7.0 HEALTH-BASED CLEAN-UP LEVELS

7.1 OVERVIEW

This section presents health-based clean-up levels for media-of-interest at the Hunterstown Road site. A health-based clean-up level is the concentration of a compound-of-interest in a particular medium that will not result in significant health effects to persons or ecological receptors based on the exposure and toxicological assumptions made in the risk assessment. Media requiring health-based clean-up levels include:

- on-site soils (surface and subsurface);
- groundwater;
- surface water; and
- sediments.

Clean-up levels for soils and groundwater were based on the human health risk assessment. For surface water and sediments, health-based clean-up levels were based on both the human health assessment and ecological risk assessment. It should be emphasized that the term "health" in the expression "health-based clean-up levels" refers to the health or welfare of ecological receptors as well as human receptors.

7.2 METHODOLOGY

Different methods were used to calculate clean-up levels for soils, groundwater, surface water and sediments, based on the human health evaluation, and for surface water and sediments, based on the ecological evaluation. Separate discussions of these methodologies are provided below.

7.2.1 Methodology for Calculating Clean-Up Levels from the Human Health Assessment

Development of Chemical-Specific Clean-up Levels

As identified above, the calculation of clean-up levels for soils, groundwater, surface water and sediment was based on the human health risk assessment presented in Sections 3, 4 and 5. The methodology for calculating clean-up levels based on a human health risk assessment is a three step process. First, for each medium, critical receptors are identified. Critical receptors are those receptors experiencing the highest estimated potential cancer

risks or chronic hazard indices from intake routes where this medium is the ultimate source. For the Hunterstown Road site, certain receptors experience exposures from more than one source medium (i.e., on-site visitor children are exposed to surface soils, surface water and sediments which serves as both source medium and exposure medium and future on-site residents are exposed to media which derive from both on-site groundwater and on-site surface soils as their ultimate source). However, the linkage of source media and exposure media for each receptor is straightforward.

Second, for each critical receptor, a unit risk factor (URF) is estimated for each compound-of-interest. URFs are derived from either the cancer risk or hazard index estimated in the risk assessment for the overall site. For example, if H_j is the health effect (i.e., cancer risk or hazard index) for a receptor from potential exposure to on-site surface soil associated with chemical j and Cs_j is the source concentration of the chemical in the on-site surface soil, then the URF for this receptor and chemical is given by:

$$URF_j = H_j / Cs_j$$

It is important to note that the relevant concentration for Cs_j is the source concentration and not the exposure point concentration used in the baseline assessment to calculate intakes and subsequent risks. Source concentrations are used because the exposure point concentrations are linearly related to the source concentrations and potential health effects are linearly related to the exposure point concentrations. Thus, the health effect is linearly related to the source concentration, with the URF being the coefficient relating these two variables.

Third, health-based clean-up levels are calculated for each compound of interest based on either an acceptable risk level for carcinogens (i.e., typically 10^{-4} or 10^{-6}) or a hazard index of 1 for noncarcinogens. For example, if URF_j is the unit risk factor for a receptor associated with chemical j in a particular source medium, and ARL is the acceptable risk level (i.e., for carcinogens, a cancer risk of 10^{-4} or 10^{-6}; or for noncarcinogens, a hazard index of 1), then the health-based clean-up level for compound j ($HBCL_j$) in that medium is given by:

$$HBCL_j = ARL / URF_j$$

This procedure is repeated for each compound in that medium. Since separate HBCL values can be obtained for compounds evaluated based on both carcinogenic effects and non-carcinogenic effects, the clean-up level is equal to the lower value.

Application of Clean-up Levels with a Clean-up Level Index

The procedure presented in Section 7.2.1 for developing health-based clean-up levels (HBCL) calculated a concentration for individual constituents in a particular medium that is at an acceptable risk level (where risk level is defined as either a specified individual lifetime cancer risk or a hazard index less than 1). In many cases, one or two constituents are responsible for much of the potential cancer risk or non-carcinogenic effect estimated for a site, so reducing concentrations of all constituents below their HBCLs should reduce total risks below their target levels. To make sure this is actually the case, the following methodology is used to ensure the target risk level for the site is achieved with remediation.

First, compare the concentrations of individual constituents in a sample with the individual HBCLs. If the concentrations are all below their individual HBCLs, the first step in the process has been successfully achieved. Second, segregate chemicals into those with HBCLs using carcinogenic effects as their endpoint and those using non-carcinogenic effects as their endpoint. For chemicals using carcinogenic effects as their endpoint, a clean-up level index is calculated.

$$CLI_C = \sum_{j=1}^{Nc} Cj \,/\, HBCL_j \qquad (3)$$

where:

CLI_C	=	clean-up level index for carcinogenic effects,
C_j	=	concentration of chemical j in a particular medium,
$HBCL_j$	=	health-based clean-up level for chemical j, and
N_C	=	number of chemicals with HBCLs using carcinogenic effects as their endpoint.

If CLI_C is less than 1 then the sum of the risks associated with these chemicals is less than the acceptable cancer risk level. To show that this is the case, recall that $HBCL_j$ is defined as:

$$HBCL_j = ARL \,/\, URF_j \tag{4}$$

where:

ARL	=	acceptable risk level, and
URF_j	=	unit risk factor for chemical j.

Substituting Equation 2 into Equation 1 gives the following:

$$CLI_C = \sum_{j=1}^{N_C} C_j \cdot URF_j \,/\, ARL \tag{5}$$

If CLI_C is equal to or less than 1, then Equation 3 can be rearranged to give:

$$ARL \geq \sum_{j=1}^{N_C} C_j \cdot URF_j \tag{6}$$

Since the quantity $C_j \cdot URF_j$ gives the risk level associated with chemical j, then Equation 4 indicates the sum of the cumulative risks are below the acceptable risk level. Thus, if CLI_C as given by Equation 1 is less than or equal to 1, then the cumulative risk associated with all chemicals is less than the acceptable risk level.

In a similar manner, a clean-up level index can be calculated for chemicals using non-carcinogenic effects as their endpoint:

$$CLI_N = \sum_{j=1}^{N_N} C_j \,/\, HBCL_j \tag{7}$$

In equation 5, the variable N_N is the number of chemicals with HBCLs using noncarcinogenic effects as their endpoint. If CLI_N is less than 1 then the cumulative hazard index associated with each chemical is less than a hazard index of 1.

7.2.2 Methodology for Calculating Clean-Up Levels from the Ecological Assessment

Health-based clean-up levels for surface water, sediments and soils were based on the ecological evaluation. These methods are provided below.

Health-Based Clean-up Levels for Surface Water

For surface water, health-based clean-up levels were assumed to be equal to the lowest chronic criterion concentrations (i.e., either based on an ambient water quality criterium or AWQC; or a no observed adverse effect level or NOAEL; or an adjusted lowest observed adverse effect level or LOAEL) for each compound for aquatic organisms in surface water based on values presented in Table 6-1.

Health-Based Clean-up Levels for Compounds-of-Interest in Surface Soils and Sediments Based on Exposures to Invertebrates

Clean-up levels for sediments and surface soils were calculated based on the concentration of a compound-of-interest in sediment interstitial pore water or soil pore water that will not result in adverse effects to benthic organisms or soil invertebrates. The corresponding sediment or soil concentration was then calculated from this acceptable pore water concentration using the Equilibrium Partitioning (EP) approach (EPA, 1988b). The EP approach is the method used by EPA for generating sediment quality criteria. This approach was developed because recent studies have shown that the bioavailability and toxicity of a compound is more directly correlated with the interstitial pore water concentration than the total sediment chemical concentration (EPA, 1988b). This procedure assumes that a compound detected in sediment is actually in equilibrium between the sediment and interstitial pore water. The EP method estimates the partitioning of a compound between sediment and the interstitial pore water. For non-polar hydrophobic organic contaminants, partitioning between sediments and sediment pore water is influenced primarily by the amount of organic carbon in the sediment; the higher the organic carbon content, the less partitioning of the contaminant to the water phase. This relationship is given by the equation:

$$C_{sed} = C_w * f_{oc} * K_{oc}$$

where:

C_{sed} = concentration of compound in sediment (mg/kg);
C_w = interstitial water concentration compound (mg/l);
f_{oc} = fraction of organic carbon in soil(fraction);
K_{oc} = organic carbon partition coefficient (L/Kg).

By substituting the acceptable concentration for compounds-of-interest in sediment interstitial pore water for Cw, an acceptable concentration for sediments can be calculated based on the above equation. This same procedure was used for calculation of health-based cleanup levels for compounds-of-interest in soils.

Health-Based Clean-up Levels For DDTR and Metals in Soils Based on Exposures to Higher Trophic Level Organisms

Health-based clean-up levels for DDTR and metals in soil were calculated based on their potential to bioaccumulate to higher trophic organisms. DDTR clean-up levels were based upon the calculated invertebrate body burdens for DDTR using the bioaccumulation model by Maxwell et al. (1989). This model was used to assess body burdens of chemicals in invertebrates to assess risks to birds and mammals. This model, first presented in Section 6, estimates chemical residues in three compartments: soil, soil moisture, and invertebrate tissue with the formulae:

$$C_B = (Cs \cdot Y_L / f_{oc}) (K_{oc_{0.022}} / 0.67)$$

where:

C_B = persistent organic chemical concentration of organism;
C_s = concentration of chemical in soil;
Y_L = lipid content of organism (assumed 2%);
f_{oc} = soil organic carbon content (assumed 1%); and
K_{oc} = organic carbon partition coefficient.

By substituting in an acceptable body burden tissue concentration (C_B) for DDTR that is protective of mammals and birds, an acceptable soil concentration for DDTR can be calculated by rearranging the above formulae as:

$$Cs = (C_B \cdot f_{oc} \cdot 0.67) \; / \; (Y_L \cdot K_{oc}^{0.028})$$

Health-based clean-up levels for metals based on exposures to higher trophic organisms was calculated based on an acceptable body burden concentration and the metal bioaccumulation factors for soil invertebrates reported by Stafford and Edwards (1985). The health-based clean-up levels for soils (C_s) was calculated based on the relationship:

$$Cs = C_B \; / \; B_{acc}$$

where:

C_B = Acceptable body burden concentration for metals; and
B_{acc} = Metal bioaccumulation factor from soil to soil invertebrate.

Health-Based Clean-up Levels For Compounds-of-Interest in Soils Based on Phytotoxicity

Clean-up levels for compounds-of-interest in soils based on phytotoxicity of the compound to plants. This analysis was done primarily for metals based on the reported phytotoxic levels reported by Rinne (1986).

7.3 HEALTH-BASED CLEAN-UP LEVELS FROM THE HUMAN HEALTH ASSESSMENT

7.3.1 Health-Based Clean-Up Levels for On-Site Surface Soils

The receptors exposed to compounds-of-interest in on-site surface soils include visitor children, in the current land use scenario, and construction workers and on-site residents, in the future land use scenario. The receptors with the highest total intake and risk from exposure to surface soils are future on-site residents. The intake routes evaluated for on-site residents exposed to on-site surface soils include:

- incidental ingestion;
- dermal contact; and
- inhalation of volatiles and fugitive dusts.

Future on-site residents are comprised of three subgroups:

- adults;
- developing children (individuals aged 2 to 31 years); and
- young children (aged 2 to 6 years).

For the risk assessment at the Hunterstown Road site, developing children had a higher overall cancer risk while young children have a higher overall chronic hazard index from exposure to on-site surface soils (see Section 5). Therefore, scenarios for developing children and young children were used to calculate clean-up levels for carcinogens and noncarcinogens, respectively.

The compounds-of-interest in surface soils are actually the total of all compounds-of-interest from each potential source area (i.e.,Borrow area, Lagoon area, Stressed Vegetation area, North and South Cornfields). However, the list of compounds-of-interest for quantitative risk assessment is unique for each area. To simplify the calculation of clean-up levels and to account for all compounds-of-interest in each source area, the maximum cancer risk or hazard index value for a particular compound over all five potential source areas, and the corresponding source concentration, was used to calculate the clean-up level for that compound. The clean-up level for a particular compound based on the maximum risk for the site is appropriate for that compound over all site areas.

Table 7-1 presents the calculations for estimating health-based clean-up levels for compounds-of-interest in on-site surface soils. Clean-up levels for carcinogens are presented for both the 10^{-4} and 10^{-6} risk levels. Clean-up levels for noncarcinogens are presented for a hazard index of 1. Note that the clean-up levels highlighted (the values enclosed within a box) were selected based on the lower of either the carcinogenic assessment or noncarcinogenic assessment. Generally, where a compound was evaluated as both a potential carcinogen and noncarcinogen, the lower clean-up level is from the carcinogenic assessment. However, for some compounds (e.g.,chromium, bis(2-ethylhexyl)phthalate, and DDT), both the clean-up level for the 10^{-6} acceptable cancer risk level, from the carcinogenic assessment, and the value from the noncarcinogenic assessment are highlighted. This was done because at a target risk level of 10^{-6} for cancer risk level, the value from the carcinogenic assessment is lower, while at the 10^{-4} acceptable risk level, the clean-up level from the noncarcinogenic assessment is lower and should be considered appropriate.

Health based cleanup levels for lead were based on the 200 mg/Kg NOAEL for lead in residential soils reported in the EPA "Three Cities Study". Thus, soil lead levels less than 200 mg/Kg were assumed protective of human health.

7.3.2 Health-Based Clean-Up Levels for On-Site Subsurface Soils

The only potential receptors exposed to compounds-of-interest in on-site subsurface soils are construction workers. Therefore, the scenario for construction workers was used to estimate clean-up levels for subsurface soils. The intake routes evaluated for construction workers exposed to on-site subsurface soils include:

- incidental ingestion;
- dermal contact; and
- inhalation of volatiles and fugitive dusts.

Table 7-2 presents the calculations for estimating health-based clean-up levels for compounds-of-interest in on-site subsurface soils. As presented above for surface soils, clean-up levels for individual compounds were based on the maximum cancer risk or hazard index for construction workers over all areas. Once the maximum cancer risk or hazard index for the site was determined, the corresponding subsurface soil concentration from the area with the maximum risk was used to calculate clean-up levels. Clean-up levels for carcinogens are presented for both the 10^{-4} and 10^{-6} risk levels. Clean-up levels for noncarcinogens are presented for a hazard index of 1.

7.3.3 Health-Based Clean-Up Levels for Off-Site Groundwater

The receptor groups exposed to on-site and off-site groundwater for both the current and future land use scenario include:

- near-site residents - current and future scenario; and
- future on-site residents - future scenario.

Both receptors are assumed to use groundwater for irrigation and potable water uses. Also, the groundwater source area for both receptor groups is from on-site locations (e.g., either the Lagoon area, Drum Burial Area 1, or Drum Burial Area 2). The compounds-of-interest associated with groundwater from these source areas were presented in Table 2-31.

Although two receptor groups were identified as potential users of groundwater from

the site, the intake assumptions made for both groups were similar. Therefore, the intake assumptions for nearby residents were used to calculate health-based clean-up levels for groundwater since their entire risk was due to the compounds-of-interest in groundwater (on-site residents were also assumed to be exposed to compounds-of-interest in on-site surface soils). There are two different exposure scenarios associated with near-site groundwater users: those associated with irrigation uses of near-site groundwater and those associated with potable uses of near-site groundwater. The exposure pathways relevant for the potable water use and irrigation use of near-site groundwater include:

- For potable uses:
  - ingestion;
  - dermal contact while showering;
  - inhalation of volatiles while showering;
- For irrigation uses:
  - incidental ingestion of irrigated soils;
  - inhalation of volatiles in ambient air from groundwater during irrigation;
  - inhalation of volatiles and fugitive dusts from irrigated soil; and
  - dermal contact with irrigated soil.

The installation of water mains near the Hunterstown Road site provides an alternative source for household drinking water. However, it is reasonable to assume that groundwater may be used in the current or future land use scenario to supplement household water for irrigation. Also, if groundwater use restrictions are implemented that prevent the use of groundwater for household use (i.e., drinking, cooking, bathing, etc.), then clean-up levels for irrigation uses alone would be relevant. Therefore, separate discussions of clean-up levels will be presented for near-site groundwater used for irrigation and groundwater used for both potable and irrigation uses.

Clean-Up Levels for Irrigation Uses of Groundwater Only

As identified above, both on-site and near-site residents are assumed to use groundwater for irrigating a garden. The specific receptors are near-site resident adults, developing children (aged 2 to 31 years), and young children (aged 2 to 6 years). The total cancer risk to developing children was highest from exposures to groundwater while the total

hazard index to young children was highest. Therefore, the assumptions used for developing children and young children were used to calculate clean-up levels for potentially carcinogenic compounds and chronic noncarcinogenic compounds, respectively. Table 7-3 presents the calculations of health-based clean-up levels for near-site residents based on calculated risks and source concentrations for irrigation uses in the future land use scenario. The risks and source concentrations assumed for near-site residents in the future land use scenario were used because the source concentrations were based on Lagoon area groundwater. The compounds-of-interest for Lagoon area groundwater are the same as for groundwater in general. As for soils, the clean-up levels for individual compounds in groundwater were selected based on the lowest acceptable concentration calculated based on either the potentially carcinogenic effects or the chronic noncarcinogenic effects. For example, 1,1-dichloroethene was evaluated both as a carcinogen and as a noncarcinogen. The health-based clean-up levels for this compound based on the carcinogenic assessment are much lower. However, for some compounds, the clean-up level based on the hazards index is often lower than the clean-up level for the 10^{-4} risk level.

Clean-Up Levels for Potable Uses and Irrigation Uses of Groundwater

Similar to the analysis for irrigation uses only, calculation of health-based clean-up levels were based on near-site developing children, for calculating clean-up levels for potentially carcinogenic compounds, and near-site young children for calculating clean-up levels for chronic noncarcinogenic compounds. For this analysis, the exposure pathways for the future land use scenario were used since the Lagoon area groundwater contains all the compounds-of-interest identified for groundwater at the site. Although this discussion focuses on near-site residents, the clean-up levels are applicable for future on-site residents as well. Also, the clean-up levels are applicable for all source areas. Table 7-4 presents the calculations of health-based clean-up levels for compounds-of-interest in groundwater based on potable water and irrigation uses. This table presents separate clean-up levels for potential carcinogens and noncarcinogens. Clean-up levels for an individual compound are based on the lower acceptable concentration calculated from either the carcinogenic assessment or the non-carcinogenic assessment.

7.3.4 Health-Based Clean-Up Levels for Surface Water

The only receptor exposed to compounds-of-interest in surface water are trespasser visitor children. The intake routes evaluated for visitor children exposed to on-site surface water include:

- incidental ingestion; and

- dermal contact.

Similar to the approach used for estimating clean-up levels for compounds-of-interest in surface and subsurface soils, clean-up levels for compounds-of-interest in surface water were based on the maximum cancer risk or hazard index value for a particular compound and the corresponding source concentration for that compound from either the East or Middle stream. However, the clean-up level for a particular compound based on the maximum risk for a particular stream is appropriate for that compound in the other stream if present. Table 7-5 presents the health-based clean-up levels for compounds-of-interest in surface water. Clean-up levels for carcinogens are presented for both the 10^{-4} and 10^{-6} risk levels. Clean-up levels for noncarcinogens are presented for a hazard index of 1.

7.3.5 Health-Based Clean-Up Levels for Sediment

As for surface water, the only receptor exposed to compounds-of-interest in sediment are visitor children. The intake routes evaluated for visitor children exposed to on-site sediment include:

- incidental ingestion; and
- dermal contact.

Similar to the approach used for estimating clean-up levels for compounds-of-interest in soils and surface water, clean-up levels for compounds-of-interest in sediment were based on the maximum cancer risk or hazard index value for a particular compound and the corresponding source concentration for that compound in either the East or Middle stream. The clean-up level for a particular compound in one stream is appropriate for that compound in the other stream as well if present. Table 7-6 presents the health-based clean-up levels for compounds-of-interest in sediment. Clean-up levels for carcinogens are presented for both the 10^{-4} and 10^{-6} risk levels. Clean-up levels for noncarcinogens are presented for a hazard index of 1.

7.4 HEALTH-BASED CLEAN-UP LEVELS FROM THE ECOLOGICAL ASSESSMENT

7.4.1 Health-Based Clean-Up Levels for Surface Water Based on the Ecological Assessment

Surface water clean-up levels are concentrations for compounds-of-interest protective or aquatic organisms. Table 7-7 presents the health-based clean-up levels for compounds-of-interest in surface water. Health-based clean-up levels for surface water were based on either an ambient water quality criteria, a NOAEL, or and an adjusted LOAEL (10% of the LOAEL).

7.4.2 Health-Based Clean-Up Levels for Sediments Based on the Ecological Assessment

Sediment clean-up levels are concentrations of compounds-of-interest that are protective of benthic invertebrates utilizing the EQ approach for sediment quality criteria. Table 7-7 presents the health-based clean-up levels for compounds-of-interest in sediments based on exposures to aquatic invertebrates. Sediment clean-up levels were calculated based on the equilibrium partitioning method using either ambient water quality criteria or a no observed adverse effect level for the compounds-of-interest.

7.4.3 Health-Based Clean-Up Levels for Surface Soils Based on the Ecological Assessment

Health-based clean-up levels, based on the ecological assessment, are concentrations of compounds-of-interest in soil that are protective of soil invertebrates and higher trophic organisms (mammals and birds). Health-based clean-up levels for soils from the ecological assessment were calculated three ways. The first method is based on a no observed adverse effect level to soil invertebrates. The second method is based on a body burden for a compound (i.e.,a compound that readily bioaccumulates) for soil invertebrates that will not result in an adverse effect to higher trophic organisms. The third method is a soil concentration for compounds that is a no observed adverse effect level to plants.

Clean-up Levels Based on Exposures to Soil Invertebrates

Table 7-7 presents the health-based clean-up levels for compounds-of-interest in soils based on exposures to soil invertebrates. Soil clean-up levels were calculated based on the equilibrium partitioning method using either ambient water quality criteria or a no observed adverse effect level.

Clean-up Levels Based on Exposures to Higher Trophic Organisms

Table 7-7 presents the health-based clean-up levels for compounds-of-interest in soils based on exposures to higher trophic organisms (birds and mammals). Health-based clean-up levels for soils from higher trophic organisms is based on acceptable body burden concentrations of compounds-of-interest in soil invertebrates. The compounds-of-interest applicable for calculation of health-based clean-up levels based on exposures to higher trophic organisms include DDT (DDTR) and certain metals (chromium, copper, lead and zinc).

Clean-up Levels Based on Exposures to Plants

Table 7-7 presents the health-based clean-up levels for compounds-of-interest in soils based on exposures to plants. Soil clean-up levels were calculated based on a no observed adverse effect level. The compounds-of-interest applicable for this assessment were metals.

7.5 SUMMARY OF HEALTH-BASED CLEAN-UP LEVELS

This section presented the health-based clean-up levels for compounds-of-interest in exposure media at the Hunterstown Road site. The exposure media include:

- on-site surface soils;
- on-site subsurface soils;
- groundwater;
- surface water; and
- sediments.

Health-based clean-up levels for on-site subsurface soils and groundwater were based on the human health evaluation. Whereas, health-based clean-up levels for surface water, sediments, and surface soils were based either on the human health or ecological evaluation. A summary of the human health-based clean-up levels is provided in Table 7-8.

For on-site surface soils, human health-based clean-up levels were based on exposures to future on-site developing children and young children. Health-based clean-up levels for subsurface soils were based on the exposure scenario assumed for construction workers. Health-based clean-up levels for groundwater were calculated under two scenarios: exposures to near-site groundwater from irrigation uses and exposures to near-site groundwater from both potable uses and irrigation uses. Health-based clean-up levels for

groundwater were based on the exposure assumption for near-site resident developing children (i.e., potentially carcinogenic effects) and young children (i.e., chronic noncarcinogenic effects) under the future land use scenario. The health-based clean-up levels for surface water and sediments in the stream areas was based on the exposure assumptions for visitor children in the stream areas.

Ecological health-based clean-up levels, presented in Table 7-7, were calculated for surface water, sediments and surface soils. Surface water clean-up levels were based on either on AWQC or and estimate of a NOAEL that is protective of aquatic organisms. Sediment clean-up criteria were based on the equilibrium partitioning method for SQC using either an AWQC or a NOAEL for surface water that was assumed protective of benthic organisms. Surface soil clean-up levels were calculated using three different methodologies. The first method was based on the equilibrium partitioning method using either an AWQC or a NOAEL that is protective of soil invertebrates. The second method was for DDTR and metals based on the potential for bioaccumulation and toxic effects to higher trophic organisms. This method involved the back calculation of a clean-up level concentration based on an acceptable invertebrate body burden using estimated or measured bioaccumulation factors. For DDTR, the bioaccumulation model by Maxwell et al. (1985) was used to estimate the bioaccumulation of DDTR and, for metals, the soil to soil invertebrate bioaccumulation factors reported by Stafford and Edwards (1985) were used. The third method was based on NOAELs for metals in soils that are protective of plants.

8.0 SUMMARY OF RISK ASSESSMENT

This section provides a summary of the risk assessment. This summary is presented in three sections: a summary of the public health evaluation; a summary of the ecological evaluation; and a summary of the health-based clean-up levels. This summary is intended to briefly present the major issues and assumptions used in the risk assessment and the results of the human health and ecological risk characterization.

8.1 SUMMARY OF THE HUMAN HEALTH EVALUATION

This section provides a summary of the human health evaluation for the Hunterstown Road site. The summary includes a discussion of compounds-of-interest, exposure assessment, toxicity assessment and risk characterization.

8.1.1 Compounds-of-Interest

The analytical data collected in the Phase I and Phase II site investigations were combined and grouped by environmental media for data evaluation. The media at the Hunterstown Road site include:

- soils;
- groundwater,;
- surface water; and
- sediment.

The compounds of potential concern for the Phase II investigation, based on the list of compounds presented in Table SAP-1 of the Sampling and Analysis Plan for Hunterstown Road (Rizzo, 1990a), include the target compound list (TCL) volatiles, bis(2-ethylhexyl)phthalate, PCBs, asbestos and selected inorganic compounds (e.g.,arsenic, total cyanide, lead, barium, antimony, cadmium, chromium, copper, mercury, zinc, manganese and selenium). The list of compounds of potential concern by media and location were presented in Table 1-1. The data evaluation involved the following procedures:

- For each data set, the analytical methods were evaluated for their suitability for risk assessment;

- For each data set, the quantitation limits were evaluated for their suitability for risk assessment;

- For each data set, qualified or coded data were evaluated if reported;

- For each data set, data from field samples were compared with field and laboratory blanks;

- For each data set, tentatively identified compounds, if they were reported, were evaluated; and

- For each data set, field samples were compared with background samples, when available.

The above procedure was applied to all data sets associated with each medium. The result of the data evaluation was a list of compounds-of-interest for quantitative risk assessment. The compounds-of-interest for the Hunterstown Road site risk assessment are provided in Table 8-1. The compounds-of-interest in each environmental medium are briefly described below.

Soils

The compounds-of-interest for surface soils, (i.e., samples taken from the surface or from a composite sample from 0 to a one foot depth) and subsurface soil (i.e., samples taken from below one foot to bedrock) were determined separately. Soil samples were also summarized separately by location since each location may have had different types of wastes deposited in them. These different locations include:

- Borrow area;
- Lagoon area;
- North Cornfield area;
- South Cornfield area;
- Drum Burial Area 1;
- Drum Burial Area 2; and
- Stressed Vegetation area.

Inorganic compounds-of-interest for quantitative risk assessment were based on the detected concentrations found in soil samples vs background levels in samples of these compounds. Compounds detected at concentrations significantly above background levels

were retained for the risk assessment. Organic compounds, except for common laboratory contaminants (e.g., methylene chloride and acetone), were retained for quantitative risk assessment if detected in any sample.

Groundwater

Groundwater samples were summarized separately for the three distinct groundwater plumes identified at the Hunterstown Road site: the first originating from the former Lagoon area; the second from the former Drum Burial Area 1; and the third from the former Drum Burial Area 2. Interim remedial removal actions were performed at all three locations to remove the source materials. Therefore, the compounds currently in groundwater are most likely residual compounds that infiltrated to groundwater from the source materials prior to implementation of the interim removal actions in these areas. Further infiltration will not occur since waste materials have been removed. The groundwater flow from each of these units is associated with distinct bedding planes that are essentially hydraulically isolated from each other. The data evaluation, exposure assessment and risk characterization considered each of these groundwater plumes separately since they are from different sources, they are in hydraulically distinct units and remediation will most likely have to address each area independently. However, the compounds identified in Table SAP-1 as compounds of potential concern in groundwater in the Phase II investigation were relevant for all three plumes.

As discussed for soils, the determination of compounds-of-interest for groundwater was done separately for inorganic and organic compounds. Inorganic compounds-of-interest for quantitative risk assessment were based on the detected concentrations found in groundwater samples vs background levels of these compounds. Compounds detected at concentrations significantly above background levels were retained for the risk assessment. Organic compounds, except for common laboratory contaminants (e.g., methylene chloride and acetone), were retained for quantitative risk assessment if detected in any sample.

Surface Water and Sediment

There are three intermittent streams in the immediate vicinity of the site: the East, Middle and West streams. The East stream is located east of Hunterstown Road near the Lagoon area, Borrow area and Stressed Vegetation area. The Middle stream is also located east of Hunterstown Road and is associated with the western end of the Cornfields and Drum Burial Area 2. The West stream is located west of Hunterstown Road and flows near Drum Burial Area 2. The West stream and Middle stream converge just east of Hunterstown Road and just North of Shealer Road (for this analysis we will assume that the

West stream flows into the Middle stream at this point and becomes the Middle stream). The East stream then converges with the Middle stream east of Hunterstown Road at approximately 750' south of Shealer Road (for this analysis we will assume that the East stream flows into the Middle stream at this point and becomes the Middle stream). Water from these tributaries (i.e., now identified as the Middle stream) eventually discharges into Rock Creek approximately 1.5 miles southwest of the site.

Surface water and sediment samples were collected from these three off-site intermittent streams and submitted for chemical analysis. Samples were also taken at locations downstream from where these streams converge. A background surface water and sediment sample was obtained from an upstream location on each stream. In addition, a sediment sample was taken from a reference stream. A sample was also collected for surface water and sediment bioassays at a perennial location (i.e., standing water exists year-around) below where all three streams converge. The compounds-of-interest for quantitative risk assessment identified for surface water and sediments were selected based on detectable concentrations vs background levels and included some TCL volatiles organics and selected inorganics for the East and Middle stream. No compounds-of-interest were selected for surface water or sediment in the West stream for two reasons. First, while organic compounds were detected in only one Phase I surface water sample from the West stream, none were detected in any of the Phase II samples. This can be explained considering the interim remedial action, taken to remove the source material and to backfill Drum Burial Area 1 (the only source are for the West stream), was not completed at the time of the Phase I investigation. Therefore, with regard to organic compounds in the West stream, the Phase I sample did not represent existing site conditions (i.e., following completion of the interim remedial action taken on Drum Burial Area 1). Second, the inorganic compounds detected in the West stream were found at or near background levels or near their detection limit. The levels detected were not indicative of potential contamination from an on-site source area. Also, no inorganic compounds were identified as compounds of potential concern for Drum Burial Area 1.

8.1.2 Exposure Assessment

The exposure assessment identifies persons potentially exposed, both now and in the future, to compounds-of-interest at the Hunterstown Road site. This assessment assumes that the site remains essentially as it is, or in other words, discusses potential exposures associated with existing site conditions. The exposure assessment identifies pathways by which humans are potentially exposed to compounds at a site and estimates the magnitude,

frequency and duration of actual or potential human exposures. In the exposure assessment, reasonable maximum estimates of exposure are developed for both current and future land use scenarios. The exposure assessment included the following elements:

- discussion of potential sources and migration pathways;
- identification of potential human receptors;
- delineation of potential receptor-specific exposure pathways;
- development of intake assumptions associated with each exposure pathway;
- estimation of exposure point concentrations; and
- estimation of pathway and receptor-specific intakes and doses of compounds-of-interest.

The intakes estimated in the exposure assessment were intended to approximate reasonable maximum exposures (RMEs) as suggested by the Risk Assessment Guidance for Superfund (EPA, 1989a) and concurrent with recent guidance (EPA, 1991). These exposures were based on conservative assumptions that are intended to be protective of the most exposed or sensitive subpopulations.

Potential Sources, Receptors and Exposure Pathways

Potential sources of compounds-of-interest include surface and subsurface soils, groundwater, surface water and sediments. Exposure pathways are routes whereby compounds-of-interest could be assimilated by a potential receptor. Exposure pathways require the existence of a receptor, the presence of compounds-of-interest in a medium that the receptor contacts, and an intake route associated with the receptor. Since exposure pathways require the presence of a receptor, these pathways depend upon the uses of the site. Both current and potential future land uses were considered in this analysis. Table 8-2 summarizes the potential sources, receptors and exposure pathways.

Intake Assumptions

As stated above, the intake assumptions presented were based on the Risk Assessment Guidance for Superfund (EPA, 1989a) and were intended to estimate reasonable maximum exposures. RME assumptions are not intended to estimate actual or expected intakes to the population on the average but, rather, estimate intakes and risks that are protective of the most exposed or sensitive subpopulations. A summary of the intake assumptions used is presented in Table 8-3, for the current land use scenario, and Table 8-4, for the future land use scenario.

Of the receptors identified at the site, residential receptors can be considered the maximum exposed individuals due to their long exposure duration and high contact rate. For residential exposure, potential health effects were calculated for three different receptors: adults (30 years), developing individuals or "children" (2 to 31 years old or 30 years) and young children (2 to 6 years old or 5 years). Note, potential risks to children were evaluated over two scenarios. Developing children were evaluated to assess potential carcinogenic health risks over a long exposure period (i.e.,30 years) whereas young children were evaluated primarily to assess potential chronic noncarcinogenic health effects. The use of a 30 year developing individual scenario can be considered very conservative since exposures are unlikely to remain at the 95th percentile for an individual throughout this 30 year time period. Therefore, risks to developing children are likely to overstate actual risks.

Estimation of Potential Exposure Point Concentrations

Each intake route involves receptor contact with compounds-of-interest in an exposure media (e.g., soil, water, or air). Thus, to quantify intakes, concentrations at the point of exposure must be estimated. These exposure point concentrations were estimated using site investigation data in conjunction with mathematical models. The source of compounds-of-interest in the exposure medium may be compounds in the medium at the point of exposure, compounds that are initially in the medium at another location and are subsequently transported through that medium to the point of exposure; or compounds that are initially in another medium, are then transported from the source medium to the exposure medium and finally transported through the exposure medium to the point of exposure. As compounds move between and through site media, concentrations can change over time though transformation, dilution, dispersion and degradation processes.

Consequently, knowing the concentration of the chemical in a particular medium at the current time is not necessarily enough, since the concentration of the chemical may change over time. To help estimate the potential change of chemical concentrations over time in a medium from transport or transformation processes, mathematical models were employed. A description of these models and the application of the models to estimate exposure point concentrations for each receptor are provided in Appendix B for a more detailed discussion. The exposure point concentrations were presented by exposure media in Section 3.

Estimated Intakes and Doses

Intake assumptions, were combined with the exposure point concentrations to calculate intakes and doses, which are presented in Appendix D. Two intakes or doses are

estimated for each receptor: 1) An average lifetime intake was estimated that can be combined with an appropriate cancer slope factor to estimate a cancer risk; and 2) A chronic intake was also estimated that can be combined with an appropriate RfD to generate a chronic hazard index. Potential intakes or doses are presented in Appendix D by pathway and by compounds-of-interest for each receptor.

Uncertainties in the Public Health Exposure Assessment

Uncertainties associated with the exposure assessment for the Hunterstown Road site include those associated with the environmental sampling, analysis, and data evaluation and those associated with the parameters used to estimate intakes. The sources of uncertainty associated with the estimates of exposure were evaluated by investigating the assumptions used in the exposure assessment. These uncertainties are discussed in more detail in Section 3.7.

8.1.3 Toxicity Assessment

The purpose of the toxicity assessment is to weigh available evidence regarding the potential for compounds-of-interest to cause adverse health effects in exposed individuals and to provide, where possible, an estimate of the relationship between the extent of exposure to a chemical and the increased likelihood or severity of the adverse effect. A toxicity assessment considers:

- the types of adverse health effects associated with exposures to compounds-of-interest;
- the relationship between the magnitude of exposure and the adverse effects; and
- related uncertainties such as the weight of evidence of a particular chemical's carcinogenicity in humans.

The toxicity assessment for the Hunterstown Road site was accomplished in two steps: hazard identification and dose-response assessment. The first step, hazard identification, is the process of determining whether exposure to an agent can cause an increase in the incidence of an adverse health effect. Hazard identification also involves characterizing the nature and strength of the evidence of causation. The second step, dose-response evaluation, is the process of quantitatively evaluating the toxicity information and characterizing the relationship between the dose of the contaminant administered or

received and the incidence of adverse health effects in the exposed population. From this quantitative dose-response relationship, toxicity values are derived that can be used to estimate the incidence of adverse effects occurring in humans at different exposure levels.

It should be emphasized that the dose-response values are based on methodology that is consistent with EPA risk assessment guidelines and is intended to be conservative and, therefore, health protective. However, because these dose-response values are conservative, they are likely to overstate the actual relationship between an actual dose and the manifestation of an adverse health effect. These dose-response relationships may overestimate the actual risk of cancer posed to the population on the average but are intended to be protective of the most sensitive subpopulations.

The toxicity assessment provides information that is used in conjunction with the identification of exposure pathways to estimate the risks posed to both human health and the environment. Table 8-5 presents toxicity information for compounds-of-interest for non-carcinogenic and carcinogenic effects.

As stated earlier, an RfD is an estimate (with uncertainty spanning perhaps an order-of-magnitude or more) of the daily exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime. An uncertainty factor is used in calculating the RfD and reflects scientific judgement regarding the various types of data used to estimate RfD values. An uncertainty factor of 10 is generally used to account for variations in human sensitivity when extrapolating from valid human studies involving long term exposure of average healthy subjects. An additional 10-fold factor is usually used for each of the following extrapolations: from long-term animal studies to the case of humans, from a LOAEL (the lowest observed adverse effect level) to a NOAEL (the no observed adverse effect level) and from subchronic studies to a chronic RfD. In order to reflect professional assessment of the uncertainties of the study and data base not explicitly addressed by the above uncertainty factors, an additional uncertainty factor or modifying factor ranging from greater than 0 to less than or equal to ten is applied. The default value for this modifying factor is 1 (HEAST, 1990).

Uncertainties are compensated for by using upper bounds for cancer slope factors for carcinogens. Cancer slope factors are estimated through the use of mathematical models for estimating the largest possible linear slope (within the 95% confidence limit) at low extrapolated doses that is consistent with the data. The slope factor is characterized as an upper-bound estimate, where at best, the dose-response assumptions used in a risk assessment provide a rough but plausible estimate of the upper limit of risk , i.e. it is not

likely that the true risk would be much more than the estimated risk, but it could very well be considerably lower, even approaching zero (HEAST, 1990).

In addition, there are varying degrees of confidence in the weight of evidence for carcinogenicity of a given chemical. EPA's weight of evidence classification provides information that can indicate the level of confidence or uncertainty in the carcinogenicity data obtained from studies in humans or experimental animals. Some of the uncertainties in the hazard evaluation are further compensated for by assuming that animal carcinogens behave as human carcinogens. The summation of the risks associated with all potential carcinogens, which is done for each evaluated exposure pathway, tends to overestimate risk by including probable human carcinogens (Group B) with demonstrated human carcinogens (Class A).

It is important to emphasize that the methodology typically employed to estimate cancer slope factors (i.e., extrapolating from risks generated at high doses in animal studies to risks at low doses) has considerable uncertainty associated with it suggesting that risks estimated with this methodology could greatly overestimate actual risks. First, the carcinogenic effect is assumed to not exhibit a threshold effect. However, the human body has mechanisms to detoxify compounds, particularly at low doses.

Second, the metabolite of a chemical as opposed to the chemical itself is often the carcinogenic entity. For such compounds, it is likely that the risk of carcinogenic effects is low at low doses where the detoxifying systems in the body work smoothly. However, at high doses, the detoxifying system may be overwhelmed allowing carcinogenic metabolites to escape into the body and greatly increase the risk of cancer. Thus, this type of behavior also suggests that carcinogenic risk increases considerably above threshold dose levels.

Third, there is considerable uncertainty regarding the appropriateness of extrapolating from carcinogenic effects at high doses in animals to low doses in either animals or humans. The high doses are often near the maximum tolerated dose for a test animal species and these high doses are believed to cause cell proliferation which, in itself, will result in increased cancer risk because the odds of mutation increase (Cohen, 1990; Ames, B.N. and L.S. Gold, 1990). These findings call into question the animal test protocol used as the basis for developing dose-response relationships for carcinogenic effects.

These three items suggest that the current practice of assuming that carcinogenic effects do not exhibit threshold behavior and assuming that carcinogenic effects observed at high doses in test animals can be used to predict cancer effects at lower doses are likely to be incorrect, at least for some compounds. Thus, while the current practice is conservative

and, therefore, health protective, it is intended to ensure that the results of the risk assessment are protective of the most sensitive subpopulations.

8.1.4 Risk Characterization

Risk characterization involves determination of potential health effects two ways. The first step in this process involves a comparison of estimated exposure point concentrations for compounds-of-interest in various media with compound specific applicable or relevant and appropriate requirement (ARARs). This analysis was presented in Section 5.1. The second step involves calculation of potential cancer risks and non-carcinogenic hazard indices for all receptors for which intakes were estimated in Section 3.6. The purpose of this analysis, which was presented in Section 5.2 for current land use conditions and Section 5.3 for future land use conditions, is to obtain a relative measure of potential cancer risks and chronic effects. For carcinogens, risks were estimated as the incremental probability of an individual developing cancer over a lifetime as a result of exposure to the potential carcinogen. EPA has established an acceptable excess lifetime cancer risk range of 1 in a 1,000 (10^{-4}) to 1 in a 1,000,000 (10^{-6}) for Superfund sites. For chronic health effects, the hazard index is estimated as the ratio of the actual or predicted dose and the RfD, where the RfD is an estimated daily chronic dose of a compound where no appreciable risk of chronic effects are expected to occur. If the hazard index exceeds 1, then there is some likelihood of an effect.

Comparison of Exposure Point Concentrations with Chemical-Specific ARARs

As part of the risk assessment for the Hunterstown Road site, chemical-specific applicable or relevant and appropriate regulations (ARARs) were identified. The ARARs identified for this analysis are chemical-specific and apply to specific media (e.g., groundwater and surface soils). Table 8-6 presents the chemical-specific ARARs applicable to the site.

Public Health Risk Characterization

Potential health effects to potential on-site and off-site receptors for current and future land use conditions were presented in Section 5 of the report and presented in detail in Appendix G. For exposures to on-site surface soil areas, stream areas, and to the three different groundwater plumes, health effects were calculated separately for each area. The health effects presented were the total potential cancer risk and total chronic hazard index summed over all intake routes and compounds for each receptor. These potential health effects are estimated for each receptor and are broken down by intake route and chemical

constituent in Appendix G. By partitioning the cancer risks and chronic hazard indices in this manner, intake routes and compounds contributing the most to the predicted health effects can be identified.

For current on-site uses, cancer risks to visitor children are less than the 10^{-6} acceptable cancer level for all soils areas and stream areas as specified by EPA. Also, the total chronic hazard index was less than 1 for all areas. Therefore, potential exposures to various media at the Hunterstown Road site does not pose unacceptable risks to visitor children. Near-site residents in the current land use scenario were assumed exposed to groundwater from the Drum Burial Areas 1 and 2 (these groundwater source areas are assumed to currently impact near-site groundwater). The cancer risks calculated for near-site residents exceeded 10^{-4} for adults, developing children and young children. The high risks to near-site residents was primarily based on the assumption that near-site residents are currently using groundwater as a potable water source and for irrigation of a garden. The pathways associated with the potable water uses of groundwater assumed for this analysis (i.e., ingestion, inhalation of volatiles from showering, and dermal contact with groundwater used for showering or bathing) typically account for 99% or more of the total intake. Chronic health effects for near-site residents in the current land use scenario only exceed 1 for young children (1.04).

For the future land use scenario, three different receptor groups were identified: on-site construction workers; on-site residents; and near-site residents. Total cancer risks to construction workers (exposed to on-site surface and subsurface soils via direct contact exposure pathways) was less than 10^{-6} for all areas except for the Lagoon area where the cancer risk was 1.76×10^{-6}. Total chronic hazard indices for construction workers were less than 1 for all areas. On-site residents were assumed to be exposed to on-site groundwater (e.g., Lagoon area, Drum Burial Area 1 and Drum Burial Area 2) and on-site surface soils. Total risks from exposure to groundwater from each source area exceeded 10^{-4} for all three receptors and total hazard indices for the Lagoon area and Drum Burial Area 1 exceeded 1 for all three receptors. Cancer risks were highest to developing children (aged 2 to 31 years) while hazard indices were highest to young children (2 to 6 years). Risks to on-site residents exposed to surface soil exceeded 10^{-4} for developing children only in the Lagoon area (1.71×10^{-4}) and exceeded 10^{-6} only in the Stressed Vegetation (2.15×10^{-6}) and Lagoon areas. Hazard indices to on-site residents exposed to surface soils exceeded 1 for young children in the Stressed Vegetation area (10.5), South and North Cornfield areas (9.2 and 8.3), and Lagoon area (5.5), primarily due to mercury. Future near-site residents were assumed to use groundwater, for irrigation and as a potable water source, from the Lagoon area (groundwater from the Lagoon area was assumed for worst case). Total risks from exposure to groundwater exceeded 10^{-4} and total hazard indices exceeded 1 for all three

near-site resident receptors. As with on-site residents, cancer risks to future near-site residents were highest to developing children (aged 2 to 31 years) while hazard indices were highest to young children (2 to 6 years).

Uncertainties associated with the risk characterization portion of the risk assessment at the Hunterstown Road site are a combination of the uncertainties evaluated through both exposure assessment and toxicity assessment. As discussed above, the assumptions used for both the exposure and toxicity assessment lend to be conservative. While the use of conservative assumptions within itself tends to overstate the actual risk, the use of overly conservative assumptions in combination can overstate the actual risk by one or more orders-of-magnitude. In general, the risks are believed to be overestimated for the receptors and exposure pathways identified at the Hunterstown Road site.

Two focused assessments were presented for the human health assessment. The first focused assessment was an evaluation of potential chronic health effects to onsite receptors due to exposure to selenium in onsite surface soils. The toxicity of selenium was evaluated based on an EPA allowable intake chronic (AIC) value reported in SPHEM (EPA, 1986). Hazard indices for selenium exposures were all well below 1 for all receptors. The second focused assessment was an evaluation of potential chronic health effects from exposure to lead in fugitive dusts from the cornfields. The analysis evaluated exposures to nearsite residents in a past and current scenario to soil lead concentrations in fugitive dusts from the cornfields. The toxicity of lead was estimated based on the NOAEL for lead that is protective of young children and an incidental ingestion rate for young children or 200 mg/day. the exposure assessment considered lead dusts concentrations due to fugitive dust emissions from wind erosion (in the past and current scenario) and due to agricultural tilling (in the past scenario). Hazard indices were below 1 for all receptors in both scenarios.

8.2 SUMMARY OF THE ECOLOGICAL ASSESSMENT

This section presents a summary of the ecological assessment. This summary is presented in four parts: selection of compounds of environmental interest; dose-response assessment; exposure assessment; and risk characterization.

8.2.1 Compounds-of-Interest

Compounds-of-interest for the ecological assessment were selected based on the compounds associated with the media-of-interest for the ecological evaluation. The media-of-interest were surface soils in on-site areas and surface water and sediments in the stream

areas. The compounds-of-interest for the ecological evaluation varied by location and media were selected based on a review of samples from these areas. The compounds-of-interest were presented in Table 8-1.

8.2.2 Ecological Exposure Assessment

The ecological exposure assessment involved the determination of potential ecological receptors and the calculation of exposure point concentrations. Potential receptors were identified by media and location. For surface soils, potential receptors include plants, terrestrial invertebrates, and higher trophic organisms such as birds and mammals. For surface water, potential receptors include aquatic organisms and fish. For sediments potential receptors include benthic macroinvertebrates.

Exposure point concentrations for aquatic organisms, benthic organisms, plants and soil invertebrates was based on sample data for each medium obtained from the Phase I and II remedial investigations. Exposure point concentrations for higher trophic organisms were the soil invertebrate body burden concentrations of compounds-of-interest estimated from either a soil chemical bioaccumulation as presented by Maxwell et al. (1989) (for DDTR) or based on bioaccumulation factors reported by Stafford and Edwards (1985).

8.2.3 Ecological Toxicity Assessment

The ecological toxicity assessment accomplished two tasks: a review of relevant toxicity data for the compounds of environmental interest and establishment of an acceptable concentration for each chemical in surface water, sediment interstitial pore water, soil moisture or terrestrial invertebrate body burdens. Acceptable concentrations were based on either a AWQC, a NOAEL, or an adjusted LOAEL (10% of the LOAEL). The toxicity assessment reviewed EPA databases AQUIRE and PHYTOTOX. Information was gathered on acute and chronic effects to aquatic vertebrates and invertebrates, plants and terrestrial vertebrate species.

8.2.4 Ecological Risk Characterization

Risk characterization involved a determination of potential ecological impacts to aquatic receptors (e.g., aquatic organisms and benthic organisms) and terrestrial plants, invertebrates and vertebrates. Potential impacts to aquatic receptors were determined based on the comparison of the exposure point concentration of a chemical, in either surface water or sediment pore water, to a media specific benchmark concentrations. Benchmarks were assumed equal to the NOAEL. The methodology for evaluating the magnitude of ecological

effects was based on the toxicity quotient method. This involves the calculation of a toxicity quotient (TQ) value. The TQ value is calculated by dividing the exposure point concentration of a chemical by its environmental benchmark (NOAEL). A potential risk would occur where the TQ value exceeded 1. Because the NOAEL values typically have uncertainty factors of 10 built into them, it is useful to evaluate the significance of the Toxicity Quotients as follows:

- Toxicity Quotient Exceeds "1": some small potential for environmental effects;

- Toxicity Quotient Exceeds "10":good potential that greater exposures could result in effects based on experimental evidence;

- Toxicity Quotient Exceeds "100":effects may be expected based on the fact that this represents an exposure level at which effects have been observed in other species.

This TQ approach was used on each sample rather than on an estimate of a single exposure point concentration. Potential impacts to terrestrial vertebrates was based on the calculation of a daily dose, based on ingestion, to a no observed adverse effect level (NOAEL) for TCE.

The ecological assessment indicated that risks to ecological receptors due to organic compounds-of-interest were low. VOCs in soil in one area of the site, the Lagoon area, are at elevated levels that pose a risk to soil invertebrates. The ecological risks due to VOCs in soil in the other areas of the site were low as were risks due to VOCs in sediment or surface water. VOCs are unlikely to bioaccumulate in invertebrates or plants and, therefore, are unlikely to pose risks to higher trophic level organisms.

Bis(2-ethylhexyl)phthalate was detected at a concentration that may pose a potential risk to soil or benthic invertebrates only in one sediment sample from the Middle stream. Potential ecological risks due to this compound in middle stream sediments are likely to be limited to a small area.

Concentrations of DDTR that may pose a risk to soil invertebrates were detected in a limited number of soil samples from the North Cornfield and Stressed Vegetation area. Concentrations were low and can be considered typical of DDT residuals in an agricultural area. Because the concentrations of DDTR were low and its distribution is limited to a few samples in the North Cornfield and Stressed Vegetation area, the potential ecological risks to soil invertebrates and higher trophic level organisms that may feed on invertebrates that

have bioaccumulated DDTR are also low.

Metals that were chosen as compounds-of-interest in soil include selenium, cadmium, antimony, barium, chromium, copper, lead, mercury, and zinc. Of these, selenium and cadmium are not expected to pose an ecological risk at the site because of their low frequency and levels of detection and limited areal distribution. Some metals such as copper and lead were at concentrations that may pose ecological risks in most areas of the site, while other metals were elevated in soil in only a few areas.

The bioavailability of metals depends on soil and sediment characteristics such as pH, organic carbon content, sulfide content, oxidation/reduction potential, and cation exchange capacity. Since the available information on soil characteristics was limited, our assessment of ecological risks due to metals is qualitative and based on concentrations shown to have effects on test biota in different types of soils.

Potentially phytotoxic levels of the following metals were detected in soil samples from these areas:

- Lagoon - antimony, chromium, copper, lead;
- Borrow Area - copper, lead;
- Stressed Vegetation Area - antimony, barium, chromium, copper, lead, mercury, zinc;
- North Cornfield - barium, lead, zinc;
- South Cornfield - copper, lead.

In general, the highest concentrations were detected in samples from the lagoon, stressed vegetation area, and a sample of sludge-like material mixed in with the top soil in the north cornfield (identified as sample "North Cornfield").

Concentrations of metals that may pose risks to soil invertebrates were also detected in most areas of the site. Copper was the most widely distributed at levels that may pose risks to soil invertebrates. These levels were detected in the Borrow area, Lagoon, Stressed Vegetation area, and South Cornfield. Lead was at levels that may pose risks to soil invertebrates only in the stressed vegetation area. Zinc concentrations that may threaten soil invertebrates were detected in the Stressed Vegetation area and North Cornfield.

For some metals, higher trophic level organisms are protected from consuming toxic levels in plants and soil invertebrates because the plant or invertebrate dies before it can accumulate the metal to a concentration toxic to the higher organism. Metals detected on-

site that may pose a risk to higher organisms due to bioaccumulation in soil invertebrates include chromium, lead, and zinc.

Phytotoxic levels of metals were only detected in a limited reach of the east stream. This area extends to approximately 400 feet downstream of the Lagoon. Metals detected at phytotoxic concentrations in this area included lead, chromium, and copper. Copper in this area may also pose a risk to benthic or soil invertebrates in this stream.

Some surface water samples from the East stream had concentrations of lead and copper that may pose chronic risks to aquatic organisms. Chromium and zinc were detected at concentrations that may pose chronic risks to aquatic organisms in the East and Middle streams. Since metals in surface water were detected at concentrations only slightly above the freshwater chronic AWQC, risks to aquatic organisms due to metals are likely to be low. In addition, since surface water samples were analyzed for total rather than dissolved metals, not all of the metal detected may be available to aquatic organisms. Ecological risks due to metals in surface water are mitigated by the fact that aquatic organisms are not present in the stream throughout the year. Fish are unlikely to be present in the stream at any time. Toxicity testing on a surface water and sediment sample from downstream of the site in a permanently flowing reach of the combined stream confirmed that risks to aquatic organisms are not present in this area.

8.3 SUMMARY OF HEALTH-BASED CLEAN-UP LEVELS

Section 7.0 presented the health-based clean-up levels for compounds-of-interest in exposure media at the Hunterstown Road site. The exposure media include:

- on-site surface and subsurface soils;
- groundwater;
- surface water; and
- sediments.

Health-based clean-up levels for on-site surface soils, groundwater, surface water and sediments were based on the human health evaluation. Health-based clean-up levels for surface water and sediments were also determined based on the ecological evaluation. A summary of the human health-based clean-up levels is provided in Table 8-7.

For on-site surface soils, health-based clean-up levels were based on exposures to on-site resident developing children for potential carcinogens, and young children for

noncarcinogens. Health-based clean-up levels for subsurface soils were based on the exposure assumptions for construction workers. Health-based clean-up levels for groundwater were calculated under two scenarios: exposures to groundwater from irrigation uses and exposures to groundwater from both potable water and irrigation uses. Health-based clean-up levels from both scenarios were based on the exposure assumptions for near-site residents under the future land use scenario. The clean-up levels for carcinogens were based on exposures to near-site developing children (aged 2 to 31 years), while clean-up levels for noncarcinogens were based on exposures for young children (aged 2 to 6 years). Health-based clean-up levels for compounds-of-interest in surface water and sediments in the stream areas from the human health evaluation were based on the exposure assumptions assumed for on-site visitor children.

Ecological health-based clean-up levels are presented in Table 8-8. Health-based clean-up levels were calculated for surface water, sediments and surface soils. Surface water clean-up levels were based on either on AWQC or and estimate of a NOAEL that is protective of aquatic organisms. Sediment clean-up criteria were based on the equilibrium partitioning method using either an AWQC or a NOAEL protective of benthic organisms. Surface soil clean-up levels were calculated using three different methodologies. The first method was based on the equilibrium partitioning method using either an AWQC or a NOAEL that is protective of soil invertebrates. The second method was for DDTR and metals based on the potential for bioaccumulation and toxic effects to higher trophic organisms. This method involved the back calculation of a clean-up level concentration based on an acceptable invertebrate body burden using estimated or measured bioaccumulation factors. For DDTR, the bioaccumulation model by Maxwell et al. (1985) was used to estimate the bioaccumulation of DDTR and, for metals, the soil to soil invertebrate bioaccumulation factors reported by Stafford and Edwards (1985) were used. The third method was based on NOAELs for metals in soils that are protective of plants.

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TABLES

TABLE 1-1
SUMMARY OF COMPOUNDS OF POTENTIAL CONCERN BY
MEDIA AND LOCATION FOR PHASE II INVESTIGATION

MEDIA: / LOCATION:	Groundwater On-site	Sediments East Stream	Sediments Middle Stream	Sediments West Stream	Surface Water East Stream	Surface Water Middle Stream
PARAMETERS (ppm):						
Cyanide		yes	yes	yes		
Arsenic		yes	yes	yes		
Lead	yes *	yes	yes	yes	yes	yes
Selenium		yes	yes	yes	yes	yes
Antimony		yes	yes	yes	yes	yes
Cadmium		yes	yes	yes	yes	yes
Chromium	yes	yes	yes	yes	yes	yes
Copper		yes	yes	yes	yes	yes
Manganese		yes	yes	yes	yes	yes
Zinc		yes	yes	yes	yes	yes
Mercury	yes					
Barium	yes					
TCL Volatiles (ppb):						
Chloromethane	yes	yes	yes	yes	yes	yes
Bromomethane	yes	yes	yes	yes	yes	yes
Vinyl Chloride	yes	yes	yes	yes	yes	yes
Chloroethane	yes	yes	yes	yes	yes	yes
Methylene Chloride	yes	yes	yes	yes	yes	yes
Acetone	yes	yes	yes	yes	yes	yes
Carbon Disulfide	yes	yes	yes	yes	yes	yes
1,1-Dichloroethene	yes	yes	yes	yes	yes	yes
1,1-Dichloroethane	yes	yes	yes	yes	yes	yes
1,2-Dichloroethene	yes	yes	yes	yes	yes	yes
Chloroform	yes	yes	yes	yes	yes	yes
1,2-Dichloroethane	yes	yes	yes	yes	yes	yes
2-Butanone	yes	yes	yes	yes	yes	yes
1,1,1-Trichloroethane	yes	yes	yes	yes	yes	yes
Carbon Tetrachloride	yes	yes	yes	yes	yes	yes
Vinyl Acetate	yes	yes	yes	yes	yes	yes
Bromodichloromethane	yes	yes	yes	yes	yes	yes
1,2-Dichloropropane	yes	yes	yes	yes	yes	yes
cis-1,3-dichloropropene	yes	yes	yes	yes	yes	yes
Trichloroethene	yes	yes	yes	yes	yes	yes
Dibromochloromethane	yes	yes	yes	yes	yes	yes
1,1,2-Trichloroethane	yes	yes	yes	yes	yes	yes
Benzene	yes	yes	yes	yes	yes	yes
trans-1,3-Dichloropropene	yes	yes	yes	yes	yes	yes
Bromoform	yes	yes	yes	yes	yes	yes
4-Methyl-2-Pentanone	yes	yes	yes	yes	yes	yes
2-Hexanone	yes	yes	yes	yes	yes	yes
Tetrachloroethene	yes	yes	yes	yes	yes	yes
1,1,2,2-Tetrachloroethane	yes	yes	yes	yes	yes	yes
Toluene	yes	yes	yes	yes	yes	yes
Chlorobenzene	yes	yes	yes	yes	yes	yes
Ethylbenzene	yes	yes	yes	yes	yes	yes
Styrene	yes	yes	yes	yes	yes	yes
Xylenes (total)	yes	yes	yes	yes	yes	yes
TCL Semi-Volatiles (ppb):						
Bis (ethylhexyl) phthalate	yes					
TCL Pesticides (ppb):						
DDT						
PCB's (ppb):						
Asbestos (%):						

* - yes = compound-of-interest

TABLE 1-1
SUMMARY OF COMPOUNDS OF POTENTIAL CONCERN BY
MEDIA AND LOCATION FOR PHASE II INVESTIGATION
(con't)

MEDIA: / LOCATION:	Surface Water West Stream	Surface Soils Borrow Area	Surface Soils Lagoon Area	Surface Soils N. Cornfield	Surface Soils S. Cornfield	Surface Soils Stress. Vege.
PARAMETERS (ppm):						
Cyanide						
Arsenic						
Lead	yes	yes	yes	yes	yes	yes
Selenium	yes			yes	yes	yes
Antimony	yes		yes			yes
Cadmium	yes		yes	yes	yes	yes
Chromium	yes		yes	yes	yes	yes
Copper	yes	yes	yes	yes	yes	yes
Manganese	yes					yes
Zinc	yes	yes	yes	yes	yes	yes
Mercury			yes	yes	yes	
Barium				yes	yes	yes
TCL Volatiles (ppb):						
Chloromethane	yes	yes	yes	yes	yes	yes
Bromomethane	yes	yes	yes	yes	yes	yes
Vinyl Chloride	yes	yes	yes	yes	yes	yes
Chloroethane	yes	yes	yes	yes	yes	yes
Methylene Chloride	yes	yes	yes	yes	yes	yes
Acetone	yes	yes	yes	yes	yes	yes
Carbon Disulfide	yes	yes	yes	yes	yes	yes
1,1-Dichloroethene	yes	yes	yes	yes	yes	yes
1,1-Dichloroethane	yes	yes	yes	yes	yes	yes
1,2-Dichloroethene	yes	yes	yes	yes	yes	yes
Chloroform	yes	yes	yes	yes	yes	yes
1,2-Dichloroethane	yes	yes	yes	yes	yes	yes
2-Butanone	yes	yes	yes	yes	yes	yes
1,1,1-Trichloroethane	yes	yes	yes	yes	yes	yes
Carbon Tetrachloride	yes	yes	yes	yes	yes	yes
Vinyl Acetate	yes	yes	yes	yes	yes	yes
Bromodichloromethane	yes	yes	yes	yes	yes	yes
1,2-Dichloropropane	yes	yes	yes	yes	yes	yes
cis-1,3-dichloropropene	yes	yes	yes	yes	yes	yes
Trichloroethene	yes	yes	yes	yes	yes	yes
Dibromochloromethane	yes	yes	yes	yes	yes	yes
1,1,2-Trichloroethane	yes	yes	yes	yes	yes	yes
Benzene	yes	yes	yes	yes	yes	yes
trans-1,3-Dichloropropene	yes	yes	yes	yes	yes	yes
Bromoform	yes	yes	yes	yes	yes	yes
4-Methyl-2-Pentanone	yes	yes	yes	yes	yes	yes
2-Hexanone	yes	yes	yes	yes	yes	yes
Tetrachloroethene	yes	yes	yes	yes	yes	yes
1,1,2,2-Tetrachloroethane	yes	yes	yes	yes	yes	yes
Toluene	yes	yes	yes	yes	yes	yes
Chlorobenzene	yes	yes	yes	yes	yes	yes
Ethylbenzene	yes	yes	yes	yes	yes	yes
Styrene	yes	yes	yes	yes	yes	yes
Xylenes (total)	yes	yes	yes	yes	yes	yes
TCL Semi-Volatiles (ppb):						
Bis (ethylhexyl) phthalate		yes				
TCL Pesticides (ppb):						
DDT						yes
PCB's (ppb):						
Asbestos (%):		yes				

* - yes = compound-of-interest

TABLE 1-1
SUMMARY OF COMPOUNDS OF POTENTIAL CONCERN BY
MEDIA AND LOCATION FOR PHASE II INVESTIGATION
(con't)

MEDIA: / LOCATION:	Surface Soils Drum Area 1	Surface Soils Drum Area 2	Subsurface Soils Borrow Area	Subsurface Soils Lagoon Area	Subsurface Soils N. Cornfield	Subsurface Soils S. Cornfield
PARAMETERS (ppm):						
Cyanide						
Arsenic						
Lead			yes	yes	yes	yes
Selenium					yes	yes
Antimony				yes		
Cadmium				yes	yes	yes
Chromium				yes	yes	yes
Copper			yes	yes	yes	yes
Manganese						
Zinc			yes	yes	yes	yes
Mercury				yes	yes	yes
Barium					yes	yes
TCL Volatiles (ppb):						
Chloromethane	yes	yes	yes	yes	yes	yes
Bromomethane	yes	yes	yes	yes	yes	yes
Vinyl Chloride	yes	yes	yes	yes	yes	yes
Chloroethane	yes	yes	yes	yes	yes	yes
Methylene Chloride	yes	yes	yes	yes	yes	yes
Acetone	yes	yes	yes	yes	yes	yes
Carbon Disulfide	yes	yes	yes	yes	yes	yes
1,1-Dichloroethene	yes	yes	yes	yes	yes	yes
1,1-Dichloroethane	yes	yes	yes	yes	yes	yes
1,2-Dichloroethene	yes	yes	yes	yes	yes	yes
Chloroform	yes	yes	yes	yes	yes	yes
1,2-Dichloroethane	yes	yes	yes	yes	yes	yes
2-Butanone	yes	yes	yes	yes	yes	yes
1,1,1-Trichloroethane	yes	yes	yes	yes	yes	yes
Carbon Tetrachloride	yes	yes	yes	yes	yes	yes
Vinyl Acetate	yes	yes	yes	yes	yes	yes
Bromodichloromethane	yes	yes	yes	yes	yes	yes
1,2-Dichloropropane	yes	yes	yes	yes	yes	yes
cis-1,3-dichloropropene	yes	yes	yes	yes	yes	yes
Trichloroethene	yes	yes	yes	yes	yes	yes
Dibromochloromethane	yes	yes	yes	yes	yes	yes
1,1,2-Trichloroethane	yes	yes	yes	yes	yes	yes
Benzene	yes	yes	yes	yes	yes	yes
trans-1,3-Dichloropropene	yes	yes	yes	yes	yes	yes
Bromoform	yes	yes	yes	yes	yes	yes
4-Methyl-2-Pentanone	yes	yes	yes	yes	yes	yes
2-Hexanone	yes	yes	yes	yes	yes	yes
Tetrachloroethene	yes	yes	yes	yes	yes	yes
1,1,2,2-Tetrachloroethane	yes	yes	yes	yes	yes	yes
Toluene	yes	yes	yes	yes	yes	yes
Chlorobenzene	yes	yes	yes	yes	yes	yes
Ethylbenzene	yes	yes	yes	yes	yes	yes
Styrene	yes	yes	yes	yes	yes	yes
Xylenes (total)	yes	yes	yes	yes	yes	yes
TCL Semi-Volatiles (ppb):						
Bis (ethylhexyl) phthalate			yes			
TCL Pesticides (ppb):						
DDT						
PCB's (ppb):	yes					
Asbestos (%):						

* - yes = compound-of-interest

TABLE 1-1
SUMMARY OF COMPOUNDS OF POTENTIAL CONCERN BY
MEDIA AND LOCATION FOR PHASE II INVESTIGATION
(con't)

MEDIA:	Subsurface Soils	Subsurface Soils	Subsurface Soils
LOCATION:	Stress. Vege.	Drum Area 1	Drum Area 2
PARAMETERS (ppm):			
Cyanide			
Arsenic			
Lead	yes		
Selenium	yes		
Antimony	yes		
Cadmium	yes		
Chromium	yes		
Copper	yes		
Manganese	yes		
Zinc	yes		
Mercury			
Barium	yes		
TCL Volatiles (ppb):			
Chloromethane	yes	yes	yes
Bromomethane	yes	yes	yes
Vinyl Chloride	yes	yes	yes
Chloroethane	yes	yes	yes
Methylene Chloride	yes	yes	yes
Acetone	yes	yes	yes
Carbon Disulfide	yes	yes	yes
1,1-Dichloroethene	yes	yes	yes
1,1-Dichloroethane	yes	yes	yes
1,2-Dichloroethene	yes	yes	yes
Chloroform	yes	yes	yes
1,2-Dichloroethane	yes	yes	yes
2-Butanone	yes	yes	yes
1,1,1-Trichloroethane	yes	yes	yes
Carbon Tetrachloride	yes	yes	yes
Vinyl Acetate	yes	yes	yes
Bromodichloromethane	yes	yes	yes
1,2-Dichloropropane	yes	yes	yes
cis-1,3-dichloropropene	yes	yes	yes
Trichloroethene	yes	yes	yes
Dibromochloromethane	yes	yes	yes
1,1,2-Trichloroethane	yes	yes	yes
Benzene	yes	yes	yes
trans-1,3-Dichloropropene	yes	yes	yes
Bromoform	yes	yes	yes
4-Methyl-2-Pentanone	yes	yes	yes
2-Hexanone	yes	yes	yes
Tetrachloroethene	yes	yes	yes
1,1,2,2-Tetrachloroethane	yes	yes	yes
Toluene	yes	yes	yes
Chlorobenzene	yes	yes	yes
Ethylbenzene	yes	yes	yes
Styrene	yes	yes	yes
Xylenes (total)	yes	yes	yes
TCL Semi-Volatiles (ppb):			
Bis (ethylhexyl) phthalate			
TCL Pesticides (ppb):			
DDT	yes		
PCB's (ppb):		yes	
Asbestos (%):			

* - yes = compound-of-interest

TABLE 1
SUMMARY OF SURFACE SOIL DATA
FOR THE BORROW AREA

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total	1	0	1	0.06	0.06		
Arsenic	1	0	1	5.76	5.76		
Lead	9	9	0			11.45	931.94
Selenium	1	0	1	0.58	0.58		
Antimony	1	0	1	5.76	5.76		
Cadmium	1	0	1	0.58	0.58		
Chromium	1	1	0			47.24	47.24
Copper	9	9	0			11.58	1192.94
Manganese	1	1	0			692.40	692.40
Zinc	9	9	0			62.28	468.59
Mercury	1	0	1	0.05	0.05		
Barium	1	1	0			103.69	103.69
TCL Volatiles (ug/kg):							
Chloromethane	9	0	9	11.52	13.09		
Bromomethane	9	0	9	11.52	13.09		
Vinyl Chloride	9	0	9	11.52	13.09		
Chloroethane	9	0	9	11.52	13.09		
Methylene Chloride	9	9	0			18.02	121.73
Acetone	9	3	6	11.52	13.09	13.72	35.25
Carbon Disulfide	9	0	9	5.76	6.54		
1,1-Dichloroethene	9	0	9	5.76	6.54		
1,1-Dichloroethane	9	0	9	5.76	6.54		
1,2-Dichloroethene	9	0	9	5.76	6.54		
Chloroform	9	0	9	5.76	6.54		
1,2-Dichloroethane	9	0	9	5.76	6.54		
2-Butanone	9	0	9	11.52	13.09		
1,1,1-Trichloroethane	9	0	9	5.76	6.54		
Carbon Tetrachloride	9	0	9	5.76	6.54		
Vinyl Acetate	9	0	9	11.52	13.09		
Bromodichloromethane	9	0	9	5.76	6.54		
1,2-Dichloropropane	9	0	9	5.76	6.54		
cis-1,3-dichloropropene	9	0	9	5.76	6.54		
Trichloroethene	9	1	8	5.76	6.44	7.00	7.00
Dibromochloromethane	9	0	9	5.76	6.54		
1,1,2-Trichloroethane	9	0	9	5.76	6.54		
Benzene	9	0	9	5.76	6.54		
trans-1,3-Dichloropropene	9	0	9	5.76	6.54		
Bromoform	9	0	9	5.76	6.54		
4-Methyl-2-Pentanone	9	0	9	11.52	13.09		
2-Hexanone	9	0	9	11.52	13.09		
Tetrachloroethene	9	0	9	5.76	6.54		
1,1,2,2-Tetrachloroethane	9	0	9	5.76	6.54		
Toluene	9	1	8	5.76	6.54	8.36	8.36
Chlorobenzene	9	0	9	5.76	6.54		
Ethylbenzene	9	0	9	5.76	6.54		
Styrene	9	0	9	5.76	6.54		
Xylenes (total)	9	0	9	5.76	6.54		
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate	8	1	7	387.78	424.71	8232.98	8232.98
TCL Pesticides (ug/kg):							
DDT	1	0	1	46.08	46.08		
PCB's (ug/Kg):							
PCB-1016	1	0	1	92.17	92.17		
PCB-1221	1	0	1	92.17	92.17		
PCB-1232	1	0	1	92.17	92.17		
PCB-1242	1	0	1	92.17	92.17		
PCB-1248	1	0	1	92.17	92.17		
PCB-1254	1	0	1	184.33	184.33		
PCB-1260	1	0	1	184.33	184.33		
Asbestos (%):							
Amosite asbestos	7	0	7	1.00	1.31		
Chrysotile asbestos	7	0	7	1.00	1.31		
Crocidolite asbestos	7	0	7	1.00	1.31		
Actinolite asbestos	7	0	7	1.00	1.31		
Tremolite asbestos	7	0	7	1.00	1.31		
Anthophyllite asbestos	7	0	7	1.00	1.31		

TABLE 2-2
SUMMARY OF SURFACE SOIL DATA
FOR THE LAGOON AREA

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total	1	0	1	0.07	0.07		
Arsenic	1	0	1	6.52	6.52		
Lead	3	3	0			118.38	5014.53
Selenium	1	0	1	0.65	0.65		
Antimony	3	2	1	6.52	6.52	9.89	18.90
Cadmium	3	0	3	0.62	0.73		
Chromium	3	3	0			71.71	1598.84
Copper	3	3	0			59.97	2369.19
Manganese	1	1	0			389.83	389.83
Zinc	3	3	0			56.06	493.20
Mercury	3	2	1	0.05	0.05	0.12	0.15
Barium	1	1	0			91.26	91.26
TCL Volatiles (ug/kg):							
Chloromethane	3	0	3	12.36	72.67		
Bromomethane	3	0	3	12.36	72.67		
Vinyl Chloride	3	1	2	12.36	13.04	610.47	610.47
Chloroethane	3	1	2	12.36	13.04	595.93	595.93
Methylene Chloride	3	3	0			19.56	188.95
Acetone	3	1	2	12.36	13.04	261.63	261.63
Carbon Disulfide	3	0	3	6.18	36.34		
1,1-Dichloroethene	3	1	2	6.18	6.52	290.70	290.70
1,1-Dichloroethane	3	1	2	6.18	6.52	6104.65	6104.65
1,2-Dichloroethene	3	1	2	6.18	6.52	21802.33	21802.33
Chloroform	3	0	3	6.18	36.34		
1,2-Dichloroethane	3	1	2	6.18	6.52	37.79	37.79
2-Butanone	3	0	3	12.36	72.67		
1,1,1-Trichloroethane	3	1	2	6.18	6.52	11337.21	11337.21
Carbon Tetrachloride	3	0	3	6.18	36.34		
Vinyl Acetate	3	0	3	12.36	72.67		
Bromodichloromethane	3	0	3	6.18	36.34		
1,2-Dichloropropane	3	0	3	6.18	36.34		
cis-1,3-dichloropropene	3	0	3	6.18	36.34		
Trichloroethene	3	1	2	6.18	6.52	334.30	334.30
Dibromochloromethane	3	0	3	6.18	36.34		
1,1,2-Trichloroethane	3	1	2	6.18	6.52	47.97	47.97
Benzene	3	0	3	6.18	36.34		
trans-1,3-Dichloropropene	3	0	3	6.18	36.34		
Bromoform	3	0	3	6.18	36.34		
4-Methyl-2-Pentanone	3	1	2	12.36	13.04	145.35	145.35
2-Hexanone	3	0	3	12.36	72.67		
Tetrachloroethene	3	1	2	6.18	6.52	174.42	174.42
1,1,2,2-Tetrachloroethane	3	0	3	6.18	36.34		
Toluene	3	1	2	6.18	6.52	537.79	537.79
Chlorobenzene	3	0	3	6.18	36.34		
Ethylbenzene	3	0	3	6.18	36.34		
Styrene	3	0	3	6.18	36.34		
Xylenes (total)	3	1	2	6.18	6.52	305.23	305.23
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate							
TCL Pesticides (ug/kg):							
DDT	1	0	1	45.63	45.63		
PCB's (ug/Kg):							
PCB-1016	1	0	1	104.30	104.30		
PCB-1221	1	0	1	104.30	104.30		
PCB-1232	1	0	1	104.30	104.30		
PCB-1242	1	0	1	104.30	104.30		
PCB-1248	1	0	1	104.30	104.30		
PCB-1254	1	0	1	208.60	208.60		
PCB-1260	1	0	1	208.60	208.60		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-3
SUMMARY OF SURFACE SOIL DATA
FOR THE NORTH CORNFIELD AREA

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total	3	1	2	0.06	0.06	0.07	0.07
Arsenic	4	2	2	6.05	6.12	2.42	2.60
Lead	6	6	0			9.11	6545.45
Selenium	6	0	6	0.60	3.51		
Antimony	4	0	4	6.05	6.49		
Cadmium	6	1	5	0.60	0.62	1.17	1.17
Chromium	6	6	0			6.16	64.94
Copper	6	6	0			4.93	188.31
Manganese	4	4	0			309.09	972.19
Zinc	6	6	0			29.56	2935.06
Mercury	6	4	2	0.05	0.05	0.17	0.35
Barium	6	6	0			61.58	7025.97
TCL Volatiles (ug/kg):							
Chloromethane	4	0	4	12.09	12.99		
Bromomethane	4	0	4	12.09	12.99		
Vinyl Chloride	4	0	4	12.09	12.99		
Chloroethane	4	0	4	12.09	12.99		
Methylene Chloride	4	3	1	6.49	6.49	7.26	12.09
Acetone	4	1	3	12.09	12.99	24.18	24.18
Carbon Disulfide	4	0	4	6.05	6.49		
1,1-Dichloroethene	4	0	4	6.05	6.49		
1,1-Dichloroethane	4	0	4	6.05	6.49		
1,2-Dichloroethene	4	0	4	6.05	6.49		
Chloroform	4	0	4	6.05	6.49		
1,2-Dichloroethane	4	0	4	6.05	6.49		
2-Butanone	4	0	4	12.09	12.99		
1,1,1-Trichloroethane	4	0	4	6.05	6.49		
Carbon Tetrachloride	4	0	4	6.05	6.49		
Vinyl Acetate	4	0	4	12.09	12.99		
Bromodichloromethane	4	0	4	6.05	6.49		
1,2-Dichloropropane	4	0	4	6.05	6.49		
cis-1,3-dichloropropene	4	0	4	6.05	6.49		
Trichloroethene	4	0	4	6.05	6.49		
Dibromochloromethane	4	0	4	6.05	6.49		
1,1,2-Trichloroethane	4	0	4	6.05	6.49		
Benzene	4	0	4	6.05	6.49		
trans-1,3-Dichloropropene	4	0	4	6.05	6.49		
Bromoform	4	0	4	6.05	6.49		
4-Methyl-2-Pentanone	4	0	4	12.09	12.99		
2-Hexanone	4	0	4	12.09	12.99		
Tetrachloroethene	4	4	0			6.05	10.39
1,1,2,2-Tetrachloroethane	4	0	4	6.05	6.49		
Toluene	4	0	4	6.05	6.49		
Chlorobenzene	4	0	4	6.05	6.49		
Ethylbenzene	4	0	4	6.05	6.49		
Styrene	4	0	4	6.05	6.49		
Xylenes (total)	4	0	4	6.05	6.49		
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate							
TCL Pesticides (ug/kg):							
DDT	3	1	2	19.35	19.35	29.38	29.38
PCB's (ug/Kg):							
PCB-1016	3	0	3	96.74	97.92		
PCB-1221	3	0	3	96.74	97.92		
PCB-1232	3	0	3	96.74	97.92		
PCB-1242	3	0	3	96.74	97.92		
PCB-1248	3	0	3	96.74	97.92		
PCB-1254	3	0	3	193.47	195.84		
PCB-1260	3	0	3	193.47	195.84		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-4
SUMMARY OF SURFACE SOIL DATA
FOR THE SOUTH CORNFIELD AREA

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total	3	0	3	0.06	0.06		
Arsenic	3	0	3	6.05	6.43		
Lead	5	5	0			17.14	1767.68
Selenium	5	1	4	0.61	0.67	0.76	0.76
Antimony	3	0	3	6.05	6.43		
Cadmium	5	1	4	0.61	0.67	1.39	1.39
Chromium	5	5	0			18.67	313.13
Copper	5	5	0			9.86	702.02
Manganese	3	3	0			488.64	1979.43
Zinc	5	5	0			34.53	584.60
Mercury	5	4	1	0.05	0.05	0.06	0.51
Barium	5	5	0			66.67	555.56
TCL Volatiles (ug/kg):							
Chloromethane	4	0	4	12.11	12.85		
Bromomethane	4	0	4	12.11	12.85		
Vinyl Chloride	4	0	4	12.11	12.85		
Chloroethane	4	0	4	12.11	12.85		
Methylene Chloride	4	3	1	6.17	6.17	11.57	20.20
Acetone	4	0	4	12.11	12.85		
Carbon Disulfide	4	0	4	6.05	6.43		
1,1-Dichloroethene	4	0	4	6.05	6.43		
1,1-Dichloroethane	4	0	4	6.05	6.43		
1,2-Dichloroethene	4	0	4	6.05	6.43		
Chloroform	4	0	4	6.05	6.43		
1,2-Dichloroethane	4	0	4	6.05	6.43		
2-Butanone	4	0	4	12.11	12.85		
1,1,1-Trichloroethane	4	0	4	6.05	6.43		
Carbon Tetrachloride	4	0	4	6.05	6.43		
Vinyl Acetate	4	0	4	12.11	12.85		
Bromodichloromethane	4	0	4	6.05	6.43		
1,2-Dichloropropane	4	0	4	6.05	6.43		
cis-1,3-dichloropropene	4	0	4	6.05	6.43		
Trichloroethene	4	1	3	6.05	6.43	11.36	11.36
Dibromochloromethane	4	0	4	6.05	6.43		
1,1,2-Trichloroethane	4	0	4	6.05	6.43		
Benzene	4	0	4	6.05	6.43		
trans-1,3-Dichloropropene	4	0	4	6.05	6.43		
Bromoform	4	0	4	6.05	6.43		
4-Methyl-2-Pentanone	4	0	4	12.11	12.85		
2-Hexanone	4	0	4	12.11	12.85		
Tetrachloroethene	4	3	1	6.17	6.17	6.05	6.43
1,1,2,2-Tetrachloroethane	4	0	4	6.05	6.43		
Toluene	4	1	3	6.05	6.43	13.89	13.89
Chlorobenzene	4	0	4	6.05	6.43		
Ethylbenzene	4	0	4	6.05	6.43		
Styrene	4	0	4	6.05	6.43		
Xylenes (total)	4	0	4	6.05	6.43		
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate							
TCL Pesticides (ug/kg):							
DDT	3	0	3	19.37	70.69		
PCB's (ug/Kg):							
PCB-1016	3	0	3	96.85	102.83		
PCB-1221	3	0	3	96.85	102.83		
PCB-1232	3	0	3	96.85	102.83		
PCB-1242	3	0	3	96.85	102.83		
PCB-1248	3	0	3	96.85	102.83		
PCB-1254	3	0	3	193.70	205.66		
PCB-1260	3	0	3	193.70	205.66		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-5
SUMMARY OF SURFACE SOIL DATA
FOR DRUM BURIAL AREA 1

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total	5	0	5	0.1	0.1		
Arsenic	5	0	5	10	10		
Lead	5	5	0			9.54	15.8
Selenium	5	0	5	0.6	0.6		
Antimony	5	0	5	6	6		
Cadmium	5	0	5	0.6	0.6		
Chromium	5	5	0			25.4	33.5
Copper	5	5	0			7.2	13.6
Manganese	5	5	0			533	933
Zinc	5	5	0			92.9	111
Mercury	5	0	5	0.05	0.05		
Barium	5	5	0			112	185
TCL Volatiles (ug/kg):							
Chloromethane	24	0	24	10	10000		
Bromomethane	24	0	24	10	10000		
Vinyl Chloride	24	0	24	10	10000		
Chloroethane	24	0	24	10	10000		
Methylene Chloride	24	7	17	6	8000	8.3	23
Acetone	24	15	9	10	10000	12	720
Carbon Disulfide	24	0	24	6	8000		
1,1-Dichloroethene	24	0	24	6	8000		
1,1-Dichloroethane	24	0	24	6	8000		
1,2-Dichloroethene	24	2	22	6	8000	17	63
Chloroform	24	0	24	6	8000		
1,2-Dichloroethane	24	1	23	6	8000	7.3	7.3
2-Butanone	24	7	17	10	10000	24	780
1,1,1-Trichloroethane	24	0	24	6	8000		
Carbon Tetrachloride	24	0	24	6	8000		
Vinyl Acetate	24	0	24	10	10000		
Bromodichloromethane	24	0	24	6	8000		
1,2-Dichloropropane	24	0	24	6	8000		
cis-1,3-dichloropropene	24	0	24	6	8000		
Trichloroethene	24	4	20	6	8000	12	28
Dibromochloromethane	24	0	24	6	8000		
1,1,2-Trichloroethane	24	4	20	6	8000	7.4	19
Benzene	24	0	24	6	8000		
trans-1,3-Dichloropropene	24	0	24	6	8000		
Bromoform	24	0	24	6	8000		
4-Methyl-2-Pentanone	24	4	20	10	10000	12	48
2-Hexanone	24	0	24	10	10000		
Tetrachloroethene	24	1	23	6	700	15000	15000
1,1,2,2-Tetrachloroethane	24	0	24	6	8000		
Toluene	24	2	22	6	700	3200	11000
Chlorobenzene	24	0	24	6	8000		
Ethylbenzene	24	5	19	6	700	7.3	46000
Styrene	24	0	24	6	8000		
Xylenes (total)	24	8	16	6	7	8.7	410000
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate							
TCL Pesticides (ug/kg):							
DDT	5	0	5	20	20		
PCB's (ug/Kg):							
PCB-1016	5	0	5	100	100		
PCB-1221	5	0	5	100	500		
PCB-1232	5	0	5	100	100		
PCB-1242	5	0	5	100	100		
PCB-1248	5	0	5	100	100		
PCB-1254	5	0	5	200	200		
PCB-1260	5	0	5	200	200		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-6
SUMMARY OF SURFACE SOIL DATA
FOR DRUM BURIAL AREA 2

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total	2	0	2	0.1	0.1		
Arsenic	2	0	2	6	10		
Lead	2	2	0			1.68	15.8
Selenium	2	0	2	0.6	0.6		
Antimony	2	0	2	6	6		
Cadmium	2	0	2	0.6	0.6		
Chromium	2	2	0			28.4	40
Copper	2	2	0			11.6	13.6
Manganese	2	2	0			533	1040
Zinc	2	2	0			97.4	111
Mercury	2	0	2	0.05	0.05		
Barium	2	2	0			173	297
TCL Volatiles (ug/kg):							
Chloromethane	6	0	6	10	10		
Bromomethane	6	0	6	10	10		
Vinyl Chloride	6	0	6	10	10		
Chloroethane	6	0	6	10	10		
Methylene Chloride	6	0	6	6	7		
Acetone	6	6	0			12	720
Carbon Disulfide	6	0	6	6	7		
1,1-Dichloroethene	6	0	6	6	7		
1,1-Dichloroethane	6	0	6	6	7		
1,2-Dichloroethene	6	0	6	6	7		
Chloroform	6	0	6	6	7		
1,2-Dichloroethane	6	0	6	6	7		
2-Butanone	6	5	1	10	10	27	460
1,1,1-Trichloroethane	6	0	6	6	7		
Carbon Tetrachloride	6	0	6	6	7		
Vinyl Acetate	6	0	6	10	10		
Bromodichloromethane	6	0	6	6	7		
1,2-Dichloropropane	6	0	6	6	7		
cis-1,3-dichloropropene	6	0	6	6	7		
Trichloroethene	6	0	6	6	7		
Dibromochloromethane	6	0	6	6	7		
1,1,2-Trichloroethane	6	1	5	6	7	7.4	7.4
Benzene	6	0	6	6	7		
trans-1,3-Dichloropropene	6	0	6	6	7		
Bromoform	6	0	6	6	7		
4-Methyl-2-Pentanone	6	1	5	10	10	12	12
2-Hexanone	6	0	6	10	10		
Tetrachloroethene	6	0	6	6	7		
1,1,2,2-Tetrachloroethane	6	0	6	6	7		
Toluene	6	0	6	6	7		
Chlorobenzene	6	0	6	6	7		
Ethylbenzene	6	0	6	6	7		
Styrene	6	0	6	6	7		
Xylenes (total)	6	1	5	6	7	31	31
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate							
TCL Pesticides (ug/kg):							
DDT	2	0	2	20	20		
PCB's (ug/Kg):							
PCB-1016	2	0	2	100	100		
PCB-1221	2	0	2	100	100		
PCB-1232	2	0	2	100	100		
PCB-1242	2	0	2	100	100		
PCB-1248	2	0	2	100	100		
PCB-1254	2	0	2	200	200		
PCB-1260	2	0	2	200	200		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-7
SUMMARY OF SURFACE SOIL DATA
FOR THE STRESSED VEGETATION AREA

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total	5	3	2	0.06	0.06	0.16	1.99
Arsenic	5	4	1	8.82	8.82	1.29	7.52
Lead	21	21	0			12.10	54320.99
Selenium	21	1	20	0.60	5.29	1.16	1.16
Antimony	21	2	19	6.00	10.00	72.67	91.71
Cadmium	21	0	21	0.60	1.00		
Chromium	21	21	0			20.00	10029.07
Copper	21	21	0			9.00	7180.23
Manganese	5	5	0			130.81	3421.05
Zinc	21	21	0			35.00	1033.43
Mercury	21	4	17	0.05	0.70	0.05	1.53
Barium	21	21	0			50.00	1526.16
TCL Volatiles (ug/kg):							
Chloromethane	21	0	21	12.00	21.00		
Bromomethane	21	0	21	12.00	21.00		
Vinyl Chloride	21	0	21	12.00	21.00		
Chloroethane	21	0	21	12.00	21.00		
Methylene Chloride	21	18	3	7.00	10.00	7.00	36.34
Acetone	21	11	10	12.00	21.00	12.53	82.00
Carbon Disulfide	21	0	21	6.00	10.00		
1,1-Dichloroethene	21	0	21	6.00	10.00		
1,1-Dichloroethane	21	2	19	6.00	10.00	10.58	33.43
1,2-Dichloroethene	21	1	20	6.00	10.00	47.97	47.97
Chloroform	21	0	21	6.00	10.00		
1,2-Dichloroethane	21	0	21	6.00	10.00		
2-Butanone	21	0	21	12.00	21.00		
1,1,1-Trichloroethane	21	2	19	6.00	10.00	194.00	508.72
Carbon Tetrachloride	21	0	21	6.00	145.35		
Vinyl Acetate	21	0	21	12.00	21.00		
Bromodichloromethane	21	0	21	6.00	10.00		
1,2-Dichloropropane	21	0	21	6.00	10.00		
cis-1,3-dichloropropene	21	0	21	6.00	10.00		
Trichloroethene	21	2	19	6.00	10.00	37.04	93.02
Dibromochloromethane	21	0	21	6.00	10.00		
1,1,2-Trichloroethane	21	0	21	6.00	10.00		
Benzene	21	0	21	6.00	10.00		
trans-1,3-Dichloropropene	21	0	21	6.00	10.00		
Bromoform	21	0	21	6.00	10.00		
4-Methyl-2-Pentanone	21	0	21	12.00	21.00		
2-Hexanone	21	0	21	12.00	21.00		
Tetrachloroethene	21	2	19	6.00	10.00	15.99	128.75
1,1,2,2-Tetrachloroethane	21	0	21	6.00	10.00		
Toluene	21	1	20	6.00	10.00	8.72	8.72
Chlorobenzene	21	0	21	6.00	10.00		
Ethylbenzene	21	0	21	6.00	10.00		
Styrene	21	0	21	6.00	10.00		
Xylenes (total)	21	0	21	6.00	10.00		
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate							
TCL Pesticides (ug/kg):							
DDT	21	2	19	19.00	348.84	60.00	670.19
PCB's (ug/Kg):							
PCB-1016	21	0	21	98.64	1744.19		
PCB-1221	21	0	21	98.64	1744.19		
PCB-1232	21	0	21	98.64	1744.19		
PCB-1242	21	0	21	98.64	1744.19		
PCB-1248	21	0	21	98.64	1744.19		
PCB-1254	21	0	21	190.00	3488.37		
PCB-1260	21	0	21	190.00	3488.37		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-8
SUMMARY OF BACKGROUND SOIL DATA
FOR THE HUNTERSTOWN ROAD SITE

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total	1	0	1	0.06	0.06		
Arsenic	1	1	0			5.16	5.16
Lead	20	20	0			7.68	965.04
Selenium	20	0	20	0.57	0.75		
Antimony	1	0	1	6.45	6.45		
Cadmium	20	0	20	0.57	0.75		
Chromium	20	20	0			8.13	42.45
Copper	20	19	1	2.32	2.32	2.31	30.88
Manganese	1	1	0			1152.26	1152.26
Zinc	20	20	0			41.29	123.65
Mercury	20	0	20	0.05	0.06		
Barium	20	20	0			34.84	149.81
TCL Volatiles (ug/kg):							
Chloromethane	8	0	8	11.44	12.90		
Bromomethane	8	0	8	11.44	12.90		
Vinyl Chloride	8	0	8	11.44	12.90		
Chloroethane	8	0	8	11.44	12.90		
Methylene Chloride	8	6	2	5.80	6.18	8.40	28.39
Acetone	8	8	0			13.94	35.85
Carbon Disulfide	8	0	8	5.72	6.45		
1,1-Dichloroethene	8	0	8	5.72	6.45		
1,1-Dichloroethane	8	0	8	5.72	6.45		
1,2-Dichloroethene	8	0	8	5.72	6.45		
Chloroform	8	0	8	5.72	6.45		
1,2-Dichloroethane	8	0	8	5.72	6.45		
2-Butanone	8	0	8	11.44	12.90		
1,1,1-Trichloroethane	8	0	8	5.72	6.45		
Carbon Tetrachloride	8	0	8	5.72	6.45		
Vinyl Acetate	8	0	8	11.44	12.90		
Bromodichloromethane	8	0	8	5.72	6.45		
1,2-Dichloropropane	8	0	8	5.72	6.45		
cis-1,3-dichloropropene	8	0	8	5.72	6.45		
Trichloroethene	8	0	8	5.72	6.45		
Dibromochloromethane	8	0	8	5.72	6.45		
1,1,2-Trichloroethane	8	0	8	5.72	6.45		
Benzene	8	0	8	5.72	6.45		
trans-1,3-Dichloropropene	8	0	8	5.72	6.45		
Bromoform	8	0	8	5.72	6.45		
4-Methyl-2-Pentanone	8	0	8	11.44	12.90		
2-Hexanone	8	0	8	11.44	12.90		
Tetrachloroethene	8	1	7	5.72	6.24	10.32	10.32
1,1,2,2-Tetrachloroethane	8	0	8	5.72	6.45		
Toluene	8	0	8	5.72	6.45		
Chlorobenzene	8	0	8	5.72	6.45		
Ethylbenzene	8	0	8	5.72	6.45		
Styrene	8	0	8	5.72	6.45		
Xylenes (total)	8	0	8	5.72	6.45		
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate							
TCL Pesticides (ug/kg):							
DDT	1	0	1	20.65	20.65		
PCB's (ug/Kg):							
PCB-1016	1	0	1	103.23	103.23		
PCB-1221	1	0	1	103.23	103.23		
PCB-1232	1	0	1	103.23	103.23		
PCB-1242	1	0	1	103.23	103.23		
PCB-1248	1	0	1	103.23	103.23		
PCB-1254	1	0	1	206.45	206.45		
PCB-1260	1	0	1	206.45	206.45		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbesto							
Crocidolite asbes							
Actinolite asbesto							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-9

SUMMARY OF PRELIMINARY COMPOUNDS-OF-INTEREST FOR SURFACE SOILS AT THE HUNTERSTOWN ROAD SITE

PARAMETERS	Borrow Area	Lagoon Area	North Cornfield Area	South Cornfield Area	Drum Burial Area 1	Drum Burial Area 2	Stressed Vegetation Area
Inorganics (mg/kg):							
Cyanide, Total							
Arsenic							
Lead	yes	yes	yes	yes			yes
Selenium				yes			yes
Antimony		yes					yes
Cadmium			yes	yes			
Chromium		yes	yes	yes			yes
Copper	yes	yes	yes	yes			yes
Manganese							
Zinc	yes	yes	yes	yes			yes
Mercury		yes	yes	yes			yes
Barium			yes	yes			yes
TCL Volatiles (ug/kg):							
Chloromethane							
Bromomethane							
Vinyl Chloride		yes					
Chloroethane		yes					
Methylene Chloride	yes	yes	yes	yes	yes	yes	yes
Acetone	yes	yes	yes		yes	yes	yes
Carbon Disulfide							
1,1-Dichloroethene		yes					
1,1-Dichloroethane		yes					yes
1,2-Dichloroethene		yes			yes		yes
Chloroform							
1,2-Dichloroethane		yes			yes		
2-Butanone					yes	yes	
1,1,1-Trichloroethane		yes					yes
Carbon Tetrachloride							
Vinyl Acetate							
Bromodichloromethane							
1,2-Dichloropropane							
cis-1,3-dichloropropene							
Trichloroethene	yes	yes		yes	yes		yes
Dibromochloromethane							
1,1,2-Trichloroethane		yes			yes	yes	
Benzene							
trans-1,3-Dichloropropene							
Bromoform							
4-Methyl-2-Pentanone		yes			yes	yes	
2-Hexanone							
Tetrachloroethene		yes	yes	yes	yes		yes
1,1,2,2-Tetrachloroethane							
Toluene	yes	yes		yes	yes		
Chlorobenzene							
Ethylbenzene					yes		
Styrene							
Xylenes (total)		yes			yes	yes	
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate	yes						
TCL Pesticides (ug/kg):							
DDT							yes
PCB's (ug/Kg):							
PCB-1016							
PCB-1221							
PCB-1232							
PCB-1242							
PCB-1248							
PCB-1254							
PCB-1260							
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

NOTE: yes = Preliminary compound-of-interest for surface soils.

TABLE 2-10
SUMMARY OF SUBSURFACE SOIL DATA
FOR THE BORROW AREA

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total							
Arsenic							
Lead	2	2	0			93.91	641.18
Selenium							
Antimony							
Cadmium							
Chromium							
Copper	2	2	0			28.99	244.14
Manganese							
Zinc	2	2	0			94.20	164.00
Mercury							
Barium							
TCL Volatiles (ug/kg):							
Chloromethane	2	0	2	12.33	14.49		
Bromomethane	2	0	2	12.33	14.49		
Vinyl Chloride	2	0	2	12.33	14.49		
Chloroethane	2	0	2	12.33	14.49		
Methylene Chloride	2	2	0			33.29	34.78
Acetone	2	1	1	12.33	12.33	14.49	14.49
Carbon Disulfide	2	0	2	6.17	7.25		
1,1-Dichloroethene	2	0	2	6.17	7.25		
1,1-Dichloroethane	2	0	2	6.17	7.25		
1,2-Dichloroethene	2	0	2	6.17	7.25		
Chloroform	2	0	2	6.17	7.25		
1,2-Dichloroethane	2	0	2	6.17	7.25		
2-Butanone	2	0	2	12.33	14.49		
1,1,1-Trichloroethane	2	0	2	6.17	7.25		
Carbon Tetrachloride	2	0	2	6.17	7.25		
Vinyl Acetate	2	0	2	12.33	14.49		
Bromodichloromethane	2	0	2	6.17	7.25		
1,2-Dichloropropane	2	0	2	6.17	7.25		
cis-1,3-dichloropropene	2	0	2	6.17	7.25		
Trichloroethene	2	0	2	6.17	7.25		
Dibromochloromethane	2	0	2	6.17	7.25		
1,1,2-Trichloroethane	2	0	2	6.17	7.25		
Benzene	2	0	2	6.17	7.25		
trans-1,3-Dichloropropene	2	0	2	6.17	7.25		
Bromoform	2	0	2	6.17	7.25		
4-Methyl-2-Pentanone	2	0	2	12.33	14.49		
2-Hexanone	2	0	2	12.33	14.49		
Tetrachloroethene	2	0	2	6.17	7.25		
1,1,2,2-Tetrachloroethane	2	0	2	6.17	7.25		
Toluene	2	0	2	6.17	7.25		
Chlorobenzene	2	0	2	6.17	7.25		
Ethylbenzene	2	0	2	6.17	7.25		
Styrene	2	0	2	6.17	7.25		
Xylenes (total)	2	0	2	6.17	7.25		
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate	2	1	1	478.26	478.26	678.18	678.18
TCL Pesticides (ug/kg):							
DDT							
PCB's (ug/Kg):							
PCB-1016							
PCB-1221							
PCB-1232							
PCB-1242							
PCB-1248							
PCB-1254							
PCB-1260							
Asbestos (%):							
Amosite asbestos	2	0	2	1.23	1.45		
Chrysotile asbestos	2	0	2	1.23	1.45		
Crocidolite asbestos	2	0	2	1.23	1.45		
Actinolite asbestos	2	0	2	1.23	1.45		
Tremolite asbestos	2	0	2	1.23	1.45		
Anthophyllite asbestos	2	0	2	1.23	1.45		

TABLE 2-11
SUMMARY OF SUBSURFACE SOIL DATA
FOR THE LAGOON AREA

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total							
Arsenic							
Lead	11	11	0			5.38	324.16
Selenium							
Antimony	11	0	11	5.62	6.19		
Cadmium	11	3	8	0.56	0.62	0.69	0.73
Chromium	11	11	0			9.00	41.87
Copper	11	11	0			5.86	320.58
Manganese							
Zinc	11	11	0			37.12	133.33
Mercury	11	0	11	0.04	0.05		
Barium							
TCL Volatiles (ug/kg):							
Chloromethane	11	0	11	11.25	61.88		
Bromomethane	11	0	11	11.25	61.88		
Vinyl Chloride	11	0	11	11.25	61.88		
Chloroethane	11	0	11	11.25	61.88		
Methylene Chloride	11	5	6	5.70	5.98	8.50	75.50
Acetone	11	8	3	11.72	12.14	12.64	2599.01
Carbon Disulfide	11	0	11	5.62	30.94		
1,1-Dichloroethene	11	0	11	5.62	30.94		
1,1-Dichloroethane	11	0	11	5.62	30.94		
1,2-Dichloroethene	11	0	11	5.62	30.94		
Chloroform	11	0	11	5.62	30.94		
1,2-Dichloroethane	11	0	11	5.62	30.94		
2-Butanone	11	3	8	11.25	12.14	34.02	556.93
1,1,1-Trichloroethane	11	1	10	5.62	30.94	8.50	8.50
Carbon Tetrachloride	11	0	11	5.62	30.94		
Vinyl Acetate	11	0	11	11.25	61.88		
Bromodichloromethane	11	0	11	5.62	30.94		
1,2-Dichloropropane	11	0	11	5.62	30.94		
cis-1,3-dichloropropene	11	0	11	5.62	30.94		
Trichloroethene	11	0	11	5.62	30.94		
Dibromochloromethane	11	0	11	5.62	30.94		
1,1,2-Trichloroethane	11	0	11	5.62	30.94		
Benzene	11	0	11	5.62	30.94		
trans-1,3-Dichloropropene	11	0	11	5.62	30.94		
Bromoform	11	0	11	5.62	30.94		
4-Methyl-2-Pentanone	11	2	9	11.25	12.15	187.13	346.53
2-Hexanone	11	0	11	11.25	61.88		
Tetrachloroethene	11	0	11	5.62	30.94		
1,1,2,2-Tetrachloroethane	11	0	11	5.62	30.94		
Toluene	11	1	10	5.62	30.94	42.11	42.11
Chlorobenzene	11	0	11	5.62	30.94		
Ethylbenzene	11	1	10	5.62	30.94	233.92	233.92
Styrene	11	0	11	5.62	30.94		
Xylenes (total)	11	2	9	5.62	30.94	35.19	1169.59
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate							
TCL Pesticides (ug/kg):							
DDT							
PCB's (ug/Kg):							
PCB-1016							
PCB-1221							
PCB-1232							
PCB-1242							
PCB-1248							
PCB-1254							
PCB-1260							
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-12
SUMMARY OF SUBSURFACE SOIL DATA
FOR THE NORTH CORNFIELD AREA

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total							
Arsenic							
Lead	18	18	0			5.11	44.81
Selenium	18	2	16	0.59	0.68	0.61	0.78
Antimony							
Cadmium	18	0	18	0.59	0.68		
Chromium	18	18	0			11.41	32.43
Copper	18	17	1	12.18	12.18	11.14	56.01
Manganese							
Zinc	18	18	0			30.42	102.46
Mercury	18	8	10	0.05	0.05	0.05	0.07
Barium	18	18	0			36.36	350.19
TCL Volatiles (ug/kg):							
Chloromethane	6	0	6	12.05	12.72		
Bromomethane	6	0	6	12.05	12.72		
Vinyl Chloride	6	0	6	12.05	12.72		
Chloroethane	6	0	6	12.05	12.72		
Methylene Chloride	6	6	0			8.63	20.88
Acetone	6	5	1	12.29	12.29	13.56	39.44
Carbon Disulfide	6	0	6	6.02	6.36		
1,1-Dichloroethene	6	0	6	6.02	6.36		
1,1-Dichloroethane	6	0	6	6.02	6.36		
1,2-Dichloroethene	6	0	6	6.02	6.36		
Chloroform	6	0	6	6.02	6.36		
1,2-Dichloroethane	6	0	6	6.02	6.36		
2-Butanone	6	0	6	12.05	12.72		
1,1,1-Trichloroethane	6	0	6	6.02	6.36		
Carbon Tetrachloride	6	0	6	6.02	6.36		
Vinyl Acetate	6	0	6	12.05	12.72		
Bromodichloromethane	6	0	6	6.02	6.36		
1,2-Dichloropropane	6	0	6	6.02	6.36		
cis-1,3-dichloropropene	6	0	6	6.02	6.36		
Trichloroethene	6	0	6	6.02	6.36		
Dibromochloromethane	6	0	6	6.02	6.36		
1,1,2-Trichloroethane	6	0	6	6.02	6.36		
Benzene	6	0	6	6.02	6.36		
trans-1,3-Dichloropropene	6	0	6	6.02	6.36		
Bromoform	6	0	6	6.02	6.36		
4-Methyl-2-Pentanone	6	0	6	12.05	12.72		
2-Hexanone	6	0	6	12.05	12.72		
Tetrachloroethene	6	0	6	6.02	6.36		
1,1,2,2-Tetrachloroethane	6	0	6	6.02	6.36		
Toluene	6	0	6	6.02	6.36		
Chlorobenzene	6	0	6	6.02	6.36		
Ethylbenzene	6	0	6	6.02	6.36		
Styrene	6	0	6	6.02	6.36		
Xylenes (total)	6	0	6	6.02	6.36		
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate							
TCL Pesticides (ug/kg):							
DDT							
PCB's (ug/Kg):							
PCB-1016							
PCB-1221							
PCB-1232							
PCB-1242							
PCB-1248							
PCB-1254							
PCB-1260							
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-13
SUMMARY OF SUBSURFACE SOIL DATA
FOR THE SOUTH CORNFIELD AREA

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total							
Arsenic							
Lead	30	30	0			6.58	54.93
Selenium	30	1	29	0.59	3.75	0.64	0.64
Antimony							
Cadmium	30	3	27	0.59	0.68	0.60	0.86
Chromium	30	30	0			12.93	43.70
Copper	30	30	0			5.97	161.75
Manganese							
Zinc	30	30	0			34.19	96.22
Mercury	30	8	22	0.05	0.05	0.05	0.61
Barium	30	30	0			35.25	217.13
TCL Volatiles (ug/kg):							
Chloromethane	10	0	10	11.93	12.84		
Bromomethane	10	0	10	11.93	12.84		
Vinyl Chloride	10	0	10	11.93	12.84		
Chloroethane	10	0	10	11.93	12.84		
Methylene Chloride	10	9	1	5.97	5.97	10.74	33.38
Acetone	10	5	5	11.93	12.82	15.51	28.01
Carbon Disulfide	10	0	10	5.97	6.42		
1,1-Dichloroethene	10	0	10	5.97	6.42		
1,1-Dichloroethane	10	0	10	5.97	6.42		
1,2-Dichloroethene	10	0	10	5.97	6.42		
Chloroform	10	0	10	5.97	6.42		
1,2-Dichloroethane	10	0	10	5.97	6.42		
2-Butanone	10	0	10	11.93	12.84		
1,1,1-Trichloroethane	10	0	10	5.97	6.42		
Carbon Tetrachloride	10	0	10	5.97	6.42		
Vinyl Acetate	10	0	10	11.93	12.84		
Bromodichloromethane	10	0	10	5.97	6.42		
1,2-Dichloropropane	10	0	10	5.97	6.42		
cis-1,3-dichloropropene	10	0	10	5.97	6.42		
Trichloroethene	10	0	10	5.97	6.42		
Dibromochloromethane	10	0	10	5.97	6.42		
1,1,2-Trichloroethane	10	0	10	5.97	6.42		
Benzene	10	0	10	5.97	6.42		
trans-1,3-Dichloropropene	10	0	10	5.97	6.42		
Bromoform	10	0	10	5.97	6.42		
4-Methyl-2-Pentanone	10	0	10	11.93	12.84		
2-Hexanone	10	0	10	11.93	12.84		
Tetrachloroethene	10	0	10	5.97	6.42		
1,1,2,2-Tetrachloroethane	10	0	10	5.97	6.42		
Toluene	10	0	10	5.97	6.42		
Chlorobenzene	10	0	10	5.97	6.42		
Ethylbenzene	10	0	10	5.97	6.42		
Styrene	10	0	10	5.97	6.42		
Xylenes (total)	10	0	10	5.97	6.42		
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate							
TCL Pesticides (ug/kg):							
DDT							
PCB's (ug/Kg):							
PCB-1016							
PCB-1221							
PCB-1232							
PCB-1242							
PCB-1248							
PCB-1254							
PCB-1260							
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-14
SUMMARY OF SUBSURFACE SOIL DATA
FOR DRUM BURIAL AREA 1

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total							
Arsenic							
Lead							
Selenium							
Antimony							
Cadmium							
Chromium							
Copper							
Manganese							
Zinc							
Mercury							
Barium							
TCL Volatiles (ug/kg):							
Chloromethane	36	0	36	10	10000		
Bromomethane	36	0	36	10	10000		
Vinyl Chloride	36	0	36	10	10000		
Chloroethane	36	0	36	10	10000		
Methylene Chloride	36	11	25	5	8000	5	34
Acetone	36	18	18	10	1000	12	27000
Carbon Disulfide	36	0	36	5	8000		
1,1-Dichloroethene	36	0	36	5	8000		
1,1-Dichloroethane	36	0	36	5	8000		
1,2-Dichloroethene	36	4	32	5	8000	7.8	27
Chloroform	36	0	36	5	8000		
1,2-Dichloroethane	36	2	34	5	8000	6	6
2-Butanone	36	10	26	10	10000	12	1300
1,1,1-Trichloroethane	36	1	35	5	8000	140	140
Carbon Tetrachloride	36	0	36	5	8000		
Vinyl Acetate	36	0	36	10	10000		
Bromodichloromethane	36	0	36	5	8000		
1,2-Dichloropropane	36	0	36	5	8000		
cis-1,3-dichloropropene	36	0	36	5	8000		
Trichloroethene	36	6	30	5	8000	6	940
Dibromochloromethane	36	0	36	5	8000		
1,1,2-Trichloroethane	36	5	31	5	8000	9	52
Benzene	36	0	36	5	8000		
trans-1,3-Dichloropropene	36	0	36	5	8000		
Bromoform	36	0	36	5	8000		
4-Methyl-2-Pentanone	36	6	30	10	10000	12	970
2-Hexanone	36	0	36	10	10000		
Tetrachloroethene	36	0	36	5	8000		
1,1,2,2-Tetrachloroethane	36	0	36	5	8000		
Toluene	36	2	34	5	8000	7	2200
Chlorobenzene	36	0	36	5	8000		
Ethylbenzene	36	5	31	5	700	5	20000
Styrene	36	0	36	5	8000		
Xylenes (total)	36	11	25	5	40	6	180000
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate							
TCL Pesticides (ug/kg):							
DDT							
PCB's (ug/Kg):							
PCB-1016	18	0	18	0.2	0.2		
PCB-1221	18	0	18	0.2	0.2		
PCB-1232	18	0	18	0.2	0.2		
PCB-1242	18	0	18	0.2	0.2		
PCB-1248	18	0	18	0.2	0.2		
PCB-1254	18	0	18	0.2	0.2		
PCB-1260	18	0	18	0.2	0.2		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-15
SUMMARY OF SUBSURFACE SOIL DATA
FOR DRUM BURIAL AREA 2

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total							
Arsenic							
Lead							
Selenium							
Antimony							
Cadmium							
Chromium							
Copper							
Manganese							
Zinc							
Mercury							
Barium							
TCL Volatiles (ug/kg):							
Chloromethane	13	0	13	10	10		
Bromomethane	13	0	13	10	10		
Vinyl Chloride	13	0	13	10	10		
Chloroethane	13	0	13	10	10		
Methylene Chloride	13	2	11	5	7	6	8
Acetone	13	12	1	10	10	11	940
Carbon Disulfide	13	0	13	5	7		
1,1-Dichloroethene	13	0	13	5	7		
1,1-Dichloroethane	13	0	13	5	7		
1,2-Dichloroethene	13	0	13	5	7		
Chloroform	13	0	13	5	7		
1,2-Dichloroethane	13	0	13	5	7		
2-Butanone	13	3	10	10	10	67	500
1,1,1-Trichloroethane	13	0	13	5	7		
Carbon Tetrachloride	13	0	13	5	7		
Vinyl Acetate	13	0	13	10	10		
Bromodichloromethane	13	0	13	5	7		
1,2-Dichloropropane	13	0	13	5	7		
cis-1,3-dichloropropene	13	0	13	5	7		
Trichloroethene	13	1	12	5	7	86	86
Dibromochloromethane	13	0	13	5	7		
1,1,2-Trichloroethane	13	0	13	5	7		
Benzene	13	0	13	5	7		
trans-1,3-Dichloropropene	13	0	13	5	7		
Bromoform	13	0	13	5	7		
4-Methyl-2-Pentanone	13	1	12	10	10	62	62
2-Hexanone	13	0	13	10	10		
Tetrachloroethene	13	0	13	5	7		
1,1,2,2-Tetrachloroethane	13	0	13	5	7		
Toluene	13	0	13	5	7		
Chlorobenzene	13	0	13	5	7		
Ethylbenzene	13	0	13	5	7		
Styrene	13	0	13	5	7		
Xylenes (total)	13	1	12	5	7	90	90
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate							
TCL Pesticides (ug/kg):							
DDT							
PCB's (ug/Kg):							
PCB-1016							
PCB-1221							
PCB-1232							
PCB-1242							
PCB-1248							
PCB-1254							
PCB-1260							
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-16
SUMMARY OF SUBSURFACE SOIL DATA
FOR THE STRESSED VEGETATION AREA

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total							
Arsenic							
Lead	4	4	0			12.87	209.42
Selenium	4	0	4	0.59	0.63		
Antimony	4	0	4	5.90	6.26		
Cadmium	4	0	4	0.59	0.63		
Chromium	4	4	0			20.07	75.59
Copper	4	4	0			10.63	63.20
Manganese							
Zinc	4	4	0			47.56	115.20
Mercury	4	0	4	0.05	0.05		
Barium	4	4	0			62.58	118.76
TCL Volatiles (ug/kg):							
Chloromethane	4	0	4	11.81	12.52		
Bromomethane	4	0	4	11.81	12.52		
Vinyl Chloride	4	0	4	11.81	12.52		
Chloroethane	4	0	4	11.81	12.52		
Methylene Chloride	4	3	1	6.20	6.20	15.35	27.32
Acetone	4	2	2	11.81	11.88	13.63	20.03
Carbon Disulfide	4	0	4	5.90	6.26		
1,1-Dichloroethene	4	0	4	5.90	6.26		
1,1-Dichloroethane	4	0	4	5.90	6.26		
1,2-Dichloroethene	4	0	4	5.90	6.26		
Chloroform	4	0	4	5.90	6.26		
1,2-Dichloroethane	4	0	4	5.90	6.26		
2-Butanone	4	0	4	11.81	12.52		
1,1,1-Trichloroethane	4	0	4	5.90	6.26		
Carbon Tetrachloride	4	0	4	5.90	6.26		
Vinyl Acetate	4	0	4	11.81	12.52		
Bromodichloromethane	4	0	4	5.90	6.26		
1,2-Dichloropropane	4	0	4	5.90	6.26		
cis-1,3-dichloropropene	4	0	4	5.90	6.26		
Trichloroethene	4	0	4	5.90	6.26		
Dibromochloromethane	4	0	4	5.90	6.26		
1,1,2-Trichloroethane	4	0	4	5.90	6.26		
Benzene	4	0	4	5.90	6.26		
trans-1,3-Dichloropropene	4	0	4	5.90	6.26		
Bromoform	4	0	4	5.90	6.26		
4-Methyl-2-Pentanone	4	0	4	11.81	12.52		
2-Hexanone	4	0	4	11.81	12.52		
Tetrachloroethene	4	0	4	5.90	6.26		
1,1,2,2-Tetrachloroethane	4	0	4	5.90	6.26		
Toluene	4	0	4	5.90	6.26		
Chlorobenzene	4	0	4	5.90	6.26		
Ethylbenzene	4	0	4	5.90	6.26		
Styrene	4	0	4	5.90	6.26		
Xylenes (total)	4	0	4	5.90	6.26		
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate							
TCL Pesticides (ug/kg):							
DDT							
PCB's (ug/Kg):							
PCB-1016							
PCB-1221							
PCB-1232							
PCB-1242							
PCB-1248							
PCB-1254							
PCB-1260							
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-17

SUMMARY OF PRELIMINARY COMPOUNDS-OF-INTEREST FOR SUBSURFACE SOIL AT THE HUNTERSTOWN ROAD SITE

PARAMETERS	Borrow Area	Lagoon Area	North Cornfield Area	South Cornfield Area	Drum Burial Area 1	Drum Burial Area 2	Stressed Vegetation Area
Inorganics (mg/kg):							
Cyanide, Total							
Arsenic							
Lead	yes	yes	no	no			yes
Selenium			yes	yes			
Antimony							
Cadmium		no		no			
Chromium		no	no	no			yes
Copper	yes	yes	yes	yes			yes
Manganese							
Zinc	yes	yes	no	no			yes
Mercury			yes	yes			
Barium			yes	yes			yes
TCL Volatiles (ug/kg):							
Chloromethane							
Bromomethane							
Vinyl Chloride							
Chloroethane							
Methylene Chloride	yes	yes	yes	yes	yes	yes	yes
Acetone	yes	yes	yes	yes	yes	yes	yes
Carbon Disulfide							
1,1-Dichloroethene							
1,1-Dichloroethane							
1,2-Dichloroethene					yes		
Chloroform							
1,2-Dichloroethane					yes		
2-Butanone		yes			yes	yes	
1,1,1-Trichloroethane		yes					
Carbon Tetrachloride							
Vinyl Acetate							
Bromodichloromethane							
1,2-Dichloropropane							
cis-1,3-dichloropropene							
Trichloroethene					yes	yes	
Dibromochloromethane							
1,1,2-Trichloroethane					yes		
Benzene							
trans-1,3-Dichloropropene							
Bromoform							
4-Methyl-2-Pentanone		yes			yes	yes	
2-Hexanone							
Tetrachloroethene							
1,1,2,2-Tetrachloroethane							
Toluene		yes			yes		
Chlorobenzene							
Ethylbenzene		yes			yes		
Styrene							
Xylenes (total)		yes			yes	yes	
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate	yes						
TCL Pesticides (ug/kg):							
DDT							
PCB's (ug/Kg):							
PCB-1016							
PCB-1221							
PCB-1232							
PCB-1242							
PCB-1248							
PCB-1254							
PCB-1260							
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

NOTE: yes = Preliminary compound-of-interest for subsurface soils.

TABLE 2-18
SUMMARY OF GROUNDWATER DATA
FOR THE LAGOON AREA

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/l):							
Cyanide, Total	6	0	6	0.005	0.005		
Arsenic	6	0	6	0.01	0.01		
Lead	21	0	21	0.003	0.005		
Selenium	6	0	6	0.005	0.005		
Antimony	6	0	6	0.05	0.05		
Cadmium	6	0	6	0.005	0.005		
Chromium	23	0	23	0.01	0.05		
Copper	6	0	6	0.02	0.02		
Manganese	6	2	4	0.01	0.01	0.01	0.07
Zinc	6	3	3	0.02	0.02	0.03	0.04
Mercury	23	2	21	0.0002	0.0002	0.0002	0.0002
Barium	23	2	21	0.1	0.2	0.1	0.2
TCL Volatiles (ug/l):							
Chloromethane	22	0	22	10	250		
Bromomethane	22	0	22	10	250		
Vinyl Chloride	22	2	20	10	250	700	1400
Chloroethane	22	2	20	10	250	310	400
Methylene Chloride	22	2	20	5	120	90	120
Acetone	22	2	20	10	250	11	16
Carbon Disulfide	22	0	22	5	120		
1,1-Dichloroethene	22	13	9	5	5	6	400
1,1-Dichloroethane	22	7	15	5	120	9	3300
1,2-Dichloroethene	22	12	10	5	5	10	18000
Chloroform	22	0	22	5	120		
1,2-Dichloroethane	22	0	22	5	120		
2-Butanone	22	0	22	10	250		
1,1,1-Trichloroethane	22	20	2	5	5	6	1300
Carbon Tetrachloride	22	0	22	5	250		
Vinyl Acetate	22	0	22	10	250		
Bromodichloromethane	22	0	22	5	120		
1,2-Dichloropropane	22	0	22	5	120		
cis-1,3-dichloropropene	22	1	21	5	120	11	11
Trichloroethene	22	16	6	5	5	7	96000
Dibromochloromethane	22	0	22	5	120		
1,1,2-Trichloroethane	22	2	20	5	120	8	8
Benzene	22	0	22	5	120		
trans-1,3-Dichloropropene	22	0	22	5	120		
Bromoform	22	0	22	5	120		
4-Methyl-2-Pentanone	22	0	22	10	250		
2-Hexanone	22	0	22	10	250		
Tetrachloroethene	22	2	20	5	120	38	60
1,1,2,2-Tetrachloroethane	22	0	22	5	120		
Toluene	22	1	21	5	120	60	60
Chlorobenzene	22	0	22	5	120		
Ethylbenzene	22	0	22	5	120		
Styrene	22	0	22	5	120		
Xylenes (total)	22	1	21	5	120	180	180
TCL Semi-Volatiles (ug/l):							
Bis (2-ethylhexyl) phthalate	17	3	14	10	10	15	61
TCL Pesticides (ug/l):							
DDT	6	0	6	0.1	0.1		
PCB's (ug/l):							
PCB-1016	6	0	6	0.5	2.5		
PCB-1221	6	0	6	0.5	5		
PCB-1232	6	0	6	0.5	2.5		
PCB-1242	6	0	6	0.5	2.5		
PCB-1248	6	0	6	0.5	2.5		
PCB-1254	6	0	6	1	1		
PCB-1260	6	0	6	1	1		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-19
SUMMARY OF GROUNDWATER DATA
FOR DRUM BURIAL AREA 1

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/l):							
Cyanide, Total	1	0	1	0.005	0.005		
Arsenic	1	0	1	0.01	0.01		
Lead	1	0	1	0.005	0.005		
Selenium	1	0	1	0.005	0.005		
Antimony	1	0	1	0.05	0.05		
Cadmium	1	0	1	0.005	0.005		
Chromium	8	1	7	0.01	0.01	0.01	0.01
Copper	1	1	0			0.02	0.02
Manganese	1	1	0			0.09	0.09
Zinc	1	1	0			0.03	0.03
Mercury	8	0	8	0.0002	0.0002		
Barium	8	1	7	0.2	0.2	0.2	0.2
TCL Volatiles (ug/l):							
Chloromethane	8	0	8	10	10		
Bromomethane	8	0	8	10	10		
Vinyl Chloride	8	0	8	10	10		
Chloroethane	8	0	8	10	10		
Methylene Chloride	8	0	8	5	5		
Acetone	8	2	6	10	10	12	14
Carbon Disulfide	8	0	8	5	5		
1,1-Dichloroethene	8	4	4	5	5	11	310
1,1-Dichloroethane	8	1	7	5	5	27	27
1,2-Dichloroethene	8	4	4	5	5	28	320
Chloroform	8	0	8	5	5		
1,2-Dichloroethane	8	0	8	5	5		
2-Butanone	8	0	8	10	10		
1,1,1-Trichloroethane	8	5	3	5	5	12	570
Carbon Tetrachloride	8	0	8	5	15		
Vinyl Acetate	8	0	8	10	10		
Bromodichloromethane	8	0	8	5	5		
1,2-Dichloropropane	8	0	8	5	5		
cis-1,3-dichloropropene	8	0	8	5	5		
Trichloroethene	8	5	3	5	5	8	440
Dibromochloromethane	8	0	8	5	5		
1,1,2-Trichloroethane	8	0	8	5	5		
Benzene	8	0	8	5	5		
trans-1,3-Dichloropropene	8	0	8	5	5		
Bromoform	8	0	8	5	5		
4-Methyl-2-Pentanone	8	0	8	10	10		
2-Hexanone	8	0	8	10	10		
Tetrachloroethene	8	0	8	5	5		
1,1,2,2-Tetrachloroethane	8	0	8	5	5		
Toluene	8	0	8	5	5		
Chlorobenzene	8	0	8	5	5		
Ethylbenzene	8	0	8	5	5		
Styrene	8	0	8	5	5		
Xylenes (total)	8	0	8	5	5		
TCL Semi-Volatiles (ug/l):							
Bis (2-ethylhexyl) phthalate	7	1	6	10	10	61	61
TCL Pesticides (ug/l):							
DDT	1	0	1	0.1	0.1		
PCB's (ug/l):							
PCB-1016	1	0	1	0.5	0.5		
PCB-1221	1	0	1	0.5	0.5		
PCB-1232	1	0	1	0.5	0.5		
PCB-1242	1	0	1	0.5	0.5		
PCB-1248	1	0	1	0.5	0.5		
PCB-1254	1	0	1	1	1		
PCB-1260	1	0	1	1	1		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-20
SUMMARY OF GROUNDWATER DATA
FOR DRUM BURIAL AREA 2

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/l):							
Cyanide, Total	2	0	2	0.005	0.005		
Arsenic	2	0	2	0.01	0.01		
Lead	7	1	6	0.003	0.005	0.005	0.005
Selenium	2	0	2	0.005	0.005		
Antimony	2	0	2	0.05	0.05		
Cadmium	2	0	2	0.005	0.005		
Chromium	9	1	8	0.01	0.01	0.05	0.05
Copper	2	1	1	0.02	0.02	0.02	0.02
Manganese	2	2	0			0.02	0.1
Zinc	2	2	0			0.03	0.05
Mercury	9	0	9	0.0002	0.0002		
Barium	9	2	7	0.1	0.2	0.2	0.2
TCL Volatiles (ug/l):							
Chloromethane	9	0	9	10	10		
Bromomethane	9	0	9	10	10		
Vinyl Chloride	9	0	9	10	10		
Chloroethane	9	0	9	10	10		
Methylene Chloride	9	0	9	5	5		
Acetone	9	4	5	10	10	11	22
Carbon Disulfide	9	0	9	5	5		
1,1-Dichloroethene	9	2	7	5	5	23	25
1,1-Dichloroethane	9	0	9	5	5		
1,2-Dichloroethene	9	2	7	5	5	6	6
Chloroform	9	0	9	5	5		
1,2-Dichloroethane	9	0	9	5	5		
2-Butanone	9	0	9	10	10		
1,1,1-Trichloroethane	9	3	6	5	5	12	91
Carbon Tetrachloride	9	0	9	5	15		
Vinyl Acetate	9	0	9	10	10		
Bromodichloromethane	9	0	9	5	5		
1,2-Dichloropropane	9	0	9	5	5		
cis-1,3-dichloropropene	9	0	9	5	5		
Trichloroethene	9	4	5	5	5	6	18
Dibromochloromethane	9	0	9	5	5		
1,1,2-Trichloroethane	9	0	9	5	5		
Benzene	9	0	9	5	5		
trans-1,3-Dichloropropene	9	0	9	5	5		
Bromoform	9	0	9	5	5		
4-Methyl-2-Pentanone	9	0	9	10	10		
2-Hexanone	9	0	9	10	10		
Tetrachloroethene	9	0	9	5	5		
1,1,2,2-Tetrachloroethane	9	0	9	5	5		
Toluene	9	0	9	5	5		
Chlorobenzene	9	0	9	5	5		
Ethylbenzene	9	0	9	5	5		
Styrene	9	0	9	5	5		
Xylenes (total)	9	0	9	5	5		
TCL Semi-Volatiles (ug/l):							
Bis (2-ethylhexyl) phthalate	7	2	5	10	10	10	75
TCL Pesticides (ug/l):							
DDT	2	0	2	0.1	0.1		
PCB's (ug/l):							
PCB-1016	2	0	2	0.5	0.5		
PCB-1221	2	0	2	0.5	0.5		
PCB-1232	2	0	2	0.5	0.5		
PCB-1242	2	0	2	0.5	0.5		
PCB-1248	2	0	2	0.5	0.5		
PCB-1254	2	0	2	1	1		
PCB-1260	2	0	2	1	1		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-21
SUMMARY OF BACKGROUND GROUNDWATER DATA
FOR THE HUNTERSTOWN ROAD SITE

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/l):							
Cyanide, Total	5	0	5	0.005	0.005		
Arsenic	5	0	5	0.01	0.01		
Lead	9	0	9	0.003	0.005		
Selenium	5	0	5	0.005	0.005		
Antimony	5	0	5	0.05	0.05		
Cadmium	5	0	5	0.005	0.005		
Chromium	11	1	10	0.01	0.01	0.14	0.14
Copper	5	0	5	0.02	0.02		
Manganese	5	4	1	0.01	0.01	0.02	0.04
Zinc	5	4	1	0.02	0.02	0.02	0.07
Mercury	11	0	11	0.0002	0.0002		
Barium	11	3	8	0.1	0.2	0.2	0.2
TCL Volatiles (ug/l):							
Chloromethane	11	0	11	10	10		
Bromomethane	11	0	11	10	10		
Vinyl Chloride	11	0	11	10	10		
Chloroethane	11	0	11	10	10		
Methylene Chloride	11	0	11	5	5		
Acetone	11	3	8	10	10	15	17
Carbon Disulfide	11	0	11	5	5		
1,1-Dichloroethene	11	0	11	5	5		
1,1-Dichloroethane	11	0	11	5	5		
1,2-Dichloroethene	11	0	11	5	5		
Chloroform	11	0	11	5	5		
1,2-Dichloroethane	11	0	11	5	5		
2-Butanone	11	0	11	10	10		
1,1,1-Trichloroethane	11	0	11	5	5		
Carbon Tetrachloride	11	0	11	5	5		
Vinyl Acetate	11	0	11	10	10		
Bromodichloromethane	11	0	11	5	5		
1,2-Dichloropropane	11	0	11	5	5		
cis-1,3-dichloropropene	11	0	11	5	5		
Trichloroethene	11	0	11	5	5		
Dibromochloromethane	11	0	11	5	5		
1,1,2-Trichloroethane	11	0	11	5	5		
Benzene	11	0	11	5	5		
trans-1,3-Dichloropropene	11	0	11	5	5		
Bromoform	11	0	11	5	5		
4-Methyl-2-Pentanone	11	0	11	10	10		
2-Hexanone	11	0	11	10	10		
Tetrachloroethene	11	0	11	5	5		
1,1,2,2-Tetrachloroethane	11	0	11	5	5		
Toluene	11	0	11	5	5		
Chlorobenzene	11	0	11	5	5		
Ethylbenzene	11	0	11	5	5		
Styrene	11	0	11	5	5		
Xylenes (total)	11	0	11	5	5		
TCL Semi-Volatiles (ug/l):							
Bis (2-ethylhexyl) phthalate	6	0	6	10	10		
TCL Pesticides (ug/l):							
DDT	5	0	5	0.1	0.1		
PCB's (ug/l):							
PCB-1016	5	0	5	0.5	0.5		
PCB-1221	5	0	5	0.5	0.5		
PCB-1232	5	0	5	0.5	0.5		
PCB-1242	5	0	5	0.5	0.5		
PCB-1248	5	0	5	0.5	0.5		
PCB-1254	5	0	5	1	1		
PCB-1260	5	0	5	1	1		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-22

SUMMARY OF PRELIMINARY COMPOUNDS-OF-INTEREST FOR GROUNDWATER AT THE HUNTERSTOWN ROAD SITE

PARAMETERS	Lagoon Area	Drum Burial Area 1	Drum Burial Area 2
Inorganics (mg/L):			
Cyanide, Total			
Arsenic			
Lead	no	no	yes
Selenium			
Antimony			
Cadmium			
Chromium	no	no	no
Copper			
Manganese			
Zinc			
Mercury	no	no	no
Barium	yes	no	no
TCL Volatiles (ug/L):			
Chloromethane			
Bromomethane			
Vinyl Chloride	yes		
Chloroethane	yes		
Methylene Chloride	yes	yes	yes
Acetone	yes	yes	yes
Carbon Disulfide			
1,1-Dichloroethene	yes	yes	yes
1,1-Dichloroethane	yes	yes	
1,2-Dichloroethene	yes	yes	yes
Chloroform			
1,2-Dichloroethane			
2-Butanone			
1,1,1-Trichloroethane	yes	yes	yes
Carbon Tetrachloride			
Vinyl Acetate			
Bromodichloromethane			
1,2-Dichloropropane			
cis-1,3-dichloropropene	yes		
Trichloroethene	yes	yes	yes
Dibromochloromethane			
1,1,2-Trichloroethane	yes		
Benzene			
trans-1,3-Dichloropropene			
Bromoform			
4-Methyl-2-Pentanone			
2-Hexanone			
Tetrachloroethene	yes		
1,1,2,2-Tetrachloroethane			
Toluene	yes		
Chlorobenzene			
Ethylbenzene			
Styrene			
Xylenes (total)	yes		
TCL Semi-Volatiles (ug/L):			
Bis (2-ethylhexyl) phthalate	yes	yes	yes
TCL Pesticides (ug/L):			
DDT			
PCB's (ug/L):			
PCB-1016			
PCB-1221			
PCB-1232			
PCB-1242			
PCB-1248			
PCB-1254			
PCB-1260			
Asbestos (%):			
Amosite asbestos			
Chrysotile asbestos			
Crocidolite asbestos			
Actinolite asbestos			
Tremolite asbestos			
Anthophyllite asbestos			

NOTES: yes = Preliminary compound-of-interest for groundwater.

TABLE 2-23
SUMMARY OF SURFACE WATER DATA
FOR THE EAST STREAM

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/l):							
Cyanide, Total	1	0	1	0.005	0.005		
Arsenic	1	0	1	0.01	0.01		
Lead	5	4	1	0.003	0.003	0.003	0.036
Selenium	5	0	5	0.005	0.005		
Antimony	5	0	5	0.05	0.05		
Cadmium	5	0	5	0.005	0.005		
Chromium	5	0	5	0.01	0.05		
Copper	5	2	3	0.02	0.02	0.02	0.04
Manganese	5	5	0			0.02	0.52
Zinc	5	4	1	0.02	0.02	0.02	0.09
Mercury	1	0	1	0.0002	0.0002		
Barium	1	0	1	0.1	0.1		
TCL Volatiles (ug/l):							
Chloromethane	5	0	5	10	10		
Bromomethane	5	0	5	10	10		
Vinyl Chloride	5	0	5	10	10		
Chloroethane	5	0	5	10	10		
Methylene Chloride	5	0	5	5	5		
Acetone	5	1	4	10	10	16	16
Carbon Disulfide	5	0	5	5	5		
1,1-Dichloroethene	5	1	4	5	5	5	5
1,1-Dichloroethane	5	1	4	5	5	25	25
1,2-Dichloroethene	5	3	2	5	5	18	280
Chloroform	5	0	5	5	5		
1,2-Dichloroethane	5	0	5	5	5		
2-Butanone	5	0	5	10	10		
1,1,1-Trichloroethane	5	2	3	5	5	8	65
Carbon Tetrachloride	5	0	5	5	5		
Vinyl Acetate	5	0	5	10	10		
Bromodichloromethane	5	0	5	5	5		
1,2-Dichloropropane	5	0	5	5	5		
cis-1,3-dichloropropene	5	0	5	5	5		
Trichloroethene	5	3	2	5	5	17	310
Dibromochloromethane	5	0	5	5	5		
1,1,2-Trichloroethane	5	0	5	5	5		
Benzene	5	0	5	5	5		
trans-1,3-Dichloropropene	5	0	5	5	5		
Bromoform	5	0	5	5	5		
4-Methyl-2-Pentanone	5	0	5	10	10		
2-Hexanone	5	0	5	10	10		
Tetrachloroethene	5	0	5	5	5		
1,1,2,2-Tetrachloroethane	5	0	5	5	5		
Toluene	5	0	5	5	5		
Chlorobenzene	5	0	5	5	5		
Ethylbenzene	5	0	5	5	5		
Styrene	5	0	5	5	5		
Xylenes (total)	5	0	5	5	5		
TCL Semi-Volatiles (ug/l):							
Bis (2-ethylhexyl) phthalate							
TCL Pesticides (ug/l):							
DDT	1	0	1	0.1	0.1		
PCB's (ug/l):							
PCB-1016	1	0	1	0.5	0.5		
PCB-1221	1	0	1	0.5	0.5		
PCB-1232	1	0	1	0.5	0.5		
PCB-1242	1	0	1	0.5	0.5		
PCB-1248	1	0	1	0.5	0.5		
PCB-1254	1	0	1	1	1		
PCB-1260	1	0	1	1	1		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-24
SUMMARY OF SURFACE WATER DATA
FOR THE MIDDLE STREAM

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/l):							
Cyanide, Total	1	0	1	0.005	0.005		
Arsenic	1	0	1	0.01	0.01		
Lead	8	3	5	0.003	0.005	0.006	0.014
Selenium	8	0	8	0.005	0.005		
Antimony	8	0	8	0.05	0.05		
Cadmium	8	0	8	0.005	0.005		
Chromium	8	2	6	0.01	0.05	0.02	0.03
Copper	8	1	7	0.02	0.02	0.04	0.04
Manganese	8	8	0			0.06	0.91
Zinc	8	6	2	0.02	0.02	0.03	0.33
Mercury	1	0	1	0.0002	0.0002		
Barium	1	0	1	0.1	0.1		
TCL Volatiles (ug/l):							
Chloromethane	8	0	8	10	10		
Bromomethane	8	0	8	10	10		
Vinyl Chloride	8	0	8	10	10		
Chloroethane	8	0	8	10	10		
Methylene Chloride	8	0	8	5	5		
Acetone	8	3	5	10	10	18	26
Carbon Disulfide	8	0	8	5	5		
1,1-Dichloroethene	8	0	8	5	5		
1,1-Dichloroethane	8	0	8	5	5		
1,2-Dichloroethene	8	0	8	5	5		
Chloroform	8	0	8	5	5		
1,2-Dichloroethane	8	0	8	5	5		
2-Butanone	8	0	8	10	10		
1,1,1-Trichloroethane	8	2	6	5	5	7	8
Carbon Tetrachloride	8	0	8	5	5		
Vinyl Acetate	8	0	8	10	10		
Bromodichloromethane	8	0	8	5	5		
1,2-Dichloropropane	8	0	8	5	5		
cis-1,3-dichloropropene	8	0	8	5	5		
Trichloroethene	8	0	8	5	5		
Dibromochloromethane	8	0	8	5	5		
1,1,2-Trichloroethane	8	0	8	5	5		
Benzene	8	0	8	5	5		
trans-1,3-Dichloropropene	8	0	8	5	5		
Bromoform	8	0	8	5	5		
4-Methyl-2-Pentanone	8	0	8	10	10		
2-Hexanone	8	0	8	10	10		
Tetrachloroethene	8	0	8	5	5		
1,1,2,2-Tetrachloroethane	8	0	8	5	5		
Toluene	8	0	8	5	5		
Chlorobenzene	8	0	8	5	5		
Ethylbenzene	8	0	8	5	5		
Styrene	8	0	8	5	5		
Xylenes (total)	8	0	8	5	5		
TCL Semi-Volatiles (ug/l):							
Bis (2-ethylhexyl) phthalate							
TCL Pesticides (ug/l):							
DDT	1	0	1	0.1	0.1		
PCB's (ug/l):							
PCB-1016	1	0	1	0.5	0.5		
PCB-1221	1	0	1	0.5	0.5		
PCB-1232	1	0	1	0.5	0.5		
PCB-1242	1	0	1	0.5	0.5		
PCB-1248	1	0	1	0.5	0.5		
PCB-1254	1	0	1	1	1		
PCB-1260	1	0	1	1	1		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-25
SUMMARY OF SURFACE WATER DATA
FOR THE WEST STREAM

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/l):							
Cyanide, Total	1	0	1	0.005	0.005		
Arsenic	1	0	1	0.01	0.01		
Lead	4	1	3	0.003	0.005	0.004	0.004
Selenium	4	0	4	0.005	0.005		
Antimony	4	0	4	0.05	0.05		
Cadmium	4	0	4	0.005	0.005		
Chromium	4	1	3	0.01	0.05	0.02	0.02
Copper	4	1	3	0.02	0.02	0.03	0.03
Manganese	4	4	0			0.11	0.56
Zinc	4	1	3	0.02	0.02	0.06	0.06
Mercury	1	0	1	0.0002	0.0002		
Barium	1	0	1	0.1	0.1		
TCL Volatiles (ug/l):							
Chloromethane	4	0	4	10	10		
Bromomethane	4	0	4	10	10		
Vinyl Chloride	4	0	4	10	10		
Chloroethane	4	0	4	10	10		
Methylene Chloride	4	1	3	5	5	7	7
Acetone	4	3	1	10	10	19	23
Carbon Disulfide	4	0	4	5	5		
1,1-Dichloroethene	4	0	4	5	5		
1,1-Dichloroethane	4	1	3	5	5	11	11
1,2-Dichloroethene	4	1	3	5	5	8	8
Chloroform	4	0	4	5	5		
1,2-Dichloroethane	4	0	4	5	5		
2-Butanone	4	0	4	10	10		
1,1,1-Trichloroethane	4	1	3	5	5	37	37
Carbon Tetrachloride	4	0	4	5	5		
Vinyl Acetate	4	0	4	10	10		
Bromodichloromethane	4	0	4	5	5		
1,2-Dichloropropane	4	0	4	5	5		
cis-1,3-dichloropropene	4	0	4	5	5		
Trichloroethene	4	0	4	5	5		
Dibromochloromethane	4	0	4	5	5		
1,1,2-Trichloroethane	4	0	4	5	5		
Benzene	4	0	4	5	5		
trans-1,3-Dichloropropene	4	0	4	5	5		
Bromoform	4	0	4	5	5		
4-Methyl-2-Pentanone	4	0	4	10	10		
2-Hexanone	4	0	4	10	10		
Tetrachloroethene	4	0	4	5	5		
1,1,2,2-Tetrachloroethane	4	0	4	5	5		
Toluene	4	0	4	5	5		
Chlorobenzene	4	0	4	5	5		
Ethylbenzene	4	0	4	5	5		
Styrene	4	0	4	5	5		
Xylenes (total)	4	0	4	5	5		
TCL Semi-Volatiles (ug/l):							
Bis (2-ethylhexyl) phthalate							
TCL Pesticides (ug/l):							
DDT	1	0	1	0.1	0.1		
PCB's (ug/l):							
PCB-1016	1	0	1	0.5	0.5		
PCB-1221	1	0	1	0.5	0.5		
PCB-1232	1	0	1	0.5	0.5		
PCB-1242	1	0	1	0.5	0.5		
PCB-1248	1	0	1	0.5	0.5		
PCB-1254	1	0	1	1	1		
PCB-1260	1	0	1	1	1		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-26
SUMMARY OF PRELIMINARY COMPOUNDS-OF-INTEREST FOR SURFACE WATER AT THE HUNTERSTOWN ROAD SITE

PARAMETERS	East Stream	Middle Stream	West Stream
Inorganics (mg/L):			
Cyanide, Total			
Arsenic			
Lead	yes	yes	no
Selenium			
Antimony			
Cadmium			
Chromium	yes	yes	no
Copper	yes	yes	no
Manganese	no	yes	no
Zinc	yes	yes	no
Mercury			
Barium			
TCL Volatiles (ug/L):			
Chloromethane			
Bromomethane			
Vinyl Chloride			
Chloroethane			
Methylene Chloride			no
Acetone	yes	yes	no
Carbon Disulfide			
1,1-Dichloroethene	yes		
1,1-Dichloroethane	yes		no
1,2-Dichloroethene	yes		no
Chloroform			
1,2-Dichloroethane		yes	
2-Butanone			
1,1,1-Trichloroethane	yes	yes	no
Carbon Tetrachloride			
Vinyl Acetate			
Bromodichloromethane			
1,2-Dichloropropane			
cis-1,3-dichloropropene			
Trichloroethene	yes		
Dibromochloromethane			
1,1,2-Trichloroethane			
Benzene			
trans-1,3-Dichloropropene			
Bromoform			
4-Methyl-2-Pentanone			
2-Hexanone			
Tetrachloroethene			
1,1,2,2-Tetrachloroethane			
Toluene			
Chlorobenzene			
Ethylbenzene			
Styrene			
Xylenes (total)			
TCL Semi-Volatiles (mg/L):			
Bis (2-ethylhexyl) phthalate			
TCL Pesticides (ug/L):			
DDT			
PCB's (ug/L):			
PCB-1016			
PCB-1221			
PCB-1232			
PCB-1242			
PCB-1248			
PCB-1254			
PCB-1260			
Asbestos (%):			
Amosite asbestos			
Chrysotile asbestos			
Crocidolite asbestos			
Actinolite asbestos			
Tremolite asbestos			
Anthophyllite asbestos			

NOTE: yes = Preliminary compound-of-interest for surface water.

TABLE 2-27
SUMMARY OF SEDIMENT DATA
FOR THE EAST STREAM

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total	11	1	10	0.08	0.24	0.10	0.10
Arsenic	11	4	7	6.39	11.93	3.29	6.51
Lead	11	11	0			15.71	4306.42
Selenium	11	0	11	0.64	1.19		
Antimony	11	0	11	6.39	11.93		
Cadmium	11	0	11	0.64	1.19		
Chromium	11	11	0			24.27	993.79
Copper	11	11	0			19.16	426.50
Manganese	11	11	0			335.59	2288.36
Zinc	11	11	0			43.42	408.11
Mercury	2	1	1	0.06	0.06	0.07	0.07
Barium	2	2	0			98.68	106.87
TCL Volatiles (ug/kg):							
Chloromethane	11	0	11	12.77	23.87		
Bromomethane	11	0	11	12.77	23.87		
Vinyl Chloride	11	1	10	12.77	23.87	95.24	95.24
Chloroethane	11	0	11	12.77	23.87		
Methylene Chloride	11	3	8	6.39	11.93	12.18	18.32
Acetone	11	7	4	12.77	13.53	24.23	88.31
Carbon Disulfide	11	0	11	6.39	11.93		
1,1-Dichloroethene	11	0	11	6.39	11.93		
1,1-Dichloroethane	11	2	9	6.39	11.93	11.31	11.97
1,2-Dichloroethene	11	5	6	6.39	16.16	9.87	130.43
Chloroform	11	0	11	6.39	11.93		
1,2-Dichloroethane	11	0	11	6.39	11.93		
2-Butanone	11	0	11	12.77	23.87		
1,1,1-Trichloroethane	11	0	11	6.39	11.93		
Carbon Tetrachloride	11	0	11	6.39	11.93		
Vinyl Acetate	11	0	11	12.77	23.87		
Bromodichloromethane	11	0	11	6.39	11.93		
1,2-Dichloropropane	11	0	11	6.39	11.93		
cis-1,3-dichloropropene	11	0	11	6.39	11.93		
Trichloroethene	11	7	4	6.39	11.93	18.23	80.92
Dibromochloromethane	11	0	11	6.39	11.93		
1,1,2-Trichloroethane	11	0	11	6.39	11.93		
Benzene	11	0	11	6.39	11.93		
trans-1,3-Dichloropropene	11	0	11	6.39	11.93		
Bromoform	11	0	11	6.39	11.93		
4-Methyl-2-Pentanone	11	0	11	12.77	23.87		
2-Hexanone	11	0	11	12.77	23.87		
Tetrachloroethene	11	0	11	6.39	11.93		
1,1,2,2-Tetrachloroethane	11	0	11	6.39	11.93		
Toluene	11	0	11	6.39	11.93		
Chlorobenzene	11	0	11	6.39	11.93		
Ethylbenzene	11	0	11	6.39	11.93		
Styrene	11	0	11	6.39	11.93		
Xylenes (total)	11	1	10	6.39	11.93	28.99	28.99
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate	9	0	9	421.46	787.59		
TCL Pesticides (ug/kg):							
DDT	2	0	2	24.43	26.32		
PCB's (ug/Kg):							
PCB-1016	2	0	2	122.14	131.58		
PCB-1221	2	0	2	122.14	131.58		
PCB-1232	2	0	2	122.14	131.58		
PCB-1242	2	0	2	122.14	131.58		
PCB-1248	2	0	2	122.14	131.58		
PCB-1254	2	0	2	244.27	263.16		
PCB-1260	2	0	2	244.27	263.16		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-28
SUMMARY OF SEDIMENT DATA
FOR THE MIDDLE STREAM

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total	9	3	6	0.13	0.15	0.15	0.22
Arsenic	9	5	4	6.95	14.22	1.43	15.01
Lead	9	9	0			12.59	96.40
Selenium	9	1	8	0.63	0.97	1.14	1.14
Antimony	9	0	9	6.34	9.65		
Cadmium	9	0	9	0.63	0.97		
Chromium	9	9	0			15.44	48.91
Copper	9	9	0			10.01	79.66
Manganese	9	9	0			197.42	10477.49
Zinc	9	9	0			35.77	322.39
Mercury	1	0	1	0.05	0.05		
Barium	1	1	0			102.96	102.96
TCL Volatiles (ug/kg):							
Chloromethane	9	0	9	12.67	19.31		
Bromomethane	9	0	9	12.67	19.31		
Vinyl Chloride	9	0	9	12.67	19.31		
Chloroethane	9	0	9	12.67	19.31		
Methylene Chloride	9	0	9	6.34	9.65		
Acetone	9	5	4	12.67	19.31	20.03	26.43
Carbon Disulfide	9	0	9	6.34	9.65		
1,1-Dichloroethene	9	0	9	6.34	9.65		
1,1-Dichloroethane	9	0	9	6.34	9.65		
1,2-Dichloroethene	9	0	9	6.34	9.65		
Chloroform	9	0	9	6.34	9.65		
1,2-Dichloroethane	9	0	9	6.34	9.65		
2-Butanone	9	0	9	12.67	19.31		
1,1,1-Trichloroethane	9	0	9	6.34	9.65		
Carbon Tetrachloride	9	0	9	6.34	9.65		
Vinyl Acetate	9	0	9	12.67	19.31		
Bromodichloromethane	9	0	9	6.34	9.65		
1,2-Dichloropropane	9	0	9	6.34	9.65		
cis-1,3-dichloropropene	9	0	9	6.34	9.65		
Trichloroethene	9	0	9	6.34	9.65		
Dibromochloromethane	9	0	9	6.34	9.65		
1,1,2-Trichloroethane	9	0	9	6.34	9.65		
Benzene	9	0	9	6.34	9.65		
trans-1,3-Dichloropropene	9	0	9	6.34	9.65		
Bromoform	9	0	9	6.34	9.65		
4-Methyl-2-Pentanone	9	0	9	12.67	19.31		
2-Hexanone	9	0	9	12.67	19.31		
Tetrachloroethene	9	0	9	6.34	9.65		
1,1,2,2-Tetrachloroethane	9	0	9	6.34	9.65		
Toluene	9	0	9	6.34	9.65		
Chlorobenzene	9	0	9	6.34	9.65		
Ethylbenzene	9	0	9	6.34	9.65		
Styrene	9	0	9	6.34	9.65		
Xylenes (total)	9	0	9	6.34	9.65		
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate	8	3	5	418.25	479.65	801.75	3834.05
TCL Pesticides (ug/kg):							
DDT	1	0	1	20.59	20.59		
PCB's (ug/Kg):							
PCB-1016	1	0	1	102.96	102.96		
PCB-1221	1	0	1	102.96	102.96		
PCB-1232	1	0	1	102.96	102.96		
PCB-1242	1	0	1	102.96	102.96		
PCB-1248	1	0	1	102.96	102.96		
PCB-1254	1	0	1	205.92	205.92		
PCB-1260	1	0	1	205.92	205.92		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-29
SUMMARY OF SEDIMENT DATA
FOR THE WEST STREAM

PARAMETERS	# Samples	# Hits	# BDL	Minimum BDL	Maximum BDL	Minimum Detected	Maximum Detected
Inorganics (mg/kg):							
Cyanide, Total	5	0	5	0.06	0.16		
Arsenic	5	3	2	7.82	8.10	3.15	7.47
Lead	5	5	0			9.56	23.66
Selenium	5	0	5	0.64	0.81		
Antimony	5	0	5	6.42	8.10		
Cadmium	5	0	5	0.64	0.81		
Chromium	5	5	0			20.93	39.12
Copper	5	5	0			9.72	17.21
Manganese	5	5	0			375.39	2077.73
Zinc	5	5	0			50.47	91.18
Mercury	2	0	2	0.05	0.06		
Barium	2	2	0			77.02	110.41
TCL Volatiles (ug/kg):							
Chloromethane	5	0	5	12.84	16.21		
Bromomethane	5	0	5	12.84	16.21		
Vinyl Chloride	5	0	5	12.84	16.21		
Chloroethane	5	0	5	12.84	16.21		
Methylene Chloride	5	3	2	7.89	8.10	9.39	44.84
Acetone	5	4	1	15.65	15.65	16.44	43.76
Carbon Disulfide	5	0	5	6.42	8.10		
1,1-Dichloroethene	5	0	5	6.42	8.10		
1,1-Dichloroethane	5	0	5	6.42	8.10		
1,2-Dichloroethene	5	0	5	6.42	8.10		
Chloroform	5	0	5	6.42	8.10		
1,2-Dichloroethane	5	0	5	6.42	8.10		
2-Butanone	5	0	5	12.84	16.21		
1,1,1-Trichloroethane	5	0	5	6.42	8.10		
Carbon Tetrachloride	5	0	5	6.42	8.10		
Vinyl Acetate	5	0	5	12.84	16.21		
Bromodichloromethane	5	0	5	6.42	8.10		
1,2-Dichloropropane	5	0	5	6.42	8.10		
cis-1,3-dichloropropene	5	0	5	6.42	8.10		
Trichloroethene	5	0	5	6.42	8.10		
Dibromochloromethane	5	0	5	6.42	8.10		
1,1,2-Trichloroethane	5	0	5	6.42	8.10		
Benzene	5	0	5	6.42	8.10		
trans-1,3-Dichloropropene	5	0	5	6.42	8.10		
Bromoform	5	0	5	6.42	8.10		
4-Methyl-2-Pentanone	5	0	5	12.84	16.21		
2-Hexanone	5	0	5	12.84	16.21		
Tetrachloroethene	5	0	5	6.42	8.10		
1,1,2,2-Tetrachloroethane	5	0	5	6.42	8.10		
Toluene	5	0	5	6.42	8.10		
Chlorobenzene	5	0	5	6.42	8.10		
Ethylbenzene	5	0	5	6.42	8.10		
Styrene	5	0	5	6.42	8.10		
Xylenes (total)	5	0	5	6.42	8.10		
TCL Semi-Volatiles (ug/kg):							
Bis (2-ethylhexyl) phthalate	3	0	3	493.27	534.85		
TCL Pesticides (ug/kg):							
DDT	2	0	2	20.54	378.55		
PCB's (ug/Kg):							
PCB-1016	2	0	2	102.70	18927.44		
PCB-1221	2	0	2	102.70	18927.44		
PCB-1232	2	0	2	102.70	18927.44		
PCB-1242	2	0	2	102.70	18927.44		
PCB-1248	2	0	2	102.70	18927.44		
PCB-1254	2	0	2	205.39	3785.49		
PCB-1260	2	0	2	205.39	3785.49		
Asbestos (%):							
Amosite asbestos							
Chrysotile asbestos							
Crocidolite asbestos							
Actinolite asbestos							
Tremolite asbestos							
Anthophyllite asbestos							

TABLE 2-30

SUMMARY OF PRELIMINARY COMPOUNDS-OF-INTEREST FOR SEDIMENTS AT THE HUNTERSTOWN ROAD SITE

PARAMETERS	East Stream	Middle Stream	West Stream
Inorganics (mg/kg):			
Cyanide, Total	no	no	no
Arsenic	no	no	no
Lead	yes	yes	no
Selenium		yes	
Antimony			
Cadmium			
Chromium	yes	yes	no
Copper	yes	yes	no
Manganese	yes	yes	no
Zinc	yes	yes	no
Mercury			
Barium			
TCL Volatiles (ug/kg):			
Chloromethane			
Bromomethane			
Vinyl Chloride	yes		
Chloroethane			
Methylene Chloride	yes	yes	no
Acetone	yes		no
Carbon Disulfide			
1,1-Dichloroethene			
1,1-Dichloroethane	yes		
1,2-Dichloroethene	yes		
Chloroform			
1,2-Dichloroethane			
2-Butanone			
1,1,1-Trichloroethane			
Carbon Tetrachloride			
Vinyl Acetate			
Bromodichloromethane			
1,2-Dichloropropane			
cis-1,3-dichloropropene			
Trichloroethene	yes		
Dibromochloromethane			
1,1,2-Trichloroethane			
Benzene			
trans-1,3-Dichloropropene			
Bromoform			
4-Methyl-2-Pentanone			
2-Hexanone			
Tetrachloroethene			
1,1,2,2-Tetrachloroethane			
Toluene			
Chlorobenzene			
Ethylbenzene			
Styrene			
Xylenes (total)	yes		
TCL Semi-Volatiles (ug/kg):			
Bis (2-ethylhexyl) phthalate		yes	
TCL Pesticides (ug/kg):			
DDT			
PCB's (ug/Kg):			
PCB-1016			
PCB-1221			
PCB-1232			
PCB-1242			
PCB-1248			
PCB-1254			
PCB-1260			
Asbestos (%):			
Amosite asbestos			
Chrysotile asbestos			
Crocidolite asbestos			
Actinolite asbestos			
Tremolite asbestos			
Anthophyllite asbestos			

NOTE: yes = Preliminary compound-of-interest for sediments.

TABLE 2-31
SUMMARY OF COMPOUNDS-OF-INTEREST BY MEDIA AND
LOCATION FOR QUANTITATIVE RISK ASSESSMENT

MEDIA: / LOCATION:	Lagoon Area Groundwater On-site	Drum Area 1 Groundwater On-site	Drum Area 2 Groundwater On-site	Sediments East Stream	Sediments Middle Stream	Sediments West Stream
PARAMETERS (ppm):						
Cyanide				no (4)	no (4)	no (4)
Arsenic				no (5)	no (5)	no (5)
Lead			yes	yes	yes	no (3)
Selenium					yes	
Antimony						
Cadmium						
Chromium				yes	yes	no (3)
Copper				yes	yes	no (3)
Manganese				yes	yes	no (3)
Zinc				yes	yes	no (3)
Mercury						
Barium	yes *					
TCL Volatiles (ppb):						
Chloromethane						
Bromomethane						
Vinyl Chloride	yes			yes		
Chloroethane	yes					
Methylene Chloride	no (2)	no (2)	no (2)	no (2)	no (2)	no (2)
Acetone	no (2)	no (2)	no (2)	no (2)		no (2)
Carbon Disulfide						
1,1-Dichloroethene	yes	yes	yes			
1,1-Dichloroethane	yes	yes		yes		
1,2-Dichloroethene	yes	yes	yes	yes		
Chloroform						
1,2-Dichloroethane						
2-Butanone						
1,1,1-Trichloroethane	yes	yes	yes			
Carbon Tetrachloride						
Vinyl Acetate						
Bromodichloromethane						
1,2-Dichloropropane						
cis-1,3-dichloropropene	no (1)					
Trichloroethene	yes	yes	yes	yes		
Dibromochloromethane						
1,1,2-Trichloroethane	yes					
Benzene						
trans-1,3-Dichloropropene						
Bromoform						
4-Methyl-2-Pentanone						
2-Hexanone						
Tetrachloroethene	yes					
1,1,2,2-Tetrachloroethane						
Toluene	yes					
Chlorobenzene						
Ethylbenzene						
Styrene						
Xylenes (total)	yes			yes		
TCL Semi-Volatiles (ppb):						
Bis (ethylhexyl) phthalate	yes	yes	yes		yes	
TCL Pesticides (ppb):						
DDT						
PCB's (ppb):						
Asbestos (%):						

* - yes = compound-of-interest

Notes:

(1) - Only detected in one groundwater sample near the detection limit.
(2) - Common laboratory contaminant and found extensively in background samples and in lab blanks.
(3) - Detected at a concentration less than background.
(4) - Detected at a concentration less than the reference sediment sample.
(5) - Detected at a concentration less than background.
(6) - Detected in only one Phase I sample and not in Phase II.
(7) - Surface soils are not currently considered an exposure media.

TABLE 2-31
SUMMARY OF COMPOUNDS-OF-INTEREST BY MEDIA AND LOCATION FOR QUANTITATIVE RISK ASSESSMENT
(con't)

MEDIA: / LOCATION:	Surface Water East Stream	Surface Water Middle Stream	Surface Water West Stream	Surface Soils Borrow Area	Surface Soils Lagoon Area	Surface Soils N. Cornfield
PARAMETERS (ppm):						
Cyanide						
Arsenic						
Lead	yes	yes	no (3)	yes	yes	yes
Selenium						
Antimony					yes	
Cadmium						yes
Chromium	yes	yes	no (3)		yes	yes
Copper	yes	yes	no (3)	yes	yes	yes
Manganese	no (3)	yes	no (3)			
Zinc	yes	yes	no (3)	yes	yes	yes
Mercury					yes	yes
Barium						yes
TCL Volatiles (ppb):						
Chloromethane						
Bromomethane						
Vinyl Chloride					yes	
Chloroethane					yes	
Methylene Chloride			no (2)	no (2)	no (2)	no (2)
Acetone	no (2)	no (2)	no (2)	no (2)	no (2)	no (2)
Carbon Disulfide						
1,1-Dichloroethene	yes				yes	
1,1-Dichloroethane	yes		no (6)		yes	
1,2-Dichloroethene	yes		no (6)		yes	
Chloroform						
1,2-Dichloroethane		yes			yes	
2-Butanone						
1,1,1-Trichloroethane	yes	yes	no (6)		yes	
Carbon Tetrachloride						
Vinyl Acetate						
Bromodichloromethane						
1,2-Dichloropropane						
cis-1,3-dichloropropene						
Trichloroethene	yes			yes	yes	
Dibromochloromethane						
1,1,2-Trichloroethane					yes	
Benzene						
trans-1,3-Dichloropropene						
Bromoform						
4-Methyl-2-Pentanone					yes	
2-Hexanone						
Tetrachloroethene					yes	yes
1,1,2,2-Tetrachloroethane						
Toluene				yes	yes	
Chlorobenzene						
Ethylbenzene						
Styrene						
Xylenes (total)					yes	
TCL Semi-Volatiles (ppb):						
Bis (ethylhexyl) phthalate				yes		
TCL Pesticides (ppb):						
DDT						
PCB's (ppb):						
Asbestos (%):						

* - yes = compound-of-interest

Notes:

(1) - Only detected in one groundwater sample near the detection limit.
(2) - Common laboratory contaminant and found extensively in background samples and in lab blanks.
(3) - Detected at a concentration less than background.
(4) - Detected at a concentration less than the reference sediment sample.
(5) - Detected at a concentration less than background.
(6) - Detected in only one Phase I sample and not in Phase II.
(7) - Surface soils are not currently considered an exposure media.

TABLE 2-31
SUMMARY OF COMPOUNDS-OF-INTEREST BY MEDIA AND
LOCATION FOR QUANTITATIVE RISK ASSESSMENT
(con't)

MEDIA:	Surface Soils	Surface Soils	Surface Soils	Surface Soils	Subsurface Soils	Subsurface Soils
LOCATION:	S. Cornfield	Stress. Vege.	Drum Area 1	Drum Area 2	Borrow Area	Lagoon Area
PARAMETERS (ppm):						
Cyanide						
Arsenic						
Lead	yes	yes			yes	yes
Selenium	yes	yes				
Antimony		yes				
Cadmium	yes					no (3)
Chromium	yes	yes				no (3)
Copper	yes	yes			yes	yes
Manganese						
Zinc	yes	yes			yes	yes
Mercury	yes	yes				
Barium	yes	yes				
TCL Volatiles (ppb):						
Chloromethane						
Bromomethane						
Vinyl Chloride						
Chloroethane						
Methylene Chloride	no (2)	no (2)	no (2)		no (2)	no (2)
Acetone		no (2)	no (2)	no (2)	no (2)	no (2)
Carbon Disulfide						
1,1-Dichloroethene						
1,1-Dichloroethane		yes				
1,2-Dichloroethene		yes	no (7)			
Chloroform						
1,2-Dichloroethane			no (7)			
2-Butanone			no (7)	no (7)		yes
1,1,1-Trichloroethane		yes				yes
Carbon Tetrachloride						
Vinyl Acetate						
Bromodichloromethane						
1,2-Dichloropropane						
cis-1,3-dichloropropene						
Trichloroethene	yes	yes	no (7)			
Dibromochloromethane						
1,1,2-Trichloroethane			no (7)	no (7)		
Benzene						
trans-1,3-Dichloropropene						
Bromoform						
4-Methyl-2-Pentanone			no (7)	no (7)		yes
2-Hexanone						
Tetrachloroethene	yes	yes	no (7)			
1,1,2,2-Tetrachloroethane						
Toluene	yes		no (7)			yes
Chlorobenzene						
Ethylbenzene			no (7)			yes
Styrene						
Xylenes (total)			no (7)	no (7)		yes
TCL Semi-Volatiles (ppb):						
Bis (ethylhexyl) phthalate					yes	
TCL Pesticides (ppb):						
DDT		yes				
PCB's (ppb):						
Asbestos (%):						

* - yes = compound-of-interest

Notes:

(1) - Only detected in one groundwater sample near the detection limit.
(2) - Common laboratory contaminant and found extensively in background samples and in lab blanks.
(3) - Detected at a concentration less than background.
(4) - Detected at a concentration less than the reference sediment sample.
(5) - Detected at a concentration less than background.
(6) - Detected in only one Phase I sample and not in Phase II.
(7) - Surface soils are not currently considered an exposure media.

TABLE 2-31
SUMMARY OF COMPOUNDS-OF-INTEREST BY MEDIA AND LOCATION FOR QUANTITATIVE RISK ASSESSMENT
(con't)

MEDIA:	Subsurface Soils	Subsurface Soils	Subsurface Soils	Subsurface Soils	Subsurface Soils
LOCATION:	N. Cornfield	S. Cornfield	Stress. Vege.	Drum Area 1	Drum Area 2
PARAMETERS (ppm):					
Cyanide					
Arsenic					
Lead	no (3)	no (3)	yes		
Selenium	yes	yes			
Antimony					
Cadmium		no (3)			
Chromium	no (3)	no (3)	yes		
Copper	yes	yes	yes		
Manganese					
Zinc	no (3)	no (3)	yes		
Mercury	yes	yes			
Barium	yes	yes	yes		
TCL Volatiles (ppb):					
Chloromethane					
Bromomethane					
Vinyl Chloride					
Chloroethane					
Methylene Chloride	no (2)	no (2)	no (2)	no (2)	no (2)
Acetone	no (2)	no (2)	no (2)	no (2)	no (2)
Carbon Disulfide					
1,1-Dichloroethene					
1,1-Dichloroethane					
1,2-Dichloroethene				yes	
Chloroform					
1,2-Dichloroethane				yes	
2-Butanone				yes	yes
1,1,1-Trichloroethane					
Carbon Tetrachloride					
Vinyl Acetate					
Bromodichloromethane					
1,2-Dichloropropane					
cis-1,3-dichloropropene					
Trichloroethene				yes	yes
Dibromochloromethane					
1,1,2-Trichloroethane				yes	
Benzene					
trans-1,3-Dichloropropene					
Bromoform					
4-Methyl-2-Pentanone				yes	yes
2-Hexanone					
Tetrachloroethene					
1,1,2,2-Tetrachloroethane					
Toluene				yes	
Chlorobenzene					
Ethylbenzene				yes	
Styrene					
Xylenes (total)				yes	yes
TCL Semi-Volatiles (ppb):					
Bis (ethylhexyl) phthalate					
TCL Pesticides (ppb):					
DDT					
PCB's (ppb):					
Asbestos (%):					

* - yes = compound-of-interest

Notes:

(1) - Only detected in one groundwater sample near the detection limit.
(2) - Common laboratory contaminant and found extensively in background samples and in lab blanks.
(3) - Detected at a concentration less than background.
(4) - Detected at a concentration less than the reference sediment sample.
(5) - Detected at a concentration less than background.
(6) - Detected in only one Phase I sample and not in Phase II.
(7) - Surface soils are not currently considered an exposure media.

TABLE 3-1
POTENTIAL HUMAN RECEPTORS FOR CURRENT AND FUTURE LAND USE SCENARIO AT THE HUNTERSTOWN ROAD SITE

CURRENT LAND USE SCENARIO

ON-SITE

On-site Visitor Children

OFF-SITE

Near-site Residents:
Adults
Developing Children
Young Children

FUTURE LAND USE SCENARIO

ON-SITE

Construction Workers

On-site Residents:
Adults
Developing Children
Young Children

OFF-SITE

Near-site Residents:
Adults
Developing Children
Young Children

TABLE 3-2

POTENTIAL RECEPTORS AND EXPOSURE PATHWAYS FOR THE CURRENT LAND USE SCENARIO AT THE HUNTERSTOWN ROAD SITE

Receptor	Exposure Media	Location	Intake Route
HUMAN HEALTH RECEPTORS:			
On-site Visitor Children	Surface Soils	On-site (a)	Dermal contact with surface soils
	Surface Water		Incidental ingestion with surface soils
	Sediments		Inhalation of volatiles and dusts from surface soils
			Dermal contact with surface water
			Incidental ingestion with surface water
			Dermal contact with sediment
			Incidental ingestion with sediment
Near-site Resident Adults	Groundwater (b)	Near-site	Groundwater ingestion
	Nearsite -	Residents	Dermal contact with groundwater while showering
	Irrigated Soils		Inhalation volatiles from groundwater while showering
			Inhalation of volatiles from groundwater with irrigation
			Dermal contact with irrigated soils
Near-site Resident Developing Children	Groundwater (b)	Near-site	Groundwater ingestion
	Nearsite -	Residents	Dermal contact with groundwater while showering
	Irrigated Soils		Inhalation volatiles from groundwater while showering
			Inhalation of volatiles from groundwater with irrigation
			Dermal contact with irrigated soils
Near-site Resident Young Children	Groundwater (b)	Near-site	Groundwater ingestion
	Nearsite -	Residents	Dermal contact with groundwater while bathing
	Irrigated Soils		Dermal contact with irrigated soils
			Inhalation of volatiles from groundwater with irrigation
			Inhalation volatiles from groundwater while bathing

Notes:

(a) - On-site areas include the S. and N. Cornfields, Borrow Area, Lagoon Area, Stressed Vegetation Area, and Drum Burial Areas.

(b) - Current near-site groundwater concentrations are based on statistical summary of groundwater from drum burial areas.

TABLE 3-3

RESIDENTIAL WELL SURVEY RESULTS
HUNTERSTOWN ROAD SITE

LOCATION #	WELL OWNER	IS WELL OPERATIONAL (Y/N)	WELL DEPTH	WELL USE	PUBLIC WATER SERVICE (Y/N)	ACTIVE SEPTIC SYSTEM (Y/N)
1	Richard & Alice Phiel	Yes	235'	Garden watering, washing cars	Yes	Yes
2	Charles W. Mortz	Yes	210'	Garden watering	Yes	Yes
3	John K. Lott	Yes	135'	Drinking, cooking, bathing/washing, garden watering, livestock	No	Yes
4	Dennis M. Weaver	Yes	Unknown	Garden watering, washing cars	Yes	Yes
5	Barbara Ketterman	Yes	Unknown	Drinking, cooking, bathing	Yes	Yes
6	Ronald H. Smith	No	Unknown	N/A	Yes	Yes
7	F. M. Shealer	Yes	170'	General use	Yes	Yes
8	Melvin E. Tressler	Yes	190'	General use	No	Yes
9	S. Catherine Shealer	No	Unknown	N/A	Yes	Yes
10	William Vaughn	Yes	45'	None	Yes	Yes
11	Jack & Tina Stevens	Yes	Unknown	Garden watering	Yes	Yes
12	Marlin L. Platt	Yes	200'	Presently none	Yes	Yes
13	Gerald F. Shealer	Yes	300'	Drinking, cooking, bathing/washing	Yes	Yes
14	Adriel Bowie	No Well	N/A	None	Yes	Yes

Note: Location numbers refer to lots indicated on Figure

TABLE 3-4
POTENTIAL RECEPTORS AND EXPOSURE PATHWAYS
FOR THE FUTURE LAND USE SCENARIO AT THE HUNTERSTOWN ROAD SITE

Receptor	Exposure Media	Location	Intake Route
HUMAN HEALTH RECEPTORS:			
Construction Workers	On-site -	On-site (a)	Dermal contact with surface soils
	Surface Soils		Incidental ingestion with surface soils
	Subsurface Soils		Inhalation of volatiles and dust from surface soils
			Dermal contact with subsurface soils
			Incidental ingestion with subsurface soils
			Inhalation of volatiles and dust from subsurface soils
On-site Resident Adults	On-site -	On-site (a)	Groundwater ingestion
	Groundwater (b)		Dermal contact with groundwater while showering
	Surface Soils		Inhalation groundwater while showering
			Inhalation of volatiles from groundwater with irrigation
			Dermal contact with surface soils
			Incidental ingestion of surface soils
On-site Resident Developing Children	On-site -	On-site (a)	Groundwater ingestion
	Groundwater (b)		Dermal contact with groundwater while showering
	Surface Soils		Inhalation groundwater while showering
			Inhalation of volatiles from groundwater with irrigation
			Dermal contact with surface soils
			Incidental ingestion of surface soils
On-site Resident Young Children	On-site -	On-site (a)	Groundwater ingestion
	Groundwater (b)		Dermal contact with groundwater while bathing
	Surface Soils		Inhalation volatiles from groundwater while bathing
			Inhalation of volatiles from groundwater with irrigation
			Dermal contact with surface soils
			Incidental ingestion of surface soils
Near-site Resident Adults	Nearsite -	Near-site	Groundwater ingestion
	Irrigated Soils	Residents	Dermal contact with groundwater while showering
	Groundwater (b)		Inhalation volatiles from groundwater while showering
			Inhalation of volatiles from groundwater with irrigation
			Dermal contact with irrigated soils
Near-site Resident Developing Children	Nearsite -	Near-site	Groundwater ingestion
	Irrigated Soils	Residents	Dermal contact with groundwater while showering
	Groundwater (b)		Inhalation volatiles from groundwater while showering
			Inhalation of volatiles from groundwater with irrigation
			Dermal contact with irrigated soils
Near-site Resident Young Children	Nearsite -	Near-site	Groundwater ingestion
	Irrigated Soils	Residents	Dermal contact with groundwater while bathing
	Groundwater (b)		Dermal contact with irrigated soils
			Inhalation of volatiles from groundwater with irrigation
			Inhalation volatiles from groundwater while bathing

Notes:

(a) - On-site areas include the S. and N. Cornfields, Borrow Area, Lagoon Area, Stressed Vegetation Area, and Drum Burial Areas.

(b) - Future near-site groundwater concentrations are based on groundwater data from HMW-3AL (Lagoon Area).
Future on-site groundwater concentrations are based data from HMW-3AL (Lagoon Area), HMW-9AW (Drum Area 1) and HMW-7AE (Drum Area 2).

TABLE 3-5
SUMMARY OF HUMAN INHALATION RATES FOR
MEN, WOMEN, AND CHILDREN BY ACTIVITY LEVEL (CU. M/HR) (a)

	RESTING (b)	LIGHT (c)	MODERATE (d)	HEAVY (e)
Adult Male	0.7	0.8	2.5	4.8
Adult Female	0.3	0.5	1.6	2.9
Average Adult (f)	0.5	0.6	2.1	3.9
Child, age 6	0.4	0.8	2	2.4
Child, age 10	0.4	1	3.2	4.2

(a) Values of inhalation rates for males, females and children presented in this table are based on values reported for each activity level in the Exposures Factors Handbook (US EPA, 1989)
(b) Includes watching television, reading and sleeping.
(c) Includes most domestic work, attending to personal needs and care, hobbies, and conducting minor indoor repairs and home improvements.
(d) Includes heavy indoor cleanup, performance of major indoor repairs and alterations, and climbing stairs.
(e) Includes vigourous physical exercise and climbing stairs carrying a load.
(f) Derived by taking the mean of the adult male and female values for each activity level.

TABLE 3-6
PERCENTAGE OF TOTAL BODY SURFACE AREA
BY PART OF BODY

Body Part	Men			Women		
	Mean (s.d.)	Min-Max.	n	Mean (s.d.)	Min-Max.	n
Head	7.8 (1.0)	6.1-10.6	48	7.1 (0.6)	5.6- 8.1	57
Trunk	35.9 (2.1)	30.5-41.4	48	34.8 (1.9)	32.8-41.7	57
Upper Extremities	18.8 (1.1)	16.4-21.0	48	17.9 (0.9)	15.6-19.9	57
Arms	14.1 (0.9)	12.5-15.5	32	14.0 (0.6)	12.4-14.8	13
Upper Arms	7.4 (0.5)	6.7- 8.1	6	-	-	-
Forearms	5.9 (0.3)	5.4- 6.3	6	-	-	-
Hands	5.2 (0.5)	4.6- 7.0	32	5.1 (0.3)	4.4- 5.4	13
Lower Extremities	37.5 (1.9)	33.3-41.2	48	40.3 (1.6)	36.0-43.2	57
Legs	31.2 (1.6)	26.1-33.4	32	32.4 (1.6)	29.8-35.3	13
Thighs	18.4 (1.2)	15.2-20.2	32	19.5 (1.1)	18.0-21.7	13
Lower Legs	12.8 (1.0)	11.0-15.8	32	12.8 (1.0)	11.4-14.9	13
Feet	7.0 (0.5)	6.0- 7.9	32	6.5 (0.3)	6.0- 7.0	13

s.d. = standard deviation.

n = number of observations.

Source: Exposure Factors Handbook (U.S. EPA, 1989).

TABLE 3-7
SUMMARY OF INTAKE EQUATIONS FOR
ON-SITE VISITOR CHILDREN FOR THE
CURRENT LAND USE SCENARIO

Incidental Ingestion of Surface Soils and Sediment:

$$I_{ing-s} = \frac{CS * IR * CF * FI * AB * EF * ED}{BW * AT}$$

Dermal Contact With Surface Soils and Sediment:

$$I_{der-s} = \frac{CS * CF * SA * AF * ABS * ET * EF * ED}{BW * AT}$$

where: $SA = TBS * FBE$

with:
TBS = total body surface area; and
FBE = fraction of body exposed.

Incidental Ingestion of Surface Water:

$$I_{ing-s} = \frac{CW * IR * ABS * EF * ED}{BW * AT}$$

Dermal Contact With Surface Water:

$$I_{der-s} = \frac{CW * SA * PC * CF * ET * EF * ED}{BW * AT}$$

Inhalation of Volatiles and Fugitive Dusts:

$$I_{inhal} = \frac{CA * IR * ET * EF * ED}{BW * AT}$$

TABLE 3-8
SUMMARY OF INTAKE PARAMETER VALUES FOR ON-SITE VISITOR CHILDREN IN THE CURRENT LAND USE SCENARIO

Assumptions				Comments/Reference
General Assumptions for Visitor Children:				
BW (body weight)	=	39.51 Kg		time-weighted average for a child aged 5 to 18 [b]
TBS (total body surface area)	=	1.23	(12,300 cm2)	time-weighted average for a child aged 5 to 18 [b]
ET (exposure time)	=	4 hrs		assumed for dermal contact and inhalation
EF (exposure frequency)	=	12 days/yr		assumed exposure to Borrow Area, Lagoon Area, Stressed Vege. Ar
		or 39 days/yr		assumed for N. and S. Cornfields and stream areas
ED (exposure duration)	=	14 yrs		assumed for age 5 to 18 years
AT (averaging times):				
Carcinogenic effects	=	70 years		mean life expectency [b]
Chronic effects (noncarc.)	=	14 years		based on exposure duration (ED)
Assumptions for Inhalation:				
IR (inhalation rate)	=	1.88 m3/hr		average for a child aged 5 to 18 normalized over BW of 39.5 Kg [b]
Assumptions for Incidental Ingestion of Surface Soils and Sediments:				
IR (ingestion rate)	=	157 mg/day		average for a child aged 5 to 18 normalized over BW of 39.5 Kg [c]
FI (fraction ingested)	=	100%		based on area of contaminated source
AB (absorption factor)	=	100%		assumed
Assumptions for Dermal Contact With Soils and Sediments:				
FBE (fraction of body exposed)	=	23.59%		50th percentile of hands, forearms and head normalized over BW [b]
AF (soil adherence factor)	=	1.45 or 2.77 mg/cm2		value for potting soil or kaolin clay (assumed for sediments) [d]
ABS (skin absorption factor)	=	0.25%/hr		1.5% absorption times 15% matrix for organics or 0.1% for metals
Assumptions for Incidental Ingestion of Surface Water:				
IR (ingestion rate)	=	157 mg/day		average for a child aged 5 to 18 normalized over BW of 39.5 Kg [c]
AB (absorption factor)	=	100%		assumed
Assumptions for Dermal Contact With Surface Water:				
FBE (fraction of body exposed)	=	23.59%		50th percentile of hands, forearms and head normalized over BW [b]
PC (chemical permiability factor)	=	0.0008 cm/hr		value for water [a]

Notes:

[a] U.S. EPA, 1989. Risk Assessment Guidance For Superfund. Volume I:Human Health Evaluation Manual (Part A). EPA/540/1-89/002.

[b] U.S. EPA, 1989. Exposure Factors Handbook. EPA/600/8-89/043.

[c] U.S. EPA, 1989. Interim Final Guidance for Soil Ingestion Rates. Memorandum from J. W. Porter. 1/27/89.

[d] Harger, J.R.E. 1979. A Model for the Determination of an Action Level for Removal of Curene Contaminated Soil. Memorandum to P.S. Cole, Executive Director, Toxic Substance Control Commision. Lansing Mi.

[e] Hawley, J. 1985. Assessment of Health Risk Associated with Exposure to Contaminated Soil. Risk Analysis, 5:289-302.

TABLE 3-9
SUMMARY OF INTAKE EQUATIONS FOR NEAR-SITE RESIDENTS FOR THE CURRENT AND FUTURE LAND USE SCENARIOS

Ingestion of Groundwater:

$$I_{ing\text{-}w} = \frac{CW * IR * ABS * EF * ED}{BW * AT}$$

Dermal Contact With Irrigated Soils:

$$I_{der\text{-}s} = \frac{CS * CF * SA * AF * ABS * ET * EF * ED}{BW * AT}$$

where: $SA = TBS * FBE$

with:
TBS = total body surface area; and
FBE = fraction of body exposed.

Inhalation of Volatiles:

$$I_{inhal} = \frac{CA * IR * ET * EF * ED}{BW * AT}$$

Dermal Contact With Groundwater (while showering):

$$I_{der\text{-}w} = \frac{CW * SA * PC * CF * ET * EF * ED}{BW * AT}$$

TABLE 3-10
SUMMARY OF INTAKE PARAMETER VALUES FOR NEAR-SITE RESIDENT ADULTS FOR THE CURRENT AND FUTURE LAND USE SCENARIO

Assumptions				Comments/Reference
General Assumptions for Near-site Resident Adults:				
BW (body weight)	=	70 Kg		mean body weight for an adult [a]
TBS (total body surface area)	=	1.94 m2		50th percentile for adult male [b]
EF (exposure frequency)	=	350 days/yr		for groundwater and inhalation, 48 irrigated soils
ED (exposure duration)	=	30 yrs		assumed for resident adults
ET (exposure time)	=	4 hrs		for dermal to soils, 15 min shower, 24 for inhalation
ABS (absorption factor)	=	1	(or 100%)	assumed absorption for ingestion
AT (averaging times):				
Carcinogenic effects	=	70 years		mean life expectency [b]
Chronic effects (noncarc.)	=	30 years		based on exposure duration (ED)
Assumptions for Groundwater Ingestion:				
IR (ingestion rate)	=	2 L/day		recommended for adult [c]
Assumptions for Soil Incidental Ingestion:				
IR (incidental ingestion rate)	=	100/mg/day		recommended for adult [c]
FI (fraction from contaminated source)	=	100%		based on exposure area of contamination
AB (absorption factor)	=	100%		assumed for all compounds
Assumptions for Inhalation:				
IR (inhalation rate daily)	=	20 m3/day	(0.83 m3/hr)	daily exposure rate for adult [f]
IR (inhalation rate for shower)	=	0.6 m3/hr		light activity level [b]
Assumptions for Dermal Contact to Soils:				
FBE (fraction of body exposed)	=	18.9%		50th percentile of hands, forearms and head for adults [b]
AF (soil adherence factor)		1.5 mg/cm2		value for potting soil [d]
ABS (skin absorption factor)		0.25 or 0.1%/hr		1.5% absorption times 15% matrix for organics or 0.1% for metals
Assumptions for Dermal Contact to Groundwater (showering):				
FBE (fraction of body exposed)	=	100%		assumes whole body exposed while showering
PC (chemical permiability factor)	=	0.0008 cm/hr		value for water [a]

Notes:

[a] U.S. EPA, 1989. Risk Assessment Guidance For Superfund. Volume I:Human Health Evaluation Manual (Part A). EPA/540/1-89/002.

[b] U.S. EPA, 1989. Exposure Factors Handbook. EPA/600/8-89/043.

[c] U.S. EPA, 1989. Interim Final Guidance for Soil Ingestion Rates. Memorandum from J. W. Porter. 1/27/89.

[d] Harger, J.R.E. 1979. A Model for the Determination of an Action Level for Removal of Curene Contaminated Soil. Memorandum to P.S. Cole, Executive Director, Toxic Substance Control Commision. Lansing Mi.

[e] Hawley, J. 1985. Assessment of Health Risk Associated with Exposure to Contaminated Soil. Risk Analysis, 5:289-302.

[f] U.S. EPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Dir. 9285.6-03.

TABLE 3-11

SUMMARY OF INTAKE PARAMETER VALUES FOR NEAR-SITE RESIDENT DEVELOPING INDIVIDUALS (CHILDREN) FOR THE CURRENT AND FUTURE LAND USE SCENARIO

Assumptions				Comments/Reference
General Assumptions for Near-site Resident Developing Individuals:				
BW (body weight)	=	50.3 Kg		time-weighted average for person aged 2 - 31 yrs [b]
TBS (total body surface area)	=	1.49 m2		time-weighted average for person aged 2 - 31 yrs [b]
EF (exposure frequency)	=	350 days/yr		for groundwater and inhalation, 96 irrigated soils
ED (exposure duration)	=	30 years		assumed for developing individual
ET (exposure time)	=	4 hrs		for dermal to soils, 24 for inhalation, 15 min shower
ABS (absorption factor)	=	1	(or 100%)	assumed absorption for ingestion and inhalation
AT (averaging times):				
Carcinogenic effects	=	70 years		mean life expectency [b]
Chronic effects (noncarc.)	=	30 years		based on exposure duration (ED)
Assumptions for Groundwater Ingestion:				
IR (ingestion rate)	=	2.44 L/day		normalized average intake for person 2 to 31 years old
Assumptions for Soil Incidental Ingestion:				
IR (incidental ingestion rate)	=	189 mg/day		normalized average intake for person 2 to 31 years old [c]
FI (fraction from contaminated source)	=	100%		based on exposure area of contamination
AB (absorption factor)	=	100%		assumed for all compounds
Assumptions for Inhalation:				
IR (inhalation rate daily)	=	28.2 m3/day		time-weighted average inhalation rate normalized to BW (b)
IR (inhalation rate for shower)	=	0.6 m3/hr		light activity level [b]
Assumptions for Dermal Contact to Soils:				
FBE (fraction of body exposed)	=	23.29%		50th percentile of hands, forearms and head normalized to BW [b]
AF (soil adherence factor)		1.5 mg/cm2		value for potting soil [d]
ABS (skin absorption factor)		0.25%/hr		1.5% absorption times 15% matrix for organics or 0.1% for metals
Assumptions for Dermal Contact to Groundwater (showering):				
FBE (fraction of body exposed)	=	108%		100% of body normalized to BW
PC (chemical permiability factor)	=	0.0008 cm/hr		value for water [a]

Notes:

[a] U.S. EPA, 1989. Risk Assessment Guidance For Superfund. Volume I:Human Health Evaluation Manual (Part A). EPA/540/1-89/002.

[b] U.S. EPA, 1989. Exposure Factors Handbook. EPA/600/8-89/043.

[c] U.S. EPA, 1989. Interim Final Guidance for Soil Ingestion Rates. Memorandum from J. W. Porter. 1/27/89.

[d] Harger, J.R.E. 1979. A Model for the Determination of an Action Level for Removal of Curene Contaminated Soil. Memorandum to P.S. Cole, Executive Director, Toxic Substance Control Commision. Lansing Mi.

[e] Hawley, J. 1985. Assessment of Health Risk Associated with Exposure to Contaminated Soil. Risk Analysis, 5:289-302.

[f] U.S. EPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Dir. 9285.6-03.

TABLE 3-12
SUMMARY OF INTAKE PARAMETER VALUES FOR NEAR-SITE RESIDENT YOUNG CHILDREN
FOR THE CURRENT AND FUTURE LAND USE SCENARIO

Assumptions				Comments/Reference
General Assumptions for Near-site Resident Young Children:				
BW (body weight)	=	15.6 Kg		mean body weight for child aged 3 – 6 yrs [a]
TBS (total body surface area)	=	0.72 m2		50th percentile for male child 3 – 6 yrs [b]
EF (exposure frequency)	=	350 days/yr		for groundwater and inhalation, 96 irrigated soils
ED (exposure duration)	=	5 years		assumed for young child
ET (exposure time)	=	4 hrs		for dermal to soils, 24 for inhalation, 15 min shower
ABS (absorption factor)	=	1	(or 100%)	assumed absorption for ingestion and inhalation
AT (averaging times):				
Carcinogenic effects	=	70 years		mean life expectency [b]
Chronic effects (noncarc.)	=	5 years		based on exposure duration (ED)
Assumptions for Groundwater Ingestion:				
IR (ingestion rate)	=	1.5 L/day		assumed for a child, 75% of an adult
Assumptions for Soil Incidental Ingestion:				
IR (incidental ingestion rate)	=	200/mg/day		recommended for young child < 6 yrs [c]
FI (fraction from contaminated source)	=	100%		based on exposure area of contamination
AB (absorption factor)	=	100%		assumed for all compounds
Assumptions for Inhalation:				
IR (inhalation rate daily)	=	20 m3/day	(0.83 m3/hr)	time-weighted intake rate for young child per day [b]
IR (inhalation rate for bathing)	=	0.6 m3/hr		light activity level [b]
Assumptions for Dermal Contact to Soils:				
FBE (fraction of body exposed)	=	25.6%		area of hands, forearms and head for young child [b]
AF (soil adherence factor)		1.5 mg/cm2		value for potting soil [d]
ABS (skin absorption factor)		0.25%/hr		1.5% absorption times 15% matrix for organics or 0.1% for metals
Assumptions for Dermal Contact to Groundwater (bathing):				
FBE (fraction of body exposed)	=	100%		assumes whole body exposed while bathing
PC (chemical permiability factor)	=	0.0008 cm/hr		value for water [a]

Notes:

[a] U.S. EPA, 1989. Risk Assessment Guidance For Superfund. Volume I:Human Health Evaluation Manual (Part A). EPA/540/1-89/002.

[b] U.S. EPA, 1989. Exposure Factors Handbook. EPA/600/8-89/043.

[c] U.S. EPA, 1989. Interim Final Guidance for Soil Ingestion Rates. Memorandum from J. W. Porter. 1/27/89.

[d] Harger, J.R.E. 1979. A Model for the Determination of an Action Level for Removal of Curene Contaminated Soil. Memorandum to P.S. Cole, Executive Director, Toxic Substance Control Commision. Lansing Mi.

[e] Hawley, J. 1985. Assessment of Health Risk Associated with Exposure to Contaminated Soil. Risk Analysis, 5:289-302.

[f] U.S. EPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Dir. 9285.6-03.

TABLE 3-13
SUMMARY OF INTAKE EQUATIONS FOR
ON-SITE CONSTRUCTION WORKERS FOR THE
CURRENT LAND USE SCENARIO

Incidental Ingestion of On-site Surface Soils:

$$Iing\text{-}s = \frac{CS * IR * CF * FI * AB * EF * ED}{BW * AT}$$

Dermal Contact With On-site Surface Soils:

$$Ider\text{-}s = \frac{CS * CF * SA * AF * ABS * ET * EF * ED}{BW * AT}$$

where: $SA = TBS * FBE$

with:
TBS = total body surface area; and
FBE = fraction of body exposed.

Incidental Ingestion of On-site Subsurface Soils:

$$Iing\text{-}ss = \frac{CS * IR * CF * FI * AB * EF * ED}{BW * AT}$$

Dermal Contact With On-site Subsurface Soils:

$$Ider\text{-}ss = \frac{CS * CF * SA * AF * ABS * ET * EF * ED}{BW * AT}$$

Inhalation of Volatiles and Fugitive Dusts:

$$Iinhal = \frac{CA * IR * ET * EF * ED}{BW * AT}$$

TABLE 3-14
SUMMARY OF INTAKE PARAMETER VALUES FOR ON-SITE CONSTRUCTION WORKERS
IN THE FUTURE LAND USE SCENARIO

Assumptions				Comments/Reference
General Assumptions for Construction Workers:				
BW (body weight)	=	70 Kg		mean body weight for an adult [a]
TBS (total body surface area)	=	1.94 m2	(19,400 cm2)	50% percentile body surface area for an adult male [a]
ET (exposure time)	=	8 hrs		assumed for dermal contact
EF (exposure frequency)	=	5 day/wk, 35 wks/yr		assumed total exposure, 3-days surface, 2-days subsurface
ED (exposure duration)	=	2 yrs		assumed for residential construction
ABS (absorption factor)	=	1	(or 100%)	assumed absorption for ingestion and inhalation
AT (averaging times):				
Carcinogenic effects	=	70 years		mean life expectency [b]
Chronic effects (noncarc.)	=	2 years		based on exposure duration (ED)
Assumptions for Inhalation:				
IR (inhalation rate)	=	2.5 m3/hr	(20 m3/day)	average daily exposure rate for working adult [f]
Assumptions for Incidental Ingestion of Soils:				
IR (ingestion rate)	=	100 mg/day		recommended for adult [c]
FI (fraction ingested)	=	100%		based on area of contaminated source
AB (absorption factor)	=	100%		assumed
Assumptions for Dermal Contact With Soils:				
FBE (fraction of body exposed)	=	18.9%		50th percentile of hands, forearms and head [b]
AF (soil adherence factor)	=	1.5 mg/cm2		value for potting soil [d]
ABS (skin absorption factor)	=	0.25 or 0.1%/hr		1.5% absorption times 15% matrix for organics or 0.1% for metals

Notes:

[a] U.S. EPA, 1989. Risk Assessment Guidance For Superfund. Volume I:Human Health Evaluation Manual (Part A). EPA/540/1-89/002.

[b] U.S. EPA, 1989. Exposure Factors Handbook. EPA/600/8-89/043.

[c] U.S. EPA, 1989. Interim Final Guidance for Soil Ingestion Rates. Memorandum from J. W. Porter. 1/27/89.

[d] Harger, J.R.E. 1979. A Model for the Determination of an Action Level for Removal of Curene Contaminated Soil. Memorandum to P.S. Cole, Executive Director, Toxic Substance Control Commision. Lansing Mi.

[e] Hawley, J. 1985. Assessment of Health Risk Associated with Exposure to Contaminated Soil. Risk Analysis, 5:289-302.

[f] U.S. EPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Dir. 9285.6-03.

TABLE 3-15
SUMMARY OF INTAKE EQUATIONS FOR ON-SITE
RESIDENTS FOR THE FUTURE LAND USE SCENARIO

Ingestion of Groundwater:

$$Iing\text{-}w = \frac{CW * IR * ABS * EF * ED}{BW * AT}$$

Dermal Contact With Irrigated Soils:

$$Ider\text{-}s = \frac{CS * CF * SA * AF * ABS * ET * EF * ED}{BW * AT}$$

where: SA = TBS * FBE

with:
TBS = total body surface area; and
FBE = fraction of body exposed.

Inhalation of Volatiles:

$$Iinhal = \frac{CA * IR * ET * EF * ED}{BW * AT}$$

Dermal Contact With Groundwater (while showering):

$$Ider\text{-}w = \frac{CW * SA * PC * CF * ET * EF * ED}{BW * AT}$$

Incidental Ingestion of Surface Soils:

$$Iing\text{-}s = \frac{CS * IR * FI * ABS * EF * ED}{BW * AT}$$

TABLE 3-16
SUMMARY OF INTAKE PARAMETER VALUES FOR ON-SITE RESIDENT ADULTS
FOR THE FUTURE LAND USE SCENARIO

Assumptions				Comments/Reference
General Assumptions for On-site Resident Adults:				
BW (body weight)	=	70 Kg		mean body weight for an adult [a]
TBS (total body surface area)	=	1.94 m2		50th percentile for adult male [b]
EF (exposure frequency)	=	350 days/yr		for groundwater and inhalation, 48 surface soils
ED (exposure duration)	=	30 yrs		assumed for resident adults
ET (exposure time)	=	4 hrs		for dermal to soils, 15 min shower, 24 for inhalation
ABS (absorption factor)	=	1	(or 100%)	assumed absorption for ingestion and inhalation
AT (averaging times):				
Carcinogenic effects	=	70 years		mean life expectency [b]
Chronic effects (noncarc.)	=	30 years		based on exposure duration (ED)
Assumptions for Groundwater Ingestion:				
IR (ingestion rate)	=	2 L/day		recommended for adult [c]
Assumptions for Soil Incidental Ingestion:				
IR (incidental ingestion rate)	=	100/mg/day		recommended for adult [c]
FI (fraction from contaminated source)	=	100%		based on exposure area of contamination
AB (absorption factor)	=	100%		assumed for all compounds
Assumptions for Inhalation:				
IR (inhalation rate daily)	=	20 m3/day	(0.83 m3/hr)	daily exposure rate for adult [f]
IR (inhalation rate for shower)	=	0.6 m3/hr		light activity level [b]
Assumptions for Dermal Contact to Soils:				
FBE (fraction of body exposed)	=	18.9%		50th percentile of hands, forearms and head for adults [b]
AF (soil adherence factor)	=	1.5 mg/cm2		value for potting soil [d]
ABS (skin absorption factor)	=	0.25 or 0.1%/hr		1.5% absorption times 15% matrix for organics or 0.1% for metals
Assumptions for Dermal Contact to Groundwater (showering):				
FBE (fraction of body exposed)	=	100%		assumes whole body exposed while showering
PC (chemical permiability factor)	=	0.0008 cm/hr		value for water [a]

Notes:

[a] U.S. EPA, 1989. Risk Assessment Guidance For Superfund. Volume I:Human Health Evaluation Manual (Part A). EPA/540/1-89/002.

[b] U.S. EPA, 1989. Exposure Factors Handbook. EPA/600/8-89/043.

[c] U.S. EPA, 1989. Interim Final Guidance for Soil Ingestion Rates. Memorandum from J. W. Porter. 1/27/89.

[d] Harger, J.R.E. 1979. A Model for the Determination of an Action Level for Removal of Curene Contaminated Soil. Memorandum to P.S. Cole, Executive Director, Toxic Substance Control Commision. Lansing Mi.

[e] Hawley, J. 1985. Assessment of Health Risk Associated with Exposure to Contaminated Soil. Risk Analysis, 5:289-302.

[f] U.S. EPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Dir. 9285.6-03.

TABLE 3-17
SUMMARY OF INTAKE PARAMETER VALUES FOR ON-SITE RESIDENT DEVELOPING INDIVIDUALS (CHILDREN) FOR THE CURRENT LAND USE SCENARIO

Assumptions				Comments/Reference
General Assumptions for On-site Resident Developing Individuals:				
BW (body weight)	=	50.3 Kg		time-weighted average for person aged 2 - 31 yrs [b]
TBS (total body surface area)	=	1.49 m2		time-weighted average for person aged 2 - 31 yrs [b]
EF (exposure frequency)	=	350 days/yr		for groundwater and inhalation, 96 surface soils
ED (exposure duration)	=	30 years		assumed for developing individual
ET (exposure time)	=	4 hrs		for dermal to soils, 24 for inhalation, 15 min shower
ABS (absorption factor)	=	1	(or 100%)	assumed absorption for ingestion and inhalation
AT (averaging times):				
Carcinogenic effects	=	70 years		mean life expectency [b]
Chronic effects (noncarc.)	=	30 years		based on exposure duration (ED)
Assumptions for Groundwater Ingestion:				
IR (ingestion rate)	=	2.44 L/day		normalized average intake for person 2 to 31 years old
Assumptions for Soil Incidental Ingestion:				
IR (incidental ingestion rate)	=	189 mg/day		normalized average intake for person 2 to 31 years old [c]
FI (fraction from contaminated source)	=	100%		based on exposure area of contamination
AB (absorption factor)	=	100%		assumed for all compounds
Assumptions for Inhalation:				
IR (inhalation rate daily)	=	28.2 m3/day		time-weighted average inhalation rate normalized to BW (b)
IR (inhalation rate for shower)	=	0.6 m3/hr		light activity level [b]
Assumptions for Dermal Contact to Soils:				
FBE (fraction of body exposed)	=	23.29%		50th percentile of hands, forearms and head normalized to BW [b]
AF (soil adherence factor)	=	1.5 mg/cm2		value for potting soil [d]
ABS (skin absorption factor)	=	0.25 or 0.1%/hr		1.5% absorption times 15% matrix for organics or 0.1% for metals
Assumptions for Dermal Contact to Groundwater (showering):				
FBE (fraction of body exposed)	=	108%		100% of body normalized to BW
PC (chemical permiability factor)	=	0.0008 cm/hr		value for water [a]

Notes:

[a] U.S. EPA, 1989. Risk Assessment Guidance For Superfund. Volume I:Human Health Evaluation Manual (Part A). EPA/540/1-89/002.

[b] U.S. EPA, 1989. Exposure Factors Handbook. EPA/600/8-89/043.

[c] U.S. EPA, 1989. Interim Final Guidance for Soil Ingestion Rates. Memorandum from J. W. Porter. 1/27/89.

[d] Harger, J.R.E. 1979. A Model for the Determination of an Action Level for Removal of Curene Contaminated Soil. Memorandum to P.S. Cole, Executive Director, Toxic Substance Control Commision. Lansing Mi.

[e] Hawley, J. 1985. Assessment of Health Risk Associated with Exposure to Contaminated Soil. Risk Analysis, 5:289-302.

[f] U.S. EPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Dir. 9285.6-03.

TABLE 3-18

SUMMARY OF INTAKE PARAMETER VALUES FOR ON-SITE RESIDENT YOUNG CHILDREN IN THE FUTURE LAND USE SCENARIO

Assumptions				Comments/Reference
General Assumptions for On-site Resident Young Children:				
BW (body weight)	=	15.6 Kg		mean body weight for child aged 3 - 6 yrs [a]
TBS (total body surface area)	=	0.72 m2		50th percentile for male child 3 - 6 yrs [b]
EF (exposure frequency)	=	350 days/yr		for groundwater and inhalation, 96 surface soils
ED (exposure duration)	=	5 years		assumed for young child
ET (exposure time)	=	4 hrs		for dermal to soils, 24 for inhalation, 15 min shower
ABS (absorption factor)	=	1	(or 100%)	assumed absorption for ingestion and inhalation
AT (averaging times):				
Carcinogenic effects	=	70 years		mean life expectency [b]
Chronic effects (noncarc.)	=	5 years		based on exposure duration (ED)
Assumptions for Groundwater Ingestion:				
IR (ingestion rate)	=	1.5 L/day		assumed for a child, 75% of an adult
Assumptions for Soil Incidental Ingestion:				
IR (incidental ingestion rate)	=	200/mg/day		recommended for young child < 6 yrs [c]
FI (fraction from contaminated source)	=	100%		based on exposure area of contamination
AB (absorption factor)	=	100%		assumed for all compounds
Assumptions for Inhalation:				
IR (inhalation rate daily)	=	20 m3/day	(0.83 m3/hr)	time-weighted intake rate for young child per day [b]
IR (inhalation rate for bathing)	=	0.6 m3/hr		light activity level [b]
Assumptions for Dermal Contact to Soils:				
FBE (fraction of body exposed)	=	25.6%		area of hands, forearms and head for young child [b]
AF (soil adherence factor)	=	1.5 mg/cm2		value for potting soil [d]
ABS (skin absorption factor)	=	0.25 or 0.1%/hr		1.5% absorption times 15% matrix for organics or 0.1% for metals
Assumptions for Dermal Contact to Groundwater (bathing):				
FBE (fraction of body exposed)	=	100%		assumes whole body exposed while bathing
PC (chemical permiability factor)	=	0.0008 cm/hr		value for water [a]

Notes:

[a] U.S. EPA, 1989. Risk Assessment Guidance For Superfund. Volume I:Human Health Evaluation Manual (Part A). EPA/540/1-89/002.

[b] U.S. EPA, 1989. Exposure Factors Handbook. EPA/600/8-89/043.

[c] U.S. EPA, 1989. Interim Final Guidance for Soil Ingestion Rates. Memorandum from J. W. Porter. 1/27/89.

[d] Harger, J.R.E. 1979. A Model for the Determination of an Action Level for Removal of Curene Contaminated Soil. Memorandum to P.S. Cole, Executive Director, Toxic Substance Control Commision. Lansing Mi.

[e] Hawley, J. 1985. Assessment of Health Risk Associated with Exposure to Contaminated Soil. Risk Analysis, 5:289-302.

[f] U.S. EPA, 1991. Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors. OSWER Dir. 9285.6-03.

TABLE 3-19

SUMMARY OF LOCATIONS, MEDIA, RECEPTORS AND EXPOSURE PATHWAYS ASSOCIATED WITH THE HUNTERSTOWN ROAD SITE

Locations	Source Media	Exposure Media		Receptors	Exposure Pathway
Current Land Use Scenario:					
On-site	Surface soils Surface water Sediment	On-site surface soils, surface water and sediments On-site air - volatiles and dusts	(a)	On-site Visitor Children	incidental ingestion dermal contact inhalation
Off-site	On-site groundwater	Near-site groundwater	(a)	Near-site Residents	ingestion dermal contact (shower)
		Near-site showerroom air	(b)		inhalation
		Near-site irrigated soils	(c)		dermal and incid. ingest
		Near-site air - vols and dust	(d)		inhalation
Future Land Use Scenario:					
On-site	Surface soils	On-site surface soils	(a)	Construction Workers On-site Residents	incidental ingestion dermal contact
		On-site air from surface soils - volatiles and dusts	(d)		inhalation
	Subsurface soils	On-site Subsurface soils	(a)	Construction Workers	incidental ingestion dermal contact
		On-site air from subsurface soils - volatiles and dusts	(d)		inhalation
	On-site groundwater	On-site groundwater	(a)	On-site Residents	ingestion dermal contact (shower)
		On-site showerroom air	(b)		inhalation
		On-site air - volatiles	(d)		inhalation
Off-site	On-site groundwater	Near-site groundwater	(a)	Near-site Residents	ingestion dermal contact (shower)
		Near-site showerroom air	(b)		inhalation
		Near-site irrigated soils	(c)		dermal and incid. ingest
		Near-site air - vols and dust	(d)		inhalation

Notes:

(a) - Exposure point concentrations based on a statistical summary of Phase I and/or II analytical data.

(b) - Exposure point concentrations estimated with a shower volatilization model.

(c) - Exposure point concentrations based on a soil irrigation model.

(d) - Exposure point concentrations based on volatilization and fugitive dust emission models and an air dispersion model.

(e) - Exposure point concentrations estimated with a groundwater transport model.

TABLE 3-20
EXPOSURE POINT CONCENTRATIONS FOR ON-SITE SURFACE SOILS AND AIR FROM SURFACE SOILS BY AREA OF SITE

Compounds-of-Interest	Borrow Area		Lagoon Area		Stressed Vegetation Area		North Cornfield Area		South Cornfield Area	
	Surface Soil (mg/Kg)	Air from Surface Soil (mg/m3)	Surface Soil (mg/Kg)	Air from Surface Soil (mg/m3)	Surface Soil (mg/Kg)	Air from Surface Soil (mg/m3)	Surface Soil (mg/Kg)	Air from Surface Soil (mg/m3)	Surface Soil (mg/Kg)	Air from Surface Soil (mg/m3)
Lead	4.37E+02	4.75E-08	5.01E+03	5.46E-07	8.95E+03	9.74E-07	3.36E+03	3.65E-07	1.12E+03	1.22E-07
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.89E-01	7.50E-11	0.00E+00	0.00E+00	5.93E-01	6.45E-11
Antimony	0.00E+00	0.00E+00	1.89E+01	2.06E-09	1.99E+01	2.17E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.39E-01	8.09E-11	9.88E-01	1.08E-10
Chromium	0.00E+00	0.00E+00	1.60E+03	1.75E-07	1.99E+03	2.18E-07	5.64E+01	6.17E-09	2.07E+02	2.27E-08
Copper	4.73E+02	5.18E-08	2.37E+03	2.59E-07	1.32E+03	1.44E-07	1.24E+02	1.36E-08	4.51E+02	4.93E-08
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.28E+03	2.48E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	2.43E+02	2.66E-08	4.93E+02	5.40E-08	2.98E+02	3.26E-08	1.53E+03	1.67E-07	3.96E+02	4.33E-08
Mercury	0.00E+00	0.00E+00	1.45E-01	2.41E-04	3.60E-01	5.97E-04	3.03E-01	5.02E-04	3.70E-01	6.13E-04
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.56E+02	3.87E-08	3.71E+03	4.04E-07	3.95E+02	4.30E-08
Vinyl Chloride	0.00E+00	0.00E+00.	6.10E-01	1.41E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloroethane	0.00E+00	0.00E+00	5.96E-01	1.39E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	0.00E+00	0.00E+00	2.91E-01	2.58E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethane	0.00E+00	0.00E+00	6.10E+00	9.62E-03	7.70E-03	1.21E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethene	0.00E+00	0.00E+00	2.18E+01	8.50E-03	9.25E-03	3.60E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane	0.00E+00	0.00E+00	3.78E-02	1.62E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Butanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane	0.00E+00	0.00E+00	1.13E+01	6.14E-03	8.02E-02	4.34E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethene	4.30E-03	1.59E-06	3.34E-01	1.23E-04	1.70E-02	6.28E-06	0.00E+00	0.00E+00	1.00E-02	3.70E-06
1,1,2-Trichloroethane	0.00E+00	0.00E+00	4.80E-02	3.33E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	1.45E-01	2.91E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	0.00E+00	0.00E+00	1.74E-01	6.60E-05	2.03E-02	7.68E-06	9.69E-03	3.67E-06	6.43E-03	2.43E-06
Toluene	4.76E-03	6.56E-07	5.38E-01	7.42E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E-02	1.68E-06
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total)	0.00E+00	0.00E+00	3.05E-01	4.79E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bis(2-ethylhexyl)phthalate	3.11E+00	4.62E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DDT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E-01	5.76E-08	2.94E-02	1.57E-08	3.53E-02	1.89E-08

TABLE 3-21

EXPOSURE POINT CONCENTRATIONS FOR ON-SITE SUBSURFACE SOILS AND AIR FROM SUBSURFACE SOILS BY AREA OF SITE

Compounds-of-Interest	Borrow Area		Lagoon Area		Stressed Vegetation Area		North Cornfield Area		South Cornfield Area		Drum Burial Area 1		Drum Burial Area 2	
	Subsurface Soil (mg/Kg)	Air from Subsurface Soil (mg/m3)	Subsurface Soil (mg/Kg)	Air from Subsurface Soil (mg/m3)	Subsurface Soil (mg/Kg)	Air from Subsurface Soil (mg/m3)	Subsurface Soil (mg/Kg)	Air from Subsurface Soil (mg/m3)	Subsurface Soil (mg/Kg)	Air from Subsurface Soil (mg/m3)	Subsurface Soil (mg/Kg)	Air from Subsurface Soil (mg/m3)	Subsurface Soil (mg/Kg)	Air from Subsurface Soil (mg/m3)
Lead	6.41E+02	5.77E-07	1.31E+02	1.18E-07	1.91E+02	1.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.78E-01	7.00E-10	4.60E-01	4.14E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.01E+01	6.31E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	2.44E+02	2.20E-07	1.08E+02	9.74E-08	6.32E+01	5.69E-08	3.45E+01	3.11E-08	3.06E+01	2.75E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	1.64E+02	1.48E-07	1.01E+02	9.13E-08	1.14E+02	1.03E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.81E-02	1.56E-04	8.43E-02	2.73E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E+02	1.02E-07	1.17E+02	1.06E-07	1.19E+02	1.07E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.33E-01	2.54E-04	0.00E+00	0.00E+00
1,2-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.32E-01	2.79E-04	0.00E+00	0.00E+00
2-Butanone	0.00E+00	0.00E+00	1.57E-01	1.50E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.90E-01	4.67E-05	1.49E-01	1.42E-05
1,1,1-Trichloroethane	0.00E+00	0.00E+00	6.74E-03	7.14E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.67E-01	2.65E-04	2.05E-02	1.48E-05
1,1,2-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.34E-01	4.54E-05	0.00E+00	0.00E+00
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	1.14E-01	4.48E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.57E-01	1.79E-06	1.72E-02	6.74E-08
Tetrachloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	1.42E-02	3.83E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.16E-01	1.12E-04	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	6.30E-02	4.02E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.28E+00	1.45E-04	0.00E+00	0.00E+00
Xylenes (total)	0.00E+00	0.00E+00	3.05E-01	9.35E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.89E+01	5.81E-03	2.14E-02	6.56E-06
Bis(2-ethylhexyl)phthalate	6.78E-01	1.97E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DDT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE 3-22

EXPOSURE POINT CONCENTRATIONS FOR ON-SITE GROUNDWATER, SHOWERROOM AIR, AND AIR FROM IRRIGATION BY AREA OF SITE

	Lagoon Area			Drum Burial Area 2			Drum Burial Area 1		
Compounds-of-Interest	Groundwater (mg/L)	Showerroom Air (mg/m3)	Air from Irrigation (mg/m3)	Groundwater (mg/L)	Showerroom Air (mg/m3)	Air from Irrigation (mg/m3)	Groundwater (mg/L)	Showerroom Air (mg/m3)	Air from Irrigation (mg/m3)
Lead	0.00E+00	0.00E+00	0.00E+00	1.50E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	1.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	1.40E+00	2.62E+00	7.37E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloroethane	3.10E-01	5.57E-01	1.57E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	2.90E-01	4.61E-01	1.30E-03	2.50E-02	3.98E-02	1.12E-04	3.10E-01	4.93E-01	1.39E-03
1,1-Dichloroethane	2.40E+00	3.79E+00	1.06E-02	0.00E+00	0.00E+00	0.00E+00	2.70E-02	4.26E-02	1.20E-04
1,2-Dichloroethene	9.20E+00	1.43E+01	4.02E-02	6.00E-03	9.34E-03	2.62E-05	1.00E-01	1.56E-01	4.37E-04
1,2-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Butanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane	8.20E-01	1.16E+00	3.26E-03	8.50E-02	1.20E-01	3.38E-04	5.70E-01	8.06E-01	2.26E-03
Trichloroethene	4.80E+01	6.76E+01	1.90E-01	1.80E-02	2.53E-02	7.12E-05	1.40E-01	1.97E-01	5.54E-04
1,1,2-Trichloroethane	1.25E-02	1.42E-02	3.98E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	3.80E-02	4.96E-02	1.39E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	1.25E-02	1.99E-02	5.60E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total)	1.80E-01	2.73E-01	7.68E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bis (ethylhexyl) phthalate	5.00E-03	6.39E-06	1.80E-08	5.00E-03	6.39E-06	1.80E-08	5.00E-03	6.39E-06	1.80E-08
DDT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE 3-23

EXPOSURE PONT CONCENTRATIONS FOR NEARSITE GROUNDWATER, AIR AND IRRIGATED SOILS IN CURRENT LAND USE SCENARIO

Compounds-of-Interest	Concen Irrigated Garden Soils (mg/Kg)	Concen Showerroom Air (mg/m3)	Concen Air from Irrigation (mg/m3)	Concen Air from Irrigated Garden Soils (mg/m3)	Source Concen Nearsite Groundwater (mg/L)
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.85E-03
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	2.06E-02	2.53E-02	7.10E-05	1.83E-05	1.59E-02
1,1-Dichloroethane	1.50E-03	3.95E-03	1.11E-05	2.36E-06	2.50E-03
1,2-Dichloroethene	9.75E-02	1.29E-01	3.62E-04	3.80E-05	8.27E-02
1,2-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Butanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane	8.40E-02	3.91E-02	1.10E-04	4.55E-05	2.77E-02
Trichloroethene	4.14E-01	2.32E-01	6.51E-04	1.53E-04	1.65E-01
1,1,2-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bis (ethylhexyl) phthalate	5.51E+00	2.16E-05	6.08E-08	8.18E-07	1.69E-02
DDT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE 3-24

EXPOSURE PONT CONCENTRATIONS FOR NEARSITE GROUNDWATER, AIR AND IRRIGATED SOILS IN FUTURE LAND USE SCENARIO

Compounds-of-Interest	Concen Irrigated Garden Soils (mg/Kg)	Concen Showerroom Air (mg/m3)	Concen Air from Irrigation (mg/m3)	Concen Air from Irrigated Garden Soils (mg/m3)	Concen Nearsite Groundwater (mg/L)
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E-01
Vinyl Chloride	1.60E+00	2.62E+00	7.37E-03	3.68E-03	1.40E+00
Chloroethane	7.23E-01	5.57E-01	1.57E-03	1.69E-03	3.10E-01
1,1-Dichloroethene	3.77E-01	4.61E-01	1.30E-03	3.34E-04	2.90E-01
1,1-Dichloroethane	1.44E+00	3.79E+00	1.06E-02	2.27E-03	2.40E+00
1,2-Dichloroethene	1.09E+01	1.43E+01	4.02E-02	4.23E-03	9.20E+00
1,2-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Butanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane	2.49E+00	1.16E+00	3.26E-03	1.35E-03	8.20E-01
Trichloroethene	1.21E+02	6.76E+01	1.90E-01	4.46E-02	4.80E+01
1,1,2-Trichloroethane	1.40E-02	1.42E-02	3.98E-05	9.72E-07	1.25E-02
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	2.76E-01	4.96E-02	1.39E-04	1.04E-04	3.80E-02
Toluene	7.49E-02	1.99E-02	5.60E-05	1.03E-05	1.25E-02
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total)	8.63E-01	2.73E-01	7.68E-04	1.35E-04	1.80E-01
Bis (ethylhexyl) phthalate	1.63E+00	6.39E-06	1.80E-08	2.42E-07	5.00E-03
DDT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE 3-25
EXPOSURE POINT CONCENTRATIONS FOR SURFACE WATER AND SEDIMENT FOR EAST AND MIDDLE STREAM

Compounds-of-Interest	SURFACE WATER CONCENTRATIONS		SEDIMENT CONCENTRATIONS	
	East Stream (mg/L)	Middle Stream (mg/L)	East Stream (mg/Kg)	Middle Stream (mg/Kg)
Lead	3.17E-02	7.42E-03	1.54E+03	6.62E+01
Selenium	0.00E+00	0.00E+00	0.00E+00	6.11E-01
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium	0.00E+00	1.97E-02	3.47E+02	3.18E+01
Copper	3.04E-02	2.09E-02	2.61E+02	4.67E+01
Manganese	3.79E-01	0.00E+00	1.23E+03	3.85E+03
Zinc	0.00E+00	1.52E-01	3.02E+02	1.94E+02
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	0.00E+00	0.00E+00	3.04E-02	0.00E+00
Chloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	4.07E-03	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethane	1.66E-02	0.00E+00	7.26E-03	0.00E+00
1,2-Dichloroethene	1.82E-01	0.00E+00	4.44E-02	0.00E+00
1,2-Dichloroethane	0.00E+00	2.50E-03	0.00E+00	0.00E+00
2-Butanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane	4.23E-02	5.31E-03	0.00E+00	0.00E+00
Trichloroethene	1.99E-01	0.00E+00	3.53E-02	0.00E+00
1,1,2-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total)	0.00E+00	0.00E+00	1.05E-02	0.00E+00
Bis(2-ethylhexyl)phthalate	0.00E+00	0.00E+00	0.00E+00	1.67E+00
DDT	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE 4-1
COMPOUNDS-OF-INTEREST FOR
FOR QUANTITATIVE RISK ASSESSMENT

METALS

Lead
Selenium
Antimony
Cadmium
Chromium
Copper
Manganese
Zinc
Mercury
Barium

VOLATILE ORGANICS

Vinyl chloride
Chloroethane
1,1-Dichloroethene
1,1-Dichloroethane
1,2-Dichloroethene
1,2-Dichloroethane
2-Butanone
1,1,1-Trichloroethane
Trichloroethene
1,1,2-Trichloroethane
4-Methyl-2-pentanone
Tetrachloroethene
Toluene
Ethyl Benzene
Xylenes

SEMIVOLATILE ORGANICS

Bis(2-ethylhexyl)phthalate

PESTICIDES

DDT

TABLE 4-2
NONCARCINOGENIC TOXICITY DATA

COMPOUND	Reference Doses mg/Kg/day Chronic Oral	Reference Doses mg/Kg/day Chronic Inhalation	Uncertainty Factors Oral	Uncertainty Factors Inhalation	Source
METALS					
Lead	ND	ND	NA	NA	
Selenium	ND	ND	NA	NA	
Antimony	0.0004	ND	1000	NA	IRIS
Cadmium	0.0005	ND	10	NA	IRIS
Chromium *	1	5.71E-07	1000	300	IRIS/HEAST
Copper	0.04	ND	NA	NA	HEAST
Manganese	0.1	1.14E-04	1	900	IRIS/HEAST
Zinc	0.2	ND	10	NA	HEAST
Mercury	0.0003	8.57E-05	1000	30	HEAST
Barium	0.05	0.0001	100	100	HEAST
VOLATILE ORGANICS					
Vinyl chloride	ND	ND	NA	NA	
Chloroethane	ND	0.029	NA	300	HEAST
1,1-Dichloroethene	0.009	ND	1000	NA	IRIS
1,1-Dichloroethane	0.1	0.1	1000	1000	HEAST
1,2-Dichloroethene	0.01	ND	1000	NA	IRIS/HEAST
1,2-Dichloroethane	ND	ND	NA	NA	
2-Butanone	0.05	0.09	1000	1000	IRIS/HEAST
1,1,1-Trichloroethane	0.009	0.3	1000	1000	IRIS/HEAST
Trichloroethene	ND	ND	NA	NA	
1,1,2-Trichloroethane	0.004	ND	NA	NA	IRIS
4-Methyl-2-pentanone	0.05	0.02	1000	1000	IRIS/HEAST
Tetrachloroethene	0.01	ND	1000	NA	IRIS
Toluene	0.2	0.57	1000	1000	IRIS/HEAST
Ethyl Benzene	0.1	0.29	1000	300	IRIS/HEAST
Xylenes	2	0.086	100	100	IRIS/HEAST
SEMIVOLATILE ORGANICS					
Bis(2-ethylhexyl)phthalate	0.02	ND	1000	NA	IRIS
PESTICIDES					
DDT	0.0005	ND	100	NA	IRIS

ABBREVIATIONS

IRIS - Integrated Risk Information System

HEAST - Health Effects Assessment Summary Tables 1991

* - Chromium III toxicity values were used for noncarcinogenic effects
Chromium VI toxicity values were used for carcinogenic effects.

ND - no data

NA - not applicable

TABLE 4-3
HEALTH ADVISORIES

COMPOUND	ONE DAY mg/L	TEN DAY mg/L
METALS		
Lead		
Selenium		
Antimony		
Cadmium		
Chromium	1.4	1.4
Copper		
Manganese		
Zinc		
Mercury		
Barium		
VOLATILE ORGANICS		
Vinyl chloride		
Chloroethane		
1,1-Dichloroethene		
1,1-Dichloroethane		
1,2-Dichloroethene		
1,2-Dichloroethane	0.74	0.74
2-Butanone	100	40
1,1,1-Trichloroethane		
Trichloroethene		
1,1,2-Trichloroethane	0.6	0.4
4-Methyl-2-pentanone		
Tetrachloroethene	2	2
Toluene	20	3
Ethyl Benzene	32	3.2
Xylenes		
SEMIVOLATILE ORGANICS		
Bis(2-ethylhexyl)phthalate		
PESTICIDES		
DDT		

TABLE 4-4
CARCINOGENIC TOXICITY DATA

COMPOUND	Carcinogen Classification	Source	Cancer Slope Factors (mg/Kg/day)-1 Oral	Inhalation	Source
METALS					
Lead	B2	IRIS			
Selenium	B2	HEAST			
Antimony					
Cadmium	B1	IRIS		6.1	IRIS
Chromium	A	IRIS		41	IRIS
Copper	D	IRIS			
Manganese	D	IRIS			
Zinc					
Mercury	D	IRIS			
Barium					
VOLATILE ORGANICS					
Vinyl chloride	A	HEAST	1.9	0.294	HEAST
Chloroethane					
1,1-Dichloroethene	C	IRIS	0.6	1.2	IRIS
1,1-Dichloroethane	C	IRIS			
1,2-Dichloroethene					
1,2-Dichloroethane	B2	HEAST	0.091	0.091	IRIS
2-Butanone	D	IRIS			
1,1,1-Trichloroethane	D	IRIS			
Trichloroethene	B2	HEAST	0.011	0.017	HEAST
1,1,2-Trichloroethane	C	IRIS	0.057	0.057	IRIS
4-Methyl-2-pentanone					
Tetrachloroethene	B2	HEAST	0.051	0.00182	HEAST
Toluene	D	IRIS			
Ethyl Benzene	D	IRIS			
Xylenes	D	IRIS			
SEMIVOLATILE ORGANICS					
Bis(2-ethylhexyl)phthalate	B2	IRIS	0.014		IRIS
PESTICIDES					
DDT	B2	IRIS	0.34		IRIS

ABBREVIATIONS

IRIS - Integrated Risk Information System

HEAST - Health Effects Assessment Summary Tables 1991

* - Chromium III toxicity values were used for noncarcinogenic effects
Chromium VI toxicity values were used for carcinogenic effects.

TABLE 4-5
SUMMARY OF TOXICITY ASSESSMENT

COMPOUND	Chronic Reference Doses mg/Kg/day Oral	Inhalation	Source	Cancer Slope Factors (mg/Kg/day)-1 Oral	Inhalation	Source
METALS						
Lead	ND	ND				
Selenium	ND	ND				
Antimony	0.0004	ND	IRIS			
Cadmium	0.0005	ND	IRIS		6.1	IRIS
Chromium *	1	5.71E-07	IRIS/HEAST		41	IRIS
Copper	0.04	ND	HEAST			
Manganese	0.1	1.14E-04	IRIS/HEAST			
Zinc	0.2	ND	HEAST			
Mercury	0.0003	8.57E-05	HEAST			
Barium	0.05	0.0001	HEAST			
VOLATILE ORGANICS						
Vinyl chloride	ND	ND		1.9	0.294	HEAST
Chloroethane	ND	0.029	HEAST			
1,1-Dichloroethene	0.009	ND	IRIS	0.6	1.2	IRIS
1,1-Dichloroethane	0.1	0.1	HEAST			
1,2-Dichloroethene	0.01	ND	IRIS/HEAST			
1,2-Dichloroethane	ND	ND		0.091	0.091	IRIS
2-Butanone	0.05	0.09	IRIS/HEAST			
1,1,1-Trichloroethane	0.009	0.3	IRIS/HEAST			
Trichloroethene	ND	ND		0.011	0.017	HEAST
1,1,2-Trichloroethane	0.004	ND	IRIS	0.057	0.057	IRIS
4-Methyl-2-pentanone	0.05	0.02	IRIS/HEAST			
Tetrachloroethene	0.01	ND	IRIS	0.051	0.00182	HEAST
Toluene	0.2	0.57	IRIS/HEAST			
Ethyl Benzene	0.1	0.29	IRIS/HEAST			
Xylenes	2	0.086	IRIS/HEAST			
SEMIVOLATILE ORGANICS						
Bis(2-ethylhexyl)phthalate	0.02	ND	IRIS	0.014		IRIS
PESTICIDES						
DDT	0.0005	ND	IRIS	0.34		IRIS

ABBREVIATIONS

IRIS - Integrated Risk Information System

HEAST - Health Effects Assessment Summary Tables 1991

* - Chromium III toxicity values were used for noncarcinogenic effects
Chromium VI toxicity values were used for carcinogenic effects.

ND - no data

NA - not applicable

TABLE 4-6
SUMMARY OF ARARs FOR THE HUNTERSTOWN ROAD SITE

	FINAL		PROPOSED		
COMPOUND	MCL	MCLG	MCL	MCLG	SOURCE
METALS					
Lead	0.05		0.005	0	
Selenium	0.05	0.05			Jan 30, 1991
Antimony			0.01	0.003	July 25, 1990
Cadmium	0.005	0.005			Jan 30, 1991
Chromium *	0.1	0.1			Jan 30, 1991
Copper *	1			1.3	May 17,1990
Manganese *	0.05				May 17,1990
Zinc *	5				May 17,1990
Mercury	0.002	0.002			May 17,1990
Barium	1		2	2	May 17,1990; Jan 30, 1991
VOLATILE ORGANICS					
Vinyl chloride	0.002	0			May 17,1990
Chloroethane					
1,1-Dichloroethene	0.007	0.007			May 17,1990
1,1-Dichloroethane					
1,2-Dichloroethene **	0.1/0.07	0.1/0.07			May 17,1990
1,2-Dichloroethane	0.005	0			May 17,1990
2-Butanone					
1,1,1-Trichloroethane	0.2	0.2			May 17,1990
Trichloroethene	0.005	0			May 17,1990
1,1,2-Trichloroethane			0.005		July 25,1990
4-Methyl-2-pentanone					
Tetrachloroethene	0.005				Jan 30 1991
Toluene	1	1			Jan 30 1991
Ethyl Benzene	0.7	0.7			Jan 30 1991
Xylenes	10	10			Jan 30 1991
SEMIVOLATILE ORGANICS					
Bis(2-ethylhexyl)phthalate					
PESTICIDES					
DDT					

* Secondary MCL

** Trans/ cis

May 17 1990 — Fact Sheet prepared by the Criteria & Stds Div. EPA

July 25, 1990 Federal Register

Jan 30 1991 Federal Register

TABLE 5-1

COMPARISON OF ARARs TO SOURCE CONCENTRATIONS OF COMPOUNDS-OF-INTEREST IN GROUNDWATER FOR THE HUNTERSTOWN ROAD SITE

	FINAL		PROPOSED		Source Concentrations (a)				Concentration Exceeds MCL?			
COMPOUND	MCL	MCLG	MCL	MCLG	Near-site Groundwater	Lagoon Area	Drum Area 1	Drum Area 2	Near-site Groundwater	Lagoon Area	Drum Area 1	Drum Area 2
METALS												
Lead	0.05		0.005	0	0.004	NA	NA	0.002				
Selenium	0.05	0.05			NA	NA	NA	NA				
Antimony			0.01	0.003	NA	NA	NA	NA				
Cadmium	0.005	0.005			NA	NA	NA	NA				
Chromium *	0.1	0.1			NA	NA	NA	NA				
Copper *	1			1.3	NA	NA	NA	NA				
Manganese *	0.05				NA	NA	NA	NA				
Zinc *	5				NA	NA	NA	NA				
Mercury	0.002	0.002			NA	NA	NA	NA				
Barium	1		2	2	NA	0.100	NA	NA				
VOLATILE ORGANICS												
Vinyl chloride	0.002	0			NA	1.400	NA	NA		yes		
Chloroethane					NA	0.310	NA	NA				
1,1-Dichloroethene	0.007	0.007			0.016	0.290	0.310	0.025	yes	yes	yes	yes
1,1-Dichloroethane					0.003	2.400	0.027	NA				
1,2-Dichloroethene **	0.1/0.07	0.1/0.07			0.083	9.200	0.100	0.006	yes	yes	yes	
1,2-Dichloroethane	0.005	0			NA	NA	NA	NA				
2-Butanone					NA	NA	NA	NA				
1,1,1-Trichloroethane	0.2	0.2			0.028	0.820	0.570	0.085		yes	yes	
Trichloroethene	0.005	0			0.165	48.000	0.140	0.018	yes	yes	yes	yes
1,1,2-Trichloroethane			0.005		NA	0.013	NA	NA		yes		
4-Methyl-2-pentanone					NA	NA	NA	NA				
Tetrachloroethene	0.005				NA	0.038	NA	NA		yes		
Toluene	1	1			NA	0.013	NA	NA				
Ethyl Benzene	0.7	0.7			NA	NA	NA	NA				
Xylenes	10	10			NA	0.180	NA	NA				
SEMIVOLATILE ORGANICS												
Bis(2-ethylhexyl)phthalate					0.017	0.005	0.005	0.005				
PESTICIDES												
DDT					NA	NA	NA	NA				

* Secondary MCL

** Trans/ cis

(a) – Nearsite groundwater under current conditions is actually derived from groundwater concentrations from the drum areas.

[redacted] concentrations are mg/L.

TABLE 5-2
SUMMARY OF CANCER RISKS FOR ON-SITE VISITOR CHILDREN

	SURFACE SOIL AREAS					STREAM AREAS	
Chemical-of-Interest	Borrow Area	Lagoon Area	Stressed Vegetation Area	North Cornfield Area	South Cornfield Area	East Stream	Middle Stream
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	1.39E-12	1.86E-12	0.00E+00	0.00E+00
Chromium	0.00E+00	6.21E-09	7.75E-09	7.12E-10	2.62E-09	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	0.00E+00	3.97E-07	0.00E+00	0.00E+00	0.00E+00	7.42E-09	0.00E+00
Chloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methylene Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	0.00E+00	2.74E-07	0.00E+00	0.00E+00	0.00E+00	2.54E-08	0.00E+00
1,1-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane	0.00E+00	1.39E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.37E-09
2-Butanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethene	2.49E-11	1.94E-09	9.86E-11	0.00E+00	1.89E-10	2.29E-08	0.00E+00
1,1,2-Trichloroethane	0.00E+00	2.56E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	0.00E+00	4.01E-10	4.66E-11	7.24E-11	4.80E-11	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bis (ethylhexyl) phthalate	1.45E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E-09
DDT	0.00E+00	0.00E+00	1.24E-09	1.10E-09	1.32E-09	0.00E+00	0.00E+00
Total:	1.48E-09	6.81E-07	9.13E-09	1.88E-09	4.18E-09	5.57E-08	5.37E-09

TABLE 5-3

SUMMARY OF HAZARD INDEX FOR ON-SITE VISITOR CHILDREN

	SURFACE SOIL AREAS					STREAM AREAS	
Chemical-of-Interest	Borrow Area	Lagoon Area	Stressed Vegetation Area	North Cornfield Area	South Cornfield Area	East Stream	Middle Stream
Lead	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Selenium	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Antimony	0.00	0.01	0.01	0.00	0.00	0.000	0.000
Cadmium	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Chromium	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Copper	0.00	0.01	0.01	0.00	0.01	0.004	0.001
Manganese	0.00	0.00	0.00	0.00	0.00	0.007	0.020
Zinc	0.00	0.00	0.00	0.00	0.00	0.001	0.001
Mercury	0.00	0.01	0.03	0.08	0.10	0.000	0.000
Barium	0.00	0.00	0.01	0.35	0.04	0.000	0.000
Vinyl Chloride	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Chloroethane	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Methylene Chloride	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Acetone	0.00	0.00	0.00	0.00	0.00	0.000	0.000
1,1-Dichloroethene	0.00	0.00	0.00	0.00	0.00	0.000	0.000
1,1-Dichloroethane	0.00	0.00	0.00	0.00	0.00	0.000	0.000
1,2-Dichloroethene	0.00	0.00	0.00	0.00	0.00	0.001	0.000
1,2-Dichloroethane	0.00	0.00	0.00	0.00	0.00	0.000	0.000
2-Butanone	0.00	0.00	0.00	0.00	0.00	0.000	0.000
1,1,1-Trichloroethane	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Trichloroethene	0.00	0.00	0.00	0.00	0.00	0.000	0.000
1,1,2-Trichloroethane	0.00	0.00	0.00	0.00	0.00	0.000	0.000
4-Methyl-2-Pentanone	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Tetrachloroethene	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Toluene	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Ethylbenzene	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Xylenes (total)	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Bis (ethylhexyl) phthalate	0.00	0.00	0.00	0.00	0.00	0.000	0.000
DDT	0.00	0.00	0.00	0.00	0.00	0.000	0.000
Total:	0.002	0.031	0.059	0.439	0.147	0.012	0.021

TABLE 5-4
SUMMARY OF CANCER RISKS BY PATHWAY AND CHEMICAL FOR NEAR-SITE RESIDENT ADULTS IN THE CURRENT LAND USE SCENARIO

Chemical-of-Interest	Incidental Ingestion Irrigated Soil	Dermal Contact Irrigated Soils	Inhalation of Showerroom Air	Inhalation of of Vols with Irrigation	Inhalation of Vols and Dust Garden Soils	Dermal Contact Groundwater in Shower	Ingestion of Groundwater	Total Oral	Total Inhal	Total
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methylene Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	9.97E-10	5.49E-10	2.67E-05	1.14E-07	2.58E-06	2.17E-07	1.12E-04	1.12E-04	2.94E-05	1.42E-04
1,1-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Butanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethene	3.67E-10	2.02E-10	3.47E-06	1.49E-08	3.05E-07	4.12E-08	2.13E-05	2.13E-05	3.79E-06	2.51E-05
1,1,2-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bis (ethylhexyl) phthalate	6.21E-09	3.41E-09	0.00E+00	0.00E+00	0.00E+00	5.39E-09	2.78E-06	2.79E-06	0.00E+00	2.79E-06
DDT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	7.57E-09	4.17E-09	3.02E-05	1.29E-07	2.89E-06	2.64E-07	1.36E-04	1.36E-04	3.32E-05	1.69E-04

TABLE 5-5
SUMMARY OF HAZARD INDEX BY PATHWAY AND CHEMICAL FOR
NEAR-SITE RESIDENT ADULTS IN THE CURRENT LAND USE SCENARIO

Chemical-of-Interest	Incidental Ingestion Irrigated Soil	Dermal Contact Irrigated Soils	Inhalation of Showerroom Air	Inhalation of of Vols with Irrigation	Inhalation of Vols and Dust Garden Soils	Dermal Contact Groundwater in Shower	Ingestion of Groundwater	Total Oral	Total Inhal	Total
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Selenium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Copper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manganese	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zinc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vinyl Chloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methylene Chloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acetone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1-Dichloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.05
1,1-Dichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,2-Dichloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.23	0.00	0.23
1,2-Dichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-Butanone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1,1-Trichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01
Trichloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1,2-Trichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4-Methyl-2-Pentanone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetrachloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Toluene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylbenzene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xylenes (total)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bis (ethylhexyl) phthalate	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.02
DDT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.31	0.00	0.31

TABLE 5-6
SUMMARY OF CANCER RISKS BY PATHWAY AND CHEMICAL FOR NEAR-SITE RESIDENT CHILDREN IN THE CURRENT LAND USE SCENARIO

Chemical-of-Interest	Incidental Ingestion Irrigated Soil	Dermal Contact Irrigated Soils	Inhalation of Showerroom Air	Inhalation of of Vols with Irrigation	Inhalation of Vols and Dust Garden Soils	Dermal Contact Groundwater in Shower	Ingestion of Groundwater	Total Oral	Total Inhal	Total
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methylene Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	5.24E-09	1.40E-09	3.71E-05	2.24E-07	5.05E-06	2.52E-07	1.90E-04	1.90E-04	4.24E-05	2.33E-04
1,1-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Butanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethene	1.93E-09	5.14E-10	4.82E-06	2.91E-08	5.97E-07	4.78E-08	3.61E-05	3.61E-05	5.45E-06	4.16E-05
1,1,2-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bis (ethylhexyl) phthalate	3.26E-08	8.69E-09	0.00E+00	0.00E+00	0.00E+00	6.26E-09	4.72E-06	4.76E-06	0.00E+00	4.76E-06
DDT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	3.98E-08	1.06E-08	4.20E-05	2.53E-07	5.65E-06	3.06E-07	2.31E-04	2.31E-04	4.79E-05	2.79E-04

TABLE 5-7

SUMMARY OF HAZARD INDEX BY PATHWAY AND CHEMICAL FOR NEAR-SITE RESIDENT CHILDREN IN THE CURRENT LAND USE SCENARIO

Chemical-of-Interest	Incidental Ingestion Irrigated Soil	Dermal Contact Irrigated Soils	Inhalation of Showerroom Air	Inhalation of of Vols with Irrigation	Inhalation of Vols and Dust Garden Soils	Dermal Contact Groundwater in Shower	Ingestion of Groundwater	Total Oral	Total Inhal	Total
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Selenium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Copper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manganese	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zinc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vinyl Chloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methylene Chloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acetone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1-Dichloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.00	0.08
1,1-Dichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,2-Dichloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.38	0.00	0.38
1,2-Dichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-Butanone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1,1-Trichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01
Trichloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1,2-Trichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4-Methyl-2-Pentanone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetrachloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Toluene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylbenzene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xylenes (total)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bis (ethylhexyl) phthalate	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.00	0.04
DDT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.52	0.00	0.52

TABLE 5-8

SUMMARY OF CANCER RISKS BY PATHWAY AND CHEMICAL FOR
NEAR-SITE RESIDENT YOUNG CHILDREN IN THE CURRENT LAND USE SCENARIO

Chemical-of-Interest	Incidental Ingestion Irrigated Soil	Dermal Contact Irrigated Soils	Inhalation of Showerroom Air	Inhalation of of Vols with Irrigation	Inhalation of Vols and Dust Garden Soils	Dermal Contact Groundwater in Shower	Ingestion of Groundwater	Total Oral	Total Inhal	Total
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methylene Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	2.98E-09	4.18E-10	2.00E-05	8.55E-08	1.93E-06	6.11E-08	6.28E-05	6.29E-05	2.20E-05	8.48E-05
1,1-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Butanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethene	1.10E-09	1.54E-10	2.59E-06	1.11E-08	2.28E-07	1.16E-08	1.19E-05	1.19E-05	2.83E-06	1.48E-05
1,1,2-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bis (ethylhexyl) phthalate	1.86E-08	2.60E-09	0.00E+00	0.00E+00	0.00E+00	1.52E-09	1.56E-06	1.58E-06	0.00E+00	1.58E-06
DDT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	2.27E-08	3.18E-09	2.26E-05	9.66E-08	2.16E-06	7.42E-08	7.63E-05	7.64E-05	2.48E-05	1.01E-04

TABLE 5-9

SUMMARY OF HAZARD INDEX BY PATHWAY AND CHEMICAL FOR
NEAR-SITE RESIDENT YOUNG CHILDREN IN THE CURRENT LAND USE SCENARIO

Chemical-of-Interest	Incidental Ingestion Irrigated Soil	Dermal Contact Irrigated Soils	Inhalation of Showerroom Air	Inhalation of of Vols with Irrigation	Inhalation of Vols and Dust Garden Soils	Dermal Contact Groundwater in Shower	Ingestion of Groundwater	Total Oral	Total Inhal	Total
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Selenium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Copper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manganese	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zinc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vinyl Chloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Methylene Chloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acetone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1-Dichloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.16	0.00	0.16
1,1-Dichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,2-Dichloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.76	0.00	0.76
1,2-Dichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-Butanone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1,1-Trichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.03
Trichloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1,2-Trichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4-Methyl-2-Pentanone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetrachloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Toluene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylbenzene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xylenes (total)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bis (ethylhexyl) phthalate	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.00	0.08
DDT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.00	0.00	0.00	0.00	1.03	1.04	0.00	1.04

TABLE 5-10

SUMMARY OF CANCER RISKS FOR FUTURE ON-SITE CONSTRUCTION WORKERS TO SURFACE SOILS

Chemical-of-Interest	Borrow Area	Lagoon Area	Stressed Vegetation Area	North Cornfield Area	South Cornfield Area	Drum Burial Area 1	Drum Burial Area 2
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	1.16E-12	1.55E-12	0.00E+00	0.00E+00
Chromium	0.00E+00	1.69E-08	2.10E-08	5.94E-10	2.19E-09	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	0.00E+00	1.00E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methylene Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	0.00E+00	7.31E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane	0.00E+00	3.55E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Butanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethene	6.45E-11	5.01E-09	2.55E-10	0.00E+00	1.50E-10	0.00E+00	0.00E+00
1,1,2-Trichloroethane	0.00E+00	5.13E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	0.00E+00	5.02E-10	5.83E-11	2.79E-11	1.85E-11	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bis (ethylhexyl) phthalate	1.07E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DDT	0.00E+00	0.00E+00	9.51E-10	2.59E-10	3.11E-10	0.00E+00	0.00E+00
Total:	1.14E-09	1.76E-06	2.23E-08	8.82E-10	2.67E-09	0.00E+00	0.00E+00

TABLE 5-10 (con't)
SUMMARY OF CANCER RISKS FOR FUTURE ON-SITE CONSTRUCTION WORKERS
TO SUBSURFACE SOILS

Chemical-of-Interest	Borrow Area	Lagoon Area	Stressed Vegetation Area	North Cornfield Area	South Cornfield Area	Drum Burial Area 1	Drum Burial Area 2
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium	0.00E+00	0.00E+00	4.05E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methylene Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.03E-08	0.00E+00
2-Butanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.11E-09	3.97E-10
1,1,2-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.36E-09	0.00E+00
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bis (ethylhexyl) phthalate	1.56E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DDT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total:	1.56E-10	0.00E+00	4.05E-09	0.00E+00	0.00E+00	5.17E-08	3.97E-10

TABLE 5-11

SUMMARY OF HAZARD INDEX FOR FUTURE ON-SITE CONSTRUCTION WORKERS TO SURFACE SOILS

Chemical-of-Interest	Borrow Area	Lagoon Area	Stressed Vegetation Area	North Comfield Area	South Comfield Area	Drum Burial Area 1	Drum Burial Area 2
Lead	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Selenium	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Antimony	0.000	0.028	0.029	0.000	0.000	0.000	0.000
Cadmium	0.000	0.000	0.000	0.001	0.001	0.000	0.000
Chromium	0.000	0.026	0.033	0.001	0.003	0.000	0.000
Copper	0.008	0.038	0.021	0.002	0.007	0.000	0.000
Manganese	0.000	0.000	0.014	0.000	0.000	0.000	0.000
Zinc	0.001	0.001	0.001	0.005	0.001	0.000	0.000
Mercury	0.000	0.231	0.573	0.482	0.589	0.000	0.000
Barium	0.000	0.000	0.042	0.440	0.047	0.000	0.000
Vinyl Chloride	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Chloroethane	0.000	0.004	0.000	0.000	0.000	0.000	0.000
Methylene Chloride	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Acetone	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,1-Dichloroethene	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,1-Dichloroethane	0.000	0.008	0.000	0.000	0.000	0.000	0.000
1,2-Dichloroethene	0.000	0.002	0.000	0.000	0.000	0.000	0.000
1,2-Dichloroethane	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-Butanone	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,1,1-Trichloroethane	0.000	0.002	0.000	0.000	0.000	0.000	0.000
Trichloroethene	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,1,2-Trichloroethane	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4-Methyl-2-Pentanone	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tetrachloroethene	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Toluene	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Xylenes (total)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Bis (ethylhexyl) phthalate	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DDT	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total:	0.008	0.340	0.713	0.930	0.649	0.000	0.000

TABLE 5-11 (con't)
SUMMARY OF HAZARD INDEX FOR FUTURE ON-SITE CONSTRUCTION WORKERS
TO SUBSURFACE SOILS

Chemical-of-Interest	Borrow Area	Lagoon Area	Stressed Vegetation Area	North Cornfield Area	South Cornfield Area	Drum Burial Area 1	Drum Burial Area 2
Lead	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Selenium	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Antimony	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Cadmium	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Chromium	0.000	0.000	0.006	0.000	0.000	0.000	0.000
Copper	0.003	0.001	0.001	0.000	0.000	0.000	0.000
Manganese	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Zinc	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mercury	0.000	0.000	0.000	0.100	0.175	0.000	0.000
Barium	0.000	0.000	0.009	0.009	0.009	0.000	0.000
Vinyl Chloride	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Chloroethane	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Methylene Chloride	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Acetone	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,1-Dichloroethene	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,1-Dichloroethane	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,2-Dichloroethene	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,2-Dichloroethane	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-Butanone	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,1,1-Trichloroethane	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Trichloroethene	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,1,2-Trichloroethane	0.000	0.000	0.000	0.000	0.000	0.000	0.000
4-Methyl-2-Pentanone	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tetrachloroethene	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Toluene	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Xylenes (total)	0.000	0.000	0.000	0.000	0.000	0.004	0.000
Bis (ethylhexyl) phthalate	0.000	0.000	0.000	0.000	0.000	0.000	0.000
DDT	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total:	0.003	0.001	0.016	0.109	0.184	0.004	0.000

TABLE 5-12
SUMMARY OF CANCER RISKS FOR FUTURE ON-SITE RESIDENT ADULTS

	SURFACE SOILS					GROUNDWATER		
Chemical-of-Interest	Borrow Area	Lagoon Area	Stressed Vegetation Area	North Cornfield Area	South Cornfield Area	Lagoon Area	Drum Burial Area 1	Drum Burial Area 2
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	5.80E-11	7.75E-11	0.00E+00	0.00E+00	0.00E+00
Chromium	0.00E+00	8.43E-07	1.05E-06	2.97E-08	1.09E-07	0.00E+00	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	0.00E+00	4.94E-05	0.00E+00	0.00E+00	0.00E+00	3.21E-02	0.00E+00	0.00E+00
Chloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methylene Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	0.00E+00	3.64E-05	0.00E+00	0.00E+00	0.00E+00	2.62E-03	2.80E-03	2.19E-04
1,1-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane	0.00E+00	1.76E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Butanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethene	3.19E-09	2.48E-07	1.26E-08	0.00E+00	7.45E-09	7.41E-03	2.16E-05	2.71E-06
1,1,2-Trichloroethane	0.00E+00	2.40E-08	0.00E+00	0.00E+00	0.00E+00	9.22E-06	0.00E+00	0.00E+00
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	0.00E+00	1.97E-08	2.29E-09	1.10E-09	7.27E-10	2.29E-05	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bis (ethylhexyl) phthalate	2.75E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.24E-07	8.24E-07	8.24E-07
DDT	0.00E+00	0.00E+00	2.55E-08	6.93E-09	8.34E-09	0.00E+00	0.00E+00	0.00E+00
Total:	3.07E-08	8.71E-05	1.09E-06	3.78E-08	1.26E-07	4.22E-02	2.83E-03	2.22E-04

TABLE 5-13

SUMMARY OF HAZARD INDEX FOR FUTURE ON-SITE RESIDENT ADULTS

	SURFACE SOILS					GROUNDWATER		
Chemical-of-Interest	Borrow Area	Lagoon Area	Stressed Vegetation Area	North Cornfield Area	South Cornfield Area	Lagoon Area	Drum Burial Area 1	Drum Burial Area 2
Lead	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Selenium	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Antimony	0.000	0.067	0.070	0.000	0.000	0.000	0.000	0.000
Cadmium	0.000	0.000	0.000	0.002	0.003	0.000	0.000	0.000
Chromium	0.000	0.086	0.107	0.003	0.011	0.000	0.000	0.000
Copper	0.018	0.090	0.050	0.005	0.017	0.000	0.000	0.000
Manganese	0.000	0.000	0.033	0.000	0.000	0.000	0.000	0.000
Zinc	0.002	0.003	0.002	0.011	0.003	0.000	0.000	0.000
Mercury	0.000	0.771	1.909	1.606	1.962	0.000	0.000	0.000
Barium	0.000	0.000	0.101	1.050	0.112	0.055	0.000	0.000
Vinyl Chloride	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Chloroethane	0.000	0.013	0.000	0.000	0.000	0.047	0.000	0.000
Methylene Chloride	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Acetone	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,1-Dichloroethene	0.000	0.000	0.000	0.000	0.000	0.885	0.946	0.076
1,1-Dichloroethane	0.000	0.026	0.000	0.000	0.000	0.751	0.008	0.000
1,2-Dichloroethene	0.000	0.003	0.000	0.000	0.000	25.254	0.275	0.016
1,2-Dichloroethane	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-Butanone	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,1,1-Trichloroethane	0.000	0.006	0.000	0.000	0.000	0.259	0.180	0.027
Trichloroethene	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,1,2-Trichloroethane	0.000	0.000	0.000	0.000	0.000	0.086	0.000	0.000
4-Methyl-2-Pentanone	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tetrachloroethene	0.000	0.000	0.000	0.000	0.000	0.104	0.000	0.000
Toluene	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Xylenes (total)	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.000
Bis (ethylhexyl) phthalate	0.000	0.000	0.000	0.000	0.000	0.007	0.007	0.007
DDT	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total:	0.020	1.066	2.273	2.676	2.108	27.460	1.416	0.126

TABLE 5-14
SUMMARY OF CANCER RISKS FOR FUTURE ON-SITE RESIDENT CHILDREN

	SURFACE SOILS					GROUNDWATER		
Chemical-of-Interest	Borrow Area	Lagoon Area	Stressed Vegetation Area	North Cornfield Area	South Cornfield Area	Lagoon Area	Drum Burial Area 1	Drum Burial Area 2
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	1.13E-10	1.51E-10	0.00E+00	0.00E+00	0.00E+00
Chromium	0.00E+00	1.65E-06	2.05E-06	5.80E-08	2.13E-07	0.00E+00	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	0.00E+00	9.70E-05	0.00E+00	0.00E+00	0.00E+00	5.40E-02	0.00E+00	0.00E+00
Chloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methylene Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	0.00E+00	7.13E-05	0.00E+00	0.00E+00	0.00E+00	4.15E-03	4.44E-03	3.58E-04
1,1-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane	0.00E+00	3.45E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Butanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethene	6.26E-09	4.87E-07	2.48E-08	0.00E+00	1.46E-08	1.19E-02	3.48E-05	4.48E-06
1,1,2-Trichloroethane	0.00E+00	4.84E-08	0.00E+00	0.00E+00	0.00E+00	1.52E-05	0.00E+00	0.00E+00
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	0.00E+00	4.33E-08	5.03E-09	2.41E-09	1.60E-09	3.88E-05	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bis (ethylhexyl) phthalate	7.70E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.40E-06	1.40E-06	1.40E-06
DDT	0.00E+00	0.00E+00	6.94E-08	1.89E-08	2.27E-08	0.00E+00	0.00E+00	0.00E+00
Total:	8.32E-08	1.71E-04	2.15E-06	7.94E-08	2.52E-07	7.02E-02	4.48E-03	3.64E-04

TABLE 5-15

SUMMARY OF HAZARD INDEX FOR FUTURE ON-SITE RESIDENT CHILDREN

	SURFACE SOILS					GROUNDWATER		
Chemical-of-Interest	Borrow Area	Lagoon Area	Stressed Vegetation Area	North Cornfield Area	South Cornfield Area	Lagoon Area	Drum Burial Area 1	Drum Burial Area 2
Lead	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Selenium	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Antimony	0.000	0.180	0.190	0.000	0.000	0.000	0.000	0.000
Cadmium	0.000	0.000	0.000	0.006	0.008	0.000	0.000	0.000
Chromium	0.000	0.170	0.212	0.006	0.022	0.000	0.000	0.000
Copper	0.049	0.243	0.135	0.013	0.046	0.000	0.000	0.000
Manganese	0.000	0.000	0.088	0.000	0.000	0.000	0.000	0.000
Zinc	0.005	0.009	0.006	0.029	0.008	0.000	0.000	0.000
Mercury	0.000	1.506	3.729	3.137	3.832	0.000	0.000	0.000
Barium	0.000	0.000	0.272	2.834	0.301	0.931	0.000	0.000
Vinyl Chloride	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Chloroethane	0.000	0.026	0.000	0.000	0.000	0.056	0.000	0.000
Methylene Chloride	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Acetone	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,1-Dichloroethene	0.000	0.000	0.000	0.000	0.000	1.500	1.603	0.129
1,1-Dichloroethane	0.000	0.052	0.000	0.000	0.000	1.226	0.014	0.000
1,2-Dichloroethene	0.000	0.009	0.000	0.000	0.000	42.818	0.465	0.028
1,2-Dichloroethane	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-Butanone	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,1,1-Trichloroethane	0.000	0.011	0.000	0.000	0.000	0.435	0.302	0.045
Trichloroethene	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,1,2-Trichloroethane	0.000	0.000	0.000	0.000	0.000	0.145	0.000	0.000
4-Methyl-2-Pentanone	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tetrachloroethene	0.000	0.000	0.000	0.000	0.000	0.177	0.000	0.000
Toluene	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Xylenes (total)	0.000	0.000	0.000	0.000	0.000	0.013	0.000	0.000
Bis (ethylhexyl) phthalate	0.001	0.000	0.000	0.000	0.000	0.012	0.012	0.012
DDT	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000
Total:	0.054	2.207	4.632	6.024	4.217	47.316	2.396	0.214

TABLE 5-16
SUMMARY OF CANCER RISKS FOR FUTURE ON-SITE RESIDENT YOUNG CHILDREN

	SURFACE SOILS					GROUNDWATER		
Chemical-of-Interest	Borrow Area	Lagoon Area	Stressed Vegetation Area	North Cornfield Area	South Cornfield Area	Lagoon Area	Drum Burial Area 1	Drum Burial Area 2
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	4.33E-11	5.80E-11	0.00E+00	0.00E+00	0.00E+00
Chromium	0.00E+00	6.30E-07	7.86E-07	2.22E-08	8.17E-08	0.00E+00	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	0.00E+00	3.74E-05	0.00E+00	0.00E+00	0.00E+00	1.75E-02	0.00E+00	0.00E+00
Chloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methylene Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	0.00E+00	2.73E-05	0.00E+00	0.00E+00	0.00E+00	1.15E-03	1.22E-03	9.88E-05
1,1-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane	0.00E+00	1.33E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Butanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethene	2.41E-09	1.87E-07	9.54E-09	0.00E+00	5.62E-09	3.48E-03	1.01E-05	1.30E-06
1,1,2-Trichloroethane	0.00E+00	1.92E-08	0.00E+00	0.00E+00	0.00E+00	4.69E-06	0.00E+00	0.00E+00
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	0.00E+00	1.87E-08	2.17E-09	1.04E-09	6.88E-10	1.28E-05	0.00E+00	0.00E+00
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bis (ethylhexyl) phthalate	3.97E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.61E-07	4.61E-07	4.61E-07
DDT	0.00E+00	0.00E+00	3.52E-08	9.58E-09	1.15E-08	0.00E+00	0.00E+00	0.00E+00
Total:	4.21E-08	6.57E-05	8.33E-07	3.29E-08	9.96E-08	2.22E-02	1.24E-03	1.01E-04

TABLE 5-17
SUMMARY OF HAZARD INDEX FOR FUTURE ON-SITE RESIDENT YOUNG CHILDREN

	SURFACE SOILS					GROUNDWATER		
Chemical-of-Interest	Borrow Area	Lagoon Area	Stressed Vegetation Area	North Cornfield Area	South Cornfield Area	Lagoon Area	Drum Burial Area 1	Drum Burial Area 2
Lead	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Selenium	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Antimony	0.000	0.590	0.621	0.000	0.000	0.000	0.000	0.000
Cadmium	0.000	0.000	0.000	0.018	0.025	0.000	0.000	0.000
Chromium	0.000	0.397	0.495	0.014	0.051	0.000	0.000	0.000
Copper	0.159	0.796	0.442	0.042	0.151	0.000	0.000	0.000
Manganese	0.000	0.000	0.287	0.000	0.000	0.000	0.000	0.000
Zinc	0.015	0.031	0.019	0.095	0.025	0.000	0.000	0.000
Mercury	0.000	3.462	8.575	7.213	8.811	0.000	0.000	0.000
Barium	0.000	0.000	0.889	9.279	0.986	1.844	0.000	0.000
Vinyl Chloride	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Chloroethane	0.000	0.060	0.000	0.000	0.000	0.000	0.000	0.000
Methylene Chloride	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Acetone	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,1-Dichloroethene	0.000	0.000	0.000	0.000	0.000	2.971	3.176	0.256
1,1-Dichloroethane	0.000	0.119	0.000	0.000	0.000	2.213	0.025	0.000
1,2-Dichloroethene	0.000	0.028	0.000	0.000	0.000	84.826	0.922	0.055
1,2-Dichloroethane	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2-Butanone	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,1,1-Trichloroethane	0.000	0.027	0.000	0.000	0.000	0.840	0.584	0.087
Trichloroethene	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
1,1,2-Trichloroethane	0.000	0.000	0.000	0.000	0.000	0.288	0.000	0.000
4-Methyl-2-Pentanone	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Tetrachloroethene	0.000	0.000	0.000	0.000	0.000	0.350	0.000	0.000
Toluene	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000
Ethylbenzene	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Xylenes (total)	0.000	0.001	0.000	0.000	0.000	0.008	0.000	0.000
Bis (ethylhexyl) phthalate	0.002	0.000	0.000	0.000	0.000	0.023	0.023	0.023
DDT	0.000	0.000	0.003	0.001	0.001	0.000	0.000	0.000
Total:	0.176	5.511	11.331	16.662	10.051	93.370	4.730	0.422

TABLE 5-18
SUMMARY OF CANCER RISKS BY PATHWAY AND CHEMICAL FOR NEAR-SITE RESIDENT ADULTS IN THE FUTURE LAND USE SCENARIO

Chemical-of-Interest	Incidental Ingestion Irrigated Soil	Dermal Contact Irrigated Soils	Inhalation of Showerroom Air	Inhalation of of Vols with Irrigation	Inhalation of Vols and Dust Garden Soils	Dermal Contact Groundwater in Shower	Ingestion of Groundwater	Total Oral	Total Inhal	Total
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	2.44E-07	1.34E-07	6.79E-04	2.91E-06	1.27E-04	6.06E-05	3.12E-02	3.13E-02	8.09E-04	3.21E-02
Chloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methylene Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	1.82E-08	1.00E-08	4.87E-04	2.09E-06	4.71E-05	3.96E-06	2.04E-03	2.05E-03	5.36E-04	2.58E-03
1,1-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Butanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethene	1.07E-07	5.89E-08	1.01E-03	4.33E-06	8.90E-05	1.20E-05	6.20E-03	6.21E-03	1.10E-03	7.32E-03
1,1,2-Trichloroethane	6.42E-11	3.53E-11	7.12E-07	3.05E-09	6.51E-09	1.62E-08	8.37E-06	8.38E-06	7.21E-07	9.10E-06
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	1.13E-09	6.23E-10	7.95E-08	3.40E-10	2.23E-08	4.41E-08	2.28E-05	2.28E-05	1.02E-07	2.29E-05
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bis (ethylhexyl) phthalate	1.84E-09	1.01E-09	0.00E+00	0.00E+00	0.00E+00	1.59E-09	8.22E-07	8.26E-07	0.00E+00	8.26E-07
DDT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	3.72E-07	2.05E-07	2.18E-03	9.33E-06	2.63E-04	7.66E-05	3.95E-02	3.96E-02	2.45E-03	4.20E-02

TABLE 5-19

SUMMARY OF HAZARD INDEX BY PATHWAY AND CHEMICAL FOR
NEAR-SITE RESIDENT ADULTS IN THE FUTURE LAND USE SCENARIO

Chemical-of-Interest	Incidental Ingestion Irrigated Soil	Dermal Contact Irrigated Soils	Inhalation of Showerroom Air	Inhalation of of Vols with Irrigation	Inhalation of Vols and Dust Garden Soils	Dermal Contact Groundwater in Shower	Ingestion of Groundwater	Total Oral	Total Inhal	Total
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Selenium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Copper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manganese	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zinc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barium	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.55	0.00	0.55
Vinyl Chloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chloroethane	0.00	0.00	0.04	0.00	0.02	0.00	0.00	0.00	0.06	0.06
Methylene Chloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acetone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1-Dichloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.88	0.00	0.88
1,1-Dichloroethane	0.00	0.00	0.08	0.00	0.01	0.00	0.66	0.66	0.08	0.74
1,2-Dichloroethene	0.00	0.00	0.00	0.00	0.00	0.05	25.21	25.25	0.00	25.25
1,2-Dichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-Butanone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1,1-Trichloroethane	0.00	0.00	0.01	0.00	0.00	0.00	0.25	0.25	0.01	0.26
Trichloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1,2-Trichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.00	0.09
4-Methyl-2-Pentanone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetrachloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.10	0.00	0.10
Toluene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylbenzene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xylenes (total)	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Bis (ethylhexyl) phthalate	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01
DDT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.13	0.00	0.02	0.05	27.74	27.80	0.16	27.96

TABLE 5-20
SUMMARY OF CANCER RISKS BY PATHWAY AND CHEMICAL FOR
NEAR-SITE RESIDENT CHILDREN IN THE FUTURE LAND USE SCENARIO

Chemical-of-Interest	Incidental Ingestion Irrigated Soil	Dermal Contact Irrigated Soils	Inhalation of Showerroom Air	Inhalation of of Vols with Irrigation	Inhalation of Vols and Dust Garden Soils	Dermal Contact Groundwater in Shower	Ingestion of Groundwater	Total Oral	Total Inhal	Total
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	1.28E-06	3.42E-07	9.44E-04	5.69E-06	2.49E-04	7.03E-05	5.30E-02	5.31E-02	1.20E-03	5.43E-02
Chloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methylene Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	9.57E-08	2.55E-08	6.78E-04	4.09E-06	9.22E-05	4.60E-06	3.47E-03	3.47E-03	7.74E-04	4.25E-03
1,1-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Butanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethene	5.63E-07	1.50E-07	1.41E-03	8.48E-06	1.74E-04	1.40E-05	1.05E-02	1.05E-02	1.59E-03	1.21E-02
1,1,2-Trichloroethane	3.38E-10	8.99E-11	9.90E-07	5.97E-09	1.27E-08	1.88E-08	1.42E-05	1.42E-05	1.01E-06	1.52E-05
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	5.96E-09	1.59E-09	1.11E-07	6.66E-10	4.37E-08	5.12E-08	3.86E-05	3.87E-05	1.55E-07	3.88E-05
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bis (ethylhexyl) phthalate	9.65E-09	2.57E-09	0.00E+00	0.00E+00	0.00E+00	1.85E-09	1.39E-06	1.41E-06	0.00E+00	1.41E-06
DDT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	1.96E-06	5.21E-07	3.03E-03	1.83E-05	5.15E-04	8.89E-05	6.70E-02	6.71E-02	3.56E-03	7.07E-02

TABLE 5-21

SUMMARY OF HAZARD INDEX BY PATHWAY AND CHEMICAL FOR NEAR-SITE RESIDENT CHILDREN IN THE FUTURE LAND USE SCENARIO

Chemical-of-Interest	Incidental Ingestion Irrigated Soil	Dermal Contact Irrigated Soils	Inhalation of Showerroom Air	Inhalation of of Vols with Irrigation	Inhalation of Vols and Dust Garden Soils	Dermal Contact Groundwater in Shower	Ingestion of Groundwater	Total Oral	Total Inhal	Total
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Selenium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Copper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manganese	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zinc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barium	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.93	0.00	0.93
Vinyl Chloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chloroethane	0.00	0.00	0.06	0.00	0.03	0.00	0.00	0.00	0.09	0.09
Methylene Chloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acetone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1-Dichloroethene	0.00	0.00	0.00	0.00	0.00	0.00	1.50	1.50	0.00	1.50
1,1-Dichloroethane	0.00	0.00	0.11	0.00	0.01	0.00	1.12	1.12	0.12	1.24
1,2-Dichloroethene	0.00	0.00	0.00	0.00	0.00	0.06	42.77	42.82	0.00	42.82
1,2-Dichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-Butanone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1,1-Trichloroethane	0.00	0.00	0.01	0.00	0.00	0.00	0.42	0.42	0.01	0.44
Trichloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1,2-Trichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.15	0.00	0.15
4-Methyl-2-Pentanone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetrachloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.18	0.00	0.18
Toluene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ethylbenzene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xylenes (total)	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01
Bis (ethylhexyl) phthalate	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01
DDT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.18	0.00	0.05	0.06	47.07	47.14	0.23	47.37

TABLE 5-22

SUMMARY OF CANCER RISKS BY PATHWAY AND CHEMICAL FOR
NEAR-SITE RESIDENT YOUNG CHILDREN IN THE FUTURE LAND USE SCENARIO

Chemical-of-Interest	Incidental Ingestion Irrigated Soil	Dermal Contact Irrigated Soils	Inhalation of Showerroom Air	Inhalation of of Vols with Irrigation	Inhalation of Vols and Dust Garden Soils	Dermal Contact Groundwater in Shower	Ingestion of Groundwater	Total Oral	Total Inhal	Total
Lead	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Antimony	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cadmium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Copper	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manganese	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zinc	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mercury	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Barium	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vinyl Chloride	7.30E-07	1.02E-07	5.08E-04	2.17E-06	9.50E-05	1.71E-05	1.75E-02	1.75E-02	6.05E-04	1.81E-02
Chloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Methylene Chloride	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Acetone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1-Dichloroethene	5.45E-08	7.63E-09	3.64E-04	1.56E-06	3.52E-05	1.12E-06	1.15E-03	1.15E-03	4.01E-04	1.55E-03
1,1-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,2-Dichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2-Butanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1,1,1-Trichloroethane	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Trichloroethene	3.20E-07	4.49E-08	7.57E-04	3.24E-06	6.65E-05	3.38E-06	3.48E-03	3.48E-03	8.26E-04	4.31E-03
1,1,2-Trichloroethane	1.92E-10	2.69E-11	5.32E-07	2.28E-09	4.87E-09	4.57E-09	4.69E-06	4.70E-06	5.39E-07	5.24E-06
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tetrachloroethene	3.39E-09	4.75E-10	5.94E-08	2.55E-10	1.67E-08	1.24E-08	1.28E-05	1.28E-05	7.64E-08	1.29E-05
Toluene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ethylbenzene	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xylenes (total)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bis (ethylhexyl) phthalate	5.49E-09	7.70E-10	0.00E+00	0.00E+00	0.00E+00	4.49E-10	4.61E-07	4.68E-07	0.00E+00	4.68E-07
DDT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	1.11E-06	1.56E-07	1.63E-03	6.98E-06	1.97E-04	2.16E-05	2.22E-02	2.22E-02	1.83E-03	2.40E-02

TABLE 5-23
SUMMARY OF HAZARD INDEX BY PATHWAY AND CHEMICAL FOR
NEAR-SITE RESIDENT YOUNG CHILDREN IN THE FUTURE LAND USE SCENARIO

Chemical-of-Interest	Incidental Ingestion Irrigated Soil	Dermal Contact Irrigated Soils	Inhalation of Showerroom Air	Inhalation of of Vols with Irrigation	Inhalation of Vols and Dust Garden Soils	Dermal Contact Groundwater in Shower	Ingestion of Groundwater	Total Oral	Total Inhal	Total
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Selenium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Antimony	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cadmium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Copper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manganese	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zinc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mercury	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Barium	0.00	0.00	0.00	0.00	0.00	0.00	1.84	1.85	0.00	1.85
Vinyl Chloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chloroethane	0.00	0.00	0.18	0.00	0.07	0.00	0.00	0.00	0.25	0.25
Methylene Chloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Acetone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1-Dichloroethene	0.00	0.00	0.00	0.00	0.00	0.00	2.97	2.97	0.00	2.97
1,1-Dichloroethane	0.00	0.00	0.35	0.00	0.03	0.00	2.21	2.22	0.38	2.59
1,2-Dichloroethene	0.00	0.00	0.00	0.00	0.00	0.08	84.83	84.91	0.00	84.91
1,2-Dichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-Butanone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1,1-Trichloroethane	0.00	0.00	0.04	0.00	0.01	0.00	0.84	0.84	0.04	0.88
Trichloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,1,2-Trichloroethane	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.29	0.00	0.29
4-Methyl-2-Pentanone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tetrachloroethene	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.35	0.00	0.35
Toluene	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01
Ethylbenzene	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Xylenes (total)	0.00	0.00	0.03	0.00	0.00	0.00	0.01	0.01	0.03	0.04
Bis (ethylhexyl) phthalate	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.02
DDT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0.00	0.00	0.59	0.00	0.11	0.09	93.37	93.47	0.71	94.17

TABLE 6-1
TOXICITY CRITERIA FOR SOIL AND BENTHIC INVERTEBRATES

	Acute Criterion, ug/l	Chronic Criterion, ug/l	Reference
VOLATILE ORGANIC COMPOUNDS			
Nonchlorinated Aromatics			
Toluene	3810	635	b
Xylene (total)	4050	675	b
Chlorinated Compounds			
Chloroethane	3480	580	a**
1,1-Dichloroethane	3480	580	b
1,2-Dichloroethane	11800	2000	a*
1,1-Dichloroethene	3480	580	b
1,2-Dichloroethene (Total)	3480	580	b
Tetrachloroethene	528	84	a*
Trichloroethene	4500	2190	a*
1,1,1-Trichloroethane	5400	900	b
1,1,2-Trichloroethane	5400	900	b
Vinyl Chloride	3480	590	a**
Other VOCs			
4-Methyl-2-Pentanone	30000	5000	b**
SEMIVOLATILE COMPOUNDS			
Other Semi-Volatile Compounds			
bis(2-Ethylhexyl)Phthalate	94	0.3	a*
PESTICIDES			
4,4' DDE	105		a*
4,4' DDD			-
4,4'-DDT	1.1	0.001	a

Notes:
a: USEPA(a) (1987)
b: Aquire database
* AWQC calculated as 10% of LOEL provided in listed source
** AWQC estimated from listed source

TABLE 6-2
DDTR DOSE RESPONSE VALUES FOR BIRDS AND MAMMALS

	Doses to Birds, mg/kg/day			Doses to Mammals, mg/kg/day		
	Potential Lethal Effects	Potential Reproductive/ Developmental Effects	Potential Other Chronic Effects	Potential Lethal Effects	Potential Reproductive/ Developmental Effects	Potential Other Chronic Effects
DDTR	8	0.08		0.29	0.1	2.3

Notes:
1)DDTR value in birds is estimated as the lowest LD50 value available in the literaturemultiplied by 0.01; this LD50 value was for pheasant assuming they ate 5% of their body weight per day (Lamb et al., 1970).
2)DDTR reproductive value for birds estimated as lowest available reported effects value of 4 mg/kg for finches; an ingestion rate of 20% of body weight per day was assumed (Garten and Trabalka, 1983).
3) DDTR lethal effects value for mammals is the rported mortality level for rats from long term studies multiplied by 0.1 (ATSDR, 1988).
4) DDTR developmental effects value for mammals is the NOAEL for rats multiplied by 0.1 (ATSDR, 1988).
5)DDTR chronic effects levels in mammals is lowest NOAEL value multiplied by 0.1 (ATSDR, 1988)

TABLE 6-3
METALS DIETARY EFFECTS LEVELS FOR BIRDS AND MAMMALS

Metal	Level	Effect	Species	Reference
Chromium	50 mg/kg	NOAEL	Black Ducks	Haseltine et al., 1985
	50 mg/kg	NOAEL	Guinea pigs	Preston et al., 1976
	1467 mg/kg/day	NOAEL	Rats	ATSDR, 1987
Lead	25 mg/kg	chronic	Mallard Duck	Finley et al., 1986
	5000 mg/kg	NOAEL	Japanese Quail	Hill and Camardese, 1986
	448 mg/kg	NOAEL	American Kestrel	Custer et al, 1984
	0.05 to0.1 mg/kg/day	chronic	Mouse	Schlick et al., 1983
	25 mg/kg	chronic	Rat	Nriagu, 1978
	100 mg/kg/day	teratogenic	Rat	Clark, 1979
Zinc	1000 mg/kg	NOAEL	Chicken	Neathery et al., 1977
	2000 mg/kg	NOAEL	Turkey	Neathery et al., 1977
	1000 to 3000 mg/kg	LD50	Rat	Carson et al., 1986
	25.5 mg/kg/day	NOAEL	Rat	EPA,1984
	95 mg/kg	NOAEL	Rat	EPA, 1984
	188 mg/kg	NOAEL	Mouse	EPA, 1984

Notes: 1. Chromium data is for chromium III.

TABLE 6-4
DAILY DOSE OF DDTR TO SMALL MAMMALS AND BIRDS

	Estimated Soil Invertebrate Body Burden, mg/kg, dry weight		Daily Dose–Shrew, mg/kg/day, wet weight		Daily Dose–Song Bird, mg/kg/day, wet weight	
	95%UCL	Average	95%UCL	Average	95%UCL	Average
DDTR						
Stressed Vegetation Area	0.63	0.31	0.13	0.06	0.03	0.01
North Cornfield	0.11	0.07	0.02	0.01	0.00	0.00

TABLE 6-5
DOSE OF METALS TO
SMALL MAMMALS AND BIRDS

Area	ZINC			COPPER		
	Average Estimated Soil Invertebrate Body Burden, mg/kg, dry wt	Average Daily Dose-Shrew, mg/kg/day, wet weight	Average Daily Dose-Song Bird, mg/kg/day, wet weight	Average Estimated Soil Invertebrate Body Burden, mg/kg, dry wt	Average Daily Dose-Shrew, mg/kg/day, wet weight	Average Daily Dose-Song Bird, mg/kg/day, wet weight
Lagoon	561	112.2	22.44	262.4	52.48	10.50
S.Corn	297.5	59.5	11.90	32.4	6.48	1.30
N.Corn	982.6	196.52	39.30	14	2.8	0.56
Stressed Vegetation	348.5	69.7	13.94	140	28	5.60
Borrow	275.4	55.08	11.02	46.6	9.32	1.86

TABLE 6-5 (con't)
DOSE OF METALS TO
SMALL MAMMALS AND BIRDS

Area	CHROMIUM			LEAD		
	Average Estimated Soil Invertebrate Body Burden, mg/kg, dry wt	Average Daily Dose-Shrew, mg/kg/day, wet weight	Average Daily Dose-Song Bird, mg/kg/day, wet weight	Average Estimated Soil Invertebrate Body Burden, mg/kg, dry wt	Average Daily Dose-Shrew, mg/kg/day, wet weight	Average Daily Dose-Song Bird, mg/kg/day, wet weight
Lagoon	109.62	21.924	4.3848	440.99	88.198	17.6396
S.Corn	12.04	2.408	0.4816	72.58	14.516	2.9032
N.Corn	5.32	1.064	0.2128	228.76	45.752	9.1504
Stressed Vegetation	132.02	26.404	5.2808	794.96	158.992	31.7984
Borrow	6.58	1.316	0.2632	43.13	8.626	1.7252

TABLE 6-6
RISK TO AQUATIC ORGANISMS IN EAST STREAM

	AWQC Fresh Water Acute		AWQC Fresh Water Chronic		1/16/89 SW-1 PH I		10/16/90 SW-7 PH II		10/16/90 SW-10 PH II		10/16/90 SW-14 PH II		10/16/90 SW-26 PH II		Background East Stream 10/16/90 SW-6 PH II
Inorganics (mg/l):															
Lead	0.082		0.0032		0.01		0.031		0.036		0.003	<	0.003		0.004
Chromium	0.016* (1.7)		0.011* (0.21)	<	0.05	<	0.01	<	0.01	<	0.01	<	0.01	<	0.01
Copper	0.018		0.012	<	0.02		0.04		0.02	<	0.02	<	0.02	<	0.02
Manganese					0.02		0.23		0.11		0.04		0.52		0.06
Zinc	0.12		0.11		0.04		0.09		0.04	<	0.02		0.02		0.12
TCL Volatiles (ug/l):															
1,1-Dichloroethene	11600			<	5	<	5		5	<	5	<	5	<	5
1,1-Dichloroethane	118000		20000	<	5	<	5		25	<	5	<	5	<	5
1,2-Dichloroethene	11600				18		280		35	<	5	<	5	<	5
1,1,1-Trichloroethane					8	<	5		65	<	5	<	5	<	5
Trichloroethene	45000		21900		24		310		17	<	5	<	5	<	5

Notes: AWQC, Ambient Water Quality Criteria
* hexavalent Cr (trivalent Cr)

TABLE 6-7
RISK TO AQUATIC ORGANISMS - MIDDLE STREAM

	AWQC Fresh Water Acute	AWQC Fresh Water Chronic		1/16/89 SW-2 PH I		10/19/90 SW-16 PH II		10/16/90 SW-17 PH II		10/16/90 SW-18 PH II		10/16/90 SW-19 PH II		10/16/90 SW-20 PH II		10/16/90 SW-25 PH II		10/17/90 SW-27 PH II		Background Middle Stream 11/21/90 SW-15 PH II
Inorganics (mg/l):																				
Lead	0.082	0.0032	<	0.005		0.014		0.007	<	0.003		0.006	<	0.003	<	0.003	<	0.003	<	0.003
Chromium	0.016* (1.7)	0.011* (0.21)	<	0.05		0.03	<	0.01	<	0.01		0.02	<	0.01	<	0.01	<	0.01	<	0.01
Copper	0.018	0.012	<	0.02	<	0.02	<	0.02	<	0.02		0.04	<	0.02	<	0.02	<	0.02	<	0.02
Manganese				0.12		0.91		0.27		0.24		0.21		0.14		0.06		0.07	<	0.01
Zinc	0.12	0.11		0.08		0.08		0.33		0.06		0.06		0.03	<	0.02	<	0.02		0.03
TCL Volatiles (ug/l):																				
1,1-Dichloroethene	11600		<	5	<	5	<	5	<	5	<	5	<	5	<	5	<	5	<	5
1,1-Dichloroethane	118000	20000	<	5	<	5	<	5	<	5	<	5	<	5	<	5	<	5	<	5
1,2-Dichloroethene	11600		<	5	<	5	<	5	<	5	<	5	<	5	<	5	<	5	<	5
1,1,1-Trichloroethane			<	5	<	5		7	<	5	<	5		8	<	5	<	5	<	5
Trichloroethene	45000	21900	<	5	<	5	<	5	<	5	<	5	<	5	<	5	<	5	<	5

Notes: AWQC, Ambient Water Quality Criteria
* hexavalent Cr (trivalent Cr)

TABLE 6-8
RISKS TO AQUATIC ORGANISMS - WEST STREAM

	AWQC Fresh Water Acute	AWQC Fresh Water Chronic		1/16/89 SW-3 PH I		10/16/90 SW-22 PH II		10/16/90 SW-23 PH II		10/16/90 SW-24 PH II		Background West Stream 10/16/90 SW-21 PH II
Inorganics (mg/l):												
Lead	0.082	0.0032	<	0.005	<	0.003	<	0.003		0.004	<	0.003
Chromium	0.016* (1.7)	0.011* (0.21)	<	0.05	<	0.01	<	0.01		0.02	<	0.01
Copper	0.018	0.012	<	0.02	<	0.02	<	0.02		0.03	<	0.02
Manganese				0.11		0.56		0.42		0.11		2.61
Zinc	0.12	0.11	<	0.02	<	0.02	<	0.02		0.06		0.02
TCL Volatiles (ug/l):												
1,1-Dichloroethene	11600		<	5	<	5	<	5	<	5	<	5
1,1-Dichloroethane	118000	20000		11	<	5	<	5	<	5	<	5
1,2-Dichloroethene	11600			8	<	5	<	5	<	5	<	5
1,1,1-Trichloroethane				37	<	5	<	5	<	5	<	5
Trichloroethene	45000	21900	<	5	<	5	<	5	<	5	<	5

Notes: AWQC, Ambient Water Quality Criteria
* hexavalent Cr (trivalent Cr)

TABLE 7-1
HUMAN HEALTH-BASED CLEANUP LEVELS FOR SURFACE SOILS

Chemical-of-Interest	Maximum Cancer Risk to Surface Soils (a)	(b)	Corresponding Source Concentration (mg/Kg)	Unit Cancer Risk Factor	Cleanup Levels for Carcinogens 10-4 (mg/Kg)	10-6 (mg/Kg)	Maximum Hazard Index to Surface Soils (c)	(b)	Corresponding Source Concentration (mg/Kg)	Unit Hazard Index Factor	Cleanup Levels Noncarcinogens (mg/Kg)	
Lead	0.00E+00		NA	NA	NA	NA	NA		NA	NA	2.00E+02	d
Selenium	0.00E+00		NA	NA	NA	NA	0.003	3	6.89E-01	4.17E-03	2.40E+02	e
Antimony	0.00E+00		NA	NA	NA	NA	0.621	3	1.99E+01	3.12E-02	3.20E+01	
Cadmium	1.51E-10	5	9.88E-01	1.53E-10	6.53E+05	6.53E+03	0.025	5	9.88E-01	2.50E-02	4.01E+01	
Chromium	2.05E-06	3	1.99E+03	1.03E-09	9.72E+04	9.72E+02	0.495	3	1.99E+03	2.48E-04	4.03E+03	
Copper	0.00E+00		NA	NA	NA	NA	0.796	2	2.37E+03	3.36E-04	2.98E+03	
Manganese	0.00E+00		NA	NA	NA	NA	0.287	3	2.28E+03	1.26E-04	7.94E+03	
Zinc	0.00E+00		NA	NA	NA	NA	0.095	4	1.53E+03	6.24E-05	1.60E+04	
Mercury	0.00E+00		NA	NA	NA	NA	8.811	5	3.70E-01	2.38E+01	4.20E-02	
Barium	0.00E+00		NA	NA	NA	NA	9.279	4	3.71E+03	2.50E-03	4.00E+02	
Vinyl Chloride	9.70E-05	2	6.10E-01	1.59E-04	6.29E-01	6.29E-03	NA		NA	NA	NA	
Chloroethane	0.00E+00		NA	NA	NA	NA	0.060	2	5.96E-01	1.01E-01	9.94E+00	
1,1-Dichloroethene	7.13E-05	2	2.91E-01	2.45E-04	4.08E-01	4.08E-03	0.000	2	2.91E-01	1.42E-03	7.05E+02	
1,1-Dichloroethane	0.00E+00		NA	NA	NA	NA	0.119	2	6.10E+00	1.95E-02	5.13E+01	
1,2-Dichloroethene	0.00E+00		NA	NA	NA	NA	0.028	2	2.18E+01	1.28E-03	7.83E+02	
1,2-Dichloroethane	3.45E-07	2	3.78E-02	9.12E-06	1.10E+01	1.10E-01	NA		NA	NA	NA	
2-Butanone	0.00E+00		NA	NA	NA	NA	NA		NA	NA	NA	
1,1,1-Trichloroethane	0.00E+00		NA	NA	NA	NA	0.027	2	1.13E+01	2.36E-03	4.24E+02	
Trichloroethene	4.87E-07	2	3.34E-01	1.46E-06	6.86E+01	6.86E-01	NA		NA	NA	NA	
1,1,2-Trichloroethane	4.84E-08	2	4.80E-02	1.01E-06	9.91E+01	9.91E-01	0.000	2	4.80E-02	3.19E-03	3.13E+02	
4-Methyl-2-Pentanone	0.00E+00		NA	NA	NA	NA	0.000	2	1.45E-01	3.78E-04	2.64E+03	
Tetrachloroethene	4.33E-08	2	1.74E-01	2.48E-07	4.03E+02	4.03E+00	0.000	2	1.74E-01	1.28E-03	7.83E+02	
Toluene	0.00E+00		NA	NA	NA	NA	0.000	2	5.38E-01	3.61E-04	2.77E+03	
Ethylbenzene	0.00E+00		NA	NA	NA	NA	NA		NA	NA	NA	
Xylenes (total)	0.00E+00		NA	NA	NA	NA	0.001	2	3.05E-01	2.26E-03	4.43E+02	
Bis (ethylhexyl) phthalate	7.70E-08	1	3.11E+00	2.48E-08	4.04E+03	4.04E+01	0.002	1	3.11E+00	6.38E-04	1.57E+03	
DDT	6.94E-08	3	1.08E-01	6.43E-07	1.56E+02	1.56E+00	0.003	3	1.08E-01	2.55E-02	3.92E+01	
Total:	1.71E-04	2					10.531	3				

NOTES:

(a) - Maximum cancer risk for on-site developing children to one of the five potential on-site source areas for compounds-of-interest in surface soils.

(b) - Potential on-site source areas where maximum cancer risk or hazard index occurred include:

1 - Borrow Area
2 - Lagoon Area
3 - Stressed Vegetation Area
4 - North Cornfield Area
5 - South Cornfield Area

(c) - Maximum hazard index for young children to one of the five potential on-site source areas for compounds-of-interest in surface soils.

(d) - Health Based cleanup levels for lead based on 200 mg/Kg from EPA's "Three Cities Study".

(e) - Health based cleanup level for selenium based on AIC value reported in SPHEM (EPA, 1986). See Appendix H.

TABLE 7-2
HUMAN HEALTH-BASED CLEANUP LEVELS FOR SUBSURFACE SOILS

Compounds-of-Interest	Maximum Cancer Risk to Subsurface Soils (a)	(b)	Corresponding Source Concentration (mg/Kg)	Unit Cancer Risk Factor	Cleanup Levels for Carcinogens 10-4 (mg/Kg)	Cleanup Levels for Carcinogens 10-6 (mg/Kg)	Maximum Hazard Index to Subsurface Soils (c)	(b)	Corresponding Source Concentration (mg/Kg)	Unit Hazard Index Factor	Cleanup Levels Noncarcinogens (mg/Kg)	
Lead	NA		NA	NA	NA	NA	NA		NA	NA	2.00E+02	d
Selenium	NA		NA	NA	NA	NA	0.0001	3	7.78E-01	1.31E-04	7.63E+03	e
Antimony	NA		NA	NA	NA	NA	NA		NA	NA	NA	
Cadmium	NA		NA	NA	NA	NA	NA		NA	NA	NA	
Chromium	4.05E-09	5	7.01E+01	5.78E-11	1.73E+06	1.73E+04	0.006	5	7.01E+01	8.67E-05	1.15E+04	
Copper	NA		NA	NA	NA	NA	0.003	1	2.44E+02	1.06E-05	9.41E+04	
Manganese	NA		NA	NA	NA	NA	NA		NA	NA	NA	
Zinc	NA		NA	NA	NA	NA	0.0003	1	1.64E+02	1.97E-06	5.07E+05	
Mercury	NA		NA	NA	NA	NA	0.175	4	8.43E-02	2.07E+00	4.83E-01	
Barium	NA		NA	NA	NA	NA	0.009	3	1.17E+02	7.94E-05	1.26E+04	
Vinyl Chloride	NA		NA	NA	NA	NA	NA		NA	NA	NA	
Chloroethane	NA		NA	NA	NA	NA	NA		NA	NA	NA	
1,1-Dichloroethene	NA		NA	NA	NA	NA	NA		NA	NA	NA	
1,1-Dichloroethane	NA		NA	NA	NA	NA	NA		NA	NA	NA	
1,2-Dichloroethene	NA		NA	NA	NA	NA	0.00002	6	3.33E-01	5.75E-05	1.74E+04	
1,2-Dichloroethane	4.03E-08	6	3.32E-01	1.21E-07	8.25E+02	8.25E+00	NA		NA	NA	NA	
2-Butanone	NA		NA	NA	NA	NA	0.00003	6	4.90E-01	6.96E-05	1.44E+04	
1,1,1-Trichloroethane	NA		NA	NA	NA	NA	0.000001	2	6.74E-03	2.00E-04	5.00E+03	
Trichloroethene	7.11E-09	6	3.67E-01	1.94E-08	5.16E+03	5.16E+01	NA		NA	NA	NA	
1,1,2-Trichloroethane	4.36E-09	6	3.34E-01	1.31E-08	7.65E+03	7.65E+01	0.00005	6	3.34E-01	1.44E-04	6.95E+03	
4-Methyl-2-Pentanone	NA		NA	NA	NA	NA	0.00001	6	4.57E-01	2.22E-05	4.50E+04	
Tetrachloroethene	NA		NA	NA	NA	NA	NA		NA	NA	NA	
Toluene	NA		NA	NA	NA	NA	0.00001	6	4.16E-01	2.88E-05	3.48E+04	
Ethylbenzene	NA		NA	NA	NA	NA	0.00004	6	2.28E+00	1.80E-05	5.56E+04	
Xylenes (total)	NA		NA	NA	NA	NA	0.004	6	1.89E+01	1.97E-04	5.09E+03	
Bis (ethylhexyl) phthalate	1.56E-10	1	6.78E-01	2.30E-10	4.35E+05	4.35E+03	0.00002	1	6.78E-01	2.88E-05	3.48E+04	
DDT	NA		NA	NA	NA	NA	NA		NA	NA	NA	
	5.17E-08	6					0.176	4				

NOTES:

(a) - Maximum cancer risk for on-site construction workers to one of the seven potential on-site source areas for compounds-of-interest in subsurface soils.

(b) - Potential on-site source areas where maximum cancer risk or hazard index occurred include:

1 - Borrow Area
2 - Lagoon Area
3 - North Cornfield Area
4 - South Cornfield Area
5 - Stressed Vegetation Area
6 - Drum Burial Area 1
7 - Drum Burial Area 2

(c) - Maximum hazard index for construction workers to one of the seven potential on-site source areas for compounds-of-interest in subsurface soils.

(d) - Health based cleanup levels for lead based on 200 mg/Kg from EPA's "Three Cities Study".

(e) - Health based cleanup level for selenium based on an AIC value reported in SPHEM (EPA, 1986). See Appendix H.

TABLE 7-3

HUMAN HEALTH-BASED CLEANUP LEVELS FOR GROUNDWATER
BASED ON IRRIGATION USES OF GROUNDWATER

Chemical-of-Interest	Near-site Developing Children Cancer Risk	Lagoon Area GW Source Concentration	Unit Cancer Risk Factor	Cleanup Levels for Carcinogens 10-4 (mg/L)	Cleanup Levels for Carcinogens 10-6 (mg/L)	Near-site Young Children Hazard Index	Unit Cancer Risk Factor	Cleanup Levels Noncarcinogens (mg/L)
Lead	0.00E+00	0.00E+00	NA	NA	NA	0.00	NA	NA
Selenium	0.00E+00	0.00E+00	NA	NA	NA	0.00	NA	NA
Antimony	0.00E+00	0.00E+00	NA	NA	NA	0.00	NA	NA
Cadmium	0.00E+00	0.00E+00	NA	NA	NA	0.00	NA	NA
Chromium	0.00E+00	0.00E+00	NA	NA	NA	0.00	NA	NA
Copper	0.00E+00	0.00E+00	NA	NA	NA	0.00	NA	NA
Manganese	0.00E+00	0.00E+00	NA	NA	NA	0.00	NA	NA
Zinc	0.00E+00	0.00E+00	NA	NA	NA	0.00	NA	NA
Mercury	0.00E+00	0.00E+00	NA	NA	NA	0.00	NA	NA
Barium	0.00E+00	1.00E-01	NA	NA	NA	0.00	NA	NA
Vinyl Chloride	4.89E-04	1.40E+00	3.50E-04	2.86E-01	2.86E-03	0.00	NA	NA
Chloroethane	0.00E+00	3.10E-01	NA	NA	NA	0.11	3.39E-01	2.95E+00
1,1-Dichloroethene	2.64E-04	2.90E-01	9.10E-04	1.10E-01	1.10E-03	0.00	5.55E-04	1.80E+03
1,1-Dichloroethane	0.00E+00	2.40E+00	NA	NA	NA	0.09	3.78E-02	2.64E+01
1,2-Dichloroethene	0.00E+00	9.20E+00	NA	NA	NA	0.00	4.53E-04	2.21E+03
1,2-Dichloroethane	0.00E+00	0.00E+00	NA	NA	NA	0.00	NA	NA
2-Butanone	0.00E+00	0.00E+00	NA	NA	NA	0.00	NA	NA
1,1,1-Trichloroethane	0.00E+00	8.20E-01	NA	NA	NA	0.01	1.47E-02	6.81E+01
Trichloroethene	5.31E-04	4.80E+01	1.11E-05	9.04E+00	9.04E-02	0.00	NA	NA
1,1,2-Trichloroethane	2.64E-07	1.25E-02	2.11E-05	4.74E+00	4.74E-02	0.00	1.08E-03	9.29E+02
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	NA	NA	NA	0.00	NA	NA
Tetrachloroethene	7.92E-08	3.80E-02	2.09E-06	4.80E+01	4.80E-01	0.00	2.79E-03	3.58E+02
Toluene	0.00E+00	1.25E-02	NA	NA	NA	0.00	6.52E-03	1.53E+02
Ethylbenzene	0.00E+00	0.00E+00	NA	NA	NA	0.00	NA	NA
Xylenes (total)	0.00E+00	1.80E-01	NA	NA	NA	0.01	4.02E-02	2.49E+01
Bis (ethylhexyl) phthalate	1.22E-08	5.00E-03	2.44E-06	4.09E+01	4.09E-01	0.00	6.26E-02	1.60E+01
DDT	0.00E+00	0.00E+00	NA	NA	NA	0.00	NA	NA
Total:	1.28E-03					0.22		

TABLE 7-4
HUMAN HEALTH-BASED CLEANUP LEVELS FOR GROUNDWATER
BASED ON POTABLE WATER AND IRRIGATION USES OF GROUNDWATER

Chemical-of-Interest	Lagoon Area GW Source Concentration	Near-site Developing Children Cancer Risk	Unit Cancer Risk Factor	Cleanup Levels for Carcinogens 10-4 (mg/L)	Cleanup Levels for Carcinogens 10-6 (mg/L)	Near-site Young Children Hazard Index	Unit Cancer Risk Factor	Cleanup Levels Noncarcinogens (mg/L)
Lead	0.00E+00	0.00E+00	NA	NA	NA	0.000	NA	NA
Selenium	0.00E+00	0.00E+00	NA	NA	NA	0.000	NA	NA
Antimony	0.00E+00	0.00E+00	NA	NA	NA	0.000	NA	NA
Cadmium	0.00E+00	0.00E+00	NA	NA	NA	0.000	NA	NA
Chromium	0.00E+00	0.00E+00	NA	NA	NA	0.000	NA	NA
Copper	0.00E+00	0.00E+00	NA	NA	NA	0.000	NA	NA
Manganese	0.00E+00	0.00E+00	NA	NA	NA	0.000	NA	NA
Zinc	0.00E+00	0.00E+00	NA	NA	NA	0.000	NA	NA
Mercury	0.00E+00	0.00E+00	NA	NA	NA	0.000	NA	NA
Barium	1.00E-01	0.00E+00	NA	NA	NA	1.850	1.85E+01	0.054
Vinyl Chloride	1.40E+00	5.43E-02	3.88E-02	2.58E-03	2.58E-05	0.000	NA	NA
Chloroethane	3.10E-01	0.00E+00	NA	NA	NA	0.250	8.06E-01	1.240
1,1-Dichloroethene	2.90E-01	4.25E-03	1.47E-02	6.82E-03	6.82E-05	2.971	1.02E+01	0.098
1,1-Dichloroethane	2.40E+00	0.00E+00	NA	NA	NA	2.590	1.08E+00	0.927
1,2-Dichloroethene	9.20E+00	0.00E+00	NA	NA	NA	84.910	9.23E+00	0.108
1,2-Dichloroethane	0.00E+00	0.00E+00	NA	NA	NA	0.000	NA	NA
2-Butanone	0.00E+00	0.00E+00	NA	NA	NA	0.000	NA	NA
1,1,1-Trichloroethane	8.20E-01	0.00E+00	NA	NA	NA	0.880	1.07E+00	0.932
Trichloroethene	4.80E+01	1.21E-02	2.52E-04	3.97E-01	3.97E-03	0.000	NA	NA
1,1,2-Trichloroethane	1.25E-02	1.52E-05	1.22E-03	8.22E-02	8.22E-04	0.290	2.32E+01	0.043
4-Methyl-2-Pentanone	0.00E+00	0.00E+00	NA	NA	NA	0.000	NA	NA
Tetrachloroethene	3.80E-02	3.88E-05	1.02E-03	9.79E-02	9.79E-04	0.350	9.21E+00	0.109
Toluene	1.25E-02	0.00E+00	NA	NA	NA	0.006	4.80E-01	2.083
Ethylbenzene	0.00E+00	0.00E+00	NA	NA	NA	0.000	NA	NA
Xylenes (total)	1.80E-01	0.00E+00	NA	NA	NA	0.040	2.22E-01	4.500
Bis (ethylhexyl) phthalate	5.00E-03	1.41E-06	2.82E-04	3.55E-01	3.55E-03	0.020	4.00E+00	0.250
DDT	0.00E+00	0.00E+00	NA	NA	NA	0.000	NA	NA
Total:		7.07E-02				94.157		

TABLE 7-5
HUMAN HEALTH-BASED CLEANUP LEVELS FOR SURFACE WATER

Chemical-of-Interest	Maximum Cancer Risk Surface Water (a)	(b)	Corresponding Source Concentration (mg/L)	Unit Cancer Risk Factor	Cleanup Levels for Carcinogens 10-4 (mg/L)	Cleanup Levels for Carcinogens 10-6 (mg/L)	Maximum Hazard Index	(b)	Corresponding Source Concentration (mg/L)	Unit Hazard Index Factor	Cleanup Levels Noncarcinogens (mg/L)
Lead	NA		NA	NA	NA	NA	NA		NA	NA	NA
Selenium	NA		NA	NA	NA	NA	NA		NA	NA	NA
Antimony	NA		NA	NA	NA	NA	NA		NA	NA	NA
Cadmium	NA		NA	NA	NA	NA	NA		NA	NA	NA
Chromium	NA		NA	NA	NA	NA	0.000	2	1.97E-02	5.22E-05	1.92E+04
Copper	NA		NA	NA	NA	NA	0.000	1	3.04E-02	1.40E-03	7.12E+02
Manganese	NA		NA	NA	NA	NA	0.000	1	3.79E-01	5.22E-04	1.92E+03
Zinc	NA		NA	NA	NA	NA	0.000	2	1.52E-01	2.61E-04	3.83E+03
Mercury	NA		NA	NA	NA	NA	NA		NA	NA	NA
Barium	NA		NA	NA	NA	NA	NA		NA	NA	NA
Vinyl Chloride	NA		NA	NA	NA	NA	NA		NA	NA	NA
Chloroethane	NA		NA	NA	NA	NA	NA		NA	NA	NA
1,1-Dichloroethene	2.54E-08	1	4.07E-03	6.26E-06	1.60E+01	1.60E-01	0.000	1	4.07E-03	5.79E-03	1.73E+02
1,1-Dichloroethane	NA		NA	NA	NA	NA	0.000	1	1.66E-02	5.22E-04	1.92E+03
1,2-Dichloroethene	NA		NA	NA	NA	NA	0.001	1	1.82E-01	5.22E-03	1.92E+02
1,2-Dichloroethane	2.37E-09	2	2.50E-03	9.49E-07	1.05E+02	1.05E+00	NA		NA	NA	NA
2-Butanone	NA		NA	NA	NA	NA	NA		NA	NA	NA
1,1,1-Trichloroethane	NA		NA	NA	NA	NA	0.000	1	4.23E-02	5.79E-04	1.73E+03
Trichloroethene	2.28E-08	1	1.99E-01	1.15E-07	8.72E+02	8.72E+00	NA		NA	NA	NA
1,1,2-Trichloroethane	NA		NA	NA	NA	NA	NA		NA	NA	NA
4-Methyl-2-Pentanone	NA		NA	NA	NA	NA	NA		NA	NA	NA
Tetrachloroethene	NA		NA	NA	NA	NA	NA		NA	NA	NA
Toluene	NA		NA	NA	NA	NA	NA		NA	NA	NA
Ethylbenzene	NA		NA	NA	NA	NA	NA		NA	NA	NA
Xylenes (total)	NA		NA	NA	NA	NA	NA		NA	NA	NA
Bis (ethylhexyl) phthalate	NA		NA	NA	NA	NA	NA		NA	NA	NA
DDT	NA		NA	NA	NA	NA	NA		NA	NA	NA
Total:	4.83E-08	1					0.001	1			

NOTES:

(a) - Maximum cancer risk for visitor children to one of the two stream areas for compounds-of-interest in surface water.

(b) - Potential stream areas where maximum cancer risk or hazard index occurred include:

1 - East Stream

2 - West Stream

(c) - Maximum hazard index for visitor children to one of the two stream areas for compounds-of-interest in surface water.

TABLE 7-6
HUMAN HEALTH-BASED CLEANUP LEVELS FOR SEDIMENTS

Chemical-of-Interest	Maximum Cancer Risk Sediments (a)	(b)	Corresponding Source Concentration (mg/Kg)	Unit Cancer Risk Factor	Cleanup Levels for Carcinogens 10-4 (mg/Kg)	Cleanup Levels for Carcinogens 10-6 (mg/Kg)	Maximum Hazard Index	(b)	Corresponding Source Concentration (mg/Kg)	Unit Hazard Index Factor	Cleanup Levels Noncarcinogens (mg/Kg)
Lead	NA		NA	NA	NA	NA	NA		NA	NA	NA
Selenium	NA		NA	NA	NA	NA	NA		NA	NA	NA
Antimony	NA		NA	NA	NA	NA	NA		NA	NA	NA
Cadmium	NA		NA	NA	NA	NA	NA		NA	NA	NA
Chromium	NA		NA	NA	NA	NA	0.000	1	3.47E+02	5.12E-07	1.95E+06
Copper	NA		NA	NA	NA	NA	0.004	1	2.61E+02	1.38E-05	7.26E+04
Manganese	NA		NA	NA	NA	NA	0.020	2	3.85E+03	5.12E-06	1.95E+05
Zinc	NA		NA	NA	NA	NA	0.001	1	3.02E+02	2.56E-06	3.91E+05
Mercury	NA		NA	NA	NA	NA	NA		NA	NA	NA
Barium	NA		NA	NA	NA	NA	NA		NA	NA	NA
Vinyl Chloride	7.42E-09	1	3.04E-02	2.44E-07	4.10E+02	4.10E+00	NA		NA	NA	NA
Chloroethane	NA		NA	NA	NA	NA	NA		NA	NA	NA
1,1-Dichloroethene	NA		NA	NA	NA	NA	NA		NA	NA	NA
1,1-Dichloroethane	NA		NA	NA	NA	NA	0.000	1	7.26E-03	6.42E-06	1.56E+05
1,2-Dichloroethene	NA		NA	NA	NA	NA	0.000	1	4.44E-02	6.42E-05	1.56E+04
1,2-Dichloroethane	NA		NA	NA	NA	NA	NA		NA	NA	NA
2-Butanone	NA		NA	NA	NA	NA	NA		NA	NA	NA
1,1,1-Trichloroethane	NA		NA	NA	NA	NA	NA		NA	NA	NA
Trichloroethene	4.98E-11	1	3.53E-02	1.41E-09	7.08E+04	7.08E+02	NA		NA	NA	NA
1,1,2-Trichloroethane	NA		NA	NA	NA	NA	NA		NA	NA	NA
4-Methyl-2-Pentanone	NA		NA	NA	NA	NA	NA		NA	NA	NA
Tetrachloroethene	NA		NA	NA	NA	NA	NA		NA	NA	NA
Toluene	NA		NA	NA	NA	NA	NA		NA	NA	NA
Ethylbenzene	NA		NA	NA	NA	NA	NA		NA	NA	NA
Xylenes (total)	NA		NA	NA	NA	NA	0.000	1	1.05E-02	3.21E-07	3.12E+06
Bis (ethylhexyl) phthalate	3.00E-09	2	1.67E+00	1.80E-09	5.56E+04	5.56E+02	0.000	2	1.67E+00	3.21E-05	3.12E+04
DDT	NA		NA	NA	NA	NA	NA		NA	NA	NA
Total:	7.47E-09	1					2.09E-02	2			

NOTES:

(a) - Maximum cancer risk for visitor children to one of the two stream areas for compounds-of-interest in sediments.

(b) - Potential stream areas where maximum cancer risk or hazard index occurred include:

1 - East Stream

2 - West Stream

(c) - Maximum hazard index for visitor children to one of the two stream areas for compounds-of-interest in sediments.

TABLE 7-7

SUMMARY OF HEALTH-BASED CLEANUP LEVELS FROM ECOLOGICAL ASSESSMENT

Chemical-of-Interest	Soil Clean-up Levels: Phytotoxicity (mg/Kg)	Soil Clean-up Levels: Soil Invertibrates (mg/Kg)	Soil Clean-up Levels: Higher Trophic Organisms (mg/Kg)	Surface Water Aquatic Organisms (j) (ug/L)	Sediment Benthic Invertibrates (mg/Kg)
Lead	500 a	52000 c	132 f	3.2 k	NA
Selenium	2 a	NA	NA	NA	NA
Antimony	10 a	NA	NA	NA	NA
Cadmium	4 a	1800 c	NA	NA	NA
Chromium	12 or 1000 a,b	46000 c	357 g	11 or 210 k,b	NA
Copper	300 a	100 d	NA	12 k	NA
Manganese	NA	NA	NA	NA	NA
Zinc	800 a	1300 c	54 h	110 k	NA
Mercury	1 a	480 c	NA	NA	NA
Barium	1000 a	ND	NA	NA	ND
Vinyl Chloride	NA	915.8 e	NA	NA	915.8 e
Chloroethane	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	580 k	NA
1,1-Dichloroethane	NA	482 e	NA	580 k	482 e
1,2-Dichloroethene	NA	868 e	NA	580 k	868 e
1,2-Dichloroethane	NA	NA	NA	2000 k	NA
2-Butanone	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	NA	NA	NA	900 k	NA
Trichloroethene	NA	7644 e	NA	2190 k	7644 e
1,1,2-Trichloroethane	NA	NA	NA	NA	NA
4-Methyl-2-Pentanone	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA
Xylenes (total)	NA	4487 e	NA	NA	4487 e
Bis (ethylhexyl) phthalate	NA	502.8 e	NA	NA	502.8 e
DDT	ND	NA	0.083 i	NA	NA

Notes:

a - Rinne (1986).
b - Value for hexavalent and trivalent, respectively.
c - Hartenstein et al. (1981).
d - Ma (1984).
e - Soil/Sediment quality criterion based on toxicity data provided in Table 6-1.
f - Chronic threshold level for mallard (Finley et al., 1986) and rat (Nriagu, 1978).
g - NOAEL for Black ducks (Haseltine et al, 1985) and Guinea pigs (ATSDR, 1987).
h - NOAEL for rat (EPA, 1984).
i - Based on potential developmental risks to shrews (Table 6-2) and bioaccumulation model by Maxwell et al. (1989).
j - Clean-up level for VOCs in surface water based on toxicity critieria in Table 6-1.
k - AWQC - freshwater chronic.
NA - Not applicable.
ND - No data.

TABLE 7-8
SUMMARY OF HUMAN HEALTH-BASED CLEANUP LEVELS

	SURFACE SOILS (a)			SUBSURFACE SOILS (b)		
	Cleanup Levels for Carcinogens		Cleanup Levels Noncarcinogens	Cleanup Levels for Carcinogens		Cleanup Levels Noncarcinogens
Chemical-of-Interest	10-4 (mg/Kg)	10-6 (mg/Kg)	HI = 1 (mg/Kg)	10-4 (mg/Kg)	10-6 (mg/Kg)	HI = 1 (mg/Kg)
Lead	NA	NA	2.00E+02	NA	NA	2.00E+02
Selenium	NA	NA	2.40E+02	NA	NA	7.63E+03
Antimony	NA	NA	3.20E+01	NA	NA	NA
Cadmium	6.53E+05	6.53E+03	4.01E+01	NA	NA	NA
Chromium	9.72E+04	9.72E+02	4.03E+03	1.73E+06	1.73E+04	1.15E+04
Copper	NA	NA	2.98E+03	NA	NA	9.41E+04
Manganese	NA	NA	7.94E+03	NA	NA	NA
Zinc	NA	NA	1.60E+04	NA	NA	5.07E+05
Mercury	NA	NA	4.20E-02	NA	NA	4.83E-01
Barium	NA	NA	4.00E+02	NA	NA	1.26E+04
Vinyl Chloride	6.29E-01	6.29E-03	NA	NA	NA	NA
Chloroethane	NA	NA	9.94E+00	NA	NA	NA
1,1-Dichloroethene	4.08E-01	4.08E-03	7.05E+02	NA	NA	NA
1,1-Dichloroethane	NA	NA	5.13E+01	NA	NA	NA
1,2-Dichloroethene	NA	NA	7.83E+02	NA	NA	1.74E+04
1,2-Dichloroethane	1.10E+01	1.10E-01	NA	8.25E+02	8.25E+00	NA
2-Butanone	NA	NA	NA	NA	NA	1.44E+04
1,1,1-Trichloroethane	NA	NA	4.24E+02	NA	NA	5.00E+03
Trichloroethene	6.86E+01	6.86E-01	NA	5.16E+03	5.16E+01	NA
1,1,2-Trichloroethane	9.91E+01	9.91E-01	3.13E+02	7.65E+03	7.65E+01	6.95E+03
4-Methyl-2-Pentanone	NA	NA	2.64E+03	NA	NA	4.50E+04
Tetrachloroethene	4.03E+02	4.03E+00	7.83E+02	NA	NA	NA
Toluene	NA	NA	2.77E+03	NA	NA	3.48E+04
Ethylbenzene	NA	NA	NA	NA	NA	5.56E+04
Xylenes (total)	NA	NA	4.43E+02	NA	NA	5.09E+03
Bis (ethylhexyl) phthalate	4.04E+03	4.04E+01	1.57E+03	4.35E+05	4.35E+03	3.48E+04
DDT	1.56E+02	1.56E+00	3.92E+01	NA	NA	NA

NOTES:

(a) - Based on maximum cancer risks and hazard indices for on-site resident developing children and young children.

(b) - Based on maximum cancer risks and hazard indices for construction workers.

(c) - Based on cancer risks and hazard indices for near-site visitor developing children and young children.

(d) - Based on maximum cancer risks and hazard indices for visitor children.

TABLE 7-8
SUMMARY OF HUMAN HEALTH-BASED CLEANUP LEVELS (con't)

	GROUNDWATER (c)					
	IRRIGATION USES ONLY			POTABLE WATER AND IRRIGATION USES		
	Cleanup Levels for Carcinogens		Cleanup Levels Noncarcinogens	Cleanup Levels for Carcinogens		Cleanup Levels Noncarcinogens
Chemical-of-Interest	10-4 (mg/L)	10-6 (mg/L)	HI = 1 (mg/L)	10-4 (mg/L)	10-6 (mg/L)	HI = 1 (mg/L)
Lead	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	5.41E-02
Vinyl Chloride	2.86E-01	2.86E-03	NA	2.58E-03	2.58E-05	NA
Chloroethane	NA	NA	2.95E+00	NA	NA	1.24E+00
1,1-Dichloroethene	1.10E-01	1.10E-03	1.80E+03	6.82E-03	6.82E-05	9.76E-02
1,1-Dichloroethane	NA	NA	2.64E+01	NA	NA	9.27E-01
1,2-Dichloroethene	NA	NA	2.21E+03	NA	NA	1.08E-01
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	NA	NA	6.81E+01	NA	NA	9.32E-01
Trichloroethene	9.04E+00	9.04E-02	NA	3.97E-01	3.97E-03	NA
1,1,2-Trichloroethane	4.74E+00	4.74E-02	9.29E+02	8.22E-02	8.22E-04	4.31E-02
4-Methyl-2-Pentanone	NA	NA	NA	NA	NA	NA
Tetrachloroethene	4.80E+01	4.80E-01	3.58E+02	9.79E-02	9.79E-04	1.09E-01
Toluene	NA	NA	1.53E+02	NA	NA	2.08E+00
Ethylbenzene	NA	NA	NA	NA	NA	NA
Xylenes (total)	NA	NA	2.49E+01	NA	NA	4.50E+00
Bis (ethylhexyl) phthalate	4.09E+01	4.09E-01	1.60E+01	3.55E-01	3.55E-03	2.50E-01
DDT	NA	NA	NA	NA	NA	NA

NOTES:

(a) - Based on maximum cancer risks and hazard indices for on-site resident developing children and young children.

(b) - Based on maximum cancer risks and hazard indices for construction workers.

(c) - Based on cancer risks and hazard indices for near-site visitor developing children and young children.

(d) - Based on maximum cancer risks and hazard indices for visitor children.

TABLE 7-8
SUMMARY OF HUMAN HEALTH-BASED CLEANUP LEVELS (con't)

Chemical-of-Interest	SURFACE WATER (d) Cleanup Levels for Carcinogens 10-4 (mg/L)	SURFACE WATER (d) Cleanup Levels for Carcinogens 10-6 (mg/L)	SURFACE WATER (d) Cleanup Levels Noncarcinogens HI = 1 (mg/L)	SEDIMENTS (d) Cleanup Levels for Carcinogens 10-4 (mg/Kg)	SEDIMENTS (d) Cleanup Levels for Carcinogens 10-6 (mg/Kg)	SEDIMENTS (d) Cleanup Levels Noncarcinogens HI = 1 (mg/Kg)
Lead	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	1.92E+04	NA	NA	1.95E+06
Copper	NA	NA	7.12E+02	NA	NA	7.26E+04
Manganese	NA	NA	1.92E+03	NA	NA	1.95E+05
Zinc	NA	NA	3.83E+03	NA	NA	3.91E+05
Mercury	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA
Vinyl Chloride	NA	NA	NA	4.10E+02	4.10E+00	NA
Chloroethane	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	1.60E+01	1.60E-01	1.73E+02	NA	NA	NA
1,1-Dichloroethane	NA	NA	1.92E+03	NA	NA	1.56E+05
1,2-Dichloroethene	NA	NA	1.92E+02	NA	NA	1.56E+04
1,2-Dichloroethane	1.05E+02	1.05E+00	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	NA	NA	1.73E+03	NA	NA	NA
Trichloroethene	8.72E+02	8.72E+00	NA	7.08E+04	7.08E+02	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA
4-Methyl-2-Pentanone	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	NA
Xylenes (total)	NA	NA	NA	NA	NA	3.12E+06
Bis (ethylhexyl) phthalate	NA	NA	NA	5.56E+04	5.56E+02	3.12E+04
DDT	NA	NA	NA	NA	NA	NA

NOTES:

(a) - Based on maximum cancer risks and hazard indices for on-site resident developing children and young children.

(b) - Based on maximum cancer risks and hazard indices for construction workers.

(c) - Based on cancer risks and hazard indices for near-site visitor developing children and young children.

(d) - Based on maximum cancer risks and hazard indices for visitor children.

TABLE 8-1
SUMMARY OF COMPOUNDS-OF-INTEREST BY MEDIA AND
LOCATION FOR QUANTITATIVE RISK ASSESSMENT

MEDIA: / LOCATION:	Lagoon Area Groundwater On-site	Drum Area 1 Groundwater On-site	Drum Area 2 Groundwater On-site	Sediments East Stream	Sediments Middle Stream	Sediments West Stream
PARAMETERS (ppm):						
Cyanide				no (4)	no (4)	no (4)
Arsenic				no (5)	no (5)	no (5)
Lead			yes	yes	yes	no (3)
Selenium					yes	
Antimony						
Cadmium						
Chromium				yes	yes	no (3)
Copper				yes	yes	no (3)
Manganese				yes	yes	no (3)
Zinc				yes	yes	no (3)
Mercury						
Barium	yes					
TCL Volatiles (ppb):						
Chloromethane						
Bromomethane						
Vinyl Chloride	yes			yes		
Chloroethane	yes					
Methylene Chloride	no (2)	no (2)	no (2)	no (2)	no (2)	no (2)
Acetone	no (2)	no (2)	no (2)	no (2)		no (2)
Carbon Disulfide						
1,1-Dichloroethene	yes	yes	yes			
1,1-Dichloroethane	yes	yes		yes		
1,2-Dichloroethene	yes	yes	yes	yes		
Chloroform						
1,2-Dichloroethane						
2-Butanone						
1,1,1-Trichloroethane	yes	yes	yes			
Carbon Tetrachloride						
Vinyl Acetate						
Bromodichloromethane						
1,2-Dichloropropane						
cis-1,3-dichloropropene	no (1)					
Trichloroethene	yes	yes	yes	yes		
Dibromochloromethane						
1,1,2-Trichloroethane	yes					
Benzene						
trans-1,3-Dichloropropene						
Bromoform						
4-Methyl-2-Pentanone						
2-Hexanone						
Tetrachloroethene	yes					
1,1,2,2-Tetrachloroethane						
Toluene	yes					
Chlorobenzene						
Ethylbenzene						
Styrene						
Xylenes (total)	yes			yes		
TCL Semi-Volatiles (ppb):						
Bis (ethylhexyl) phthalate	yes	yes	yes		yes	
TCL Pesticides (ppb):						
DDT						
PCB's (ppb):						
Asbestos (%):						

Notes:

(1) - Only detected in one groundwater sample near the detection limit.

(2) - Common laboratory contaminant and found extensively in background samples and in lab blanks.

(3) - Detected at a concentration less than background.

(4) - Detected at a concentration less than the reference sediment sample.

(5) - Detected at a concentration less than background.

(6) - Detected in only one Phase I sample and not in Phase II.

(7) - Surface soils are not currently considered an exposure media.

TABLE 8-1
SUMMARY OF COMPOUNDS-OF-INTEREST BY MEDIA AND
LOCATION FOR QUANTITATIVE RISK ASSESSMENT
(con't)

MEDIA:	Surface Water	Surface Water	Surface Water	Surface Soils	Surface Soils	Surface Soils
LOCATION:	East Stream	Middle Stream	West Stream	Borrow Area	Lagoon Area	N. Cornfield
PARAMETERS (ppm):						
Cyanide						
Arsenic						
Lead	yes	yes	no (3)	yes	yes	yes
Selenium						
Antimony					yes	
Cadmium						yes
Chromium	yes	yes	no (3)		yes	yes
Copper	yes	yes	no (3)	yes	yes	yes
Manganese	no (3)	yes	no (3)			
Zinc	yes	yes	no (3)	yes	yes	yes
Mercury					yes	yes
Barium						yes
TCL Volatiles (ppb):						
Chloromethane						
Bromomethane						
Vinyl Chloride					yes	
Chloroethane					yes	
Methylene Chloride			no (2)	no (2)	no (2)	no (2)
Acetone	no (2)	no (2)	no (2)	no (2)	no (2)	no (2)
Carbon Disulfide						
1,1-Dichloroethene	yes				yes	
1,1-Dichloroethane	yes		no (6)		yes	
1,2-Dichloroethene	yes		no (6)		yes	
Chloroform						
1,2-Dichloroethane		yes			yes	
2-Butanone						
1,1,1-Trichloroethane	yes	yes	no (6)		yes	
Carbon Tetrachloride						
Vinyl Acetate						
Bromodichloromethane						
1,2-Dichloropropane						
cis-1,3-dichloropropene						
Trichloroethene	yes			yes	yes	
Dibromochloromethane						
1,1,2-Trichloroethane					yes	
Benzene						
trans-1,3-Dichloropropene						
Bromoform						
4-Methyl-2-Pentanone					yes	
2-Hexanone						
Tetrachloroethene					yes	yes
1,1,2,2-Tetrachloroethane						
Toluene				yes	yes	
Chlorobenzene						
Ethylbenzene						
Styrene						
Xylenes (total)					yes	
TCL Semi-Volatiles (ppb):						
Bis (ethylhexyl) phthalate				yes		
TCL Pesticides (ppb):						
DDT						
PCB's (ppb):						
Asbestos (%):						

Notes:

(1) - Only detected in one groundwater sample near the detection limit.

(2) - Common laboratory contaminant and found extensively in background samples and in lab blanks.

(3) - Detected at a concentration less than background.

(4) - Detected at a concentration less than the reference sediment sample.

(5) - Detected at a concentration less than background.

(6) - Detected in only one Phase I sample and not in Phase II.

(7) - Surface soils are not currently considered an exposure media.

TABLE 8-1
SUMMARY OF COMPOUNDS-OF-INTEREST BY MEDIA AND
LOCATION FOR QUANTITATIVE RISK ASSESSMENT
(con't)

MEDIA: / LOCATION:	Surface Soils S. Cornfield	Surface Soils Stress. Vege.	Surface Soils Drum Area 1	Surface Soils Drum Area 2	Subsurface Soils Borrow Area	Subsurface Soils Lagoon Area
PARAMETERS (ppm):						
Cyanide						
Arsenic						
Lead	yes	yes			yes	yes
Selenium	yes	yes				
Antimony		yes				
Cadmium	yes					no (3)
Chromium	yes	yes				no (3)
Copper	yes	yes			yes	yes
Manganese						
Zinc	yes	yes			yes	yes
Mercury	yes	yes				
Barium	yes	yes				
TCL Volatiles (ppb):						
Chloromethane						
Bromomethane						
Vinyl Chloride						
Chloroethane						
Methylene Chloride	no (2)	no (2)	no (2)		no (2)	no (2)
Acetone		no (2)	no (2)	no (2)	no (2)	no (2)
Carbon Disulfide						
1,1-Dichloroethene						
1,1-Dichloroethane		yes				
1,2-Dichloroethene		yes	no (7)			
Chloroform						
1,2-Dichloroethane			no (7)			
2-Butanone			no (7)	no (7)		yes
1,1,1-Trichloroethane		yes				yes
Carbon Tetrachloride						
Vinyl Acetate						
Bromodichloromethane						
1,2-Dichloropropane						
cis-1,3-dichloropropene						
Trichloroethene	yes	yes	no (7)			
Dibromochloromethane						
1,1,2-Trichloroethane			no (7)	no (7)		
Benzene						
trans-1,3-Dichloropropene						
Bromoform						
4-Methyl-2-Pentanone			no (7)	no (7)		yes
2-Hexanone						
Tetrachloroethene	yes	yes	no (7)			
1,1,2,2-Tetrachloroethane						
Toluene	yes		no (7)			yes
Chlorobenzene						
Ethylbenzene			no (7)			yes
Styrene						
Xylenes (total)			no (7)	no (7)		yes
TCL Semi-Volatiles (ppb):						
Bis (ethylhexyl) phthalate					yes	
TCL Pesticides (ppb):						
DDT		yes				
PCB's (ppb):						
Asbestos (%):						

Notes:

(1) - Only detected in one groundwater sample near the detection limit.
(2) - Common laboratory contaminant and found extensively in background samples and in lab blanks.
(3) - Detected at a concentration less than background.
(4) - Detected at a concentration less than the reference sediment sample.
(5) - Detected at a concentration less than background.
(6) - Detected in only one Phase I sample and not in Phase II.
(7) - Surface soils are not currently considered an exposure media.

TABLE 8-1
SUMMARY OF COMPOUNDS-OF-INTEREST BY MEDIA AND LOCATION FOR QUANTITATIVE RISK ASSESSMENT
(con't)

MEDIA:	Subsurface Soils	Subsurface Soils	Subsurface Soils	Subsurface Soils	Subsurface Soils
LOCATION:	N. Cornfield	S. Cornfield	Stress. Vege.	Drum Area 1	Drum Area 2
PARAMETERS (ppm):					
Cyanide					
Arsenic					
Lead	no (3)	no (3)	yes		
Selenium	yes	yes			
Antimony					
Cadmium		no (3)			
Chromium	no (3)	no (3)	yes		
Copper	yes	yes	yes		
Manganese					
Zinc	no (3)	no (3)	yes		
Mercury	yes	yes			
Barium	yes	yes	yes		
TCL Volatiles (ppb):					
Chloromethane					
Bromomethane					
Vinyl Chloride					
Chloroethane					
Methylene Chloride	no (2)	no (2)	no (2)	no (2)	no (2)
Acetone	no (2)	no (2)	no (2)	no (2)	no (2)
Carbon Disulfide					
1,1-Dichloroethene					
1,1-Dichloroethane					
1,2-Dichloroethene				yes	
Chloroform					
1,2-Dichloroethane				yes	
2-Butanone				yes	yes
1,1,1-Trichloroethane					
Carbon Tetrachloride					
Vinyl Acetate					
Bromodichloromethane					
1,2-Dichloropropane					
cis-1,3-dichloropropene					
Trichloroethene				yes	yes
Dibromochloromethane					
1,1,2-Trichloroethane				yes	
Benzene					
trans-1,3-Dichloropropene					
Bromoform					
4-Methyl-2-Pentanone				yes	yes
2-Hexanone					
Tetrachloroethene					
1,1,2,2-Tetrachloroethane					
Toluene				yes	
Chlorobenzene					
Ethylbenzene				yes	
Styrene					
Xylenes (total)				yes	yes
TCL Semi-Volatiles (ppb):					
Bis (ethylhexyl) phthalate					
TCL Pesticides (ppb):					
DDT					
PCB's (ppb):					
Asbestos (%):					

Notes:

(1) - Only detected in one groundwater sample near the detection limit.
(2) - Common laboratory contaminant and found extensively in background samples and in lab blanks.
(3) - Detected at a concentration less than background.
(4) - Detected at a concentration less than the reference sediment sample.
(5) - Detected at a concentration less than background.
(6) - Detected in only one Phase I sample and not in Phase II.
(7) - Surface soils are not currently considered an exposure media.

TABLE 8-2
LOCATIONS, MEDIA, RECEPTORS AND EXPOSURE PATHWAYS ASSOCIATED WITH THE HUNTERSTOWN ROAD SITE

Locations	Source Media	Exposure Media		Receptors	Exposure Pathway
Current Land Use Scenario:					
On-site	Surface soils	On-site surface soils, surface	(a)	On-site Visitor Children	incidental ingestion
	Surface water	water and sediments			dermal contact
	Sediment	On-site air - volatiles and dusts			inhalation
Off-site	On-site groundwater	Near-site groundwater	(a)	Near-site Residents	ingestion
					dermal contact (shower)
		Near-site showerroom air	(b)		inhalation
		Near-site irrigated soils	(c)		dermal contact
		Near-site air - volatiles	(d)		inhalation
	On-site Surface Soils	Nearsite Air	(d)	Near-site Residents (e)	inhalation of fugitive dusts (e
Future Land Use Scenario:					
On-site	Surface soils	On-site surface soils	(a)	Construction Workers	incidental ingestion
				On-site Residents	dermal contact
		On-site air from surface soils - volatiles and dusts	(d)		inhalation
	Subsurface soils	On-site Subsurface soils	(a)	Construction Workers	incidental ingestion
					dermal contact
		On-site air from subsurface soils - volatiles and dusts	(d)		inhalation
	On-site groundwater	On-site groundwater	(a)	On-site Residents	ingestion
					dermal contact (shower)
		On-site showerroom air	(b)		inhalation
		On-site air - volatiles	(d)		inhalation
Off-site	On-site groundwater	Near-site groundwater	(a)	Near-site Residents	ingestion
					dermal contact (shower)
		Near-site showerroom air	(b)		inhalation
		Near-site irrigated soils	(c)		dermal contact
		Near-site air - volatiles	(d)		inhalation

Notes:

(a) - Exposure point concentrations based on a statistical summary of Phase I and/or II analytical data.

(b) - Exposure point concentrations estimated with a shower volatilization model.

(c) - Exposure point concentrations based on a soil irrigation model.

(d) - Exposure point concentrations based on volatilization and fugitive dust emission models and an air dispersion model.

(e) - Exposure point concentrations estimated with a groundwater transport model.

(f) - Analysis was made for past and current scneario in focused assessment provided in Appendix I.

TABLE 8-3
HUMAN HEALTH EXPOSURE ASSUMPTIONS FOR THE CURRENT LAND USE SCENARIO AT THE HUNTERSTOWN ROAD SITE

Receptor	Exposure Duration	Hours per Day	Medium	Pathway	Parameter	Value	Units	Comments
ONSITE RECEPTORS								
Visitor Children	1 day/wk, 12 wk/yr, 14 yrs	4	Surface Soils	Incidental Ingestion	Ingestion Rate	157	mg/day	average daily dose normalized to BW (a)
	1 day/wk, 39 wk/yr, 14 yrs (Cornfields and Stream areas)		Surface Water Sediments	Dermal Contact	Body Surface Area	1.23	m2	50th percentile for children aged 5 to 18 (b)
					% Area Exposed	23.59	%	area of hands, forearms, and head normalized to BW (b)
					Soil Adherence	0.0145	Kg/m2	value for soil, 2.77 Kg/m2 for sediment (c)
					Absorption Rate	0.25	%/hr	1.5% absorption times 15% matrix effect (d)
				Inhalation	Inhalation Rate	1.88	m3/hour	average hourly outdoor inhalation rate for adults (b)
					Body Weight	39.5	Kg	time weighted average value for children 5-18 years (b)
OFFSITE RECEPTORS								
Near-site Residents:								
- Adults	7 day/wk, 50 wk/yr, 30 yrs		Groundwater	Ingestion	Ingestion Rate	2	L/day	reasonable worst-case value for adults (b)
	7 day/wk, 50 wk/yr, 30 yrs	0.25		Dermal Contact	Body Surface Area	1.94	m2	50th percentile for adult males (b)
					% Area Exposed	100	%	entire body assumed for shower
					Absorption Rate	0.0008	cm/hr	value for water (c)
	7 day/wk, 50 wk/yr, 30 yrs	0.25		Inhalation (shower)	Inhalation Rate	0.6	m3/hr	based on light activity level (b)
	4 day/wk, 24 wk/yr, 30 yrs	1		Inhalation (irrigation)	Inhalation Rate	20	m3/day	value for adult (c)
	2 day/wk, 24 wk/yr, 30 yrs		Irrigated Soil	Incidental Ingestion	Ingestion Rate	100	mg/day	value for adult (a)
	2 day/wk, 24 wk/yr, 30 yrs	4		Dermal Contact	% Area Exposed	18.9	%	area of hands, forearms, and head for adult (b)
					Soil Adherence	0.0145	Kg/m2	value for soil (c)
					Absorption Rate	0.25	%/hr	1.5% absorption times 15% matrix effect (d)
	7 day/wk, 50 wk/yr, 30 yrs	24		Inhalation (vols and dust)	Inhalation Rate	20	m3/day	value for adult (c)
					Body Weight	70	Kg	value for adults (b)
- Developing Children	7 day/wk, 50 wk/yr, 30 yrs		Groundwater	Ingestion	Ingestion Rate	2	L/day	assumed for children
	7 day/wk, 50 wk/yr, 30 yrs	0.25		Dermal Contact	Body Surface Area	1.49	m2	median total body surface area for child 3-18 yrs (b)
					% Area Exposed	108	%	entire body assumed for shower normalized to BW
					Absorption Rate	0.0008	cm/hr	value for water (c)
	7 day/wk, 50 wk/yr, 30 yrs	0.25		Inhalation (shower)	Inhalation Rate	0.6	m3/hr	based on light activity level (b)
	4 day/wk, 24 wk/yr, 30 yrs	1		Inhalation (irrigation)	Inhalation Rate	28.2	m3/day	time weighted calculated value for children (b)
	4 day/wk, 24 wk/yr, 30 yrs		Irrigated Soil	Incidental Ingestion	Ingestion Rate	189	mg/day	time weighted average value for developing children (a)
	4 day/wk, 24 wk/yr, 30 yrs	4		Dermal Contact	% Area Exposed	23.59	%	area of hands, forearms, and head normalized to BW (b)
					Soil Adherence	0.0145	Kg/m2	value for soil (c)
					Absorption Rate	0.25	%/hr	1.5% absorption times 15% matrix effect (d)
	7 day/wk, 50 wk/yr, 30 yrs	24		Inhalation (vols and dust)	Inhalation Rate	28.2	m3/day	time weighted calculated value for children (b)
					Body Weight	50.3	Kg	time weighted average value for developing children (b)
- Young Children	7 day/wk, 50 wk/yr, 5 yrs		Groundwater	Ingestion	Ingestion Rate	1.5	L/day	assumed for children
	7 day/wk, 50 wk/yr, 5 yrs	0.25		Dermal Contact	Body Surface Area	0.73	m2	median total body surface area for child 3 - 6 yrs (b)
					% Area Exposed	100	%	entire body assumed for bath
					Absorption Rate	0.0008	cm/hr	value for water (c)
	7 day/wk, 50 wk/yr, 5 yrs	0.25		Inhalation (shower)	Inhalation Rate	0.6	m3/hr	based on light activity level (b)
	4 day/wk, 24 wk/yr, 5 yrs	1		Inhalation (irrigation)	Inhalation Rate	20	m3/day	time weighted calculated value for young children (b)
	4 day/wk, 24 wk/yr, 5 yrs		Irrigated Soil	Incidental Ingestion	Ingestion Rate	200	mg/day	value for young children (a)
	4 day/wk, 24 wk/yr, 5 yrs	4		Dermal Contact	% Area Exposed	25.6	%	area of hands, forearms, and head normalized to BW (b)
					Soil Adherence	0.0145	Kg/m2	value for soil (c)
					Absorption Rate	0.25	%/hr	1.5% absorption times 15% matrix effect (d)
	7 day/wk, 50 wk/yr, 5 yrs	24		Inhalation (vols and dust)	Inhalation Rate	20	m3/day	time weighted calculated value for young children (b)
					Body Weight	15.6	Kg	value for young children (b)

Notes:
(a) U.S. EPA. Interim Final Guidance for Soil Ingestion Rates. Memorandum from J. W. Porter dated January 27, 1989.
(b) U.S. EPA. 1989. Exposure Factors Handbook. Office of Health and Environmental Assessment. EPA/600/8-89/043
(c) U.S. EPA. 1988. Superfund Exposure Assessment Manual. EPA/540/1-88/001.
(d) Hawley, J. 1985. Assessment of Health Risk Associated With Exposure to Contaminated Soil. Risk Analysis, 5:289-302.
(e) U.S. EPA. 1991. Standard Assumptions

TABLE 8-4
HUMAN HEALTH EXPOSURE ASSUMPTIONS FOR THE FUTURE LAND USE SCENARIO AT THE HUNTERSTOWN ROAD SITE

Receptor	Exposure Duration	Hours per Day	Medium	Pathway	Parameter	Value	Units	Comments
ONSITE RECEPTORS								
Construction Workers	3 day/wk, 35 wk/yr, 2 yrs	8	Surface Soils	Incidental Ingestion	Ingestion Rate	100	mg/day	100% of average daily dose of 100 mg/day (a)
				Dermal Contact	Body Surface Area	1.94	m2	50th percentile for adult (b)
					% Area Exposed	18.9	%	surface area for hands, forearms, and head (b)
					Soil Adherence	0.0145	Kg/m2	value determined for potting soil (c)
					Absorption Rate	0.25	%/hr	1.5% absorption times 15% matrix effect (d)
				Inhalation	Inhalation Rate	2.5	m3/hour	based on reasonable maximum exposure of 20 m3/work-day (g)
	2 day/wk, 35 wk/yr, 2 yrs	8	Subsurface Soils	Incidental Ingestion	Ingestion Rate	100	mg/day	100% of average daily dose of 100 mg/day (a)
				Dermal Contact	Body Surface Area	1.94	m2	50th percentile for adult (b)
					% Area Exposed	18.9	%	surface area for hands, forearms, and head (b)
					Soil Adherence	0.0145	Kg/m2	value determined for potting soil (c)
					Absorption Rate	0.25	%/hr	1.5% absorption times 15% matrix effect (d)
				Inhalation	Inhalation Rate	2.5	m3/hour	based on reasonable maximum exposure of 30 m3/day (b)
					Body Weight	70	Kg	Body weight for adult (b)
Onsite Residents:								
- Adults	7 days/wk, 50 wks/yr, 30 yrs		Surface Soils	Incidental Ingestion	Ingestion Rate	100	mg/day	100% of average daily dose of 100 mg/day (a)
	2 days/wk, 24 wks/yr, 30 yrs	4		Dermal Contact	Body Surface Area	1.94	m2	50th percentile for adult (b)
					% Area Exposed	18.9	%	surface area for hands, forearms, and head (b)
					Soil Adherence	0.0145	Kg/m2	value determined for potting soil (c)
					Absorption Rate	0.25	%/hr	1.5% absorption times 15% matrix effect (d)
	7 days/wk, 50 wks/yr, 30 yrs	24		Inhalation (vols and dust)	Inhalation Rate	20	m3/day	based on reasonable maximum exposure of 20 m3/day (g)
	7 days/wk, 50 wks/yr, 30 yrs		Groundwater	Ingestion	Ingestion Rate	2	L/day	reasonable worst-case value for adults (b)
	7 days/wk, 50 wks/yr, 30 yrs	0.25		Dermal Contact	Body Surface Area	1.94	m2	50th percentile for adult males (b)
					% Area Exposed	100	%	entire body assumed for shower
					Absorption Rate	0.0008	cm/hr	value for water (c)
	7 days/wk, 50 wks/yr, 30 yrs	0.25		Inhalation (shower)	Inhalation Rate	0.6	m3/hr	light activity level (b)
					Body Weight	70	Kg	Body weight for adult (b)
- Children	7 days/wk, 50 wks/yr, 30 yrs		Surface Soils	Incidental Ingestion	Ingestion Rate	189	mg/day	time weighted average value for developing children (a)
	4 days/wk, 24 wks/yr, 30 yrs	4		Dermal Contact	Body Surface Area	1.49	m2	median total body surface area for child 3-18 yrs (b)
					% Area Exposed	23.59	%	surface area for hands, forearms, and head (b)
					Soil Adherence	0.0145	Kg/m2	value determined for potting soil (c)
					Absorption Rate	0.25	%/hr	1.5% absorption times 15% matrix effect (d)
	7 days/wk, 50 wks/yr, 30 yrs	24		Inhalation (vols and dust)	Inhalation Rate	28.2	m3/day	time weighted calculated value for children (b)
	7 days/wk, 50 wks/yr, 30 yrs		Groundwater	Ingestion	Ingestion Rate	2	L/day	assumed for children
	7 days/wk, 50 wks/yr, 30 yrs	0.25		Dermal Contact	Body Surface Area	1.49	m2	median total body surface area for child 3-18 yrs (b)
					% Area Exposed	108	%	entire body assumed for shower normalized to BW
					Absorption Rate	0.0008	cm/hr	value for water (c)
	7 days/wk, 50 wks/yr, 30 yrs	0.25		Inhalation (shower)	Inhalation Rate	0.6	m3/hr	light activity level (b)
					Body Weight	50.3	Kg	Time-weighted average body weight for developing child (b)
- Young Children	7 days/wk, 50 wks/yr, 5 yrs		Surface Soils	Incidental Ingestion	Ingestion Rate	200	mg/day	100% of average daily dose of 200 mg/day for young child (a)
	4 days/wk, 24 wks/yr, 5 yrs	4		Dermal Contact	Body Surface Area	0.73	m2	50th percentile for adult (b)
					% Area Exposed	18.9	%	surface area for hands, forearms, and head (b)
					Soil Adherence	0.0145	Kg/m2	value determined for potting soil (c)
					Absorption Rate	0.25	%/hr	1.5% absorption times 15% matrix effect (d)
	7 days/wk, 50 wks/yr, 5 yrs	24		Inhalation (vols and dust)	Inhalation Rate	20	m3/day	based on reasonable maximum exposure of 20 m3/day (g)
	7 days/wk, 50 wks/yr, 5 yrs		Groundwater	Ingestion	Ingestion Rate	1.5	L/day	assumed for children
	7 days/wk, 50 wks/yr, 5 yrs	0.25		Dermal Contact	Body Surface Area	0.73	m2	median total body surface area for child 3 - 6 yrs (b)
					% Area Exposed	108	%	entire body assumed for shower normalized to BW
					Absorption Rate	0.0008	cm/hr	value for water (c)
	7 days/wk, 50 wks/yr, 5 yrs			Inhalation (shower)	Inhalation Rate	0.6	m3/hr	light activity level (b)
					Body Weight	15.6	Kg	Time-weighted average body weight for developing child (b)

TABLE 8-4 (con't)

HUMAN HEALTH EXPOSURE ASSUMPTIONS FOR THE FUTURE LAND USE SCENARIO AT THE HUNTERSTOWN ROAD SITE

Receptor	Exposure Duration	Hours per Day	Medium	Pathway	Parameter	Value	Units	Comments
OFFSITE RECEPTORS								
Near-site Residents:								
- Adults	7 day/wk, 50 wk/yr, 30 yrs		Groundwater	Ingestion	Ingestion Rate	2	L/day	reasonable worst-case value for adults (b)
	7 day/wk, 50 wk/yr, 30 yrs	0.25		Dermal Contact	Body Surface Area	1.94	m2	50th percentile for adult males (b)
					% Area Exposed	100	%	entire body assumed for shower
					Absorption Rate	0.0008	cm/hr	value for water (c)
	7 day/wk, 50 wk/yr, 30 yrs	0.25		Inhalation (shower)	Inhalation Rate	0.6	m3/hr	based on light activity level (b)
	4 day/wk, 24 wk/yr, 30 yrs	1		Inhalation (irrigation)	Inhalation Rate	20	m3/day	value for adult (c)
	2 day/wk, 24 wk/yr, 30 yrs		Irrigated Soil	Incidental Ingestion	Ingestion Rate	100	mg/day	value for adult (a)
	2 day/wk, 24 wk/yr, 30 yrs	4		Dermal Contact	% Area Exposed	18.9	%	area of hands, forearms, and head for adult (b)
					Soil Adherence	0.0145	Kg/m2	value for soil (c)
					Absorption Rate	0.25	%/hr	1.5% absorption times 15% matrix effect (d)
	7 day/wk, 50 wk/yr, 30 yrs	24		Inhalation (vols and dust)	Inhalation Rate	20	m3/day	value for adult (c)
					Body Weight	70	Kg	value for adults (b)
- Developing Children	7 day/wk, 50 wk/yr, 30 yrs		Groundwater	Ingestion	Ingestion Rate	2	L/day	assumed for children
	7 day/wk, 50 wk/yr, 30 yrs	0.25		Dermal Contact	Body Surface Area	1.49	m2	median total body surface area for child 3-18 yrs (b)
					% Area Exposed	108	%	entire body assumed for shower normalized to BW
					Absorption Rate	0.0008	cm/hr	value for water (c)
	7 day/wk, 50 wk/yr, 30 yrs	0.25		Inhalation (shower)	Inhalation Rate	0.6	m3/hr	based on light activity level (b)
	4 day/wk, 24 wk/yr, 30 yrs	1		Inhalation (irrigation)	Inhalation Rate	28.2	m3/day	time weighted calculated value for children (b)
	4 day/wk, 24 wk/yr, 30 yrs		Irrigated Soil	Incidental Ingestion	Ingestion Rate	189	mg/day	time weighted average value for developing children (a)
	4 day/wk, 24 wk/yr, 30 yrs	4		Dermal Contact	% Area Exposed	23.59	%	area of hands, forearms, and head normalized to BW (b)
					Soil Adherence	0.0145	Kg/m2	value for soil (c)
					Absorption Rate	0.25	%/hr	1.5% absorption times 15% matrix effect (d)
	7 day/wk, 50 wk/yr, 30 yrs	24		Inhalation (vols and dust)	Inhalation Rate	28.2	m3/day	time weighted calculated value for children (b)
					Body Weight	50.3	Kg	time weighted average value for developing children (b)
- Young Children	7 day/wk, 50 wk/yr, 5 yrs		Groundwater	Ingestion	Ingestion Rate	1.5	L/day	assumed for children
	7 day/wk, 50 wk/yr, 5 yrs	0.25		Dermal Contact	Body Surface Area	0.73	m2	median total body surface area for child 3 - 6 yrs (b)
					% Area Exposed	100	%	entire body assumed for bath
					Absorption Rate	0.0008	cm/hr	value for water (c)
	7 day/wk, 50 wk/yr, 5 yrs	0.25		Inhalation (shower)	Inhalation Rate	0.6	m3/hr	based on light activity level (b)
	4 day/wk, 24 wk/yr, 5 yrs	1		Inhalation (irrigation)	Inhalation Rate	20	m3/day	time weighted calculated value for young children (b)
	4 day/wk, 24 wk/yr, 5 yrs		Irrigated Soil	Incidental Ingestion	Ingestion Rate	200	mg/day	value for young children (a)
	4 day/wk, 24 wk/yr, 5 yrs	4		Dermal Contact	% Area Exposed	25.6	%	area of hands, forearms, and head normalized to BW (b)
					Soil Adherence	0.0145	Kg/m2	value for soil (c)
					Absorption Rate	0.25	%/hr	1.5% absorption times 15% matrix effect (d)
	7 day/wk, 50 wk/yr, 5 yrs	24		Inhalation (vols and dust)	Inhalation Rate	20	m3/day	time weighted calculated value for young children (b)
					Body Weight	15.6	Kg	value for young children (b)

Notes:

(a) U.S. EPA. Interim Final Guidance for Soil Ingestion Rates. Memorandum from J. W. Porter dated January 27, 1989.

(b) U.S. EPA. 1989. Exposure Factors Handbook. Office of Health and Environmental Assessment. EPA/600/8-89/043

(c) U.S. EPA. 1988. Superfund Exposure Assessment Manual. EPA/540/1-88/001.

(d) Hawley, J. 1985. Assessment of Health Risk Associated With Exposure to Contaminated Soil. Risk Analysis, 5:289-302.

(e) U.S. EPA. 1991. Standard Assumptions

TABLE 8-5
SUMMARY OF TOXICITY ASSESSMENT

COMPOUND	Chronic Reference Doses mg/Kg/day Oral	Inhalation	Source	Cancer Slope Factors (mg/Kg/day)-1 Oral	Inhalation	Source
METALS						
Lead	ND	ND				
Selenium	0.003	ND	SPHEM - AIC			
Antimony	0.0004	ND	IRIS			
Cadmium	0.0005	ND	IRIS		6.1	IRIS
Chromium *	1	5.71E-07	IRIS/HEAST		41	IRIS
Copper	0.04	ND	HEAST			
Manganese	0.1	1.14E-04	IRIS/HEAST			
Zinc	0.2	ND	HEAST			
Mercury	0.0003	8.57E-05	HEAST			
Barium	0.05	0.001	HEAST			
VOLATILE ORGANICS						
Vinyl chloride	ND	ND		1.9	0.294	HEAST
Chloroethane	ND	0.029	HEAST			
1,1-Dichloroethene	0.009	ND	IRIS	0.6	1.2	IRIS
1,1-Dichloroethane	0.1	0.1	HEAST			
1,2-Dichloroethene	0.01	ND	IRIS/HEAST			
1,2-Dichloroethane	ND	ND		0.091	0.091	IRIS
2-Butanone	0.05	0.09	IRIS/HEAST			
1,1,1-Trichloroethane	0.009	0.3	IRIS/HEAST			
Trichloroethene	ND	ND		0.011	0.017	HEAST
1,1,2-Trichloroethane	0.004	ND	IRIS	0.057	0.057	IRIS
4-Methyl-2-pentanone	0.05	0.02	IRIS/HEAST			
Tetrachloroethene	0.01	ND	IRIS	0.051	0.00182	HEAST
Toluene	0.2	0.57	IRIS/HEAST			
Ethyl Benzene	0.1	0.29	IRIS/HEAST			
Xylenes	2	0.086	IRIS/HEAST			
SEMIVOLATILE ORGANICS						
Bis(2-ethylhexyl)phthalate	0.02	ND	IRIS	0.014		IRIS
PESTICIDES						
DDT	0.0005	ND	IRIS	0.34		IRIS

ABBREVIATIONS

SPHEM - Superfund Public Health Evaluation Manual (EPA, 1986).
AIC - Allowable intake chronic.
IRIS - Integrated Risk Information System
HEAST - Health Effects Assessment Summary Tables Third Quarter 1990
* - Chromium III toxicity values were used for noncarcinogenic effects
Chromium VI toxicity values were used for carcinogenic effects

ORIGINAL (Red)

TABLE 8-6
SUMMARY OF ARARs FOR GROUNDWATER AT THE HUNTERSTOWN ROAD SITE

	FINAL		PROPOSED		
COMPOUND	MCL	MCLG	MCL	MCLG	SOURCE
METALS					
Lead	0.05		0.005	0	
Selenium	0.05	0.05			Jan 30, 1991
Antimony			0.01	0.003	July 25, 1990
Cadmium	0.005	0.005			Jan 30, 1991
Chromium *	0.1	0.1			Jan 30, 1991
Copper *	1			1.3	May 17,1990
Manganese *	0.05				May 17,1990
Zinc *	5				May 17,1990
Mercury	0.002	0.002			May 17,1990
Barium	1		2	2	May 17,1990; Jan 30, 1991
VOLATILE ORGANICS					
Vinyl chloride	0.002	0			May 17,1990
Chloroethane					
1,1-Dichloroethene	0.007	0.007			May 17,1990
1,1-Dichloroethane					
1,2-Dichloroethene **	0.1/0.07	0.1/0.07			May 17,1990
1,2-Dichloroethane	0.005	0			May 17,1990
2-Butanone					
1,1,1-Trichloroethane	0.2	0.2			May 17,1990
Trichloroethene	0.005	0			May 17,1990
1,1,2-Trichloroethane			0.005		July 25,1990
4-Methyl-2-pentanone					
Tetrachloroethene	0.005				Jan 30 1991
Toluene	1	1			Jan 30 1991
Ethyl Benzene	0.7	0.7			Jan 30 1991
Xylenes	10	10			Jan 30 1991
SEMIVOLATILE ORGANICS					
Bis(2-ethylhexyl)phthalate					
PESTICIDES					
DDT					

* Secondary MCL

** Trans/ cis

May 17 1990 — Fact Sheet prepared by the Criteria & Stds Div. EPA

July 25, 1990 Federal Register

Jan 30 1991 Federal Register

TABLE 8-7
SUMMARY OF HUMAN HEALTH-BASED CLEANUP LEVELS

	SURFACE SOILS (a)			SUBSURFACE SOILS (b)		
	Cleanup Levels for Carcinogens		Cleanup Levels Noncarcinogens	Cleanup Levels for Carcinogens		Cleanup Levels Noncarcinogens
Chemical-of-Interest	10-4 (mg/Kg)	10-6 (mg/Kg)	HI = 1 (mg/Kg)	10-4 (mg/Kg)	10-6 (mg/Kg)	HI = 1 (mg/Kg)
Lead	NA	NA	2.00E+02	NA	NA	2.00E+02
Selenium	NA	NA	2.40E+02	NA	NA	7.63E+03
Antimony	NA	NA	3.20E+01	NA	NA	NA
Cadmium	6.53E+05	6.53E+03	4.01E+01	NA	NA	NA
Chromium	9.72E+04	9.72E+02	4.03E+03	1.73E+06	1.73E+04	1.15E+04
Copper	NA	NA	2.98E+03	NA	NA	9.41E+04
Manganese	NA	NA	7.94E+03	NA	NA	NA
Zinc	NA	NA	1.60E+04	NA	NA	5.07E+05
Mercury	NA	NA	4.20E-02	NA	NA	4.83E-01
Barium	NA	NA	4.00E+02	NA	NA	1.26E+04
Vinyl Chloride	6.29E-01	6.29E-03	NA	NA	NA	NA
Chloroethane	NA	NA	9.94E+00	NA	NA	NA
1,1-Dichloroethene	4.08E-01	4.08E-03	7.05E+02	NA	NA	NA
1,1-Dichloroethane	NA	NA	5.13E+01	NA	NA	NA
1,2-Dichloroethene	NA	NA	7.83E+02	NA	NA	1.74E+04
1,2-Dichloroethane	1.10E+01	1.10E-01	NA	8.25E+02	8.25E+00	NA
2-Butanone	NA	NA	NA	NA	NA	1.44E+04
1,1,1-Trichloroethane	NA	NA	4.24E+02	NA	NA	5.00E+03
Trichloroethene	6.86E+01	6.86E-01	NA	5.16E+03	5.16E+01	NA
1,1,2-Trichloroethane	9.91E+01	9.91E-01	3.13E+02	7.65E+03	7.65E+01	6.95E+03
4-Methyl-2-Pentanone	NA	NA	2.64E+03	NA	NA	4.50E+04
Tetrachloroethene	4.03E+02	4.03E+00	7.83E+02	NA	NA	NA
Toluene	NA	NA	2.77E+03	NA	NA	3.48E+04
Ethylbenzene	NA	NA	NA	NA	NA	5.56E+04
Xylenes (total)	NA	NA	4.43E+02	NA	NA	5.09E+03
Bis (ethylhexyl) phthalate	4.04E+03	4.04E+01	1.57E+03	4.35E+05	4.35E+03	3.48E+04
DDT	1.56E+02	1.56E+00	3.92E+01	NA	NA	NA

NOTES:

(a) - Based on maximum cancer risks and hazard indices for on-site resident developing children and young children.

(b) - Based on maximum cancer risks and hazard indices for construction workers.

(c) - Based on cancer risks and hazard indices for near-site visitor developing children and young children.

(d) - Based on maximum cancer risks and hazard indices for visitor children.

TABLE 8-7
SUMMARY OF HUMAN HEALTH-BASED CLEANUP LEVELS (con't)

	GROUNDWATER (c)					
	IRRIGATION USES ONLY			POTABLE WATER AND IRRIGATION USES		
	Cleanup Levels for Carcinogens		Cleanup Levels Noncarcinogens	Cleanup Levels for Carcinogens		Cleanup Levels Noncarcinogens
Chemical-of-Interest	10-4 (mg/L)	10-6 (mg/L)	HI = 1 (mg/L)	10-4 (mg/L)	10-6 (mg/L)	HI = 1 (mg/L)
Lead	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	5.41E-02
Vinyl Chloride	2.86E-01	2.86E-03	NA	2.58E-03	2.58E-05	NA
Chloroethane	NA	NA	2.95E+00	NA	NA	1.24E+00
1,1-Dichloroethene	1.10E-01	1.10E-03	1.80E+03	6.82E-03	6.82E-05	9.76E-02
1,1-Dichloroethane	NA	NA	2.64E+01	NA	NA	9.27E-01
1,2-Dichloroethene	NA	NA	2.21E+03	NA	NA	1.08E-01
1,2-Dichloroethane	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	NA	NA	6.81E+01	NA	NA	9.32E-01
Trichloroethene	9.04E+00	9.04E-02	NA	3.97E-01	3.97E-03	NA
1,1,2-Trichloroethane	4.74E+00	4.74E-02	9.29E+02	8.22E-02	8.22E-04	4.31E-02
4-Methyl-2-Pentanone	NA	NA	NA	NA	NA	NA
Tetrachloroethene	4.80E+01	4.80E-01	3.58E+02	9.79E-02	9.79E-04	1.09E-01
Toluene	NA	NA	1.53E+02	NA	NA	2.08E+00
Ethylbenzene	NA	NA	NA	NA	NA	NA
Xylenes (total)	NA	NA	2.49E+01	NA	NA	4.50E+00
Bis (ethylhexyl) phthalate	4.09E+01	4.09E-01	1.60E+01	3.55E-01	3.55E-03	2.50E-01
DDT	NA	NA	NA	NA	NA	NA

NOTES:

(a) - Based on maximum cancer risks and hazard indices for on-site resident developing children and young children.

(b) - Based on maximum cancer risks and hazard indices for construction workers.

(c) - Based on cancer risks and hazard indices for near-site visitor developing children and young children.

(d) - Based on maximum cancer risks and hazard indices for visitor children.

ORIGINAL (Red)

TABLE 8-7
SUMMARY OF HUMAN HEALTH-BASED CLEANUP LEVELS (con't)

Chemical-of-Interest	SURFACE WATER (d) Cleanup Levels for Carcinogens 10-4 (mg/L)	SURFACE WATER (d) Cleanup Levels for Carcinogens 10-6 (mg/L)	SURFACE WATER (d) Cleanup Levels Noncarcinogens HI = 1 (mg/L)	SEDIMENTS (d) Cleanup Levels for Carcinogens 10-4 (mg/Kg)	SEDIMENTS (d) Cleanup Levels for Carcinogens 10-6 (mg/Kg)	SEDIMENTS (d) Cleanup Levels Noncarcinogens HI = 1 (mg/Kg)
Lead	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	1.92E+04	NA	NA	1.95E+06
Copper	NA	NA	7.12E+02	NA	NA	7.26E+04
Manganese	NA	NA	1.92E+03	NA	NA	1.95E+05
Zinc	NA	NA	3.83E+03	NA	NA	3.91E+05
Mercury	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA
Vinyl Chloride	NA	NA	NA	4.10E+02	4.10E+00	NA
Chloroethane	NA	NA	NA	NA	NA	NA
1,1-Dichloroethene	1.60E+01	1.60E-01	1.73E+02	NA	NA	NA
1,1-Dichloroethane	NA	NA	1.92E+03	NA	NA	1.56E+05
1,2-Dichloroethene	NA	NA	1.92E+02	NA	NA	1.56E+04
1,2-Dichloroethane	1.05E+02	1.05E+00	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	NA	NA	1.73E+03	NA	NA	NA
Trichloroethene	8.72E+02	8.72E+00	NA	7.08E+04	7.08E+02	NA
1,1,2-Trichloroethane	NA	NA	NA	NA	NA	NA
4-Methyl-2-Pentanone	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA	NA
Xylenes (total)	NA	NA	NA	NA	NA	3.12E+06
Bis (ethylhexyl) phthalate	NA	NA	NA	5.56E+04	5.56E+02	3.12E+04
DDT	NA	NA	NA	NA	NA	NA

NOTES:

(a) - Based on maximum cancer risks and hazard indices for on-site resident developing children and young children.

(b) - Based on maximum cancer risks and hazard indices for construction workers.

(c) - Based on cancer risks and hazard indices for near-site visitor developing children and young children.

(d) - Based on maximum cancer risks and hazard indices for visitor children.

TABLE 8-8

SUMMARY OF HEALTH-BASED CLEANUP LEVELS FROM ECOLOGICAL ASSESSMENT

Chemical-of-Interest	Soil Clean-up Levels: Phytotoxicity (mg/Kg)	Soil Clean-up Levels: Soil Invertibrates (mg/Kg)	Soil Clean-up Levels: Higher Trophic Organisms (mg/Kg)	Surface Water Aquatic Organisms (j) (ug/L)	Sediment Benthic Invertibrates (mg/Kg)
Lead	500 a	52000 c	132 f	3.2 k	NA
Selenium	2 a	NA	NA	NA	NA
Antimony	10 a	NA	NA	NA	NA
Cadmium	4 a	1800 c	NA	NA	NA
Chromium	12 or 1000 a,b	46000 c	357 g	11 or 210 k,b	NA
Copper	300 a	100 d	NA	12 k	NA
Manganese	NA	NA	NA	NA	NA
Zinc	800 a	1300 c	54 h	110 k	NA
Mercury	1 a	480 c	NA	NA	NA
Barium	1000 a	ND	NA	NA	NA
Vinyl Chloride	NA	915.8 e	NA	NA	915.8 e
Chloroethane	NA	NA	NA	NA	NA
1,1-Dichloroethene	NA	NA	NA	580 k	NA
1,1-Dichloroethane	NA	482 e	NA	580 k	482 e
1,2-Dichloroethene	NA	868 e	NA	580 k	868 e
1,2-Dichloroethane	NA	NA	NA	2000 k	NA
2-Butanone	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	NA	NA	NA	900 k	NA
Trichloroethene	NA	7644 e	NA	2190 k	7644 e
1,1,2-Trichloroethane	NA	NA	NA	NA	NA
4-Methyl-2-Pentanone	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA
Ethylbenzene	NA	NA	NA	NA	NA
Xylenes (total)	NA	4487 e	NA	NA	4487 e
Bis (ethylhexyl) phthalate	NA	502.8 e	NA	NA	502.8 e
DDT	ND	NA	0.083 i	NA	NA

Notes:

a - Rinne (1986).

b - Value for hexavalent and trivalent, respectively.

c - Hartenstein et al. (1981).

d - Ma (1984).

e - Soil/Sediment quality criterion based on toxicity data provided in Table 6-1.

f - Chronic threshold level for mallard (Finley et al., 1986) and rat (Nriagu, 1978).

g - NOAEL for Black ducks (Haseltine et al, 1985) and Guinea pigs (ATSDR, 1987).

h - NOAEL for rat (EPA, 1984).

i - Based on potential developmental risks to shrews (Table 6-2) and bioaccumulation model by Maxwell et al. (1989).

j - Clean-up level for VOCs in surface water based on toxicity critieria in Table 6-1.

k - AWQC - freshwater chronic.

NA - Not applicable.

ND - No data.