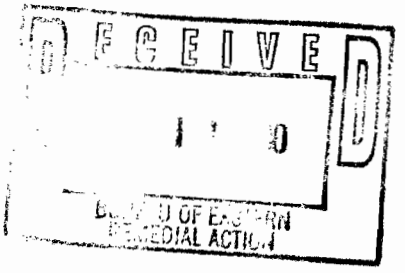
Greco (NYSDEC)

URS



September 12, 2000

Chief, NY Remediation Branch
United States Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007

Attn: Mr. Lorenzo Thantu

Re: Final Baseline Human Health Risk Assessment – Replacement Pages
Continued Remedial Investigation/Feasibility Study
Liberty Industrial Finishing Site
Farmingdale, Nassau County, New York

Dear Mr. Thantu:

Enclosed are two (2) unbound sets of replacement pages to the Final Baseline Human Health Risk Assessment (BHHRA) for the referenced site. The Final BHHRA was submitted to the EPA on July 27, 2000. On August 30, 2000 you notified Mr. Ralph Golia (URS) via e-mail of additional comments to the Final BHHRA. According to your August 30, 2000 e-mail, these comments needed to be addressed prior to release of the Final BHHRA to the public.

In response to these comments, URS has prepared revisions to the Final BHHRA that adequately address the EPA's needs. Please remove the following sections from the unbound July 27, 2000 Final BHHRA and insert in their place the replacement pages, as follows (each Section is separated by yellow sheets; do not insert the yellow sheets into the Final BHHRA):

Revised text located in:	Remove and replace these pages:
Table of Contents, pages v and vi	v, vi
Executive Summary	ES-5 through ES-7
Section 4.5.2.10	4-24
Section 6.2.4.2	6-6 through end of Chapter 6
Section 6.3.4	6-6 through end of Chapter 6
Section 6.4.2.1	6-6 through end of Chapter 6
Section 6.4.3	6-6 through end of Chapter 6
Section 7.2	7-2 through end of Chapter 7
Section 8.1.4	8-2 through end of Chapter 8
Section 8.2	8-2 through end of Chapter 8
Section 8.4	8-2 through end of Chapter 8

URS Corporation
2325 Maryland Road, 2nd Floor
Willow Grove, PA 19090
Tel: 215.657.5000
Fax: 215.657.5454

Also replace the following tables:

Table 2.4 (not revised)
Table 2.5 (not revised)
Table 2.6 (not revised)
Table 2.7 (not revised)
Table 2.8 (not revised)
Table 2.9 (not revised)
Table 5.1
Table F7.72.RME (Appendix F)
Table F7.73.RME (Appendix F)
Table G7.72.CTE (Appendix G)
Table G7.73.CTE (Appendix G)
Table 9.14.RME
Table 9.14.CTE
Table 10.14.RME
Table 10.14.CTE

Due to the nature of these changes (i.e., small changes in the text necessitated shifts in the entirety of Chapters 6, 7, and 8), we also enclosed bound copies of the replacement pages, which may be used as an 'errata document' for your personal working copies. Please call us if you have any additional questions.

Sincerely,
URS

Ralph T. Gotia
Project Coordinator

Matthias Ohr, Ph.D.
Project Manager

P:\Liberty CRI-FS\HHRA 07-27-00\09-12-00 cover letter.doc

Enclosures

cc: Mr. Bruce Amig (BFGoodrich, Inc.) - 1 copy of Errata Document
Tracey Salmon-Smith, Esq. (U.S. Attorney's Office) - 1 copy of Errata Document
Michael Mintzer, Esq (EPA) – 1 copy of Errata Document
Mr. John Greco (NYSDEC) 2 copies of Errata Document
Mr. Ted Toskos (Weston, Inc.) – 1 copy of Errata Document
Mr. Tom Maher (Dvirka and Bartilucci) – 1 copy of Errata Document
Mr. Gary Loesch (H2M) – 1 copy of Errata Document

ENCLOSURE 1: RESPONSE TO COMMENTS

Comment No. 1: *"The fish ingestion rates have been adjusted to reflect recreational anglers specific to New York State. However, the incorrect reference dose for cadmium was used, and the text included in the document requires revision. EPA's IRIS database provides reference doses (RfDs) for cadmium which are specific to the medium of exposure. Specifically, if exposure occurs through drinking water, the RfD of 5E-04 mg/kg-day is recommended, while an RfD of 1E-03 mg/kg-day is suggested when cadmium in food is evaluated. For the pathway of fish ingestion, the RfD for food of 1E-03 mg/kg-day should be used. The Final Baseline Human Health Risk Assessment (FBHHRA) incorporates the RfD for water of 5E-04 mg/kg-day. Using the appropriate RfD results in hazard quotients (HQs) of 0.28 for the adult recreational fisher and 0.45 for the child recreational fisher. When these HQ values are added to the HQ values for chromium in fish tissue (which are correctly estimated in the FBHHRA) the hazard index (HI) values are 0.42 for the adult recreational fisher and 0.68 for the child recreational fisher, as stated in my memo of June 30, 2000. These changes are necessary in RAGS Part D Tables F7.72.RME, F7.73.RME, 9.14.RME, 9.14.CTE and in the text in Sections 6.2.4.2 and 8.1.4. Also, RAGS Part D Tables10.14.RME and 10.14.CTE are not necessary."*

Response: The reference dose for cadmium, as it pertains to fish ingestion, was revised to 1E-03 mg/kg-day. The tables and text sections cited were revised to reflect the revised risk results. Tables 10.14.RME and 10.14.CTE were retained; however, they will show no HQs above 1.0 for this pathway.

Comment No. 2: *"Additionally, the text which was included to explain the ingestion rate should be revised. Although EPA's Exposure Factors Handbook (EPA/600/P-95/002Fb) provides recommendations based on data from studies which reflect national trends and patterns, data which reflect behaviors or exposure patterns which are more site-specific should be included when available. For the Liberty Industrial Finishing site, recreational fish ingestion rates for the state of New York are available and are appropriate to use in place of recommendations provided in the Exposure Factors Handbook. On pages 4-24, 7-3, and 8-2, the text should be revised to state that fish ingestion rates, which are based on State-specific studies, are used. The text which is currently included in the document on these three pages which compares the ingestion rates for New York with the recommendations based on national behavioral patterns is not appropriate or necessary to include in the discussion and should be removed. Also, the reference to the Region I toxicologist should be revised to reflect that I am employed in Region II."*

Response: Reference to national fish ingestion rates were removed from the text, and only text detailing New York State fish ingestion rates were used. However, the text was also be revised to detail that the 90th percentile recreational fish ingestion rates for New York State are more appropriate for larger bodies than the Massapequa Preserve. All references to EPA Region I were corrected to EPA Region II.

ADDITIONAL COMMENTS/SPECIFIC COMMENTS:

Comment No. 3: *Section 6.4.2.1, Paragraph 2, Sentence 3: "Although the text has been revised, the concepts behind the additional text have not been incorporated into the document. Specifically, the comment states that the probability density plots show that 8 to 10 percent of the child population have blood lead levels greater than the 10 ug/dl threshold. The levels of concern for lead, including 15 ug/l in drinking water and 400 mg/kg in soil, were established to reach the goal of 95 percent of children with a blood lead level of less than 10ug/dl. Based on the information provided by the modeling, that goal is not met at the site, and these conclusions are not discussed. The text, including the executive summary and the conclusions, must be revised to evaluate any potential impacts of the site on child blood lead levels."*

Response: Appropriate text sections were revised to include an evaluation of potential impacts of the site on child blood lead levels.

Comment No. 4: *"RAGS Part D Tables 2.4 through 2.9 are missing. It cannot be determined if this comment has been adequately addressed."*

Response: Tables 2.4 through 2.9 were included as replacement pages.

Comment No. 5: *"RAGS Part D Tables 2.4 through 2.9 are missing. It cannot be determined if this comment has been adequately addressed."*

Response: Tables 2.4 through 2.9 were included as replacement pages.

Comment No. 6: *RAGS Part D Table 2.11. "Was this comment addressed? If the detection limits and maximum detected concentrations in RAGS Part D Table 2.11 have been verified against the laboratory reports, then this should be noted in a Response to Comments memo."*

Response: The detection limits and maximum detection concentrations in Table 2.11 were verified against the laboratory reports. A discussion of the detection limits and maximum detected concentrations was included in the Response to Comments letter, dated July 17, 2000, under number 18 (Comment No. 12).

REPLACEMENT PAGES
SEPTEMEBR 12, 2000

TO:

FINAL BASELINE HUMAN HEALTH RISK ASSESSMENT
LIBERTY INDUSTRIAL FINISHING SITE
FARMINGDALE, NEW YORK
JULY 2000

TABLE OF CONTENTS (Continued)

Page

TABLE OF CONTENTS (Continued)

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 x 10-^{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 Hls exceed 1.0 for the Magothy Aquifer for CNS, driven by manganese.

Massapequa Preserve

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

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. The predicted blood lead levels resulting from the IEUBK model analysis of ingesting fish in Massapequa Preserve marginally exceeded the EPA target of 95% of the population below 10 µg/dl. Eight to ten percent of the child population within the 1-2 year old and 2-3 year old

age groups have predicted blood lead levels greater than the 10 µg/dl threshold. As a result, lead in fish may present a slight risk to children in this age group based upon the IEUBK blood lead modeling. However, it should be noted that the assumption that a 0-7 year old eats 10% of his meat as recreationally caught fish may be very conservative given the typical diet of a young child.

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. Ingestion of lead in fish may pose a risk to a small part of the population in ages 1-3 years.

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.

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 II Toxicologist, (personal communication). It should be noted that the Massapequa Preserve most likely could not support this level of fish consumption for the local population. The 90th percentile value used for recreational fishers in New York State is more likely to reflect ingestion rates for anglers fishing from the state's larger bodies of water, such as Lake Erie, Lake Ontario, Long Island Sound, and the Atlantic Ocean. As a result, the fish ingestion rates utilized herein may overestimate actual risks for fish ingestion at the site.

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 0.68 for RME and 0.19 for CTE. Total HIs for resident adult were 0.42 under RME and 0.08 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 Hls exceed 1.0 for the Magothy Aquifer for CNS driven by manganese.

6.3.4 Massapequa Preserve

Table 10.14RME shows that none of the cancer risks or hazard indices exceed point of departure levels.

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

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

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 $\mu g/m^3$ (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:

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

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. This exceeds EPA's target of no more than 5% of the population exceeding 10 µg/dl. Therefore, there may be a slight risk to children in this age group. However, 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:

$$PbB_{fetal,0.95} = PbB_{adultcentral} \times GSD_{i,adult}^{1.645} \times R_{fetal/maternal}$$

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. The predicted blood lead levels resulting from the IEUBK model analysis of ingesting fish in Massapequa Preserve marginally exceeded the EPA target of 95% of the population below 10 µg/dl. Eight to ten percent of the child population within the 1-2 year old and 2-3 year old age groups have predicted blood lead levels greater than the 10 µg/dl threshold. As a result, lead in fish may present a slight risk to children in this age group based upon the IEUBK blood lead modeling. However, it should be noted that the assumption that a 0-7 year old eats 10% of his meat as recreationally caught fish may be very conservative given the typical diet of a young child.

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.

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 II Toxicologist, (personal communication). It should be noted that the Massapequa Preserve most likely could not support this level of fish consumption for the local population. The 90th percentile value for recreational fishers in New York State is more likely to reflect ingestion rates for anglers fishing from the state's larger bodies of water, such as Lake Erie, Lake Ontario, Long Island Sound, and the Atlantic Ocean. As a result, the fish ingestion rates utilized herein may 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.

8.1.3 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 3.0×10^{-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 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.

8.1.4 Massapequa Preserve

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

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. The predicted blood lead levels resulting from the IEUBK model analysis of ingesting fish in

Massapequa Preserve marginally exceeded the EPA target of 95% of the population below 10 µg/dl. Eight to ten percent of the child population within the 1-2 year old and 2-3 year old age groups have predicted blood lead levels greater than the 10 µg/dl threshold. As a result, lead in fish may present a slight risk to children in this age group based upon the IEUBK blood lead modeling. However, it should be noted that the assumption that a 0-7 year old eats 10% of his meat as recreationally caught fish may be very conservative given the typical diet of a young child.

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. Ingestion of lead in fish may pose a risk to a small part of the population in ages 1-3 years.

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.

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	65	B2N*J	7060		ug/l	MW-18-02 7/27/92	13/24	38-86.9	7060	451	3.7E+03	N			YES	ASL
7440382	Arsenic	1	B2	4.5	B2	ug/l	MW-6-01 3/27/92	5/25	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	5.4	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	2.9-6	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	11.5	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	40.5	B2JNM	ug/l	MW-7B 1/10/92	2/28	1-15	40.5		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		5.5E+00	N	5	NY DEC 703	YES	ASL

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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	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-nitroaniline 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	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		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	65	B2N*J	7060		ug/l	MW-18-02 7/27/92	13/24	38-86.9	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		6.3	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	2.9-6	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	1.6-4.4	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	6/28	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**	**8**	**JN**	**310**		**ug/l**	**MW-7 A 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**	**8.3E-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-1B 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**
79018	**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-nitroaniline 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	(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
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		688		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	6.4	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**	**53**		**89.7**		**ug/l**	**MW-6D 8/18/98**	**4/4**	**0-0**	**89.7**		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 8/18/98	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-nitroaniline 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		688		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- and 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		22.6		mg/kg	SB-35-8_5-10 02/20/92	12/59	0.44-28.2	22.5		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	0.82	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 0.0835	67/133	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 0.0835	135/135	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	6/11	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		1950	JN*	mg/kg	SB-33-11-14 01/27/92	52/56	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	0.58	BNJ	1220	S*	mg/kg	SB-35-8_5-10 02/20/92	57/58	0.43-0.43	1220	400	4.0E+02				YES	ASL
7439954	Magnesium	89.4		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	13/59	0.05-0.67	3.2	0.1	7.8E-01	N			YES	ASL
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	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	8.5	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	59/59	0-0	178	150	5.5E+01	N			YES	ASL
7440666	Zinc	2.6	B2*	5060		mg/kg	SB-33-11-14 01/27/92	54/54	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**	**0.75**	**J**	**mg/kg**	**SL-04_0_5-1_0 5/22/97**	**6/24**	**0.34-6.9**	**0.75**		**8.7E-02**	**C**			**YES**	**ASL**
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**		**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			ND	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			ND	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			ND	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_5-4_5 01/21/92**	**25/119**	**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	67500		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	6/11	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	(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
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		4.6E+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	0.98	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	1.6	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	6.1		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	25/119	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)

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 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
Cadmium (Food)	Chronic	1.00E-03	mg/kg-day	0.025	2.50E-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	6.00E-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 F7.72.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Fish
Exposure Medium: Fish Tissue
Exposure Point: Massapequa Preserve
Receptor Population: Fisher
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Cadmium	6.40E-01	mg/kg	6.40E-01	mg/kg	R	4.50E-04	mg/kg-day	1.00E-03	mg/kg-day			4.5E-01
	Chromium VI	9.80E-01	mg/kg	9.80E-01	mg/kg	R	6.89E-04	mg/kg-day	3.00E-03	mg/kg-day			2.3E-01
												Total Hazard Index	6.8E-01

R = Route EPC
* Total hazard index is broken down by target organ in other tables.

TABLE F7.73.RME
CALCULATION OF NON-CANCER HAZARDS
REASONABLE MAXIMUM EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Fish
Exposure Medium: Fish Tissue
Exposure Point: Massapequa Preserve
Receptor Population: Fisher
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Cadmium	6.40E-01	mg/kg	6.40E-01	mg/kg	R	9.62E-05	mg/kg-day	1.00E-03	mg/kg-day			2.8E-01
	Chromium VI	9.80E-01	mg/kg	9.80E-01	mg/kg	R	1.47E-04	mg/kg-day	3.00E-03	mg/kg-day			1.4E-01
												Total Hazard Index	4.2E-01

R = Route EPC
* Total hazard index is broken down by target organ in other tables.

TABLE G7.72.CTE
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Fish
Exposure Medium: Fish Tissue
Exposure Point: Massapequa Preserve
Receptor Population: Fisher
Receptor Age: Child

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Cadmium	6.40E-01	mg/kg	6.40E-01	mg/kg	R	1.23E-04	mg/kg-day	1.00E-03	mg/kg-day			1.2E-01
	Chromium VI	9.80E-01	mg/kg	9.80E-01	mg/kg	R	1.88E-04	mg/kg-day	3.00E-03	mg/kg-day			6.3E-02
												Total Hazard Index	1.9E-01

R = Route EPC
* Total hazard index is broken down by target organ in other tables.

TABLE G7.73.CTE
CALCULATION OF NON-CANCER HAZARDS
CENTRAL TENDENCY EXPOSURE
LIBERTY INDUSTRIAL FINISHING SITE

Scenario Timeframe: Future
Medium: Fish
Exposure Medium: Fish Tissue
Exposure Point: Massapequa Preserve
Receptor Population: Fisher
Receptor Age: Adult

Exposure Route	Chemical of Potential Concern	Medium EPC Value	Medium EPC Units	Route EPC Value	Route EPC Units	EPC Selected for Hazard Calculation	Intake (Non-Cancer)	Intake (Non-Cancer) Units	Reference Dose	Reference Dose Units	Reference Concentration	Reference Concentration Units	Hazard Quotient
Ingestion	Cadmium	6.40E-01	mg/kg	6.40E-01	mg/kg	R	5.26E-05	mg/kg-day	1.00E-03	mg/kg-day			5.3E-02
	Chromium VI	9.80E-01	mg/kg	9.80E-01	mg/kg	R	8.05E-05	mg/kg-day	3.00E-03	mg/kg-day			2.7E-02
												Total Hazard Index	7.9E-02

R = Route EPC
* Total hazard index is broken down by target organ in other tables.

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	4.5E-01	---	---	4 5E-01
			Chromium VI	NA	---	---	NA	Chromium VI	NOEL	2.3E-01	---	---	2 3E-01
	(Child)		(Total Child)	---	---	---	---		(Total Child)	6.8E-01	---	---	6 8E-01
			Total Risk Across Fish Tissue (Child)				---		**Total Hazard Index Across Fish Tissue (Child)**				**6.8E-01**
Surface Water	Fish Tissue (Adult)	Massapequa Preserve	Cadmium	NA	---	---	NA	Cadmium	kidney	2.8E-01	---	---	2.8E-01
			Chromium VI	NA	---	---	NA	Chromium VI	NOEL	1.4E-01	---	---	1.4E-01
	(Adult)		(Total Adult)	---	---	---	---		(Total Adult)	4.2E-01	---	---	4.2E-01
			Total Risk Across Fish Tissue (Adult)				---		**Total Hazard Index Across Fish Tissue (Adult)**				**4.2E-01**
			Total Risk Across All Media and All Exposure Routes				---		**Total Hazard Index Across All Media and All Exposure Routes (Child)**				**6.8E-01**
									Total Hazard Index Across All Media and All Exposure Routes (Adult)				**4.2E-01**

Total Kidney HI (Child) =	**4.5E-01**
Total Kidney HI (Adult) =	**2.8E-01**

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	1 2E-01	---	---	1 2E-01
			Chromium VI	NA	---	---	NA	Chromium VI	NOEL	6.3E-02	---	---	6 3E-02
			Lead	NA	---	---	NA	Lead	NA	NA	---	---	NA
			(Total)	---	---	---	---		(Total)	1.9E-01	---	---	1.9E-01
				Total Risk Across Fish Tissue (Child)			**NA**		**Total Hazard Index Across Fish Tissue (Child)**				**1.9E-01**
Surface Water	Fish Tissue (Adult)	Massapequa Preserve	Cadmium	NA	---	---	NA	Cadmium	kidney	5.3E-02	---	---	5.3E-02
			Chromium VI	NA	---	---	NA	Chromium VI	NOEL	2.7E-02	---	---	2 7E-02
			Lead	NA	---	---	NA	Lead	NA	NA	---	---	NA
			(Total)	---	---	---	---		(Total)	7.9E-02	---	---	7.9E-02
				Total Risk Across Fish Tissue (Adult)			**NA**		**Total Hazard Index Across Fish Tissue (Adult)**				**7.9E-02**
				Total Risk Across All Media and All Exposure Routes			**NA**		**Total Hazard Index Across All Media and All Exposure Routes (Child)**				**1.9E-01**
									Total Hazard Index Across All Media and All Exposure Routes (Adult)				**7.9E-02**

Total Kidney HI (Child) = **1.2E-01**
Total Kidney HI (Adult) = **5.3E-02**

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											
			(Total Child)	---	---	---	---		(Total Child)	---	---	---	---
				Total Risk Across Fish Tissue (Child)			**NA**		**Total Hazard Index Across Fish Tissue (Child)**				---
Surface Water	Fish Tissue (Adult)	Massapequa Preserve											
			(Total Adult)	---	---	---	---		(Total Adult)	---	---	---	---
				Total Risk Across Fish Tissue (Adult)			**NA**		**Total Hazard Index Across Fish Tissue (Adult)**				---
				Total Risk Across All Media and All Exposure Routes			**NA**		**Total Hazard Index Across All Media and All Exposure Routes (Child)**				---
									Total Hazard Index Across All Media and All Exposure Routes (Adult)				---

Total Kidney HI (Child) = **NA**
Total Kidney HI (Adult) = **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