.4E-05	Trichloroethene	NA	NA	---	NA	NA
			(Total for Adult)	1.8E-04	---	3.5E-05	2.2E-04		(Total for Adult)	---	---	---	---
	Groundwater Child + Adult	Offsite Residential Areas (Tap)	Arsenic	5.7E-05	---	2.4E-07	5.7E-05						
			1,1-Dichloroethene	1.4E-04	---	1.8E-05	1.5E-04						
			1,2-Dichloroethane	1.6E-05	---	7.2E-07	1.7E-05						
			Benzene	8.9E-06	---	1.4E-06	1.0E-05						
			Carbon tetrachloride	2.6E-06	---	7.0E-07	3.3E-06						
			Tetrachloroethene	1.2E-05	---	7.1E-06	1.9E-05						
			Trichloroethene	1.7E-04	---	2.7E-05	1.9E-04						
			(Total for Child + Adult)	4.0E-04	---	5.6E-05	4.5E-04						

TABLE 10.10.RME
RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Tap)
Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Vapors Child	Offsite Residential Areas (Tap)	1,1-Dichloroethene	---	6.4E-06	---	6.4E-06	1,1-Dichloroethene	liver	---	NA	---	NA
			1,2-Dichloroethane	---	2.6E-06	---	2.6E-06	1,2-Dichloroethane	gastrointestinal system	---	2.4E-01	---	2.4E-01
			Trichloroethene	---	1.5E-05	---	1.5E-05	Trichloroethene	NA	---	NA	---	NA
			(Total for Child)	---	2.4E-05	---	2.4E-05		(Total for Child)	---	4.9E-01	---	4.9E-01
	Vapors Adult	Offsite Residential Areas (Tap)	1,1-Dichloroethene	---	2.2E-06	---	2.2E-06	1,1-Dichloroethene	liver	---	NA	---	NA
			1,2-Dichloroethane	---	8.9E-07	---	8.9E-07	1,2-Dichloroethane	gastrointestinal system	---	2.0E-02	---	2.0E-02
			Trichloroethene	---	5.0E-06	---	5.0E-06	Trichloroethene	NA	---	NA	---	NA
			(Total for Adult)	---	8.1E-06	---	8.1E-06		(Total for Adult)	---	4.3E-02	---	4.3E-02
	Vapors Child + Adult	Offsite Residential Areas (Tap)	1,1-Dichloroethene	---	8.6E-06	---	8.6E-06						
			1,2-Dichloroethane	---	3.5E-06	---	3.5E-06						
			Trichloroethene	---	2.0E-05	---	2.0E-05						
			(Total for Child + Adult)	---	3.2E-05	---	3.2E-05		Total Hazard Index Across Groundwater (Child)				7.3E+00
				Total Risk Across Groundwater			4.9E-04		Total Hazard Index Across Groundwater (Adult)				4.3E-02

Total Risk Across All Media and All Exposure Routes (Child + Adult) 4.9E-04

Total Hazard Index Across All Media and All Exposure Routes (Child) 7.3E+00

Total Hazard Index Across All Media and All Exposure Routes (Adult) 4.3E-02

Total Blood HI (child) =	NA
Total Skin HI (child) =	NA
Total Circulatory System HI (child) =	NA
Total CNS HI (child) =	3.2E+00
Total Liver HI (child) =	NA
Total Kidney HI (child) =	NA
Total Gastrointestinal HI (child) =	2.4E-01
Total Blood HI (adult) =	NA
Total Skin HI (adult) =	NA
Total Circulatory System HI (adult) =	NA
Total CNS HI (adult) =	NA
Total Liver HI (adult) =	NA
Total Kidney HI (adult) =	NA
Total Gastrointestinal HI (adult) =	2.0E-02

TABLE 10.11.RME

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

REASONABLE MAXIMUM EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Woodward Parkway School)

Scenario Timeframe Current
Receptor Population: School Child
Receptor Age: Pre-Adolescent (6-12 years old)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors	Offsite Residential Areas (Woodward Parkway School)	Vinyl chloride	---	4.8E-06	---	4.8E-06	Vinyl chloride	liver	—	NA	—	NA
			(Total)	---	4.8E-06	---	4.8E-06		(Total)	—	—	—	—
				Total Risk Across Groundwater			**4.8E-06**		**Total Hazard Index Across Groundwater**				**NA**
				Total Risk Across All Media and All Exposure Routes			**4.8E-06**		**Total Hazard Index Across All Media and All Exposure Routes**				**NA**

Total Liver HI = **NA**

TABLE 10.12.RME

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

REASONABLE MAXIMUM EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Woodward Parkway School)

Scenario Timeframe: Current
Receptor Population: School Employee
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors	Offsite Residential Areas (Woodward Parkway School)	1,1-Dichloroethene	---	1.0E-06	---	1.0E-06	1,1-Dichloroethene	liver	---	NA	---	NA
			Vinyl chloride	---	1.9E-05	---	1.9E-05	Vinyl chloride	liver	---	NA	---	NA
			(Total)	---	2.0E-05	---	2.0E-05		(Total)	---	---	---	---
				Total Risk Across Groundwater			2.0E-05		Total Hazard Index Across Groundwater				NA
				Total Risk Across All Media and All Exposure Routes			2.0E-05		Total Hazard Index Across All Media and All Exposure Routes				NA

Total Liver HI = NA

TABLE 10.13.RME
RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Massapequa Preserve
Scenario Timeframe: Current
Receptor Population: Swimmer
Receptor Age: Pre-Adolescent (6-12 years old)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Massapequa Preserve											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Surface Water				NA		Total Hazard Index Across Surface Water				NA
Sediment	Sediment	Massapequa Preserve											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Sediment				NA		Total Hazard Index Across Sediment				NA
			Total Risk Across All Media and All Exposure Routes				NA		Total Hazard Index Across All Media and All Exposure Routes				NA

Total Skin HI =	NA
Total Circulatory System HI =	NA
Total Kidney HI =	NA
Total Liver HI =	NA
Total Hair HI =	NA
Total CNS HI =	NA

TABLE 10.14.RME
RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Massapequa Preserve
Scenario Timeframe: Current
Receptor Population: Resident Fisher
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Fish Tissue (Child)	Massapequa Preserve	Cadmium	NA	---	---	NA	Cadmium	kidney	9.0E-01	—	—	9.0E-01
			Chromium VI	NA	---	---	NA	Chromium VI	NOEL	2.3E-01	—	—	2.3E-01
	(Child)		(Total Child)	---	---	---	---		(Total Child)	1.1E+00	—	—	1.1E+00
			Total Risk Across Fish Tissue (Child)				**NA**		**Total Hazard Index Across Fish Tissue (Child)**				**1.1E+00**
Surface Water	Fish Tissue (Adult)	Massapequa Preserve	Cadmium	NA	---	---	NA	Cadmium	kidney	5.6E-01	—	—	5.6E-01
			Chromium VI	NA	---	---	NA	Chromium VI	NOEL	1.4E-01	—	—	1.4E-01
	(Adult)		(Total Adult)	---	---	---	—		(Total Adult)	7.0E-01	—	—	7.0E-01
			Total Risk Across Fish Tissue (Adult)				**NA**		**Total Hazard Index Across Fish Tissue (Adult)**				**7.0E-01**
			Total Risk Across All Media and All Exposure Routes				**NA**		**Total Hazard Index Across All Media and All Exposure Routes (Child)**				**1.1E+00**
									Total Hazard Index Across All Media and All Exposure Routes (Adult)				**7.0E-01**

Total Kidney HI (Child) = 9.0E-01
Total Kidney HI (Adult) = 5.6E-01

TABLE 10 15.RME

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

REASONABLE MAXIMUM EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Ellsworth Allen Park

Scenario Timeframe: Current
Receptor Population: Recreational User
Receptor Age: Pre-Adolescent/Adolescent (6-18 years old)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Subsurface Soil	Ellsworth Allen Park											
			(Total)	---	---	---	---		(Total)	—	—	—	—
	Particulates	Ellsworth Allen Park											
			(Total)	---	---	---	---		(Total)	—	—	—	—
				Total Risk Across Subsurface Soil			NA		Total Hazard Index Across Subsurface Soil				NA
				Total Risk Across All Media and All Exposure Routes			NA		Total Hazard Index Across All Media and All Exposure Routes				NA

Total Kidney HI = NA

TABLE 10.1.CTE
RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Current
Receptor Population: Trespassers
Receptor Age: 10-18 years

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Western Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Particulates	Western Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
						Total Risk Across Surface Soil	NA					Total Hazard Index Across Surface Soil	NA
Surface/Subsurface Soil	Vapors	Western Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
						Total Risk Across Surface/Subsurface Soil	NA					Total Hazard Index Across Surface/Subsurface Soil	NA
Groundwater Upper Glacial	Vapors	Western Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
						Total Risk Across Groundwater	NA					Total Hazard Index Across Groundwater	NA
						Total Risk Across All Media and All Exposure Routes	NA					Total Hazard Index Across All Media and All Exposure Routes	NA

Total Blood HI =	NA
Total Skin HI =	NA
Total Circulatory System HI =	NA
Total Kidney HI =	NA
Total GI System HI =	NA
Total Immune System HI =	NA
Total Growth HI =	NA
Total Liver HI =	NA

TABLE 10.2.CTE
RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future Receptor Population: Commercial/Industrial Worker Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Western Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Particulates	Western Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Western Parcel (Indoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Western Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Surface/Subsurface Soil				NA		Total Hazard Index Across Surface/Subsurface Soil				NA
Groundwater	Groundwater	Western Parcel	Arsenic	2.3E-06	---	---	2.3E-06	Arsenic	skin, circulatory system	NA	---	---	NA
			Cadmium	NA	---	---	NA	Cadmium	kidney	7.5E+00	---	---	7.5E+00
			Chromium VI	NA	---	---	NA	Chromium VI	NOEL	1.3E+00	---	---	1.3E+00
			bis(2-Ethylhexyl)phthalate	2.6E-06	---	---	2.6E-06	bis(2-Ethylhexyl)phthalate	liver	NA	---	---	NA
			Trichloroethene	1.2E-05	---	---	1.2E-05	Trichloroethene	NA	NA	---	---	NA
			(Total)	1.7E-05	---	---	1.7E-05		(Total)	8.8E+00	---	---	8.8E+00
	Vapors	Western Parcel (Indoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Western Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
Groundwater	Groundwater	Western Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Groundwater				1.7E-05		Total Hazard Index Across Groundwater				8.8E+00
			Total Risk Across All Media and All Exposure Routes				1.7E-05		Total Hazard Index Across All Media and All Exposure Routes				8.8E+00

Total Blood HI =	NA
Total Skin HI =	NA
Total Circulatory System HI =	NA
Total Kidney HI =	7.5E+00
Total GI System HI =	NA
Total Immune System HI =	NA
Total Growth HI =	NA
Total Liver HI =	NA
Total CNS HI =	NA

TABLE 10 3.CTE

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

CENTRAL TENDENCY EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel
Scenario Timeframe: Future Receptor Population: Construction Workers Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Western Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Particulates	Western Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Western Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Surface/Subsurface Soil				NA		Total Hazard Index Across Surface/Subsurface Soil				NA
Groundwater (Upper Glacial)	Vapors	Western Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Groundwater				NA		Total Hazard Index Across Groundwater				NA
			Total Risk Across All Media and All Exposure Routes				NA		Total Hazard Index Across All Media and All Exposure Routes				NA

Total Blood HI =	NA
Total Skin HI =	NA
Total Circulatory System HI =	NA
Total Kidney HI =	NA
Total GI System HI =	NA
Total Immune System HI =	NA
Total Growth HI =	NA
Total Liver HI =	NA
Total CNS HI =	NA

TABLE 10.4.CTE

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

CENTRAL TENDENCY EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Western Parcel

Scenario Timeframe: Future
Receptor Population: Recreational User
Receptor Age: Pre-Adolescent/Adolescent (6-18 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Western Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Particulates	Western Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Western Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Surface/Subsurface Soil				NA		Total Hazard Index Across Surface/Subsurface Soil				NA
Groundwater (Upper Glacial)	Vapors	Western Parcel (Outdoors)											
			(Total)	---	8.9E-12	---	8.9E-12		(Total)	---	---	---	---
			Total Risk Across Groundwater				NA		Total Hazard Index Across Groundwater				NA
			Total Risk Across All Media and All Exposure Routes				NA		Total Hazard Index Across All Media and All Exposure Routes				NA

Total Blood HI =	NA
Total Skin HI =	NA
Total Circulatory System HI =	NA
Total Kidney HI =	NA
Total GI System HI =	NA
Total Immune System HI =	NA
Total Growth HI =	NA
Total Liver HI =	NA
Total CNS HI =	NA

TABLE 10.5.CTE
RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Current Receptor Population: Trespasser Receptor Age: 10-18 years

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Solid Waste	Vapors	Eastern Parcel (Outdoors)											
			(Total)	---	---	---	---	(Total)	(Total)	---	---	---	---
				Total Risk Across Solid Waste			NA		Total Hazard Index Across Solid Waste				NA
Liquid Waste	Vapors	Eastern Parcel (Outdoors)											
			(Total)	---	---	---	---	(Total)	(Total)	---	---	---	---
				Total Risk Across Liquid Waste			NA		Total Hazard Index Across Liquid Waste				NA
			Total Risk Across All Media and All Exposure Routes				NA	Total Hazard Index Across All Media and All Exposure Routes					NA

Total Liver HI =	NA
Total Development HI =	NA
Total Blood HI =	NA
Total Kidney HI =	NA

TABLE 10.6.CTE
RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Current
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Solid Waste	Vapors	Eastern Parcel (Indoors)											
			(Total)	---	---	---	---	(Total)	(Total)	---	---	---	---
				Total Risk Across Solid Waste			NA		Total Hazard Index Across Solid Waste				NA
			Total Risk Across All Media and All Exposure Routes				NA	Total Hazard Index Across All Media and All Exposure Routes					NA

TABLE 10.7.CTE

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

CENTRAL TENDENCY EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel

Scenario Timeframe: Future
Receptor Population: Commercial/Industrial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Eastern Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Particulates	Eastern Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Eastern Parcel (Indoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Eastern Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Surface/Subsurface Soil				**NA**		**Total Hazard Index Across Surface/Subsurface Soil**				**NA**
Solid Waste	Vapors	Eastern Parcel (Indoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Eastern Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Solid Waste				**NA**		**Total Hazard Index Across Solid Waste**				**NA**
Liquid Waste	Vapors	Eastern Parcel (Indoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Eastern Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Liquid Waste				**NA**		**Total Hazard Index Across Liquid Waste**				**NA**
			Total Risk Across All Media and All Exposure Routes				**NA**		**Total Hazard Index Across All Media and All Exposure Routes**				**NA**

Total Skin HI =	**NA**
Total Circulatory System HI =	**NA**
Total Kidney HI =	**NA**
Total Liver HI =	**NA**
Total Development HI =	**NA**
Total Blood HI =	**NA**
Total CNS HI =	**NA**

TABLE 10.8.CTE
RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface/Subsurface Soil	Soil	Eastern Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Particulates	Eastern Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Eastern Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Surface/Subsurface Soil				NA		Total Hazard Index Across Surface/Subsurface Soil				NA
Solid Waste	Solid Waste	Eastern Parcel	Benz(a)anthracene	1.3E-06	---	1.1E-07	1.4E-06	Benz(a)anthracene	NA	NA	---	NA	NA
			Benzo(a)pyrene	8.2E-06	---	7.0E-07	8.9E-06	Benzo(a)pyrene	NA	NA	---	NA	NA
			Benzo(b)fluoranthene	1.4E-06	---	1.2E-07	1.5E-06	Benzo(b)fluoranthene	NA	NA	---	NA	NA
			Dibenz(a,h)anthracene	1.3E-06	---	NA	1.3E-06	Dibenz(a,h)anthracene	NA	NA	---	NA	NA
			(Total)	1.2E-05	---	9.3E-07	1.3E-05		(Total)	---	---	---	---
	Particulates	Eastern Parcel											
			(Total)	---	---	---	---		(Total)	---	---	---	---
	Vapors	Eastern Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Solid Waste				1.3E-05		Total Hazard Index Across Solid Waste				NA

TABLE 10.8.CTE

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

CENTRAL TENDENCY EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Eastern Parcel
Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Liquid Waste	Liquid Waste	Eastern Parcel	Chromium VI	---	---	NA	NA	Chromium VI	NOEL	---	---	1.5E+00	1.5E+00
			4,4'-DDT	---	---	1.4E-06	1.4E-06	4,4'-DDT	liver	---	---	NA	NA
			Aroclor-1260	---	---	4.3E-05	4.3E-05	Aroclor-1260	immune system, growth	---	---	3.0E+01	3.0E+01
			Benz(a)anthracene	---	---	3.4E-05	3.4E-05	Benz(a)anthracene	NA	---	---	NA	NA
			Benzo(a)pyrene	---	---	5.3E-04	5.3E-04	Benzo(a)pyrene	NA	---	---	NA	NA
			Benzo(b)fluoranthene	---	---	8.6E-05	8.6E-05	Benzo(b)fluoranthene	NA	---	---	NA	NA
			Benzo(k)fluoranthene	---	---	3.6E-06	3.6E-06	Benzo(k)fluoranthene	NA	---	---	NA	NA
			Dibenz(a,h)anthracene	---	---	2.4E-04	2.4E-04	Dibenz(a,h)anthracene	NA	---	---	NA	NA
			Indeno(1,2,3-cd)pyrene	---	---	5.8E-05	5.8E-05	Indeno(1,2,3-cd)pyrene	NA	---	---	NA	NA
			Pentachlorophenol	---	---	1.7E-06	1.7E-06	Pentachlorophenol	liver, kidney	---	---	NA	NA
			(Total)	---	---	1.0E-03	1.0E-03		(Total)	---	---	3.1E+01	3.1E+01
	Vapors	Eastern Parcel (Outdoors)											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Liquid Waste				1.0E-03		Total Hazard Index Across Liquid Waste				3.1E+01
			Total Risk Across All Media and All Exposure Routes				1.0E-03		Total Hazard Index Across All Media and All Exposure Routes				3.1E+01

Total Kidney HI =	NA
Total Liver HI =	NA
Total Immune System HI =	3.0E+01
Total Growth HI =	3.0E+01

TABLE 10.9.CTE
RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas

Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater	Groundwater (Child)	Offsite Residential Area (Tap)	Arsenic	1.28E-05	---	4.12E-08	1.3E-05	Arsenic	skin, circulatory system	NA	—	NA	NA
			Cadmium	NA	---	NA	NA	Cadmium	kidney	1.19E+01	—	1.53E+00	1.3E+01
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	7.44E+00	—	1.91E+00	9.4E+00
			Manganese	NA	---	NA	NA	Manganese	CNS	1.75E+01	—	1.41E+00	1.9E+01
			Dieldrin	6.63E-06	---	6.21E-06	1.3E-05	Dieldrin	liver	NA	—	NA	NA
			Heptachlor epoxide	1.33E-06	---	9.05E-07	2.2E-06	Heptachlor epoxide	liver	NA	—	NA	NA
			1,1-Dichloroethene	1.14E-05	---	1.70E-06	1.3E-05	1,1-Dichloroethene	liver	NA	—	NA	NA
			Tetrachloroethene	1.09E-06	---	7.66E-07	1.9E-06	Tetrachloroethene	liver	NA	—	NA	NA
			Trichloroethene	1.32E-06	---	2.47E-07	1.6E-06	Trichloroethene	NA	NA	—	NA	NA
			Vinyl Chloride	3.26E-04	---	1.79E-05	3.4E-04	Vinyl Chloride	liver	NA	—	NA	NA
			Total (Child)	3.6E-04	---	2.8E-05	3.9E-04		Total (Child)	3.7E+01	—	4.9E+00	4.2E+01
	Groundwater (Adult)	Offsite Residential Area (Tap)	Arsenic	2.60E-06	---	8.42E-09	2.6E-06	Arsenic	skin, circulatory system	NA	—	NA	NA
			Cadmium	NA	—	NA	NA	Cadmium	kidney	4.83E+00	—	6.27E-01	5.5E+00
			Chromium VI	NA	---	NA	NA	Chromium VI	NOEL	3.02E+00	—	7.82E-01	3.8E+00
			Manganese	NA	—	NA	NA	Manganese	CNS	7.11E+00	—	5.76E-01	7.7E+00
			Dieldrin	1.34E-06	—	1.46E-06	2.8E-06	Dieldrin	liver	NA	—	NA	NA
			Heptachlor epoxide	2.71E-07	—	2.12E-07	4.8E-07	Heptachlor epoxide	liver	NA	—	NA	NA
			1,1-Dichloroethene	2.30E-06	---	4.00E-07	2.7E-06	1,1-Dichloroethene	liver	NA	—	NA	NA
			Tetrachloroethene	2.21E-07	---	1.80E-07	4.0E-07	Tetrachloroethene	liver	NA	—	NA	NA
			Trichloroethene	2.68E-07	---	5.80E-08	3.3E-07	Trichloroethene	NA	NA	—	NA	NA
			Vinyl Chloride	6.61E-05	---	4.21E-06	7.0E-05	Vinyl Chloride	liver	NA	—	NA	NA
			Total (Adult)	7.3E-05	---	6.5E-06	8.0E-05		Total (Adult)	1.5E+01	—	2.0E+00	1.7E+01
	Groundwater Adult and Child	Offsite Residential Area (Tap)	Arsenic	1.5E-05	---	5.0E-08	1.5E-05						
			Dieldrin	8.0E-06	---	7.7E-06	1.6E-05						
			Heptachlor epoxide	1.6E-06	---	1.1E-06	2.7E-06						
			1,1-Dichloroethene	1.4E-05	---	2.1E-06	1.6E-05						
			Tetrachloroethene	1.3E-06	---	9.5E-07	2.3E-06						
			Trichloroethene	1.6E-06	---	3.1E-07	1.9E-06						
			Vinyl Chloride	3.9E-04	---	2.2E-05	4.1E-04						
			Total (Adult + Child)	4.3E-04	---	3.4E-05	4.7E-04						

TABLE 10.9.CTE
RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas
Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors Child	Offsite Residential Area (Tap)	1,1-Dichloroethene	---	1.9E-04	---	1.9E-04	1,1-Dichloroethene	liver	---	NA	---	NA
			Trichloroethene	---	1.2E-08	---	1.2E-08	Trichloroethene	NA	---	NA	---	NA
			Vinyl Chloride	---	9.3E-05	---	9.3E-05	Vinyl Chloride	liver	---	NA	---	NA
			Total (Child)	---	2.8E-04	---	1.2E-03		Total (Child)	---	---	---	---
	Vapors Adult	Offsite Residential Area (Tap)	1,1-Dichloroethene	---	2.1E-06	---	2.1E-06	1,1-Dichloroethene	liver	---	NA	---	NA
			Vinyl Chloride	---	1.0E-06	---	1.0E-06	Vinyl Chloride	liver	---	NA	---	NA
			Total (Adult)	---	3.1E-06	---	3.1E-06		Total (Adult)	---	---	---	---
	Vapors Adult and Child	Offsite Residential Area (Tap)	1,1-Dichloroethene	---	1.9E-04	---	1.9E-04						
			Vinyl Chloride	---	9.4E-05	---	9.4E-05						
			Total (Adult + Child)	---	2.8E-04	---	2.8E-04						
	Vapors Child	Offsite Residential Areas (Indoors)	1,1-Dichloroethene	---	1.5E-05	---	1.5E-05	1,1-Dichloroethene	liver	---	NA	---	NA
			Vinyl Chloride	---	3.0E-04	---	3.0E-04	Vinyl Chloride	liver	---	NA	---	NA
			(Total for Child)	---	3.1E-04	---	3.1E-04		(Total for Child)	---	---	---	---
	Vapors Adult	Offsite Residential Areas (Indoors)	1,1-Dichloroethene	---	1.4E-08	---	1.4E-08	1,1-Dichloroethene	liver	---	NA	---	NA
			Vinyl Chloride	---	2.8E-07	---	2.8E-07	Vinyl Chloride	liver	---	NA	---	NA
			(Total for Adult)	---	2.9E-07	---	2.9E-07		(Total for Adult)	---	---	---	---
	Vapors Adult and Child	Offsite Residential Areas (Indoors)	1,1-Dichloroethene	---	1.5E-05	---	1.5E-05						
			Vinyl Chloride	---	3.0E-04	---	3.0E-04						
			(Total for Child + Adult)	---	3.1E-04	---	3.1E-04						

TABLE 10.9.CTE
RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas
Scenario Timeframe: Current
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors Child	Offsite Residential Areas (Outdoors)											
			(Total for Child)	---	---	---	---		(Total for Child)	---	---	---	---
	Vapors Adult	Offsite Residential Areas (Outdoors)											
			(Total for Adult)	---	---	---	---		(Total for Adult)	---	---	---	---
	Vapors Adult and Child	Offsite Residential Areas (Outdoors)											
			(Total for Child + Adult)	---	---	---	---		Total Hazard Index Across Groundwater (Child)				4.2E+01
				Total Risk Across Groundwater			1.1E-03		Total Hazard Index Across Groundwater (Adult)				1.7E+01

Total Risk Across All Media and All Exposure Routes: 1.1E-03

Total Hazard Index Across All Media and All Exposure Routes (Child): 4.2E+01
Total Hazard Index Across All Media and All Exposure Routes (Adult): 1.7E+01

Total Liver HI (Child) =	NA
Total Kidney HI (Child) =	1.3E+01
Total Skin HI (Child) =	NA
Total Circulatory HI (Child) =	NA
Total CNS HI (Child) =	1.9E+01
Total Liver HI (Adult) =	NA
Total Kidney HI (Adult) =	5.5E+00
Total Skin HI (Adult) =	NA
Total Circulatory HI (Adult) =	NA
Total CNS HI (Adult) =	7.7E+00

TABLE 10.10.CTE

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

CENTRAL TENDENCY EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Tap)

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Magothy)	Groundwater Child	Offsite Residential Areas (Tap)	Arsenic	1.1E-05	---	3.4E-08	1.1E-05	Arsenic	skin, circulatory system	NA	---	NA	NA
			Manganese	NA	---	NA	NA	Manganese	CNS	1.1E+00	---	8.2E-02	1.2E+00
			1,1-Dichloroethene	2.7E-05	---	3.7E-06	3.1E-05	1,1-Dichloroethene	liver	NA	---	NA	NA
			1,2-Dichloroethane	3.2E-06	---	1.5E-07	3.3E-06	1,2-Dichloroethane	gastrointestinal system	NA	---	NA	NA
			Benzene	1.8E-06	---	2.8E-07	2.1E-06	Benzene	blood	NA	---	NA	NA
			Tetrachloroethene	2.3E-06	---	1.5E-06	3.8E-06	Tetrachloroethene	liver	NA	---	NA	NA
			Trichloroethene	3.3E-05	---	5.6E-06	3.9E-05	Trichloroethene	NA	NA	---	NA	NA
			(Total for Child)	7.9E-05	---	1.1E-05	9.0E-05		(Total for Child)	1.1E+00	---	8.2E-02	1.2E+00
	Groundwater Adult	Offsite Residential Areas (Tap)	Arsenic	2.3E-06	---	7.4E-09	2.3E-06	Arsenic	skin, circulatory system	NA	---	NA	NA
			1,1-Dichloroethene	5.5E-06	---	9.5E-07	6.4E-06	1,1-Dichloroethene	liver	NA	---	NA	NA
			1,2-Dichloroethane	6.4E-07	---	3.7E-08	6.8E-07	1,2-Dichloroethane	gastrointestinal system	NA	---	NA	NA
			Benzene	3.6E-07	---	7.2E-08	4.3E-07	Benzene	blood	NA	---	NA	NA
			Tetrachloroethene	4.7E-07	---	3.8E-07	8.4E-07	Tetrachloroethene	liver	NA	---	NA	NA
			Trichloroethene	6.7E-06	---	1.4E-06	8.1E-06	Trichloroethene	NA	NA	---	NA	NA
			(Total for Adult)	1.6E-05	---	2.9E-06	1.9E-05		(Total for Adult)	---	---	---	---
	Groundwater Child + Adult	Offsite Residential Areas (Tap)	Arsenic	1.4E-05	---	4.1E-08	1.4E-05						
			1,1-Dichloroethene	3.3E-05	---	4.7E-06	3.7E-05						
			1,2-Dichloroethane	3.8E-06	---	1.8E-07	4.0E-06						
			Benzene	2.1E-06	---	3.6E-07	2.5E-06						
			Tetrachloroethene	2.8E-06	---	1.9E-06	4.6E-06						
			Trichloroethene	4.0E-05	---	7.1E-06	4.7E-05						
			(Total for Child + Adult)	9.5E-05	---	1.4E-05	1.1E-04						

TABLE 10.10.CTE
RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Tap)
Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
	Vapors Child	Offsite Residential Areas (Tap)	1,1-Dichloroethene	---	1.8E-06	---	1.8E-06	1,1-Dichloroethene	liver	---	NA	---	NA
			Trichloroethene	---	4.0E-06	---	4.0E-06	Trichloroethene	NA	---	NA	---	NA
			(Total for Child)	---	5.8E-06	---	5.8E-06		(Total for Child)	---	---	---	---
	Vapors Adult	Offsite Residential Areas (Tap)	1,1-Dichloroethene	---	1.4E-07	---	1.4E-07	1,1-Dichloroethene	liver	---	NA	---	NA
			Trichloroethene	---	3.3E-07	---	3.3E-07	Trichloroethene	NA	---	NA	---	NA
			(Total for Adult)	---	4.7E-07	---	4.7E-07		(Total for Adult)	---	---	---	---
	Vapors Child + Adult	Offsite Residential Areas (Tap)	1,1-Dichloroethene	---	1.9E-06	---	1.9E-06						
			Trichloroethene	---	4.3E-06	---	4.3E-06						
			(Total for Child + Adult)	---	6.2E-06	---	6.2E-06		Total Hazard Index Across Groundwater (Child)				1.2E+00
				Total Risk Across Groundwater			1.2E-04		Total Hazard Index Across Groundwater (Adult)				NA
				Total Risk Across All Media and All Exposure Routes			1.2E-04		Total Hazard Index Across All Media and All Exposure Routes (Child)				1.2E+00
									Total Hazard Index Across All Media and All Exposure Routes (Adult)				NA

Total Blood HI (child) =	NA
Total Skin HI (child) =	NA
Total Circulatory System HI (child) =	NA
Total CNS HI (child) =	1.2E+00
Total Liver HI (child) =	NA
Total GI HI (child) =	NA
Total Kidney HI (child) =	NA
Total Blood HI (adult) =	NA
Total Skin HI (adult) =	NA
Total Circulatory System HI (adult) =	NA
Total CNS HI (adult) =	NA
Total Liver HI (adult) =	NA
Total GI HI (adult) =	NA
Total Kidney HI (adult) =	NA

TABLE 10.11.CTE

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

CENTRAL TENDENCY EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Woodward Parkway School)

Scenario Timeframe: Current
Receptor Population: School Child
Receptor Age: Pre-Adolescent (6-12 years old)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors	Offsite Residential Areas (Woodward Parkway (School)	Vinyl chloride	---	3.4E-06	---	3.4E-06	Vinyl chloride	liver	—	NA	—	NA
			(Total)	---	3.4E-06	---	3.4E-06		(Total)	—	---	—	—
				Total Risk Across Groundwater			**3.4E-06**		**Total Hazard Index Across Groundwater**				**NA**
			Total Risk Across All Media and All Exposure Routes				**3.4E-06**		**Total Hazard Index Across All Media and All Exposure Routes**				**NA**

Total Liver HI = **NA**

TABLE 10.12.CTE

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

CENTRAL TENDENCY EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Offsite Residential Areas (Woodward Parkway School)
Scenario Timeframe: Current
Receptor Population: School Employee
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Groundwater (Upper Glacial)	Vapors	Offsite Residential Areas (Woodward Parkway (School)	Vinyl chloride	---	5.1E-06	---	5.1E-06	Vinyl chloride	liver	---	NA	---	NA
			(Total)	---	5.1E-06	---	5.1E-06		(Total)	---	---	---	---
				Total Risk Across Groundwater			5.1E-06		Total Hazard Index Across Groundwater				NA
				Total Risk Across All Media and All Exposure Routes			5.1E-06		Total Hazard Index Across All Media and All Exposure Routes				NA

Total Liver HI = NA

TABLE 10.13.CTE

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

CENTRAL TENDENCY EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Massapequa Preserve

Scenario Timeframe: Current
Receptor Population: Swimmer
Receptor Age: Pre-Adolescent (6-12 years old)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Surface Water	Massapequa Preserve											
			(Total)	---	---	---	---		(Total)	—	—	—	—
			Total Risk Across Surface Water				NA		Total Hazard Index Across Surface Water				NA
Sediment	Sediment	Massapequa Preserve											
			(Total)	---	---	---	---		(Total)	—	—	—	—
			Total Risk Across Sediment				NA		Total Hazard Index Across Sediment				NA
			Total Risk Across All Media and All Exposure Routes				NA		Total Hazard Index Across All Media and All Exposure Routes				NA

Total Skin HI =	NA
Total Circulatory System HI =	NA
Total Kidney HI =	NA
Total Liver HI =	NA
Total Hair HI =	NA
Total CNS HI =	NA

TABLE 10.14.CTE

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

CENTRAL TENDENCY EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Massapequa Preserve
Scenario Timeframe: Current
Receptor Population: Resident Fisher
Receptor Age: Child and Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Water	Fish Tissue (Child)	Massapequa Preserve											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Fish Tissue (Child)				NA		Total Hazard Index Across Fish Tissue (Child)				NA
Surface Water	Fish Tissue (Adult)	Massapequa Preserve											
			(Total)	---	---	---	---		(Total)	---	---	---	---
			Total Risk Across Fish Tissue (Adult)				NA		Total Hazard Index Across Fish Tissue (Adult)				NA
			Total Risk Across All Media and All Exposure Routes				NA		Total Hazard Index Across All Media and All Exposure Routes (Child)				NA
									Total Hazard Index Across All Media and All Exposure Routes (Adult)				NA

Total Kidney HI (Child) = NA
Total Kidney HI (Adult) = NA

TABLE 10.15.CTE

RISK ASSESSMENT SUMMARY (RISKS EXCEEDING 1.0E-06 AND HAZARD INDICES EXCEEDING 1.0)

CENTRAL TENDENCY EXPOSURE

LIBERTY INDUSTRIAL FINISHING SITE

Location: Ellsworth Allen Park
Scenario Timeframe: Current Receptor Population: Recreational User Receptor Age: Pre-Adolescent/Adolescent (6-18 years old)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Soil	Subsurface Soil	Ellsworth Allen Park											
			(Total)	—	—	—	—		(Total)	—	—	—	—
	Particulates	Ellsworth Allen Park											
			(Total)	—	—	—	—		(Total)	—	—	—	—
			Total Risk Across Subsurface Soil				NA		Total Hazard Index Across Subsurface Soil				NA
			Total Risk Across All Media and All Exposure Routes				NA		Total Hazard Index Across All Media and All Exposure Routes				NA

Total Kidney HI = NA