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# Phase II
# Remedial Investigation
for
# Naval Submarine Base
# New London
Groton, Connecticut

# Volume VI - Appendices F.1 - F.8

## Northern Division
## Naval Facilities Engineering Command
Contract Number N62472-90-D-1298
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**Brown & Root Environmental**

A Division of Halliburton NUS Corporation

# APPENDIX F

## RISK ASSESSMENT CALCULATIONS


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# APPENDIX F.1

# BACKGROUND SOIL

## TABLE 2-4
## BACKGROUND SOIL CONCENTRATIONS

| Parameter | Naval Submarine Base Site-Specific Background[1] (ppm) | | Site-Specific[2] Background (July 1994 Data Report) | Published Background[3] (ppm) |
|---|---|---|---|---|
| | (0-2 feet) | (0-4 feet) | | |
| Aluminum | 17,600 | 17,600 | 21,100 | 272,000 |
| Antimony | 2.05[6] | 2.05[6] | ND | 2.95 |
| Arsenic | 3.6 | 3.6 | 4.60 | 31.5 |
| Barium | 39 | 57.2 | 69.1 | 1,600 |
| Beryllium | 0.72 | 0.72 | 1.00 | 3.52 |
| Boron | 3.1[6] | 3.1[6] | 6.85 | 109 |
| Cadmium | 0.24[6] | 0.24[6] | 4.54 | 7[4] |
| Calcium | 314 | 499 | 1,190 | 32,300 |
| Chromium | 19.3 | 21.5 | 25.3 | 223 |
| Cobalt | 7 | 8 | 12.9 | 39 |
| Copper | 17.9 | 25.6 | 34.5 | 102 |
| Iron | 16,800 | 17,200 | 20,500 | 115,000 |
| Lead | 17.5 | 17.5 | 19.3 | 53.2 |
| Magnesium | 2,460 | 3,650 | 5,620 | 26,500 |
| Manganese | 172 | 188 | 245 | 3,790 |
| Mercury | 0.055[6] | 0.05 | 0.0379 | 0.51 |
| Nickel | 5.0[6] | 5.95[6] | 21.1 | 76.7 |
| Potassium | 669 | 2,580 | 3,045 | 12,000 |
| Selenium | 0.445[6] | 0.445[6] | 0.824 | 1.79 |
| Silver | 0.385[6] | 0.385[5] | ND | 5 |
| Sodium | 16.5[6] | 20.5[6] | 142 | 51,800 |
| Thallium | 0.105[6] | 0.29 | 0.21 | 5[5] |
| Vanadium | 33.3 | 35.1 | 42.3 | 271 |
| Zinc | 25.6 | 31.3 | 83.6 | 178 |

**Notes:**

1. The site-specific background value is the highest value detected from among all the background soil samples collected in April 1993.
2. The site-specific background value is the upper tolerance limit of the upper 95% confidence limit for the true 95th percentile for the background soil sample results using the April 1993 results and select samples from the Phase I RI as reported in the July 1994 data report.
3. The published background value is the upper limit of the range which contains 95% of the sample results from Shacklette and Boerngen USGS Paper 1270 using the formula $M \times D^2$, where M is the geometric mean and D is the geometric deviation, except as noted.
4. Dragun (1988)
5. Lisk (1972)
6. Value based on one-half of the highest detection level from among all the background soil samples collected in April 1993.

## TABLE 2-5
## NEW LONDON SUBASE BACKGROUND

| Parameter | NSB-NLON | | | Eastern U.S. (Shacklette) | | |
|---|---|---|---|---|---|---|
| | Arithmetic Mean | Range | Upper 95% Value[1] | Arithmetic Mean | Range | Upper 95% Value[2] |
| Aluminum | 13,427 | 7,630 - 17,600 | 17,929 | 57,000 | 7,000 - >100,000 | 271,817 |
| Antimony | ND | --- | --- | 0.76 | <1 - 8.8 | 2.95 |
| Arsenic | 2.3 | 0.53 - 3.6 | 4.0 | 7.4 | <0.1 - 73 | 31.5 |
| Barium | 29.4 | 2.413.6 - 57.2 | 49.7 | 420 | 10 - 1,500 | 1,601 |
| Beryllium | 0.39 | ND - 0.72 | --- | 0.85 | <1 - 7 | 3.5 |
| Boron | ND | --- | --- | 38 | <20 - 150 | 110 |
| Cadmium | ND | --- | --- | NR | --- | --- |
| Calcium | 241 | 102 - 499 | 392.5 | 6,300 | 100 - 280,000 | 32,253 |
| Chromium | 15.8 | 10.2 - 21.5 | 20.9 | 52 | 1 - 1,000 | 223 |
| Cobalt | 6.0 | 4.0 - 8.0 | 3.5 | 9.2 | <0.3 - 70 | 39 |
| Copper | 11.9 | 4.5 - 25.6 | 24.4 | 22 | <1 - 700 | 102 |
| Cyanide | ND | --- | --- | NR | --- | --- |
| Iron | 13,341 | 8,360 - 17,200 | 17,570 | 25,000 | 100 - >100,000 | 115,317 |
| Lead | 8.0 | 2.8 - 17.5 | 15.3 | 17 | <10 - 300 | 53 |
| Magnesium | 2,290 | 1,410 - 3,650 | 3,355.1 | 4,600 | 50 - 50,000 | 26,465 |
| Manganese | 114 | 63.6 - 188 | 181.3 | 640 | <2 - 7,000 | 3,794 |
| Nickel | ND | --- | --- | 18 | <5 - 700 | 77 |
| Potassium | 635 | 229 - 2,580 | 1,612 | 12,000 | 50 - 37,000 | 21,333 |
| Mercury | ND | --- | --- | 0.12 | 0.01 - 3.4 | 0.51 |
| Selenium | ND | --- | --- | 0.45 | <0.1 - 3.9 | 1.8 |
| Silver | ND | --- | --- | NR | --- | --- |
| Sodium | ND | --- | --- | 7,800 | <500 - 50,000 | 51,756 |
| Thallium | 2.45 | 0.20 - 0.29 | 0.344 | NR | --- | --- |
| Vanadium | 25.5 | 16.0 - 35.1 | 34.3 | 66 | <7 - 300 | 271 |
| Zinc | 21.2 | 13.9 - 31.3 | 27.9 | 52 | <5 - 2,900 | 178 |

Notes:
1. The upper 95% value is calculated as follows: $\bar{x} + 1.65S$, where $\bar{x}$ is the mean and S is the standard deviation.
2. The value is the upper limit of the range which contains 95% of the sample results from Shacklette and Boerngen USGS Paper 1270 using the formula $M \times D^2$, where M is the geometric mean and D is the geometric deviation.
3. ND - not detected.

# 3.0 SUMMARY AND CONCLUSIONS

Based on the results of analysis of 16 samples collected from the 0 to 2 foot depth and the 2 to 4 foot depth at 8 locations in and near NSB-NLON, background levels (as shown in Table 3-1) were established to be used to screen site analytical data to identify areas where releases of pollutants may have occurred at NSB-NLON.

**TABLE 3-1**
**BACKGROUND SOIL CONCENTRATIONS**

| Parameter | Naval Submarine Base Site-Specific Background[1] (ppm) | |
|---|---|---|
| | (0-2 feet) | (0-4 feet) |
| Aluminum | 17,600 | 17,600 |
| Arsenic | 3.6 | 3.6 |
| Antimony | 2.05[2] | 2.05[2] |
| Barium | 39 | 57.2 |
| Beryllium | 0.72 | 0.72 |
| Boron | 3.1[2] | 3.1[2] |
| Cadmium | 0.24[2] | 0.24[2] |
| Calcium | 314 | 499 |
| Chromium | 19.3 | 21.5 |
| Cobalt | 7 | 8 |
| Copper | 17.9 | 25.6 |
| Iron | 16,800 | 17,200 |
| Lead | 17.5 | 17.5 |
| Magnesium | 2,460 | 3,650 |
| Manganese | 172 | 188 |
| Mercury | 0.055[2] | 0.05 |
| Nickel | 5.0[2] | 5.95[2] |
| Potassium | 669 | 2,580 |
| Selenium | 0.445[2] | 0.445[2] |
| Silver | 0.385[2] | 0.385[2] |
| Sodium | 16.56[2] | 20.56[2] |
| Thallium | 0.105[2] | 0.29 |
| Vanadium | 33.3 | 35.1 |
| Zinc | 25.6 | 31.3 |

**Notes:**
1. The site-specific background value is the highest value detected from among all the background soil samples collected in April 1993.
2. Value based on one-half of the highest detection level from among all the background soil samples collected in April 1993.

# APPENDIX F.2

# REGION III SCREENING CONCENTRATIONS

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
Region III
841 Chestnut Street
Philadelphia, Pennsylvania 19107

October 20, 1995

SUBJECT: Risk-Based Concentration Table, July - December 1995

FROM: Roy L. Smith, Ph.D.
Office of RCRA
Technical & Program Support Branch (3HW70)

TO: RBC Table mailing list

Attached is the EPA Region III risk-based concentration (RBC) table, which we distribute semi-annually to all interested parties.

*IMPORTANT MESSAGE*

*EPA Region III has established a homepage on the World Wide Web which you can find at http://earth1.epa.gov:80/ or http://www.epa.gov/. Our homepage will soon include the RBC table in downloadable form. We strongly encourage all RBC table users having Internet access to obtain the table electronically rather than on paper. In this way, users can obtain the most current issue immediately in a form that can be used directly as input for risk assessment calculations. This distribution method will also save large amounts of paper and cost substantially less.*

*For those lacking Internet access, it's once again time to re-register to receive a paper copy of the RBC table. We need to hear from you periodically to ensure that you still have an interest and that we have your correct address. Please fax your registration request to Vanessa Sizer at 215-597-9890, including your name, address, and phone number. Please don't phone to re-register; we need hard copy to document your continued interest. If we don't hear from you by March 30, 1996, we'll assume you no longer need a paper copy. Thanks for your cooperation.*

## CONTENTS, USES, AND LIMITATIONS OF THE RBC TABLE

The table contains reference doses and carcinogenic potency slopes (obtained from IRIS through September 1, 1995, HEAST through May 1995, the EPA-NCEA Superfund Health Risk Technical Support Center, and other EPA sources) for nearly 600 chemicals. These toxicity constants have been combined with "standard" exposure scenarios to calculate RBCs--chemical concentrations corresponding to fixed levels of risk (*i.e.*, a hazard quotient of 1, or lifetime cancer risk of $10^{-6}$, whichever occurs at a lower concentration) in water, air, fish tissue, and soil.

The RBC table also includes soil screening levels (SSLs) for protection of groundwater

and air. Most SSLs were obtained directly from EPA/OSWER's proposed SSL guidance document, to which we have added some additional SSLs based on the same methodology. Sources of SSLs are noted in the table. SSLs incorporate the same exposure assumptions as RBCs, plus additional assumptions needed for inter-media extrapolation. SSLs are therefore distinct from RBCs, and should be used only in the framework proposed in the OSWER document (available from NTIS as document numbers 9355.4-1, PB95-965530, or EPA540/R-94/105).

The Region III toxicologists use RBCs to screen sites not yet on the NPL, respond rapidly to citizen inquiries, and spot-check formal baseline risk assessments. The background materials provide the complete basis for all the calculations, with the intent of showing users exactly how the RBCs were developed. Simply put, RBCs are risk assessments run in reverse. For a single contaminant in a single medium, under standard default exposure assumptions, the RBC corresponds to the target risk or hazard quotient.

RBCs also have several important limitations. Specifically excluded from consideration are (1) transfers from soil to air and groundwater, and (2) cumulative risk from multiple contaminants or media. Also, the toxicity information in the table has been assembled by hand, and (despite extensive checking and years of use) may contain errors. It's advisable to cross-check before relying on any RfDs or CPSs in the table. If you find any errors, please send me a note.

Many users want to know if the risk-based concentrations can be used as valid no-action levels or cleanup levels, especially for soils. The answer is a bit complex. First, it is important to realize that the RBC table does not constitute regulation or guidance, and should not be viewed as a substitute for a site-specific risk assessment. For sites where:

1. A single medium is contaminated;
2. A single contaminant contributes nearly all of the health risk;
3. Volatilization or leaching of that contaminant from soil is expected not to be significant;
4. The exposure scenarios used in the RBC table are appropriate for the site;
5. The fixed risk levels used in the RBC table are appropriate for the site; and
6. Risk to ecological receptors is expected not to be significant;

the risk-based concentrations would probably be protective as no-action levels or cleanup goals. However, to the extent that a site deviates from this description, as most do, the RBCs would not necessarily be appropriate.

*To summarize, the table should generally not be used to (1) set cleanup or no-action levels at CERCLA sites or RCRA Corrective Action sites, (2) substitute for EPA guidance for preparing baseline risk assessments, or (3) determine if a waste is hazardous under RCRA.*

## ANSWERS TO FREQUENTLY ASKED QUESTIONS

To help you better understand the RBC table, here are answers to our most often-asked questions:

*1. How can the age-adjusted inhalation factor (11.66) be less than either the inhalation rate for a child (12) or for an adult (20)?*

Age-adjusted factors are not intake rates, but rather partial calculations which have different units than intake rates do. The fact that these partial calculations have values similar to intake rates is really coincidental, an artifact of the similar magnitude of years of exposure and time-averaged body weight.

*2. Why does arsenic appear in the RBC table separately as a carcinogen and a non-carcinogen, while other contaminants do not?*

Arsenic is double-entered to ensure that the risk assessor realizes that non-carcinogenic concerns are significant for arsenic. Otherwise, one might be tempted to accept a 1e-4 risk (37 ppm in residential soil), when the oral reference dose would be exceeded at 23 ppm.

Also, EPA has a little-known risk management policy for arsenic (dating from 1988) that suggests that arsenic-related cancer risks of up to 1e-3 can be accepted because the cancers are squamous cell carcinomas with a low mortality rate. Thus, noncarcinogenic RBCs represent an important limitation on acceptable arsenic concentrations.

*3. Many contaminants have no inhaled reference dose or carcinogenic potency slope in IRIS, yet these numbers appear in the RBC table with IRIS given as the source. Where did the numbers come from?*

Most inhaled reference doses and potency slopes in the RBC table are converted from reference concentrations and unit risk values which do appear in IRIS. These conversions assume 70-kg persons inhaling 20 $m^3$/d. For example, the inhalation unit risk for arsenic (4.3e-3 risk per $\mu g/m^3$) is divided by 20 $m^3$/d and multiplied by 70 kg times 1000 $\mu$g/mg, yielding a CPSi of 15.1 risk per mg/kg/d.

*4. Why does the RBC table base soil RBCs for cadmium and manganese on reference doses that apply only to drinking water?*

The RBC table's use of the drinking water RfDs for cadmium and manganese reflects (1) the limited space available in the already-crowded table, and (2) the intended use of the table as a screening tool rather than a source of cleanup levels (thereby making false positives acceptable). For a formal risk assessment, Region III would use the food RfDs for soil ingestion.

At this time, only two substances (as far as we know) have distinct oral RfDs for water and food--cadmium and manganese. Adding the two food RfDs to the table would require an entire column, which would be about 99.9% blank. The table has become so crowded that it would be difficult to accommodate another column. Also, we given this problem a relatively low

priority because the table's primary purpose is to identify environmental problems needing further study. RBCs were never intended for uncritical use as cleanup levels, merely to identify potential problems which need a closer look.

*5. What is the source of the child inhalation rate of 12 m3/d?*

The calculation comes from basic physiology. It's a scaling of the mass-specific 20 m3/d rate for adults from a body mass of 70 kg to 15 kg, using the 2/3 power of mass, as follows:

Let: IRcm = mass-specific child inhalation rate (m3/kg/d)
IRc = child inhalation rate (m3/d)

20 m3/d ÷ 70kg = 0.286 m3/kg/d (mass-specific adult inhalation rate)

$0.286 \text{ m3/kg/d} \times (70^{.67}) = (\text{IRcm}) \times (15^{.67})$

$\text{IRcm} = (0.286) \times (70^{.67}) \div (15^{.67}) = 0.286 \times 2.807 = 0.803 \text{ m3/kg/d}$

IRc = IRcm x 15kg = 0.803 m3/kg/d x 15kg = 12.04 m3/d

A short (but algebraically equivalent) way to do the conversion:

$20 \times (15 \div 70)^{.333} = 11.97$ (different from, but actually more correct than, 12.04 because of rounding error in the long form).

*6. Can the oral RfDs in the RBC table be applied to dermal exposure?*

Not directly. EPA's Office of Research and Development is working on dermal RfDs for some substances, but has not yet produced any final values. When dermal RfDs do appear, they will undoubtedly be based on absorbed dose rather than administered dose. Oral RfDs are (usually) based on administered dose and therefore tacitly include a GI absorption factor. Thus, any use of oral RfDs in dermal risk calculations would have to involve removing this absorption factor.

*7. The exposure variables table in the RBC background document lists the averaging time for non-carcinogens as "ED*365". What does that mean?*

ED is exposure duration, in years. Multiplying ED by 365 simply converts the duration to days. In fact, the ED term is included in both the numerator and denominator of the RBC algorithms for non-cancer risk, canceling it altogether. We expressed the algorithm this way to allow users to realize this. The total exposure is really corrected only by EF (days exposed per year) divided by 365. (Note that this explanation applies to noncarcinogenic risk only; for carcinogens, exposure is pro-rated over the number of days in a 70-year life span.)

*8. Why is inorganic lead not included in the RBC table?*

The reason lead is missing from the RBC table is simple, and fundamental: EPA has no

reference dose or potency slope for inorganic lead, so it wasn't possible to calculate risk-based concentrations. EPA considers lead a special case because:

(1) Lead is ubiquitous in all media, so human exposure comes from multiple sources. Comparing single-medium exposures with a reference dose would be misleading.

(2) If EPA did develop a reference dose for lead by the same methods other reference doses, we would probably find that most people already exceed it. Since EPA already knows this and is moving aggressively to lower lead releases nationally, such findings at individual sites would be irrelevant and unduly alarming.

(3) EPA decided to take a new approach to separate important lead exposures from trivial ones. EPA developed a computer model (the IEUBK model) which predicts children's blood lead concentrations using lead levels in various media as inputs. The idea is to evaluate a child's entire environment, and reduce lead exposures in the most cost-effective way.

On the practical side, there are several EPA policies which effectively substitute for RBCs. The EPA Office of Solid Waste has released a detailed directive on risk assessment and cleanup of residential soil lead. The directive recommends that soil lead levels less than 400 ppm be considered safe for residential use. Above that level, the document suggests collecting certain types of data and modeling children's blood lead with the IEUBK model. For the purposes of the RBC table, the de facto residential soil number would be 400 mg/kg. For water, we suggest 15 ppb (from the national EPA Action Level), and for air, the National Ambient Air Quality Standard.

*9. Where did the potency slopes for carcinogenic PAHs come from?*

The source of the potency slopes for PAHs is "Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons", Final Draft, EPA Environmental Criteria and Assessment Office, Cincinnati, OH. It's available from NTIS as document number ECAO-CIN-842 (March, 1993). The slopes are expressed in terms of order-of-magnitude equivalence factors relating the compounds to benzo[a]pyrene; we have converted these TEQs to potency slopes to fit the format of the table.

*10. May I please have a copy of the January 1991 RBC table?*

We're sorry, but no. The RBC table doesn't represent regulation or guidance, so past issues should have no legal importance. Each time we update the table we destroy all obsolete copies, electronic and paper. We do this to ensure that only one set of RBCs, that based on current information, exists at any time.

*11. I've noticed that some soil RBCs are 1 million parts per million. Since some of these substances are liquids, that's obviously ridiculous. What is that basis for these calculations?*

A soil RBC of 1 million parts per million means that no amount of the contaminant in soil will cause a receptor to exceed the oral reference dose by incidental ingestion of soil. In

fact, some contaminants would have RBCs of more than 1 million ppm, but the algorithms cap concentrations at 100%. The reason we retain these admittedly impossible numbers is to let users see that the contaminant is not a threat via soil ingestion.

However, it's important to realize that the RBC calculations do not consider the potential of soil contaminants to leach to groundwater or escape to air by volatilization or dust entrainment. To consider these inter-media transfers, it's necessary to either monitor air and groundwater, or to use a model. Measured or modeled air and groundwater concentrations should then be compared to the RBCs for air and tap water.

We have begun to incorporate inter-media transfers into the RBC table in the form of soil screening levels (SSLs). However, EPA Headquarters has proposed only about a hundred SSLs so far, so the list is still rather short.

*12. Please elaborate on the meaning of the 'W' source code in the table.*

The "W" code means that a reference dose or potency slope for a contaminant is currently not present on either IRIS or HEAST, but that it once was present on either IRIS or HEAST and was removed. Such withdrawal usually indicates that consensus on the number no longer exists among EPA scientists, but not that EPA believes the contaminant to be unimportant. Older versions of the RBC table had separate codes for IRIS and HEAST withdrawals, but we changed to a single code for both because, after all, it hardly matters.

We retain withdrawn numbers in the table because we still need to deal with these contaminants during the sometimes very long delays before replacement numbers are ready. We take the position that for the purpose of screening an obsolete RBC is better than none at all. The 'W' code should serve as a clear warning that before making any serious decision involving that contaminant you will need to develop an interim value based on current scientific understanding.

If you are assessing risks at a site where a major contaminant is coded "W", consider working with your Regional EPA risk assessor to develop a current toxicity constant. If the site is being studied under CERCLA, the EPA-NCEA Regional Technical Support group may be able to assist.

*13. Can I get copies of supporting documents for interim toxicity constants which are coded "E" in the RBC table?*

Unfortunately, Region 3 does not have a complete set of supporting documents. The EPA-NCEA Superfund Health Risk Technical Support Center prepares these interim toxicity constants in response to site-specific requests from Regional risk assessors, and sends the documentation only to the requestor. The RBC tables contain only the interim values (those with "E" codes) that we've either requested ourselves or otherwise obtained copies of. There may be many more interim values of which we are unaware. Also, we don't receive automatic updates when NCEA revisits a contaminant, so it's likely that some interim values in the RBC table are obsolete.

It has been NCEA's policy to deny requests for documentation of interim toxicity constants. Although Region 3 has sometimes provided this documentation on request, for the above-stated reasons we have no assurance that the documentation, or even the interim numbers, are current. We've decided to discontinue distributing information that may be misleading. If one of the "E"-coded contaminants is a major risk contributor at your site, we strongly suggest that you work with EPA to develop an up-to-date reference dose or slope factor.

## CHANGES IN THIS ISSUE OF THE RBC TABLE

New or revised EPA toxicity constants are now marked with "**" before the contaminant name. This is to help users quickly pick out substances with new RBCs. Formerly these contaminants were printed in underlined boldface type that copied badly. A new basis code, "M" for MCL, has been added to the upper right corner of each page. This code denotes soil screening levels for groundwater protection that are based on EPA Maximum Contaminant Levels.

If you want to raise issues or get answers to questions about the RBC table, please call the Technical Support Help Line at 215-597-1116. The line has a voice mail system to take your calls if we're not available. We'll return your call as soon as we can. Please limit calls to RBC issues; if you have a question about applying RBCs to a site, please call the EPA Regional office handling the project. Thanks for your help and cooperation, and we hope the RBC table continues to be a useful resource.

Attachment

# EPA Region III Risk-Based Concentration Table

## Background Information

*Roy L. Smith, Ph.D.*
*Toxicologist*
*October 4, 1995*

## Development of Risk-Based Concentrations

### General

Separate carcinogenic and non-carcinogenic risk-based concentrations were calculated for each compound for each pathway. The concentration in the table is the lower of the two, rounded to two significant figures. The following terms and values were used in the calculations:

| **Exposure variables** | **Value** | **Symbol** |
|---|---|---|
| *General:* | | |
| Carcinogenic potency slope oral (risk per mg/kg/d): | * | CPSo |
| Carcinogenic potency slope inhaled (risk per mg/kg/d): | * | CPSi |
| Reference dose oral (mg/kg/d): | * | RfDo |
| Reference dose inhaled (mg/kg/d): | * | RfDi |
| Target cancer risk: | 1e-06 | TR |
| Target hazard quotient: | 1 | THQ |
| Body weight, adult (kg): | 70 | BWa |
| Body weight, age 1-6 (kg): | 15 | BWc |
| Averaging time carcinogens (d): | 25550 | ATc |
| Averaging time non-carcinogens (d): | ED*365 | ATn |
| Inhalation, adult (m3/d): | 20 | IRAa |
| Inhalation, child (m3/d): | 12 | IRAc |
| Inhalation factor, age-adjusted (m3-y/kg-d): | 11.66 | IFAadj |
| Tap water ingestion, adult (L/d): | 2 | IRWa |
| Tap water ingestion, age 1-6 (L/d): | 1 | IRWc |
| Tap water ingestion factor, age-adjusted (L-y/kg-d): | 1.09 | IFWadj |
| Fish ingestion (g/d): | 54 | IRF |
| Soil ingestion, adult (mg/d): | 100 | IRSa |
| Soil ingestion, age 1-6 (mg/d): | 200 | IRSc |
| Soil ingestion factor, age adjusted (mg-y/kg-d): | 114.29 | IFSadj |
| *Residential:* | | |
| Exposure frequency (d/y): | 350 | EFr |
| Exposure duration, total (y): | 30 | EDtot |
| Exposure duration, age 1-6 (y): | 6 | EDc |
| Volatilization factor (L/m3): | 0.5 | K |

| Exposure variables | Value | Symbol |
|---|---|---|
| *Occupational:* | | |
| Exposure frequency (d/y): | 250 | EFo |
| Exposure duration (y): | 25 | EDo |
| Fraction of contaminated soil ingested (unitless) | 0.5 | FC |

*: Contaminant-specific toxicological constants. The priority among sources of toxicological constants was as follows: (1) IRIS, (2) HEAST, (3) HEAST alternative method, (4) EPA-NCEA Superfund Health Risk Technical Support Center, (5) withdrawn from IRIS or HEAST, and (6) other EPA documents. Each source was used only if numbers from higher-priority sources were unavailable. The EPA Superfund Health Risk Technical Support Center, part of the EPA National Center for Environmental Assessment in Cincinnati, develops provisional RfDs and CPSs on request for contaminants not in IRIS or HEAST. These provisional values are labeled "E = EPA-NCEA provisional" in the table. It is possible they may be obsolete. If one of the "E" constants is important to a Superfund risk assessment, consider requesting, through a Regional risk assessor, a new provisional value.

**Age-adjusted factors**

Because contact rates with tap water, ambient air, and residential soil are different for children and adults, carcinogenic risks during the first 30 years of life were calculated using age-adjusted factors. These factors approximated the integrated exposure from birth until age 30 by combining contact rates, body weights, and exposure durations for two age groups - small children and adults. The age-adjusted factor for soil was obtained from RAGS IB; the others were developed by analogy.

**Air inhalation**

$$IFAadj \ \frac{m^3 \cdot y}{kg \cdot d} = \frac{EDc \cdot IRAc}{BWc} + \frac{(EDtot - EDc) \cdot IRAa}{BWa}$$

**Tap water ingestion**

$$IFWadj \ \frac{L \cdot y}{kg \cdot d} = \frac{EDc \cdot IRWc}{BWc} + \frac{(EDtot - EDc) \cdot IRWa}{BWa}$$

**Soil ingestion**

$$IFSadj \ \frac{mg \cdot y}{kg \cdot d} = \frac{EDc \cdot IRSc}{BWc} + \frac{(EDtot - EDc) \cdot IRSa}{BWa}$$

**Residential water**

Volatilization terms were calculated only for compounds with a mark in the "VOC" column. Compounds having a Henry's Law constant greater than $10^{-5}$ were considered volatile. The list may be incomplete, but is unlikely to include false positives. The equations and the volatilization factor (K, above) were obtained from RAGS IB. Oral potency slopes and reference doses were used for both oral and inhaled exposures for volatile compounds lacking inhalation values. Inhaled potency slopes were substituted for unavailable oral potency slopes only for volatile compounds; inhaled RfDs were substituted for unavailable

oral RfDs for both volatile and non-volatile compounds. RBCs for carcinogens were based on combined childhood and adult exposure; for non-carcinogens RBCs were based on adult exposure.

**Carcinogens**

$$RBC\ \frac{\mu g}{L} = \frac{TR \cdot ATc \cdot 1000\ \frac{\mu g}{mg}}{EFr \cdot ([\ K \cdot IFAadj\ \cdot CPSi\ ] + [\ IFWadj\ \cdot CPSo\ ])}$$

**Non-carcinogens**

$$RBC\ \frac{\mu g}{L} = \frac{THQ \cdot BWa \cdot ATn \cdot 1000\ \frac{\mu g}{mg}}{EFr \cdot EDtot \cdot \left(\frac{K \cdot IRAa}{RfDi} + \frac{IRWa}{RfDo}\right)}$$

**Ambient air**

Oral potency slopes and references were used where inhalation values were not available. RBCs for carcinogens were based on combined childhood and adult exposure; for non-carcinogens RBCs were based on adult exposure.

**Carcinogens**

$$RBC\ \frac{\mu g}{m^3} = \frac{TR \cdot ATc \cdot 1000\ \frac{\mu g}{mg}}{EFr \cdot IFAadj\ \cdot CPSi}$$

**Non-carcinogens**

$$RBC\ \frac{\mu g}{m^3} = \frac{THQ \cdot RfDi\ \cdot BWa \cdot ATn \cdot 1000\ \frac{\mu g}{mg}}{EFr \cdot EDtot\ \cdot IRAa}$$

**Edible fish**

All RBCs were based on adult exposure.

**Carcinogens**

$$RBC\ \frac{mg}{kg} = \frac{TR \cdot BWa \cdot ATc}{EFr \cdot EDtot\ \cdot \frac{IRF}{1000\ \frac{g}{kg}}\ \cdot CPSo}$$

**Non-carcinogens**

$$RBC\ \frac{mg}{kg} = \frac{THQ \cdot RfDo \cdot BWa \cdot ATn}{EFr \cdot EDtot\ \cdot \frac{IRF}{1000\ \frac{g}{kg}}}$$

**Commercial/industrial soil ingestion**

RBCs were based on adult occupational exposure, including an assumption that only 50% of total soil ingestion is work-related.

**Carcinogens**

$$RBC\ \frac{mg}{kg} = \frac{TR\ BWa\ ATc}{EFo\ EDo \cdot \frac{IRSa}{10^6\ \frac{mg}{kg}} \cdot FC \cdot CPSo}$$

**Non-carcinogens**

$$RBC\ \frac{mg}{kg} = \frac{THQ\ RfDo \cdot BWa \cdot ATn}{EFo \cdot EDo \cdot \frac{IRSa}{10^6\ \frac{mg}{kg}} \cdot FC}$$

**Residential soil ingestion**

RBCs for carcinogens were based on combined childhood and adult exposure; RBCs for non-carcinogens were based on childhood exposure only.

**Carcinogens**

$$RBC\ \frac{mg}{kg} = \frac{TR \cdot ATc}{EFr \cdot \frac{IFSadj}{10^6\ \frac{mg}{kg}} \cdot CPSo}$$

**Non-carcinogens**

$$RBC\ \frac{mg}{kg} = \frac{THQ\ RfDo \cdot BWc \cdot ATn}{EFr \cdot EDc \cdot \frac{IRSc}{10^6\ \frac{mg}{kg}}}$$

## Development of Soil Screening Levels

**General**

In December 1994 the EPA Office of Solid Waste and Emergency Response proposed Soil Screening Guidance (Document 9355.4-1, PB95-963530, EPA540/R-94/101, available through NTIS at 703-487-4650). This draft document provides (1) a framework in which soil screening levels are to be used, (2) a detailed methodology for calculating soil screening levels, and (3) soil screening levels for 107 substances.

Consistent with this new guidance, the risk-based concentration table now includes two columns of generic soil screening levels (SSLs). OSWER's 107 proposed soil screening levels have been added verbatim. In addition, the proposed SSL methodology has been used to calculate soil screening levels for more substances, which are also included in the

new table. The table clearly distinguishes the OSWER SSLs from the "unofficial" ones.

These SSLs provide reasonable maximum estimates of transfers of contaminants from soil to other media. One column contains soil concentrations protective of groundwater quality; the other contains soil concentrations protective of air quality. "Protective" is defined in the same terms as the risk-based concentrations for tap water and air -- that residential contact scenarios will yield a fixed upper bound risk of $10^{-6}$ or a fixed hazard quotient of 1 (whichever occurs at the lower concentration).

*OSWER's SSLs should be used only within the framework proposed in the guidance document. The additional SSLs included in the RBC table are intended for the same uses (although they obviously carry less weight than the formally proposed numbers).*

The SSLs are based on the following assumptions:

| **Input variables** | **Value** | **Symbol*** |
|---|---|---|
| Surface soil moisture content (g/g) | 0.1 | $W_s$ |
| Vadose zone soil moisture content (kg/kg) | 0.2 | $W_v$ |
| Surface soil bulk density (g/cm$^3$) | 1.5 | $\rho_{bs}$ |
| Vadose zone soil bulk density (kg/L) | 1.5 | $\rho_{bv}$ |
| Surface soil particle density (g/cm$^3$) | 2.65 | $\rho_{ss}$ |
| Vadose zone soil particle density (g/cm$^3$) | 2.65 | $\rho_{sv}$ |
| Total surface soil porosity (L pore /L soil) | 0.43 | $N_s$ |
| Total vadose zone soil porosity (L pore/L soil) | 0.43 | $N_v$ |
| Air-filled surface soil porosity (L air/L soil) | 0.28 | $\theta_{as}$ |
| Water-filled surface soil porosity (L water/L soil) | 0.15 | $\theta_{ws}$ |
| Air-filled vadose zone soil porosity (L air/L soil) | 0.13 | $\theta_{av}$ |
| Water-filled vadose zone soil porosity (L water/L soil) | 0.30 | $\theta_{wv}$ |
| Organic carbon fraction of surface soil (g/g) | 0.006 | $FOC_s$ |
| Organic carbon fraction of vadose zone soil (g/g) | 0.002 | $FOC_v$ |
| Dispersion factor for 0.5 acres (g/m$^2$s per kg/m$^3$) | 35.1 | Q/C |
| Particulate emission factor (m$^3$/kg) | 6.79e+08 | PEF |
| Exposure interval (s) | 9.50e+08 | T |
| Dilution-attenuation factor (unitless) | 10 | DAF |

*: Symbols were adjusted, variables were rearranged, and derived and chemical-specific variables were omitted for simplicity and clarity. Presentation of the input variables in a single table using the same terms as in the OSWER SSL document would have been confusing. The terms used here are generally similar to OSWER's, and can easily be compared with the SSL guidance document.

With two exceptions described in the following section, SSL calculations were based on the same algorithms presented in the OSWER draft SSL guidance document. For details of the calculations (and for general background information on SSLs), I strongly recommend

consulting that document. The "unofficial" SSLs were developed under the following conditions:

**Soil Screening Levels for Inhalation**

Inhaled reference doses and potency slopes were used if available. If inhalation values were not available, oral RfDs and potency slopes were substituted. SSLs were calculated only for substances for which aqueous solubility, Koc, Henry's Law constant, and diffusivity in air were available. SSLs were calculated only for substances for which a volatilization factor could be calculated. This was done because OSWER's large proposed particulate emission factor rendered it pointless to estimate SSLs for particulate emissions alone. The final calculated SSL shown in the RBC table is the smaller of the risk-based SSL and the soil saturation concentration. All calculated SSLs were rounded to 2 significant figures.

The OSWER risk algorithms for inhalation were revised in order to be consistent with the rest of the RBC table. Only calculated SSLs were affected by this; SSLs proposed by OSWER are presented verbatim. Calculated SSLs for inhalation of carcinogens were based on an integrated lifetime exposure rather than adult exposure. SSLs for inhalation of noncarcinogens were based on adult exposure for 350 days per year rather than 365 days per year. The following algorithms were used to calculate inhalation SSLs:

**Carcinogens**

$$SSL \ \frac{mg}{kg} = \frac{TR \cdot ATc}{EFr \cdot IFAadj \cdot \left(\frac{1}{VF} + \frac{1}{PEF}\right) \cdot CPSi}$$

**Non-carcinogens**

$$SSL \ \frac{mg}{kg} = \frac{THQ \cdot BWa \cdot ATn \cdot RfDi}{EFr \cdot EDtot \cdot IRAa \cdot \left(\frac{1}{VF} + \frac{1}{PEF}\right)}$$

**Soil Screening Levels for Groundwater Use**

All algorithms were as proposed by OSWER. MCLs were used as target groundwater concentrations if available. If MCLs were unavailable the risk-based concentration in the "tap water" column of the RBC table was used as the target groundwater concentration. All SSLs for groundwater are based on a dilution-attenuation factor (DAF) of 10. Since these SSLs scale linearly with DAF, the SSLs for DAF=1 would be ten times lower. They were omitted to conserve space. All groundwater SSLs were rounded to 2 significant figures and capped at unity.

*Sources: I=IRIS H=HEAST A=HEAST alternate W=Withdrawn from IRIS or HEAST E=EPA-NCEA Regional Support provisional value O=Other EPA documents.*

*Basis: C=carcinogenic effects N=noncarcinogenic effects E=EPA draft Soil Screening Level S=soil saturation concentration M=EPA MCL.*

| Contaminant | CAS | RfDo mg/kg/d | RfDi mg/kg/d | CPSo kg·d/mg | CPSi kg·d/mg | VOC | Risk-Based Concentrations: Tap Water µg/L | Ambient Air µg/m3 | Fish mg/kg | Soil Ingestion: Industrial mg/kg | Soil Ingestion: Residential mg/kg | Soil Screening Levels-Transfers from Soil to: Air mg/kg | Groundwater mg/kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Acephate | 30560191 | 4.00E-03 I | | 8.70E-03 I | | | 7.7 C | 0.72 C | 0.36 C | 660 C | 73 C | | |
| Acetaldehyde | 75070 | | 2.57E-03 I | | 7.70E-03 I | | 94 N | 0.81 C | | | | | |
| Acetochlor | 34256821 | 2.00E-02 I | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| Acetone | 67641 | 1.00E-01 I | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | 62000 E | 8 E |
| Acetone cyanohydrin | 75865 | 7.00E-02 H | 4.00E-02 A | | | | 2600 N | 150 N | 95 N | 140000 N | 5500 N | | |
| Acetonitrile | 75078 | 6.00E-03 I | 1.43E-02 A | | | | 220 N | 52 N | 8.1 N | 12000 N | 470 N | | |
| Acetophenone | 98862 | 1.00E-01 I | 5.71E-06 W | | | ☒ | 0.042 N | 0.021 N | 140 N | 200000 N | 7800 N | | |
| Acifluorfen | 62476599 | 1.30E-02 I | | | | | 470 N | 47 N | 18 N | 27000 N | 1000 N | | |
| Acrolein | 107028 | 2.00E-02 H | 5.71E-06 I | | | | 730 N | 0.021 N | 27 N | 41000 N | 1600 N | | |
| Acrylamide | 79061 | 2.00E-04 I | | 4.50E+00 I | 4.55E+00 I | | 0.015 C | 0.0014 C | 0.0007 C | 1.3 C | 0.14 C | | |
| Acrylic acid | 79107 | 5.00E-01 I | 2.86E-04 I | | | | 18000 N | 1 N | 680 N | 1E+06 N | 39000 N | | |
| Acrylonitrile | 107131 | 1.00E-03 H | 5.71E-04 I | 5.40E-01 I | 2.38E-01 I | | 0.12 C | 0.026 C | 0.0058 C | 11 C | 1.2 C | | |
| Alachlor | 15972608 | 1.00E-02 I | | 8.00E-02 H | | | 0.84 C | 0.078 C | 0.039 C | 72 C | 8 C | | |
| Alar | 1596845 | 1.50E-01 I | | | | | 5500 N | 550 N | 200 N | 310000 N | 12000 N | | |
| Aldicarb | 116063 | 1.00E-03 I | | | | | 37 N | 3.7 N | 1.4 N | 2000 N | 78 N | 570 E | 0.036 M |
| Aldicarb sulfone | 1646884 | 1.00E-03 I | | | | | 37 N | 3.7 N | 1.4 N | 2000 N | 78 N | | |
| Aldrin | 309002 | 3.00E-05 I | | 1.70E+01 I | 1.71E+01 I | | 0.004 C | 0.00037 C | 0.00019 C | 0.34 C | 0.038 C | 0.5 E | 0.005 E |
| Ally | 74223646 | 2.50E-01 I | | | | | 9100 N | 910 N | 340 N | 510000 N | 20000 N | | |
| Allyl alcohol | 107186 | 5.00E-03 I | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | | |
| Allyl chloride | 107051 | 5.00E-02 W | 2.86E-04 I | | | | 1800 N | 1 N | 68 N | 100000 N | 3900 N | | |
| Aluminum | 7429905 | 1.00E+00 E | | | | | 37000 N | 3700 N | 1400 N | 1E+06 N | 78000 N | | |
| Aluminum phosphide | 20859738 | 4.00E-04 I | | | | | 15 N | 1.5 N | 0.54 N | 820 N | 31 N | | |
| Amdro | 67485294 | 3.00E-04 I | | | | | 11 N | 1.1 N | 0.41 N | 610 N | 23 N | | |
| Ametryn | 834128 | 9.00E-03 I | | | | | 330 N | 33 N | 12 N | 18000 N | 700 N | | |
| m-Aminophenol | 591275 | 7.00E-02 H | | | | | 2600 N | 260 N | 95 N | 140000 N | 5500 N | | |
| 4-Aminopyridine | 504245 | 2.00E-05 H | | | | | 0.73 N | 0.073 N | 0.027 N | 41 N | 1.6 N | | |
| Amitraz | 33089611 | 2.50E-03 I | | | | | 91 N | 9.1 N | 3.4 N | 5100 N | 200 N | | |
| Ammonia | 7664417 | | 2.86E-02 I | | | | 1000 N | 100 N | | | | | |
| Ammonium sulfamate | 7773060 | 2.00E-01 I | | | | | 7300 N | 730 N | 270 N | 410000 N | 16000 N | | |
| Aniline | 62533 | | 2.86E-04 I | 5.70E-03 I | | | 10 N | 1 N | 0.55 C | 1000 C | 110 C | 45 N | 0.031 N |
| Antimony and compounds | 7440360 | 4.00E-04 I | | | | | 15 N | 1.5 N | 0.54 N | 820 N | 31 N | | |
| Antimony pentoxide | 1314609 | 5.00E-04 H | | | | | 18 N | 1.8 N | 0.68 N | 1000 N | 39 N | | |
| Antimony potassium tartrate | 304610 | 9.00E-04 H | | | | | 33 N | 3.3 N | 1.2 N | 1800 N | 70 N | | |
| Antimony tetroxide | 1332316 | 4.00E-04 H | | | | | 15 N | 1.5 N | 0.54 N | 820 N | 31 N | | |
| Antimony trioxide | 1309644 | 4.00E-04 H | | | | | 15 N | 1.5 N | 0.54 N | 820 N | 31 N | | |
| Apollo | 74115245 | 1.30E-02 I | | | | | 470 N | 47 N | 18 N | 27000 N | 1000 N | | |
| Aramite | 140578 | 5.00E-02 H | | 2.50E-02 I | 2.49E-02 I | | 2.7 C | 0.25 C | 0.13 C | 230 C | 26 C | | |
| Arsenic | 7440382 | 3.00E-04 I | | | | | 11 N | 1.1 N | 0.41 N | 610 N | 23 N | 380 E | 15 E |
| **Arsenic (as carcinogen) | 7440382 | | | 1.50E+00 I | 1.51E+01 I | | 0.045 C | 0.00041 C | 0.0021 C | 3.8 C | 0.43 C | 380 E | 15 E |

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*Basis: C=carcinogenic effects N=noncarcinogenic effects E=EPA draft Soil Screening Level S=soil saturation concentration M=EPA MCL.*

| Contaminant | CAS | RfDo mg/kg/d | RfDi mg/kg/d | CPSo kg·d/mg | CPSi kg·d/mg | VOC | Risk-Based Concentrations: Tap Water µg/L | Ambient Air µg/m3 | Fish mg/kg | Soil Ingestion: Industrial mg/kg | Soil Ingestion: Residential mg/kg | Soil Screening Levels-Transfers from Soil to: Air mg/kg | Groundwater mg/kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsine | 7784421 | | 1.43E-05 I | | | | 0.52 N | 0.052 N | | | | | |
| Assure | 76578148 | 9.00E-03 I | | | | | 330 N | 33 N | 12 N | 18000 N | 700 N | | |
| Asulam | 3337711 | 5.00E-02 I | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | | |
| Atrazine | 1912249 | 3.50E-02 I | | 2.22E-01 H | | | 0.3 C | 0.028 C | 0.014 C | 26 C | 2.9 C | | |
| Avermectin B1 | 65195553 | 4.00E-04 I | | | | | 15 N | 1.5 N | 0.54 N | 820 N | 31 N | | |
| Azobenzene | 103333 | | | 1.10E-01 I | 1.08E-01 I | | 0.61 C | 0.058 C | 0.029 C | 52 C | 5.8 C | | |
| Barium and compounds | 7440393 | 7.00E-02 I | 1.43E-04 A | | | | 2600 N | 0.52 N | 95 N | 140000 N | 5500 N | 350000 E | 32 E |
| Baygon | 114261 | 4.00E-03 I | | | | | 150 N | 15 N | 5.4 N | 8200 N | 310 N | | |
| Bayleton | 43121433 | 3.00E-02 I | | | | | 1100 N | 110 N | 41 N | 61000 N | 2300 N | | |
| Baythroid | 68359375 | 2.50E-02 I | | | | | 910 N | 91 N | 34 N | 51000 N | 2000 N | | |
| Benefin | 1861401 | 3.00E-01 I | | | | | 11000 N | 1100 N | 410 N | 610000 N | 23000 N | | |
| Benomyl | 17804352 | 5.00E-02 I | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | | |
| Bentazon | 25057890 | 2.50E-03 I | | | | | 91 N | 9.1 N | 3.4 N | 5100 N | 200 N | | |
| Benzaldehyde | 100527 | 1.00E-01 I | | | | ☒ | 610 N | 370 N | 140 N | 200000 N | 7800 N | | |
| Benzene | 71432 | | 1.71E-03 E | 2.90E-02 I | 2.90E-02 I | ☒ | 0.36 C | 0.22 C | 0.11 C | 200 C | 22 C | 0.5 E | 0.02 E |
| Benzenethiol | 108985 | 1.00E-05 H | | | | | 0.37 N | 0.037 N | 0.014 N | 20 N | 0.78 N | | |
| Benzidine | 92875 | 3.00E-03 I | | 2.30E+02 I | 2.35E+02 I | | 0.00029 C | 0.00003 C | 0.00001 C | 0.025 C | 0.0028 C | 1.3 C | 1.100E-06 C |
| Benzoic acid | 65850 | 4.00E+00 I | | | | | 150000 N | 15000 N | 5400 N | 1E+06 N | 310000 N | 320 E | 280 E |
| Benzotrichloride | 98077 | | | 1.30E+01 I | | | 0.0052 C | 0.00048 C | 0.00024 C | 0.44 C | 0.049 C | 0.012 C | 0.000073 C |
| Benzyl alcohol | 100516 | 3.00E-01 H | | | | | 11000 N | 1100 N | 410 N | 610000 N | 23000 N | | |
| Benzyl chloride | 100447 | | | 1.70E-01 I | | ☒ | 0.062 C | 0.037 C | 0.019 C | 34 C | 3.8 C | 0.5 C | 0.00036 C |
| Beryllium and compounds | 7440417 | 5.00E-03 I | | 4.30E+00 I | 8.40E+00 I | | 0.016 C | 0.00075 C | 0.00073 C | 1.3 C | 0.15 C | 690 E | 180 E |
| Bidrin | 141662 | 1.00E-04 I | | | | | 3.7 N | 0.37 N | 0.14 N | 200 N | 7.8 N | | |
| Biphenthrin (Talstar) | 82657043 | 1.50E-02 I | | | | | 550 N | 55 N | 20 N | 31000 N | 1200 N | | |
| 1,1-Biphenyl | 92524 | 5.00E-02 I | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | 9000 E | 110 N |
| Bis(2-chloroethyl)ether | 111444 | | | 1.10E+00 I | 1.16E+00 I | ☒ | 0.0092 C | 0.0054 C | 0.0029 C | 5.2 C | 0.58 C | 0.3 E | 0.0003 E |
| Bis(2-chloroisopropyl)ether | 39638329 | 4.00E-02 I | | 7.00E-02 H | 3.50E-02 H | ☒ | 0.26 C | 0.18 C | 0.045 C | 82 C | 9.1 C | | |
| Bis(chloromethyl)ether | 542881 | | | 2.20E+02 I | 2.17E+02 I | ☒ | 0.00005 C | 0.00003 C | 0.00001 C | 0.026 C | 0.0029 C | 0.00004 C | 1.000E-07 C |
| Bis(2-chloro-1-methylethyl)ether | | | | 7.00E-02 W | 7.00E-02 W | | 0.96 C | 0.089 C | 0.045 C | 82 C | 9.1 C | | |
| Bis(2-ethylhexyl)phthalate (DEHP) | 117817 | 2.00E-02 I | | 1.40E-02 I | | | 4.8 C | 0.45 C | 0.23 C | 410 C | 46 C | 210 E | 11 E |
| Bisphenol A | 80057 | 5.00E-02 I | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | | |
| Boron (and borates) | 7440428 | 9.00E-02 I | 5.71E-03 H | | | | 3300 N | 21 N | 120 N | 180000 N | 7000 N | | |
| Boron trifluoride | 7637072 | | 2.00E-04 H | | | | 7.3 N | 0.73 N | | | | | |
| Bromodichloromethane | 75274 | 2.00E-02 I | | 6.20E-02 I | | ☒ | 0.17 C | 0.1 C | 0.051 C | 92 C | 10 C | 1800 E | 0.3 E |
| Bromoethene | 593602 | | | | 1.10E-01 H | ☒ | 0.096 C | 0.057 C | | | | | |
| Bromoform (tribromomethane) | 75252 | 2.00E-02 I | | 7.90E-03 I | 3.85E-03 I | ☒ | 2.4 C | 1.6 C | 0.4 C | 720 C | 81 C | 46 E | 0.5 E |
| Bromomethane | 74839 | 1.40E-03 I | 1.43E-03 I | | | ☒ | 8.7 N | 5.2 N | 1.9 N | 2900 N | 110 N | 2 E | 0.1 E |
| 4-Bromophenyl phenyl ether | 101553 | 5.80E-02 O | | | | | 2100 N | 210 N | 78 N | 120000 N | 4500 N | | |
| Bromophos | 2104963 | 5.00E-03 H | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | | |

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*Basis: C=carcinogenic effects N=noncarcinogenic effects E=EPA draft Soil Screening Level S=soil saturation concentration M=EPA MCL.*

| Contaminant | CAS | RfDo mg/kg/d | RfDi mg/kg/d | CPSo kg·d/mg | CPSi kg·d/mg | V O C | Risk-Based Concentrations: Tap Water µg/L | Ambient Air µg/m3 | Fish mg/kg | Soil Ingestion: Industrial mg/kg | Residential mg/kg | Soil Screening Levels-Transfers from Soil to: Air mg/kg | Groundwater mg/kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromoxynil | 1689845 | 2.00E-02 I | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| Bromoxynil octanoate | 1689992 | 2.00E-02 I | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| 1,3-Butadiene | 106990 | | | | 9.80E-01 I | ☒ | 0.011 C | 0.0064 C | | | | 0.0013 C | 0.000072 C |
| 1-Butanol | 71363 | 1.00E-01 I | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | 9700 E | 8 E |
| Butyl benzyl phthalate | 85687 | 2.00E-01 I | | | | | 7300 N | 730 N | 270 N | 410000 N | 16000 N | 530 E | 68 E |
| Butylate | 2008415 | 5.00E-02 I | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | | |
| sec-Butylbenzene | 135988 | 1.00E-02 E | | | | ☒ | 61 N | 37 N | 14 N | 20000 N | 780 N | 80 S | 0.27 M |
| tert-Butylbenzene | 104518 | 1.00E-02 E | | | | ☒ | 61 N | 37 N | 14 N | 20000 N | 780 N | | 0.27 M |
| Butylphthalyl butylglycolate | 85701 | 1.00E+00 I | | | | | 37000 N | 3700 N | 1400 N | 1E+06 N | 78000 N | | |
| Cacodylic acid | 75605 | 3.00E-03 H | | | | | 110 N | 11 N | 4.1 N | 6100 N | 230 N | | |
| **Cadmium and compounds | 7440439 | 5.00E-04 I | 5.71E-05 E | | 6.30E+00 I | | 18 N | 0.00099 C | 0.68 N | 1000 N | 39 N | 920 E | 6 E |
| Caprolactam | 105602 | 5.00E-01 I | | | | | 18000 N | 1800 N | 680 N | 1E+06 N | 39000 N | | |
| Captafol | 2425061 | 2.00E-03 I | | 8.60E-03 H | | | 7.8 C | 0.73 C | 0.37 C | 670 C | 74 C | | |
| Captan | 133062 | 1.30E-01 I | | 3.50E-03 H | | | 19 C | 1.8 C | 0.9 C | 1600 C | 180 C | | |
| Carbaryl | 63252 | 1.00E-01 I | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | 0.34 S | 23 N |
| Carbofuran | 1563662 | 5.00E-03 I | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | | |
| **Carbon disulfide | 75150 | 1.00E-01 I | 2.00E-01 I | | | ☒ | 1000 N | 730 N | 140 N | 200000 N | 7800 N | 11 E | 14 E |
| Carbon tetrachloride | 56235 | 7.00E-04 I | 5.71E-04 E | 1.30E-01 I | 5.25E-02 I | ☒ | 0.16 C | 0.12 C | 0.024 C | 44 C | 4.9 C | 0.2 E | 0.03 E |
| Carbosulfan | 55285148 | 1.00E-02 I | | | | | 370 N | 37 N | 14 N | 20000 N | 780 N | | |
| Carboxin | 5234684 | 1.00E-01 I | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | | |
| Chloral | 75876 | 2.00E-03 I | | | | | 73 N | 7.3 N | 2.7 N | 4100 N | 160 N | | |
| Chloramben | 133904 | 1.50E-02 I | | | | | 550 N | 55 N | 20 N | 31000 N | 1200 N | | |
| Chloranil | 118752 | | | 4.03E-01 H | | | 0.17 C | 0.016 C | 0.0078 C | 14 C | 1.6 C | | |
| Chlordane | 57749 | 6.00E-05 I | | 1.30E+00 I | 1.29E+00 I | | 0.052 C | 0.0049 C | 0.0024 C | 4.4 C | 0.49 C | 10 E | 2 E |
| Chlorimuron-ethyl | 90982324 | 2.00E-02 I | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| Chlorine | 7782505 | 1.00E-01 I | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | | |
| Chlorine dioxide | 10049044 | | 5.71E-05 I | | | | 2.1 N | 0.21 N | | | | | |
| Chloroacetaldehyde | 107200 | 6.90E-03 O | | | | | 250 N | 25 N | 9.3 N | 14000 N | 540 N | | |
| Chloroacetic acid | 79118 | 2.00E-03 H | | | | | 73 N | 7.3 N | 2.7 N | 4100 N | 160 N | | |
| 2-Chloroacetophenone | 532274 | | 8.57E-06 I | | | | 0.31 N | 0.031 N | | | | | |
| 4-Chloroaniline | 106478 | 4.00E-03 I | | | | | 150 N | 15 N | 5.4 N | 8200 N | 310 N | 1200 S | 0.3 E |
| Chlorobenzene | 108907 | 2.00E-02 I | 5.71E-03 A | | | ☒ | 39 N | 21 N | 27 N | 41000 N | 1600 N | 94 E | 0.6 E |
| Chlorobenzilate | 510156 | 2.00E-02 I | | 2.70E-01 H | 2.70E-01 H | | 0.25 C | 0.023 C | 0.012 C | 21 C | 2.4 C | | |
| p-Chlorobenzoic acid | 74113 | 2.00E-01 H | | | | | 7300 N | 730 N | 270 N | 410000 N | 16000 N | | |
| 4-Chlorobenzotrifluoride | 98566 | 2.00E-02 H | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | 86 N | 7.5 N |
| 2-Chloro-1,3-butadiene | 126998 | 2.00E-02 A | 2.00E-03 H | | | ☒ | 14 N | 7.3 N | 27 N | 41000 N | 1600 N | | |
| 1-Chlorobutane | 109693 | 4.00E-01 H | | | | ☒ | 2400 N | 1500 N | 540 N | 820000 N | 31000 N | | |
| Chlorodibromomethane | 124481 | 2.00E-02 I | | 8.40E-02 I | | ☒ | 0.13 C | 0.075 C | 0.038 C | 68 C | 7.6 C | 1900 E | 0.2 E |
| **1-Chloro-1,1-difluoroethane | 75683 | I | 1.43E+01 | | | ☒ | 87000 N | 52000 N | | | | | |

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| Contaminant | CAS | RfDo mg/kg/d | RfDi mg/kg/d | CPSo kg·d/mg | CPSi kg·d/mg | VOC | Risk-Based Concentrations: Tap Water µg/L | Ambient Air µg/m3 | Fish mg/kg | Soil Ingestion: Industrial mg/kg | Soil Ingestion: Residential mg/kg | Soil Screening Levels-Transfers from Soil to: Air mg/kg | Groundwater mg/kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chlorodifluoromethane | 75456 | | 1.43e+01 I | | | ☒ | 87000 N | 52000 N | | | | | |
| Chloroethane | 75003 | 4.00E-01 E | 2.86E+00 I | | | ☒ | 8600 N | 10000 N | 540 N | 820000 N | 31000 N | 2600 S | 33 N |
| 2-Chloroethyl vinyl ether | 110758 | 2.50E-02 O | | | | ☒ | 150 N | 91 N | 34 N | 51000 N | 2000 N | | |
| Chloroform | 67663 | 1.00E-02 I | | 6.10E-03 I | 8.05E-02 I | ☒ | 0.15 C | 0.078 C | 0.52 C | 940 C | 100 C | 0.2 E | 0.3 E |
| Chloromethane | 74873 | | | 1.30E-02 H | 6.30E-03 H | ☒ | 1.4 C | 0.99 C | 0.24 C | 440 C | 49 C | 0.063 C | 0.0066 C |
| 4-Chloro-2,2-methylaniline hydrochloride | 3165933 | | | 4.60E-01 H | | | 0.15 C | 0.014 C | 0.0069 C | 12 C | 1.4 C | | |
| 4-Chloro-2-methylaniline | 95692 | | | 5.80E-01 H | | | 0.12 C | 0.011 C | 0.0054 C | 9.9 C | 1.1 C | | |
| beta-Chloronaphthalene | 91587 | 8.00E-02 I | | | | | 2900 N | 290 N | 110 N | 160000 N | 6300 N | 2.8 S | 140 N |
| o-Chloronitrobenzene | 88733 | | | 2.50E-02 H | | ☒ | 0.42 C | 0.25 C | 0.13 C | 230 C | 26 C | | |
| p-Chloronitrobenzene | 100005 | | | 1.80E-02 H | | ☒ | 0.59 C | 0.35 C | 0.18 C | 320 C | 35 C | | |
| 2-Chlorophenol | 95578 | 5.00E-03 I | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | 53000 E | 2 E |
| 2-Chloropropane | 75296 | | 2.86E-02 H | | | ☒ | 170 N | 100 N | | | | 22 N | 0.64 N |
| Chlorothalonil | 1897456 | 1.50E-02 I | | 1.10E-02 H | | | 6.1 C | 0.57 C | 0.29 C | 520 C | 58 C | | |
| o-Chlorotoluene | 95498 | 2.00E-02 I | | | | ☒ | 120 N | 73 N | 27 N | 41000 N | 1600 N | 1200 N | 5.6 N |
| Chlorpropham | 101213 | 2.00E-01 I | | | | | 7300 N | 730 N | 270 N | 410000 N | 16000 N | | |
| Chlorpyrifos | 2921882 | 3.00E-03 I | | | | | 110 N | 11 N | 4.1 N | 6100 N | 230 N | | |
| Chlorpyrifos-methyl | 5598130 | 1.00E-02 H | | | | | 370 N | 37 N | 14 N | 20000 N | 780 N | | |
| Chlorsulfuron | 64902723 | 5.00E-02 I | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | | |
| Chlorthiophos | 60238564 | 8.00E-04 H | | | | | 29 N | 2.9 N | 1.1 N | 1600 N | 63 N | | |
| Chromium III and compounds | 16065831 | 1.00E+00 I | 5.71E-07 W | | | | 37000 N | 0.0021 N | 1400 N | 1E+06 N | 78000 N | | |
| Chromium VI and compounds | 18540299 | 5.00E-03 I | | | 4.20E+01 I | | 180 N | 0.00015 C | 6.8 N | 10000 N | 390 N | 140 E | 19 E |
| Coal tar | 8001589 | | | | 2.20E+00 W | | | 0.0028 C | | | | | |
| Cobalt | 7440484 | 6.00E-02 E | | | | | 2200 N | 220 N | 81 N | 120000 N | 4700 N | | |
| Coke Oven Emissions | 8007452 | | | | 2.17E+00 I | | | 0.0029 C | | | | | |
| **Copper and compounds | 7440508 | 4.00E-02 E | | | | | 1500 N | 150 N | 54 N | 82000 N | 3100 N | | |
| Crotonaldehyde | 123739 | 1.00E-02 W | | 1.90E+00 H | 1.90E+00 W | | 0.035 C | 0.0033 C | 0.0017 C | 3 C | 0.34 C | | |
| Cumene | 98828 | 4.00E-02 I | 2.57E-03 H | | | | 1500 N | 9.4 N | 54 N | 82000 N | 3100 N | 81 N | 65 N |
| Cyanides: | | | | | | | | | | | | | |
| Barium cyanide | 542621 | 1.00E-01 W | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | | |
| Calcium cyanide | 592018 | 4.00E-02 I | | | | | 1500 N | 150 N | 54 N | 82000 N | 3100 N | | |
| Copper cyanide | 544923 | 5.00E-03 I | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | | |
| Cyanazine | 21725462 | 2.00E-03 H | | 8.40E-01 H | | | 0.08 C | 0.0075 C | 0.0038 C | 6.8 C | 0.76 C | | |
| Cyanogen | 460195 | 4.00E-02 I | | | | | 1500 N | 150 N | 54 N | 82000 N | 3100 N | | |
| Cyanogen bromide | 506683 | 9.00E-02 I | | | | | 3300 N | 330 N | 120 N | 180000 N | 7000 N | | |
| Cyanogen chloride | 506774 | 5.00E-02 I | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | | |
| Free cyanide | 57125 | 2.00E-02 I | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| Hydrogen cyanide | 74908 | 2.00E-02 I | 8.57E-04 I | | | | 730 N | 3.1 N | 27 N | 41000 N | 1600 N | | |
| Potassium cyanide | 151508 | 5.00E-02 I | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | | |
| Potassium silver cyanide | 506616 | 2.00E-01 I | | | | | 7300 N | 730 N | 270 N | 410000 N | 16000 N | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Silver cyanide | 506649 | 1.00E-01 I | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | | |
| Sodium cyanide | 143339 | 4.00E-02 I | | | | | 1500 N | 150 N | 54 N | 82000 N | 3100 N | | |
| **Thiocyanate | | 2.00E-02 E | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| Zinc cyanide | 557211 | 5.00E-02 I | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | | |
| Cyclohexanone | 108941 | 5.00E+00 I | | | | ☒ | 30000 N | 18000 N | 6800 N | 1E+06 N | 390000 N | | |
| Cyclohexlamine | 108918 | 2.00E-01 I | | | | | 7300 N | 730 N | 270 N | 410000 N | 16000 N | | |
| Cyhalothrin/Karate | 68085858 | 5.00E-03 I | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | | |
| Cypermethrin | 52315078 | 1.00E-02 I | | | | | 370 N | 37 N | 14 N | 20000 N | 780 N | | |
| Cyromazine | 66215278 | 7.50E-03 I | | | | | 270 N | 27 N | 10 N | 15000 N | 590 N | | |
| Dacthal | 1861321 | 1.00E-02 I | | | | | 370 N | 37 N | 14 N | 20000 N | 780 N | | |
| Dalapon | 75990 | 3.00E-02 I | | | | | 1100 N | 110 N | 41 N | 61000 N | 2300 N | | |
| Danitol | 39515418 | 2.50E-02 I | | | | | 910 N | 91 N | 34 N | 51000 N | 2000 N | | |
| DDD | 72548 | | | 2.40E-01 I | | | 0.28 C | 0.026 C | 0.013 C | 24 C | 2.7 C | 37 S | 0.7 E |
| DDE | 72559 | | | 3.40E-01 I | | | 0.2 C | 0.018 C | 0.0093 C | 17 C | 1.9 C | 10 S | 0.5 E |
| DDT | 50293 | 5.00E-04 I | | 3.40E-01 I | 3.40E-01 I | | 0.2 C | 0.018 C | 0.0093 C | 17 C | 1.9 C | 80 E | 1 E |
| Decabromodiphenyl ether | 1163195 | 1.00E-02 I | | | | ☒ | 61 N | 37 N | 14 N | 20000 N | 780 N | | |
| Demeton | 8065483 | 4.00E-05 I | | | | | 1.5 N | 0.15 N | 0.054 N | 82 N | 3.1 N | | |
| Diallate | 2303164 | | | 6.10E-02 H | | ☒ | 0.17 C | 0.1 C | 0.052 C | 94 C | 10 C | | |
| Diazinon | 333415 | 9.00E-04 H | | | | | 33 N | 3.3 N | 1.2 N | 1800 N | 70 N | 5400 S | 2.8 N |
| Dibenzofuran | 132649 | 4.00E-03 E | | | | | 150 N | 15 N | 5.4 N | 8200 N | 310 N | 120 S | 120 N |
| 1,4-Dibromobenzene | 106376 | 1.00E-02 I | | | | ☒ | 61 N | 37 N | 14 N | 20000 N | 780 N | | |
| 1,2-Dibromo-3-chloropropane | 96128 | | 5.71E-05 I | 1.40E+00 H | 2.42E-03 H | ☒ | 0.048 C | 0.21 N | 0.0023 C | 4.1 C | 0.46 C | 1.9 N | 0.00061 M |
| 1,2-Dibromoethane | 106934 | | 5.71E-05 H | 8.50E+01 I | 7.70E-01 I | ☒ | 0.00075 C | 0.0081 C | 0.00004 C | 0.067 C | 0.0075 C | 0.0058 C | 0.00018 M |
| Dibutyl phthalate | 84742 | 1.00E-01 I | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | 100 E | 120 E |
| Dicamba | 1918009 | 3.00E-02 I | | | | | 1100 N | 110 N | 41 N | 61000 N | 2300 N | | |
| 1,2-Dichlorobenzene | 95501 | 9.00E-02 I | 4.00E-02 A | | | ☒ | 270 N | 150 N | 120 N | 180000 N | 7000 N | 300 E | 6 E |
| 1,3-Dichlorobenzene | 541731 | 8.90E-02 O | | | | ☒ | 540 N | 320 N | 120 N | 180000 N | 7000 N | | |
| 1,4-Dichlorobenzene | 106467 | | 2.29E-01 I | 2.40E-02 H | | ☒ | 0.44 C | 0.26 C | 0.13 C | 240 C | 27 C | 7700 E | 1 E |
| 3,3'-Dichlorobenzidine | 91941 | | | 4.50E-01 I | | | 0.15 C | 0.014 C | 0.007 C | 13 C | 1.4 C | 52 S | 0.01 E |
| 1,4-Dichloro-2-butene | 764410 | | | | 9.30E+00 H | ☒ | 0.0011 C | 0.00067 C | | | | | |
| Dichlorodifluoromethane | 75718 | 2.00E-01 I | 5.71E-02 A | | | ☒ | 390 N | 210 N | 270 N | 410000 N | 16000 N | 37 N | 7.5 N |
| 1,1-Dichloroethane | 75343 | 1.00E-01 H | 1.43E-01 A | | | ☒ | 810 N | 520 N | 140 N | 200000 N | 7800 N | 980 E | 11 E |
| 1,2-Dichloroethane (EDC) | 107062 | | 2.86E-03 E | 9.10E-02 I | 9.10E-02 I | ☒ | 0.12 C | 0.069 C | 0.035 C | 63 C | 7 C | 0.3 E | 0.01 E |
| 1,1-Dichloroethylene | 75354 | 9.00E-03 I | | 6.00E-01 I | 1.75E-01 I | ☒ | 0.044 C | 0.036 C | 0.0053 C | 9.5 C | 1.1 C | 0.04 E | 0.03 E |
| 1,2-Dichloroethylene (cis) | 156592 | 1.00E-02 H | | | | ☒ | 61 N | 37 N | 14 N | 20000 N | 780 N | 1500 E | 0.2 E |
| 1,2-Dichloroethylene (trans) | 156605 | 2.00E-02 I | | | | ☒ | 120 N | 73 N | 27 N | 41000 N | 1600 N | 3600 E | 0.3 E |
| 1,2-Dichloroethylene (mixture) | 540590 | 9.00E-03 H | | | | ☒ | 55 N | 33 N | 12 N | 18000 N | 700 N | | |
| 2,4-Dichlorophenol | 120832 | 3.00E-03 I | | | | | 110 N | 11 N | 4.1 N | 6100 N | 230 N | 4800 S | 0.5 E |
| 2,4-Dichlorophenoxyacetic Acid (2,4-D) | 94757 | 1.00E-02 I | | | | ☒ | 61 N | 37 N | 14 N | 20000 N | 780 N | 7000 S | 1.7 M |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-(2,4-Dichlorophenoxy)butyric Acid | 94826 | 8.00E-03 I | | | | | 290 N | 29 N | 11 N | 16000 N | 630 N | | |
| 1,2-Dichloropropane | 78875 | | 1.14E-03 I | 6.80E-02 H | | ☒ | 0.16 C | 0.092 C | 0.046 C | 84 C | 9.4 C | 11 E | 0.02 E |
| 2,3-Dichloropropanol | 616239 | 3.00E-03 I | | | | | 110 N | 11 N | 4.1 N | 6100 N | 230 N | | |
| 1,3-Dichloropropene | 542756 | 3.00E-04 I | 5.71E-03 I | 1.75E-01 H | 1.30E-01 H | ☒ | 0.077 C | 0.048 C | 0.018 C | 33 C | 3.7 C | 0.1 E | 0.001 E |
| Dichlorvos | 62737 | 5.00e-04 I | 1.43E-04 I | 2.90E-01 I | | | 0.23 C | 0.022 C | 0.011 C | 20 C | 2.2 C | 3.5 C | 0.00072 C |
| Dicofol | 115322 | | | 4.40E-01 W | | | 0.15 C | 0.014 C | 0.0072 C | 13 C | 1.5 C | | |
| Dicyclopentadiene | 77736 | 3.00E-02 H | 5.71E-05 A | | | ☒ | 0.42 N | 0.21 N | 41 N | 61000 N | 2300 N | | |
| Dieldrin | 60571 | 5.00E-05 I | | 1.60E+01 I | 1.61E+01 I | | 0.0042 C | 0.00039 C | 0.0002 C | 0.36 C | 0.04 C | 2 E | 0.001 E |
| Diesel emissions | | | 1.43E-03 I | | | | 52 N | 5.2 N | | | | | |
| Diethyl phthalate | 84662 | 8.00E-01 I | | | | | 29000 N | 2900 N | 1100 N | 1E+06 N | 63000 N | 520 E | 110 E |
| Diethylene glycol, monobutyl ether | 112345 | | 5.71E-03 H | | | | 210 N | 21 N | | | | | |
| Diethylene glycol, monoethyl ether | 111900 | 2.00E+00 H | | | | | 73000 N | 7300 N | 2700 N | 1E+06 N | 160000 N | | |
| Diethylforamide | 617845 | 1.10E-02 H | | | | | 400 N | 40 N | 15 N | 22000 N | 860 N | | |
| Di(2-ethylhexyl)adipate | 103231 | 6.00E-01 I | | 1.20E-03 I | | | 56 C | 5.2 C | 2.6 C | 4800 C | 530 C | | |
| Diethylstilbestrol | 56531 | | | 4.70E+03 H | | | 0.00001 C | 1E-06 C | 7E-07 C | 0.0012 C | 0.00014 C | | |
| Difenzoquat (Avenge) | 43222486 | 8.00E-02 I | | | | | 2900 N | 290 N | 110 N | 160000 N | 6300 N | | |
| Diflubenzuron | 35367385 | 2.00E-02 I | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| 1,1-Difluoroethane | 75376 | | 1.14E+01 I | | | ☒ | 69000 N | 42000 N | | | | | |
| Diisopropyl methylphosphonate (DIMP) | 1445756 | 8.00E-02 I | | | | | 2900 N | 290 N | 110 N | 160000 N | 6300 N | | |
| Dimethipin | 55290647 | 2.00E-02 I | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| Dimethoate | 60515 | 2.00E-04 I | | | | | 7.3 N | 0.73 N | 0.27 N | 410 N | 16 N | | |
| 3,3'-Dimethoxybenzidine | 119904 | | | 1.40E-02 H | | | 4.8 C | 0.45 C | 0.23 C | 410 C | 46 C | | |
| Dimethylamine | 124403 | | 5.71E-06 W | | | | 0.21 N | 0.021 N | | | | | |
| 2,4-Dimethylaniline hydrochloride | 21436964 | | | 5.80E-01 H | | | 0.12 C | 0.011 C | 0.0054 C | 9.9 C | 1.1 C | | |
| 2,4-Dimethylaniline | 95681 | | | 7.50E-01 H | | | 0.09 C | 0.0083 C | 0.0042 C | 7.6 C | 0.85 C | | |
| N-N-Dimethylaniline | 121697 | 2.00E-03 I | | | | | 73 N | 7.3 N | 2.7 N | 4100 N | 160 N | | |
| 3,3'-Dimethylbenzidine | 119937 | | | 9.20E+00 H | | | 0.0073 C | 0.00068 C | 0.00034 C | 0.62 C | 0.069 C | 29 C | 0.00039 C |
| N,N-Dimethylformamide | 68122 | 1.00E-01 H | 8.57E-03 I | | | | 3700 N | 31 N | 140 N | 200000 N | 7800 N | | |
| 1,1-Dimethylhydrazine | 57147 | | | 2.60E+00 W | 3.50E+00 W | | 0.026 C | 0.0018 C | 0.0012 C | 2.2 C | 0.25 C | | |
| 1,2-Dimethylhydrazine | 540738 | | | 3.70E+01 W | 3.70E+01 W | | 0.0018 C | 0.00017 C | 0.00009 C | 0.15 C | 0.017 C | | |
| 2,4-Dimethylphenol | 105679 | 2.00E-02 I | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | 5400 S | 3 E |
| 2,6-Dimethylphenol | 576261 | 6.00E-04 I | | | | | 22 N | 2.2 N | 0.81 N | 1200 N | 47 N | | |
| 3,4-Dimethylphenol | 95658 | 1.00E-03 I | | | | | 37 N | 3.7 N | 1.4 N | 2000 N | 78 N | | |
| Dimethyl phthalate | 131113 | 1.00E+01 H | | | | | 370000 N | 37000 N | 14000 N | 1E+06 N | 780000 N | 1600 E | 1200 E |
| Dimethyl terephthalate | 120616 | 1.00E-01 I | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | | |
| 1,2-Dinitrobenzene | 528290 | 4.00E-04 H | | | | | 15 N | 1.5 N | 0.54 N | 820 N | 31 N | | |
| 1,3-Dinitrobenzene | 99650 | 1.00E-04 I | | | | | 3.7 N | 0.37 N | 0.14 N | 200 N | 7.8 N | | |
| 1,4-Dinitrobenzene | 100254 | 4.00E-04 H | | | | | 15 N | 1.5 N | 0.54 N | 820 N | 31 N | | |
| 4,6-Dinitro-o-cyclohexyl phenol | 131895 | 2.00E-03 I | | | | | 73 N | 7.3 N | 2.7 N | 4100 N | 160 N | | |

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| Contaminant | CAS | RfDo mg/kg/d | RfDi mg/kg/d | CPSo kg·d/mg | CPSi kg·d/mg | VOC | Risk-Based Concentrations: Tap Water µg/L | Ambient Air µg/m3 | Fish mg/kg | Soil Ingestion: Industrial mg/kg | Residential mg/kg | Soil Screening Levels-Transfers from Soil to: Air mg/kg | Groundwater mg/kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4-Dinitrophenol | 51285 | 2.00E-03 I | | | | | 73 N | 7.3 N | 2.7 N | 4100 N | 160 N | 360 N | 0.1 E |
| Dinitrotoluene mixture | | | | 6.80E-01 I | | | 0.099 C | 0.0092 C | 0.0046 C | 8.4 C | 0.94 C | | |
| 2,4-Dinitrotoluene | 121142 | 2.00E-03 I | | | | | 73 N | 7.3 N | 2.7 N | 4100 N | 160 N | 120 S | 0.2 E |
| 2,6-Dinitrotoluene | 606202 | 1.00E-03 H | | | | | 37 N | 3.7 N | 1.4 N | 2000 N | 78 N | 370 S | 0.1 E |
| Dinoseb | 88857 | 1.00E-03 I | | | | | 37 N | 3.7 N | 1.4 N | 2000 N | 78 N | | |
| di-n-Octyl phthalate | 117840 | 2.00E-02 H | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | 1000000 S | 1000000 E |
| 1,4-Dioxane | 123911 | | | 1.10E-02 I | | | 6.1 C | 0.57 C | 0.29 C | 520 C | 58 C | | |
| Diphenamid | 957517 | 3.00E-02 I | | | | | 1100 N | 110 N | 41 N | 61000 N | 2300 N | | |
| Diphenylamine | 122394 | 2.50E-02 I | | | | | 910 N | 91 N | 34 N | 51000 N | 2000 N | | |
| 1,2-Diphenylhydrazine | 122667 | | | 8.00E-01 I | 7.70E-01 I | | 0.084 C | 0.0081 C | 0.0039 C | 7.2 C | 0.8 C | | |
| Diquat | 85007 | 2.20E-03 I | | | | | 80 N | 8 N | 3 N | 4500 N | 170 N | | |
| Direct black 38 | 1937377 | | | 8.60E+00 H | | | 0.0078 C | 0.00073 C | 0.00037 C | 0.67 C | 0.074 C | | |
| Direct blue 6 | 2602462 | | | 8.10E+00 H | | | 0.0083 C | 0.00077 C | 0.00039 C | 0.71 C | 0.079 C | | |
| Direct brown 95 | 16071866 | | | 9.30E+00 H | | | 0.0072 C | 0.00067 C | 0.00034 C | 0.62 C | 0.069 C | | |
| Disulfoton | 298044 | 4.00E-05 I | | | | | 1.5 N | 0.15 N | 0.054 N | 82 N | 3.1 N | | |
| 1,4-Dithiane | 505293 | 1.00E-02 I | | | | | 370 N | 37 N | 14 N | 20000 N | 780 N | | |
| Diuron | 330541 | 2.00E-03 I | | | | | 73 N | 7.3 N | 2.7 N | 4100 N | 160 N | | |
| Dodine | 2439103 | 4.00E-03 I | | | | | 150 N | 15 N | 5.4 N | 8200 N | 310 N | | |
| Endosulfan | 115297 | 6.00E-03 I | | | | | 220 N | 22 N | 8.1 N | 12000 N | 470 N | 1 S | 3 E |
| Endothall | 145733 | 2.00E-02 I | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| Endrin | 72208 | 3.00E-04 I | | | | | 11 N | 1.1 N | 0.41 N | 610 N | 23 N | 16 S | 0.4 E |
| Epichlorohydrin | 106898 | 2.00E-03 H | 2.86E-04 I | 9.90E-03 I | 4.20E-03 I | | 6.8 C | 1 N | 0.32 C | 580 C | 65 C | | |
| 1,2-Epoxybutane | 106887 | | 5.71E-03 I | | | | 210 N | 21 N | | | | | |
| Ethephon (2-chloroethyl phosphonic acid) | 16672870 | 5.00E-03 I | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | | |
| Ethion | 563122 | 5.00E-04 I | | | | | 18 N | 1.8 N | 0.68 N | 1000 N | 39 N | | |
| 2-Ethoxyethanol acetate | 111159 | 3.00E-01 A | | | | | 11000 N | 1100 N | 410 N | 610000 N | 23000 N | | |
| 2-Ethoxyethanol | 110805 | 4.00E-01 H | 5.71E-02 I | | | | 15000 N | 210 N | 540 N | 820000 N | 31000 N | | |
| Ethyl acrylate | 140885 | | | 4.80E-02 H | | | 1.4 C | 0.13 C | 0.066 C | 120 C | 13 C | | |
| EPTC (S-Ethyl dipropylthiocarbamate) | 759944 | 2.50E-02 I | | | | | 910 N | 91 N | 34 N | 51000 N | 2000 N | | |
| Ethyl acetate | 141786 | 9.00E-01 I | | | | | 33000 N | 3300 N | 1200 N | 1E+06 N | 70000 N | | |
| Ethylbenzene | 100414 | 1.00E-01 I | 2.86E-01 I | | | ☒ | 1300 N | 1000 N | 140 N | 200000 N | 7800 N | 260 E | 5 E |
| Ethylene cyanohydrin | 109784 | 3.00E-01 H | | | | | 11000 N | 1100 N | 410 N | 610000 N | 23000 N | | |
| Ethylene diamine | 107153 | 2.00E-02 H | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| Ethylene glycol | 107211 | 2.00E+00 I | | | | | 73000 N | 7300 N | 2700 N | 1E+06 N | 160000 N | | |
| Ethylene glycol, monobutyl ether | 111762 | | 5.71E-03 H | | | | 210 N | 21 N | | | | | |
| Ethylene oxide | 75218 | | | 1.02E+00 H | 3.50E-01 H | | 0.066 C | 0.018 C | 0.0031 C | 5.6 C | 0.63 C | | |
| Ethylene thiourea (ETU) | 96457 | 8.00E-05 I | | 1.19E-01 H | | | 0.57 C | 0.053 C | 0.027 C | 48 C | 5.4 C | | |
| Ethyl ether | 60297 | 2.00E-01 I | | | | ☒ | 1200 N | 730 N | 270 N | 410000 N | 16000 N | | |
| Ethyl methacrylate | 97632 | 9.00E-02 H | | | | | 3300 N | 330 N | 120 N | 180000 N | 7000 N | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ethyl p-nitrophenyl phenylphosphorothioate | 2104645 | 1.00E-05 I | | | | | 0.37 N | 0.037 N | 0.014 N | 20 N | 0.78 N | | |
| Ethylnitrosourea | 759739 | | | 1.40E+02 W | | | 0.00048 C | 0.00005 C | 0.00002 C | 0.041 C | 0.0046 C | | |
| Ethylphthalyl ethyl glycolate | 84720 | 3.00E+00 I | | | | | 110000 N | 11000 N | 4100 N | 1E+06 N | 230000 N | | |
| Express | 10120 | 8.00E-03 I | | | | | 290 N | 29 N | 11 N | 16000 N | 630 N | | |
| Fenamiphos | 22224926 | 2.50E-04 I | | | | | 9.1 N | 0.91 N | 0.34 N | 510 N | 20 N | | |
| Fluometuron | 2164172 | 1.30E-02 I | | | | | 470 N | 47 N | 18 N | 27000 N | 1000 N | | |
| Fluoride | 7782414 | 6.00E-02 I | | | | | 2200 N | 220 N | 81 N | 120000 N | 4700 N | | |
| Fluoridone | 59756604 | 8.00E-02 I | | | | | 2900 N | 290 N | 110 N | 160000 N | 6300 N | | |
| Flurprimidol | 56425913 | 2.00E-02 I | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| Flutolanil | 66332965 | 6.00E-02 I | | | | | 2200 N | 220 N | 81 N | 120000 N | 4700 N | | |
| Fluvalinate | 69409945 | 1.00E-02 I | | | | | 370 N | 37 N | 14 N | 20000 N | 780 N | | |
| Folpet | 133073 | 1.00E-01 I | | 3.50E-03 I | | | 19 C | 1.8 C | 0.9 C | 1600 C | 180 C | | |
| Fomesafen | 72178020 | | | 1.90E-01 I | | | 0.35 C | 0.033 C | 0.017 C | 30 C | 3.4 C | | |
| Fonofos | 944229 | 2.00E-03 I | | | | | 73 N | 7.3 N | 2.7 N | 4100 N | 160 N | | |
| Formaldehyde | 50000 | 2.00E-01 I | | | 4.55E-02 I | | 7300 N | 0.14 C | 270 N | 410000 N | 16000 N | | |
| Formic Acid | 64186 | 2.00E+00 H | | | | | 73000 N | 7300 N | 2700 N | 1E+06 N | 160000 N | | |
| Fosetyl-al | 39148248 | 3.00E+00 I | | | | | 110000 N | 11000 N | 4100 N | 1E+06 N | 230000 N | | |
| Furan | 110009 | 1.00E-03 I | | | | | 37 N | 3.7 N | 1.4 N | 2000 N | 78 N | | |
| Furazolidone | 67458 | | | 3.80E+00 H | | | 0.018 C | 0.0016 C | 0.00083 C | 1.5 C | 0.17 C | | |
| Furfural | 98011 | 3.00E-03 I | 1.43E-02 A | | | | 110 N | 52 N | 4.1 N | 6100 N | 230 N | | |
| Furium | 531828 | | | 5.00E+01 H | | | 0.0013 C | 0.00013 C | 0.00006 C | 0.11 C | 0.013 C | | |
| Furmecyclox | 60568050 | | | 3.00E-02 I | | | 2.2 C | 0.21 C | 0.11 C | 190 C | 21 C | | |
| Glufosinate-ammonium | 77182822 | 4.00E-04 I | | | | | 15 N | 1.5 N | 0.54 N | 820 N | 31 N | | |
| Glycidaldehyde | 765344 | 4.00E-04 I | 2.86E-04 H | | | | 15 N | 1 N | 0.54 N | 820 N | 31 N | | |
| Glyphosate | 1071836 | 1.00E-01 I | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | | |
| Haloxyfop-methyl | 69806402 | 5.00E-05 I | | | | | 1.8 N | 0.18 N | 0.068 N | 100 N | 3.9 N | | |
| Harmony | 79277273 | 1.30E-02 I | | | | | 470 N | 47 N | 18 N | 27000 N | 1000 N | | |
| HCH (alpha) | 319846 | | | 6.30E+00 I | 6.30E+00 I | | 0.011 C | 0.00099 C | 0.0005 C | 0.91 C | 0.1 C | 0.9 E | 0.0004 E |
| HCH (beta) | 319857 | | | 1.80E+00 I | 1.80E+00 I | | 0.037 C | 0.0035 C | 0.0018 C | 3.2 C | 0.35 C | 16 E | 0.002 E |
| HCH (gamma) Lindane | 58899 | 3.00E-04 I | | 1.30E+00 H | | | 0.052 C | 0.0048 C | 0.0024 C | 4.4 C | 0.49 C | 4.2 C | 0.006 E |
| HCH-technical | 608731 | | | 1.80E+00 I | 1.79E+00 I | | 0.037 C | 0.0035 C | 0.0018 C | 3.2 C | 0.35 C | | |
| Heptachlor | 76448 | 5.00E-04 I | | 4.50E+00 I | 4.55E+00 I | X | 0.0023 C | 0.0014 C | 0.0007 C | 1.3 C | 0.14 C | 0.3 E | 0.06 E |
| Heptachlor epoxide | 1024573 | 1.30E-05 I | | 9.10E+00 I | 9.10E+00 I | X | 0.0012 C | 0.00069 C | 0.00035 C | 0.63 C | 0.07 C | 1 E | 0.03 E |
| Hexabromobenzene | 87821 | 2.00E-03 I | | | | X | 12 N | 7.3 N | 2.7 N | 4100 N | 160 N | | |
| Hexachlorobenzene | 118741 | 8.00E-04 I | | 1.60E+00 I | 1.61E+00 I | X | 0.0066 C | 0.0039 C | 0.002 C | 3.6 C | 0.4 C | 1 E | 0.8 E |
| Hexachlorobutadiene | 87683 | 2.00E-04 H | | 7.80E-02 I | 7.70E-02 I | X | 0.14 C | 0.081 C | 0.04 C | 73 C | 8.2 C | 1 E | 0.1 E |
| Hexachlorocyclopentadiene | 77474 | 7.00E-03 I | 2.00E-05 H | | | X | 0.15 N | 0.073 N | 9.5 N | 14000 N | 550 N | 2 E | 10 E |
| Hexachlorodibenzo-p-dioxin mixture | 19408743 | | | 6.20E+03 I | 4.55E+03 I | | 0.00001 C | 1E-06 C | 5E-07 C | 0.0009 C | 0.0001 C | | |
| Hexachloroethane | 67721 | 1.00E-03 I | | 1.40E-02 I | 1.40E-02 I | X | 0.75 C | 0.45 C | 0.23 C | 410 C | 46 C | 49 E | 0.2 E |

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| Contaminant | CAS | RfDo mg/kg/d | RfDi mg/kg/d | CPSo kg·d/mg | CPSi kg·d/mg | VOC | Risk-Based Concentrations: Tap Water µg/L | Ambient Air µg/m3 | Fish mg/kg | Soil Ingestion: Industrial mg/kg | Soil Ingestion: Residential mg/kg | Soil Screening Levels-Transfers from Soil to: Air mg/kg | Groundwater mg/kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hexachlorophene | 70304 | 3.00E-04 I | | | | | 11 N | 1.1 N | 0.41 N | 610 N | 23 N | | |
| Hexahydro-1,3,5-trinitro-1,3,5-triazine | 121824 | 3.00E-03 I | | 1.10E-01 I | | | 0.61 C | 0.057 C | 0.029 C | 52 C | 5.8 C | | |
| 1,6-Hexamethylene diisocyanate | 822060 | | 2.86E-06 I | | | | 0.1 N | 0.01 N | | | | | |
| n-Hexane | 110543 | 6.00E-02 H | 5.71E-02 I | | | X | 350 N | 210 N | 81 N | 120000 N | 4700 N | 32 N | 13 N |
| Hexazinone | 51235042 | 3.30E-02 I | | | | | 1200 N | 120 N | 45 N | 67000 N | 2600 N | | |
| Hydrazine, hydrazine sulfate | 302012 | | | 3.00E+00 I | 1.71E+01 I | | 0.022 C | 0.00037 C | 0.0011 C | 1.9 C | 0.21 C | | |
| **Hydrogen chloride | 7647010 | | 5.71E-03 I | | | | 210 N | 21 N | | | | | |
| **Hydrogen sulfide | 7783064 | 3.00E-03 I | 2.85E-04 I | | | | 110 N | 1 N | 4.1 N | 6100 N | 230 N | | |
| Hydroquinone | 123319 | 4.00E-02 H | | | | | 1500 N | 150 N | 54 N | 82000 N | 3100 N | | |
| Imazalil | 35554440 | 1.30E-02 I | | | | | 470 N | 47 N | 18 N | 27000 N | 1000 N | | |
| Imazaquin | 81335377 | 2.50E-01 I | | | | | 9100 N | 910 N | 340 N | 510000 N | 20000 N | | |
| Iprodione | 36734197 | 4.00E-02 I | | | | | 1500 N | 150 N | 54 N | 82000 N | 3100 N | | |
| **Iron | 7439896 | 3.00E-01 E | | | | | 11000 N | 1100 N | 410 N | 610000 N | 23000 N | | |
| Isobutanol | 78831 | 3.00E-01 I | | | | X | 1800 N | 1100 N | 410 N | 610000 N | 23000 N | | |
| Isophorone | 78591 | 2.00E-01 I | | 9.50E-04 I | | | 71 C | 6.6 C | 3.3 C | 6000 C | 670 C | 3400 E | 0.2 E |
| Isopropalin | 33820530 | 1.50E-02 I | | | | | 550 N | 55 N | 20 N | 31000 N | 1200 N | | |
| Isopropyl methyl phosphonic acid | 1832548 | 1.00E-01 I | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | | |
| Isoxaben | 82558507 | 5.00E-02 I | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | | |
| Kepone | 143500 | | | 1.80E+01 E | | | 0.0037 C | 0.00035 C | 0.00018 C | 0.32 C | 0.035 C | | |
| Lactofen | 77501634 | 2.00E-03 I | | | | | 73 N | 7.3 N | 2.7 N | 4100 N | 160 N | | |
| Linuron | 330552 | 2.00E-03 I | | | | | 73 N | 7.3 N | 2.7 N | 4100 N | 160 N | | |
| Lithium | 7439932 | 2.00E-02 E | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| Londax | 83056996 | 2.00E-01 I | | | | | 7300 N | 730 N | 270 N | 410000 N | 16000 N | | |
| Malathion | 121755 | 2.00E-02 I | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| Maleic anhydride | 108316 | 1.00E-01 I | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | | |
| Maleic hydrazide | 123331 | 5.00E-01 I | | | | | 18000 N | 1800 N | 680 N | 1E+06 N | 39000 N | | |
| Malononitrile | 109773 | 2.00E-05 H | | | | | 0.73 N | 0.073 N | 0.027 N | 41 N | 1.6 N | | |
| Mancozeb | 8018017 | 3.00E-02 H | | | | | 1100 N | 110 N | 41 N | 61000 N | 2300 N | | |
| Maneb | 12427382 | 5.00E-03 I | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | | |
| Manganese and compounds | 7439965 | 5.00E-03 I | 1.43e-05 I | | | | 180 N | 0.052 N | 6.8 N | 10000 N | 390 N | | |
| Mephosfolan | 950107 | 9.00E-05 H | | | | | 3.3 N | 0.33 N | 0.12 N | 180 N | 7 N | | |
| Mepiquat chloride | 24307264 | 3.00E-02 I | | | | | 1100 N | 110 N | 41 N | 61000 N | 2300 N | | |
| **Mercuric chloride | 7487947 | 3.00E-04 I | | | | | 11 N | 1.1 N | 0.41 N | 610 N | 23 N | | |
| Mercury (inorganic) | 7439976 | 3.00E-04 H | 8.57E-05 H | | | | 11 N | 0.31 N | 0.41 N | 610 N | 23 N | 7 E | 3 E |
| Mercury (methyl) | 22967926 | 1.00E-04 I | | | | | 3.7 N | 0.37 N | 0.14 N | 200 N | 7.8 N | | |
| Merphos | 150505 | 3.00E-05 I | | | | | 1.1 N | 0.11 N | 0.041 N | 61 N | 2.3 N | | |
| Merphos oxide | 78488 | 3.00E-05 I | | | | | 1.1 N | 0.11 N | 0.041 N | 61 N | 2.3 N | | |
| Metalaxyl | 57837191 | 6.00E-02 I | | | | | 2200 N | 220 N | 81 N | 120000 N | 4700 N | | |
| Methacrylonitrile | 126987 | 1.00E-04 I | 2.00E-04 A | | | | 3.7 N | 0.73 N | 0.14 N | 200 N | 7.8 N | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Methamidophos | 10265926 | 5.00E-05 I | | | | | 1.8 N | 0.18 N | 0.068 N | 100 N | 3.9 N | | |
| Methanol | 67561 | 5.00E-01 I | | | | | 18000 N | 1800 N | 680 N | 1E+06 N | 39000 N | | |
| Methidathion | 950378 | 1.00E-03 I | | | | | 37 N | 3.7 N | 1.4 N | 2000 N | 78 N | | |
| Methomyl | 16752775 | 2.50E-02 I | | | | | 910 N | 91 N | 34 N | 51000 N | 2000 N | | |
| Methoxychlor | 72435 | 5.00E-03 I | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | 41 S | 62 E |
| 2-Methoxyethanol acetate | 110496 | 2.00E-03 A | | | | | 73 N | 7.3 N | 2.7 N | 4100 N | 160 N | | |
| 2-Methoxyethanol | 109864 | 1.00E-03 H | 5.71E-03 I | | | | 37 N | 21 N | 1.4 N | 2000 N | 78 N | | |
| 2-Methoxy-5-nitroaniline | 99592 | | | 4.60E-02 H | | | 1.5 C | 0.14 C | 0.069 C | 120 C | 14 C | | |
| Methyl acetate | 79209 | 1.00E+00 H | | | | | 37000 N | 3700 N | 1400 N | 1E+06 N | 78000 N | | |
| Methyl acrylate | 96333 | 3.00E-02 A | | | | | 1100 N | 110 N | 41 N | 61000 N | 2300 N | | |
| 2-Methylaniline hydrochloride | 636215 | | | 1.80E-01 H | | | 0.37 C | 0.035 C | 0.018 C | 32 C | 3.5 C | | |
| 2-Methylaniline | 95534 | | | 2.40E-01 H | | | 0.28 C | 0.026 C | 0.013 C | 24 C | 2.7 C | | |
| Methyl chlorocarbonate | 79221 | 1.00E+00 W | | | | | 37000 N | 3700 N | 1400 N | 1E+06 N | 78000 N | | |
| 4-(2-Methyl-4-chlorophenoxy) butyric acid | 94815 | 1.00E-02 I | | | | | 370 N | 37 N | 14 N | 20000 N | 780 N | | |
| 2-Methyl-4-chlorophenoxyacetic acid | 94746 | 5.00E-04 I | | | | | 18 N | 1.8 N | 0.68 N | 1000 N | 39 N | | |
| 2-(2-Methyl-14-chlorophenoxy)propionic acid | 93652 | 1.00E-03 I | | | | | 37 N | 3.7 N | 1.4 N | 2000 N | 78 N | | |
| Methylcyclohexane | 108872 | | 8.57E-01 H | | | | 31000 N | 3100 N | | | | 60 S | 1500 N |
| Methylene bromide | 74953 | 1.00E-02 A | | | | ☒ | 61 N | 37 N | 14 N | 20000 N | 780 N | | |
| Methylene chloride | 75092 | 6.00E-02 I | 8.57E-01 H | 7.50E-03 I | 1.64E-03 I | ☒ | 4.1 C | 3.8 C | 0.42 C | 760 C | 85 C | 7 E | 0.01 E |
| 4,4'-Methylene bis(2-chloroaniline) | 101144 | 7.00E-04 H | | 1.30E-01 H | 1.30E-01 H | | 0.52 C | 0.048 C | 0.024 C | 44 C | 4.9 C | | |
| 4,4'-Methylenebisbenzeneamine | 101779 | | | 2.50E-01 W | | | 0.27 C | 0.025 C | 0.013 C | 23 C | 2.6 C | | |
| 4,4'-Methylene bis(N,N'-dimethyl)aniline | 101611 | | | 4.60E-02 I | | | 1.5 C | 0.14 C | 0.069 C | 120 C | 14 C | | |
| 4,4'-Methylenediphenyl isocyanate | 101688 | | 5.71E-06 I | | | ☒ | 0.035 N | 0.021 N | | | | | |
| Methyl ethyl ketone | 78933 | 6.00E-01 I | 2.86E-01 I | | | ☒ | 1900 N | 1000 N | 810 N | 1E+06 N | 47000 N | | |
| Methyl hydrazine | 60344 | | | 1.10E+00 W | | | 0.061 C | 0.0057 C | 0.0029 C | 5.2 C | 0.58 C | | |
| Methyl isobutyl ketone | 108101 | 8.00E-02 H | 2.29E-02 A | | | | 2900 N | 84 N | 110 N | 160000 N | 6300 N | | |
| Methyl methacrylate | 80626 | 8.00E-02 H | | | | | 2900 N | 290 N | 110 N | 160000 N | 6300 N | | |
| 2-Methyl-5-nitroaniline | 99558 | | | 3.30E-02 H | | | 2 C | 0.19 C | 0.096 C | 170 C | 19 C | | |
| Methyl parathion | 298000 | 2.50E-04 I | | | | | 9.1 N | 0.91 N | 0.34 N | 510 N | 20 N | 28 S | 0.041 N |
| 2-Methylphenol (o-cresol) | 95487 | 5.00E-02 I | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | 12000 S | 6 E |
| 3-Methylphenol (m-cresol) | 103394 | 5.00E-02 I | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | | |
| 4-Methylphenol (p-cresol) | 106445 | 5.00E-03 H | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | | |
| Methyl styrene (mixture) | 25013154 | 6.00E-03 A | 1.14E-02 A | | | ☒ | 60 N | 42 N | 8.1 N | 12000 N | 470 N | 100 N | 1 N |
| Methyl styrene (alpha) | 98839 | 7.00E-02 A | | | | ☒ | 430 N | 260 N | 95 N | 140000 N | 5500 N | 8.8 S | 7.5 N |
| Methyl tertbutyl ether (MTBE) | 1634044 | 5.00E-03 E | 8.57E-01 I | | | ☒ | 180 N | 3100 N | 6.8 N | 10000 N | 390 N | | |
| Metolaclor (Dual) | 51218452 | 1.50E-01 H | | | | | 5500 N | 550 N | 200 N | 310000 N | 12000 N | | |
| Metribuzin | 21087649 | 2.50E-02 I | | | | | 910 N | 91 N | 34 N | 51000 N | 2000 N | | |
| Mirex | 2385855 | 2.00E-04 I | | 1.80E+00 W | | | 0.037 C | 0.0035 C | 0.0018 C | 3.2 C | 0.35 C | | |
| Molinate | 2212671 | 2.00E-03 I | | | | | 73 N | 7.3 N | 2.7 N | 4100 N | 160 N | | |

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| Contaminant | CAS | RfDo mg/kg/d | RfDi mg/kg/d | CPSo kg·d/mg | CPSi kg·d/mg | VOC | Risk-Based Concentrations: Tap Water µg/L | Ambient Air µg/m3 | Fish mg/kg | Soil Ingestion: Industrial mg/kg | Residential mg/kg | Soil Screening Levels-Transfers from Soil to: Air mg/kg | Groundwater mg/kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Molybdenum | 7439987 | 5.00E-03 I | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | | |
| Monochloramine | 10599903 | 1.00E-01 I | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | | |
| Naled | 300765 | 2.00E-03 I | | | | | 73 N | 7.3 N | 2.7 N | 4100 N | 160 N | | |
| 2-Naphthylamine | 91598 | | | 1.30e+02 E | | | 0.00052 C | 0.00005 C | 0.00002 C | 0.044 C | 0.0049 C | | |
| Napropamide | 15299997 | 1.00E-01 I | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | | |
| Nickel refinery dust | | | | | 8.40E-01 I | | | 0.0075 C | | | | | |
| Nickel and compounds | 7440020 | 2.00E-02 I | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | 6900 E | 21 E |
| Nickel subsulfide | 12035722 | | | | 1.70E+00 I | | | 0.0037 C | | | | | |
| Nitrapyrin | 1929824 | 1.50E-03 W | | | | | 55 N | 5.5 N | 2 N | 3100 N | 120 N | | |
| Nitrate | 14797558 | 1.60E+00 I | | | | | 58000 N | 5800 N | 2200 N | 1E+06 N | 130000 N | | |
| Nitric Oxide | 10102439 | 1.00E-01 W | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | | |
| Nitrite | 14797650 | 1.00E-01 I | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | | |
| 2-Nitroaniline | 88744 | 6.00E-05 W | 5.71E-05 H | | | | 2.2 N | 0.21 N | 0.081 N | 120 N | 4.7 N | | |
| 3-Nitroaniline | 99092 | 3.00E-03 O | | | | | 110 N | 11 N | 4.1 N | 6100 N | 230 N | | |
| 4-Nitroaniline | 100016 | 3.00E-03 O | | | | | 110 N | 11 N | 4.1 N | 6100 N | 230 N | | |
| Nitrobenzene | 98953 | 5.00E-04 I | 5.71E-04 A | | | X | 3.4 N | 2.1 N | 0.68 N | 1000 N | 39 N | 110 E | 0.09 E |
| Nitrofurantoin | 67209 | 7.00E-02 H | | | | | 2600 N | 260 N | 95 N | 140000 N | 5500 N | | |
| Nitrofurazone | 59870 | | | 1.50E+00 H | 9.40E+00 H | | 0.045 C | 0.00067 C | 0.0021 C | 3.8 C | 0.43 C | | |
| Nitrogen dioxide | 10102440 | 1.00E+00 W | | | | | 37000 N | 3700 N | 1400 N | 1E+06 N | 78000 N | | |
| Nitroguanidine | 556887 | 1.00E-01 I | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | | |
| 4-Nitrophenol | 100027 | 6.20E-02 O | | | | | 2300 N | 230 N | 84 N | 130000 N | 4800 N | | |
| 2-Nitropropane | 79469 | | 5.71E-03 I | | 9.40E+00 H | | 210 N | 0.00067 C | | | | | |
| N-Nitrosodi-n-butylamine | 924163 | | | 5.40E+00 I | 5.60E+00 I | | 0.012 C | 0.0011 C | 0.00058 C | 1.1 C | 0.12 C | | |
| N-Nitrosodiethanolamine | 1116547 | | | 2.80E+00 I | | | 0.024 C | 0.0022 C | 0.0011 C | 2 C | 0.23 C | | |
| N-Nitrosodiethylamine | 55185 | | | 1.50E+02 I | 1.51E+02 I | | 0.00045 C | 0.00004 C | 0.00002 C | 0.038 C | 0.0043 C | | |
| N-Nitrosodimethylamine | 62759 | | | 5.10E+01 I | 4.90E+01 I | | 0.0013 C | 0.00013 C | 0.00006 C | 0.11 C | 0.013 C | | |
| N-Nitrosodiphenylamine | 86306 | | | 4.90E-03 I | | | 14 C | 1.3 C | 0.64 C | 1200 C | 130 C | 29 C | 0.2 E |
| N-Nitroso di-n-propylamine | 621647 | | | 7.00E+00 I | | | 0.0096 C | 0.00089 C | 0.00045 C | 0.82 C | 0.091 C | 0.014 C | 0.00002 E |
| N-Nitroso-N-methylethylamine | 10595956 | | | 2.20E+01 I | | | 0.0031 C | 0.00028 C | 0.00014 C | 0.26 C | 0.029 C | | |
| N-Nitrosopyrrolidine | 930552 | | | 2.10E+00 I | 2.13E+00 I | | 0.032 C | 0.0029 C | 0.0015 C | 2.7 C | 0.3 C | | |
| m-Nitrotoluene | 99081 | 1.00E-02 H | | | | X | 61 N | 37 N | 14 N | 20000 N | 780 N | 460 S | 0.42 N |
| o-Nitrotoluene | 88722 | 1.00E-02 H | | | | X | 61 N | 37 N | 14 N | 20000 N | 780 N | 460 S | 0.42 N |
| p-Nitrotoluene | 99990 | 1.00E-02 H | | | | X | 61 N | 37 N | 14 N | 20000 N | 780 N | 460 S | 0.42 N |
| Norflurazon | 27314132 | 4.00E-02 I | | | | | 1500 N | 150 N | 54 N | 82000 N | 3100 N | | |
| NuStar | 85509199 | 7.00E-04 I | | | | | 26 N | 2.6 N | 0.95 N | 1400 N | 55 N | | |
| Octabromodiphenyl ether | 32536520 | 3.00E-03 I | | | | | 110 N | 11 N | 4.1 N | 6100 N | 230 N | | |
| Octahydro-1357-tetranitro-1357-tetrazocine | 2691410 | 5.00E-02 I | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | | |
| Octamethylpyrophosphoramide | 152169 | 2.00E-03 H | | | | | 73 N | 7.3 N | 2.7 N | 4100 N | 160 N | | |
| Oryzalin | 19044883 | 5.00E-02 I | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oxadiazon | 19666309 | 5.00E-03 I | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | | |
| Oxamyl | 23135220 | 2.50E-02 I | | | | | 910 N | 91 N | 34 N | 51000 N | 2000 N | | |
| Oxyfluorfen | 42874033 | 3.00E-03 I | | | | | 110 N | 11 N | 4.1 N | 6100 N | 230 N | | |
| Paclobutrazol | 76738620 | 1.30E-02 I | | | | | 470 N | 47 N | 18 N | 27000 N | 1000 N | | |
| Paraquat | 1910425 | 4.50E-03 I | | | | | 160 N | 16 N | 6.1 N | 9200 N | 350 N | | |
| Parathion | 56382 | 6.00E-03 H | | | | | 220 N | 22 N | 8.1 N | 12000 N | 470 N | 110 S | 3.9 N |
| Pebulate | 1114712 | 5.00E-02 H | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | | |
| Pendimethalin | 40487421 | 4.00E-02 I | | | | | 1500 N | 150 N | 54 N | 82000 N | 3100 N | | |
| Pentabromo-6-chloro cyclohexane | 87843 | | | 2.30E-02 H | | | 2.9 C | 0.27 C | 0.14 C | 250 C | 28 C | | |
| Pentabromodiphenyl ether | 32534819 | 2.00E-03 I | | | | | 73 N | 7.3 N | 2.7 N | 4100 N | 160 N | | |
| Pentachlorobenzene | 608935 | 8.00E-04 I | | | | X | 4.9 N | 2.9 N | 1.1 N | 1600 N | 63 N | 570 N | 48 N |
| Pentachloronitrobenzene | 82688 | 3.00E-03 I | | 2.60E-01 H | | X | 0.041 C | 0.024 C | 0.012 C | 22 C | 2.5 C | | |
| Pentachlorophenol | 87865 | 3.00E-02 I | | 1.20E-01 I | | | 0.56 C | 0.052 C | 0.026 C | 48 C | 5.3 C | 7.9 C | 0.2 E |
| Permethrin | 52645531 | 5.00E-02 I | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | | |
| Phenmedipham | 13684634 | 2.50E-01 I | | | | | 9100 N | 910 N | 340 N | 510000 N | 20000 N | | |
| Phenol | 108952 | 6.00E-01 I | | | | | 22000 N | 2200 N | 810 N | 1E+06 N | 47000 N | 21000 S | 49 E |
| m-Phenylenediamine | 108452 | 6.00E-03 I | | | | | 220 N | 22 N | 8.1 N | 12000 N | 470 N | | |
| p-Phenylenediamine | 106503 | 1.90E-01 H | | | | | 6900 N | 690 N | 260 N | 390000 N | 15000 N | | |
| Phenylmercuric acetate | 62384 | 8.00E-05 I | | | | | 2.9 N | 0.29 N | 0.11 N | 160 N | 6.3 N | | |
| 2-Phenylphenol | 90437 | | | 1.94E-03 H | | | 35 C | 3.2 C | 1.6 C | 3000 C | 330 C | | |
| Phorate | 298022 | 2.00E-04 H | | | | | 7.3 N | 0.73 N | 0.27 N | 410 N | 16 N | | |
| Phosmet | 732116 | 2.00E-02 I | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| **Phosphine | 7803512 | 3.00E-04 I | 8.57E-05 H | | | | 11 N | 0.31 N | 0.41 N | 610 N | 23 N | | |
| **Phosphoric acid | 7664382 | I | 2.86E-03 | | | | 100 N | 10 N | | | | | |
| Phosphorus (white) | 7723140 | 2.00E-05 I | | | | | 0.73 N | 0.073 N | 0.027 N | 41 N | 1.6 N | | |
| p-Phthalic acid | 100210 | 1.00E+00 H | | | | | 37000 N | 3700 N | 1400 N | 1E+06 N | 78000 N | | |
| Phthalic anhydride | 85449 | 2.00E+00 I | 3.43E-02 H | | | | 73000 N | 130 N | 2700 N | 1E+06 N | 160000 N | | |
| Picloram | 1918021 | 7.00E-02 I | | | | | 2600 N | 260 N | 95 N | 140000 N | 5500 N | | |
| Pirimiphos-methyl | 29232937 | 1.00E-02 I | | | | | 370 N | 37 N | 14 N | 20000 N | 780 N | | |
| Polybrominated biphenyls | | 7.00E-06 H | | 8.90E+00 H | | | 0.0076 C | 0.0007 C | 0.00035 C | 0.64 C | 0.072 C | | |
| Polychlorinated biphenyls (PCBs) | 1336363 | | | 7.70E+00 I | | | 0.0087 C | 0.00081 C | 0.00041 C | 0.74 C | 0.083 C | | |
| Aroclor 1016 | 12674112 | 7.00E-05 I | | | | | 2.6 N | 0.26 N | 0.095 N | 140 N | 5.5 N | | |
| Aroclor 1254 | 11097691 | 2.00E-05 I | | | | | 0.73 N | 0.073 N | 0.027 N | 41 N | 1.6 N | | |
| Polychlorinated terphenyls (PCTs) | | | | 4.50E+00 E | | | 0.015 C | 0.0014 C | 0.0007 C | 1.3 C | 0.14 C | | |
| Polynuclear aromatic hydrocarbons | | | | | | | | | | | | 110000 S | |
| Acenaphthene | 83329 | 6.00E-02 I | | | | | 2200 N | 220 N | 81 N | 120000 N | 4700 N | 120 S | 200 E |
| Anthracene | 120127 | 3.00E-01 I | | | | | 11000 N | 1100 N | 410 N | 610000 N | 23000 N | 6.8 S | 4300 E |
| Benz[a]anthracene | 56553 | | | 7.30E-01 E | 6.10E-01 E | | 0.092 C | 0.01 C | 0.0043 C | 7.8 C | 0.88 C | 27 S | 0.7 E |
| Benzo[b]fluoranthene | 205992 | | | 7.30E-01 E | 6.10E-01 E | | 0.092 C | 0.01 C | 0.0043 C | 7.8 C | 0.88 C | 23 S | 4 E |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzo[k]fluoranthene | 207089 | | | 7.30E-02 E | 6.10E-02 E | | 0.92 C | 0.1 C | 0.043 C | 78 C | 8.8 C | | 4 E |
| Benzo[a]pyrene | 50328 | | | 7.30E+00 I | 6.10E+00 W | | 0.0092 C | 0.001 C | 0.00043 C | 0.78 C | 0.088 C | 11 S | 4 E |
| Carbazole | 86748 | | | 2.00E-02 H | | | 3.4 C | 0.31 C | 0.16 C | 290 C | 32 C | 11 S | 0.5 E |
| Chrysene | 218019 | | | 7.30E-03 E | 6.10E-03 E | | 9.2 C | 1 C | 0.43 C | 780 C | 88 C | 3.6 S | 1 E |
| Dibenz[ah]anthracene | 53703 | | | 7.30E+00 E | 6.10E+00 E | | 0.0092 C | 0.001 C | 0.00043 C | 0.78 C | 0.088 C | 7.2 S | 11 E |
| Fluoranthene | 206440 | 4.00E-02 I | | | | | 1500 N | 150 N | 54 N | 82000 N | 3100 N | 68 S | 980 E |
| Fluorene | 86737 | 4.00E-02 I | | | | | 1500 N | 150 N | 54 N | 82000 N | 3100 N | 89 S | 160 E |
| Indeno[1,2,3-cd]pyrene | 193395 | | | 7.30E-01 E | 6.10E-01 E | | 0.092 C | 0.01 C | 0.0043 C | 7.8 C | 0.88 C | 280 S | 35 E |
| Naphthalene | 91203 | 4.00E-02 W | | | | | 1500 N | 150 N | 54 N | 82000 N | 3100 N | 180 S | 30 E |
| Pyrene | 129000 | 3.00E-02 I | | | | | 1100 N | 110 N | 41 N | 61000 N | 2300 N | 56 S | 1400 E |
| Prochloraz | 67747095 | 9.00E-03 I | | 1.50E-01 I | | | 0.45 C | 0.042 C | 0.021 C | 38 C | 4.3 C | | |
| Profluralin | 26399360 | 6.00E-03 H | | | | | 220 N | 22 N | 8.1 N | 12000 N | 470 N | | |
| Prometon | 1610180 | 1.50E-02 I | | | | | 550 N | 55 N | 20 N | 31000 N | 1200 N | | |
| Prometryn | 7287196 | 4.00E-03 I | | | | | 150 N | 15 N | 5.4 N | 8200 N | 310 N | | |
| Pronamide | 23950585 | 7.50E-02 I | | | | | 2700 N | 270 N | 100 N | 150000 N | 5900 N | | |
| Propachlor | 1918167 | 1.30E-02 I | | | | | 470 N | 47 N | 18 N | 27000 N | 1000 N | | |
| Propanil | 709988 | 5.00E-03 I | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | | |
| Propargite | 2312358 | 2.00E-02 I | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| Propargyl alcohol | 107197 | 2.00E-03 I | | | | | 73 N | 7.3 N | 2.7 N | 4100 N | 160 N | | |
| Propazine | 139402 | 2.00E-02 I | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| Propham | 122429 | 2.00E-02 I | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| Propiconazole | 60207901 | 1.30E-02 I | | | | | 470 N | 47 N | 18 N | 27000 N | 1000 N | | |
| Propylene glycol | 57556 | 2.00E+01 H | | | | | 730000 N | 73000 N | 27000 N | 1E+06 N | 1000000 N | | |
| Propylene glycol, monoethyl ether | 52125538 | 7.00E-01 H | | | | | 26000 N | 2600 N | 950 N | 1E+06 N | 55000 N | | |
| Propylene glycol, monomethyl ether | 107982 | 7.00E-01 H | 5.71E-01 I | | | | 26000 N | 2100 N | 950 N | 1E+06 N | 55000 N | | |
| Propylene oxide | 75569 | | 8.57E-03 I | 2.40E-01 I | 1.29E-02 I | | 0.28 C | 0.49 C | 0.013 C | 24 C | 2.7 C | | |
| Pursuit | 81335775 | 2.50E-01 I | | | | | 9100 N | 910 N | 340 N | 510000 N | 20000 N | | |
| Pydrin | 51630581 | 2.50E-02 I | | | | | 910 N | 91 N | 34 N | 51000 N | 2000 N | | |
| Pyridine | 110861 | 1.00E-03 I | | | | | 37 N | 3.7 N | 1.4 N | 2000 N | 78 N | | |
| Quinalphos | 13593038 | 5.00E-04 I | | | | | 18 N | 1.8 N | 0.68 N | 1000 N | 39 N | | |
| Quinoline | 91225 | | | 1.20E+01 H | | | 0.0056 C | 0.00052 C | 0.00026 C | 0.48 C | 0.053 C | | |
| Resmethrin | 10463868 | 3.00E-02 I | | | | | 1100 N | 110 N | 41 N | 61000 N | 2300 N | | |
| Ronnel | 299843 | 5.00E-02 H | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | | |
| Rotenone | 83794 | 4.00E-03 I | | | | | 150 N | 15 N | 5.4 N | 8200 N | 310 N | | |
| Savey | 78587050 | 2.50E-02 I | | | | | 910 N | 91 N | 34 N | 51000 N | 2000 N | | |
| Selenious Acid | 7783008 | 5.00E-03 I | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | | |
| Selenium | 7782492 | 5.00E-03 I | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | | 3 E |
| Selenourea | 630104 | 5.00E-03 H | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | | |
| Sethoxydim | 74051802 | 9.00E-02 I | | | | | 3300 N | 330 N | 120 N | 180000 N | 7000 N | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Silver and compounds | 7440224 | 5.00E-03 I | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | | |
| Simazine | 122349 | 5.00E-03 I | | 1.20E-01 H | | | 0.56 C | 0.052 C | 0.026 C | 48 C | 5.3 C | | |
| Sodium azide | 26628228 | 4.00E-03 I | | | | | 150 N | 15 N | 5.4 N | 8200 N | 310 N | | |
| Sodium diethyldithiocarbamate | 148185 | 3.00E-02 I | | 2.70E-01 H | | | 0.25 C | 0.023 C | 0.012 C | 21 C | 2.4 C | | |
| Sodium fluoroacetate | 62748 | 2.00E-05 I | | | | | 0.73 N | 0.073 N | 0.027 N | 41 N | 1.6 N | | |
| Sodium metavanadate | 13718268 | 1.00E-03 H | | | | | 37 N | 3.7 N | 1.4 N | 2000 N | 78 N | | |
| Strontium, stable | 7440246 | 6.00E-01 I | | | | | 22000 N | 2200 N | 810 N | 1E+06 N | 47000 N | | |
| Strychnine | 57249 | 3.00E-04 I | | | | | 11 N | 1.1 N | 0.41 N | 610 N | 23 N | | |
| Styrene | 100425 | 2.00E-01 I | 2.86E-01 I | | | ☒ | 1600 N | 1000 N | 270 N | 410000 N | 16000 N | 1400 E | 2 E |
| Systhane | 88671890 | 2.50E-02 I | | | | | 910 N | 91 N | 34 N | 51000 N | 2000 N | | |
| 2,3,7,8-TCDD (dioxin) | 1746016 | | | 1.56E+05 H | 1.16E+05 H | | 4E-07 C | 5E-08 C | C | 4E-05 C | 4E-06 C | | |
| Tebuthiuron | 34014181 | 7.00E-02 I | | | | | 2600 N | 260 N | 95 N | 140000 N | 5500 N | | |
| Temephos | 3383968 | 2.00E-02 H | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| Terbacil | 5902512 | 1.30E-02 I | | | | | 470 N | 47 N | 18 N | 27000 N | 1000 N | | |
| Terbufos | 13071799 | 2.50E-05 H | | | | | 0.91 N | 0.091 N | 0.034 N | 51 N | 2 N | | |
| Terbutryn | 886500 | 1.00E-03 I | | | | | 37 N | 3.7 N | 1.4 N | 2000 N | 78 N | | |
| 1,2,4,5-Tetrachlorobenzene | 95943 | 3.00E-04 I | | | | ☒ | 1.8 N | 1.1 N | 0.41 N | 610 N | 23 N | 91 N | 0.69 N |
| 1,1,1,2-Tetrachloroethane | 630206 | 3.00E-02 I | | 2.60E-02 I | 2.59E-02 I | ☒ | 0.41 C | 0.24 C | 0.12 C | 220 C | 25 C | | |
| 1,1,2,2-Tetrachloroethane | 79345 | | | 2.00E-01 I | 2.03E-01 I | ☒ | 0.052 C | 0.031 C | 0.016 C | 29 C | 3.2 C | 0.4 E | 0.001 E |
| Tetrachloroethylene (PCE) | 127184 | 1.00E-02 I | | 5.20E-02 E | 2.03E-03 E | ☒ | 1.1 C | 3.1 C | 0.061 C | 110 C | 12 C | 11 E | 0.04 E |
| 2,3,4,6-Tetrachlorophenol | 58902 | 3.00E-02 I | | | | | 1100 N | 110 N | 41 N | 61000 N | 2300 N | | |
| p,a,a,a-Tetrachlorotoluene | 5216251 | | | 2.00E+01 H | | ☒ | 0.00053 C | 0.00031 C | 0.00016 C | 0.29 C | 0.032 C | | |
| Tetrachlorovinphos | 961115 | 3.00E-02 I | | 2.40E-02 H | | | 2.8 C | 0.26 C | 0.13 C | 240 C | 27 C | | |
| Tetraethyldithiopyrophosphate | 3689245 | 5.00E-04 I | | | | | 18 N | 1.8 N | 0.68 N | 1000 N | 39 N | | |
| Tetraethyl lead | 78002 | 1.00E-07 I | | | | | 0.0037 N | 0.00037 N | 0.00014 N | 0.2 N | 0.0078 N | 0.00068 N | 0.000034 N |
| **1,1,1,2-Tetrafluoroethane | 811972 | I | 2.29E+01 | | | ☒ | 140000 N | 84000 N | | | | | |
| Thallic oxide | 1314325 | 7.00E-05 W | | | | | 2.6 N | 0.26 N | 0.095 N | 140 N | 5.5 N | | |
| Thallium | | | | | | | | | | | | | 0.4 E |
| Thallium acetate | 563688 | 9.00E-05 I | | | | | 3.3 N | 0.33 N | 0.12 N | 180 N | 7 N | | |
| Thallium carbonate | 6533739 | 8.00E-05 I | | | | | 2.9 N | 0.29 N | 0.11 N | 160 N | 6.3 N | | |
| Thallium chloride | 7791120 | 8.00E-05 I | | | | | 2.9 N | 0.29 N | 0.11 N | 160 N | 6.3 N | | |
| Thallium nitrate | 10102451 | 9.00E-05 I | | | | | 3.3 N | 0.33 N | 0.12 N | 180 N | 7 N | | |
| Thallium selenite | 12039520 | 9.00E-05 W | | | | | 3.3 N | 0.33 N | 0.12 N | 180 N | 7 N | | |
| Thallium sulfate | 7446186 | 8.00E-05 I | | | | | 2.9 N | 0.29 N | 0.11 N | 160 N | 6.3 N | | |
| Thiobencarb | 28249776 | 1.00E-02 I | | | | | 370 N | 37 N | 14 N | 20000 N | 780 N | | |
| 2-(Thiocyanomethylthio)-benzothiazole | 21564170 | 3.00E-02 H | | | | | 1100 N | 110 N | 41 N | 61000 N | 2300 N | | |
| Thiofanox | 39196184 | 3.00E-04 H | | | | | 11 N | 1.1 N | 0.41 N | 610 N | 23 N | | |
| Thiophanate-methyl | 23564058 | 8.00E-02 I | | | | | 2900 N | 290 N | 110 N | 160000 N | 6300 N | | |
| Thiram | 137268 | 5.00E-03 I | | | | | 180 N | 18 N | 6.8 N | 10000 N | 390 N | | |

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*Sources: I=IRIS H=HEAST A=HEAST alternate W=Withdrawn from IRIS or HEAST E=EPA-NCEA Regional Support provisional value O=Other EPA documents.*

*Basis : C=carcinogenic effects N=noncarcinogenic effects E=EPA draft Soil Screening Level S=soil saturation concentration M=EPA MCL.*

| Contaminant | CAS | RfDo mg/kg/d | RfDi mg/kg/d | CPSo kg·d/mg | CPSi kg·d/mg | VOC | Risk-Based Concentrations: Tap Water µg/L | Ambient Air µg/m3 | Fish mg/kg | Soil Ingestion: Industrial mg/kg | Residential mg/kg | Soil Screening Levels-Transfers from Soil to: Air mg/kg | Groundwater mg/kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tin and compounds | | 6.00E-01 H | | | | | 22000 N | 2200 N | 810 N | 1E+06 N | 47000 N | | |
| Toluene | 108883 | 2.00E-01 I | 1.14E-01 I | | | ☒ | 750 N | 420 N | 270 N | 410000 N | 16000 N | 520 E | 5 E |
| Toluene-2,4-diamine | 95807 | | | 3.20E+00 H | | | 0.021 C | 0.002 C | 0.00099 C | 1.8 C | 0.2 C | | |
| Toluene-2,5-diamine | 95705 | 6.00E-01 H | | | | | 22000 N | 2200 N | 810 N | 1E+06 N | 47000 N | | |
| Toluene-2,6-diamine | 823405 | 2.00E-01 H | | | | | 7300 N | 730 N | 270 N | 410000 N | 16000 N | | |
| p-Toluidine | 106490 | | | 1.90E-01 H | | | 0.35 C | 0.033 C | 0.017 C | 30 C | 3.4 C | | |
| Toxaphene | 8001352 | | | 1.10E+00 I | 1.12E+00 I | | 0.061 C | 0.0056 C | 0.0029 C | 5.2 C | 0.58 C | 5 E | 0.04 E |
| Tralomethrin | 66841256 | 7.50E-03 I | | | | | 270 N | 27 N | 10 N | 15000 N | 590 N | | |
| Triallate | 2303175 | 1.30E-02 I | | | | | 470 N | 47 N | 18 N | 27000 N | 1000 N | | |
| Triasulfuron | 82097505 | 1.00E-02 I | | | | | 370 N | 37 N | 14 N | 20000 N | 780 N | | |
| 1,2,4-Tribromobenzene | 615543 | 5.00E-03 I | | | | ☒ | 30 N | 18 N | 6.8 N | 10000 N | 390 N | | |
| Tributyltin oxide (TBTO) | 56359 | 3.00E-05 I | | | | | 1.1 N | 0.11 N | 0.041 N | 61 N | 2.3 N | | |
| 2,4,6-Trichloroaniline hydrochloride | 33663502 | | | 2.90E-02 H | | | 2.3 C | 0.22 C | 0.11 C | 200 C | 22 C | | |
| 2,4,6-Trichloroaniline | 634935 | | | 3.40E-02 H | | | 2 C | 0.18 C | 0.093 C | 170 C | 19 C | | |
| 1,2,4-Trichlorobenzene | 120821 | 1.00E-02 I | 5.71e-02 H | | | ☒ | 190 N | 210 N | 14 N | 20000 N | 780 N | 240 E | 2 E |
| 1,1,1-Trichloroethane | 71556 | 9.00E-02 W | 2.86E-01 W | | | ☒ | 1300 N | 1000 N | 120 N | 180000 N | 7000 N | 980 E | 0.9 E |
| 1,1,2-Trichloroethane | 79005 | 4.00E-03 I | | 5.70E-02 I | 5.60E-02 I | ☒ | 0.19 C | 0.11 C | 0.055 C | 100 C | 11 C | 0.8 E | 0.01 E |
| Trichloroethylene (TCE) | 79016 | 6.00E-03 E | | 1.10E-02 W | 6.00E-03 E | ☒ | 1.6 C | 1 C | 0.29 C | 520 C | 58 C | 3 E | 0.02 E |
| Trichlorofluoromethane | 75694 | 3.00E-01 I | 2.00E-01 A | | | ☒ | 1300 N | 730 N | 410 N | 610000 N | 23000 N | 790 N | 13 N |
| 2,4,5-Trichlorophenol | 95954 | 1.00E-01 I | | | | | 3700 N | 370 N | 140 N | 200000 N | 7800 N | 8200 S | 120 E |
| 2,4,6-Trichlorophenol | 88062 | | | 1.10E-02 I | 1.09E-02 I | | 6.1 C | 0.57 C | 0.29 C | 520 C | 58 C | 150 C | 0.06 E |
| 2,4,5-Trichlorophenoxyacetic acid | 93765 | 1.00E-02 I | | | | | 370 N | 37 N | 14 N | 20000 N | 780 N | | |
| 2-(2,4,5-Trichlorophenoxy)propionic acid | 93721 | 8.00E-03 I | | | | | 290 N | 29 N | 11 N | 16000 N | 630 N | | |
| 1,1,2-Trichloropropane | 598776 | 5.00E-03 I | | | | ☒ | 30 N | 18 N | 6.8 N | 10000 N | 390 N | 13 N | 0.14 N |
| 1,2,3-Trichloropropane | 96184 | 6.00E-03 I | | 7.00e+00 I | | ☒ | 0.0015 C | 0.00089 C | 0.00045 C | 0.82 C | 0.091 C | 0.00003 C | 6.000E-06 C |
| 1,2,3-Trichloropropene | 96195 | 5.00E-03 H | | | | ☒ | 30 N | 18 N | 6.8 N | 10000 N | 390 N | | |
| 1,1,2-Trichloro-1,2,2- trifluoroethane | 76131 | 3.00E+01 I | 8.57E+00 H | | | ☒ | 59000 N | 31000 N | 41000 N | 1E+06 N | 1000000 N | 2400 S | 3100 N |
| Tridiphane | 58138082 | 3.00E-03 I | | | | | 110 N | 11 N | 4.1 N | 6100 N | 230 N | | |
| Triethylamine | 121448 | | 2.00E-03 I | | | | 73 N | 7.3 N | | | | | |
| Trifluralin | 1582098 | 7.50E-03 I | | 7.70E-03 I | | | 8.7 C | 0.81 C | 0.41 C | 740 C | 83 C | | |
| **1,2,4-Trimethylbenzene | 95636 | 5.00e-02 E | | | | ☒ | 300 N | 180 N | 68 N | 100000 N | 3900 N | | |
| **1,3,5-Trimethylbenzene | 108678 | 5.00e-02 E | | | | ☒ | 300 N | 180 N | 68 N | 100000 N | 3900 N | 98 S | 0.26 M |
| Trimethyl phosphate | 512561 | | | 3.70E-02 H | | | 1.8 C | 0.17 C | 0.085 C | 150 C | 17 C | | |
| 1,3,5-Trinitrobenzene | 99354 | 5.00E-05 I | | | | | 1.8 N | 0.18 N | 0.068 N | 100 N | 3.9 N | | |
| Trinitrophenylmethylnitramine | 479458 | 1.00E-02 H | | | | | 370 N | 37 N | 14 N | 20000 N | 780 N | | |
| 2,4,6-Trinitrotoluene | 118967 | 5.00E-04 I | | 3.00E-02 I | | | 2.2 C | 0.21 C | 0.11 C | 190 C | 21 C | | |
| Uranium (soluble salts) | 7440611 | 3.00E-03 I | | | | | 110 N | 11 N | 4.1 N | 6100 N | 230 N | | |
| Vanadium | 7440622 | 7.00E-03 H | | | | | 260 N | 26 N | 9.5 N | 14000 N | 550 N | | |
| Vanadium pentoxide | 1314621 | 9.00E-03 I | | | | | 330 N | 33 N | 12 N | 18000 N | 700 N | | |

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*Sources: I=IRIS H=HEAST A=HEAST alternate W=Withdrawn from IRIS or HEAST E=EPA-NCEA Regional Support provisional value O=Other EPA documents.*

*Basis: C=carcinogenic effects N=noncarcinogenic effects E=EPA draft Soil Screening Level S=soil saturation concentration M=EPA MCL.*

| Contaminant | CAS | RfDo mg/kg/d | RfDi mg/kg/d | CPSo kg·d/mg | CPSi kg·d/mg | VOC | Risk-Based Concentrations: Tap Water µg/L | Ambient Air µg/m3 | Fish mg/kg | Soil Ingestion: Industrial mg/kg | Residential mg/kg | Soil Screening Levels- Transfers from Soil to: Air mg/kg | Groundwater mg/kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Vanadium sulfate | 36907423 | 2.00E-02 H | | | | | 730 N | 73 N | 27 N | 41000 N | 1600 N | | |
| Vernam | 1929777 | 1.00E-03 I | | | | | 37 N | 3.7 N | 1.4 N | 2000 N | 78 N | | |
| Vinclozolin | 50471448 | 2.50E-02 I | | | | | 910 N | 91 N | 34 N | 51000 N | 2000 N | | |
| Vinyl acetate | 108054 | 1.00E+00 H | 5.71E-02 I | | | | 37000 N | 210 N | 1400 N | 1E+06 N | 78000 N | 370 E | 84 E |
| Vinyl bromide | 593602 | | 8.57E-04 I | | | ☒ | 5.2 N | 3.1 N | | | | 2 N | 0.018 N |
| Vinyl chloride | 75014 | | | 1.90E+00 H | 3.00E-01 H | ☒ | 0.019 C | 0.021 C | 0.0017 C | 3 C | 0.34 C | 0.002 E | 0.01 E |
| Warfarin | 81812 | 3.00E-04 I | | | | | 11 N | 1.1 N | 0.41 N | 610 N | 23 N | 0.046 N | 1800 N |
| m-Xylene | 108323 | 2.00E+00 H | 2.00E-01 W | | | ☒ | 1400 N | 730 N | 2700 N | 1E+06 N | 160000 N | 950 S | 240 M |
| o-Xylene | 9.55E+04 | 2.00E+00 H | 2.00E-01 W | | | ☒ | 1400 N | 730 N | 2700 N | 1E+06 N | 160000 N | 730 S | 1.50E+02 M |
| p-Xylene | 1.06E+05 | | 8.57E-02 W | | | ☒ | 520 N | 310 N | | | | 1000 S | 2.20E+02 M |
| Xylene (mixed) | 1.33E+06 | 2.00E+00 I | | | | ☒ | 12000 N | 7300 N | 2700 N | 1E+06 N | 160000 N | 320 E | 7.40E+01 E |
| Zinc | 7.44E+06 | 3.00E-01 I | | | | | 11000 N | 1100 N | 410 N | 610000 N | 23000 N | | 4.20E+04 E |
| Zinc phosphide | 1.31E+06 | 3.00E-04 I | | | | | 11 N | 1.1 N | 0.41 N | 610 N | 23 N | | |
| Zineb | 1.21E+07 | 5.00E-02 I | | | | | 1800 N | 180 N | 68 N | 100000 N | 3900 N | | |

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# APPENDIX F.3

# SAMPLE CALCULATIONS

| | |
|---|---|
| CLIENT NSB-NLON, Groton, CT | JOB NUMBER 9596-0600 |
| SUBJECT Calculation of the UCL for Log-Normal Distribution | |
| BASED ON | DRAWING NUMBER — |
| BY KAJ / CHECKED BY KMS 02/02/96 | APPROVED BY — / DATE 1/12/96 |

Objective: To calculate the 95% Upper Confidence Limit (UCL) of the transformed data for a set of log-normally distributed data.

Relevant Equation:

$$UCL = e^{\left(\bar{x} + 0.5s^2 + \frac{S H_{1-\alpha}}{\sqrt{n-1}}\right)} \quad \text{and} \quad S = \sqrt{\frac{\sum(\ln x_i - \bar{x})^2}{n-1}}$$

Where: $e$ = Constant, base of the natural log ($e = 2.718$)
$\bar{x}$ = mean of the transformed data
$x_i$ = individual sample value
$n$ = population of a data set
UCL = Upper Confidence Limit of transformed data (95% used)
$S$ = Standard Deviation
$H_{1-\alpha}$ = H-statistic for computing one-sided confidence limit ($1-\alpha = 95\%$)

Sample Calculation:

For arsenic in surface soil from Area A Landfill, $n = 14$ and $H_{0.95} = 2.309$

**CALCULATION WORKSHEET** Order No. 19116 (01-91)



| | |
|---|---|
| CLIENT: NSB-NLON, GROTON, CT | JOB NUMBER: 9596-0600 |
| SUBJECT: Calculation of UCL for Log-Normally distributed data | |
| BASED ON: | DRAWING NUMBER: — |
| BY: KAJ | CHECKED BY: KMS 02/02/96 |
| APPROVED BY: — | DATE: 1/12/96 |

| Sample | $X_i$ (mg/Kg) | $\ln x_i$ | $(\ln x_i - \bar{x})^2$ |
|---|---|---|---|
| 1 | 1.8 | 0.5878 | 0.1105 |
| 2 | 3.7 | 1.3083 | 1.1087 |
| 3 | 2.0 | 0.6931 | 0.1916 |
| 4 | 1.1 | 0.0953 | 0.0256 |
| 5 | 0.54 | -0.6162 | 0.7597 |
| 6 | 2.2 | 0.7885 | 0.2841 |
| 7 | 1.2 | 0.1823 | 0.0053 |
| 8 | 1.9 | 0.6419 | 0.1493 |
| 9 | 1.1 | 0.0953 | 0.0256 |
| 10 | 0.47 | -0.7550 | 1.0210 |
| 11 | 2.0 | 0.6931 | 0.1916 |
| 12 | 0.75 | -0.2877 | 0.2950 |
| 13 | 2.7 | 0.9933 | 0.5444 |
| 14 | 0.43 | -0.8440 | 1.2086 |
| | | $\Sigma = 3.5760$ | $\Sigma = 5.9210$ |

$$\bar{X} = (3.5760)/14 = 0.2554$$

$$S = \sqrt{\frac{5.9210}{13}} = 0.6749$$

$$UCL = e^{\left(0.2554 + 0.5(0.6749)^2 + \frac{(0.6749)(2.309)}{\sqrt{13}}\right)} = e^{(0.9153)} = \boxed{2.5 \ \frac{mg}{Kg}}$$

**CALCULATION WORKSHEET** Order No. 19116 (01-91)

| | |
|---|---|
| CLIENT NSB-NLON, GROTON, CT | JOB NUMBER 9596-0600 |
| SUBJECT Calculation of UCL for Log-Normally Distributed data | |
| BASED ON | DRAWING NUMBER — |
| BY KAJ / CHECKED BY KMS 02/02/96 | APPROVED BY — / DATE 1/12/96 |

**Table A12** Values of $H_{1-\alpha} = H_{0.95}$ for Computing a One-Sided Upper 95% Confidence Limit on a Lognormal Mean

| $s_y$ | n = 3 | 5 | 7 | 10 | 12 | 15 | 21 | 31 | 51 | 101 |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.10 | 2.750 | 2.035 | 1.886 | 1.802 | 1.775 | 1.749 | 1.722 | 1.701 | 1.684 | 1.670 |
| 0.20 | 3.295 | 2.198 | 1.992 | 1.881 | 1.843 | 1.809 | 1.771 | 1.742 | 1.718 | 1.697 |
| 0.30 | 4.109 | 2.402 | 2.125 | 1.977 | 1.927 | 1.882 | 1.833 | 1.793 | 1.761 | 1.733 |
| 0.40 | 5.220 | 2.651 | 2.282 | 2.089 | 2.026 | 1.968 | 1.905 | 1.856 | 1.813 | 1.777 |
| 0.50 | 6.495 | 2.947 | 2.465 | 2.220 | 2.141 | 2.068 | 1.989 | 1.928 | 1.876 | 1.830 |
| 0.60 | 7.807 | 3.287 | 2.673 | 2.368 | 2.271 | 2.181 | 2.085 | 2.010 | 1.946 | 1.891 |
| 0.70 | 9.120 | 3.662 | 2.904 | 2.532 | 2.414 | 2.306 | 2.191 | 2.102 | 2.025 | 1.960 |
| 0.80 | 10.43 | 4.062 | 3.155 | 2.710 | 2.570 | 2.443 | 2.307 | 2.202 | 2.112 | 2.035 |
| 0.90 | 11.74 | 4.478 | 3.420 | 2.902 | 2.738 | 2.589 | 2.432 | 2.310 | 2.206 | 2.117 |
| 1.00 | 13.05 | 4.905 | 3.698 | 3.103 | 2.915 | 2.744 | 2.564 | 2.423 | 2.306 | 2.205 |
| 1.25 | 16.33 | 6.001 | 4.426 | 3.639 | 3.389 | 3.163 | 2.923 | 2.737 | 2.580 | 2.447 |
| 1.50 | 19.60 | 7.120 | 5.184 | 4.207 | 3.896 | 3.612 | 3.311 | 3.077 | 2.881 | 2.713 |
| 1.75 | 22.87 | 8.250 | 5.960 | 4.795 | 4.422 | 4.081 | 3.719 | 3.437 | 3.200 | 2.997 |
| 2.00 | 26.14 | 9.387 | 6.747 | 5.396 | 4.962 | 4.564 | 4.141 | 3.812 | 3.533 | 3.295 |
| 2.50 | 32.69 | 11.67 | 8.339 | 6.621 | 6.067 | 5.557 | 5.013 | 4.588 | 4.228 | 3.920 |
| 3.00 | 39.23 | 13.97 | 9.945 | 7.864 | 7.191 | 6.570 | 5.907 | 5.388 | 4.947 | 4.569 |
| 3.50 | 45.77 | 16.27 | 11.56 | 9.118 | 8.326 | 7.596 | 6.815 | 6.201 | 5.681 | 5.233 |
| 4.00 | 52.31 | 18.58 | 13.18 | 10.38 | 9.469 | 8.630 | 7.731 | 7.024 | 6.424 | 5.908 |
| 4.50 | 58.85 | 20.88 | 14.80 | 11.64 | 10.62 | 9.669 | 8.652 | 7.854 | 7.174 | 6.590 |
| 5.00 | 65.39 | 23.19 | 16.43 | 12.91 | 11.77 | 10.71 | 9.579 | 8.688 | 7.929 | 7.277 |
| 6.00 | 78.47 | 27.81 | 19.68 | 15.45 | 14.08 | 12.81 | 11.44 | 10.36 | 9.449 | 8.661 |
| 7.00 | 91.55 | 32.43 | 22.94 | 18.00 | 16.39 | 14.90 | 13.31 | 12.05 | 10.98 | 10.05 |
| 8.00 | 104.6 | 37.06 | 26.20 | 20.55 | 18.71 | 17.01 | 15.18 | 13.74 | 12.51 | 11.45 |
| 9.00 | 117.7 | 41.68 | 29.46 | 23.10 | 21.03 | 19.11 | 17.05 | 15.43 | 14.05 | 12.85 |
| 10.00 | 130.8 | 46.31 | 32.73 | 25.66 | 23.35 | 21.22 | 18.93 | 17.13 | 15.59 | 14.26 |

*Source:* After Land, 1975.

This table is used in Section 13.2.

| | |
|---|---|
| CLIENT NSB-NLON, GROTON, CT | JOB NUMBER 9596-0600 |
| SUBJECT Calculation of average concentrations for groundwater | |
| BASED ON | DRAWING NUMBER — |

| BY | CHECKED BY | APPROVED BY | DATE |
|---|---|---|---|
| KAJ | NMO 02/02/96 | — | 1/11/96 |

**Objective:** To calculate the average chemical concentration in a groundwater well over several sampling rounds. Then to utilize the average concentration for each groundwater well to calculate an average of all average well concentrations. The average of all average concentrations is representative of all groundwater at a given site over all sampling rounds and all phases of investigation. The average of all averages will be utilized in Risk assessment.

**Relevant Equations:**

$$\bar{X}_W = \frac{\sum X_1 + X_2 + X_3 \cdots}{n_s}$$

$$\bar{X}_a = \frac{\sum \bar{X}_{W1} + \bar{X}_{W2} + \bar{X}_{W3} \cdots}{n_w}$$

Where: $\bar{X}_W$ = average chemical concentration in a groundwater well.
$X_1$ = Chemical concentration in a well during sampling round 1.
$X_2$ = Chemical concentration in a well during sampling round 2.
$n_s$ = number of sampling rounds.

$\bar{X}_a$ = average of all average concentrations
$\bar{X}_{W1}$ = average chemical concentration in well 1.
$\bar{X}_{W2}$ = average chemical concentration in well 2.
$n_w$ = number of wells in site being evaluated.

The number of $X_1$ values used depends on how many rounds of data were collected. Similarly the number $\bar{X}_{W1}$ values used depends on how many groundwater wells are in a given site.

| | |
|---|---|
| CLIENT NSB-NLON, GROTON, CT | JOB NUMBER 9594-0600 |
| SUBJECT Calculation of average concentrations for groundwater | |
| BASED ON | DRAWING NUMBER |
| BY KAJ / CHECKED BY KMS 02/02/96 | APPROVED BY — / DATE 1/11/96 |

The following assumptions are made:

1) Nondetected results were utilized in average calculations by using 1/2 of the detection limit.

2) Field duplicate samples were averaged and treated as one sample.

Sample Calculation:

For Study Area H - Area A Weapons Center
For 1,3-dichlorobenzene in unfiltered Groundwater for monitoring well 2WCGW1S where:

$X_1$ = Concentration of 1,3-dichlorobenzene in 2WCGW1S round 1 = 0.6 ug/L
$X_2$ = Concentration of 1,3-dichlorobenzene in 2WCGW1S-2 round 2 = 10U = 5 ug/L
$n_s$ = 2 sampling rounds

$$\bar{X}_W = \sum \frac{0.6\,ug/L + 5\,ug/L}{2}$$

$$\boxed{\bar{X}_W = 2.8\,ug/L}$$

For 1,3-dichlorobenzene in all unfiltered groundwater monitoring wells for Study Area H - Area A Weapons Center where:

| Well | $\bar{X}$ |
|---|---|
| $W_1$ = 2WCGW1S | 2.8 ug/L |
| $W_2$ = 2WCGW2S | 5 ug/L |
| $W_3$ = 2WCGW3S | 5 ug/L |
| $W_4$ = 2WCGW4S | 5 ug/L |

$$\bar{X}_a = \frac{2.8+5+5+5}{4}$$

$$\boxed{\bar{X}_a = 4.45\,ug/L}$$

| CLIENT | JOB NUMBER |
|---|---|
| NSB-NLON, Groton, CT | 9594-0600 |
| SUBJECT: Calculation of Inhalation SSL for 2-butanone (noncarcinogen) | |
| BASED ON: USEPA, December 1994 | DRAWING NUMBER: – |

| BY | CHECKED BY | APPROVED BY | DATE |
|---|---|---|---|
| KAS | RJH | – | 01/24/96 |

Objective: To calculate a generic soil screening level (SSL) for the inhalation pathway for 2-butanone using current USEPA guidance.

Relevant Equations:

For noncarcinogens,

$$SSL_{inh} = \frac{THQ \times AT \times 365\ days/yr}{EF \times ED \times \left[\frac{1}{RfC} \times \left(\frac{1}{VF} + \frac{1}{PEF}\right)\right]}$$

where: $SSL_{inh}$ = soil screening level for inhalation of noncarcinogenic contaminants in residential soil (mg/kg)

THQ = target hazard quotient (unitless)
AT = averaging time (yr)
EF = exposure frequency (day/yr)
ED = exposure duration (yr)
RfC = inhalation reference concentration ($mg/m^3$)
VF = soil-to-air volatilization factor ($m^3/kg$)
PEF = particulate emission factor ($m^3/kg$)

$$VF = Q/C \times \frac{(3.14 \times \alpha \times T)^{1/2}}{2 \times D_{ei} \times \theta_a \times K_{as}} \times 10^{-4}\ m^2/cm^2$$

$$\alpha = \frac{D_{ei} \times \theta_a}{\theta_a + (\rho_s)(1-\theta_a)/K_{as}}$$

$$D_{ei} = D_i\,(\theta_a^{3.33}/n^2)$$

$$K_{as} = H/K_d \times 41$$

$$K_d = K_{oc} \times f_{oc}$$

where: Q/C = inverse of mean concentration @ center of 30-acre-square source ($g/m^2 s$ per $kg/m^3$)

| CLIENT | JOB NUMBER |
|---|---|
| NSB-NLON, Groton, CT | 9594-0600 |

SUBJECT: Calculation of SSL inhalation for 2-Butanone (noncarcinogen)

| BASED ON | DRAWING NUMBER |
|---|---|
| USEPA, December 1994 | – |

| BY | CHECKED BY | APPROVED BY | DATE |
|---|---|---|---|
| KMS | RH | – | 01/24/96 |

T = exposure interval (s)
$D_{ei}$ = effective diffusivity ($cm^2/s$)
$\theta_a$ = air-filled soil porosity ($L_{air}/L_{soil}$)
$K_{as}$ = soil-air partition coefficient (g-soil/$cm^3$-air)
$D_i$ = diffusivity in air ($cm^2/s$)
n = total soil porosity ($L_{pore}/L_{soil}$)
$\rho_s$ = soil particle density ($g/cm^3$)
H = Henry's Law constant (atm-$m^3$/mol)
$K_d$ = soil-water partition coefficient ($cm^3/g$)
$K_{oc}$ = organic carbon partition coefficient ($cm^3/g$)
$f_{oc}$ = organic carbon content in soil (g/g)

Sample calculation:

The following general assumptions are made, as presented in the cited guidance:

| Parameter (units) | Value |
|---|---|
| THQ (unitless) | 1 |
| AT (yr) | 30 |
| EF (days/yr) | 350 |
| ED (yr) | 30 |
| PEF ($m^3$/kg) | 6.79E+8 |
| Q/C ($g/m^2$-s per kg/$m^3$) | 35.10 |
| T (s) | 9.5E+8 |
| $\theta_a$ ($L_{air}/L_{soil}$) | 0.28 |
| n ($L_{pore}/L_{soil}$) | 0.43 |
| $\rho_s$ (kg/L) | 2.65 |
| $f_{oc}$ (g/g) | 0.006 |

| CLIENT | JOB NUMBER |
|---|---|
| NOB-NLON, Groton, CT | 9594-0600 |

SUBJECT: Calculation of Inhalation SSL for 2-Butanone (noncarcinogen)

| BASED ON | DRAWING NUMBER |
|---|---|
| USEPA, December 1994 | — |

| BY | CHECKED BY | APPROVED BY | DATE |
|---|---|---|---|
| KMD | DJH | | 01/24/96 |

The following chemical-specific assumptions are made for 2-Butanone:

| Parameter (units) | Value |
|---|---|
| RfC (mg/m³) | 1E+0 |
| Di (cm²/s) | 7.02E-2 |
| H (atm-m³/mol) | 4.66E-5 |
| Koc (cm³/g) | 4.44E+0 |

Using the values presented in the two previous tables,

$$K_d = \left(4.44E+0\ \frac{cm^3}{g}\right)\left(0.006\ \frac{g}{g}\right) = 2.66E-2\ \frac{cm^3}{g}$$

$$K_{as} = \frac{4.66E-5\ \frac{atm\text{-}m^3}{mol}}{2.664E-2\ \frac{cm^3}{g}} \times 41\ \frac{mol}{atm\text{-}m^3} = 7.17E-2\ \frac{g}{cm^3}$$

$$D_{ei} = \left(7.02E-2\ \frac{cm^2}{s}\right)\left(\frac{0.28^{3.33}}{0.43^2}\right) = 5.48E-3\ \frac{cm^2}{s}$$

$$\alpha = \frac{\left(5.48E-3\ \frac{cm^2}{s}\right)(0.28)}{\left[0.28 + \frac{\left(2.65\ \frac{g}{cm^3}\right)(1-0.28)}{7.17E-2\ \frac{g}{cm^3}}\right]} = 5.71E-5\ \frac{cm^2}{s}$$

$$VF = \left(35.10\ \frac{\frac{g}{m^2\cdot s}}{\frac{kg}{m^3}}\right)\left[\frac{\left(3.14 \times 5.71E-5\ \frac{cm^2}{s} \times 9.5E+8\ s\right)^{1/2}}{\left(2 \times 5.48E-3\ \frac{cm^2}{s} \times 0.28 \times 7.17E-2\ \frac{g}{cm^2}\right)}\right]\left(10^{-4}\ \frac{m^2}{cm^2}\right)$$

$$= 6.58E+3\ \frac{m^3}{kg}$$

$$SSL_{inh} = \frac{(1)(30\ yrs)\left(365\ \frac{days}{yr}\right)}{\left(350\ \frac{days}{yr}\right)(30\ yrs)\left[\frac{1}{1E+0\ \frac{mg}{m^3}}\left(\frac{1}{6.58E+3\ \frac{m^3}{kg}} + \frac{1}{6.79E+8\ \frac{m^3}{kg}}\right)\right]} = \boxed{6.9E+3\ \frac{mg}{kg}}$$

| CLIENT | JOB NUMBER | | |
|---|---|---|---|
| NSB-NLON, Groton, CT | 9594-0600 | | |
| SUBJECT: Calculation of Chemical-Specific Constants for Evaluating Dermal Exposures to Water | | | |
| BASED ON: USEPA, January 1992 | DRAWING NUMBER: — | | |
| BY: KMS | CHECKED BY: RH | APPROVED BY: — | DATE: 01/24/96 |

Objective: To calculate chemical-specific constants ($K_p$, $\tau$, $t^*$, and B) for use in evaluating dermal exposures to water, in particular the $DA_{event}$ term, via the dermal guidance. Values are calculated for those COCs which do not have published values in the dermal guidance (Table 5-8).

Relevant Equations:

$$\log K_p = -2.72 + 0.71 \log K_{ow} - 0.0061\, MW$$

$$B = \frac{K_{ow}}{10^4} \quad \text{(for organics)}$$

$$\log \frac{D_{sc}}{l_{sc}} = -2.72 - 0.0061\, MW$$

$$\tau = \frac{l_{sc}^2}{6 D_{sc}}$$

If $B \leq 0.1$, then $t^* = 2.4\tau$

If $0.1 \leq B \leq 1.17$, then $t^* = (8.4 + 6 \log B)\tau$

If $B \geq 1.17$, then $t^* = 6\left(b - \sqrt{b^2 - c^2}\right)\tau$

$$b = \frac{2}{\pi}(1+B)^2 - c$$

$$c = \frac{1 + 3B}{3}$$

where: $K_p$ = permeability coefficient from water through the skin (cm/hr)
$K_{ow}$ = Partition coefficient between octanol and water (unitless)
MW = molecular weight (g/mole)

| CLIENT | JOB NUMBER |
|---|---|
| NSB-NLON, Groton, CT | 9594-0600 |

SUBJECT: Calculation of Chemical-specific Constants for Evaluating Dermal Exposures to Water

| BASED ON | DRAWING NUMBER |
|---|---|
| USEPA, January 1992 | — |

| BY | CHECKED BY | APPROVED BY | DATE |
|---|---|---|---|
| KMS | RJW | — | 01/24/96 |

B = Constant reflecting partitioning properties of a compound used in Bunge Model (dimensionless)
$D_{sc}$ = Diffusivity of a substance within the membrane ($cm^2/hr$)
$l_{sc}$ = Thickness of stratum corneum ($\mu m$)
T = Lag time (hr)
t* = Time it takes to reach steady state conditions (hr)
b = constant (unitless)
c = constant (unitless)

Sample calcs:

For 4-methylphenol, $K_{ow}$ = 8.32E+1 and MW = 108.1 g/mole

$$\log K_p = -2.72 + 0.71 \log(8.32E+1) - 0.0061(108.1)$$
$$= -2.016$$
$$\boxed{K_p = 9.6E-3 \text{ cm/hr}}$$

$$B = \frac{8.32E+1}{10^4} = \boxed{8.3E-3}$$

$$\log \frac{D_{sc}}{10^{-3}} = -2.72 - 0.0061(108.1) \quad \text{(assuming } l_{sc} = 10^{-3} \text{ cm)}$$
$$D_{sc} = 4.17E-7 \text{ cm}^2/\text{hr}$$

$$T = \frac{(10^{-3} \text{ cm})^2}{6(4.17E-7 \frac{\text{cm}^2}{\text{hr}})} = \boxed{4.0E-1 \text{ hr}}$$

Since $B(8.3E-3) \leq 0.1$, then $t^* = 2.4(4.0E-1 \text{ hr}) = \boxed{9.6E-1 \text{ hr}}$

| | |
|---|---|
| CLIENT NSB-NLON, Groton, CT | JOB NUMBER 9594-0600 |
| SUBJECT Calculation of Chemical-specific Constants for Evaluating Dermal Exposures to Water | |
| BASED ON USEPA, January 1992 | DRAWING NUMBER — |
| BY KMS / CHECKED BY RJH | APPROVED BY — / DATE 01/24/96 |

Values were calculated for the following COCs:

| COC | Ko/w | MW (g/mole) | Kp (cm/hr) | B | T (hr) | t* (hr) |
|---|---|---|---|---|---|---|
| Acetone | 5.75E-1 | 58.08 | 5.7E-4 | 5.8E-5 | 2.0E-1 | 4.8E-1 |
| Carbazole | 1.95E+3 | 167.22 | 3.9E-2 | 1.95E-1 | 9.2E-1 | 3.8E+0 |
| 4-Methylphenol | 8.32E+1 | 108.1 | 9.6E-3 | 8.3E-3 | 4.0E-1 | 9.6E-1 |

| CLIENT | JOB NUMBER |
|---|---|
| NSB-NLON, GROTON, CT | 9594-0600 |

SUBJECT: Calculation of Intakes/Risks Associated with Incidental Ingestion of Soil/Sediment

| BASED ON | DRAWING NUMBER |
|---|---|
| USEPA, December 1989 | — |

| BY | CHECKED BY | APPROVED BY | DATE |
|---|---|---|---|
| KMS | KAJ | — | 01/01/96 |

Objective: To calculate estimated intakes and noncarcinogenic and carcinogenic risks associated with incidental ingestion of soil/sediment. Central Tendency (CTE) and Reasonable Maximum Exposures (RME) are calculated.

Relevant Equations:

$$IEX_{si} = \frac{C_{si} \times IR \times F_i \times EF \times ED}{CF \times BW \times AT}$$

where: $IEX_{si}$ = intake of contaminant "i" from soil or sediment (mg/kg·day)
$C_{si}$ = concentration of contaminant "i" in soil or sediment (mg/kg)
IR = ingestion rate (mg/day)
$F_i$ = fraction ingested from contaminated source (decimal fraction)
EF = exposure frequency (days/yr)
ED = exposure duration (yr)
CF = conversion factor ($10^6$ mg/kg)
BW = body weight (kg)
AT = averaging time (days) = 365 days/yr × ED for noncarcinogens; 365 days/yr × 70 yrs for carcinogens

For future residents, the equation above is modified to consider age-adjusted exposure parameters for adult and child receptors, as follows:

$$IEX_{si} = \frac{C_{si} \times IF_{adj} \times F_i \times EF}{CF \times AT}$$

$$IF_{adj} = \frac{IR_c \times ED_c}{BW_c} + \frac{IR_a \times ED_a}{BW_a}$$

where: $IF_{adj}$ = Age-adjusted soil ingestion factor (mg·yr/kg·day)
$IR_c$ = child ingestion rate (mg/day)
$ED_c$ = child exposure duration (yr)
$BW_c$ = child body weight (kg)

| CLIENT | JOB NUMBER |
|---|---|
| NSB-NLON, Groton, CT | 9594-0600 |

SUBJECT: Calculation of Intakes/Risks Associated with Incidental Ingestion of Soil/Sediment

| BASED ON | DRAWING NUMBER |
|---|---|
| USEPA, December 1989 | – |

| BY | CHECKED BY | APPROVED BY | DATE |
|---|---|---|---|
| KMS | KAJ | – | 01/01/96 |

$IR_a$ = adult ingestion rate (mg/day)
$ED_a$ = adult exposure duration
$BW_a$ = adult body weight (kg)

Sample Calculations:

For future residents, the following exposure assumptions are made for soil:

| | RME | CTE |
|---|---|---|
| $C_{si}$ (mg/kg) | UCL or maximum | UCL or average |
| $IR_c$ (mg/day) | 200 | 100 |
| $IR_a$ " | 100 | 50 |
| $ED_c$ (yr) | 6 | 2 |
| $ED_a$ " | 24 | 7 |
| $BW_c$ (kg) | 15 | 15 |
| $BW_a$ " | 70 | 70 |
| $IF_{adj}$ (mg·yr/kg·day) | 114.2857 | 18.3333 |
| $F_i$ (unitless) | 1.0 | 0.5 |
| EF (days/yr) | 150 | 150 |
| AT (days) – nonc. | 10950 | 3285 |
| – carc. | 25550 | 25550 |

For arsenic at an average concentration of 4.7 mg/kg (CTE) and a maximum concentration of 10.8 mg/kg (RME) for Site 2 - Area A Weapons Center:

$$IEX_{nonc.-CTE} = \frac{(4.7\ \frac{mg}{kg})(18.333\ \frac{mg \cdot yr}{kg \cdot day})(0.5)(150\ \frac{days}{yr})}{(1E+6\ \frac{mg}{kg})(3285\ days)} = \boxed{1.97E-6\ mg/kg \cdot day}$$

$$IEX_{carc-CTE} = \frac{(4.7\ \frac{mg}{kg})(18.333\ \frac{mg \cdot yr}{kg \cdot day})(0.5)(150\ \frac{days}{yr})}{(1E+6\ \frac{mg}{kg})(25550\ days)} = \boxed{2.53E-7\ mg/kg \cdot day}$$

| CLIENT | JOB NUMBER | | |
|---|---|---|---|
| NSB-NLON, Groton, CT | 9594-0600 | | |
| SUBJECT: Calculation of Intakes/Risks Associated with Incidental Ingestion of Soil/Sediment | | | |
| BASED ON: USEPA, December 1989 | | DRAWING NUMBER: – | |
| BY: KMS | CHECKED BY: KAJ | APPROVED BY: – | DATE: 01/01/96 |

$$IEX_{nonc.-RME} = \frac{(10.8\ \frac{mg}{kg})(114.2857\ \frac{mg \cdot yr}{kg \cdot day})(1.0)(150\ \frac{days}{yr})}{(1E+6\ \frac{mg}{kg})(10950\ days)} = \boxed{1.69E-5\ mg/kg \cdot day}$$

$$IEX_{carc.-RME} = \frac{(10.8\ \frac{mg}{kg})(114.2857\ \frac{mg \cdot yr}{kg \cdot day})(1.0)(150\ \frac{days}{yr})}{(1E+6\ \frac{mg}{kg})(25550\ days)} = \boxed{7.25E-6\ mg/kg \cdot day}$$

Risks are then calculated using the following equations:

$$HQ = IEX_{nonc.} \div RfD$$

$$ICR = IEX_{carc.} \times CSF$$

where:
- HQ = hazard quotient (unitless)
- $IEX_{nonc}$ = intake for noncarcinogenic chemical (mg/kg·day)
- RfD = reference dose (mg/kg·day)
- ICR = incremental cancer risk (unitless)
- $IEX_{carc.}$ = intake for carcinogenic chemical (mg/kg·day)
- CSF = cancer slope factor (kg·day/mg)

For arsenic, the oral RfD = 3E-4 mg/kg·day and the oral CSF = 1.5E+0 kg·day/mg.

$$HQ_{As-CTE} = (1.97E-6\ \frac{mg}{kg \cdot day}) \div 3E-4\ \frac{mg}{kg \cdot day} = \boxed{6.6E-3}$$

$$ICR_{As-CTE} = (2.53E-7\ \frac{mg}{kg \cdot day})(1.5E+0\ \frac{kg \cdot day}{mg}) = \boxed{3.8E-7}$$

$$HQ_{As-RME} = (1.69E-5\ \frac{mg}{kg \cdot day}) \div 3E-4\ \frac{mg}{kg \cdot day} = \boxed{5.6E-2}$$

$$ICR_{As-CTE} = (7.25E-6\ \frac{mg}{kg \cdot day})(1.5E+0\ \frac{kg \cdot day}{mg}) = \boxed{1.1E-5}$$

| | |
|---|---|
| CLIENT: NSB-NLON, Groton, CT | JOB NUMBER: 9594-0600 |
| SUBJECT: Calculation of Intakes/Risks Associated With Dermal Contact with Soil/Sediment | |
| BASED ON: USEPA, December 1989 & January 1992 | DRAWING NUMBER: — |
| BY: KMS / CHECKED BY: KAJ | APPROVED BY: — / DATE: 01/01/96 |

Objective: To calculate estimated intakes and noncarcinogenic and carcinogenic risks associated with dermal contact with soil/sediment. Central Tendency (CTE) and Reasonable Maximum Exposures (RME) are calculated. Because of the lack of available guidance, exposures to cadmium, PCBs, and dioxins only are evaluated quantitatively.

Relevant Equations:

$$DEX_{si} = \frac{C_{si} \times SA \times AF \times ABS \times F_d \times EF \times ED}{CF \times BW \times AT}$$

where: $DEX_{si}$ = amount of chemical "i" absorbed during contact with soil/sediment (mg/kg·day)
$C_{si}$ = concentration of chemical "i" in soil/sediment (mg/kg)
SA = skin surface area available for contact per day ($cm^2$/day)
AF = skin adherence factor ($mg/cm^2$)
ABS = absorption factor (decimal fraction)
$F_d$ = fraction of soil/sediment from contaminated source available for dermal contact (decimal fraction)
EF = exposure frequency (days/yr)
ED = exposure duration (yr)
CF = conversion factor (1E+6 mg/kg)
BW = body weight (kg)
AT = averaging time (days) = 365 days/yr × ED for noncarcinogens; 365 days/yr × 70 yrs for carcinogens

For future residents, the equation above is modified to consider age-adjusted exposure parameters for adult and child receptors, as follows:

$$DEX_{si} = \frac{C_{si} \times AF \times ABS \times F_d \times EF \times SA_{adj}}{CF \times AT}$$

$$SA_{adj} = \frac{SA_c \times ED_c}{BW_c} + \frac{SA_a \times ED_a}{BW_a}$$

| CLIENT | JOB NUMBER |
|---|---|
| NSB-NLON, Groton, CT | 9594-0600 |

SUBJECT: Calculation of Intakes/Risks Associated With Dermal Contact with Soil/Sediment

| BASED ON | DRAWING NUMBER |
|---|---|
| USEPA, December 1989 & January 1992 | — |

| BY | CHECKED BY | APPROVED BY | DATE |
|---|---|---|---|
| KMS | KAJ | — | 01/01/96 |

where:
$SA_{adj}$ = Age-adjusted skin surface area factor ($cm^2 \cdot yr/day \cdot kg$)
$SA_c$ = child skin surface area available for contact ($cm^2/day$)
$ED_c$ = child exposure duration (yr)
$BW_c$ = child body weight (kg)
$SA_a$ = adult skin surface area available for contact ($cm^2/day$)
$ED_a$ = adult exposure duration (yr)
$BW_a$ = adult body weight (kg)

Sample Calculations:

For a construction worker, the following assumptions are made for soil:

| | RME | CTE |
|---|---|---|
| $C_{si}$ (mg/kg) | UCL or maximum | UCL or average |
| SA ($cm^2$/day) | 3800 | 3800 |
| AF (mg/$cm^2$) | 1.0 | 0.2 |
| ABS (unitless) | 0.01 - Cd | 0.01 - Cd |
| | 0.03 - Dioxins | 0.03 - Dioxins |
| | 0.06 - PCBs | 0.06 - PCBs |
| Fd (unitless) | 1.0 | 0.5 |
| EF (days/yr) | 120 | 80 |
| ED (yr) | 1 | 1 |
| BW (kg) | 70 | 70 |
| AT (days) - nonc. | 365 | 365 |
| - carc. | 25550 | 25550 |

For PCBs at an average concentration of 0.51 mg/kg (CTE) and a maximum concentration of 0.78 mg/kg (RME) for Site 1 - CBU Drum Storage Area:

$$DEX_{nonc-CTE} = \frac{(0.51\,\frac{mg}{kg})(3800\,\frac{cm^2}{day})(0.2)(0.06)(0.5)(80\,\frac{days}{yr})(1\,yr)}{(1E+6\,\frac{mg}{kg})(70\,kg)(365\,days)} = \boxed{3.64E-8\ mg/kg\,day}$$

$$DEX_{carc-CTE} = \frac{(0.51\,\frac{mg}{kg})(3800\,\frac{cm^2}{day})(0.2)(0.06)(0.5)(80\,\frac{days}{yr})(1\,yr)}{(1E+6\,\frac{mg}{kg})(70\,kg)(25550\,days)} = \boxed{5.20E-10\ mg/kg\,day}$$

| CLIENT | JOB NUMBER | | |
|---|---|---|---|
| NSB-NLON, Groton, CT | 9594-0600 | | |
| SUBJECT: Calculation of Intakes/Risks Associated with Dermal Contact with Soil/Sediment | | | |
| BASED ON: USEPA, December 1989 & January 1992 | | DRAWING NUMBER: – | |
| BY: KMO | CHECKED BY: KAJ | APPROVED BY: – | DATE: 01/01/96 |

$$DEX_{nonc-RME} = \frac{(0.78\ \frac{mg}{kg})(3800\ \frac{cm^2}{day})(1.0)(0.06)(1.0)(120\ \frac{days}{yr})(1yr)}{(1E+6\ \frac{mg}{kg})(70\ kg)(365\ days)} = \boxed{8.35E-7\ mg/kg\cdot day}$$

$$DEX_{carc-RME} = \frac{(0.78\ \frac{mg}{kg})(3800\ \frac{cm^2}{day})(1.0)(0.06)(1.0)(120\ \frac{days}{yr})(1yr)}{(1E+6\ \frac{mg}{kg})(70\ kg)(25550\ days)} = \boxed{1.19E-8\ mg/kg\cdot day}$$

Risks are then calculated using the following equations:

$$HQ = DEX_{nonc} \div RfD$$
$$ICR = DEX_{carc} \times CSF$$

where: HQ = hazard quotient (unitless)
$DEX_{nonc}$ = dermal intake for noncarcinogenic chemical (mg/kg·day)
RfD = reference dose (mg/kg·day)
ICR = incremental cancer risk (unitless)
$DEX_{carc}$ = dermal intake for carcinogenic chemical (mg/kg·day)
CSF = cancer slope factor (kg·day/mg)

For PCBs, the oral RfD = 2E-5 mg/kg·day and the oral CSF = 7.7E+0 kg·day/mg. These values are used as the dermal parameters because of the lack of published Gastrointestinal absorption efficiencies.

$$HQ_{PCBs-CTE} = (3.64E-8\ \frac{mg}{kg\cdot day}) \div 2E-5\ \frac{mg}{kg\cdot day} = \boxed{1.8E-3}$$

$$ICR_{PCBs-CTE} = (5.20E-10\ \frac{mg}{kg\cdot day})(7.7E+0\ \frac{kg\cdot day}{mg}) = \boxed{4.0E-9}$$

$$HQ_{PCBs-RME} = (8.35E-7\ \frac{mg}{kg\cdot day}) \div 2E-5\ \frac{mg}{kg\cdot day} = \boxed{4.2E-2}$$

$$ICR_{PCBs-RME} = (1.19E-8\ \frac{mg}{kg\cdot day})(7.7E+0\ \frac{kg\cdot day}{mg}) = \boxed{9.2E-8}$$

| CLIENT | JOB NUMBER |
|---|---|
| NSB-NLON, Groton, CT | 9594-0600 |

SUBJECT: Calculation of Intakes / Risks Associated with Direct Ingestion of Groundwater

| BASED ON | DRAWING NUMBER |
|---|---|
| USEPA, December 1989 | — |

| BY | CHECKED BY | APPROVED BY | DATE |
|---|---|---|---|
| KMS | KAJ | — | 01/01/96 |

Objective: To calculate estimated exposure intakes and noncarcinogenic and carcinogenic risks associated with the direct ingestion of groundwater. Central Tendency (CTE) and Reasonable Maximum Exposures (RME) are calculated.

Relevant Equations:

$$IEX_{wi} = \frac{C_{wi} \times IR \times EF \times ED}{BW \times AT}$$

where: $IEX_{wi}$ = intake of chemical "i" from groundwater (mg/kg·day)
$C_{wi}$ = concentration of chemical "i" in groundwater (mg/L)
IR = ingestion rate (L/day)
EF = exposure frequency (days/yr)
ED = exposure duration (yr)
BW = body weight (kg)
AT = averaging time (days) = 365 days/yr x ED for noncarcinogens; 365 days/yr x 70 yrs for carcinogens

Sample Calculations:

For future residents, the following exposure assumptions are made:

| | RME | CTE |
|---|---|---|
| $C_{wi}$ (mg/L) | maximum | average |
| IR (L/day) | 2.0 | 1.4 |
| EF (days/yr) | 350 | 234 |
| ED (yr) | 30 | 9 |
| BW (kg) | 70 | 70 |
| AT (days) - nonc. | 10950 | 3285 |
| - carc. | 25550 | 25550 |

| | |
|---|---|
| CLIENT NSB-NLON, Groton, CT | JOB NUMBER 9594-0600 |
| SUBJECT Calculation of Intakes/Risks Associated with Direct Ingestion of Groundwater | |
| BASED ON USEPA, December 1989 | DRAWING NUMBER — |
| BY KMS / CHECKED BY KAJ | APPROVED BY — / DATE 01/01/96 |

For beryllium at an average concentration of 0.00082 mg/L (CTE) and a maximum concentration of 0.0012 mg/L for Site 2 - Area A Weapons Center:

$$IEX_{nonc-CTE} = \frac{(0.00082\ \frac{mg}{L})(1.4\ \frac{L}{day})(234\ \frac{days}{yr})(9\ yrs)}{(70\ kg)(3285\ days)} = \boxed{1.05E\text{-}5\ mg/kg\cdot day}$$

$$IEX_{carc-CTE} = \frac{(0.00082\ \frac{mg}{L})(1.4\ \frac{L}{day})(234\ \frac{days}{yr})(9\ yrs)}{(70\ kg)(25550\ days)} = \boxed{1.35E\text{-}6\ mg/kg\cdot day}$$

$$IEX_{nonc-RME} = \frac{(0.0012\ \frac{mg}{L})(2.0\ \frac{L}{day})(350\ \frac{days}{yr})(30\ yrs)}{(70\ kg)(10950\ days)} = \boxed{3.29E\text{-}5\ mg/kg\cdot day}$$

$$IEX_{carc-RME} = \frac{(0.0012\ \frac{mg}{L})(2.0\ \frac{L}{day})(350\ \frac{days}{yr})(30\ yrs)}{(70\ kg)(25550\ days)} = \boxed{1.41E\text{-}5\ mg/kg\cdot day}$$

Risks are then calculated using the following equations:

$$HQ = IEX_{nonc.} \div RfD$$
$$ICR = IEX_{carc} \times CSF$$

where: HQ = hazard quotient (unitless)
$IEX_{nonc}$ = intake for noncarcinogenic chemical (mg/kg·day)
RfD = reference dose (mg/kg·day)
ICR = incremental cancer risk (unitless)
$IEX_{carc}$ = intake for carcinogenic chemical (mg/kg·day)
CSF = cancer slope factor (kg·day/mg)

For beryllium, the oral RfD = 5E-3 mg/kg·day and the oral CSF = 4.3E+0 kg·day/mg.

$$HQ_{Be-CTE} = (1.05E\text{-}5\ \frac{mg}{kg\cdot day}) \div 5E\text{-}3\ \frac{mg}{kg\cdot day} = \boxed{2.1E\text{-}3}$$

$$ICR_{Be-CTE} = (1.35E\text{-}6\ \frac{mg}{kg\cdot day})(4.3E+0\ \frac{kg\cdot day}{mg}) = \boxed{5.8E\text{-}6}$$

| | |
|---|---|
| CLIENT NSB-NLON, Groton, CT | JOB NUMBER 9594-0600 |
| SUBJECT Calculation of Intakes/Risks Associated with Direct Ingestion of Groundwater | |
| BASED ON USEPA, December 1989 | DRAWING NUMBER — |

| BY | CHECKED BY | APPROVED BY | DATE |
|---|---|---|---|
| KMO | KAJ | — | 01/01/96 |

$$HQ_{Be\text{-}RME} = \left(3.29E\text{-}5 \ \frac{mg}{kg \cdot day}\right) \div 5E\text{-}3 \ \frac{mg}{kg \cdot day} = \boxed{6.6E\text{-}3}$$

$$ICR_{Be\text{-}RME} = \left(1.41E\text{-}5 \ \frac{mg}{kg \cdot day}\right)\left(4.3E+0 \ \frac{kg \cdot day}{mg}\right) = \boxed{6.1E\text{-}5}$$

| CLIENT | JOB NUMBER |
|---|---|
| NSB-NLON, Groton, CT | 9594-0600 |

SUBJECT: Calculation of Intakes/Risks Associated with Dermal Contact with Groundwater/Surface Water

| BASED ON | DRAWING NUMBER |
|---|---|
| USEPA, December 1989 & January 1992 | — |

| BY | CHECKED BY | APPROVED BY | DATE |
|---|---|---|---|
| KMS | KAJ | — | 01/01/96 |

Objective: To calculate estimated intakes and noncarcinogenic and carcinogenic risks associated with dermal contact with groundwater/surface water. Central Tendency (CTE) and Reasonable Maximum Exposures (RME) are calculated.

Relevant Equations:

$$DAD_{wi} = \frac{DA_{event} \times EV \times ED \times EF \times A}{BW \times AT}$$

where:
- $DAD_{wi}$ = Dermally absorbed dose (mg/kg·day) of chemical "i" in water
- $DA_{event}$ = absorbed dose per event (mg/cm²·event)
- EV = event frequency (events/day)
- EF = exposure frequency (days/yr)
- ED = exposure duration (yr)
- A = skin surface area available for contact (cm²)
- BW = body weight (kg)
- AT = averaging time (days) = 365 days/yr × ED for noncarcinogens; 365 days/yr × 70 yrs for carcinogens

for inorganics: $DA_{event} = K_p \times C_{wi} \times t_{event} \times CF$

for organics: If $t_{event} < t^*$, $DA_{event} = 2K_p \times C_{wi} \times CF \times \sqrt{\frac{6\,\tau\, t_{event}}{\pi}}$

If $t_{event} > t^*$, $DA_{event} = K_p \times C_{wi} \times \left( \frac{t_{event}}{1+B} + 2\tau \left[ \frac{1+3B}{1+B} \right] \right) \times CF$

where:
- $K_p$ = permeability coefficient from water (cm/hr)
- $C_{wi}$ = concentration of chemical "i" in water (mg/L)
- $t_{event}$ = duration of event (hr/event)
- CF = conversion factor (1E-3 L/cm³)
- $t^*$ = time it takes to reach steady state conditions (hr)
- $\tau$ = lag time (hr)

| | |
|---|---|
| CLIENT NSB-NLON, Groton, CT | JOB NUMBER 9594-0600 |
| SUBJECT Calculation of Intakes/Risks Associated with Dermal Contact with Groundwater/Surface Water | |
| BASED ON USEPA, December 1989 & January 1992 | DRAWING NUMBER – |

| BY | CHECKED BY | APPROVED BY | DATE |
|---|---|---|---|
| KMS | KAJ | – | 01/01/96 |

$\pi$ = pi (unitless) = 3.141592654
B = partioning constant derived by Bunge Model (dimensionless)

Sample Calculations:

For future residents, the following exposure assumptions are made for groundwater:

| | RME | CTE |
|---|---|---|
| Cwi (mg/L) | maximum | average |
| tevent (hr/event) | 0.25 (15 min/event) | 0.1667 (10 min/event) |
| EV (events/day) | 1 | 1 |
| ED (yrs) | 30 | 9 |
| EF (days/yr) | 350 | 234 |
| A ($cm^2$) | 20000 | 20000 |
| BW (kg) | 70 | 70 |
| AT (days)-nonc. | 10950 | 3285 |
| -carc. | 25550 | 25550 |

For 1,1,2-trichloroethane, the following chemical-specific parameters apply:

| Parameter | Value |
|---|---|
| t* (hr) | 1.4 E+0 |
| T (hr) | 5.7E-1 |
| Kp (cm/hr) | 8.4 E-3 |
| B (unitless) | 1.1 E-2 |

For 1,1,2-trichloroethane at an average and a maximum concentration of 0.003 mg/L:

$t_{event}\left(\begin{smallmatrix}0.25-RME\\0.1667-CTE\end{smallmatrix}\right) < t^*(1.4E+0)$, ∴

$$DA_{event-CTE} = 2(8.4E-3\ \tfrac{cm}{hr})(0.003\ \tfrac{mg}{L})(1E-3\ \tfrac{L}{cm^3})\left(\sqrt{\frac{6(5.7E-1\ hr)(0.1667\ \frac{hr}{event})}{3.141592654}}\right)$$
$$= 2.15\ E-8\ \ mg/cm^2 \cdot event$$

| CLIENT | JOB NUMBER |
|---|---|
| NSB-NLON, Groton, CT | 9594-0600 |
| SUBJECT: Calculation of Intakes/Risks Associated with Dermal Contact with Groundwater/Surface Water | |
| BASED ON: USEPA, December 1989 & January 1992 | DRAWING NUMBER: – |
| BY: KMS / CHECKED BY: KAJ | APPROVED BY: – / DATE: 01/01/96 |

$$DA_{event-RME} = 2(8.4E-3\ \tfrac{cm}{hr})(0.003\ \tfrac{mg}{L})(1E-3\ \tfrac{L}{cm^3})\left(\sqrt{\frac{6(5.7E-1\ hr)(0.25\ \tfrac{hr}{event})}{3.141592654}}\right)$$
$$= 2.63\ E-8\ mg/cm^2 \cdot event$$

$$DAD_{nonc-CTE} = \frac{(2.15E-8\ \tfrac{mg}{cm^2 \cdot event})(1\ \tfrac{event}{day})(9\ yr)(234\ \tfrac{days}{yr})(20000\ cm^2)}{(70\ kg)(3285\ days)} = \boxed{3.94E-6\ mg/kg \cdot day}$$

$$DAD_{carc-CTE} = \frac{(2.15E-8\ \tfrac{mg}{cm^2 \cdot event})(1\ \tfrac{event}{day})(9\ yr)(234\ \tfrac{days}{yr})(20000\ cm^2)}{(70\ kg)(25550\ days)} = \boxed{5.06E-7\ mg/kg \cdot day}$$

$$DAD_{nonc-RME} = \frac{(2.63E-8\ \tfrac{mg}{cm^2 \cdot event})(1\ \tfrac{event}{day})(30\ yr)(350\ \tfrac{days}{yr})(20000\ cm^2)}{(70\ kg)(10950\ days)} = \boxed{7.21E-6\ mg/kg \cdot day}$$

$$DAD_{carc-RME} = \frac{(2.63E-8\ \tfrac{mg}{cm^2 \cdot event})(1\ \tfrac{event}{day})(30\ yr)(350\ \tfrac{days}{yr})(20000\ cm^2)}{(70\ kg)(25550\ days)} = \boxed{3.09E-6\ mg/kg \cdot day}$$

Risks are then calculated using the following equations:

$$HQ = DAD_{nonc.} \div RfD$$
$$ICR = DAD_{carc.} \times CSF$$

where: HQ = hazard quotient (unitless)
$DAD_{nonc}$ = dermal absorbed dose for noncarcinogenic chemical (mg/kg·day)
RfD = reference dose (mg/kg·day)
ICR = incremental cancer risk (unitless)
$DAD_{carc}$ = dermal absorbed dose for carcinogenic chemical (mg/kg·day)
CSF = cancer slope factor (kg·day/mg)

For 1,1,2-trichloroethane, the oral RfD = 4E-3 mg/kg·day and the oral CSF = 5.7E-2 kg·day/mg. Because of the lack of published Gastrointestinal absorption efficiencies for this chemical the oral toxicity parameters are used as the dermal parameters.

| CLIENT | JOB NUMBER |
|---|---|
| NSB-NLON, Groton, CT | 9594-0600 |

SUBJECT: Calculation of Intakes/Risks Associated with Dermal Contact with Groundwater/Surface Water

| BASED ON | DRAWING NUMBER |
|---|---|
| USEPA, December 1989 & January 1992 | — |

| BY | CHECKED BY | APPROVED BY | DATE |
|---|---|---|---|
| KMS | KAJ | — | 01/01/95 |

$$HQ_{112TCA-CTE} = \left(3.94E-6 \frac{mg}{kg \cdot day}\right) \div 4E-3 \frac{mg}{kg \cdot day} = \boxed{9.9\ E-4}$$

$$ICR_{112TCA-CTE} = \left(5.06E-7 \frac{mg}{kg \cdot day}\right) \times \left(5.7E-2 \frac{kg \cdot day}{mg}\right) = \boxed{2.9E-8}$$

$$HQ_{112TCA-RME} = \left(7.21E-6 \frac{mg}{kg \cdot day}\right) \div 4E-3 \frac{mg}{kg \cdot day} = \boxed{1.8E-3}$$

$$ICR_{112TCA-RME} = \left(3.09E-6 \frac{mg}{kg \cdot day}\right)\left(5.7E-2 \frac{kg \cdot day}{mg}\right) = \boxed{1.8E-7}$$

| | |
|---|---|
| CLIENT NSB-NLON, GROTON, CT | JOB NUMBER 9594-0600 |
| SUBJECT Calculation of Intakes / Risks Associated with incidental Ingestion of Surface Water | |
| BASED ON EPA, December 1989 | DRAWING NUMBER — |
| BY KAJ / CHECKED BY KMS 02/02/96 | APPROVED BY — / DATE 1/12/96 |

Objective: To calculate estimated intakes and noncarcinogenic and carcinogenic risks associated with incidental ingestion of surface water. Central Tendency Exposures (CTE) and Reasonable Maximum Exposures (RME) are calculated.

Relevant Equations:

$$IEX = \frac{C \times CR \times ET \times EF \times ED}{BW \times AT}$$

Where: IEX = Intake of chemical from surface water (mg/kg·day)
C = Surface water concentration (mg/L)
CR = Contact Rate (L/Hr)
ET = Exposure Time (Hrs/Event)
EF = Exposure Frequency (Events/year)
ED = Exposure Duration (years)
BW = Body Weight (Kg)
AT = Averaging Time (days)

Sample Calculations:

For the recreational Adult user (waterskier), the following Exposure Assumptions are made:

| | RME | CTE |
|---|---|---|
| C (mg/L) | maximum | average |
| CR (L/hr) | 0.05 | 0.05 |
| ET (hours/event) | 2.6 | 2.6 |
| EF (Events/Year) | 16 | 8 |
| ED (years) | 30 | 9 |
| BW (Kg) | 70 | 70 |
| AT NONCARC (days) | 10950 | 3285 |
| AT CARC (days) | 25550 | 25550 |

| | |
|---|---|
| CLIENT NSB-NLON, Groton, CT | JOB NUMBER 9596-0600 |
| SUBJECT Calculation of Intakes/Risks Associated with incidental ingestion of surface Water | |
| BASED ON EPA, December 1989 | DRAWING NUMBER — |
| BY KAJ / CHECKED BY KMB 02/02/96 | APPROVED BY — / DATE 1/12/96 |

For trichloroethene at a maximum concentration of 0.003 mg/L for both RME and CTE. The maximum was used for both as a result of infrequent number of detections for trichloroethene.

$$IEX_{noncarc-CTE} = \frac{(0.003\,mg/L)(0.05\,L/hr)(2.6\,hrs/event)(8\,events/yr)(9\,years)}{(70\,Kg)(3285\,days)}$$

$$= \boxed{1.22 \times 10^{-7}\ mg/kg\cdot day}$$

$$IEX_{carc-CTE} = \frac{(0.003\,mg/L)(0.05\,L/hr)(2.6\,hrs/event)(8\,events/yr)(9\,years)}{(70\,Kg)(25550\,days)}$$

$$= \boxed{1.57 \times 10^{-8}\ mg/Kg\cdot day}$$

$$IEX_{noncarc-RME} = \frac{(0.003\,mg/L)(0.05\,L/hr)(2.6\,hrs/event)(16\,events/year)(30\,years)}{(70\,Kg)(10950\,days)}$$

$$= \boxed{2.44 \times 10^{-7}\ mg/Kg\cdot day}$$

$$IEX_{carc-RME} = \frac{(0.003\,mg/L)(0.05\,L/hr)(2.6\,hrs/event)(16\,events/yr)(30\,years)}{(70\,Kg)(25550\,days)}$$

$$= \boxed{1.05 \times 10^{-7}\ mg/Kg\cdot day}$$

Risks are then calculated using the following equations:

$$HQ = IEX_{noncarc} \div RfD$$

$$ICR = IEX_{carc} \times CSF$$

| | |
|---|---|
| CLIENT NSB-NLON, GROTON, CT | JOB NUMBER 9596-0600 |
| SUBJECT Calculation of Intakes / Risks associated with incidental ingestion of Surface Wate | |
| BASED ON EPA, December 1989 | DRAWING NUMBER — |
| BY KAJ / CHECKED BY KMB 02/02/96 | APPROVED BY — / DATE 1/12/96 |

Where: HQ = Hazard Quotient (unitless)
$IEX_{noncarc}$ = Intake for noncarcinogenic chemical (mg/kg·day)
RfD = Reference Dose (mg/kg·day)
ICR = Incremental Cancer Risk (unitless)
$IEX_{carc}$ = Intake for carcinogenic chemical (mg/kg·day)
CSF = Cancer Slope Factor (kg·day/mg)

For trichloroethene the oral RfD = $6.0 \times 10^{-3}$ mg/kg·day and the oral CSF = $1.1 \times 10^{-2}$ kg·day/mg.

$$HQ_{TCE\text{-}CTE} = (1.22 \times 10^{-7}\ \text{mg/kg·day}) \div (6.0 \times 10^{-3}\ \text{mg/kg·day})$$
$$= \boxed{2.03 \times 10^{-5}}$$

$$ICR_{TCE\text{-}CTE} = (1.57 \times 10^{-8}\ \text{mg/kg·day})(1.1 \times 10^{-2}\ \text{kg·day/mg})$$
$$= \boxed{1.73 \times 10^{-10}}$$

$$HQ_{TCE\text{-}RME} = (2.44 \times 10^{-7}\ \text{mg/kg·day}) \div (6.0 \times 10^{-3}\ \text{mg/kg/day})$$
$$= \boxed{4.07 \times 10^{-5}}$$

$$ICR_{TCE\text{-}RME} = (1.05 \times 10^{-7}\ \text{mg/kg·day})(1.1 \times 10^{-2}\ \text{kg·day/mg})$$
$$= \boxed{1.16 \times 10^{-9}}$$

| | |
|---|---|
| CLIENT NSB-NLON, GROTON, CT | JOB NUMBER |
| SUBJECT Calculation of intakes / Risks Associated with ingestion of oysters | |
| BASED ON EPA, December 1989 | DRAWING NUMBER — |
| BY KAJ / CHECKED BY KMS 02/02/96 | APPROVED BY — / DATE 1/11/96 |

Objective: To calculate estimated intakes and noncarcinogenic and carcinogenic risks associated with ingestion of oysters from the Thames River. Central Tendency Exposure (CTE) and Reasonable Maximum Exposures (RME) are calculated.

Relevant Equations:

$$IEX = \frac{C \times IR \times FI \times EF \times ED}{BW \times AT}$$

Where: IEX = Intake of contaminants from ingestion of oysters (mg/kg/day)
C = Concentration of contaminants in oysters (mg/kg)
IR = Ingestion Rate (kg/meal)
FI = Fraction Ingestion from contaminated source (dimensionless)
EF = Exposure Frequency (meals/year)
ED = Exposure Duration (years)
BW = Receptor Body Weight (kg)
AT = Averaging Time (Days)

Sample Calculation:

For the Recreational Adult Consumer, the following exposure assumptions are made:

| | RME | CTE |
|---|---|---|
| C (mg/kg) | UCL or Maximum | UCL or Average |
| IR (kg/meal) | 0.055 | 0.003 |
| FI (unitless) | 1.0 | 0.5 |
| EF (meals/year) | 350 | 234 |
| ED (years) | 30 | 9 |
| BW (kg) | 70 | 70 |
| AT (Days)-noncar | 10950 | 3285 |
| -carc | 25550 | 25550 |

| | |
|---|---|
| CLIENT NSB-NLON, GROTON, CT | JOB NUMBER |
| SUBJECT Calculation of Intakes / Risks Associated with ingestion of oysters | |
| BASED ON EPA, December 1989 | DRAWING NUMBER — |
| BY KAJ / CHECKED BY KMS 02/02/96 | APPROVED BY — / DATE 1/11/96 |

For Arsenic at an average concentration of 1.1 mg/kg (CTE) and at a maximum concentration of 1.2 mg/kg (RME) for the Thames River.

$$IEX_{noncarc\text{-}CTE} = \frac{(1.1\ \frac{mg}{kg})(0.003\ \frac{kg}{meal})(0.5)(234\ \frac{meals}{year})(9\ years)}{(70\ kg)(3285\ days)}$$

$$= \boxed{1.51 \times 10^{-5}\ mg/kg/day}$$

$$IEX_{carc\text{-}CTE} = \frac{(1.1\ \frac{mg}{kg})(0.003\ \frac{kg}{meal})(0.5)(234\ \frac{meals}{yr})(9\ years)}{(70\ kg)(25550\ days)}$$

$$= \boxed{1.94 \times 10^{-6}\ mg/kg/day}$$

$$IEX_{noncarc\text{-}RME} = \frac{(1.2\ mg/kg)(0.055\ kg/meal)(1)(350\ meals/yr)(30\ years)}{(70\ kg)(10950\ days)}$$

$$= \boxed{9.04 \times 10^{-4}\ mg/kg/day}$$

$$IEX_{carc\text{-}RME} = \frac{(1.2\ mg/kg)(0.055\ kg/meal)(1)(350\ meals/yr)(30\ years)}{(70\ kg)(25550\ days)}$$

$$= \boxed{3.87 \times 10^{-4}\ mg/kg/day}$$

| | |
|---|---|
| CLIENT NSB-NLON, GROTON, CT | JOB NUMBER |
| SUBJECT Calculation of Intakes / Risks associated with ingestion of oysters | |
| BASED ON EPA, December 1989 | DRAWING NUMBER — |
| BY KAJ / CHECKED BY KMS 02/02/96 | APPROVED BY — / DATE 1/11/96 |

Risks are then calculated using the following equations:

$$HQ = IEX_{noncarc} \div RfD$$

$$ICR = IEX_{carc} \times CSF$$

Where: HQ = hazard quotient (unitless)
$IEX_{noncarc}$ = Intake for noncarcinogenic Chemical (mg/kg·day)
RfD = Reference Dose (mg/kg·day)
ICR = Incremental Cancer Risk (unitless)
$IEX_{carc}$ = Intake for carcinogenic chemicals (mg/kg·day)
CSF = Cancer Slope Factor (kg·day/mg)

For Arsenic the oral RfD = $3.0 \times 10^{-4}$ mg/kg·day and the oral CSF = $1.5 \times 10^{0}$ kg·day/mg

$$HQ_{As-CTE} = (1.51 \times 10^{-5} \tfrac{mg}{kg \cdot day}) \div (3.0 \times 10^{-4} mg/kg \cdot day)$$
$$= \boxed{5.03 \times 10^{-2}}$$

$$ICR_{As-CTE} = (1.94 \times 10^{-6} \tfrac{mg}{kg \cdot day})(1.5 \times 10^{0} kg \cdot day/mg)$$
$$= \boxed{2.91 \times 10^{-6}}$$

$$HQ_{As-RME} = (9.04 \times 10^{-4} mg/kg \cdot day) \div (3.0 \times 10^{-4} mg/kg \cdot day)$$
$$= \boxed{3.01 \times 10^{0}}$$

$$ICR_{As-RME} = (3.87 \times 10^{-4} mg/kg \cdot day)(1.5 \times 10^{0} kg \cdot day/mg)$$
$$= \boxed{5.81 \times 10^{-4}}$$

| | |
|---|---|
| CLIENT NSB-NLON, GROTON, CT | JOB NUMBER 9594.0600 |
| SUBJECT Sample Calculation for Intakes / Risks for Inhalation | |
| BASED ON USEPA, December 1989 | DRAWING NUMBER — |
| BY KAJ / CHECKED BY KMD 02/02/96 | APPROVED BY — / DATE 01/16/96 |

Objective: To calculate estimated exposure intakes and risks (noncarcinogenic and carcinogenic) associated with inhalation of ambient air. Central Tendency Exposures (CTE) and Reasonable Maximum Exposures (RME) are calculated.

Relevant Equations:

$$IEX = \frac{C \times IR \times ET \times EF \times ED}{BW \times AT}$$

Where:
IEX = Estimated Exposure intake (mg/kg-day)
C = Contaminant Concentration in air (mg/m³)
IR = Inhalation Rate (m³/hour)
ET = Exposure Time (hrs/day)
EF = Exposure Frequency (days/yr)
ED = Exposure Duration (years)
BW = Body Weight (kg)
AT = Averaging Time (days)

$$HQ = IEX_n / RfD$$

$$ICR = (IEX_c)(CSF)$$

Where:
HQ = Hazard Quotient (unitless)
$IEX_n$ = Estimated exposure intake for noncarcinogenic effects (mg/kg-day)
RfD = Chemical-Specific Reference Dose (mg/kg-day)
ICR = Chemical-Specific Incremental Cancer Risk (unitless)
$IEX_c$ = Estimated exposure intake for carcinogenic effects (mg/kg-day)
CSF = Cancer Slope Factor (kg-day/mg)

| | |
|---|---|
| CLIENT NSB-NLON, GROTON, CT | JOB NUMBER 959 |
| SUBJECT Sample Calculations for Intakes/Risks for Inhalation | |
| BASED ON USEPA, December, 1989 | DRAWING NUMBER — |
| BY KAJ / CHECKED BY KMO 02/02/96 | APPROVED BY — / DATE 1/16/96 |

Sample Calculation:

For Construction Workers utilizing all soils data, the following exposure assumptions are made:

| Parameter | CTE | RME |
|---|---|---|
| C (mg/Kg)(1) | AVERAGE x 9E-8 | Maximum x 9E-8 |
| IR (m3/hr) | 3.9 | 3.9 |
| ET (hrs/day) | 8.0 | 8.0 |
| EF (days/yr) | 80 | 120 |
| ED (yrs) | 1 | 1 |
| BW (Kg) | 70 | 70 |
| ATn (days) | 365 | 365 |
| ATc (days) | 25550 | 25550 |

(1) C = contaminant concentration in soil X concentration as $PM_{10}$ emmisions.

For Cadmium at an average concentration of 2.7 mg/Kg in soil for the CTE and at a maximum concentration of 6.7 mg/Kg in soil for the RME (Site 6-DRMO):

$$IEX_{n\text{-}CTE} = \frac{\left(2.7\,mg/Kg \times 9E\text{-}8\,\frac{mg\text{-}Kg}{m^3\text{-}mg}\right)\left(3.9\,m^3/hr\right)\left(8\,hr/day\right)\left(80\,days/yr\right)\left(1\,yr\right)}{(70\,Kg) \times (365\,days)}$$

$$= \boxed{2.37\,E\text{-}8\ mg/Kg\text{-}day}$$

$$IEX_{c\text{-}CTE} = \frac{\left(2.7\,mg/Kg \times 9E\text{-}8\,\frac{mg\text{-}Kg}{m^3\text{-}mg}\right)\left(3.9\,m^3/hr\right)\left(8\,hr/day\right)\left(.5\,days/yr\right)\left(1\,yr\right)}{(70\,Kg) \times (25550\,days)}$$

$$= \boxed{3.39\,E\text{-}10\ mg/Kg\text{-}day}$$

| | |
|---|---|
| CLIENT NSB-NLON, GROTON, CT | JOB NUMBER 9594 0600 |
| SUBJECT Sample Calculation for Intakes/Risks for Inhalation | |
| BASED ON USEPA December 1989 | DRAWING NUMBER — |
| BY KAJ / CHECKED BY KMS 02/02/96 | APPROVED BY — / DATE 1/16/96 |

$$IEX_{n\text{-}RME} = \frac{\left(6.7\,mg/kg \times 9E\text{-}8\,\frac{mg\text{-}kg}{m^3\text{-}mg}\right)\left(3.9\,\frac{m^3}{hr}\right)\left(8\,\frac{hrs}{day}\right)\left(120\,\frac{days}{yr}\right)(1\,year)}{(70\,kg) \times (365\,days)}$$

$$= \boxed{8.84\,E\text{-}8\ mg/kg\text{-}day}$$

$$IEX_{c\text{-}RME} = \frac{\left(6.7\,mg/kg \times 9E\text{-}8\,\frac{mg\text{-}kg}{m^3\text{-}mg}\right)\left(3.9\,\frac{m^3}{hr}\right)\left(8\,\frac{hrs}{day}\right)\left(120\,\frac{days}{yr}\right)(1\,yr)}{(70\,kg) \times (25{,}550\,days)}$$

$$= \boxed{1.26E\text{-}9\ mg/kg\text{-}day}$$

Risks are then calculated in the following manner. The inhalation RfD for cadmium is 5.71E-5 mg/kg-day and the CSF for cadmium is 6.3E+0 kg-day/mg.

$$HQ_{CTE} = (2.37E\text{-}8\ mg/kg\text{-}day) / 5.71E\text{-}5\ mg/kg\text{-}day =$$

$$= \boxed{4.15\,E\text{-}4}$$

$$HQ_{RME} = 8.84E\text{-}8\ mg/kg\text{-}day / 5.71E\text{-}5\ mg/kg\text{-}day =$$

$$= \boxed{1.55\,E\text{-}3}$$

$$ICR_{CTE} = (3.39E\text{-}10\ mg/kg\text{-}day)(6.3E+0\ kg\text{-}day/mg) = \boxed{2.14\,E\text{-}9}$$

$$ICR_{RME} = (1.26E\text{-}9\ mg/kg\text{-}day)(6.3E+0\ kg\text{-}day/mg) = \boxed{7.94\,E\text{-}9}$$

# APPENDIX F.4

## SITE 1 - CBU DRUM STORAGE AREA

## SUMMARY OF COC SELECTION
## SITE 1 CBU DRUM STORAGE AREA - SURFACE SOIL (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 2-Butanone | 2/6 | 0.015 - 0.02 | 1TB1-0002 | 0.011 - 0.056 | 4700 | 6900 (11) | - | N | 2 |
| Ethylbenzene | 2/6 | 0.006 - 0.023 | 1TB3-0002 | 0.006 - 0.011 | 780 | 260 | 5 | N | 2 |
| Methylene chloride | 1/6 | 0.001 | 1SS2D | 0.006 - 0.028 | 85 | 7 | 0.01 | N | 2 |
| Tetrachloroethene | 1/6 | 0.002 | 1TB3-0002 | 0.006 - 0.028 | 12 | 11 | 0.04 | N | 2 |
| Trichloroethene | 1/6 | 0.002 | 1TB3-0002 | 0.006 - 0.028 | 58 | 3 | 0.02 | N | 2 |
| Xylenes, total | 3/6 | 0.029 - 0.3 | 1SS3D | 0.006 | 16000 | 320 | 74 | N | 2 |
| 1,4-Dichlorobenzene | 1/2 | 0.11 | 1TB1-0002 | 0.37 | 27 | 7700 | 1 | N | 2 |
| 2-Methylnaphthalene | 2/2 | 0.025 - 2.1 | 1TB1-0002 | - | - | - | - | N | 1 |
| Acenaphthylene | 1/2 | 0.035 | 1TB3-0002 | 0.37 | - | - | - | N | 1 |
| Anthracene | 2/2 | 0.086 - 0.19 | 1TB1-0002 | - | 2300 | - | 4300 | N | 2 |
| Benzo(a)anthracene | 2/2 | 0.23 - 0.68 | 1TB1-0002 | - | 0.88 | - | 0.7 | N | 2 |
| Benzo(a)pyrene | 2/2 | 0.25 - 0.38 | 1TB1-0002 | - | 0.088 | - | 4 | Y | 3 |
| Benzo(b)fluoranthene | 2/2 | 0.44 - 0.63 | 1TB1-0002 | - | 0.88 | - | 4 | N | 2 |
| Benzo(g,h,i)perylene | 2/2 | 0.18 - 0.22 | 1TB1-0002 | - | - | - | - | N | 1 |
| Benzo(k)fluoranthene | 1/2 | 0.61 | 1TB1-0002 | 0.37 | 8.8 | - | 4 | N | 2 |
| Butyl benzyl phthalate | 1/2 | 0.82 | 1TB3-0002 | 0.37 | 1600 | 530 | 68 | N | 2 |
| Carbazole | 1/2 | 0.035 | 1TB3-0002 | 0.37 | 32 | - | 0.2 | N | 2 |
| Chrysene | 2/2 | 0.29 - 1.1 | 1TB1-0002 | - | 88 | - | 1 | N | 2 |
| Di-n-butyl phthalate | 1/2 | 0.97 | 1TB1-0002 | 0.37 | 780 | 100 | 120 | N | 2 |
| Dibenzo(a,h)anthracene | 1/2 | 0.059 | 1TB3-0002 | 0.37 | 0.088 | - | 11 | N | 2 |
| Dibenzofuran | 1/2 | 0.024 | 1TB3-0002 | 0.37 | 31 | - | - | N | 2 |
| Fluoranthene | 2/2 | 0.65 - 1.3 | 1TB1-0002 | - | 310 | - | 980 | N | 2 |
| Fluorene | 2/2 | 0.043 - 0.26 | 1TB1-0002 | - | 310 | - | 160 | N | 2 |
| Indeno(1,2,3-cd)pyrene | 2/2 | 0.2 - 0.21 | 1TB3-0002 | - | 0.88 | - | 35 | N | 2 |
| Naphthalene | 1/2 | 0.93 | 1TB1-0002 | 0.37 | 310 | - | 30 | N | 2 |
| Phenanthrene | 2/2 | 0.41 - 0.43 | 1TB3-0002 | - | - | - | - | N | 1 |
| Pyrene | 2/2 | 0.56 - 1.4 | 1TB1-0002 | - | 230 | - | 1400 | N | 2 |
| 4,4'-DDD | 1/2 | 3.9 | 1TB1-0002 | 0.037 | 2.7 | - | 0.7 | Y | 3 |
| 4,4'-DDE | 1/2 | 0.058 | 1TB1-0002 | 0.037 | 1.9 | - | 0.5 | N | 2 |

**SUMMARY OF COC SELECTION (Continued)**
**SITE 1 CBU DRUM STORAGE AREA - SURFACE SOIL (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDT | 1/2 | 0.026 | 1TB1-0002 | 0.037 | 1.9 | 80 | 1.0 | N | 2 |
| Alpha-chlordane | 1/2 | 0.028 | 1TB1-0002 | 0.019 | 0.49 (7) | - | 2 (7) | N | 2 |
| Aroclor-1254 | 1/2 | 0.42 | 1TB1-0002 | 0.37 | 0.16 | - | - | Y | 3 |
| Dieldrin | 1/2 | 0.029 | 1TB1-0002 | 0.037 | 0.04 | 2 | 0.001 | N | 2 |
| Endrin | 1/2 | 0.0041 | 1TB1-0002 | 0.037 | 2.3 | - | 0.4 | N | 2 |
| Gamma-chlordane | 1/2 | 0.0076 | 1TB1-0002 | 0.019 | 0.49 (7) | - | 2 (7) | N | 2 |
| Aluminum | 2/2 | 7110 - 10100 | 1TB1-0002 | - | 7800 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Antimony | 2/2 | 5.3 - 6.8 | 1TB1-0002 | - | 3.1 | - | - | Y | 3 |
| Arsenic | 1/2 | 4.8 | 1TB1-0002 | 2.7 | 0.43 | 380 | 15 | Y | 3 |
| Barium | 2/2 | 40.7 - 75.7 | 1TB1-0002 | - | 550 | 350000 | 32 | N | 2 |
| Beryllium | 2/2 | 0.36 - 1 | 1TB1-0002 | - | 0.15 | 690 | 180 | Y | 3 |
| Cadmium | 2/2 | 0.73 - 1.2 | 1TB1-0002 | - | 3.9 | 920 | 6 | N | 2 |
| Calcium | 2/2 | 3460 - 4240 | 1TB3-0002 | - | - | - | - | N | 1 |
| Chromium (total) | 2/2 | 14.7 - 34.1 | 1TB1-0002 | - | 39 (8) | 140 (8) | 19 (8) | N | 2 |
| Cobalt | 2/2 | 4.7 - 6.2 | 1TB1-0002 | - | 470 | - | - | N | 2 |
| Copper | 2/2 | 31.3 - 115 | 1TB1-0002 | - | 290 | - | - | N | 2 |
| Iron | 2/2 | 12000 - 19100 | 1TB1-0002 | - | 2300 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Lead | 2/2 | 4.8 - 104 | 1TB1-0002 | - | 400 (9) | - | - | N | 2 |
| Magnesium | 2/2 | 2490 - 2880 | 1TB1-0002 | - | - | - | - | N | 1 |
| Manganese | 2/2 | 166 - 215 | 1TB1-0002 | - | ~~39~~ 190 | - | - | Y | 3 |
| Mercury | 2/2 | 0.21 - 0.47 | 1TB3-0002 | - | 2.3 | 7 | 3 | N | 2 |
| Nickel | 2/2 | 9.1 - 33.8 | 1TB1-0002 | - | 160 | 6900 | 21 | N | 2 |
| Potassium | 2/2 | 1660 - 1750 | 1TB3-0002 | - | - | - | - | N | 1 |
| Sodium | 2/2 | 270 - 342 | 1TB1-0002 | - | - | - | - | N | 1 |
| Vanadium | 2/2 | 19.1 - 186 | 1TB1-0002 | - | 55 | - | - | Y | 3 |
| Zinc | 2/2 | 39.6 - 460 | 1TB1-0002 | - | 2300 | - | 42000 | N | 2 |
| TPH | 8/8 | 100 - 9800 | 1SS3D | - | 500 (10) | - | 2500 (12) | Y | 3 |

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## SUMMARY OF COC SELECTION (Continued)
## SITE 1 CBU DRUM STORAGE AREA - SURFACE SOIL (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

Footnotes:

1 Results in mg/kg unless otherwise noted. Surface soil designated as soil from depths of 0 to 2 feet.
2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment.
3 Sample-specific.
4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
5 Soil screening level guidance (USEPA, December 1994).
6 Soil screening level guidance (USEPA, December 1994) with a dilution and attenuation factor of 10.
7 Total chlordane.
8 Hexavalent chromium.
9 OSWER soil screening level for residential land use (USEPA, July 14, 1994).
10 Direct exposure criteria for soil (CTDEP, October 13, 1995).
11 Calculated using SSL guidance (See Appendix F.3).
12 Pollutant mobility criteria for soil for GA, GAA area (CTDEP, October 13, 1995).

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS**
**SITE 1 CBU DRUM STORAGE AREA - SURFACE SOIL (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| 2-Butanone | 20 | 13.25 |
| Ethylbenzene | 23 | 7.25 |
| Methylene chloride | 1 | 5.3333 |
| Tetrachloroethene | 2 | 5.0833 |
| Trichloroethene | 2 | 5.0833 |
| Xylenes, total | 300 | 62.6667 |
| 1,4-Dichlorobenzene | 110 | 147.5 |
| 2-Methylnaphthalene | 2100 | 1062.5 |
| Acenaphthylene | 35 | 110 |
| Anthracene | 190 | 138 |
| Benzo(a)anthracene | 680 | 455 |
| Benzo(a)pyrene | 380 | 315 |
| Benzo(b)fluoranthene | 630 | 535 |
| Benzo(g,h,i)perylene | 220 | 200 |
| Benzo(k)fluoranthene | 610 | 397.5 |
| Butyl benzyl phthalate | 820 | 502.5 |
| Carbazole | 35 | 110 |
| Chrysene | 1100 | 695 |
| Di-N-butyl phthalate | 970 | 577.5 |
| Dibenzo(a,h)anthracene | 59 | 122 |
| Dibenzofuran | 24 | 104.5 |
| Fluoranthene | 1300 | 975 |
| Fluorene | 260 | 151.5 |
| Indeno(1,2,3-Cd)pyrene | 210 | 205 |
| Naphthalene | 930 | 557.5 |
| Phenanthrene | 430 | 420 |
| Pyrene | 1400 | 980 |
| 4,4'-DDD | 3900 | 1959.25 |
| 4,4'-DDE | 58 | 38.25 |
| 4,4'-DDT | 26 | 22.25 |
| alpha-Chlordane | 28 | 18.75 |
| Aroclor-1254 | 420 | 302.5 |
| Dieldrin | 29 | 23.75 |
| Endrin | 4.1 | 11.3 |
| gamma-Chlordane | 7.6 | 8.55 |
| **Inorganics (mg/kg)** | | |
| Aluminum | 10100 | 8605 |
| Antimony | 6.8 | 6.05 |
| Arsenic | 4.8 | 3.075 |
| Barium | 75.7 | 58.2 |
| Beryllium | 1 | 0.68 |
| Cadmium | 1.2 | 0.965 |
| Calcium | 4240 | 3850 |

**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS (Continued)**
**SITE 1 CBU DRUM STORAGE AREA - SURFACE SOIL (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Inorganics (mg/kg) (Continued)** | | |
| Chromium (total) | 34.1 | 24.4 |
| Cobalt | 6.2 | 5.45 |
| Copper | 115 | 73.15 |
| Iron | 19100 | 15550 |
| Lead | 104 | 54.4 |
| Magnesium | 2880 | 2685 |
| Manganese | 215 | 190.5 |
| Mercury | 0.47 | 0.34 |
| Nickel | 33.8 | 21.45 |
| Potassium | 1750 | 1705 |
| Sodium | 342 | 306 |
| Vanadium | 186 | 102.55 |
| Zinc | 460 | 249.8 |
| Tph | 9800 | 1776.75 |

## SUMMARY OF COC SELECTION
## SITE 1 CBU DRUM STORAGE AREA - ALL SOIL (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 1/8 | 0.001 | 1TB3-0507 | 0.006 - 0.028 | 700 | 980 | 0.9 | N | 2 |
| 2-Butanone | 4/8 | 0.015 - 0.17 | 1TB3-0507 | 0.011 - 0.056 | 4700 | 6900 (11) | - | N | 2 |
| Ethylbenzene | 4/8 | 0.006 - 0.079 | 1TB3-0507 | 0.006 - 0.011 | 780 | 260 | 5 | N | 2 |
| Methylene chloride | 2/8 | 0.001 - 0.028 | 1TB3-0507 | 0.006 - 0.028 | 85 | 7 | 0.01 | N | 2 |
| Tetrachloroethene | 2/8 | 0.002 - 0.004 | 1TB3-0507 | 0.006 - 0.028 | 12 | 11 | 0.04 | N | 2 |
| Trichloroethene | 2/8 | 0.002 - 0.003 | 1TB3-0507 | 0.006 - 0.028 | 58 | 3 | 0.02 | N | 2 |
| Xylenes, total | 5/8 | 0.029 - 0.38 | 1TB3-0507 | 0.006 | 16000 | 320 | 74 | N | 2 |
| 1,4-Dichlorobenzene | 1/4 | 0.11 | 1TB1-0002 | 0.37 - 3.8 | 27 | 7700 | 1 | N | 2 |
| 2-Methylnaphthalene | 3/4 | 0.025 - 12 | 1TB1-0608 | 3.8 | - | - | - | N | 1 |
| Acenaphthene | 2/4 | 0.24 - 2.8 | 1TB1-0608 | 0.37 | 470 | - | 200 | N | 2 |
| Acenaphthylene | 1/4 | 0.035 | 1TB3-0002 | 0.37 - 3.8 | - | - | - | N | 1 |
| Anthracene | 4/4 | 0.086 - 2.8 | 1TB1-0608 | - | 2300 | - | 4300 | N | 2 |
| Benzo(a)anthracene | 4/4 | 0.23 - 2.3 | 1TB1-0608 | - | 0.88 | - | 0.7 | Y | 3 |
| Benzo(a)pyrene | 4/4 | 0.25 - 1.1 | 1TB3-0507 | - | 0.088 | - | 4 | Y | 3 |
| Benzo(b)fluoranthene | 4/4 | 0.44 - 2.2 | 1TB3-0507 | - | 0.88 | - | 4 | Y | 3 |
| Benzo(g,h,i)perylene | 3/4 | 0.18 - 0.28 | 1TB1-0608 | 3.8 | - | - | - | N | 1 |
| Benzo(k)fluoranthene | 1/4 | 0.61 | 1TB1-0002 | 0.37 - 3.8 | 8.8 | - | 4 | N | 2 |
| Butyl benzyl phthalate | 1/4 | 0.82 | 1TB3-0002 | 0.37 - 3.8 | 1600 | 530 | 68 | N | 2 |
| Carbazole | 3/4 | 0.035 - 0.7 | 1TB1-0608 | 0.37 | 32 | - | 0.2 | N | 2 |
| Chrysene | 4/4 | 0.29 - 1.9 | 1TB1-0608 | - | 88 | - | 1 | N | 2 |
| Di-n-butyl phthalate | 2/4 | 0.46 - 0.97 | 1TB1-0002 | 0.37 - 3.8 | 7800 | - | 120 | N | 2 |
| Dibenzo(a,h)anthracene | 1/4 | 0.059 | 1TB3-0002 | 0.37 - 3.8 | 0.088 | - | 11 | N | 2 |
| Dibenzofuran | 2/4 | 0.024 - 2.5 | 1TB1-0608 | 0.37 - 3.8 | 31 | - | - | N | 2 |
| Fluoranthene | 4/4 | 0.65 - 13 | 1TB1-0608 | - | 310 | - | 980 | N | 2 |
| Fluorene | 4/4 | 0.043 - 3.6 | 1TB1-0608 | - | 310 | - | 160 | N | 2 |
| Indeno(1,2,3-cd)pyrene | 4/4 | 0.2 - 0.95 | 1TB3-0507 | - | 0.88 | - | 35 | Y | 3 |
| Naphthalene | 2/4 | 0.93 - 6.5 | 1TB1-0608 | 0.37 - 3.8 | 310 | - | 30 | N | 2 |
| Phenanthrene | 4/4 | 0.41 - 16 | 1TB1-0608 | - | - | - | - | N | 1 |
| Pyrene | 4/4 | 0.56 - 9 | 1TB1-0608 | - | 230 | - | 1400 | N | 2 |



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**SUMMARY OF COC SELECTION (Continued)**
**SITE 1 CBU DRUM STORAGE AREA - ALL SOIL (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 2/4 | 2.1 - 3.9 | 1TB1-0002 | 0.037 - 0.038 | 2.7 | - | 0.7 | Y | 3 |
| 4,4'-DDE | 2/4 | 0.025 - 0.058 | 1TB1-0002 | 0.037 - 0.038 | 1.9 | - | 0.5 | N | 2 |
| 4,4'-DDT | 2/4 | 0.0079 - 0.026 | 1TB1-0002 | 0.037 - 0.038 | 1.9 | 80 | 1.0 | N | 2 |
| Aldrin | 1/4 | 0.0026 | 1TB1-0608 | 0.019 - 0.020 | 0.038 | 0.5 | 0.005 | N | 2 |
| Alpha-chlordane | 2/4 | 0.0099 - 0.028 | 1TB1-0002 | 0.019 - 0.020 | 0.49 (7) | - | 2 (7) | N | 2 |
| Aroclor-1248 | 1/4 | 0.36 | 1TB3-0507 | 0.37 - 0.52 | 0.083 | - | - | Y | 3 |
| Aroclor-1254 | 1/4 | 0.42 | 1TB1-0002 | 0.37 - 0.52 | 0.16 | - | - | Y | 3 |
| Dieldrin | 2/4 | 0.029 - 0.031 | 1TB1-0608 | 0.037 - 0.038 | 0.04 | 2 | 0.001 | N | 2 |
| Endrin | 2/4 | 0.0035 - 0.0041 | 1TB1-0002 | 0.037 - 0.038 | 2.3 | - | 0.4 | N | 2 |
| Gamma-BHC (lindane) | 1/4 | 0.0018 | 1TB1-0608 | 0.019 - 0.020 | 0.49 | - | 0.006 | N | 2 |
| Gamma-chlordane | 1/4 | 0.0076 | 1TB1-0002 | 0.019 - 0.027 | 0.49 (7) | - | 2 (7) | N | 2 |
| Heptachlor | 1/4 | 0.0034 | 1TB1-0608 | 0.019 - 0.020 | 0.14 | 0.3 | 0.06 | N | 2 |
| Heptachlor epoxide | 1/4 | 0.027 | 1TB1-0608 | 0.019 - 0.020 | 0.07 | 1 | 0.03 | N | 2 |
| Aluminum | 4/4 | 7110 - 18900 | 1TB1-0608 | - | 7800 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Antimony | 4/4 | 5.3 - 17.4 | 1TB1-0608 | - | 3.1 | - | - | Y | 3 |
| Arsenic | 3/4 | 3.3 - 10.2 | 1TB1-0608 | 2.7 | 0.43 | 380 | 15 | Y | 3 |
| Barium | 4/4 | 40.7 - 93.9 | 1TB1-0608 | - | 550 | 350000 | 32 | N | 2 |
| Beryllium | 4/4 | 0.36 - 1.6 | 1TB3-0507 | - | 0.15 | 690 | 180 | Y | 3 |
| Boron | 2/4 | 14.6 - 19.7 | 1TB1-0608 | 11.4 | 700 | - | - | N | 2 |
| Cadmium | 4/4 | 0.73 - 2.6 | 1TB1-0608 | - | 3.9 | 920 | 6 | N | 2 |
| Calcium | 4/4 | 3460 - 9130 | 1TB3-0507 | - | - | - | - | N | 1 |
| Chromium (total) | 4/4 | 14.7 - 42.9 | 1TB1-0608 | - | 39 (8) | 140 (8) | 19 (8) | Y | 3 |
| Cobalt | 4/4 | 4.7 - 9.5 | 1TB3-0507 | - | 470 | - | - | N | 2 |
| Copper | 4/4 | 31.3 - 164 | 1TB3-0507 | - | 290 | - | - | N | 2 |
| Iron | 4/4 | 12000 - 31200 | 1TB1-0608 | - | 2300 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Lead | 4/4 | 4.8 - 366 | 1TB1-0608 | - | 400 (9) | - | - | N | 2 |
| Magnesium | 4/4 | 2490 - 5610 | 1TB1-0608 | - | - | - | - | N | 1 |
| Manganese | 4/4 | 166 - 290 | 1TB1-0608 | - | ~~39~~ 190 | - | - | Y | 3 |
| Mercury | 3/4 | 0.21 - 0.61 | 1TB3-0507 | 0.18 | 2.3 | 7 | 3 | N | 2 |

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**SUMMARY OF COC SELECTION (Continued)**
**SITE 1 CBU DRUM STORAGE AREA - ALL SOIL (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Nickel | 4/4 | 9.1 - 46.6 | 1TB3-0507 | - | 160 | 6900 | 21 | N | 2 |
| Potassium | 4/4 | 1460 - 3550 | 1TB1-0608 | - | - | - | - | N | 1 |
| Sodium | 4/4 | 270 - 582 | 1TB1-0608 | - | - | - | - | N | 1 |
| Vanadium | 4/4 | 19.1 - 186 | 1TB1-0002 | - | 55 | - | - | Y | 3 |
| Zinc | 4/4 | 39.6 - 709 | 1TB3-0507 | - | 2300 | - | 42000 | N | 2 |
| TPH | 10/10 | 41 - 9800 | 1SS3D | - | 500 (10) | - | 2500 (12) | Y | 3 |

Footnotes:

1 Results in mg/kg unless otherwise noted. All soil designated as soil from depths of 0 to 10 feet.
2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment.
3 Sample-specific.
4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
5 Soil screening level guidance (USEPA, December 1994).
6 Soil screening level guidance (USEPA, December 1994) with a dilution and attenuation factor of 10.
7 Total chlordane.
8 Hexavalent chromium.
9 OSWER soil screening level for residential land use (USEPA, July 14, 1994).
10 Direct exposure criteria for soil (CTDEP, October 13, 1995).
11 Calculated using SSL guidance (See Appendix F.3).
12 Pollutant mobility criteria for soil for GA, GAA area (CTDEP, October 13, 1995).

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS**
**SITE 1 CBU DRUM STORAGE AREA - ALL SOIL (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| 1,1,1-Trichloroethane | 1 | 5.375 |
| 2-Butanone | 170 | 33.1875 |
| Ethylbenzene | 79 | 18.1875 |
| Methylene chloride | 28 | 8.5 |
| Tetrachloroethene | 4 | 5.3125 |
| Trichloroethene | 3 | 5.1875 |
| Xylenes, total | 380 | 106.625 |
| 1,4-Dichlorobenzene | 110 | 613.75 |
| 2-Methylnaphthalene | 12000 | 4006.25 |
| Acenaphthene | 2800 | 852.5 |
| Acenaphthylene | 35 | 595 |
| Anthracene | 2800 | 894 |
| Benzo(a)anthracene | 2300 | 1077.5 |
| Benzo(a)pyrene | 1100 | 645 |
| Benzo(b)fluoranthene | 2200 | 1217.5 |
| Benzo(g,h,i)perylene | 280 | 645 |
| Benzo(k)fluoranthene | 610 | 738.75 |
| Butyl benzyl phthalate | 820 | 791.25 |
| Carbazole | 700 | 290 |
| Chrysene | 1900 | 1222.5 |
| Di-N-butyl phthalate | 970 | 878.75 |
| Dibenzo(a,h)anthracene | 59 | 601 |
| Dibenzofuran | 2500 | 1152.25 |
| Fluoranthene | 13000 | 4562.5 |
| Fluorene | 3600 | 1050.75 |
| Indeno(1,2,3-Cd)pyrene | 950 | 412.5 |
| Naphthalene | 6500 | 2378.75 |
| Phenanthrene | 16000 | 4860 |
| Pyrene | 9000 | 3390 |
| 4,4'-DDD | 3900 | 1509.375 |
| 4,4'-DDE | 58 | 30.125 |
| 4,4'-DDT | 26 | 17.85 |
| Aldrin | 2.6 | 7.9 |
| Alpha-Chlordane | 28 | 14.35 |
| Aroclor-1248 | 360 | 247.5 |
| Aroclor-1254 | 420 | 263.75 |
| Dieldrin | 31 | 24.375 |
| Endrin | 4.1 | 11.275 |
| Gamma-Bhc (lindane) | 1.8 | 7.7 |
| Gamma-Chlordane | 7.6 | 10.15 |
| Heptachlor | 3.4 | 8.1 |
| Heptachlor epoxide | 27 | 14 |

**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS (Continued)**
**SITE 1 CBU DRUM STORAGE AREA - ALL SOIL (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Inorganics (mg/kg)** | | |
| Aluminum | 18900 | 10967.5 |
| Antimony | 17.4 | 10.325 |
| Arsenic | 10.2 | 4.9125 |
| Barium | 93.9 | 72.225 |
| Beryllium | 1.6 | 0.9575 |
| Boron | 19.7 | 11.425 |
| Cadmium | 2.6 | 1.5575 |
| Calcium | 9130 | 5087.5 |
| Chromium (total) | 42.9 | 31.6 |
| Cobalt | 9.5 | 7.425 |
| Copper | 164 | 114.325 |
| Iron | 31200 | 19525 |
| Lead | 366 | 170.45 |
| Magnesium | 5610 | 3415 |
| Manganese | 290 | 215.5 |
| Mercury | 0.61 | 0.345 |
| Nickel | 46.6 | 28.325 |
| Potassium | 3550 | 2105 |
| Sodium | 582 | 397 |
| Vanadium | 186 | 71.6 |
| Zinc | 709 | 335.65 |
| Tph | 9800 | 2176.5 |

UNFILTERED

# SUMMARY OF COC SELECTION
## SITE 1 CBU DRUM STORAGE AREA - GROUNDWATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Federal MCL (4) | State MCL (5) | Risk-based COC Screening Level (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Chlorobenzene | 1/2 | 12 | 1GW2S | 10 | 100 | 100 | 3.9 | Y | 3 |
| Xylenes, total | 1/2 | 24 | 1GW2S | 10 | 10000 | 10000 | 1200 | N | 2 |
| 2-Methylnaphthalene | 2/2 | 1 - 12 | 1GW2S | - | - | - | - | N | 1 |
| 4-Methylphenol | 2/2 | 0.6 - 1 | 1GW2S | - | - | - | 18 | N | 2 |
| Acenaphthene | 2/2 | 2 - 8 | 1GW2S | - | - | - | 220 | N | 2 |
| Anthracene | 2/2 | 1 - 3 | 1GW2S | - | - | - | 1100 | N | 2 |
| Carbazole | 2/2 | 7 - 19 | 1GW2S | - | - | - | 3.4 | Y | 3 |
| Di-n-butyl phthalate | 1/2 | 0.6 | 1GW2S | 10 | - | - | 370 | N | 2 |
| Dibenzofuran | 2/2 | 2 - 13 | 1GW2S | - | - | - | 15 | N | 2 |
| Diethyl phthalate | 2/2 | 1 | 1GW2S | - | - | - | 2900 | N | 2 |
| Fluoranthene | 1/2 | 3 | 1GW2S | 10 | - | - | 150 | N | 2 |
| Fluorene | 2/2 | 2 - 13 | 1GW2S | - | - | - | 150 | N | 2 |
| Naphthalene | 2/2 | 9 - 31 | 1GW2S | - | - | - | 150 | N | 2 |
| Phenanthrene | 2/2 | 4 - 22 | 1GW2S | - | - | - | - | N | 1 |
| Pyrene | 1/2 | 1 | 1GW2S | 10 | - | - | 110 | N | 2 |
| Aluminum | 1/2 | 94.9 | 1GW2S | 132 | 50 TO 200 (7) | - | 3700 | N | 2 |
| Arsenic | 2/2 | 2.4 - 3.5 | 1GW2S | - | 50 | 50 | 0.045 | Y | 3 |
| Barium | 2/2 | 35.5 - 92.5 | 1GW2S | - | 2000 | 2000 | 260 | N | 2 |
| Boron | 2/2 | 54.5 - 130 | 1GW2S | - | - | - | 330 | N | 2 |
| Calcium | 2/2 | 29900 - 68500 | 1GW2S | - | - | - | - | N | 1 |
| Chromium (total) | 1/2 | 1.6 | 1GW2S | 4.5 | 100 | 100 | 18 (8) | N | 2 |
| Iron | 2/2 | 13400 - 27600 | 1GW2S | - | 300 (7) | - | 1100 | ~~Y~~ N | ~~3~~ 4 |
| Magnesium | 2/2 | 4290 - 5400 | 1GW2S | - | - | - | - | N | 1 |
| Manganese | 2/2 | 409 - 527 | 1GW2S | - | 50 (7) | - | ~~18~~ 88 | Y | 3 |
| Potassium | 2/2 | 3490 - 3930 | 1GW2S | - | - | - | - | N | 1 |
| Sodium | 2/2 | 17400 - 28300 | 1GW2S | - | - | - | - | N | 1 |
| Zinc | 1/2 | 8 | 1GW2S | 9.8 | 5000 (7) | - | 1100 | N | 2 |
| TPH | 1/2 | 1.2 | 1GW2S | 0.5 | - | - | 500 (9) | N | 2 |

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**SUMMARY OF COC SELECTION (Continued)**
**SITE 1 CBU DRUM STORAGE AREA - GROUNDWATER (UG/L) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as separate samples. Non-validated and rejected results are not used in risk assessment.
3 Sample-specific.
4 Maximum contaminant level. (USEPA, May 1995).
5 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II EnvironmentalHealth.
6 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
7 Secondary MCL.
8 Hexavalent chromium.
9 Groundwater protection criteria (CTDEP, October 3, 1995).

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.

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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS**
**SITE 1 CBU DRUM STORAGE AREA - GROUNDWATER (UG/L) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| Chlorobenzene | 8.5 | 8.5 |
| Xylenes, total | 14.5 | 14.5 |
| 2-Methylnaphthalene | 6.5 | 6.5 |
| 4-Methylphenol | 0.8 | 0.8 |
| Acenaphthene | 5 | 5 |
| Anthracene | 2 | 2 |
| Carbazole | 13 | 13 |
| Di-N-butyl phthalate | 2.8 | 2.8 |
| Dibenzofuran | 7.5 | 7.5 |
| Diethyl phthalate | 1 | 1 |
| Fluoranthene | 4 | 4 |
| Fluorene | 7.5 | 7.5 |
| Naphthalene | 20 | 20 |
| Phenanthrene | 13 | 13 |
| Pyrene | 3 | 3 |
| Aluminum | 80.45 | 80.45 |
| Arsenic | 2.95 | 2.95 |
| Barium | 64 | 64 |
| Boron | 92.25 | 92.25 |
| Calcium | 49200 | 49200 |
| Chromium (total) | 1.925 | 1.925 |
| Iron | 20500 | 20500 |
| Magnesium | 4845 | 4845 |
| Manganese | 468 | 468 |
| Potassium | 3710 | 3710 |
| Sodium | 22850 | 22850 |
| Zinc | 6.45 | 6.45 |
| Tph | 0.725 | 0.725 |

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## SUMMARY OF COC SELECTION
## SITE 1 CBU DRUM STORAGE AREA - FILTERED GROUNDWATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Federal MCL (4) | State MCL (5) | Risk-based COC Screening Level (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 2/2 | 4.0J - 4.4 | 1GW2S | - | 50 | 50 | 0.045 | N | 1 |
| Barium | 2/2 | 32.1 - 90.6 | 1GW2S | - | 2000 | 2000 | 260 | N | 1 |
| Boron | 2/2 | 57.1J - 112 | 1GW2S | - | - | - | 330 | N | 1 |
| Calcium | 2/2 | 29600 - 67700 | 1GW2S | - | - | - | - | N | 1 |
| Iron | 2/2 | 13300 - 27100 | 1GW2S | - | 300 (7) | - | 1100 | N | 1 |
| Magnesium | 2/2 | 4320 - 5220 | 1GW2S | - | - | - | - | N | 1 |
| Manganese | 2/2 | 406 - 520 | 1GW2S | - | 50 (7) | - | 88 | N | 1 |
| Potassium | 2/2 | 2940 - 4060 | 1GW2S | - | - | - | - | N | 1 |
| Silver | 1/2 | 2.2 | 1GW2S | 3.9 | 100 | 50 | 18 | N | 2 |
| Sodium | 2/2 | 17900 - 27500 | 1GW2S | - | - | - | - | N | 1 |
| Zinc | 2/2 | 2.8 - 12.4 | 1GW2S | - | 5000 (7) | - | 1100 | N | 1 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as separate samples. Non-validated and rejected results are not used in risk assessment.
3 Sample-specific.
4 Maximum contaminant level. (USEPA, May 1995).
5 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II EnvironmentalHealth.
6 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
7 Secondary MCL.
8 Hexavalent chromium.
9 Groundwater protection criteria (CTDEP, October 3, 1995).

Rationale Designations:

1 Chemical detected in unfiltered samples; filtered results not used in risk assessment.
2 Chemical not detected in unfiltered samples; maximum is less than action level/COC screening level.

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** Site 1 – CBU Drum Storage Area
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 02/15/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 0 | IR: | 50 |
| EF: | 1 | EF: | 52 |
| Fi: | 1 | Fi: | 0.5 |
| ED: | 1 | ED: | 3 |
| BW: | 1 | BW: | 43 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 1095 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 8.28E–08 | (AVG ANNUAL DOSE) | CF: | 3.55E–09 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)**
**Site 1 – CBU Drum Storage Area**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), CTE**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Benzo(a)pyrene | 0.32 | 1 | 2.65E–08 | 0.00E+00 | 1.14E–09 | | 7.30E+00 |
| Indeno(1,2,3–cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| 4,4'–DDD | 2 | 1 | 1.66E–07 | 0.00E+00 | 7.10E–09 | | 2.40E–01 |
| Aroclors | 0.3 | 1 | 2.48E–08 | 0.00E+00 | 1.06E–09 | 2.00E–05 | ~~7.70E+00~~ 1E+0 * |
| ~~Aluminum~~ | ~~8610~~ | ~~1~~ | ~~7.13E–04~~ | ~~0.00E+00~~ | ~~3.06E–05~~ | ~~1.00E+00~~ | |
| Antimony | 6.1 | 1 | 5.05E–07 | 0.00E+00 | 2.17E–08 | 4.00E–04 | |
| Arsenic | 3.1 | 1 | 2.57E–07 | 0.00E+00 | 1.10E–08 | 3.00E–04 | 1.50E+00 |
| Beryllium | 0.68 | 1 | 5.63E–08 | 0.00E+00 | 2.41E–09 | 5.00E–03 | 4.30E+00 |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Iron~~ | ~~15600~~ | ~~1~~ | ~~1.29E–03~~ | ~~0.00E+00~~ | ~~5.54E–05~~ | ~~3.00E–01~~ | |
| Manganese | 191 | 1 | 1.58E–05 | 0.00E+00 | 6.78E–07 | ~~5.00E–03~~ 2.4E-2 | |
| Vanadium | 103 | 1 | 8.53E–06 | 0.00E+00 | 3.66E–07 | 7.00E–03 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

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**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)**
**Site 1 – CBU Drum Storage Area**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), CTE**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 8.29E-09 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 1.70E-09 |
| Aroclors | 1.24E-03 | 0.00E+00 | ~~8.20E-09~~ 1.06E-9 * |
| ~~Aluminum~~ | ~~7.13E-04~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 1.26E-03 | 0.00E+00 | 0.00E+00 |
| Arsenic | 8.56E-04 | 0.00E+00 | 1.65E-08 |
| Beryllium | 1.13E-05 | 0.00E+00 | 1.04E-08 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~4.01E-03~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | ~~8.18E-03~~ 6.58E-4 | 0.00E+00 | 0.00E+00 |
| Vanadium | 1.22E-03 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~1.28E-02~~ 5.25E-3 | 0.00E+00 | ~~4.51E-08~~ 3.80E-8 |

Revisions
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* Based on new PCB guidance (USEPA, September 1996).

**RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL**

**SITE NAME:** Site 1 – CBU Drum Storage Area
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 02/15/96

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), CTE**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 3150 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 0.2 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 52 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 3 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 0.5 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 43 |
| BW2 = BODY WEIGHT ADULT (KG): | | 1 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 1095 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 1.04E–06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 4.47E–08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
Site 1 – CBU Drum Storage Area
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), CTE
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG-DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0.3 | 0.06 | 1.88E-08 | 0.00E+00 | 8.05E-10 | 2.00E-05 | ~~7.70E+00~~ 1E+0.* |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

000022

Revisions
02/24/97
JMS

* Based on new PCB guidance (USEPA, September 1996).

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
Site 1 – CBU Drum Storage Area
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 9.39E-04 | 0.00E+00 | ~~6.20E-09~~ 8.05E-10 * |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 9.39E-04 | 0.00E+00 | ~~6.20E-09~~ 8.05E-10 |

Revisions
02/24/97
KMS

* Based on new PCB guidance (USEPA, September 1996).

000023

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** Site 1 – CBU Drum Storage Area
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 0 | IR: | 100 |
| EF: | 1 | EF: | 120 |
| Fi: | 1 | Fi: | 1 |
| ED: | 1 | ED: | 10 |
| BW: | 1 | BW: | 43 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 3650 |

DETERMINE CONVERSION FACTORS:

ADULT:
CF: 0.00E+00 (AVG ANNUAL DOSE)

YOUTH:
CF: 7.65E–07 (AVG ANNUAL DOSE)

ADULT/YOUTH (CANCER RISK):
CF: 1.09E–07

000025

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)**
**Site 1 – CBU Drum Storage Area**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), RME**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Benzo(a)pyrene | 0.38 | 1 | 2.91E–07 | 0.00E+00 | 4.15E–08 | | 7.30E+00 |
| Indeno(1,2,3–cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| 4,4'–DDD | 3.9 | 1 | 2.98E–06 | 0.00E+00 | 4.26E–07 | | 2.40E–01 |
| Aroclors | 0.42 | 1 | 3.21E–07 | 0.00E+00 | 4.59E–08 | 2.00E–05 | ~~7.70E+00~~ 2E+0 * |
| ~~Aluminum~~ | ~~10100~~ | ~~1~~ | ~~7.72E–03~~ | ~~0.00E+00~~ | ~~1.10E–03~~ | ~~1.00E+00~~ | |
| Antimony | 6.8 | 1 | 5.20E–06 | 0.00E+00 | 7.43E–07 | 4.00E–04 | |
| Arsenic | 4.8 | 1 | 3.67E–06 | 0.00E+00 | 5.24E–07 | 3.00E–04 | 1.50E+00 |
| Beryllium | 1 | 1 | 7.65E–07 | 0.00E+00 | 1.09E–07 | 5.00E–03 | 4.30E+00 |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Iron~~ | ~~19100~~ | ~~1~~ | ~~1.46E–02~~ | ~~0.00E+00~~ | ~~2.09E–03~~ | ~~0.00E–01~~ | |
| Manganese | 215 | 1 | 1.64E–04 | 0.00E+00 | 2.35E–05 | ~~5.00E–03~~ 2.4E-2 | |
| Vanadium | 186 | 1 | 1.42E–04 | 0.00E+00 | 2.03E–05 | 7.00E–03 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 1/24/97 SMS

000026

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)**
**Site 1 – CBU Drum Storage Area**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), RME**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 3.03E-07 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 1.02E-07 |
| Aroclors | 1.61E-02 | 0.00E+00 | ~~3.53E-07~~ 9.17E-8 * |
| ~~Aluminum~~ | ~~7.72E-03~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 1.30E-02 | 0.00E+00 | 0.00E+00 |
| Arsenic | 1.22E-02 | 0.00E+00 | 7.86E-07 |
| Beryllium | 1.53E-04 | 0.00E+00 | 4.70E-07 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~4.87E-02~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | ~~2.20E-02~~ 6.67E-3 | 0.00E+00 | 0.00E+00 |
| Vanadium | 2.03E-02 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~1.51E-01~~ 6.84E-2 | 0.00E+00 | ~~2.01E-06~~ 1.75E-6 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions
02/24/97
XWS

**RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL**

**SITE NAME:** Site 1 – CBU Drum Storage Area
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 02/15/96

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), RME**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 3150 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 1 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 120 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 10 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 1 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 43 |
| BW2 = BODY WEIGHT ADULT (KG): | | 1 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 3650 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 2.41E-05 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 3.44E-06
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
Site 1 – CBU Drum Storage Area
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), RME
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0.42 | 0.06 | 6.07E–07 | 0.00E+00 | 8.67E–08 | 2.00E–05 | ~~7.70E+00~~ 2E+0 * |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/24/97
XMG

* Based on new PCB guidance (USEPA, September 1996).

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
Site 1 – CBU Drum Storage Area
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), RME
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 3.03E-02 | 0.00E+00 | ~~6.00E-07~~ 1.78E-7 * |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 3.03E-02 | 0.00E+00 | ~~6.00E-07~~ 1.78E-7 |

Revisions 02/24/97 KMS

* Based on new PCB guidance (USEPA, September 1996).

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** Site 1 – CBU Drum Storage Area
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker (All Soil), CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 240 | IR: | 0 |
| EF: | 80 | EF: | 1 |
| Fi: | 0.5 | Fi: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 3.76E–07 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 5.37E–09 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)**
**Site 1 – CBU Drum Storage Area**
**EXPOSURE SCENARIO: Construction Worker (All Soil), CTE**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(b)fluoranthene | 1.2 | 1 | 0.00E+00 | 4.51E–07 | 6.44E–09 | | 7.30E–01 |
| Benzo(a)pyrene | 0.65 | 1 | 0.00E+00 | 2.44E–07 | 3.49E–09 | | 7.30E+00 |
| Indeno(1,2,3–cd)pyrene | 0.41 | 1 | 0.00E+00 | 1.54E–07 | 2.20E–09 | | 7.30E–01 |
| 4,4'–DDD | 1.5 | 1 | 0.00E+00 | 5.64E–07 | 8.05E–09 | | 2.40E–01 |
| Aroclors | 0.51 | 1 | 0.00E+00 | 1.92E–07 | 2.74E–09 | 2.00E–05 | ~~7.70E+00~~ 1E+0* |
| ~~Aluminum~~ | ~~11000~~ | ~~1~~ | ~~0.00E+00~~ | ~~4.13E–03~~ | ~~3.90E–05~~ | ~~1.00E+00~~ | |
| Antimony | 10.3 | 1 | 0.00E+00 | 3.87E–06 | 5.53E–08 | 4.00E–04 | |
| Arsenic | 4.9 | 1 | 0.00E+00 | 1.84E–06 | 2.63E–08 | 3.00E–04 | 1.50E+00 |
| Beryllium | 0.96 | 1 | 0.00E+00 | 3.61E–07 | 5.15E–09 | 5.00E–03 | 4.30E+00 |
| Chromium | 31.6 | 1 | 0.00E+00 | 1.19E–05 | 1.70E–07 | 5.00E–03 | |
| ~~Iron~~ | ~~19500~~ | ~~1~~ | ~~0.00E+00~~ | ~~7.33E–03~~ | ~~1.05E–04~~ | ~~3.00E–01~~ | |
| Manganese | 216 | 1 | 0.00E+00 | 8.12E–05 | 1.16E–06 | ~~5.00E–03~~ 2.4E-2 | |
| Vanadium | 71.6 | 1 | 0.00E+00 | 2.69E–05 | 3.84E–07 | 7.00E–03 | |
| Benzo(a)anthracene | 1.1 | 1 | 0.00E+00 | 4.13E–07 | 5.90E–09 | | 7.30E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions
02/24/97
US

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)**
**Site 1 – CBU Drum Storage Area**
**EXPOSURE SCENARIO: Construction Worker (All Soil), CTE**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 4.70E−09 |
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 2.55E−08 |
| Indeno(1,2,3−cd)pyrene | 0.00E+00 | 0.00E+00 | 1.61E−09 |
| 4,4'−DDD | 0.00E+00 | 0.00E+00 | 1.93E−09 |
| Aroclors | 0.00E+00 | 9.58E−03 | ~~2.11E−08~~ 2.74E−9 * |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~4.13E−03~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 9.68E−03 | 0.00E+00 |
| Arsenic | 0.00E+00 | 6.14E−03 | 3.95E−08 |
| Beryllium | 0.00E+00 | 7.21E−05 | 2.22E−08 |
| Chromium | 0.00E+00 | 2.37E−03 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~2.44E−02~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~1.62E−02~~ 3.38E-3 | 0.00E+00 |
| Vanadium | 0.00E+00 | 3.84E−03 | 0.00E+00 |
| Benzo(a)anthracene | 0.00E+00 | 0.00E+00 | 4.31E−09 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~**7.65E−02**~~ 3.51E-2 | ~~**1.21E−07**~~ 1.02E-7 |

* Based on new PCB guidance (USEPA, September 1996).

Revision 02/24/97 KLS

000036

**RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL**

**SITE NAME:** Site 1 – CBU Drum Storage Area
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Construction Worker (All Soil), CTE**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 3800 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 0.2 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 80 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 1 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 0.5 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 1 |
| BW2 = BODY WEIGHT ADULT (KG): | | 70 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 365 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

| | | | | | |
|---|---|---|---|---|---|
| DOSEyouth = (CF1)*(C)*(ABS) | CF1 = | 0.00E+00 | CANCER RISK = (CF3)*(C)*(ABS) | CF3 = | 1.70E-08 |
| DOSEadult = (CF2)*(C)*(ABS) | CF2 = | 1.19E-06 | | | |

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
Site 1 – CBU Drum Storage Area
EXPOSURE SCENARIO: Construction Worker (All Soil), CTE
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0.51 | 0.06 | 0.00E+00 | 3.64E–08 | 5.20E–10 | 2.00E–05 | ~~7.70E+00~~ 1E+0* |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | |

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
Site 1 – CBU Drum Storage Area
EXPOSURE SCENARIO: Construction Worker (All Soil), CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 1.82E-03 | ~~4.00E-09~~ 5.20E-10 * |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 0.00E+00 | 1.82E-03 | ~~4.00E-09~~ 5.20E-10 |

Revisions
12/24/97
KMS

* Based on new PCB guidance

000040

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: Site 1 – CBU Drum Storage Area
LOCATION: NSB–NLON, Groton, CT
DATE: 12/21/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: Construction Worker, CTE

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE: DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE: Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1 L/1000 CM**3)
t* = TIME IT TAKES TO REACH STEADY–STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

| | |
|---|---|
| EV: | 1 |
| ED: | 1 |
| EF: | 80 |
| A: | 3800 |
| tevent: | 8 |
| BW: | 70 |
| AT(NON): | 365 |
| AT(CAR): | 25550 |

CONVERSION FACTOR (NONCAR) = 1.19E+01

CONVERSION FACTOR (CARCIN) = 1.70E–01

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
Site 1 – CBU Drum Storage Area
EXPOSURE SCENARIO: Construction Worker, CTE

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | 0.009 | O | 1.00E +00 | 4.30E –01 | 4.10E –02 | 6.90E –02 | 3.12E –06 |
| Carbazole | 0.013 | O | 3.80E +00 | 9.20E –01 | 3.90E –02 | 1.95E –01 | 4.83E –06 |
| Arsenic | 0.003 | I | | | 1.00E –03 | | 2.40E –08 |
| ~~Iron~~ | ~~29.5~~ | ~~I~~ | | | ~~1.00E –03~~ | | ~~1.84E –04~~ |
| Manganese | 0.468 | I | | | 1.00E –03 | | 3.74E –06 |
| | | | | | | | 0.00E +00 |
| | | | | | | | 0.00E +00 |
| | | | | | | | 0.00E +00

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER WATER (PAGE THREE)
Site 1 – CBU Drum Storage Area
EXPOSURE SCENARIO: Construction Worker, CTE
CALCULATE DOSES:

| CHEMICAL | ANNUAL DERMAL DOSE (MG/KG/DAY) | DERMAL RID (MG/KG/DAY) | HAZARD INDEX DERMAL |
|---|---|---|---|
| Chlorobenzene | 3.71E –05 | 6.00E –03 | 6.19E –03 |
| Carbazole | 5.51E –05 | | 0.00E +00 |
| Arsenic | 2.86E –07 | 2.80E –04 | 1.02E –03 |
| 0 | 0.00E +00 | 3.50E –03 | 0.00E +00 |
| ~~Iron~~ | ~~1.95E –08~~ | ~~1.50E –02~~ | ~~1.30E –01~~ |
| Manganese | 4.45E –05 | ~~1.56E –04~~ 7.2E-4 | ~~2.87E –01~~ 6.19E-2 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| TOTAL RISK | | | ~~4.84E –01~~ 6.91 E-2 |

Revisions
08/19/96
– KMS

000043

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE FOUR)
Site 1 – CBU Drum Storage Area
EXPOSURE SCENARIO: Construction Worker, CTE
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF DERMAL (KG/DAY/MG) | CANCER RISK DERMAL CONTACT |
|---|---|---|---|
| Chlorobenzene | 5.30E –07 | | 0.00E +00 |
| Carbazole | 7.87E –07 | 2.00E –02 | 1.57E –08 |
| Arsenic | 4.08E –09 | 1.60E +00 | 6.53E –09 |
| 0 | 0.00E +00 | | 0.00E +00 |
| ~~Iron~~ | ~~2.79E –05~~ | | ~~0.00E +00~~ |
| Manganese | 6.36E –07 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** Site 1 – CBU Drum Storage Area
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker (All Soil), RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 480 | IR: | 0 |
| EF: | 120 | EF: | 1 |
| Fi: | 1 | Fi: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 2.25E–06 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 3.22E–08 |

00345

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)**
**Site 1 – CBU Drum Storage Area**
**EXPOSURE SCENARIO: Construction Worker (All Soil), RME**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(b)fluoranthene | 1.2 | 1 | 0.00E+00 | 2.71E−06 | 3.86E−08 | | 7.30E−01 |
| Benzo(a)pyrene | 0.65 | 1 | 0.00E+00 | 1.47E−06 | 2.09E−08 | | 7.30E+00 |
| Indeno(1,2,3−cd)pyrene | 0.41 | 1 | 0.00E+00 | 9.24E−07 | 1.32E−08 | | 7.30E−01 |
| 4,4'−DDD | 1.5 | 1 | 0.00E+00 | 3.38E−06 | 4.83E−08 | | 2.40E−01 |
| Aroclors | 0.51 | 1 | 0.00E+00 | 1.15E−06 | 1.64E−08 | 2.00E−05 | ~~7.70E+00~~ 2E+0* |
| ~~Aluminum~~ | ~~11000~~ | ~~1~~ | ~~0.00E+00~~ | ~~2.48E−02~~ | ~~3.54E−04~~ | ~~1.00E+00~~ | |
| Antimony | 10.3 | 1 | 0.00E+00 | 2.32E−05 | 3.32E−07 | 4.00E−04 | |
| Arsenic | 4.9 | 1 | 0.00E+00 | 1.10E−05 | 1.58E−07 | 3.00E−04 | 1.50E+00 |
| Beryllium | 0.96 | 1 | 0.00E+00 | 2.16E−06 | 3.09E−08 | 5.00E−03 | 4.30E+00 |
| Chromium | 31.6 | 1 | 0.00E+00 | 7.12E−05 | 1.02E−06 | 5.00E−03 | |
| ~~Iron~~ | ~~19500~~ | ~~1~~ | ~~0.00E+00~~ | ~~4.40E−02~~ | ~~6.28E−04~~ | ~~3.00E−01~~ | |
| Manganese | 216 | 1 | 0.00E+00 | 4.87E−04 | 6.96E−06 | ~~5.00E−03~~ 2.4E-2 | |
| Vanadium | 71.6 | 1 | 0.00E+00 | 1.61E−04 | 2.31E−06 | 7.00E−03 | |
| Benzo(a)anthracene | 2.3 | 1 | 0.00E+00 | 5.19E−06 | 7.41E−08 | | 7.30E−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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

*Based on new PCB guidance (SEPA, September 1996).

Revisions 02/24/97 KLS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)**
**Site 1 – CBU Drum Storage Area**
**EXPOSURE SCENARIO: Construction Worker (All Soil), RME**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 2.82E-08 |
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 1.53E-07 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 9.64E-09 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 1.16E-08 |
| Aroclors | 0.00E+00 | 5.75E-02 | ~~1.26E-07~~ 3.28E-8 * |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~2.48E-02~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 5.81E-02 | 0.00E+00 |
| Arsenic | 0.00E+00 | 3.68E-02 | 2.37E-07 |
| Beryllium | 0.00E+00 | 4.33E-04 | 1.33E-07 |
| Chromium | 0.00E+00 | 1.42E-02 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~1.47E-01~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~9.74E-02~~ 2.03E-2 | 0.00E+00 |
| Vanadium | 0.00E+00 | 2.31E-02 | 0.00E+00 |
| Benzo(a)anthracene | 0.00E+00 | 0.00E+00 | 5.41E-08 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~4.60E-01~~ 2.10E-1 | ~~7.62E-07~~ 6.59E-7 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/24/97 KWS

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RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

**SITE NAME:** Site 1 – CBU Drum Storage Area
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Construction Worker (All Soil), RME**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

| WHERE: | | | |
|---|---|---|---|
| | C = CONCENTRATION IN SOIL (MG/KG) | | |
| | SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| | SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 3800 |
| | AF = ADHERENCE FACTOR (MG/SQ CM): | | 1 |
| | ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | | Dioxins: | 0.03 |
| | | PCBS: | 0.06 |
| | EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| | EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 120 |
| | ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 1 |
| | ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| | Fd = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 1 |
| | BW1 = BODY WEIGHT ADOLESCENT (KG): | | 1 |
| | BW2 = BODY WEIGHT ADULT (KG): | | 70 |
| | AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 365 |
| | AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| | AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

| | | | | | |
|---|---|---|---|---|---|
| DOSEyouth = (CF1)*(C)*(ABS) | CF1 = | 0.00E+00 | CANCER RISK = (CF3)*(C)*(ABS) | CF3 = | 2.55E-07 |
| DOSEadult = (CF2)*(C)*(ABS) | CF2 = | 1.78E-05 | | | |

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
Site 1 – CBU Drum Storage Area
EXPOSURE SCENARIO: Construction Worker (All Soil), RME
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0.78 | 0.06 | 0.00E+00 | 8.35E–07 | 1.19E–08 | 2.00E–05 | ~~7.70E+00~~ 2E+0 * |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/24/97
KMS

* Based on new PCB guidance (USEPA, September 1996).

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
Site 1 – CBU Drum Storage Area
EXPOSURE SCENARIO: Construction Worker (All Soil), RME
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 4.18E-02 | ~~0.10E-08~~ 2.39E-8 * |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 0.00E+00 | 4.18E-02 | ~~0.10E-08~~ 2.39E-8 |

Revisions
02/24/97
KMS

* Based on new PCB guidance
USEPA September (1996).

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: Site 1 – CBU Drum Storage Area
LOCATION: NSB–NLON, Groton, CT
DATE: 12/21/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: **Construction Worker, RME**

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF

FOR ORGANICS:
IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY–STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

| | |
|---|---|
| EV: | 1 |
| ED: | 1 |
| EF: | 120 |
| A: | 3600 |
| tevent: | 8 |
| BW: | 70 |
| AT(NON): | 365 |
| AT(CAR): | 25550 |

CONVERSION FACTOR (NONCAR) = 1.78E+01

CONVERSION FACTOR (CARCIN) = 2.55E–01

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
Site 1 – CBU Drum Storage Area
EXPOSURE SCENARIO: Construction Worker, RME

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Chlorobenzene | 0.009 | O | 1.00E +00 | 4.30E –01 | 4.10E –02 | 8.90E –02 | 3.12E –06 |
| Carbazole | 0.013 | O | 3.80E +00 | 9.20E –01 | 3.90E –02 | 1.95E –01 | 4.83E –06 |
| Arsenic | 0.003 | I | | | 1.00E –03 | | 2.40E –08 |
| ~~Iron~~ | ~~20.5~~ | ~~I~~ | | | ~~1.00E –03~~ | | ~~1.84E –04~~ |
| Manganese | 0.468 | I | | | 1.00E –03 | | 3.74E –06 |
| | | | | | | | 0.00E +00 |
| | | | | | | | 0.00E +00 |
| | | | | | | | 0.00E +00

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER WATER (PAGE THREE)
Site 1 – CBU Drum Storage Area
EXPOSURE SCENARIO: Construction Worker, RME
CALCULATE DOSES:

| CHEMICAL | ANNUAL DERMAL DOSE (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX DERMAL |
|---|---|---|---|
| Chlorobenzene | 5.57E –05 | 6.00E –03 | 9.28E –03 |
| Carbazole | 8.27E –05 | | 0.00E +00 |
| Arsenic | 4.28E –07 | 2.80E –04 | 1.53E –03 |
| 0 | 0.00E +00 | 3.50E –03 | 0.00E +00 |
| ~~Iron~~ | ~~2.08E –03~~ | ~~1.50E –02~~ | ~~1.95E –01~~ |
| Manganese | 6.68E –05 | ~~1.50E –04~~ 7.2E-4 | ~~4.45E –01~~ 9.27E-2 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| TOTAL RISK | | | ~~8.51E –01~~ 1.04E-1 |

Revisions
08/19/96
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RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE FOUR)
Site 1 – CBU Drum Storage Area
EXPOSURE SCENARIO: Construction Worker, RME
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF DERMAL (KG/DAY/MG) | CANCER RISK DERMAL CONTACT |
|---|---|---|---|
| Chlorobenzene | 7.95E –07 | | 0.00E +00 |
| Carbazole | 1.18E –06 | 2.00E –02 | 2.36E –08 |
| Arsenic | 6.12E –09 | 1.60E +00 | 9.79E –09 |
| 0 | 0.00E +00 | | 0.00E +00 |
| ~~Iron~~ | ~~4.18E –05~~ | | ~~0.00E +00~~ |
| Manganese | 9.55E –07 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 1 CBU DRUM STORAGE AREA - SOIL (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| 1,1,1-Trichloroethane | 0.001 | 0.001 | 500 | 1000 | 4 | 40 |
| 2-Butanone | 0.17 | 0.06 | 500 | 1000 | 8 | 80 |
| Ethylbenzene | 0.079 | 0.033 | 500 | 1000 | 10.1 | 10.1 |
| Methylene chloride | 0.028 | 0.015 | 82 | 760 | 0.1 | 1.0 |
| Tetrachloroethene | 0.004 | 0.003 | 12 | 110 | 0.1 | 1 |
| Trichloroethene | 0.003 | 0.003 | 56 | 520 | 0.1 | 1 |
| Xylenes (total) | 0.38 | 0.17 | 500 | 1000 | 19.5 | 19.5 |
| 1,4-Dichlorobenzene | 0.11 | 0.11 | 26 | 240 | 1.5 | 15 |
| 2-Methylnaphthalene | 12 | 5 | - | - | - | - |
| Acenaphthene | 2.8 | 1.5 | - | - | - | - |
| Acenaphthylene | 0.035 | 0.035 | 1000 | 2500 | 8.4 | 84 |
| Anthracene | 2.8 | 0.9 | 1000 | 2500 | 40 | 400 |
| Benzo(a)anthracene | 2.3 | 1.1 | 1 * | 7.8 | 1 * | 1 * |
| Benzo(a)pyrene | 1.1 | 0.6 | 1 * | 1 * | 1 * | 1 * |
| Benzo(b)fluoranthene | 2.2 | 1.2 | 1 * | 7.8 | 1 * | 1 * |
| Benzo(g,h,i)perylene | 0.28 | 0.23 | - | - | - | - |
| Benzo(k)fluoranthene | 0.61 | 0.61 | 8.4 | 78 | 1 | 1 |
| Butyl benzyl phthalate | 0.82 | 0.82 | 1000 | 2500 | 20 | 200 |
| Carbazole | 0.7 | 0.33 | - | - | - | - |
| Chrysene | 1.9 | 1.2 | - | - | - | - |
| Di-N-butyl phthalate | 0.97 | 0.72 | 1000 | 2500 | 14 | 140 |
| Dibenzo(a,h)anthracene | 0.059 | 0.059 | - | - | - | - |
| Dibenzofuran | 2.5 | 1.3 | - | - | - | - |
| Fluoranthene | 13 | 5 | 1000 | 2500 | 5.6 * | 56 |
| Fluorene | 3.6 | 1.1 | 1000 | 2500 | 5.6 | 56 |
| Indeno(1,2,3-Cd)pyrene | 0.95 | 0.41 | - | - | - | - |
| Naphthalene | 6.5 | 3.7 | 1000 | 2500 | 5.6 * | 56 |
| Phenanthrene | 16 | 5 | 1000 | 2500 | 4 * | 40 |
| Pyrene | 9 | 3 | 1000 | 2500 | 4 * | 40 |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 1 CBU DRUM STORAGE AREA - SOIL (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| 4,4'-DDD | 3.9 | 3.0 | - | - | - | - |
| 4,4'-DDE | 0.058 | 0.042 | - | - | - | - |
| 4,4'-DDT | 0.026 | 0.017 | - | - | - | - |
| Aldrin | 0.0026 | 0.0026 | - | - | - | - |
| Alpha-Chlordane | 0.028 | 0.019 | 0.49 (5) | 2.2 (5) | 0.066 (5) | 0.066 (5) |
| Aroclor-1248 | 0.36 | 0.36 | 1 | 10 | - | - |
| Aroclor-1254 | 0.42 | 0.42 | 1 | 10 | - | - |
| Dieldrin | 0.031 | 0.030 | 0.038 | 0.36 | 0.007 * | 0.007 * |
| Endrin | 0.0041 | 0.0038 | 20 | 610 | - | - |
| Gamma-Bhc (lindane) | 0.0018 | 0.0018 | 20 | 610 | 0.02 | 0.04 |
| Gamma-Chlordane | 0.0076 | 0.0076 | 0.49 (5) | 2.2 (5) | 0.066 (5) | 0.066 (5) |
| Heptachlor | 0.0034 | 0.0034 | 0.14 | 1.3 | 0.013 | 0.013 |
| Heptachlor epoxide | 0.027 | 0.027 | 0.067 | 0.63 | 0.02 * | 0.02 * |
| Aluminum | 18900 | 10968 | - | - | - | - |
| Antimony | 17.4 | 10.3 | 27 | 8200 | - | - |
| Arsenic | 10.2 | 6.1 | 10 * | 10 * | - | - |
| Barium | 93.9 | 72.2 | 4700 | 1.4E+5 | - | - |
| Beryllium | 1.6 | 1.0 | 2 | 2 | - | - |
| Boron | 19.7 | 17.2 | - | - | - | - |
| Cadmium | 2.6 | 1.6 | 34 | 1000 | - | - |
| Calcium | 9130 | 5088 | - | - | - | - |
| Chromium (total) | 42.9 | 31.6 | 100 (6) | 100 (6) | - | - |
| Cobalt | 9.5 | 7.4 | - | - | - | - |
| Copper | 164 | 114 | 2500 | 7.6E+4 | - | - |
| Iron | 31200 | 19525 | - | - | - | - |
| Lead | 366 | 170 | 500 | 1000 | - | - |
| Magnesium | 5610 | 3415 | - | - | - | - |
| Manganese | 290 | 216 | - | - | - | - |
| Mercury | 0.61 | 0.43 | 20 | 610 | - | - |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 1 CBU DRUM STORAGE AREA - SOIL (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| Nickel | 46.6 | 28.3 | 1400 | 7500 | - | - |
| Potassium | 3550 | 2105 | - | - | - | - |
| Sodium | 582 | 397 | - | - | - | - |
| Vanadium | 186 | 72 | 470 | 1.4E+4 | - | - |
| Zinc | 709 | 336 | 2E+4 | 6.1E+5 | - | - |
| TPH | 9800 | 2177 | 500 * | 2500 * | 500 * | 2500 * |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 CTDEP, December 13, 1995.
3 Cis-1,2-dichloroethene.
4 1,3-Dichloropropene (total).
5 Chlordane.
6 Chromium (hexavalent).

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 1 CBU DRUM STORAGE AREA - UNFILTERED GROUNDWATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | State MCL (2) | Groundwater Protection (3) | Surface Water Protection (3) |
|---|---|---|---|---|---|
| Chlorobenzene | 12 | 12 | 100 | 100 | 420000 |
| Xylenes (total) | 24 | 24 | 10000 | 530 | - |
| 2-Methylnaphthalene | 12 | 7 | - | - | - |
| 4-Methylphenol | 1 | 1 | - | - | - |
| Acenaphthene | 8 | 5 | - | - | - |
| Anthracene | 3 | 2 | - | 2000 | 1100000 |
| Carbazole | 19 | 13 | - | - | - |
| Di-N-butyl phthalate | 0.6 | 0.60 | - | 700 | 120000 |
| Dibenzofuran | 13 | 8 | - | - | - |
| Diethyl phthalate | 1 | 1 | - | - | - |
| Fluoranthene | 3 | 3 | - | 280 | 3700 |
| Fluorene | 13 | 8 | - | 280 | 140000 |
| Naphthalene | 31 | 20 | - | 280 | - |
| Phenanthrene | 22 | 13 | - | 200 | 0.077 * |
| Pyrene | 1 | 1 | - | 200 | 110000 |
| Aluminum | 94.9 | 94.9 | - | - | - |
| Arsenic | 3.5 | 3.0 | 50 | 50 | 4 |
| Barium | 92.5 | 64.0 | 2000 | 1000 | - |
| Boron | 130 | 92 | - | - | - |
| Calcium | 68500 | 49200 | - | - | - |
| Chromium (total) | 1.6 | 1.6 | 100 (5) | 50 (5) | 110 (6) |
| Iron | 27600 | 20500 | - | - | - |
| Magnesium | 5400 | 4845 | - | - | - |
| Manganese | 527 | 468 | 5000 (7) | - | - |
| Potassium | 3930 | 3710 | - | - | - |
| Sodium | 28300 | 22850 | 28000 (8) * | - | - |
| Zinc | 8 | 8 | - | 5000 | 123 |
| TPH | 1.2 | 1.2 | - | 500 | - |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 1 CBU DRUM STORAGE AREA - UNFILTERED GROUNDWATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

Footnotes:

1 * - Indicates that maximum detection exceed this standard.
2 Maximum Contaminant Level. Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
3 CTDEP, December 13, 1995.
4 Cis-1,2-dichloroethene.
5 Chromium (total).
6 Chromium (hexavalent).
7 Current Connecticut Department of Public Health and Addiction Services Action Level.
8 Notification Level.

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 1 CBU DRUM STORAGE AREA - FILTERED GROUNDWATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | State MCL (2) | Groundwater Protection (2) | Surface Water Protection (3) |
|---|---|---|---|---|---|
| Arsenic | 4.4 | 4.2 | 50 | 50 | 4 * |
| Barium | 32.1 | 61.4 | 2000 | 1000 | - |
| Boron | 112 | 84.6 | - | - | - |
| Calcium | 67700 | 48650 | - | - | - |
| Iron | 27100 | 20200 | - | - | - |
| Magnesium | 5220 | 4770 | - | - | - |
| Manganese | 520 | 463 | 5000 (7) | - | - |
| Potassium | 4060 | 3500 | - | - | - |
| Silver | 2.2 | 2.2 | 50 | 36 | 12 |
| Sodium | 27500 | 22700 | 28000 (8) | - | - |
| Zinc | 12.4 | 7.6 | - | 5000 | 123 |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 Maximum Contaminant Level. Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
3 CTDEP, December 13, 1995.
4 Cis-1,2-dichloroethene.
5 Chromium (total).
6 Chromium (hexavalent).
7 Current Conneticut Department of Public Health and Addiction Services Action Level.
8 Notification Level.

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# APPENDIX F.5

## SITE 2 - AREA A LANDFILL

## SUMMARY OF COC SELECTION
## SITE 2 AREA A LANDFILL - SURFACE SOIL (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 2-Butanone | 1/15 | 0.002 | 2LSS2 | 0.01 - 5.3 | 4700 | 6900 | - | N | 2 |
| Acetone | 5/15 | 0.009 - 0.015 | 2LSS23 (0-1) | 0.011 - 5.3 | 780 | 62000 | 8 | N | 2 |
| Chlorobenzene | 2/15 | 0.043 - 4.5 | 2LSS1 | 0.005 - 0.012 | 160 | 94 | 0.6 | N | 2 |
| Ethylbenzene | 3/15 | 0.002 - 14 | 2LSS1 | 0.005 - 0.012 | 780 | 260 | 5 | N | 2 |
| Methylene chloride | 7/15 | 0.003 - 0.006 | 2LSS21 (0-1)/2LSS23 (0-1)/2LSS30 (0-1) | 0.005 - 2.6 | 85 | 7 | 0.01 | N | 2 |
| Tetrachloroethene | 1/15 | 0.004 | 2LSS2 | 0.005 - 2.6 | 12 | 11 | 0.04 | N | 2 |
| Toluene | 4/15 | 0.004 - 0.016 | 2LTB16 (0-2) | 0.005 - 2.6 | 1600 | 520 | 5 | N | 2 |
| Trichloroethene | 1/15 | 0.002 | 2LSS2 | 0.005 - 2.6 | 58 | 3 | 0.02 | N | 2 |
| Xylenes, total | 4/15 | 0.004 - 75 | 2LSS1 | 0.005 - 0.012 | 16000 | 320 | 74 | N | 2 |
| Benzo(a)anthracene | 4/15 | 0.097 - 0.2 | 2LTB9 (0-2) | 0.35 - 11 | 0.88 | - | 0.7 | N | 2 |
| Benzo(a)pyrene | 3/15 | 0.046 - 0.19 | 2LTB9 (0-2) | 0.34 - 11 | 0.088 | - | 4 | Y | 3 |
| Benzo(b)fluoranthene | 4/15 | 0.13 - 0.22 | 2LSS1 | 0.35 - 11 | 0.88 | - | 4 | N | 2 |
| Benzo(g,h,i)perylene | 1/15 | 0.044 | 2LMW17(0-2) | 0.34 - 11 | - | - | - | N | 1 |
| Benzo(k)fluoranthene | 5/15 | 0.057 - 0.21 | 2LTB9 (0-2) | 0.35 - 11 | 8.8 | - | 4 | N | 2 |
| Bis(2-ethylhexyl)phthalate | 1/15 | 0.39 | 2LMW18S(0-2) | 0.35 - 11 | 46 | 210 | 11 | N | 2 |
| Chrysene | 5/15 | 0.037 - 0.19 | 2LTB9 (0-2) | 0.35 - 11 | 88 | - | 1 | N | 2 |
| Di-n-butyl phthalate | 1/15 | 0.061 | 2LMW17(0-2) | 0.34 - 11 | 780 | 100 | 120 | N | 2 |
| Fluoranthene | 6/15 | 0.049 - 0.3 | 2LTB9 (0-2) | 0.35 - 11 | 310 | - | 980 | N | 2 |
| Phenanthrene | 3/15 | 0.066 - 0.15 | 2LSS23 (0-1) | 0.35 - 11 | - | - | - | N | 1 |
| Pyrene | 7/15 | 0.057 - 1.1 | 2LSS2 | 0.35 - 11 | 230 | - | 1400 | N | 2 |
| 4,4'-DDD | 4/15 | 0.079 - 0.23 | 2LTB9 (0-2) | 0.0037 - 0.17 | 2.7 | - | 0.7 | N | 2 |
| 4,4'-DDE | 5/15 | 0.02 - 0.067 | 2LTB18 (0-2) | 0.0037 - 0.17 | 1.9 | - | 0.5 | N | 2 |
| 4,4'-DDT | 7/15 | 0.0068 - 2.3 | 2LSS2 | 0.0035 - 0.17 | 1.9 | 80 | 1.0 | Y | 3 |
| Aldrin | 1/15 | 0.0006 | 2LTB16 (0-2) | 0.0018 - 0.086 | 0.038 | 0.5 | 0.005 | N | 2 |
| alpha-Chlordane | 4/15 | 0.012 - 0.039 | 2LTB16 (0-2) | 0.0018 - 0.86 | 0.49 (7) | 10 (7) | 2 (7) | N | 2 |
| Aroclor-1254 | 7/15 | 0.015 - 0.49 | 2LTB18 (0-2) | 0.037 - 1.7 | 0.16 | - | - | Y | 3 |
| Aroclor-1260 | 3/15 | 0.23 - 12 | 2LSS2 | 0.035 - 1.7 | 0.083 | - | - | Y | 3 |
| Dieldrin | 3/15 | 0.0044 - 0.0075 | 2LTB9 (0-2) | 0.0035 - 0.17 | 0.04 | 2 | 0.001 | N | 2 |



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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A LANDFILL - SURFACE SOIL (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Endosulfan II | 1/15 | 0.002 | 2LTB17 (0-2) | 0.0035 - 0.17 | 47 | - | 4 | N | 2 |
| Endrin | 3/15 | 0.0009 - 0.0024 | 2LTB16 (0-2) | 0.0035 - 0.17 | 2.3 | - | 0.4 | N | 2 |
| Endrin aldehyde | 1/11 | 0.019 | 2LTB17 (0-2) | 0.0035 - 0.0069 | - | - | - | N | 1 |
| Endrin ketone | 1/15 | 0.57 | 2LSS2 | 0.0035 - 0.17 | - | - | - | N | 1 |
| gamma-Chlordane | 4/15 | 0.011 - 0.061 | 2LTB16 (0-2) | 0.0018 - 0.86 | 0.49 (7) | 10 (7) | 2 (7) | N | 2 |
| Methoxychlor | 1/15 | 0.019 | 2LTB17 (0-2) | 0.0018 - 0.86 | 39 | - | 62 | N | 2 |
| OCDD | 2/2 | 0.0016 - 0.0025 | 2LTB13-0001 | - | 0.004 | - | - | N | 2 |
| Aluminum | 15/15 | 5150 - 12200 | 2LSS21 (0-1) | - | 7800 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Arsenic | 12/15 | 0.5 - 3.7 | 2LMW18S(0-2) | 0.87 - 1.5 | 0.43 | 380 | 15 | Y | 3 |
| Barium | 15/15 | 29.5 - 199 | 2LTB17 (0-2) | - | 550 | 350000 | 32 | N | 2 |
| Beryllium | 15/15 | 0.24 - 2.2 | 2LTB18 (0-2) | - | 0.15 | 690 | 180 | Y | 3 |
| Cadmium | 9/15 | 0.48 - 4.7 | 2LTB17 (0-2) | 0.31 - 0.43 | 3.9 | 920 | 6 | Y | 3 |
| Calcium | 15/15 | 794 - 6090 | 2LSS23 (0-1) | - | - | - | - | N | 1 |
| Chromium (total) | 15/15 | 6.5 - 26.5 | 2LTB17 (0-2) | - | 39 (8) | 140 (8) | 19 (8) | N | 2 |
| Cobalt | 15/15 | 3.8 - 14.7 | 2LTB17 (0-2) | - | 470 | - | - | N | 2 |
| Copper | 15/15 | 3.1 - 871 | 2LTB18 (0-2) | - | 290 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Cyanide | 4/15 | 0.08 - 0.22 | 2LTB17 (0-2) | 0.09 - 1.4 | 160 | - | - | N | 2 |
| Iron | 15/15 | 7660 - 15600 | 2LTB17 (0-2) | - | 2300 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Lead | 15/15 | 4.9 - 449 | 2LTB17 (0-2) | - | 400 (9) | - | - | Y | 3 |
| Magnesium | 15/15 | 1680 - 3960 | 2LSS20 (0-1) | - | - | - | - | N | 1 |
| Manganese | 15/15 | 93.9 - 285 | 2LTB18 (0-2) | - | ~~39~~ 190 | - | - | Y | 3 |
| Mercury | 3/15 | 0.03 - 0.61 | 2LTB18 (0-2) | 0.02 - 0.24 | 2.3 | 7 | 3 | N | 2 |
| Nickel | 15/15 | 4.9 - 47.8 | 2LTB17 (0-2) | - | 160 | 6900 | 21 | N | 2 |
| Potassium | 15/15 | 935 - 3110 | 2LSS20 (0-1) | - | - | - | - | N | 1 |
| Selenium | 3/15 | 0.13 - 0.47 | 2LSS1 | 0.22 - 0.46 | 39 | - | 3 | N | 2 |
| Sodium | 14/15 | 33.6 - 2030 | 2LTB17 (0-2) | 140 | - | - | - | N | 1 |
| Vanadium | 15/15 | 13.8 - 36.2 | 2LMW18S(0-2) | - | 55 | - | - | N | 2 |
| Zinc | 15/15 | 24.5 - 5340 | 2LTB18 (0-2) | - | 2300 | - | 42000 | Y | 3 |

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## SUMMARY OF COC SELECTION (Continued)
## SITE 2 AREA A LANDFILL - SURFACE SOIL (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

Footnotes:

1 Results in mg/kg unless otherwise noted. Surface soil designated as soil from depths of 0 to 2 feet.

2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment.

3 Sample-specific.

4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).

5 Soil screening level guidance (USEPA, December 1994).

6 Soil screening level guidance (USEPA, December 1994) with a dilution and attenuation factor of 10.

7 Total Chlordane.

8 Hexavalent Chromium.

9 OSWER soil screening level for residential land use (USEPA, July 14, 1994).

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.

2 Maximum is less than the COC screening level.

3 Maximum is greater than or equal to the COC screening level.

4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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Revisions 08/10/96 FAS

A2L_COC.XLS

## SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS
## SITE 2 AREA A LANDFILL - SURFACE SOIL
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| 2-Butanone | 2 | 194.3214 |
| Acetone | 15 | 204.25 |
| Chlorobenzene | 4500 | 328.8214 |
| Ethylbenzene | 14000 | 1004.3929 |
| Methylene chloride | 6 | 97.3929 |
| Tetrachloroethene | 4 | 97.4643 |
| Toluene | 16 | 98.5357 |
| Trichloroethene | 2 | 97.3214 |
| Xylenes, total | 75000 | 5362.0714 |
| Benzo(a)anthracene | 200 | 1529.0714 |
| Benzo(a)pyrene | 190 | 1529 |
| Benzo(b)fluoranthene | 220 | 1540 |
| Benzo(g,h,i)perylene | 44 | 1531.3571 |
| Benzo(k)fluoranthene | 210 | 1515.7857 |
| Bis(2-Ethylhexyl)phthalate | 390 | 1556.4286 |
| Chrysene | 190 | 1522.2857 |
| Di-N-butyl phthalate | 61 | 1532.5714 |
| Fluoranthene | 300 | 1535.2857 |
| Phenanthrene | 150 | 1523.3571 |
| Pyrene | 1100 | 1285.1429 |
| 4,4'-DDD | 230 | 54.7607 |
| 4,4'-DDE | 67 | 29.7607 |
| 4,4'-DDT | 2300 | 192.1357 |
| Aldrin | 0.56 | 7.4721 |
| alpha-Chlordane | 39 | 74.4929 |
| Aroclor-1254 | 490 | 219.2857 |
| Aroclor-1260 | 12000 | 978.5 |
| Dieldrin | 7.5 | 15.5893 |
| Endosulfan II | 2 | 14.8179 |
| Endrin | 2.4 | 14.7671 |
| Endrin aldehyde | 19 | 3.745 |
| Endrin ketone | 570 | 49.4464 |
| gamma-Chlordane | 61 | 76.1357 |
| Methoxychlor | 19 | 75.6786 |
| **Dioxins (ug/kg)** | | |
| OCDD | 2.5 | 2.046 |
| **Inorganics (mg/kg)** | | |
| Aluminum | 12200 | 7191.4286 |
| Arsenic | 3.7 | 1.5679 |
| Barium | 199 | 60.3643 |
| Beryllium | 2.2 | 0.76 |
| Cadmium | 4.7 | 1.8818 |
| Calcium | 6090 | 2384.2143 |

**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS (Continued)**
**SITE 2 AREA A LANDFILL - SURFACE SOIL**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Inorganics (mg/kg) (Continued)** | | |
| Chromium (total) | 26.5 | 14.0643 |
| Cobalt | 14.7 | 6.8714 |
| Copper | 871 | 124.3929 |
| Cyanide | 0.22 | 0.2432 |
| Iron | 15600 | 11036.4286 |
| Lead | 449 | 81.9 |
| Magnesium | 3960 | 2683.5714 |
| Manganese | 285 | 180.7786 |
| Mercury | 0.61 | 0.0946 |
| Nickel | 47.8 | 19.3786 |
| Potassium | 3110 | 1500.3571 |
| Selenium | 0.47 | 0.1979 |
| Sodium | 2030 | 305.2714 |
| Vanadium | 36.2 | 21.6143 |
| Zinc | 5340 | 557.6714 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A LANDFILL - ALL SOIL (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2,2-Tetrachloroethane | 1/36 | 0.022 | 2LMW14S(5-7) | 0.005 - 4.5 | 3.2 | 0.4 | 0.001 | N | 2 |
| 1,1,2-Trichloroethane | 1/36 | 0.011 | 2LMW14S(5-7) | 0.005 - 4.5 | 11 | 0.8 | 0.01 | N | 2 |
| 2-Butanone | 1/36 | 0.002 | 2LSS2 | 0.01 - 3.5 | 4700 | 6900 (10) | - | N | 2 |
| 4-Methyl-2-pentanone | 1/36 | 0.012 | 2LMW18S(2-6) | 0.01 - 3.5 | 630 | 1000 | - | N | 2 |
| Acetone | 10/36 | 0.009 - 0.25 | 2LTB2(2-8) | 0.011 - 3.5 | 780 | 62000 | 8 | N | 2 |
| Carbon disulfide | 1/36 | 0.005 | 2LMW18S(2-6) | 0.005 - 4.5 | 780 | 11 | 14 | N | 2 |
| Chlorobenzene | 3/36 | 0.043 - 4.5 | 2LSS1/2LTB33 (4-8) | 0.005 - 3.3 | 160 | 94 | 0.6 | N | 2 |
| Ethylbenzene | 9/36 | 0.002 - 28 | 2LTB33 (4-8) | 0.005 - 0.037 | 780 | 260 | 5 | N | 2 |
| Methylene chloride | 11/36 | 0.001 - 0.025 | 2LTB19 (2-4) | 0.005 - 4.5 | 85 | 7 | 0.01 | N | 2 |
| Tetrachloroethene | 1/36 | 0.004 | 2LSS2 | 0.005 - 4.5 | 12 | 11 | 0.04 | N | 2 |
| Toluene | 12/36 | 0.004 - 3.2 | 2LTB33 (4-8) | 0.005 - 3 | 1600 | 520 | 5 | N | 2 |
| Trichloroethene | 2/36 | 0.002 | 2LSS2/2LMW14S (5-7) | 0.005 - 4.5 | 58 | 3 | 0.02 | N | 2 |
| Xylenes, total | 11/36 | 0.004 - 140 | 2LTB33 (4-8) | 0.005 - 0.037 | 16000 | 320 | 74 | N | 2 |
| 2,4-Dimethylphenol | 1/36 | 0.19 | 2LTB33 (4-8) | 0.34 - 12 | 160 | - | 3 | N | 2 |
| 2-Methylnaphthalene | 5/36 | 0.053 - 1.3 | 2LTB2(2-8) | 0.34 - 12 | - | - | - | N | 1 |
| 4-Methylphenol | 3/36 | 0.34 - 2 | 2LTB23 (4-8) | 0.34 - 12 | 39 | - | - | N | 2 |
| Acenaphthene | 4/36 | 0.05 - 8.4 | 2LTB20 (6-8) | 0.34 - 11 | 470 | - | 200 | N | 2 |
| Acenaphthylene | 1/36 | 0.22 | 2LTB28 (4-6) | 0.34 - 12 | - | - | - | N | 1 |
| Anthracene | 5/36 | 0.23 - 19 | 2LTB20 (6-8) | 0.34 - 11 | 2300 | - | 4300 | N | 2 |
| Benzo(a)anthracene | 16/36 | 0.097 - 23 | 2LTB20 (6-8) | 0.35 - 11 | 0.88 | - | 0.7 | Y | 3 |
| Benzo(a)pyrene | 12/36 | 0.046 - 15 | 2LTB20 (6-8) | 0.34 - 11 | 0.088 | - | 4 | Y | 3 |
| Benzo(b)fluoranthene | 15/36 | 0.07 - 15 | 2LTB20 (6-8) | 0.35 - 11 | 0.88 | - | 4 | Y | 3 |
| Benzo(g,h,i)perylene | 4/36 | 0.044 - 0.59 | 2LTB26 (4-6) | 0.34 - 12 | - | - | - | N | 1 |
| Benzo(k)fluoranthene | 16/36 | 0.057 - 14 | 2LTB20 (6-8) | 0.35 - 11 | 8.8 | - | 4 | Y | 3 |
| Bis(2-ethylhexyl)phthalate | 6/36 | 0.078 - 1.9 | 2LMW9(2-8) | 0.35 - 12 | 46 | 210 | 11 | N | 2 |
| Carbazole | 3/20 | 0.41 - 9.8 | 2LTB20 (6-8) | 0.35 - 11 | 32 | - | 0.5 | N | 2 |
| Chrysene | 17/36 | 0.037 - 19 | 2LTB20 (6-8) | 0.35 - 11 | 88 | - | 1 | N | 2 |
| Di-n-butyl phthalate | 2/36 | 0.061 - 0.076 | 2LMW7(7-10) | 0.34 - 12 | 780 | 100 | 120 | N | 2 |
| Dibenzofuran | 4/36 | 0.083 - 13 | 2LTB20 (6-8) | 0.34 - 11 | 31 | - | 120 | N | 2 |

**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A LANDFILL - ALL SOIL (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Fluoranthene | 19/36 | 0.049 - 47 | 2LTB20 (6-8) | 0.35 - 11 | 310 | - | 980 | N | 2 |
| Fluorene | 4/36 | 0.13 - 17 | 2LTB20 (6-8) | 0.34 - 11 | 310 | - | 160 | N | 2 |
| Indeno(1,2,3-cd)pyrene | 3/36 | 0.23 - 0.64 | 2LTB26 (4-6) | 0.34 - 12 | 0.88 | - | 35 | N | 2 |
| Naphthalene | 7/36 | 0.12 - 20 | 2LTB20 (6-8) | 0.34 - 11 | 310 | - | 30 | N | 2 |
| Phenanthrene | 17/36 | 0.066 - 61 | 2LTB20 (6-8) | 0.35 - 11 | - | - | - | N | 1 |
| Pyrene | 20/36 | 0.057 - 40 | 2LTB20 (6-8) | 0.34 - 11 | 230 | - | 1400 | N | 2 |
| 4,4'-DDD | 13/36 | 0.0096 - 0.49 | 2LTB28 (4-6) | 0.0037 - 0.37 | 2.7 | - | 0.7 | N | 2 |
| 4,4'-DDE | 12/36 | 0.0042 - 0.45 | 2LTB31 (8-10) | 0.0037 - 0.37 | 1.9 | - | 0.5 | N | 2 |
| 4,4'-DDT | 13/36 | 0.0068 - 2.3 | 2LSS2 | 0.0035 - 0.37 | 1.9 | 80 | 1.0 | Y | 3 |
| Aldrin | 1/36 | 0.0006 | 2LTB16 (0-2) | 0.0018 - 0.19 | 0.038 | 0.5 | 0.005 | N | 2 |
| Alpha-chlordane | 6/36 | 0.002 - 0.039 | 2LTB16 (0-2) | 0.0018 - 0.91 | 0.49 (7) | 10 (7) | 2 (7) | N | 2 |
| Aroclor-1242 | 1/36 | 1.7 | 2LTB31 (8-10) | 0.035 - 3.7 | 0.083 | - | - | Y | 3 |
| Aroclor-1254 | 15/36 | 0.015 - 100 | 2LTB23 | 0.037 - 1.8 | 0.16 | - | - | Y | 3 |
| Aroclor-1260 | 4/36 | 0.23 - 12 | 2LSS2 | 0.035 - 3.7 | 0.083 | - | - | Y | 3 |
| Dieldrin | 4/36 | 0.0012 - 0.007 | 2LTB9 (0-2) | 0.0035 - 0.37 | 0.04 | 2 | 0.001 | N | 2 |
| Endosulfan II | 1/36 | 0.002 | 2LTB17 (0-2) | 0.0035 - 0.37 | 47 | - | 4 | N | 2 |
| Endosulfan I | 3/36 | 0.002 - 0.34 | 2LTB33 (4-8) | 0.0018 - 0.19 | 47 | - | 3 | N | 2 |
| Endrin | 8/36 | 0.0009 - 0.47 | 2LTB23 (4-8) | 0.0035 - 0.18 | 2.3 | - | 0.4 | N | 2 |
| Endrin aldehyde | 3/20 | 0.019 - 0.091 | 2LTB20 (6-8) | 0.0035 - 0.37 | - | - | - | N | 1 |
| Endrin ketone | 2/36 | 0.0059 - 0.57 | 2LSS2 | 0.0035 - 0.37 | - | - | - | N | 1 |
| Gamma-chlordane | 5/36 | 0.003 - 0.061 | 2LTB16 (0-2) | 0.0018 - 0.91 | 0.49 (7) | 10 (7) | 2 (7) | N | 2 |
| Heptachlor | 3/36 | 0.0005 - 0.079 | 2LTB23 (4-8) | 0.0018 - 0.19 | 0.14 | 0.3 | 0.06 | N | 2 |
| Heptachlor epoxide | 1/36 | 0.0007 | 2LTB20 (6-8) | 0.0018 - 0.19 | 0.07 | 1 | 0.03 | N | 2 |
| Methoxychlor | 1/36 | 0.019 | 2LTB17 (0-2) | 0.018 - 1.9 | 39 | - | 62 | N | 2 |
| 1,2,3,4,6,7,8-HPCDF | 1/5 | 0.0002 | 2LTB33 (4-8) | 0.0001 - 0.0003 | 0.0004 | - | - | N | 2 |
| 1,2,3,4,7,8-HXCDF | 1/5 | 0.0003 | 2LTB33 (4-8) | 0.0002 - 0.0006 | 0.00004 | - | - | Y | 3 |
| 1,2,3,6,7,8-HXCDF | 1/5 | 0.0002 | 2LTB33 (4-8) | 0.0001 - 0.0007 | 0.00004 | - | - | Y | 3 |
| OCDD | 4/5 | 0.0016 - 0.002 | 2LTB13-0001 | 0.002 | 0.004 | - | - | N | 2 |

**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A LANDFILL - ALL SOIL (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 35/36 | 4450 - 15100 | 2LMW13(6-8) | - | 7800 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Antimony | 5/32 | 25.6 - 134 | 2LTB22 (6-8) | 1.3 - 26.9 | 3.1 | - | - | Y | 3 |
| Arsenic | 33/36 | 0.5 - 10.6 | 2LTB22 (6-8) | 0.87 - 1.5 | 0.43 | 380 | 15 | Y | 3 |
| Barium | 36/36 | 18.4 - 667 | 2LTB23 (4-8) | - | 550 | 350000 | 32 | Y | 3 |
| Beryllium | 36/36 | 0.24 - 3.9 | 2LMW18S(2-6) | - | 0.15 | 690 | 180 | Y | 3 |
| Boron | 4/19 | 22.7 - 79.8 | 2LTB22 (6-8) | 0.95 - 19 | 700 | - | - | N | 2 |
| Cadmium | 29/36 | 0.48 - 12.1 | 2LMW8S(6-10)/2LTB33 (4-8) | 0.31 - 0.43 | 3.9 | 920 | 6 | Y | 3 |
| Calcium | 36/36 | 794 - 17200 | 2LTB22 (6-8) | - | - | - | - | N | 1 |
| Chromium (total) | 36/36 | 6.5 - 289 | 2LTB22 (6-8) | - | 39 (8) | 140 (8) | 19 (8) | Y | 3 |
| Cobalt | 35/36 | 3.8 - 122 | 2LTB22 (6-8) | 4.5 | 470 | - | - | N | 2 |
| Copper | 36/36 | 3.1 - 21600 | 2LTB22 (6-8) | - | 290 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Cyanide | 6/36 | 0.08 - 0.53 | 2LTB31 (8-10) | 0.09 - 1.8 | 160 | - | - | N | 2 |
| Iron | 36/36 | 7660 - 157000 | 2LTB22 (6-8) | - | 2300 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Lead | 36/36 | 4.9 - 1780 | 2LTB22 (6-8) | - | 400 (9) | - | - | Y | 3 |
| Magnesium | 36/36 | 1570 - 9330 | 2LTB33 (4-8) | - | - | - | - | N | 1 |
| Manganese | 36/36 | 74 - 1150 | 2LTB22 (6-8) | - | ~~39~~ 190 | - | - | Y | 3 |
| Mercury | 12/36 | 0.03 - 3.6 | 2LMW17(4-8) | 0.02 - 0.24 | 2.3 | 7 | 3 | Y | 3 |
| Nickel | 36/36 | 4.9 - 1440 | 2LTB22 (6-8) | - | 160 | 6900 | 21 | Y | 3 |
| Potassium | 36/36 | 549 - 3700 | LF-SB04 | - | - | - | - | N | 1 |
| Selenium | 5/36 | 0.13 - 0.81 | LF-SB04 | 0.16 - 0.93 | 39 | - | 3 | N | 2 |
| Silver | 7/34 | 2.8 - 38.9 | 2LTB19 (2-4) | 0.15 - 2.69 | 39 | - | - | N | 2 |
| Sodium | 34/36 | 33.6 - 4120 | 2LTB19 (2-4) | 140 - 267 | - | - | - | N | 1 |
| Vanadium | 36/36 | 13.8 - 138 | 2LTB20 (6-8) | - | 55 | - | - | Y | 3 |
| Zinc | 36/36 | 24.5 - 9850 | 2LTB22 (6-8) | - | 2300 | - | 42000 | Y | 3 |

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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A LANDFILL - ALL SOIL (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

Footnotes:

1 Results in mg/kg unless otherwise noted. All soil designated as soil from depths of 0 to 10 feet.
2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment.
3 Sample-specific.
4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
5 Soil screening level guidance (USEPA, December 1994).
6 Soil screening level guidance (USEPA, December 1994) with a dilution and attenuation factor of 10.
7 Total Chlordane.
8 Hexavalent Chromium.
9 OSWER soil screening level for residential land use (USEPA, July 14, 1994).
10 Calculated using soil screening guidance (See Appendix F.3).

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.



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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS**
**SITE 2 AREA A LANDFILL - ALL SOIL**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| 1,1,2,2-Tetrachloroethane | 22 | 163.2656 |
| 1,1,2-Trichloroethane | 11 | 162.9219 |
| 2-Butanone | 2 | 206.875 |
| 4-Methyl-2-pentanone | 12 | 207.0938 |
| Acetone | 250 | 228.6875 |
| Carbon disulfide | 5 | 162.75 |
| Chlorobenzene | 4500 | 334.25 |
| Ethylbenzene | 28000 | 1560.8281 |
| Methylene chloride | 25 | 163.6094 |
| Tetrachloroethene | 4 | 162.7188 |
| Toluene | 3200 | 194.0469 |
| Trichloroethene | 2 | 162.625 |
| Xylenes, total | 140000 | 7031.6719 |
| 2,4-Dimethylphenol | 190 | 1205.3125 |
| 2-Methylnaphthalene | 1300 | 1134.7813 |
| 4-Methylphenol | 2000 | 1267.0313 |
| Acenaphthene | 8400 | 1317.8125 |
| Acenaphthylene | 220 | 1223.75 |
| Anthracene | 19000 | 1657.5 |
| Benzo(a)anthracene | 23000 | 1838.7813 |
| Benzo(a)pyrene | 15000 | 1560.8125 |
| Benzo(b)fluoranthene | 15000 | 1570.4688 |
| Benzo(g,h,i)perylene | 590 | 1229.8125 |
| Benzo(k)fluoranthene | 14000 | 1479.25 |
| Bis(2-ethylhexyl)phthalate | 1900 | 1252.2813 |
| Carbazole | 9800 | 1667.5 |
| Chrysene | 19000 | 1715.2188 |
| Di-n-butyl phthalate | 76 | 1216.1563 |
| Dibenzofuran | 13000 | 1456.6563 |
| Fluoranthene | 47000 | 2779.3438 |
| Fluorene | 17000 | 1614.6875 |
| Indeno(1,2,3-cd)pyrene | 640 | 1234.8438 |
| Naphthalene | 20000 | 1671.5625 |
| Phenanthrene | 61000 | 3093.8125 |
| Pyrene | 40000 | 2489.2813 |
| 4,4'-DDD | 490 | 91.2063 |
| 4,4'-DDE | 450 | 61.8516 |
| 4,4'-DDT | 2300 | 123.1578 |
| Aldrin | 0.56 | 15.5316 |
| alpha-Chlordane | 39 | 122.0063 |
| Aroclor-1242 | 1700 | 240.8594 |
| Aroclor-1254 | 100000 | 3753.9531 |

**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS (Continued)**
**SITE 2 AREA A LANDFILL - ALL SOIL**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg) (Continued)** | | |
| Aroclor-1260 | 12000 | 743.8594 |
| Dieldrin | 7.5 | 31.1063 |
| Endosulfan-I | 340 | 30.7938 |
| Endosulfan II | 2 | 23.9172 |
| Endrin | 470 | 39.8747 |
| Endrin aldehyde | 91 | 22.2972 |
| Endrin ketone | 570 | 46.0641 |
| gamma-Chlordane | 61 | 125.4514 |
| Heptachlor | 79 | 14.9066 |
| Heptachlor epoxide | 0.66 | 15.5316 |
| Methoxychlor | 19 | 155.7344 |
| 1,2,3,4,6,7,8-HPCDF | 0.246 | 0.1291 |
| 1,2,3,4,7,8-HXCDF | 0.306 | 0.2208 |
| 1,2,3,6,7,8-HXCDF | 0.153 | 0.1414 |
| OCDD | 2.5 | 1.8545 |
| **Inorganics (mg/kg)** | | |
| Aluminum | 15100 | 8031.5625 |
| Antimony | 134 | 13.9066 |
| Arsenic | 10.6 | 2.8247 |
| Barium | 667 | 97.1063 |
| Beryllium | 3.9 | 0.9097 |
| Boron | 79.8 | 11.9662 |
| Cadmium | 12.1 | 3.3936 |
| Calcium | 17200 | 3499.875 |
| Chromium (total) | 289 | 32.5125 |
| Cobalt | 122 | 13.3328 |
| Copper | 21600 | 961.6281 |
| Cyanide | 0.53 | 0.3838 |
| Iron | 157000 | 25107.5 |
| Lead | 1780 | 226.1719 |
| Magnesium | 9330 | 3055 |
| Manganese | 1150 | 265.3094 |
| Mercury | 3.6 | 0.2739 |
| Nickel | 1440 | 81.9219 |
| Potassium | 3700 | 1465.4063 |
| Selenium | 0.81 | 0.2414 |
| Silver | 38.9 | 2.9667 |
| Sodium | 4120 | 571.5375 |
| Vanadium | 138 | 28.0375 |
| Zinc | 9850 | 1111.9969 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A LANDFILL - UNFILTERED GROUNDWATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Federal MCL (4) | State MCL (5) | Risk-based COC Screening Level (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2,2-Tetrachloroethane | 4/55 | 1 - 140 | 2LGW13D | 5 - 100 | - | - | 0.052 | Y | 3 |
| 1,2-Dichloroethene (total) | 4/55 | 1 - 2 | 2LGW13S/2LGW13D | 5 - 100 | - | - | 5.5 | N | 2 |
| 4-Methyl-2-pentanone | 9/55 | 3 - 49 | 2LGW17D | 10 - 100 | - | - | 290 | N | 2 |
| Acetone | 1/55 | 10 | 2LGW9S | 10 - 110 | - | - | 370 | N | 2 |
| Benzene | 4/55 | 6 - 32 | 2LGW18S | 5 - 10 | 5 | 5 | 0.36 | Y | 3 |
| Carbon disulfide | 5/55 | 1 - 3 | 2LGW7S | 5 - 100 | - | - | 100 | N | 2 |
| Chlorobenzene | 5/55 | 6 - 1200 | 2LGW18S | 5 - 10 | 100 | 100 | 3.9 | Y | 3 |
| Chloroform | 1/55 | 16 | 2LGW18S | 5 - 25 | 100 | 100 | 0.15 | Y | 3 |
| Ethylbenzene | 13/55 | 2 - 120 | 2LGW18S | 5 - 10 | 700 | 700 | 130 | N | 2 |
| Methylene chloride | 6/55 | 1 - 22 | 2LPW1S/2LPW1S | 5 - 100 | 5 | 5 | 4.1 | Y | 3 |
| Tetrachloroethene | 1/55 | 3 | 2LGW13D | 5 - 100 | 5 | 5 | 1.1 | Y | 3 |
| Toluene | 9/55 | 1 - 2 | 2LPW1S/2LGW18S | 5 - 100 | 1000 | 1000 | 75 | N | 2 |
| Trichloroethene | 3/55 | 4 - 23 | 2LGW13D | 5 - 100 | 5 | 5 | 1.6 | Y | 3 |
| Xylenes, total | 17/55 | 2 - 840 | 2LGW18S | 5 - 10 | 10000 | 10000 | 1200 | N | 2 |
| 1,2,4-Trichlorobenzene | 4/50 | 7 - 72 | 2LGW18S | 10 - 20 | 70 | 70 | 19 | Y | 3 |
| 1,2-Dichlorobenzene | 3/50 | 8 - 14 | 2LGW18S | 10 - 20 | 60 | 600 | 27 | N | 2 |
| 1,3-Dichlorobenzene | 4/50 | 7 - 33 | 2LGW18S | 10 - 20 | 60 | - | 54 | N | 2 |
| 1,4-Dichlorobenzene | 4/50 | 14 - 140 | 2LGW18S | 10 - 20 | 75 | 75 | 0.44 | Y | 3 |
| 2,4-Dichlorophenol | 1/50 | 2 | 2LGW18S | 10 - 20 | - | - | 11 | N | 2 |
| 2,4-Dimethylphenol | 3/50 | 0.8 - 19 | 2LGW18S | 10 - 20 | - | - | 73 | N | 2 |
| 2,4-Dinitrotoluene | 1/50 | 7 | 2LGW7S | 10 - 20 | - | - | 7.3 | N | 2 |
| 2-Chlorophenol | 2/50 | 4 - 12 | 2LGW18S | 10 - 20 | - | - | 18 | N | 2 |
| 2-Methylnaphthalene | 7/50 | 0.8 - 6 | 2LGW18S | 10 - 20 | - | - | - | N | 1 |
| 4-Chloro-3-methylphenol | 1/50 | 8 | 2LGW18S | 10 - 20 | - | - | - | N | 1 |
| 4-Methylphenol | 8/50 | 0.5 - 22 | 2LGW18S | 10 - 20 | - | - | 18 | Y | 3 |
| Acenaphthene | 5/50 | 0.5 - 1 | 2LGW7S/2LGW9S/2LGW18S | 10 - 20 | - | - | 220 | N | 2 |
| Anthracene | 1/50 | 0.5 | 2LGW18S | 10 - 20 | - | - | 1100 | N | 2 |
| Benzoic acid | 12/50 | 0.5 - 14 | 2LGW18S | 10 - 50 | - | - | 15000 | N | 2 |
| Bis(2-ethylhexyl)phthalate | 11/50 | 1 - 62 | 2LGW7S | 10 - 17 | 6 | 6 | 4.8 | Y | 3 |

U2L_COC.XLS

000013

**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A LANDFILL - UNFILTERED GROUNDWATER (UG/L) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Federal MCL (4) | State MCL (5) | Risk-based COC Screening Level (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Butyl benzyl phthalate | 2/50 | 0.5 - 1 | 2LGW8S | 10 - 20 | - | - | 730 | N | 2 |
| Carbazole | 4/36 | 0.5 - 2 | 2LGW18S | 10 - 20 | - | - | 3.4 | N | 2 |
| Di-n-butyl phthalate | 3/50 | 0.8 - 1 | 2LGW9D/2LGW9S | 10 - 20 | - | - | 370 | N | 2 |
| Di-n-octyl phthalate | 1/50 | 2 | 2LGW19D | 10 - 20 | - | - | 73 | N | 2 |
| Dibenzofuran | 1/50 | 0.6 | 2LPW1S | 10 - 20 | - | - | 15 | N | 2 |
| Diethyl phthalate | 7/50 | 0.6 - 120 | 2LGW17D | 10 | - | - | 2900 | N | 2 |
| Fluorene | 5/50 | 0.8 - 1 | 2LGW7S/2LGW18S | 10 - 20 | - | - | 150 | N | 2 |
| N-Nitrosodiphenylamine | 1/50 | 1 | 2LGW18S | 10 - 20 | - | - | 14 | N | 2 |
| Naphthalene | 12/50 | 1 - 42 | 2LGW18S | 10 - 20 | - | - | 150 | N | 2 |
| Phenanthrene | 3/50 | 1 | 2LPW1S | 10 - 20 | - | - | - | N | 1 |
| Phenol | 4/50 | 0.7 - 6 | 2LGW17D | 10 | - | - | 2200 | N | 2 |
| Aroclor-1016 | 1/19 | 7.5 | 2LGW18S | 0.10 - 10 | 0.5 | 0.5 | 0.26 | Y | 3 |
| Aroclor-1254 | 2/19 | 130 - 150 | 2LGW18S | 0.10 - 10 | 0.5 | 0.5 | 0.073 | Y | 3 |
| Aroclor-1260 | 2/19 | 290 - 710 | 2LGW18S | 0.10 - 1.1 | 0.5 | 0.5 | 0.0087 | Y | 3 |
| Aluminum | 20/49 | 24 - 89300 | 2LGW13S | 30 - 240 | 50 - 200 (7) | - | 3700 | ~~Y~~ N | ~~3~~ 4 |
| Antimony | 1/47 | 20.6 | 2LGW18D | 3 - 25 | 6 | 6 | 1.5 | Y | 3 |
| Arsenic | 22/49 | 2.3 - 37 | 2LGW7S | 2 - 20 | 50 | 50 | 0.045 | Y | 3 |
| Barium | 48/49 | 8.7 - 956 | 2LPW1S | 15 | 2000 | 2000 | 260 | Y | 3 |
| Beryllium | 4/49 | 1.1 - 4.2 | 2LGW13S | 1 | 4 | 4 | 0.016 | Y | 3 |
| Boron | 10/35 | 52.5 - 3010 | 2LGW7S | 16.4 - 719 | - | - | 330 | Y | 3 |
| Cadmium | 11/47 | 1.7 - 44.8 | 2LGW13D | 1 - 3 | 5 | 5 | 1.8 | Y | 3 |
| Calcium | 49/49 | 10800 - 174000 | 2LGW18S | - | - | - | - | N | 1 |
| Chromium (total) | 13/49 | 2.3 - 142 | 2LGW13S | 3 - 5.4 | 100 | 100 | 18 (8) | Y | 3 |
| Cobalt | 10/49 | 3.2 - 35.5 | 2LGW13S | 3 - 18 | - | - | 220 | N | 2 |
| Copper | 26/49 | 2.5 - 125 | 2LGW13S | 2 - 10.2 | 1300 (9) | - | 150 | N | 2 |
| Iron | 49/49 | 28.1 - 193000 | 2LGW18S | - | 300 (7) | - | 1100 | ~~Y~~ N | ~~3~~ 4 |
| Lead | 16/50 | 2.6 - 84 | 2LGW18S | 1 - 10 | 15 (9) | - | - | Y | 3 |
| Magnesium | 49/49 | 2120 - 563000 | 2LGW7S | - | - | - | - | N | 1 |
| Manganese | 49/49 | 57.5 - 2570 | 2LGW13S | - | 50 (7) | - | ~~18~~ 88 | Y | 3 |

Revisions 08/10/96 SMS



000014

**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A LANDFILL - UNFILTERED GROUNDWATER (UG/L) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Federal MCL (4) | State MCL (5) | Risk-based COC Screening Level (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 3/49 | 0.32 - 0.36 | 2LGW17D | 0.2 | 2 | 2 | 1.1 | N | 2 |
| Nickel | 17/50 | 9.3 - 80.9 | 2LGW19D | 7 - 59.2 | 100 | 100 | 73 | Y | 3 |
| Potassium | 48/49 | 865 - 208000 | 2LGW7S | 1020 | - | - | - | N | 1 |
| Selenium | 7/49 | 1 - 2.9 | 2LGW7S/2LGW18S | 1 - 30 | 50 | 50 | 18 | N | 2 |
| Silver | 2/48 | 2.5 - 3.5 | 2LGW19D | 1 - 7 | 100 (7) | 50 | 18 | N | 2 |
| Sodium | 49/49 | 10600 - 7280000 | 2LPW1S | - | - | - | - | N | 1 |
| Thallium | 3/34 | 2 - 4 | 2LGW13D | 1 - 20 | 2 | 2 | 0.26 (10) | Y | 3 |
| Vanadium | 7/49 | 4.5 - 182 | 2LGW13S | 1 - 20 | - | - | 26 | Y | 3 |
| Zinc | 34/50 | 2.8 - 612 | 2LGW18S | 2 - 26.3 | 5000 (7) | - | 1100 | N | 2 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as separate samples. Non-validated and rejected results are not used in risk assessment.
3 Sample-specific.
4 Maximum contaminant level. (USEPA, May 1995).
5 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II EnvironmentalHealth.
6 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
7 Secondary MCL.
8 Hexavalent Chromium.
9 Action level.
10 Thallic oxide.

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

Revisions
08/10/96
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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS**
**SITE 2 AREA A LANDFILL - UNFILTERED GROUNDWATER**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/L)** | | |
| 1,1,2,2-Tetrachloroethane | 84.6667 | 9.9537 |
| 1,2-Dichloroethene (total) | 2 | 5.1852 |
| 4-Methyl-2-pentanone | 19.6667 | 7.2407 |
| Acetone | 7.5 | 7.3997 |
| Benzene | 15.8333 | 5.0463 |
| Carbon disulfide | 3.5 | 4.9537 |
| Chlorobenzene | 573.3333 | 36.0371 |
| Chloroform | 12.8333 | 4.8796 |
| Ethylbenzene | 84.3333 | 8.8488 |
| Methylene chloride | 12.1111 | 6.6914 |
| Tetrachloroethene | 3.5 | 5.4722 |
| Toluene | 21.5 | 5.1945 |
| Trichloroethene | 12.3333 | 5.963 |
| Xylenes, total | 666.6667 | 42.1358 |
| 1,2,4-Trichlorobenzene | 47.1667 | 7.4352 |
| 1,2-Dichlorobenzene | 8.3333 | 5.2778 |
| 1,3-Dichlorobenzene | 19.3333 | 5.8889 |
| 1,4-Dichlorobenzene | 62.8333 | 8.3056 |
| 2,4-Dichlorophenol | 4 | 5.037 |
| 2,4-Dimethylphenol | 8.3333 | 5.2194 |
| 2,4-Dinitrotoluene | 5.6667 | 5.1296 |
| 2-Chlorophenol | 7 | 5.2037 |
| 2-Methylnaphthalene | 4.8333 | 4.9111 |
| 4-Chloro-3-methylphenol | 6 | 5.1482 |
| 4-Methylphenol | 8.3667 | 5.1569 |
| Acenaphthene | 3.6667 | 4.7097 |
| Acenaphthene | 3.6667 | 4.7097 |
| Anthracene | 3.5 | 5.0093 |
| Benzoic acid | 22 | 18.062 |
| Bis(2-Ethylhexyl)phthalate | 22.6667 | 8.2361 |
| Butyl benzyl phthalate | 3.6667 | 4.9352 |
| Carbazole | 2.775 | 4.8153 |
| Di-N-butyl phthalate | 3.6667 | 4.8296 |
| Di-N-octyl phthalate | 3.5 | 5.0093 |
| Dibenzofuran | 3.9 | 5.0315 |
| Diethyl phthalate | 41.8667 | 7.1037 |
| Fluorene | 3.6667 | 4.7722 |
| Fluorene | 3.6667 | 4.7722 |
| N-Nitrosodiphenylamine | 3.6667 | 5.0185 |
| Naphthalene | 25.5 | 5.9167 |
| Phenanthrene | 2 | 4.9259 |
| Phenol | 5.3333 | 4.7083 |

**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS (Continued)**
**SITE 2 AREA A LANDFILL - UNFILTERED GROUNDWATER**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/L) (Continued)** | | |
| Aroclor-1016 | 4.25 | 0.5719 |
| Aroclor-1254 | 48.5 | 4.1846 |
| Aroclor-1260 | 333.5 | 26.1077 |
| **Inorganics (ug/L)** | | |
| Aluminum | 89300 | 5618.6801 |
| Antimony | 13.0333 | 8.6069 |
| Arsenic | 19.6 | 4.2972 |
| Barium | 919.6667 | 191.7731 |
| Beryllium | 4.2 | 0.7593 |
| Boron | 1684.75 | 179.816 |
| Cadmium | 16.1667 | 2.9301 |
| Calcium | 122666.6667 | 47425 |
| Chromium (total) | 142 | 11.8986 |
| Cobalt | 35.5 | 6.2403 |
| Copper | 125 | 13.706 |
| Iron | 176500 | 33846.6056 |
| Lead | 51.1 | 7.3991 |
| Magnesium | 242066.6667 | 27455.8333 |
| Manganese | 2570 | 695.8241 |
| Mercury | 0.32 | 0.1211 |
| Nickel | 79.5 | 15.8567 |
| Potassium | 90733.3333 | 16656.3426 |
| Selenium | 6.4667 | 2.6884 |
| Silver | 2.3333 | 1.7481 |
| Sodium | 7003333.333 | 595959.2593 |
| Thallium | 2.5 | 3.1269 |
| Vanadium | 182 | 16.5611 |
| Zinc | 297.4 | 48.0618 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A LANDFILL - FILTERED GROUNDWATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Federal MCL (4) | State MCL (5) | Risk-based COC Screening Level (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 4/36 | 12.8 - 62.5 | 2LGW18S | 30 - 240 | 50 - 200 (7) | - | 3700 | N | 1 |
| Antimony | 4/35 | 13.7 - 34.1 | 2LGW13S | 3 - 25 | 6 | 6 | 1.5 | N | 1 |
| Arsenic | 12/36 | 2.3 - 7.3 | 2LGW13S | 2 - 20 | 50 | 50 | 0.045 | N | 1 |
| Barium | 31/36 | 29.2 - 924 | 2LPW1S | 15 | 2000 | 2000 | 260 | N | 1 |
| Beryllium | 4/36 | 1.2 - 1.4 | 2LGW19D | 1 | 4 | 4 | 0.016 | N | 1 |
| Boron | 17/36 | 11.8 - 2670 | 2LGW7S | 16.4 - 719 | - | - | 330 | N | 1 |
| Cadmium | 1/35 | 2.1 | 2LGW18D | 1 - 3 | 5 | 5 | 1.8 | N | 1 |
| Calcium | 35/36 | 19200 - 161000 | 2LGW18S | - | - | - | - | N | 1 |
| Chromium (total) | 2/36 | 3.9 - 6.7 | 2LGW18S | 3 - 5.4 | 100 | 100 | 18 (8) | N | 1 |
| Cobalt | 3/36 | 4.5 - 14.4 | 2LGW18S | 3 - 18 | - | - | 220 | N | 1 |
| Copper | 7/36 | 2.7 - 30.1 | 2LGW7S | 2 - 10.2 | 1300 (9) | - | 150 | N | 1 |
| Iron | 34/36 | 22.7 - 193000 | 2LGW18S | - | 300 (7) | - | 1100 | N | 1 |
| Lead | 5/36 | 2.6 - 20.6 | 2LGW1S | 1 - 10 | 15 (9) | - | - | N | 1 |
| Magnesium | 35/36 | 2730 - 451000 | 2LGW7S | - | - | - | - | N | 1 |
| Manganese | 36/36 | 9.1 - 2010 | 2LGW20S | - | 50 (7) | - | ~~18~~ 88 | N | 1 |
| Mercury | 2/36 | 0.2 - 0.29 | 2LGW8S | 0.2 | 2 | 2 | 1.1 | N | 1 |
| Nickel | 8/36 | 3.9 - 34.9 | 2LGW19D | 7 - 59.2 | 100 | 100 | 73 | N | 1 |
| Potassium | 32/36 | 1450 - 172000 | 2LGW7S | 1020 | - | - | - | N | 1 |
| Selenium | 1/36 | 3 | 2LGW19D | 1 - 30 | 50 | 50 | 18 | N | 1 |
| Sodium | 35/36 | 12300 - 6960000 | 2LPW1S | - | - | - | - | N | 1 |
| Thallium | 1/27 | 5.8 | 2LGW20S | 1 - 20 | 2 | 2 | 0.26 (10) | N | 1 |
| Vanadium | 4/36 | 2.3 - 6.3 | 2LGW14D | 1 - 20 | - | - | 26 | N | 1 |
| Zinc | 20/36 | 2.3 - 74 | 2LGW18S | 2 - 26.3 | 5000 (7) | - | 1100 | N | 1 |

Footnotes:

1 Results in ug/L unless otherwise noted.

2 Sample and duplicate counted as separate samples. Non-validated and rejected results are not used in risk assessment.

Rationale Designations:

1 Chemical detected in unfiltered samples; filtered results not used in risk assessment.

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**SUMMARY OF COC SELECTION**
**SITE 2 AREA A LANDFILL - FILTERED GROUNDWATER (UG/L) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

3 Sample-specific.
4 Maximum contaminant level. (USEPA, May 1995).
5 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II EnvironmentalHealth.
6 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
7 Secondary MCL.
8 Hexavalent Chromium.
9 Action level.
10 Thallic oxide.

000018C

(0-2') Soil Data : Area A Landfill

~~Table X~~

Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| OCDD | 2/2 | 1.5900<br>2.5000 | Log | 2.0450 | | na | na | na | na | na | |
| TIC-KNOWN | 1/1 | 92.0000<br>92.0000 | Log | 92.0000 | | na | na | na | na | na | |
| ALUMINUM | 14/14 | 5150.0000<br>12200.0000 | Log ✓ | 7086.4286 | 8060(b) | na | na | na | na | na | |
| ARSENIC | 11/14 | 0.5900<br>3.7000 | Log ✓ | 1.8445 | 2.5(b) | na | na | na | na | na | |
| BARIUM | 14/14 | 29.5000<br>199.0000 | Und | 59.9786 | | na | na | na | na | na | |
| BERYLLIUM | 14/14 | 0.2400<br>2.2000 | Log ✓ | 0.7550 | 1.2(b) | na | na | na | na | na | |
| CADMIUM | 9/14 | 0.4800<br>4.7000 | Und | 2.8211 | | na | na | na | na | na | |
| CALCIUM | 14/14 | 794.0000<br>6090.0000 | Log ✓ | 2369.9286 | 3680(b) | na | na | na | na | na | |
| CHROMIUM | 14/14 | 6.5000<br>26.5000 | Log ✓ | 13.9429 | 17.2(b) | na | na | na | na | na | |
| COBALT | 14/14 | 3.8000<br>14.7000 | Log ✓ | 6.7929 | 8.2(b) | na | na | na | na | na | |
| COPPER | 14/14 | 3.1000<br>871.0000 | Log ✓ | 124.3071 | 794(b) | na | na | na | na | na | |
| IRON | 14/14 | 7660.0000<br>15600.0000 | Log ✓ | 10883.5714 | 12000(b) | na | na | na | na | na | |

Table X
Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LEAD | 14/14 | 4.9000<br>449.0000 | Log ✓ | 81.8929 | 367(b) | na | na | na | na | na | |
| MAGNESIUM | 14/14 | 1680.0000<br>3570.0000 | Log ✓ | 2620.0000 | 2940(b) | na | na | na | na | na | |
| MANGANESE | 14/14 | 93.9000<br>285.0000 | Log ✓ | 178.3500 | 212(b) | na | na | na | na | na | |
| NICKEL | 14/14 | 4.9000<br>47.8000 | Log ✓ | 19.3286 | 33.6(b) | na | na | na | na | na | |
| POTASSIUM | 14/14 | 935.0000<br>2370.0000 | Log ✓ | 1447.5000 | 1660(b) | na | na | na | na | na | |
| SODIUM | 13/14 | 33.6000<br>2030.0000 | Log ✓ | 323.0769 | 830(b) | na | na | na | na | na | |
| VANADIUM | 14/14 | 13.8000<br>36.2000 | Log ✓ | 21.4071 | 24.9(b) | na | na | na | na | na | |
| ZINC | 14/14 | 24.5000<br>5340.0000 | Log ✓ | 557.3571 | 2140(b) | na | na | na | na | na | |
| PYRENE | 7/14 | 57.0000<br>1100.0000 | Und | 306.7143 | | na | na | na | na | na | |
| 4,4'-DDT | 7/14 | 6.8000<br>2300.0000 | Und | 370.2571 | | na | na | na | na | na | |
| AROCLOR-1254 | 9/17 | 15.0000<br>490.0000 | Log | 186.8889 | | na | na | na | na | na | |
| TOTAL ORGANIC CARBON | 1/1 | 4500.0000<br>4500.0000 | Log | 4500.0000 | | na | na | na | na | na | |

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : ALUMINUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 7086.4286 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 5150.0000 | |
| Positive Hits - Maximum | 12200.0000 | |
| Average Of Positive Hits | 7086.4286 | |
| Standard Deviation | 1960.9833 | |
| Upper Confidence Limit - Normal | 8014.6005 | |
| Upper Confidence Limit - Lognormal | 8056.8320 UCL | |
| 95th Percentile - Nonparametric | 12200.0000 | |
| 95th Percentile - Normal | 10312.2461 | |
| 95th Percentile - Lognormal | 10345.6472 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9017 | |
| Corr Coeff - Detected - Lognormal | 0.9371 | |
| Corr Coeff - Total - Normal | 0.9017 | |
| Corr Coeff - Total - Lognormal | 0.9371 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.8213 | NA |
| W-Test - Lognormal | 0.8780 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : ARSENIC (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 11.0000 | |
| Average | 1.5679 | |
| Detection Limit - Minimum | 0.4350 | |
| Detection Limits - Maximum | 0.7500 | |
| Positive Hits - Minimum | 0.5900 | |
| Positive Hits - Maximum | 3.7000 | |
| Average Of Positive Hits | 1.8445 | |
| Standard Deviation | 0.9381 | |
| Upper Confidence Limit - Normal | ~~2.0119~~ | |
| Upper Confidence Limit - Lognormal | 2.4744 ucl | |
| 95th Percentile - Nonparametric | ~~3.7000~~ | |
| 95th Percentile - Normal | 3.1111 | |
| 95th Percentile - Lognormal | 3.8775 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8661 | |
| Corr Coeff - Detected - Lognormal | 0.9199 | |
| Corr Coeff - Total - Normal | 0.9645 | |
| Corr Coeff - Total - Lognormal | 0.9780 | |
| Corr Coeff - Crit Val - Detected | 0.9220 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.9279 | NA |
| W-Test - Lognormal | 0.9437 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

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Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : BERYLLIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 0.7550 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 0.2400 | |
| Positive Hits - Maximum | 2.2000 | |
| Average Of Positive Hits | 0.7550 | |
| Standard Deviation | 0.6358 | |
| Upper Confidence Limit - Normal | ~~1.0560~~ | |
| Upper Confidence Limit - Lognormal | 1.1780 UCL | |
| 95th Percentile - Nonparametric | 2.2000 | |
| 95th Percentile - Normal | 1.8010 | |
| 95th Percentile - Lognormal | 1.8508 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8637 | |
| Corr Coeff - Detected - Lognormal | 0.9505 | |
| Corr Coeff - Total - Normal | 0.8637 | |
| Corr Coeff - Total - Lognormal | 0.9505 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.7441 | NA |
| W-Test - Lognormal | 0.8925 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000023

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : CALCIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 2369.9286 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 794.0000 | |
| Positive Hits - Maximum | 6090.0000 | |
| Average Of Positive Hits | 2369.9286 | |
| Standard Deviation | 1819.2406 | |
| Upper Confidence Limit - Normal | ~~3231.0109~~ | |
| Upper Confidence Limit - Lognormal | 3680.1428 UCL | |
| 95th Percentile - Nonparametric | ~~6090.0000~~ | |
| 95th Percentile - Normal | 5362.5794 | |
| 95th Percentile - Lognormal | 5777.3069 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8874 | |
| Corr Coeff - Detected - Lognormal | 0.9548 | |
| Corr Coeff - Total - Normal | 0.8874 | |
| Corr Coeff - Total - Lognormal | 0.9548 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.7770 | NA |
| W-Test - Lognormal | 0.8938 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000024

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : CHROMIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 13.9429 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 6.5000 | |
| Positive Hits - Maximum | 26.5000 | |
| Average Of Positive Hits | 13.9429 | |
| Standard Deviation | 5.3985 | |
| Upper Confidence Limit - Normal | 16.4981 | |
| Upper Confidence Limit - Lognormal | 17.2588 ud | |
| 95th Percentile - Nonparametric | 26.5000 | |
| 95th Percentile - Normal | 22.8234 | |
| 95th Percentile - Lognormal | 24.3884 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9710 | |
| Corr Coeff - Detected - Lognormal | 0.9974 | |
| Corr Coeff - Total - Normal | 0.9710 | |
| Corr Coeff - Total - Lognormal | 0.9974 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.9477 | NA |
| W-Test - Lognormal | 0.9958 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000025

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : COBALT (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 6.7929 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 3.8000 | |
| Positive Hits - Maximum | 14.7000 | |
| Average Of Positive Hits | 6.7929 | |
| Standard Deviation | 2.8572 | |
| Upper Confidence Limit - Normal | ~~8.1452~~ | |
| Upper Confidence Limit - Lognormal | 8.2304 UCL | |
| 95th Percentile - Nonparametric | ~~14.7000~~ | |
| 95th Percentile - Normal | 11.4930 | |
| 95th Percentile - Lognormal | 11.4606 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8937 | |
| Corr Coeff - Detected - Lognormal | 0.9640 | |
| Corr Coeff - Total - Normal | 0.8937 | |
| Corr Coeff - Total - Lognormal | 0.9640 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.8162 | NA |
| W-Test - Lognormal | 0.9379 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000026

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : COPPER (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 14.0000 | No samples |
| Number of Detects ..... | 14.0000 | |
| Average ..... | 124.3071 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 3.1000 | |
| Positive Hits - Maximum ..... | 871.0000 | |
| Average Of Positive Hits ..... | 124.3071 | |
| Standard Deviation ..... | 232.7075 | |
| Upper Confidence Limit - Normal ..... | 234.4522 | |
| Upper Confidence Limit - Lognormal ... | 793.9525 Pucc | |
| 95th Percentile - Nonparametric..... | 871.0000 | |
| 95th Percentile - Normal..... | 507.1109 | |
| 95th Percentile - Lognormal ..... | 537.8634 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.7271 | |
| Corr Coeff - Detected - Lognormal .... | 0.9911 | |
| Corr Coeff - Total - Normal ..... | 0.7271 | |
| Corr Coeff - Total - Lognormal ..... | 0.9911 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9340 | |
| Corr Coeff - Crit Val - Total ..... | 0.9340 | |
| W-Test - Table Value ..... | 0.8740 | NA |
| W-Test - Normal ..... | 0.5570 | NA |
| W-Test - Lognormal ..... | 0.9776 | NA |
| Type of Distribution ..... | LOGNORMAL✓ | |

Test Results:

000027

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : IRON (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 10883.5714 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 7660.0000 | |
| Positive Hits - Maximum | 15600.0000 | |
| Average Of Positive Hits | 10883.5714 | |
| Standard Deviation | 2092.0936 | |
| Upper Confidence Limit - Normal | 11873.8004 | |
| Upper Confidence Limit - Lognormal | 12004.7503 ucl | |
| 95th Percentile - Nonparametric | 15600.0000 | |
| 95th Percentile - Normal | 14325.0653 | |
| 95th Percentile - Lognormal | 14673.4307 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9768 | |
| Corr Coeff - Detected - Lognormal | 0.9838 | |
| Corr Coeff - Total - Normal | 0.9768 | |
| Corr Coeff - Total - Lognormal | 0.9838 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.9615 | NA |
| W-Test - Lognormal | 0.9713 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

000028

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : LEAD (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 81.8929 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 4.9000 | |
| Positive Hits - Maximum | 449.0000 | |
| Average Of Positive Hits | 81.8929 | |
| Standard Deviation | 124.5782 | |
| Upper Confidence Limit - Normal | 140.8582 | |
| Upper Confidence Limit - Lognormal | 367.4594 UCL | |
| 95th Percentile - Nonparametric | 449.0000 | |
| 95th Percentile - Normal | 286.8240 | |
| 95th Percentile - Lognormal | 338.6732 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8030 | |
| Corr Coeff - Detected - Lognormal | 0.9815 | |
| Corr Coeff - Total - Normal | 0.8030 | |
| Corr Coeff - Total - Lognormal | 0.9815 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.6630 | NA |
| W-Test - Lognormal | 0.9481 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000029

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : MAGNESIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 2620.0000 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 1680.0000 | |
| Positive Hits - Maximum | 3570.0000 | |
| Average Of Positive Hits | 2620.0000 | |
| Standard Deviation | 574.9515 | |
| Upper Confidence Limit - Normal | ~~2892.1358~~ | |
| Upper Confidence Limit - Lognormal | 2943.1277 utc | |
| 95th Percentile - Nonparametric | ~~3570.0000~~ | |
| 95th Percentile - Normal | 3565.7952 | |
| 95th Percentile - Lognormal | 3700.6165 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9838 | |
| Corr Coeff - Detected - Lognormal | 0.9845 | |
| Corr Coeff - Total - Normal | 0.9838 | |
| Corr Coeff - Total - Lognormal | 0.9845 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.9560 | NA |
| W-Test - Lognormal | 0.9600 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : MANGANESE (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 178.3500 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 93.9000 | |
| Positive Hits - Maximum | 285.0000 | |
| Average Of Positive Hits | 178.3500 | |
| Standard Deviation | 58.2555 | |
| Upper Confidence Limit - Normal | ~~205.9235~~ | |
| Upper Confidence Limit - Lognormal | 211.7478 UCL | |
| 95th Percentile - Nonparametric | ~~285.0000~~ | |
| 95th Percentile - Normal | 274.1802 | |
| 95th Percentile - Lognormal | 286.8673 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9518 | |
| Corr Coeff - Detected - Lognormal | 0.9723 | |
| Corr Coeff - Total - Normal | 0.9518 | |
| Corr Coeff - Total - Lognormal | 0.9723 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.8987 | NA |
| W-Test - Lognormal | 0.9425 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : NICKEL (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 19.3286 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 4.9000 | |
| Positive Hits - Maximum | 47.8000 | |
| Average Of Positive Hits | 19.3286 | |
| Standard Deviation | 13.6209 | |
| Upper Confidence Limit - Normal | 25.7756 | |
| Upper Confidence Limit - Lognormal | 33.5810 | |
| 95th Percentile - Nonparametric | 47.8000 | |
| 95th Percentile - Normal | 41.7350 | |
| 95th Percentile - Lognormal | 52.6239 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9489 | |
| Corr Coeff - Detected - Lognormal | 0.9705 | |
| Corr Coeff - Total - Normal | 0.9489 | |
| Corr Coeff - Total - Lognormal | 0.9705 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.8881 | NA |
| W-Test - Lognormal | 0.9206 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : POTASSIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 1447.5000 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 935.0000 | |
| Positive Hits - Maximum | 2370.0000 | |
| Average Of Positive Hits | 1447.5000 | |
| Standard Deviation | 403.9171 | |
| Upper Confidence Limit - Normal | ~~1638.6819~~ | |
| Upper Confidence Limit - Lognormal | 1664.1560 UCL | |
| 95th Percentile - Nonparametric | ~~2370.0000~~ | |
| 95th Percentile - Normal | 2111.9437 | |
| 95th Percentile - Lognormal | 2166.8814 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9633 | |
| Corr Coeff - Detected - Lognormal | 0.9869 | |
| Corr Coeff - Total - Normal | 0.9633 | |
| Corr Coeff - Total - Lognormal | 0.9869 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.9282 | NA |
| W-Test - Lognormal | 0.9692 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000033

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : SODIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 13.0000 | |
| Average | 305.0000 | |
| Detection Limit - Minimum | 70.0000 | |
| Detection Limits - Maximum | 70.0000 | |
| Positive Hits - Minimum | 33.6000 | |
| Positive Hits - Maximum | 2030.0000 | |
| Average Of Positive Hits | 323.0769 | |
| Standard Deviation | 516.2840 | |
| Upper Confidence Limit - Normal | ~~549.3673~~ | |
| Upper Confidence Limit - Lognormal | 830.3181 ucl | |
| 95th Percentile - Nonparametric | ~~2030.0000~~ | |
| 95th Percentile - Normal | 1154.2871 | |
| 95th Percentile - Lognormal | 1024.6780 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6433 | |
| Corr Coeff - Detected - Lognormal | 0.9491 | |
| Corr Coeff - Total - Normal | 0.7077 | |
| Corr Coeff - Total - Lognormal | 0.9688 | |
| Corr Coeff - Crit Val - Detected | 0.9310 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.5331 | NA |
| W-Test - Lognormal | 0.9335 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

000034

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : ZINC (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 557.3571 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 24.5000 | |
| Positive Hits - Maximum | 5340.0000 | |
| Average Of Positive Hits | 557.3571 | |
| Standard Deviation | 1401.4023 | |
| Upper Confidence Limit - Normal | 1220.6684 | |
| Upper Confidence Limit - Lognormal | 2141.3805 UCL | |
| 95th Percentile - Nonparametric | 5340.0000 | |
| 95th Percentile - Normal | 2862.6639 | |
| 95th Percentile - Lognormal | 1623.6456 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6216 | |
| Corr Coeff - Detected - Lognormal | 0.9439 | |
| Corr Coeff - Total - Normal | 0.6216 | |
| Corr Coeff - Total - Lognormal | 0.9439 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.4208 | NA |
| W-Test - Lognormal | 0.8915 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000035

Area A Landfill - 0-2' Soils (Add-On) 1/10/96

~~Table X~~

Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 4/14 | 79.0000Und<br>230.0000 | 128.7500 | | na | na | na | na | na | |
| 4,4'-DDE | 5/14 | 20.0000Und<br>67.0000 | 44.0000 | | na | na | na | na | na | |
| 4,4'-DDT | 7/14 | 6.8000Und<br>2300.0000 | 370.2571 | 2300(d) | na | na | na | na | na | |
| ALDRIN | 1/14 | 0.5600Und<br>0.5600 | 0.5600 | | na | na | na | na | na | |
| ALPHA-CHLORDANE | 4/14 | 12.0000Und<br>39.0000 | 23.0000 | | na | na | na | na | na | |
| AROCLOR-1254 | 7/14 | 15.0000~~Und~~<br>490.0000LOS | 163.1429 | 490(c) | na | na | na | na | na | |
| AROCLOR-1260 | 3/14 | 230.0000Und<br>12000.0000 | 4193.3333 | | na | na | na | na | na | |
| DIELDRIN | 3/14 | 4.4000Und<br>7.5000 | 5.4667 | | na | na | na | na | na | |
| ENDOSULFAN II | 1/14 | 2.0000Und<br>2.0000 | 2.0000 | | na | na | na | na | na | |
| ENDRIN | 3/14 | 0.8900Und<br>2.4000 | 1.6300 | | na | na | na | na | na | |
| ENDRIN ALDEHYDE | 1/10 | 19.0000Und<br>19.0000 | 19.0000 | | na | na | na | na | na | |
| ENDRIN KETONE | 1/14 | 570.0000Und<br>570.0000 | 570.0000 | | na | na | na | na | na | |

000037

Dataset: UTMP_RES
Media : SOIL DATA(0-2') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : AROCLOR-1254 (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 7.0000 | |
| Average | 219.2857 | |
| Detection Limit - Minimum | 18.5000 | |
| Detection Limits - Maximum | 850.0000 | |
| Positive Hits - Minimum | ~~15.0000~~ | |
| Positive Hits - Maximum | 490.0000 UCL | |
| Average Of Positive Hits | ~~163.1429~~ | |
| Standard Deviation | 295.1088 | |
| Upper Confidence Limit - Normal | 358.9665 | |
| Upper Confidence Limit - Lognormal | 1072.1229 > max hit | |
| 95th Percentile - Nonparametric | 850.0000 | |
| 95th Percentile - Normal | 704.7396 | |
| 95th Percentile - Lognormal | 967.7757 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7872 | |
| Corr Coeff - Detected - Lognormal | 0.7642 | |
| Corr Coeff - Total - Normal | 0.8386 | |
| Corr Coeff - Total - Lognormal | 0.9601 | |
| Corr Coeff - Crit Val - Detected | 0.8990 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.6969 | NA |
| W-Test - Lognormal | 0.8970 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000039

Dataset: UTMP_RES
Media : SOIL DATA(0-2') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : 4,4'-DDT (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 14.0000 | No samples |
| Number of Detects ..... | 7.0000 | |
| Average ..... | 192.1357 | |
| Detection Limit - Minimum ..... | 1.7500 | |
| Detection Limits - Maximum ..... | 85.0000 | |
| Positive Hits - Minimum ..... | ~~6.8000~~ | |
| Positive Hits - Maximum ..... | 2300.0000 ucl | |
| Average Of Positive Hits ..... | ~~370.2571~~ | |
| Standard Deviation ..... | 607.8489 | |
| Upper Confidence Limit - Normal ..... | 479.8425 | |
| Upper Confidence Limit - Lognormal ... | 3206.7471 | |
| 95th Percentile - Nonparametric..... | 2300.0000 | |
| 95th Percentile - Normal..... | 1192.0471 | |
| 95th Percentile - Lognormal ..... | 513.3570 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.5273 | |
| Corr Coeff - Detected - Lognormal .... | 0.4454 | |
| Corr Coeff - Total - Normal ..... | 0.5556 | |
| Corr Coeff - Total - Lognormal ..... | 0.9337 | |
| Corr Coeff - Crit Val - Detected ..... | 0.8990 | |
| Corr Coeff - Crit Val - Total ..... | 0.9340 | |
| W-Test - Table Value ..... | 0.8740 | NA |
| W-Test - Normal ..... | 0.3441 | NA |
| W-Test - Lognormal ..... | 0.8663 | NA |
| Type of Distribution ..... | UNDEFINED✓ | |

Test Results:

Soil Data (0-10') - Area A Landfill

~~Table X~~

Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALUMINUM | 32/32 | 4450.0000<br>15100.0000 | Log ✓ | 8031.5625 | 8800(b) | na | na | na | na | na | |
| ARSENIC | 29/32 | 0.5900<br>10.6000 | Log ✓ | 3.0597 | 3.9(b) | na | na | na | na | na | |
| BARIUM | 32/32 | 18.4000<br>667.0000 | Und ✓ | 97.1063 | 667(d) | na | na | na | na | na | |
| BERYLLIUM | 32/32 | 0.2500<br>3.9000 | Und ✓ | 0.9097 | 3.9(d) | na | na | na | na | na | |
| CADMIUM | 26/32 | 0.4800<br>12.1000 | Und ✓ | 4.1358 | 12.1(d) | na | na | na | na | na | |
| CALCIUM | 32/32 | 794.0000<br>17200.0000 | Log ✓ | 3499.8750 | 4730(b) | na | na | na | na | na | |
| CHROMIUM | 32/32 | 8.2000<br>289.0000 | Und ✓ | 32.5125 | 289(d) | na | na | na | na | na | |
| COBALT | 31/32 | 3.8000<br>122.0000 | Und ✓ | 13.6903 | 122(d) | na | na | na | na | na | |
| COPPER | 32/32 | 4.3000<br>21600.0000 | Log ✓ | 961.6281 | 2240(b) | na | na | na | na | na | |
| IRON | 32/32 | 7660.0000<br>*****.**** | Und ✓ | 25107.5000 | 157000(d) | na | na | na | na | na | |
| LEAD | 32/32 | 5.0000<br>1780.0000 | Log ✓ | 226.1719 | 915(b) | na | na | na | na | na | |
| MAGNESIUM | 32/32 | 1570.0000<br>9330.0000 | Log ✓ | 3055.0000 | 3430(b) | na | na | na | na | na | |

Table X
Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MANGANESE | 32/32 | 74.0000<br>1150.0000 | Und ✓ | 265.3094 | 1150(d) | na | na | na | na | na | |
| NICKEL | 32/32 | 5.6000<br>1440.0000 | Und ✓ | 81.9219 | 1440(d) | na | na | na | na | na | |
| POTASSIUM | 32/32 | 549.0000<br>3700.0000 | Log ✓ | 1465.4063 | 1660(b) | na | na | na | na | na | |
| SODIUM | 30/32 | 34.3000<br>4120.0000 | Log ✓ | 602.8567 | 936(b) | na | na | na | na | na | |
| VANADIUM | 32/32 | 13.8000<br>138.0000 | Und | 28.0375 | 138(d) | na | na | na | na | na | |
| ZINC | 32/32 | 24.5000<br>9850.0000 | Log ✓ | 1111.9969 | 9850(d) | na | na | na | na | na | |
| BENZO(K)FLUORANTHENE | 16/32 | 57.0000<br>14000.0000 | Und ✓ | 1315.3750 | 14,000(d) | na | na | na | na | na | |
| CHRYSENE | 16/32 | 37.0000<br>19000.0000 | Und ✓ | 1796.6875 | 19,000(d) | na | na | na | na | na | |
| FLUORANTHENE | 18/32 | 49.0000<br>47000.0000 | Und ✓ | 3541.0556 | 47000(d) | na | na | na | na | na | |
| PHENANTHRENE | 16/32 | 66.0000<br>61000.0000 | Und ✓ | 4813.2500 | 61,000(d) | na | na | na | na | na | |
| PYRENE | 19/32 | 57.0000<br>40000.0000 | Und | 3110.8947 | 40000(d) | na | na | na | na | na | |

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : ALUMINUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 32.0000 | |
| Average | 8031.5625 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 4450.0000 | |
| Positive Hits - Maximum | 15100.0000 | |
| Average Of Positive Hits | 8031.5625 | |
| Standard Deviation | 2534.2812 | |
| Upper Confidence Limit - Normal | ~~8791.2393~~ | |
| Upper Confidence Limit - Lognormal | 8801.8694 ucl | |
| 95th Percentile - Nonparametric | ~~15100.0000~~ | |
| 95th Percentile - Normal | 12200.4551 | |
| 95th Percentile - Lognormal | 12367.8258 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9382 | |
| Corr Coeff - Detected - Lognormal | 0.9804 | |
| Corr Coeff - Total - Normal | 0.9382 | |
| Corr Coeff - Total - Lognormal | 0.9804 | |
| Corr Coeff - Crit Val - Detected | 0.9660 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.8812 | NA |
| W-Test - Lognormal | 0.9590 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000043

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : ARSENIC (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 32.0000 | No samples |
| Number of Detects ..... | 29.0000 | |
| Average ..... | 2.8247 | |
| Detection Limit - Minimum ..... | 0.4350 | |
| Detection Limits - Maximum ..... | 0.7500 | |
| Positive Hits - Minimum ..... | 0.5900 | |
| Positive Hits - Maximum ..... | 10.6000 | |
| Average Of Positive Hits ..... | 3.0597 | |
| Standard Deviation ..... | 2.3891 | |
| Upper Confidence Limit - Normal ..... | 3.5409 | |
| Upper Confidence Limit - Lognormal ... | 3.9056 use | |
| 95th Percentile - Nonparametric..... | 10.6000 | |
| 95th Percentile - Normal..... | 6.7548 | |
| 95th Percentile - Lognormal ..... | 7.6785 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.8431 | |
| Corr Coeff - Detected - Lognormal .... | 0.9624 | |
| Corr Coeff - Total - Normal ..... | 0.8872 | |
| Corr Coeff - Total - Lognormal ..... | 0.9923 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9620 | |
| Corr Coeff - Crit Val - Total ..... | 0.9660 | |
| W-Test - Table Value ..... | 0.9300 | NA |
| W-Test - Normal ..... | 0.7936 | NA |
| W-Test - Lognormal ..... | 0.9777 | NA |
| Type of Distribution ..... | LOGNORMAL | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : BARIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 32.0000 | |
| Average | 97.1063 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 18.4000 | |
| Positive Hits - Maximum | 667.0000 UCL | |
| Average Of Positive Hits | 97.1063 | |
| Standard Deviation | 128.3736 | |
| Upper Confidence Limit - Normal | 135.5876 | |
| Upper Confidence Limit - Lognormal | 119.0184 | |
| 95th Percentile - Nonparametric | 667.0000 | |
| 95th Percentile - Normal | 308.2808 | |
| 95th Percentile - Lognormal | 232.1794 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7064 | |
| Corr Coeff - Detected - Lognormal | 0.9397 | |
| Corr Coeff - Total - Normal | 0.7064 | |
| Corr Coeff - Total - Lognormal | 0.9397 | |
| Corr Coeff - Crit Val - Detected | 0.9660 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.5289 | NA |
| W-Test - Lognormal | 0.8941 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : BERYLLIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 32.0000 | |
| Average | 0.9097 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 0.2500 | |
| Positive Hits - Maximum | 3.9000 ucl | |
| Average Of Positive Hits | ~~0.9097~~ | |
| Standard Deviation | 0.8647 | |
| Upper Confidence Limit - Normal | 1.1689 | |
| Upper Confidence Limit - Lognormal | 1.1810 | |
| 95th Percentile - Nonparametric | 3.9000 | |
| 95th Percentile - Normal | 2.3321 | |
| 95th Percentile - Lognormal | 2.2975 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8465 | |
| Corr Coeff - Detected - Lognormal | 0.9529 | |
| Corr Coeff - Total - Normal | 0.8465 | |
| Corr Coeff - Total - Lognormal | 0.9529 | |
| Corr Coeff - Crit Val - Detected | 0.9660 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.7251 | NA |
| W-Test - Lognormal | 0.8957 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

000046

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : CADMIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 26.0000 | |
| Average | 3.3936 | |
| Detection Limit - Minimum | 0.1100 | |
| Detection Limits - Maximum | 0.2150 | |
| Positive Hits - Minimum | 0.4800 | |
| Positive Hits - Maximum | 12.1000 UCL | |
| Average Of Positive Hits | 4.1358 | |
| Standard Deviation | 3.0922 | |
| Upper Confidence Limit - Normal | 4.3205 | |
| Upper Confidence Limit - Lognormal | 9.6480 | |
| 95th Percentile - Nonparametric | 12.1000 | |
| 95th Percentile - Normal | 8.4803 | |
| 95th Percentile - Lognormal | 17.5274 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8537 | |
| Corr Coeff - Detected - Lognormal | 0.9098 | |
| Corr Coeff - Total - Normal | 0.9285 | |
| Corr Coeff - Total - Lognormal | 0.9464 | |
| Corr Coeff - Crit Val - Detected | 0.9590 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.8575 | NA |
| W-Test - Lognormal | 0.8794 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

00047

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : CALCIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 32.0000 | |
| Average | 3499.8750 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 794.0000 | |
| Positive Hits - Maximum | 17200.0000 | |
| Average Of Positive Hits | 3499.8750 | |
| Standard Deviation | 3508.3652 | |
| Upper Confidence Limit - Normal | 4551.5434 | |
| Upper Confidence Limit - Lognormal | 4726.0258 | |
| 95th Percentile - Nonparametric | 17200.0000 | |
| 95th Percentile - Normal | 9271.1357 | |
| 95th Percentile - Lognormal | 9370.7312 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8446 | |
| Corr Coeff - Detected - Lognormal | 0.9711 | |
| Corr Coeff - Total - Normal | 0.8446 | |
| Corr Coeff - Total - Lognormal | 0.9711 | |
| Corr Coeff - Crit Val - Detected | 0.9660 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.7302 | NA |
| W-Test - Lognormal | 0.9317 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

000048

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : CHROMIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 32.0000 | |
| Average | 32.5125 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 8.2000 | |
| Positive Hits - Maximum | 289.0000 | |
| Average Of Positive Hits | 32.5125 | |
| Standard Deviation | 52.3857 | |
| Upper Confidence Limit - Normal | 48.2157 | |
| Upper Confidence Limit - Lognormal | 37.9983 | |
| 95th Percentile - Nonparametric | 289.0000 | |
| 95th Percentile - Normal | 118.6870 | |
| 95th Percentile - Lognormal | 74.4276 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6347 | |
| Corr Coeff - Detected - Lognormal | 0.9140 | |
| Corr Coeff - Total - Normal | 0.6347 | |
| Corr Coeff - Total - Lognormal | 0.9140 | |
| Corr Coeff - Crit Val - Detected | 0.9660 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.4384 | NA |
| W-Test - Lognormal | 0.8464 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

000049

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : COBALT (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 31.0000 | |
| Average | 13.3328 | |
| Detection Limit - Minimum | 2.2500 | |
| Detection Limits - Maximum | 2.2500 | |
| Positive Hits - Minimum | 3.8000 | |
| Positive Hits - Maximum | 122.0000 | |
| Average Of Positive Hits | 13.6903 | |
| Standard Deviation | 21.9862 | |
| Upper Confidence Limit - Normal | 19.9234 | |
| Upper Confidence Limit - Lognormal | 15.5167 | |
| 95th Percentile - Nonparametric | 122.0000 | |
| 95th Percentile - Normal | 49.5001 | |
| 95th Percentile - Lognormal | 30.4133 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6278 | |
| Corr Coeff - Detected - Lognormal | 0.8931 | |
| Corr Coeff - Total - Normal | 0.6248 | |
| Corr Coeff - Total - Lognormal | 0.9021 | |
| Corr Coeff - Crit Val - Detected | 0.9650 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.4272 | NA |
| W-Test - Lognormal | 0.8363 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

00050

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : COPPER (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 32.0000 | |
| Average | 961.6281 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 4.3000 | |
| Positive Hits - Maximum | 21600.0000 | |
| Average Of Positive Hits | 961.6281 | |
| Standard Deviation | 3831.1909 | |
| Upper Confidence Limit - Normal | 2110.0668 | |
| Upper Confidence Limit - Lognormal | 2262.7734 ucc | |
| 95th Percentile - Nonparametric | 21600.0000 | |
| 95th Percentile - Normal | 7263.9371 | |
| 95th Percentile - Lognormal | 2117.3655 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.4760 | |
| Corr Coeff - Detected - Lognormal | 0.9744 | |
| Corr Coeff - Total - Normal | 0.4760 | |
| Corr Coeff - Total - Lognormal | 0.9744 | |
| Corr Coeff - Crit Val - Detected | 0.9660 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.2639 | NA |
| W-Test - Lognormal | 0.9490 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : IRON (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 32.0000 | |
| Average | 25107.5000 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 7660.0000 | |
| Positive Hits - Maximum | 157000.0000 ucl | |
| Average Of Positive Hits | 25107.5000 | |
| Standard Deviation | 35361.9816 | |
| Upper Confidence Limit - Normal | 35707.6162 | |
| Upper Confidence Limit - Lognormal | 29701.9088 | |
| 95th Percentile - Nonparametric | 157000.0000 | |
| 95th Percentile - Normal | 83277.9597 | |
| 95th Percentile - Lognormal | 58002.2992 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6864 | |
| Corr Coeff - Detected - Lognormal | 0.8717 | |
| Corr Coeff - Total - Normal | 0.6864 | |
| Corr Coeff - Total - Lognormal | 0.8717 | |
| Corr Coeff - Crit Val - Detected | 0.9660 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.4895 | NA |
| W-Test - Lognormal | 0.7618 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : LEAD (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 32.0000 | |
| Average | 226.1719 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 5.0000 | |
| Positive Hits - Maximum | 1780.0000 | |
| Average Of Positive Hits | 226.1719 | |
| Standard Deviation | 397.0656 | |
| Upper Confidence Limit - Normal | 345.1964 | |
| Upper Confidence Limit - Lognormal | 915.4268 UCL | |
| 95th Percentile - Nonparametric | 1780.0000 | |
| 95th Percentile - Normal | 879.3449 | |
| 95th Percentile - Lognormal | 1112.0742 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7709 | |
| Corr Coeff - Detected - Lognormal | 0.9772 | |
| Corr Coeff - Total - Normal | 0.7709 | |
| Corr Coeff - Total - Lognormal | 0.9772 | |
| Corr Coeff - Crit Val - Detected | 0.9660 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.6121 | NA |
| W-Test - Lognormal | 0.9318 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

000053

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : MAGNESIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 32.0000 | |
| Average | 3055.0000 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 1570.0000 | |
| Positive Hits - Maximum | 9330.0000 | |
| Average Of Positive Hits | 3055.0000 | |
| Standard Deviation | 1457.8398 | |
| Upper Confidence Limit - Normal | 3492.0024 | |
| Upper Confidence Limit - Lognormal | 3432.3017 | |
| 95th Percentile - Nonparametric | 9330.0000 | |
| 95th Percentile - Normal | 5453.1464 | |
| 95th Percentile - Lognormal | 5235.4899 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8483 | |
| Corr Coeff - Detected - Lognormal | 0.9671 | |
| Corr Coeff - Total - Normal | 0.8483 | |
| Corr Coeff - Total - Lognormal | 0.9671 | |
| Corr Coeff - Crit Val - Detected | 0.9660 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.7480 | NA |
| W-Test - Lognormal | 0.9449 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : MANGANESE (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 32.0000 | |
| Average | 265.3094 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 74.0000 | |
| Positive Hits - Maximum | 1150.0000 | |
| Average Of Positive Hits | ~~265.3094~~ | |
| Standard Deviation | 238.3138 | |
| Upper Confidence Limit - Normal | 336.7464 | |
| Upper Confidence Limit - Lognormal | 320.4965 | |
| 95th Percentile - Nonparametric | 1150.0000 | |
| 95th Percentile - Normal | 657.3355 | |
| 95th Percentile - Lognormal | 584.3149 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7802 | |
| Corr Coeff - Detected - Lognormal | 0.9590 | |
| Corr Coeff - Total - Normal | 0.7802 | |
| Corr Coeff - Total - Lognormal | 0.9590 | |
| Corr Coeff - Crit Val - Detected | 0.9660 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.6271 | NA |
| W-Test - Lognormal | 0.9239 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

00055

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : NICKEL (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 32.0000 | |
| Average | 81.9219 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 5.6000 | |
| Positive Hits - Maximum | 1440.0000 | |
| Average Of Positive Hits | 81.9219 | |
| Standard Deviation | 252.7576 | |
| Upper Confidence Limit - Normal | 157.6885 | |
| Upper Confidence Limit - Lognormal | 95.0575 | |
| 95th Percentile - Nonparametric | 1440.0000 | |
| 95th Percentile - Normal | 497.7081 | |
| 95th Percentile - Lognormal | 187.0047 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.5117 | |
| Corr Coeff - Detected - Lognormal | 0.9431 | |
| Corr Coeff - Total - Normal | 0.5117 | |
| Corr Coeff - Total - Lognormal | 0.9431 | |
| Corr Coeff - Crit Val - Detected | 0.9660 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.3004 | NA |
| W-Test - Lognormal | 0.8976 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : POTASSIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 32.0000 | |
| Average | 1465.4063 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 549.0000 | |
| Positive Hits - Maximum | 3700.0000 | |
| Average Of Positive Hits | 1465.4063 | |
| Standard Deviation | 652.8873 | |
| Upper Confidence Limit - Normal | 1661.1159 | |
| Upper Confidence Limit - Lognormal | 1664.9980 UCL | |
| 95th Percentile - Nonparametric | 3700.0000 | |
| 95th Percentile - Normal | 2539.4058 | |
| 95th Percentile - Lognormal | 2577.5355 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9093 | |
| Corr Coeff - Detected - Lognormal | 0.9819 | |
| Corr Coeff - Total - Normal | 0.9093 | |
| Corr Coeff - Total - Lognormal | 0.9819 | |
| Corr Coeff - Crit Val - Detected | 0.9660 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.8426 | NA |
| W-Test - Lognormal | 0.9753 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

000057

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : SODIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 30.0000 | |
| Average | 571.5375 | |
| Detection Limit - Minimum | 70.0000 | |
| Detection Limits - Maximum | 133.5000 | |
| Positive Hits - Minimum | 34.3000 | |
| Positive Hits - Maximum | 4120.0000 | |
| Average Of Positive Hits | 602.8567 | |
| Standard Deviation | 1000.8339 | |
| Upper Confidence Limit - Normal | 871.5477 | |
| Upper Confidence Limit - Lognormal | 935.5844 ucl | |
| 95th Percentile - Nonparametric | 4120.0000 | |
| 95th Percentile - Normal | 2217.9093 | |
| 95th Percentile - Lognormal | 1837.0987 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6751 | |
| Corr Coeff - Detected - Lognormal | 0.9642 | |
| Corr Coeff - Total - Normal | 0.7115 | |
| Corr Coeff - Total - Lognormal | 0.9740 | |
| Corr Coeff - Crit Val - Detected | 0.9640 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.5214 | NA |
| W-Test - Lognormal | 0.9414 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : VANADIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 32.0000 | |
| Average | 28.0375 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | ~~13.8000~~ | |
| Positive Hits - Maximum | 138.0000 | |
| Average Of Positive Hits | ~~28.0375~~ | |
| Standard Deviation | 22.9182 | |
| Upper Confidence Limit - Normal | 34.9075 | |
| Upper Confidence Limit - Lognormal | 31.7008 | |
| 95th Percentile - Nonparametric | 138.0000 | |
| 95th Percentile - Normal | 65.7380 | |
| 95th Percentile - Lognormal | 52.3834 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6946 | |
| Corr Coeff - Detected - Lognormal | 0.8977 | |
| Corr Coeff - Total - Normal | 0.6946 | |
| Corr Coeff - Total - Lognormal | 0.8977 | |
| Corr Coeff - Crit Val - Detected | 0.9660 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.5180 | NA |
| W-Test - Lognormal | 0.8237 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

000039

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : ZINC (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 32.0000 | |
| Average | 1111.9969 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 24.5000 | |
| Positive Hits - Maximum | 9850.0000 UCL | |
| Average Of Positive Hits | 1111.9969 | |
| Standard Deviation | 2290.3541 | |
| Upper Confidence Limit - Normal | 1798.5540 | |
| Upper Confidence Limit - Lognormal | 3440.6371 | |
| 95th Percentile - Nonparametric | 9850.0000 | |
| 95th Percentile - Normal | 4879.6293 | |
| 95th Percentile - Lognormal | 4296.2415 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7203 | |
| Corr Coeff - Detected - Lognormal | 0.9677 | |
| Corr Coeff - Total - Normal | 0.7203 | |
| Corr Coeff - Total - Lognormal | 0.9677 | |
| Corr Coeff - Crit Val - Detected | 0.9660 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.5366 | NA |
| W-Test - Lognormal | 0.9168 | NA |
| Type of Distribution | ~~LOGNORMAL~~ Undefined | |

Test Results:

000050

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : BENZO(K)FLUORANTHENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 16.0000 | |
| Average | 1479.2500 | |
| Detection Limit - Minimum | 175.0000 | |
| Detection Limits - Maximum | 5500.0000 | |
| Positive Hits - Minimum | 57.0000 | |
| Positive Hits - Maximum | 14000.000 | |
| Average Of Positive Hits | 1315.3750 | |
| Standard Deviation | 2818.8834 | |
| Upper Confidence Limit - Normal | 2324.2392 | |
| Upper Confidence Limit - Lognormal | 2956.5046 | |
| 95th Percentile - Nonparametric | 14000.0000 | |
| 95th Percentile - Normal | 6116.3132 | |
| 95th Percentile - Lognormal | 5048.0558 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.5901 | |
| Corr Coeff - Detected - Lognormal | 0.9499 | |
| Corr Coeff - Total - Normal | 0.7222 | |
| Corr Coeff - Total - Lognormal | 0.9435 | |
| Corr Coeff - Crit Val - Detected | 0.9400 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.5489 | NA |
| W-Test - Lognormal | 0.8807 | NA |
| Type of Distribution | ~~LOGNORMAL~~ Undefined | |

Test Results:

000061

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : CHRYSENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 16.0000 | |
| Average | 1715.2188 | |
| Detection Limit - Minimum | 175.0000 | |
| Detection Limits - Maximum | 5500.0000 | |
| Positive Hits - Minimum | 37.0000 | |
| Positive Hits - Maximum | 19000.0000 UCL | |
| Average Of Positive Hits | 1796.6875 | |
| Standard Deviation | 3571.5421 | |
| Upper Confidence Limit - Normal | 2785.8251 | |
| Upper Confidence Limit - Lognormal | 3508.4776 | |
| 95th Percentile - Nonparametric | 19000.0000 | |
| 95th Percentile - Normal | 7590.4055 | |
| 95th Percentile - Lognormal | 5880.0079 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.5637 | |
| Corr Coeff - Detected - Lognormal | 0.9108 | |
| Corr Coeff - Total - Normal | 0.6782 | |
| Corr Coeff - Total - Lognormal | 0.9472 | |
| Corr Coeff - Crit Val - Detected | 0.9400 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.4938 | NA |
| W-Test - Lognormal | 0.8959 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : FLUORANTHENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 2779.3438 | |
| Detection Limit - Minimum | 175.0000 | |
| Detection Limits - Maximum | 5500.0000 | |
| Positive Hits - Minimum | ~~49.0000~~ | |
| Positive Hits - Maximum | 47000.0000 ucl | |
| Average Of Positive Hits | ~~3541.0556~~ | |
| Standard Deviation | 8272.1957 | |
| Upper Confidence Limit - Normal | 5259.0192 | |
| Upper Confidence Limit - Lognormal | 5316.5757 | |
| 95th Percentile - Nonparametric | 47000.0000 | |
| 95th Percentile - Normal | 16387.1058 | |
| 95th Percentile - Lognormal | 8224.3150 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.3869 | |
| Corr Coeff - Detected - Lognormal | 0.7189 | |
| Corr Coeff - Total - Normal | 0.5381 | |
| Corr Coeff - Total - Lognormal | 0.9376 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.3284 | NA |
| W-Test - Lognormal | 0.8814 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : PHENANTHRENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 16.0000 | |
| Average | 3093.8125 | |
| Detection Limit - Minimum | 175.0000 | |
| Detection Limits - Maximum | 5500.0000 | |
| Positive Hits - Minimum | ~~66.0000~~ | |
| Positive Hits - Maximum | 61000.0000 UCL | |
| Average Of Positive Hits | ~~4813.2500~~ | |
| Standard Deviation | 10724.2434 | |
| Upper Confidence Limit - Normal | 6308.5143 | |
| Upper Confidence Limit - Lognormal | 4715.9885 | |
| 95th Percentile - Nonparametric | 61000.0000 | |
| 95th Percentile - Normal | 20735.1929 | |
| 95th Percentile - Lognormal | 7273.9054 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.5527 | |
| Corr Coeff - Detected - Lognormal | 0.9528 | |
| Corr Coeff - Total - Normal | 0.4991 | |
| Corr Coeff - Total - Lognormal | 0.9214 | |
| Corr Coeff - Crit Val - Detected | 0.9400 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.2873 | NA |
| W-Test - Lognormal | 0.8525 | NA |
| Type of Distribution | ~~LOGNORMAL~~ Undefined | |

Test Results:

000464

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A LANDFILL

Parameter : PYRENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 32.0000 | No samples |
| Number of Detects | 19.0000 | |
| Average | 2489.2813 | |
| Detection Limit - Minimum | 175.0000 | |
| Detection Limits - Maximum | 5500.0000 | |
| Positive Hits - Minimum | 57.0000 | |
| Positive Hits - Maximum | 40000.0000 UCL | |
| Average Of Positive Hits | 3110.8947 | |
| Standard Deviation | 7063.8174 | |
| Upper Confidence Limit - Normal | 4606.7329 | |
| Upper Confidence Limit - Lognormal | 4513.3734 | |
| 95th Percentile - Nonparametric | 40000.0000 | |
| 95th Percentile - Normal | 14109.2609 | |
| 95th Percentile - Lognormal | 7399.9565 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.4021 | |
| Corr Coeff - Detected - Lognormal | 0.7425 | |
| Corr Coeff - Total - Normal | 0.5538 | |
| Corr Coeff - Total - Lognormal | 0.9487 | |
| Corr Coeff - Crit Val - Detected | 0.9470 | |
| Corr Coeff - Crit Val - Total | 0.9660 | |
| W-Test - Table Value | 0.9300 | NA |
| W-Test - Normal | 0.3456 | NA |
| W-Test - Lognormal | 0.9012 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

Unfiltered Groundwater - Area A Landfill

~~Table X~~

Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| OIL & GREASE | 1/1 | 0.8000Log<br>0.8000 | 0.8000 | | na | na | na | na | na | |
| BIOCHEMICAL OXYGEN DEMAND | 1/1 | 2.2000Log<br>2.2000 | 2.2000 | | na | na | na | na | na | |
| GROSS ALPHA | 12/12 | 0.5000Log<br>17.9000 | 6.7583 | | na | na | na | na | na | |
| GROSS BETA | 13/13 | 1.8000Log ✓<br>64.0000 | 20.0538 | 60.3(b) | na | na | na | na | na | |
| GROSS GAMMA | 4/1 | *****.****Norm<br>190.0000 | *****.**** | | na | na | na | na | na | |
| ALUMINUM | 13/18 | 45.0500Und<br>89300.0000 | 7762.1962 | | na | na | na | na | na | |
| ANTIMONY | 1/17 | 13.0333Und<br>13.0333 | 13.0333 | | na | na | na | na | na | |
| ARSENIC | 15/18 | 2.0333Und<br>19.6000 | 4.8289 | | na | na | na | na | na | |
| BARIUM | 18/18 | 8.6333Log ✓<br>919.6667 | 191.7731 | 473(b) | na | na | na | na | na | |
| BERYLLIUM | 4/18 | 0.7000Und<br>4.2000 | 1.6667 | | na | na | na | na | na | |
| BORON | 6/18 | 40.6625Und<br>1684.7500 | 481.6771 | | na | na | na | na | na | |
| CADMIUM | 7/18 | 1.4167Und<br>16.1667 | 5.8441 | | na | na | na | na | na | |

000067

Table X
Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CALCIUM | 18/18 | 14933.3333<br>*****.**** | Log✓ | 47425.0000 | 64600(b) | na | na | na | na | na | |
| CHROMIUM | 11/18 | 2.1000<br>142.0000 | Und | 18.2477 | | na | na | na | na | na | |
| COBALT | 7/18 | 2.9750<br>35.5000 | Und | 11.0583 | | na | na | na | na | na | |
| COPPER | 17/18 | 2.7500<br>125.0000 | Und | 14.4240 | | na | na | na | na | na | |
| IRON | 18/18 | 2524.0500<br>*****.**** | Log✓ | 33846.6056 | 66000(b) | na | na | na | na | na | |
| LEAD | 13/18 | 1.5000<br>51.1000 | Log✓ | 9.7224 | 14.2(b) | na | na | na | na | na | |
| MAGNESIUM | 18/18 | 2746.6667<br>*****.**** | Und | 27455.8334 | | na | na | na | na | na | |
| MANGANESE | 18/18 | 152.8333<br>2570.0000 | Log ✓ | 695.8241 | 996(b) | na | na | na | na | na | |
| MERCURY | 3/18 | 0.1733<br>0.3200 | Und | 0.2267 | | na | na | na | na | na | |
| NICKEL | 11/18 | 8.7000<br>79.5000 | Log✓ | 23.0000 | 25.6(b) | na | na | na | na | na | |
| POTASSIUM | 18/18 | 931.6667<br>90733.3333 | Log✓ | 16656.3426 | 35700(b) | na | na | na | na | na | |
| SELENIUM | 6/18 | 1.1667<br>6.4667 | Und | 2.3722 | | na | na | na | na | na | |

000068

Table X
Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| SILVER | 2/18 | 2.2500Und<br>2.3333 | 2.2917 | | na | na | na | na | na | |
| SODIUM | 18/18 | 12600.0000Und<br>*****.**** | *****.**** | | na | na | na | na | na | |
| THALLIUM | 2/18 | 1.6750Und<br>2.5000 | 2.0875 | | na | na | na | na | na | |
| VANADIUM | 5/18 | 2.8333Und<br>182.0000 | 47.9200 | | na | na | na | na | na | |
| ZINC | 18/18 | 3.4667Log<br>297.4000 | 48.0618 | 122(b) | na | na | na | na | na | |
| 1,1,2,2-TETRACHLOROETHANE | 2/18 | 3.6667Und<br>84.6667 | 44.1667 | | na | na | na | na | na | |
| 1,2-DICHLOROETHENE (TOTAL) | 2/18 | 1.3333Und<br>2.0000 | 1.6667 | | na | na | na | na | na | |
| 4-METHYL-2-PENTANONE | 2/18 | 7.3333Und<br>19.6667 | 13.5000 | | na | na | na | na | na | |
| ACETONE | 1/18 | 7.5000Und<br>7.5000 | 7.5000 | | na | na | na | na | na | |
| BENZENE | 1/18 | 15.8333Und<br>15.8333 | 15.8333 | | na | na | na | na | na | |
| CARBON DISULFIDE | 5/18 | 1.0000Und<br>3.5000 | 2.1667 | | na | na | na | na | na | |
| CHLOROBENZENE | 2/18 | 4.5000Und<br>573.3333 | 288.9167 | | na | na | na | na | na | |

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : GROSS ALPHA (PCI/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 12.0000 | No samples |
| Number of Detects | 12.0000 | |
| Average | 6.7583 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 0.5000 | |
| Positive Hits - Maximum | 17.9000 | |
| Average Of Positive Hits | 6.7583 | |
| Standard Deviation | 5.7703 | |
| Upper Confidence Limit - Normal | 9.7500 | |
| Upper Confidence Limit - Lognormal | 21.8934 >mcl | |
| 95th Percentile - Nonparametric | 17.9000 | |
| 95th Percentile - Normal | 16.2505 | |
| 95th Percentile - Lognormal | 26.2531 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9525 | |
| Corr Coeff - Detected - Lognormal | 0.9806 | |
| Corr Coeff - Total - Normal | 0.9525 | |
| Corr Coeff - Total - Lognormal | 0.9806 | |
| Corr Coeff - Crit Val - Detected | 0.9260 | |
| Corr Coeff - Crit Val - Total | 0.9260 | |
| W-Test - Table Value | 0.8590 | NA |
| W-Test - Normal | 0.8931 | NA |
| W-Test - Lognormal | 0.9533 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : GROSS BETA (PCI/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 13.0000 | No samples |
| Number of Detects | 13.0000 | |
| Average | 20.0538 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 1.8000 | |
| Positive Hits - Maximum | 64.0000 | |
| Average Of Positive Hits | 20.0538 | |
| Standard Deviation | 18.8443 | |
| Upper Confidence Limit - Normal | ~~29.3674~~ | |
| Upper Confidence Limit - Lognormal | 60.2932 UCL | |
| 95th Percentile - Nonparametric | ~~64.0000~~ | |
| 95th Percentile - Normal | 51.0527 | |
| 95th Percentile - Lognormal | 76.4185 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9246 | |
| Corr Coeff - Detected - Lognormal | 0.9857 | |
| Corr Coeff - Total - Normal | 0.9246 | |
| Corr Coeff - Total - Lognormal | 0.9857 | |
| Corr Coeff - Crit Val - Detected | 0.9310 | |
| Corr Coeff - Crit Val - Total | 0.9310 | |
| W-Test - Table Value | 0.8660 | NA |
| W-Test - Normal | 0.8542 | NA |
| W-Test - Lognormal | 0.9596 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000072

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : ALUMINUM (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 18.0000 | No samples |
| Number of Detects ..... | 13.0000 | |
| Average ..... | 5618.6801 | |
| Detection Limit - Minimum ..... | 28.1750 | |
| Detection Limits - Maximum ..... | 94.2500 | |
| Positive Hits - Minimum ..... | 45.0500 | |
| Positive Hits - Maximum ..... | 89300.0000 | |
| Average Of Positive Hits ..... | 7762.1962 | |
| Standard Deviation ..... | 20924.7656 | |
| Upper Confidence Limit - Normal ..... | 14200.3854 | |
| Upper Confidence Limit - Lognormal ... | 33608.6410 | |
| 95th Percentile - Nonparametric..... | 89300.0000 | |
| 95th Percentile - Normal..... | 40039.9196 | |
| 95th Percentile - Lognormal ..... | 8756.4491 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.4777 | |
| Corr Coeff - Detected - Lognormal .... | 0.7000 | |
| Corr Coeff - Total - Normal ..... | 0.5066 | |
| Corr Coeff - Total - Lognormal ..... | 0.9194 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9310 | |
| Corr Coeff - Crit Val - Total ..... | 0.9450 | |
| W-Test - Table Value ..... | 0.8970 | NA |
| W-Test - Normal ..... | 0.2901 | NA |
| W-Test - Lognormal ..... | 0.8467 | NA |
| Type of Distribution ..... | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : ANTIMONY (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 17.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 8.6069 | |
| Detection Limit - Minimum | 6.2500 | |
| Detection Limits - Maximum | 10.0000 | |
| Positive Hits - Minimum | 13.0333 | |
| Positive Hits - Maximum | 13.0333 | |
| Average Of Positive Hits | 13.0333 | |
| Standard Deviation | 1.7624 | |
| Upper Confidence Limit - Normal | 9.3532 | |
| Upper Confidence Limit - Lognormal | 9.4260 | |
| 95th Percentile - Nonparametric | 13.0333 | |
| 95th Percentile - Normal | 11.5060 | |
| 95th Percentile - Lognormal | 11.7386 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.9482 | |
| Corr Coeff - Total - Lognormal | 0.9618 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9420 | |
| W-Test - Table Value | 0.8920 | NA |
| W-Test - Normal | 0.9038 | NA |
| W-Test - Lognormal | 0.9233 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : ARSENIC (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 4.2972 | |
| Detection Limit - Minimum | 1.4333 | |
| Detection Limits - Maximum | 2.0500 | |
| Positive Hits - Minimum | 2.0333 | |
| Positive Hits - Maximum | 19.6000 | |
| Average Of Positive Hits | 4.8289 | |
| Standard Deviation | 4.8059 | |
| Upper Confidence Limit - Normal | 6.2682 | |
| Upper Confidence Limit - Lognormal | 5.8393 | |
| 95th Percentile - Nonparametric | 19.6000 | |
| 95th Percentile - Normal | 12.2030 | |
| 95th Percentile - Lognormal | 9.8540 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6129 | |
| Corr Coeff - Detected - Lognormal | 0.7616 | |
| Corr Coeff - Total - Normal | 0.7305 | |
| Corr Coeff - Total - Lognormal | 0.8970 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.5544 | NA |
| W-Test - Lognormal | 0.8133 | NA |

Type of Distribution ..... UNDEFINED

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : BARIUM (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 18.0000 | No samples |
| Number of Detects ..... | 18.0000 | |
| Average ..... | 191.7731 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 8.6333 | |
| Positive Hits - Maximum ..... | 919.6667 | |
| Average Of Positive Hits ..... | 191.7731 | |
| Standard Deviation ..... | 235.1473 | |
| Upper Confidence Limit - Normal ..... | ~~288.2122~~ | |
| Upper Confidence Limit - Lognormal ... | 472.8112 uu | |
| 95th Percentile - Nonparametric..... | ~~919.6667~~ | |
| 95th Percentile - Normal..... | 578.5905 | |
| 95th Percentile - Lognormal ..... | 712.9172 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.8456 | |
| Corr Coeff - Detected - Lognormal .... | 0.9874 | |
| Corr Coeff - Total - Normal ..... | 0.8456 | |
| Corr Coeff - Total - Lognormal ..... | 0.9874 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9450 | |
| Corr Coeff - Crit Val - Total ..... | 0.9450 | |
| W-Test - Table Value ..... | 0.8970 | NA |
| W-Test - Normal ..... | 0.7293 | NA |
| W-Test - Lognormal ..... | 0.9785 | NA |
| Type of Distribution ..... | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : BERYLLIUM (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 4.0000 | |
| Average | 0.7593 | |
| Detection Limit - Minimum | 0.5000 | |
| Detection Limits - Maximum | 0.5000 | |
| Positive Hits - Minimum | 0.7000 | |
| Positive Hits - Maximum | 4.2000 | |
| Average Of Positive Hits | 1.6667 | |
| Standard Deviation | 0.8691 | |
| Upper Confidence Limit - Normal | 1.1157 | |
| Upper Confidence Limit - Lognormal | 0.9043 | |
| 95th Percentile - Nonparametric | 4.2000 | |
| 95th Percentile - Normal | 2.1890 | |
| 95th Percentile - Lognormal | 1.4347 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8256 | |
| Corr Coeff - Detected - Lognormal | 0.8773 | |
| Corr Coeff - Total - Normal | 0.5506 | |
| Corr Coeff - Total - Lognormal | 0.6511 | |
| Corr Coeff - Crit Val - Detected | 0.8680 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.3366 | NA |
| W-Test - Lognormal | 0.4533 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : BORON (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 6.0000 | |
| Average | 179.8160 | |
| Detection Limit - Minimum | 16.4750 | |
| Detection Limits - Maximum | 62.0000 | |
| Positive Hits - Minimum | 40.6625 | |
| Positive Hits - Maximum | 1684.7500 | |
| Average Of Positive Hits | 481.6771 | |
| Standard Deviation | 404.0153 | |
| Upper Confidence Limit - Normal | 345.5115 | |
| Upper Confidence Limit - Lognormal | 377.2606 | |
| 95th Percentile - Nonparametric | 1684.7500 | |
| 95th Percentile - Normal | 844.4212 | |
| 95th Percentile - Lognormal | 491.1238 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8683 | |
| Corr Coeff - Detected - Lognormal | 0.9895 | |
| Corr Coeff - Total - Normal | 0.6558 | |
| Corr Coeff - Total - Lognormal | 0.8898 | |
| Corr Coeff - Crit Val - Detected | 0.8900 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4601 | NA |
| W-Test - Lognormal | 0.7916 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : CADMIUM (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 7.0000 | |
| Average | 2.9301 | |
| Detection Limit - Minimum | 0.8333 | |
| Detection Limits - Maximum | 1.5000 | |
| Positive Hits - Minimum | 1.4167 | |
| Positive Hits - Maximum | 16.1667 | |
| Average Of Positive Hits | 5.8441 | |
| Standard Deviation | 4.6255 | |
| Upper Confidence Limit - Normal | 4.8271 | |
| Upper Confidence Limit - Lognormal | 4.1396 | |
| 95th Percentile - Nonparametric | 16.1667 | |
| 95th Percentile - Normal | 10.5391 | |
| 95th Percentile - Lognormal | 7.0423 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8340 | |
| Corr Coeff - Detected - Lognormal | 0.8956 | |
| Corr Coeff - Total - Normal | 0.6710 | |
| Corr Coeff - Total - Lognormal | 0.8172 | |
| Corr Coeff - Crit Val - Detected | 0.8990 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4654 | NA |
| W-Test - Lognormal | 0.6744 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : CALCIUM (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 18.0000 | No samples |
| Number of Detects ..... | 18.0000 | |
| Average ..... | 47425.0000 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 14933.3333 | |
| Positive Hits - Maximum ..... | 122666.6670 | |
| Average Of Positive Hits ..... | 47425.0000 | |
| Standard Deviation ..... | 29705.8798 | |
| Upper Confidence Limit - Normal ..... | 59608.0328 | |
| Upper Confidence Limit - Lognormal ... | 64613.7737 UCL | |
| 95th Percentile - Nonparametric..... | 122666.6670 | |
| 95th Percentile - Normal..... | 96291.1722 | |
| 95th Percentile - Lognormal ..... | 105730.3453 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9319 | |
| Corr Coeff - Detected - Lognormal .... | 0.9896 | |
| Corr Coeff - Total - Normal ..... | 0.9319 | |
| Corr Coeff - Total - Lognormal ..... | 0.9896 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9450 | |
| Corr Coeff - Crit Val - Total ..... | 0.9450 | |
| W-Test - Table Value ..... | 0.8970 | NA |
| W-Test - Normal ..... | 0.8685 | NA |
| W-Test - Lognormal ..... | 0.9712 | NA |
| Type of Distribution ..... | LOGNORMAL ✓ | |

Test Results:

00080

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : CHROMIUM (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 18.0000 | No samples |
| Number of Detects ..... | 11.0000 | |
| Average ..... | 11.8986 | |
| Detection Limit - Minimum ..... | 1.8333 | |
| Detection Limits - Maximum ..... | 2.1167 | |
| Positive Hits - Minimum ..... | 2.1000 | |
| Positive Hits - Maximum ..... | 142.0000 | |
| Average Of Positive Hits ..... | 18.2477 | |
| Standard Deviation ..... | 32.7338 | |
| Upper Confidence Limit - Normal ..... | 25.3235 | |
| Upper Confidence Limit - Lognormal ... | 15.7766 | |
| 95th Percentile - Nonparametric..... | 142.0000 | |
| 95th Percentile - Normal..... | 65.7457 | |
| 95th Percentile - Lognormal ..... | 24.6588 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.5188 | |
| Corr Coeff - Detected - Lognormal .... | 0.5187 | |
| Corr Coeff - Total - Normal ..... | 0.5477 | |
| Corr Coeff - Total - Lognormal ..... | 0.8327 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9220 | |
| Corr Coeff - Crit Val - Total ..... | 0.9450 | |
| W-Test - Table Value ..... | 0.8970 | NA |
| W-Test - Normal ..... | 0.3338 | NA |
| W-Test - Lognormal ..... | 0.7090 | NA |
| Type of Distribution ..... | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : COBALT (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 7.0000 | |
| Average | 6.2403 | |
| Detection Limit - Minimum | 2.0000 | |
| Detection Limits - Maximum | 5.7500 | |
| Positive Hits - Minimum | 2.9750 | |
| Positive Hits - Maximum | 35.5000 | |
| Average Of Positive Hits | 11.0583 | |
| Standard Deviation | 8.1534 | |
| Upper Confidence Limit - Normal | 9.5841 | |
| Upper Confidence Limit - Lognormal | 8.7989 | |
| 95th Percentile - Nonparametric | 35.5000 | |
| 95th Percentile - Normal | 19.6526 | |
| 95th Percentile - Lognormal | 15.0051 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8582 | |
| Corr Coeff - Detected - Lognormal | 0.9594 | |
| Corr Coeff - Total - Normal | 0.7143 | |
| Corr Coeff - Total - Lognormal | 0.9107 | |
| Corr Coeff - Crit Val - Detected | 0.8990 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.5379 | NA |
| W-Test - Lognormal | 0.8348 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : COPPER (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 17.0000 | |
| Average | 13.7060 | |
| Detection Limit - Minimum | 1.5000 | |
| Detection Limits - Maximum | 1.5000 | |
| Positive Hits - Minimum | 2.7500 | |
| Positive Hits - Maximum | 125.0000 | |
| Average Of Positive Hits | 14.4240 | |
| Standard Deviation | 28.6250 | |
| Upper Confidence Limit - Normal | 25.4458 | |
| Upper Confidence Limit - Lognormal | 20.9163 | |
| 95th Percentile - Nonparametric | 125.0000 | |
| 95th Percentile - Normal | 60.7941 | |
| 95th Percentile - Lognormal | 34.1980 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.5952 | |
| Corr Coeff - Detected - Lognormal | 0.8822 | |
| Corr Coeff - Total - Normal | 0.6173 | |
| Corr Coeff - Total - Lognormal | 0.9085 | |
| Corr Coeff - Crit Val - Detected | 0.9420 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4150 | NA |
| W-Test - Lognormal | 0.8457 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : IRON (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 33846.6056 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 2524.0500 | |
| Positive Hits - Maximum | 176500.0000 | |
| Average Of Positive Hits | 33846.6056 | |
| Standard Deviation | 44139.6980 | |
| Upper Confidence Limit - Normal | ~~51949.2638~~ | |
| Upper Confidence Limit - Lognormal | 66020.8352 UCL | |
| 95th Percentile - Nonparametric | 176500.0000 | |
| 95th Percentile - Normal | 106456.4087 | |
| 95th Percentile - Lognormal | 107658.3773 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7850 | |
| Corr Coeff - Detected - Lognormal | 0.9792 | |
| Corr Coeff - Total - Normal | 0.7850 | |
| Corr Coeff - Total - Lognormal | 0.9792 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.6369 | NA |
| W-Test - Lognormal | 0.9677 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000048

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : LEAD (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 13.0000 | |
| Average | 7.3991 | |
| Detection Limit - Minimum | 0.7500 | |
| Detection Limits - Maximum | 2.5750 | |
| Positive Hits - Minimum | 1.5000 | |
| Positive Hits - Maximum | 51.1000 | |
| Average Of Positive Hits | 9.7224 | |
| Standard Deviation | 12.8660 | |
| Upper Confidence Limit - Normal | ~~12.6757~~ | |
| Upper Confidence Limit - Lognormal | 14.1689 UCL | |
| 95th Percentile - Nonparametric | ~~51.1000~~ | |
| 95th Percentile - Normal | 28.5636 | |
| 95th Percentile - Lognormal | 21.8334 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.5935 | |
| Corr Coeff - Detected - Lognormal | 0.7149 | |
| Corr Coeff - Total - Normal | 0.7186 | |
| Corr Coeff - Total - Lognormal | 0.9524 | |
| Corr Coeff - Crit Val - Detected | 0.9310 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.5402 | NA |
| W-Test - Lognormal | 0.9078 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000085

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : MAGNESIUM (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 27455.8334 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 2746.6667 | |
| Positive Hits - Maximum | 242066.6670 | |
| Average Of Positive Hits | 27455.8334 | |
| Standard Deviation | 56156.3198 | |
| Upper Confidence Limit - Normal | 50486.7718 | |
| Upper Confidence Limit - Lognormal | 53688.5327 | |
| 95th Percentile - Nonparametric | 242066.6670 | |
| 95th Percentile - Normal | 119832.9794 | |
| 95th Percentile - Lognormal | 79349.6110 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6566 | |
| Corr Coeff - Detected - Lognormal | 0.9375 | |
| Corr Coeff - Total - Normal | 0.6566 | |
| Corr Coeff - Total - Lognormal | 0.9375 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4632 | NA |
| W-Test - Lognormal | 0.8809 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : MANGANESE (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 18.0000 | No samples |
| Number of Detects ..... | 18.0000 | |
| Average ..... | 695.8241 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 152.8333 | |
| Positive Hits - Maximum ..... | 2570.0000 | |
| Average Of Positive Hits ..... | 695.8241 | |
| Standard Deviation ..... | 565.0463 | |
| Upper Confidence Limit - Normal ..... | ~~827.5620~~ | |
| Upper Confidence Limit - Lognormal ... | 996.1888 ucl | |
| 95th Percentile - Nonparametric..... | 2570.0000 | |
| 95th Percentile - Normal..... | 1625.3252 | |
| 95th Percentile - Lognormal ..... | 1673.0666 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.8535 | |
| Corr Coeff - Detected - Lognormal .... | 0.9873 | |
| Corr Coeff - Total - Normal ..... | 0.8535 | |
| Corr Coeff - Total - Lognormal ..... | 0.9873 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9450 | |
| Corr Coeff - Crit Val - Total ..... | 0.9450 | |
| W-Test - Table Value ..... | 0.8970 | NA |
| W-Test - Normal ..... | 0.7516 | NA |
| W-Test - Lognormal ..... | 0.9845 | NA |
| Type of Distribution ..... | LOGNORMAL ✓ | |

Test Results:

00087

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : MERCURY (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 3.0000 | |
| Average | 0.1211 | |
| Detection Limit - Minimum | 0.1000 | |
| Detection Limits - Maximum | 0.1000 | |
| Positive Hits - Minimum | 0.1733 | |
| Positive Hits - Maximum | 0.3200 | |
| Average Of Positive Hits | 0.2267 | |
| Standard Deviation | 0.0560 | |
| Upper Confidence Limit - Normal | 0.1441 | |
| Upper Confidence Limit - Lognormal | 0.1386 | |
| 95th Percentile - Nonparametric | 0.3200 | |
| 95th Percentile - Normal | 0.2132 | |
| 95th Percentile - Lognormal | 0.1928 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9044 | |
| Corr Coeff - Detected - Lognormal | 0.9163 | |
| Corr Coeff - Total - Normal | 0.6488 | |
| Corr Coeff - Total - Lognormal | 0.6761 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4476 | NA |
| W-Test - Lognormal | 0.4774 | NA |
| Type of Distribution | Undefined | |

Test Results:

000088

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : NICKEL (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 11.0000 | |
| Average | 15.8567 | |
| Detection Limit - Minimum | 4.0000 | |
| Detection Limits - Maximum | 6.1500 | |
| Positive Hits - Minimum | 8.7000 | |
| Positive Hits - Maximum | 79.5000 | |
| Average Of Positive Hits | 23.0000 | |
| Standard Deviation | 18.7426 | |
| Upper Confidence Limit - Normal | ~~23.5435~~ | |
| Upper Confidence Limit - Lognormal | 25.6385 UCL | |
| 95th Percentile - Nonparametric | ~~79.5000~~ | |
| 95th Percentile - Normal | 46.6883 | |
| 95th Percentile - Lognormal | 43.6298 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.4959 | |
| Corr Coeff - Detected - Lognormal | 0.3754 | |
| Corr Coeff - Total - Normal | 0.7925 | |
| Corr Coeff - Total - Lognormal | 0.9601 | |
| Corr Coeff - Crit Val - Detected | 0.9220 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.6496 | NA |
| W-Test - Lognormal | 0.9136 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

00009

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : POTASSIUM (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 16656.3426 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 931.6667 | |
| Positive Hits - Maximum | 90733.3333 | |
| Average Of Positive Hits | 16656.3426 | |
| Standard Deviation | 27917.6257 | |
| Upper Confidence Limit - Normal | ~~28105.9732~~ | |
| Upper Confidence Limit - Lognormal | 35718.2043 UCL | |
| 95th Percentile - Nonparametric | ~~90733.3333~~ | |
| 95th Percentile - Normal | 62580.8369 | |
| 95th Percentile - Lognormal | 52225.3349 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7362 | |
| Corr Coeff - Detected - Lognormal | 0.9466 | |
| Corr Coeff - Total - Normal | 0.7362 | |
| Corr Coeff - Total - Lognormal | 0.9466 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.5511 | NA |
| W-Test - Lognormal | 0.8994 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

000030

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : SELENIUM (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 6.0000 | |
| Average | 2.6884 | |
| Detection Limit - Minimum | 1.0000 | |
| Detection Limits - Maximum | 15.0000 | |
| Positive Hits - Minimum | 1.1667 | |
| Positive Hits - Maximum | 6.4667 | |
| Average Of Positive Hits | 2.3722 | |
| Standard Deviation | 3.5437 | |
| Upper Confidence Limit - Normal | 4.1418 | |
| Upper Confidence Limit - Lognormal | 3.7561 | |
| 95th Percentile - Nonparametric | 15.0000 | |
| 95th Percentile - Normal | 8.5178 | |
| 95th Percentile - Lognormal | 6.4083 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7771 | |
| Corr Coeff - Detected - Lognormal | 0.8655 | |
| Corr Coeff - Total - Normal | 0.7061 | |
| Corr Coeff - Total - Lognormal | 0.8391 | |
| Corr Coeff - Crit Val - Detected | 0.8900 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.5233 | NA |
| W-Test - Lognormal | 0.7100 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : SILVER (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 2.0000 | |
| Average | 1.7481 | |
| Detection Limit - Minimum | 1.0000 | |
| Detection Limits - Maximum | 2.7500 | |
| Positive Hits - Minimum | 2.2500 | |
| Positive Hits - Maximum | 2.3333 | |
| Average Of Positive Hits | 2.2917 | |
| Standard Deviation | 0.5300 | |
| Upper Confidence Limit - Normal | 1.9655 | |
| Upper Confidence Limit - Lognormal | 2.0492 | |
| 95th Percentile - Nonparametric | 2.7500 | |
| 95th Percentile - Normal | 2.6200 | |
| 95th Percentile - Lognormal | 2.8806 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 1.0000 | |
| Corr Coeff - Detected - Lognormal | 1.0000 | |
| Corr Coeff - Total - Normal | 0.9475 | |
| Corr Coeff - Total - Lognormal | 0.9257 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.8872 | NA |
| W-Test - Lognormal | 0.8419 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : SODIUM (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 595959.2593 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 12600.0000 | |
| Positive Hits - Maximum | 7003333.3300 | |
| Average Of Positive Hits | 595959.2593 | |
| Standard Deviation | 1679866.4304 | |
| Upper Confidence Limit - Normal | 1284909.3270 | |
| Upper Confidence Limit - Lognormal | 2071781.7180 | |
| 95th Percentile - Nonparametric | 7003333.3300 | |
| 95th Percentile - Normal | 3359339.5372 | |
| 95th Percentile - Lognormal | 1462670.1566 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6024 | |
| Corr Coeff - Detected - Lognormal | 0.9241 | |
| Corr Coeff - Total - Normal | 0.6024 | |
| Corr Coeff - Total - Lognormal | 0.9241 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.3947 | NA |
| W-Test - Lognormal | 0.8536 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

000093

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : THALLIUM (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 2.0000 | |
| Average | 3.1269 | |
| Detection Limit - Minimum | 0.7750 | |
| Detection Limits - Maximum | 7.5000 | |
| Positive Hits - Minimum | 1.6750 | |
| Positive Hits - Maximum | 2.5000 | |
| Average Of Positive Hits | 2.0875 | |
| Standard Deviation | 2.0506 | |
| Upper Confidence Limit - Normal | 3.9679 | |
| Upper Confidence Limit - Lognormal | 4.8802 | |
| 95th Percentile - Nonparametric | 7.5000 | |
| 95th Percentile - Normal | 6.5001 | |
| 95th Percentile - Lognormal | 8.2936 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 1.0000 | |
| Corr Coeff - Detected - Lognormal | 1.0000 | |
| Corr Coeff - Total - Normal | 0.9433 | |
| Corr Coeff - Total - Lognormal | 0.9651 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.8782 | NA |
| W-Test - Lognormal | 0.9124 | NA |
| Type of Distribution | Undefined | |

Test Results:

000034

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : VANADIUM (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 18.0000 | No samples |
| Number of Detects ..... | 5.0000 | |
| Average ..... | 16.5611 | |
| Detection Limit - Minimum ..... | 1.9500 | |
| Detection Limits - Maximum ..... | 6.2500 | |
| Positive Hits - Minimum ..... | 2.8333 | |
| Positive Hits - Maximum ..... | 182.0000 | |
| Average Of Positive Hits ..... | 47.9200 | |
| Standard Deviation ..... | 41.6898 | |
| Upper Confidence Limit - Normal ..... | 33.6590 | |
| Upper Confidence Limit - Lognormal ... | 22.5689 | |
| 95th Percentile - Nonparametric..... | 182.0000 | |
| 95th Percentile - Normal..... | 85.1409 | |
| 95th Percentile - Lognormal ..... | 36.5583 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.8524 | |
| Corr Coeff - Detected - Lognormal .... | 0.7721 | |
| Corr Coeff - Total - Normal ..... | 0.5582 | |
| Corr Coeff - Total - Lognormal ..... | 0.8576 | |
| Corr Coeff - Crit Val - Detected ..... | 0.8790 | |
| Corr Coeff - Crit Val - Total ..... | 0.9450 | |
| W-Test - Table Value ..... | 0.8970 | NA |
| W-Test - Normal ..... | 0.3460 | NA |
| W-Test - Lognormal ..... | 0.7607 | NA |
| Type of Distribution ..... | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : ZINC (ug/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 48.0618 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 3.4667 | |
| Positive Hits - Maximum | 297.4000 | |
| Average Of Positive Hits | 48.0618 | |
| Standard Deviation | 79.0099 | |
| Upper Confidence Limit - Normal | 80.4655 | |
| Upper Confidence Limit - Lognormal | 121.8080 acc | |
| 95th Percentile - Nonparametric | 297.4000 | |
| 95th Percentile - Normal | 178.0330 | |
| 95th Percentile - Lognormal | 166.8490 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7579 | |
| Corr Coeff - Detected - Lognormal | 0.9641 | |
| Corr Coeff - Total - Normal | 0.7579 | |
| Corr Coeff - Total - Lognormal | 0.9641 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.5920 | NA |
| W-Test - Lognormal | 0.9209 | NA |
| Type of Distribution | LOGNORMAL✓ | |

Test Results:

000036

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : 1,1,2,2-TETRACHLOROETHANE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 2.0000 | |
| Average | 9.9537 | |
| Detection Limit - Minimum | 3.7500 | |
| Detection Limits - Maximum | 24.1667 | |
| Positive Hits - Minimum | 3.6667 | |
| Positive Hits - Maximum | 84.6667 | |
| Average Of Positive Hits | 44.1667 | |
| Standard Deviation | 19.2235 | |
| Upper Confidence Limit - Normal | 17.8377 | |
| Upper Confidence Limit - Lognormal | 12.2344 | |
| 95th Percentile - Nonparametric | 84.6667 | |
| 95th Percentile - Normal | 41.5763 | |
| 95th Percentile - Lognormal | 20.8895 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 1.0000 | |
| Corr Coeff - Detected - Lognormal | 1.0000 | |
| Corr Coeff - Total - Normal | 0.5651 | |
| Corr Coeff - Total - Lognormal | 0.6923 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.3524 | NA |
| W-Test - Lognormal | 0.5053 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : 1,2-DICHLOROETHENE (TOTAL) (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 2.0000 | |
| Average | 5.1852 | |
| Detection Limit - Minimum | 3.7500 | |
| Detection Limits - Maximum | 24.1667 | |
| Positive Hits - Minimum | 1.3333 | |
| Positive Hits - Maximum | 2.0000 | |
| Average Of Positive Hits | 1.6667 | |
| Standard Deviation | 4.8378 | |
| Upper Confidence Limit - Normal | 7.1693 | |
| Upper Confidence Limit - Lognormal | 6.5897 | |
| 95th Percentile - Nonparametric | 24.1667 | |
| 95th Percentile - Normal | 13.1433 | |
| 95th Percentile - Lognormal | 10.5945 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 1.0000 | |
| Corr Coeff - Detected - Lognormal | 1.0000 | |
| Corr Coeff - Total - Normal | 0.6161 | |
| Corr Coeff - Total - Lognormal | 0.8096 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4206 | NA |
| W-Test - Lognormal | 0.7055 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : 4-METHYL-2-PENTANONE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 2.0000 | |
| Average | 7.2407 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 28.3333 | |
| Positive Hits - Minimum | 7.3333 | |
| Positive Hits - Maximum | 19.6667 | |
| Average Of Positive Hits | 13.5000 | |
| Standard Deviation | 6.2995 | |
| Upper Confidence Limit - Normal | 9.8243 | |
| Upper Confidence Limit - Lognormal | 8.8559 | |
| 95th Percentile - Nonparametric | 28.3333 | |
| 95th Percentile - Normal | 17.6034 | |
| 95th Percentile - Lognormal | 13.9546 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 1.0000 | |
| Corr Coeff - Detected - Lognormal | 1.0000 | |
| Corr Coeff - Total - Normal | 0.6267 | |
| Corr Coeff - Total - Lognormal | 0.6527 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4167 | NA |
| W-Test - Lognormal | 0.4441 | NA |
| Type of Distribution | Undefined | |

Test Results:

00039

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : ACETONE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 7.3997 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 33.1667 | |
| Positive Hits - Minimum | 7.5000 | |
| Positive Hits - Maximum | 7.5000 | |
| Average Of Positive Hits | 7.5000 | |
| Standard Deviation | 6.6450 | |
| Upper Confidence Limit - Normal | 10.1250 | |
| Upper Confidence Limit - Lognormal | 8.8500 | |
| 95th Percentile - Nonparametric | 33.1667 | |
| 95th Percentile - Normal | 18.3307 | |
| 95th Percentile - Lognormal | 13.6770 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.6118 | |
| Corr Coeff - Total - Lognormal | 0.7336 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4070 | NA |
| W-Test - Lognormal | 0.5626 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : BENZENE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 5.0463 | |
| Detection Limit - Minimum | 3.7500 | |
| Detection Limits - Maximum | 5.0000 | |
| Positive Hits - Minimum | 15.8333 | |
| Positive Hits - Maximum | 15.8333 | |
| Average Of Positive Hits | 15.8333 | |
| Standard Deviation | 2.7300 | |
| Upper Confidence Limit - Normal | 6.1659 | |
| Upper Confidence Limit - Lognormal | 5.7325 | |
| 95th Percentile - Nonparametric | 15.8333 | |
| 95th Percentile - Normal | 9.5371 | |
| 95th Percentile - Lognormal | 7.9661 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.5919 | |
| Corr Coeff - Total - Lognormal | 0.6947 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.3861 | NA |
| W-Test - Lognormal | 0.5181 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : CARBON DISULFIDE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 5.0000 | |
| Average | 4.9537 | |
| Detection Limit - Minimum | 4.1667 | |
| Detection Limits - Maximum | 24.1667 | |
| Positive Hits - Minimum | 1.0000 | |
| Positive Hits - Maximum | 3.5000 | |
| Average Of Positive Hits | 2.1667 | |
| Standard Deviation | 4.9483 | |
| Upper Confidence Limit - Normal | 6.9831 | |
| Upper Confidence Limit - Lognormal | 6.7447 | |
| 95th Percentile - Nonparametric | 24.1667 | |
| 95th Percentile - Normal | 13.0936 | |
| 95th Percentile - Lognormal | 11.2215 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9718 | |
| Corr Coeff - Detected - Lognormal | 0.9730 | |
| Corr Coeff - Total - Normal | 0.6557 | |
| Corr Coeff - Total - Lognormal | 0.8748 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4697 | NA |
| W-Test - Lognormal | 0.8049 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : CHLOROBENZENE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 18.0000 | No samples |
| Number of Detects ..... | 2.0000 | |
| Average ..... | 36.0371 | |
| Detection Limit - Minimum ..... | 3.7500 | |
| Detection Limits - Maximum ..... | 5.0000 | |
| Positive Hits - Minimum ..... | 4.5000 | |
| Positive Hits - Maximum ..... | 573.3333 | |
| Average Of Positive Hits ..... | 288.9167 | |
| Standard Deviation ..... | 134.0922 | |
| Upper Confidence Limit - Normal ..... | 91.0312 | |
| Upper Confidence Limit - Lognormal ... | 25.1472 | |
| 95th Percentile - Nonparametric..... | 573.3333 | |
| 95th Percentile - Normal..... | 256.6188 | |
| 95th Percentile - Lognormal ..... | 38.4267 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 1.0000 | |
| Corr Coeff - Detected - Lognormal .... | 1.0000 | |
| Corr Coeff - Total - Normal ..... | 0.4718 | |
| Corr Coeff - Total - Lognormal ..... | 0.5379 | |
| Corr Coeff - Crit Val - Detected ..... | 0.8790 | |
| Corr Coeff - Crit Val - Total ..... | 0.9450 | |
| W-Test - Table Value ..... | 0.8970 | NA |
| W-Test - Normal ..... | 0.2554 | NA |
| W-Test - Lognormal ..... | 0.3243 | NA |
| Type of Distribution ..... | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : CHLOROFORM (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 4.8796 | |
| Detection Limit - Minimum | 3.7500 | |
| Detection Limits - Maximum | 5.0000 | |
| Positive Hits - Minimum | 12.8333 | |
| Positive Hits - Maximum | 12.8333 | |
| Average Of Positive Hits | 12.8333 | |
| Standard Deviation | 2.0361 | |
| Upper Confidence Limit - Normal | 5.7147 | |
| Upper Confidence Limit - Lognormal | 5.4598 | |
| 95th Percentile - Nonparametric | 12.8333 | |
| 95th Percentile - Normal | 8.2290 | |
| 95th Percentile - Lognormal | 7.2941 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.6307 | |
| Corr Coeff - Total - Lognormal | 0.7280 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4336 | NA |
| W-Test - Lognormal | 0.5643 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : ETHYLBENZENE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 3.0000 | |
| Average | 8.8488 | |
| Detection Limit - Minimum | 3.7500 | |
| Detection Limits - Maximum | 5.0000 | |
| Positive Hits - Minimum | 4.0000 | |
| Positive Hits - Maximum | 84.3333 | |
| Average Of Positive Hits | 31.1481 | |
| Standard Deviation | 18.8443 | |
| Upper Confidence Limit - Normal | 16.5772 | |
| Upper Confidence Limit - Lognormal | 9.7378 | |
| 95th Percentile - Nonparametric | 84.3333 | |
| 95th Percentile - Normal | 39.8476 | |
| 95th Percentile - Lognormal | 16.4717 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.4895 | |
| Corr Coeff - Detected - Lognormal | 0.4360 | |
| Corr Coeff - Total - Normal | 0.4888 | |
| Corr Coeff - Total - Lognormal | 0.5833 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.2723 | NA |
| W-Test - Lognormal | 0.3759 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : METHYLENE CHLORIDE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 3.0000 | |
| Average | 6.6914 | |
| Detection Limit - Minimum | 3.7500 | |
| Detection Limits - Maximum | 24.1667 | |
| Positive Hits - Minimum | 2.8333 | |
| Positive Hits - Maximum | 12.1111 | |
| Average Of Positive Hits | 6.8981 | |
| Standard Deviation | 4.9497 | |
| Upper Confidence Limit - Normal | 8.7213 | |
| Upper Confidence Limit - Lognormal | 8.4058 | |
| 95th Percentile - Nonparametric | 24.1667 | |
| 95th Percentile - Normal | 14.8336 | |
| 95th Percentile - Lognormal | 13.2629 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9778 | |
| Corr Coeff - Detected - Lognormal | 0.9999 | |
| Corr Coeff - Total - Normal | 0.7810 | |
| Corr Coeff - Total - Lognormal | 0.9269 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.6383 | NA |
| W-Test - Lognormal | 0.8751 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : TETRACHLOROETHENE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 18.0000 | No samples |
| Number of Detects ..... | 1.0000 | |
| Average ..... | 5.4722 | |
| Detection Limit - Minimum ..... | 3.7500 | |
| Detection Limits - Maximum ..... | 24.1667 | |
| Positive Hits - Minimum ..... | 3.5000 | |
| Positive Hits - Maximum ..... | 3.5000 | |
| Average Of Positive Hits ..... | 3.5000 | |
| Standard Deviation ..... | 4.6922 | |
| Upper Confidence Limit - Normal ..... | 7.3966 | |
| Upper Confidence Limit - Lognormal ... | 6.3717 | |
| 95th Percentile - Nonparametric..... | 24.1667 | |
| 95th Percentile - Normal..... | 13.1908 | |
| 95th Percentile - Lognormal ..... | 9.5416 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | | |
| Corr Coeff - Detected - Lognormal .... | | |
| Corr Coeff - Total - Normal ..... | 0.5525 | |
| Corr Coeff - Total - Lognormal ..... | 0.6731 | |
| Corr Coeff - Crit Val - Detected ..... | 0.8790 | |
| Corr Coeff - Crit Val - Total ..... | 0.9450 | |
| W-Test - Table Value ..... | 0.8970 | NA |
| W-Test - Normal ..... | 0.3408 | NA |
| W-Test - Lognormal ..... | 0.4907 | NA |
| Type of Distribution ..... | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : TOLUENE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 18.0000 | No samples |
| Number of Detects ..... | 2.0000 | |
| Average ..... | 5.1945 | |
| Detection Limit - Minimum ..... | 3.7500 | |
| Detection Limits - Maximum ..... | 5.0000 | |
| Positive Hits - Minimum ..... | 2.0000 | |
| Positive Hits - Maximum ..... | 21.5000 | |
| Average Of Positive Hits ..... | 11.7500 | |
| Standard Deviation ..... | 4.1298 | |
| Upper Confidence Limit - Normal ..... | 6.8882 | |
| Upper Confidence Limit - Lognormal ... | 6.1892 | |
| 95th Percentile - Nonparametric..... | 21.5000 | |
| 95th Percentile - Normal..... | 11.9880 | |
| 95th Percentile - Lognormal ..... | 9.3801 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 1.0000 | |
| Corr Coeff - Detected - Lognormal .... | 1.0000 | |
| Corr Coeff - Total - Normal ..... | 0.5921 | |
| Corr Coeff - Total - Lognormal ..... | 0.7471 | |
| Corr Coeff - Crit Val - Detected ..... | 0.8790 | |
| Corr Coeff - Crit Val - Total ..... | 0.9450 | |
| W-Test - Table Value ..... | 0.8970 | NA |
| W-Test - Normal ..... | 0.3915 | NA |
| W-Test - Lognormal ..... | 0.6113 | NA |

Type of Distribution ..... Undefined

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : TRICHLOROETHENE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 5.9630 | |
| Detection Limit - Minimum | 3.7500 | |
| Detection Limits - Maximum | 24.1667 | |
| Positive Hits - Minimum | 12.3333 | |
| Positive Hits - Maximum | 12.3333 | |
| Average Of Positive Hits | 12.3333 | |
| Standard Deviation | 4.9297 | |
| Upper Confidence Limit - Normal | 7.9847 | |
| Upper Confidence Limit - Lognormal | 7.1720 | |
| 95th Percentile - Nonparametric | 24.1667 | |
| 95th Percentile - Normal | 14.0723 | |
| 95th Percentile - Lognormal | 11.0610 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.6401 | |
| Corr Coeff - Total - Lognormal | 0.7389 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4407 | NA |
| W-Test - Lognormal | 0.5704 | NA |
| Type of Distribution | Undefined | |

Test Results:

000199

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : XYLENES, TOTAL (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 6.0000 | |
| Average | 42.1358 | |
| Detection Limit - Minimum | 3.7500 | |
| Detection Limits - Maximum | 5.0000 | |
| Positive Hits - Minimum | 3.1667 | |
| Positive Hits - Maximum | 666.6667 | |
| Average Of Positive Hits | 117.6574 | |
| Standard Deviation | 155.9440 | |
| Upper Confidence Limit - Normal | 106.0919 | |
| Upper Confidence Limit - Lognormal | 33.8100 | |
| 95th Percentile - Nonparametric | 666.6667 | |
| 95th Percentile - Normal | 298.6636 | |
| 95th Percentile - Lognormal | 47.7515 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.5199 | |
| Corr Coeff - Detected - Lognormal | 0.6247 | |
| Corr Coeff - Total - Normal | 0.4839 | |
| Corr Coeff - Total - Lognormal | 0.6527 | |
| Corr Coeff - Crit Val - Detected | 0.8900 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.2672 | NA |
| W-Test - Lognormal | 0.4585 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : 1,2,4-TRICHLOROBENZENE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 18.0000 | No samples |
| Number of Detects ..... | 1.0000 | |
| Average ..... | 7.4352 | |
| Detection Limit - Minimum ..... | 5.0000 | |
| Detection Limits - Maximum ..... | 6.6667 | |
| Positive Hits - Minimum ..... | 47.1667 | |
| Positive Hits - Maximum ..... | 47.1667 | |
| Average Of Positive Hits ..... | 47.1667 | |
| Standard Deviation ..... | 9.9234 | |
| Upper Confidence Limit - Normal ..... | 11.5050 | |
| Upper Confidence Limit - Lognormal ... | 8.6241 | |
| 95th Percentile - Nonparametric..... | 47.1667 | |
| 95th Percentile - Normal..... | 23.7592 | |
| 95th Percentile - Lognormal ..... | 13.7474 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | | |
| Corr Coeff - Detected - Lognormal .... | | |
| Corr Coeff - Total - Normal ..... | 0.4838 | |
| Corr Coeff - Total - Lognormal ..... | 0.5139 | |
| Corr Coeff - Crit Val - Detected ..... | 0.8790 | |
| Corr Coeff - Crit Val - Total ..... | 0.9450 | |
| W-Test - Table Value ..... | 0.8970 | NA |
| W-Test - Normal ..... | 0.2671 | NA |
| W-Test - Lognormal ..... | 0.2974 | NA |
| Type of Distribution ..... | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : 1,2-DICHLOROBENZENE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 5.2778 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 6.6667 | |
| Positive Hits - Minimum | 8.3333 | |
| Positive Hits - Maximum | 8.3333 | |
| Average Of Positive Hits | 8.3333 | |
| Standard Deviation | 0.8575 | |
| Upper Confidence Limit - Normal | 5.6295 | |
| Upper Confidence Limit - Lognormal | 5.5855 | |
| 95th Percentile - Nonparametric | 8.3333 | |
| 95th Percentile - Normal | 6.6883 | |
| 95th Percentile - Lognormal | 6.5229 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.5909 | |
| Corr Coeff - Total - Lognormal | 0.5964 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.3770 | NA |
| W-Test - Lognormal | 0.3820 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : 1,3-DICHLOROBENZENE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 5.8889 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 6.6667 | |
| Positive Hits - Minimum | 19.3333 | |
| Positive Hits - Maximum | 19.3333 | |
| Average Of Positive Hits | 19.3333 | |
| Standard Deviation | 3.3781 | |
| Upper Confidence Limit - Normal | 7.2743 | |
| Upper Confidence Limit - Lognormal | 6.6778 | |
| 95th Percentile - Nonparametric | 19.3333 | |
| 95th Percentile - Normal | 11.4459 | |
| 95th Percentile - Lognormal | 9.3017 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.5101 | |
| Corr Coeff - Total - Lognormal | 0.5385 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.2935 | NA |
| W-Test - Lognormal | 0.3229 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : 1,4-DICHLOROBENZENE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 18.0000 | No samples |
| Number of Detects ..... | 1.0000 | |
| Average ..... | 8.3056 | |
| Detection Limit - Minimum ..... | 5.0000 | |
| Detection Limits - Maximum ..... | 6.6667 | |
| Positive Hits - Minimum ..... | 62.8333 | |
| Positive Hits - Maximum ..... | 62.8333 | |
| Average Of Positive Hits ..... | 62.8333 | |
| Standard Deviation ..... | 13.6140 | |
| Upper Confidence Limit - Normal ..... | 13.8889 | |
| Upper Confidence Limit - Lognormal ... | 9.5060 | |
| 95th Percentile - Nonparametric..... | 62.8333 | |
| 95th Percentile - Normal..... | 30.7006 | |
| 95th Percentile - Lognormal ..... | 15.5985 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | | |
| Corr Coeff - Detected - Lognormal .... | | |
| Corr Coeff - Total - Normal ..... | 0.4799 | |
| Corr Coeff - Total - Lognormal ..... | 0.5092 | |
| Corr Coeff - Crit Val - Detected ..... | 0.8790 | |
| Corr Coeff - Crit Val - Total ..... | 0.9450 | |
| W-Test - Table Value ..... | 0.8970 | NA |
| W-Test - Normal ..... | 0.2632 | NA |
| W-Test - Lognormal ..... | 0.2926 | NA |
| Type of Distribution ..... | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : 2,4-DICHLOROPHENOL (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 5.0370 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 6.6667 | |
| Positive Hits - Minimum | 4.0000 | |
| Positive Hits - Maximum | 4.0000 | |
| Average Of Positive Hits | 4.0000 | |
| Standard Deviation | 0.4699 | |
| Upper Confidence Limit - Normal | 5.2297 | |
| Upper Confidence Limit - Lognormal | 5.4468 | |
| 95th Percentile - Nonparametric | 6.6667 | |
| 95th Percentile - Normal | 5.8100 | |
| 95th Percentile - Lognormal | 5.8017 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.6276 | |
| Corr Coeff - Total - Lognormal | 0.6403 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4523 | NA |
| W-Test - Lognormal | 0.4708 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : 2,4-DIMETHYLPHENOL (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 18.0000 | No samples |
| Number of Detects ..... | 2.0000 | |
| Average ..... | 5.2194 | |
| Detection Limit - Minimum ..... | 5.0000 | |
| Detection Limits - Maximum ..... | 6.6667 | |
| Positive Hits - Minimum ..... | 3.9500 | |
| Positive Hits - Maximum ..... | 8.3333 | |
| Average Of Positive Hits ..... | 6.1417 | |
| Standard Deviation ..... | 0.9115 | |
| Upper Confidence Limit - Normal ..... | 5.5933 | |
| Upper Confidence Limit - Lognormal ... | 5.5622 | |
| 95th Percentile - Nonparametric..... | 8.3333 | |
| 95th Percentile - Normal..... | 6.7189 | |
| 95th Percentile - Lognormal ..... | 6.6008 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 1.0000 | |
| Corr Coeff - Detected - Lognormal .... | 1.0000 | |
| Corr Coeff - Total - Normal ..... | 0.6832 | |
| Corr Coeff - Total - Lognormal ..... | 0.7100 | |
| Corr Coeff - Crit Val - Detected ..... | 0.8790 | |
| Corr Coeff - Crit Val - Total ..... | 0.9450 | |
| W-Test - Table Value ..... | 0.8970 | NA |
| W-Test - Normal ..... | 0.5100 | NA |
| W-Test - Lognormal ..... | 0.5504 | NA |
| Type of Distribution ..... | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : 2,4-DINITROTOLUENE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 5.1296 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 6.6667 | |
| Positive Hits - Minimum | 5.6667 | |
| Positive Hits - Maximum | 5.6667 | |
| Average Of Positive Hits | 5.6667 | |
| Standard Deviation | 0.4144 | |
| Upper Confidence Limit - Normal | 5.2996 | |
| Upper Confidence Limit - Lognormal | 5.7223 | |
| 95th Percentile - Nonparametric | 6.6667 | |
| 95th Percentile - Normal | 5.8114 | |
| 95th Percentile - Lognormal | 5.7625 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.5780 | |
| Corr Coeff - Total - Lognormal | 0.5831 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.3642 | NA |
| W-Test - Lognormal | 0.3694 | NA |

Type of Distribution ..... Undefined

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : 2-CHLOROPHENOL (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 5.2037 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 6.6667 | |
| Positive Hits - Minimum | 7.0000 | |
| Positive Hits - Maximum | 7.0000 | |
| Average Of Positive Hits | 7.0000 | |
| Standard Deviation | 0.5956 | |
| Upper Confidence Limit - Normal | 5.4480 | |
| Upper Confidence Limit - Lognormal | 5.4297 | |
| 95th Percentile - Nonparametric | 7.0000 | |
| 95th Percentile - Normal | 6.1835 | |
| 95th Percentile - Lognormal | 6.1147 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.6031 | |
| Corr Coeff - Total - Lognormal | 0.6027 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.3828 | NA |
| W-Test - Lognormal | 0.3818 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : 2-METHYLNAPHTHALENE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 2.0000 | |
| Average | 4.9111 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 6.6667 | |
| Positive Hits - Minimum | 1.9000 | |
| Positive Hits - Maximum | 4.8333 | |
| Average Of Positive Hits | 3.3667 | |
| Standard Deviation | 0.8497 | |
| Upper Confidence Limit - Normal | 5.2596 | |
| Upper Confidence Limit - Lognormal | 5.5039 | |
| 95th Percentile - Nonparametric | 6.6667 | |
| 95th Percentile - Normal | 6.3088 | |
| 95th Percentile - Lognormal | 7.1500 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 1.0000 | |
| Corr Coeff - Detected - Lognormal | 1.0000 | |
| Corr Coeff - Total - Normal | 0.6366 | |
| Corr Coeff - Total - Lognormal | 0.5863 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4628 | NA |
| W-Test - Lognormal | 0.3930 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : 4-CHLORO-3-METHYLPHENOL (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 5.1482 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 6.6667 | |
| Positive Hits - Minimum | 6.0000 | |
| Positive Hits - Maximum | 6.0000 | |
| Average Of Positive Hits | 6.0000 | |
| Standard Deviation | 0.4461 | |
| Upper Confidence Limit - Normal | 5.3311 | |
| Upper Confidence Limit - Lognormal | 5.6912 | |
| 95th Percentile - Nonparametric | 6.6667 | |
| 95th Percentile - Normal | 5.8820 | |
| 95th Percentile - Lognormal | 5.8360 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.5989 | |
| Corr Coeff - Total - Lognormal | 0.6006 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.3839 | NA |
| W-Test - Lognormal | 0.3851 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : 4-METHYLPHENOL (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 4.0000 | |
| Average | 5.1569 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 5.0000 | |
| Positive Hits - Minimum | 3.1250 | |
| Positive Hits - Maximum | 8.3667 | |
| Average Of Positive Hits | 5.7063 | |
| Standard Deviation | 0.9554 | |
| Upper Confidence Limit - Normal | 5.5488 | |
| Upper Confidence Limit - Lognormal | 5.5630 | |
| 95th Percentile - Nonparametric | 8.3667 | |
| 95th Percentile - Normal | 6.7286 | |
| 95th Percentile - Lognormal | 6.7731 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9874 | |
| Corr Coeff - Detected - Lognormal | 0.9764 | |
| Corr Coeff - Total - Normal | 0.7162 | |
| Corr Coeff - Total - Lognormal | 0.7342 | |
| Corr Coeff - Crit Val - Detected | 0.8680 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.5690 | NA |
| W-Test - Lognormal | 0.5982 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : ACENAPHTHENE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 4.0000 | |
| Average | 4.7097 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 6.6667 | |
| Positive Hits - Minimum | 2.7750 | |
| Positive Hits - Maximum | 3.6667 | |
| Average Of Positive Hits | 3.2771 | |
| Standard Deviation | 0.8999 | |
| Upper Confidence Limit - Normal | 5.0788 | |
| Upper Confidence Limit - Lognormal | 5.1823 | |
| 95th Percentile - Nonparametric | 6.6667 | |
| 95th Percentile - Normal | 6.1901 | |
| 95th Percentile - Lognormal | 6.5515 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9271 | |
| Corr Coeff - Detected - Lognormal | 0.9307 | |
| Corr Coeff - Total - Normal | 0.8369 | |
| Corr Coeff - Total - Lognormal | 0.8266 | |
| Corr Coeff - Crit Val - Detected | 0.8680 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.7266 | NA |
| W-Test - Lognormal | 0.7055 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : ANTHRACENE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 5.0093 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 6.6667 | |
| Positive Hits - Minimum | 3.5000 | |
| Positive Hits - Maximum | 3.5000 | |
| Average Of Positive Hits | 3.5000 | |
| Standard Deviation | 0.5438 | |
| Upper Confidence Limit - Normal | 5.2323 | |
| Upper Confidence Limit - Lognormal | 5.2524 | |
| 95th Percentile - Nonparametric | 6.6667 | |
| 95th Percentile - Normal | 5.9037 | |
| 95th Percentile - Lognormal | 5.9794 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.6440 | |
| Corr Coeff - Total - Lognormal | 0.6415 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4763 | NA |
| W-Test - Lognormal | 0.4726 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : BENZOIC ACID (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 10.0000 | |
| Average | 18.0620 | |
| Detection Limit - Minimum | 18.3333 | |
| Detection Limits - Maximum | 25.0000 | |
| Positive Hits - Minimum | 1.0000 | |
| Positive Hits - Maximum | 22.0000 | |
| Average Of Positive Hits | 13.1783 | |
| Standard Deviation | 8.2017 | |
| Upper Confidence Limit - Normal | 21.4257 | |
| Upper Confidence Limit - Lognormal | 42.0876 | |
| 95th Percentile - Nonparametric | 25.0000 | |
| 95th Percentile - Normal | 31.5538 | |
| 95th Percentile - Lognormal | 69.9132 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9206 | |
| Corr Coeff - Detected - Lognormal | 0.8469 | |
| Corr Coeff - Total - Normal | 0.9019 | |
| Corr Coeff - Total - Lognormal | 0.7930 | |
| Corr Coeff - Crit Val - Detected | 0.9170 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.7991 | NA |
| W-Test - Lognormal | 0.6346 | NA |
| Type of Distribution | ~~NORMAL~~ . Undefined | |

Test Results:

001-24

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : BIS(2-ETHYLHEXYL)PHTHALATE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 9.0000 | |
| Average | 8.2361 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 6.1667 | |
| Positive Hits - Minimum | 3.0000 | |
| Positive Hits - Maximum | 22.6667 | |
| Average Of Positive Hits | 11.3426 | |
| Standard Deviation | 6.2559 | |
| Upper Confidence Limit - Normal | 10.8018 | |
| Upper Confidence Limit - Lognormal | 10.8333 | |
| 95th Percentile - Nonparametric | 22.6667 | |
| 95th Percentile - Normal | 18.5270 | |
| 95th Percentile - Lognormal | 17.6626 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9212 | |
| Corr Coeff - Detected - Lognormal | 0.9569 | |
| Corr Coeff - Total - Normal | 0.7960 | |
| Corr Coeff - Total - Lognormal | 0.8650 | |
| Corr Coeff - Crit Val - Detected | 0.9120 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.6357 | NA |
| W-Test - Lognormal | 0.7518 | NA |
| Type of Distribution | ~~LOGNORMAL~~ Undefined | |

Test Results:

000125

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : BUTYL BENZYL PHTHALATE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 18.0000 | No samples |
| Number of Detects ..... | 2.0000 | |
| Average ..... | 4.9352 | |
| Detection Limit - Minimum ..... | 5.0000 | |
| Detection Limits - Maximum ..... | 6.6667 | |
| Positive Hits - Minimum ..... | 3.5000 | |
| Positive Hits - Maximum ..... | 3.6667 | |
| Average Of Positive Hits ..... | 3.5834 | |
| Standard Deviation ..... | 0.6292 | |
| Upper Confidence Limit - Normal ..... | 5.1932 | |
| Upper Confidence Limit - Lognormal ... | 5.2250 | |
| 95th Percentile - Nonparametric..... | 6.6667 | |
| 95th Percentile - Normal..... | 5.9702 | |
| 95th Percentile - Lognormal ..... | 6.0875 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 1.0000 | |
| Corr Coeff - Detected - Lognormal .... | 1.0000 | |
| Corr Coeff - Total - Normal ..... | 0.7321 | |
| Corr Coeff - Total - Lognormal ..... | 0.7320 | |
| Corr Coeff - Crit Val - Detected ..... | 0.8790 | |
| Corr Coeff - Crit Val - Total ..... | 0.9450 | |
| W-Test - Table Value ..... | 0.8970 | NA |
| W-Test - Normal ..... | 0.5831 | NA |
| W-Test - Lognormal ..... | 0.5796 | NA |
| Type of Distribution ..... | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : CARBAZOLE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 2.0000 | |
| Average | 4.8153 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 7.5000 | |
| Positive Hits - Minimum | 1.4000 | |
| Positive Hits - Maximum | 2.7750 | |
| Average Of Positive Hits | 2.0875 | |
| Standard Deviation | 1.1769 | |
| Upper Confidence Limit - Normal | 5.2979 | |
| Upper Confidence Limit - Lognormal | 5.7300 | |
| 95th Percentile - Nonparametric | 7.5000 | |
| 95th Percentile - Normal | 6.7513 | |
| 95th Percentile - Lognormal | 8.1229 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 1.0000 | |
| Corr Coeff - Detected - Lognormal | 1.0000 | |
| Corr Coeff - Total - Normal | 0.7297 | |
| Corr Coeff - Total - Lognormal | 0.6810 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.5827 | NA |
| W-Test - Lognormal | 0.5082 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : DI-N-BUTYL PHTHALATE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 3.0000 | |
| Average | 4.8296 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 6.6667 | |
| Positive Hits - Minimum | 3.0000 | |
| Positive Hits - Maximum | 3.6667 | |
| Average Of Positive Hits | 3.4222 | |
| Standard Deviation | 0.7667 | |
| Upper Confidence Limit - Normal | 5.1441 | |
| Upper Confidence Limit - Lognormal | 5.2110 | |
| 95th Percentile - Nonparametric | 6.6667 | |
| 95th Percentile - Normal | 6.0909 | |
| 95th Percentile - Lognormal | 6.3314 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9079 | |
| Corr Coeff - Detected - Lognormal | 0.9044 | |
| Corr Coeff - Total - Normal | 0.7941 | |
| Corr Coeff - Total - Lognormal | 0.7870 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.6699 | NA |
| W-Test - Lognormal | 0.6554 | NA |

Type of Distribution ..... Undefined

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : DI-N-OCTYL PHTHALATE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 5.0093 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 6.6667 | |
| Positive Hits - Minimum | 3.5000 | |
| Positive Hits - Maximum | 3.5000 | |
| Average Of Positive Hits | 3.5000 | |
| Standard Deviation | 0.5438 | |
| Upper Confidence Limit - Normal | 5.2323 | |
| Upper Confidence Limit - Lognormal | 5.2524 | |
| 95th Percentile - Nonparametric | 6.6667 | |
| 95th Percentile - Normal | 5.9037 | |
| 95th Percentile - Lognormal | 5.9794 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.6440 | |
| Corr Coeff - Total - Lognormal | 0.6415 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4763 | NA |
| W-Test - Lognormal | 0.4726 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : DIBENZOFURAN (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 5.0315 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 6.6667 | |
| Positive Hits - Minimum | 3.9000 | |
| Positive Hits - Maximum | 3.9000 | |
| Average Of Positive Hits | 3.9000 | |
| Standard Deviation | 0.4833 | |
| Upper Confidence Limit - Normal | 5.2297 | |
| Upper Confidence Limit - Lognormal | 5.3824 | |
| 95th Percentile - Nonparametric | 6.6667 | |
| 95th Percentile - Normal | 5.8264 | |
| 95th Percentile - Lognormal | 5.8313 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.6331 | |
| Corr Coeff - Total - Lognormal | 0.6433 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4603 | NA |
| W-Test - Lognormal | 0.4752 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : DIETHYL PHTHALATE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 18.0000 | No samples |
| Number of Detects ..... | 4.0000 | |
| Average ..... | 7.1037 | |
| Detection Limit - Minimum ..... | 5.0000 | |
| Detection Limits - Maximum ..... | 5.0000 | |
| Positive Hits - Minimum ..... | 3.6667 | |
| Positive Hits - Maximum ..... | 41.8667 | |
| Average Of Positive Hits ..... | 14.4667 | |
| Standard Deviation ..... | 8.7225 | |
| Upper Confidence Limit - Normal ..... | 10.6810 | |
| Upper Confidence Limit - Lognormal ... | 8.3740 | |
| 95th Percentile - Nonparametric..... | 41.8667 | |
| 95th Percentile - Normal..... | 21.4521 | |
| 95th Percentile - Lognormal ..... | 13.3177 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.8410 | |
| Corr Coeff - Detected - Lognormal .... | 0.9204 | |
| Corr Coeff - Total - Normal ..... | 0.5254 | |
| Corr Coeff - Total - Lognormal ..... | 0.6293 | |
| Corr Coeff - Crit Val - Detected ..... | 0.8680 | |
| Corr Coeff - Crit Val - Total ..... | 0.9450 | |
| W-Test - Table Value ..... | 0.8970 | NA |
| W-Test - Normal ..... | 0.3116 | NA |
| W-Test - Lognormal ..... | 0.4364 | NA |
| Type of Distribution ..... | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : FLUORENE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 3.0000 | |
| Average | 4.7722 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 6.6667 | |
| Positive Hits - Minimum | 1.9000 | |
| Positive Hits - Maximum | 3.6667 | |
| Average Of Positive Hits | 3.0778 | |
| Standard Deviation | 0.9396 | |
| Upper Confidence Limit - Normal | 5.1576 | |
| Upper Confidence Limit - Lognormal | 5.3857 | |
| 95th Percentile - Nonparametric | 6.6667 | |
| 95th Percentile - Normal | 6.3179 | |
| 95th Percentile - Lognormal | 7.0919 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8660 | |
| Corr Coeff - Detected - Lognormal | 0.8660 | |
| Corr Coeff - Total - Normal | 0.7715 | |
| Corr Coeff - Total - Lognormal | 0.7209 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.6416 | NA |
| W-Test - Lognormal | 0.5633 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : N-NITROSODIPHENYLAMINE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 5.0185 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 6.6667 | |
| Positive Hits - Minimum | 3.6667 | |
| Positive Hits - Maximum | 3.6667 | |
| Average Of Positive Hits | 3.6667 | |
| Standard Deviation | 0.5173 | |
| Upper Confidence Limit - Normal | 5.2307 | |
| Upper Confidence Limit - Lognormal | 5.2418 | |
| 95th Percentile - Nonparametric | 6.6667 | |
| 95th Percentile - Normal | 5.8695 | |
| 95th Percentile - Lognormal | 5.9118 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.6413 | |
| Corr Coeff - Total - Lognormal | 0.6444 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4723 | NA |
| W-Test - Lognormal | 0.4769 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : NAPHTHALENE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 4.0000 | |
| Average | 5.9167 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 6.6667 | |
| Positive Hits - Minimum | 2.5000 | |
| Positive Hits - Maximum | 25.5000 | |
| Average Of Positive Hits | 8.7083 | |
| Standard Deviation | 4.9657 | |
| Upper Confidence Limit - Normal | 7.9532 | |
| Upper Confidence Limit - Lognormal | 7.0738 | |
| 95th Percentile - Nonparametric | 25.5000 | |
| 95th Percentile - Normal | 14.0852 | |
| 95th Percentile - Lognormal | 10.8181 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8063 | |
| Corr Coeff - Detected - Lognormal | 0.8578 | |
| Corr Coeff - Total - Normal | 0.5876 | |
| Corr Coeff - Total - Lognormal | 0.7443 | |
| Corr Coeff - Crit Val - Detected | 0.8680 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.3851 | NA |
| W-Test - Lognormal | 0.6022 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : PHENANTHRENE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 4.9259 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 6.6667 | |
| Positive Hits - Minimum | 2.0000 | |
| Positive Hits - Maximum | 2.0000 | |
| Average Of Positive Hits | 2.0000 | |
| Standard Deviation | 0.8289 | |
| Upper Confidence Limit - Normal | 5.2659 | |
| Upper Confidence Limit - Lognormal | 5.4852 | |
| 95th Percentile - Nonparametric | 6.6667 | |
| 95th Percentile - Normal | 6.2894 | |
| 95th Percentile - Lognormal | 7.0505 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.6226 | |
| Corr Coeff - Total - Lognormal | 0.5785 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.4452 | NA |
| W-Test - Lognormal | 0.3843 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : PHENOL (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 4.0000 | |
| Average | 4.7083 | |
| Detection Limit - Minimum | 5.0000 | |
| Detection Limits - Maximum | 5.0000 | |
| Positive Hits - Minimum | 2.8500 | |
| Positive Hits - Maximum | 5.3333 | |
| Average Of Positive Hits | 3.6875 | |
| Standard Deviation | 0.7379 | |
| Upper Confidence Limit - Normal | 5.0110 | |
| Upper Confidence Limit - Lognormal | 5.1192 | |
| 95th Percentile - Nonparametric | 5.3333 | |
| 95th Percentile - Normal | 5.9222 | |
| 95th Percentile - Lognormal | 6.3109 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9107 | |
| Corr Coeff - Detected - Lognormal | 0.9341 | |
| Corr Coeff - Total - Normal | 0.7240 | |
| Corr Coeff - Total - Lognormal | 0.7153 | |
| Corr Coeff - Crit Val - Detected | 0.8680 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.5372 | NA |
| W-Test - Lognormal | 0.5248 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : AROCLOR-1016 (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 13.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 0.5719 | |
| Detection Limit - Minimum | 0.2500 | |
| Detection Limits - Maximum | 0.3500 | |
| Positive Hits - Minimum | 4.2500 | |
| Positive Hits - Maximum | 4.2500 | |
| Average Of Positive Hits | 4.2500 | |
| Standard Deviation | 1.1054 | |
| Upper Confidence Limit - Normal | 1.1183 | |
| Upper Confidence Limit - Lognormal | 0.7721 | |
| 95th Percentile - Nonparametric | 4.2500 | |
| 95th Percentile - Normal | 2.3904 | |
| 95th Percentile - Lognormal | 1.1720 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.5385 | |
| Corr Coeff - Total - Lognormal | 0.5899 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9310 | |
| W-Test - Table Value | 0.8660 | NA |
| W-Test - Normal | 0.3258 | NA |
| W-Test - Lognormal | 0.3836 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : AROCLOR-1254 (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 13.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 4.1846 | |
| Detection Limit - Minimum | 0.3500 | |
| Detection Limits - Maximum | 0.5500 | |
| Positive Hits - Minimum | 48.5000 | |
| Positive Hits - Maximum | 48.5000 | |
| Average Of Positive Hits | 48.5000 | |
| Standard Deviation | 13.3152 | |
| Upper Confidence Limit - Normal | 10.7655 | |
| Upper Confidence Limit - Lognormal | 5.4806 | |
| 95th Percentile - Nonparametric | 48.5000 | |
| 95th Percentile - Normal | 26.0881 | |
| 95th Percentile - Lognormal | 5.7131 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.5268 | |
| Corr Coeff - Total - Lognormal | 0.5689 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9310 | |
| W-Test - Table Value | 0.8660 | NA |
| W-Test - Normal | 0.3134 | NA |
| W-Test - Lognormal | 0.3643 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : AROCLOR-1260 (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 13.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 26.1077 | |
| Detection Limit - Minimum | 0.3500 | |
| Detection Limits - Maximum | 0.5500 | |
| Positive Hits - Minimum | 333.5000 | |
| Positive Hits - Maximum | 333.5000 | |
| Average Of Positive Hits | 333.5000 | |
| Standard Deviation | 92.3599 | |
| Upper Confidence Limit - Normal | 71.7555 | |
| Upper Confidence Limit - Lognormal | 42.6194 | |
| 95th Percentile - Nonparametric | 333.5000 | |
| 95th Percentile - Normal | 178.0397 | |
| 95th Percentile - Lognormal | 15.9376 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | 0.5252 | |
| Corr Coeff - Total - Lognormal | 0.5563 | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.9310 | |
| W-Test - Table Value | 0.8660 | NA |
| W-Test - Normal | 0.3114 | NA |
| W-Test - Lognormal | 0.3487 | NA |
| Type of Distribution | Undefined | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

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Parameter : AMMONIA, AS NITROGEN ()

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| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 1.0000 | No samples |
| Number of Detects ..... | 1.0000 | |
| Average ..... | 8.2633 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 8.2633 | |
| Positive Hits - Maximum ..... | 8.2633 | |
| Average Of Positive Hits ..... | 8.2633 | |
| Standard Deviation ..... | 0.0000 | |
| Upper Confidence Limit - Normal ..... | ********** | |
| Upper Confidence Limit - Lognormal ... | 0.0000 | |
| 95th Percentile - Nonparametric..... | 8.2633 | |
| 95th Percentile - Normal..... | 8.2633 | |
| 95th Percentile - Lognormal ..... | 162.9662 | |

Shapiro-Wilk and Probabilty Plot Results:

---

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | | |
| Corr Coeff - Detected - Lognormal .... | | |
| Corr Coeff - Total - Normal ..... | | |
| Corr Coeff - Total - Lognormal ..... | | |
| Corr Coeff - Crit Val - Detected ..... | 0.8790 | |
| Corr Coeff - Crit Val - Total ..... | 0.8790 | |
| W-Test - Table Value ..... | 0.0000 | NA |
| W-Test - Normal ..... | ********** | NA |
| W-Test - Lognormal ..... | ********** | NA |
| Type of Distribution ..... | UNDEFINED | |

Test Results:

---

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : CHEMICAL OXYGEN DEMAND (NONE)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 1.0000 | No samples |
| Number of Detects ..... | 1.0000 | |
| Average ..... | 3726.3333 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 3726.3333 | |
| Positive Hits - Maximum ..... | 3726.3333 | |
| Average Of Positive Hits ..... | 3726.3333 | |
| Standard Deviation ..... | 0.0000 | |
| Upper Confidence Limit - Normal ..... | ********** | |
| Upper Confidence Limit - Lognormal ... | 0.0000 | |
| 95th Percentile - Nonparametric..... | 3726.3333 | |
| 95th Percentile - Normal..... | 3726.3333 | |
| 95th Percentile - Lognormal ..... | 73489.5797 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | | |
| Corr Coeff - Detected - Lognormal .... | | |
| Corr Coeff - Total - Normal ..... | | |
| Corr Coeff - Total - Lognormal ..... | | |
| Corr Coeff - Crit Val - Detected ..... | 0.8790 | |
| Corr Coeff - Crit Val - Total ..... | 0.8790 | |
| W-Test - Table Value ..... | 0.0000 | NA |
| W-Test - Normal ..... | ********** | NA |
| W-Test - Lognormal ..... | ********** | NA |
| Type of Distribution ..... | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : TOTAL ORGANIC CARBON (MG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 1.0000 | No samples |
| Number of Detects ..... | 1.0000 | |
| Average ..... | 9.7667 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 9.7667 | |
| Positive Hits - Maximum ..... | 9.7667 | |
| Average Of Positive Hits ..... | 9.7667 | |
| Standard Deviation ..... | 0.0000 | |
| Upper Confidence Limit - Normal ..... | ********** | |
| Upper Confidence Limit - Lognormal ... | 0.0000 | |
| 95th Percentile - Nonparametric..... | 9.7667 | |
| 95th Percentile - Normal..... | 9.7667 | |
| 95th Percentile - Lognormal ..... | 192.6158 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | | |
| Corr Coeff - Detected - Lognormal .... | | |
| Corr Coeff - Total - Normal ..... | | |
| Corr Coeff - Total - Lognormal ..... | | |
| Corr Coeff - Crit Val - Detected ..... | 0.8790 | |
| Corr Coeff - Crit Val - Total ..... | 0.8790 | |
| W-Test - Table Value ..... | 0.0000 | NA |
| W-Test - Normal ..... | ********** | NA |
| W-Test - Lognormal ..... | ********** | NA |
| Type of Distribution ..... | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : TOTAL PHOSPHORUS (MG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 1.0000 | No samples |
| Number of Detects ..... | 1.0000 | |
| Average ..... | 0.0933 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 0.0933 | |
| Positive Hits - Maximum ..... | 0.0933 | |
| Average Of Positive Hits ..... | 0.0933 | |
| Standard Deviation ..... | 0.0000 | |
| Upper Confidence Limit - Normal ..... | ********** | |
| Upper Confidence Limit - Lognormal ... | 0.0000 | |
| 95th Percentile - Nonparametric..... | 0.0933 | |
| 95th Percentile - Normal..... | 0.0933 | |
| 95th Percentile - Lognormal ..... | 1.8400 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | | |
| Corr Coeff - Detected - Lognormal .... | | |
| Corr Coeff - Total - Normal ..... | | |
| Corr Coeff - Total - Lognormal ..... | | |
| Corr Coeff - Crit Val - Detected ..... | 0.8790 | |
| Corr Coeff - Crit Val - Total ..... | 0.8790 | |
| W-Test - Table Value ..... | 0.0000 | NA |
| W-Test - Normal ..... | ********** | NA |
| W-Test - Lognormal ..... | ********** | NA |
| Type of Distribution ..... | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : UNFILTERED GROUNDWATER DATA - CTO 129 (NSB-NLON)
Group : AREA 2L: AREA A LANDFILL

Parameter : TOTAL SUSPENDED SOLIDS ()

| | Sample Results | Background Results |
|---|---|---|
| Count | 1.0000 | No samples |
| Number of Detects | 1.0000 | |
| Average | 35.6667 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 35.6667 | |
| Positive Hits - Maximum | 35.6667 | |
| Average Of Positive Hits | 35.6667 | |
| Standard Deviation | 0.0000 | |
| Upper Confidence Limit - Normal | ********** | |
| Upper Confidence Limit - Lognormal | 0.0000 | |
| 95th Percentile - Nonparametric | 35.6667 | |
| 95th Percentile - Normal | 35.6667 | |
| 95th Percentile - Lognormal | 703.4075 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | | |
| Corr Coeff - Detected - Lognormal | | |
| Corr Coeff - Total - Normal | | |
| Corr Coeff - Total - Lognormal | | |
| Corr Coeff - Crit Val - Detected | 0.8790 | |
| Corr Coeff - Crit Val - Total | 0.8790 | |
| W-Test - Table Value | 0.0000 | NA |
| W-Test - Normal | ********** | NA |
| W-Test - Lognormal | ********** | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** Site 2 – Area A Landfill
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Full–Time Employee (Surface Soil), CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 50 | IR: | 0 |
| EF: | 150 | EF: | 1 |
| Fi: | 0.5 | Fi: | 1 |
| ED: | 6 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 2190 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 1.47E–07 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 1.26E–08 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)**
***Site 2 – Area A Landfill***
**EXPOSURE SCENARIO: Full–Time Employee (Surface Soil), CTE**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Benzo(a)pyrene | 0.19 | 1 | 0.00E+00 | 2.79E–08 | 2.39E–09 | | 7.30E+00 |
| Benzo(k)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–02 |
| 4,4'–DDT | 0.19 | 1 | 0.00E+00 | 2.79E–08 | 2.39E–09 | 5.00E–04 | 3.40E–01 |
| Aroclors | 1.2 | 1 | 0.00E+00 | 1.76E–07 | 1.51E–08 | 2.00E–05 | ~~7.70E+00~~ 1E+0* |
| 1,2,3,4,7,8–HxCDF | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | ~~4.00E–07~~ 1.56E+4 |
| 1,2,3,6,7,8–HxCDF | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | ~~4.00E–07~~ 1.56E+4 |
| ~~Aluminum~~ | ~~8060~~ | ~~1~~ | ~~0.00E+00~~ | ~~1.18E–03~~ | ~~1.01E–04~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E–04 | |
| Arsenic | 2.5 | 1 | 0.00E+00 | 3.67E–07 | 3.15E–08 | 3.00E–04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–02 | |
| Beryllium | 1.2 | 1 | 0.00E+00 | 1.76E–07 | 1.51E–08 | | 4.30E+00 |
| Cadmium | 1.9 | 1 | 0.00E+00 | 2.79E–07 | 2.39E–08 | 5.00E–04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Copper~~ | ~~794~~ | ~~1~~ | ~~0.00E+00~~ | ~~1.17E–04~~ | ~~0.00E–06~~ | ~~4.00E–02~~ | |
| ~~Iron~~ | ~~12000~~ | ~~1~~ | ~~0.00E+00~~ | ~~1.76E–03~~ | ~~1.51E–04~~ | ~~3.00E–01~~ | |
| Manganese | 212 | 1 | 0.00E+00 | 3.11E–05 | 2.67E–06 | ~~5.00E–03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–04 | |
| Nickel | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–02 | |
| Vanadium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–03 | |
| Zinc | 2140 | 1 | 0.00E+00 | 3.14E–04 | 2.69E–05 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 12/24/97 KMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)**
**Site 2 – Area A Landfill**
**EXPOSURE SCENARIO: Full-Time Employee (Surface Soil), CTE**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)anthracene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 1.74E-08 |
| Benzo(k)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 5.58E-05 | 8.13E-10 |
| Aroclors | 0.00E+00 | 8.81E-03 | ~~1.16E-07~~ 1.51E-8 * |
| 1,2,3,4,7,8-HxCDF | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,6,7,8-HxCDF | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~1.18E-03~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 1.22E-03 | 4.72E-08 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 0.00E+00 | 0.00E+00 | 6.49E-08 |
| Cadmium | 0.00E+00 | 5.58E-04 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Copper~~ | ~~0.00E+00~~ | ~~2.91E-03~~ | ~~0.00E+00~~ |
| ~~Iron~~ | ~~0.00E+00~~ | ~~5.87E-03~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~6.22E-03~~ 1.30E-3 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Nickel | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 1.05E-03 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~2.79E-02~~ 1.30E-2 | ~~2.47E-07~~ 1.45E-7 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/24/97 JMO

000147

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: Site 2 – Area A Landfill
LOCATION: NSB–NLON, Groton, CT
DATE: 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Full–Time Employee (Surface Soil), CTE**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | | |
|---|---|---|---|
| C | = CONCENTRATION IN SOIL (MG/KG) | | |
| SA1 | = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| SA2 | = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 3800 |
| AF | = ADHERENCE FACTOR (MG/SQ CM): | | 0.2 |
| ABS | = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | | Dioxins: | 0.03 |
| | | PCBS: | 0.06 |
| EF1 | = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| EF2 | = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 150 |
| ED1 | = YOUTH EXPOSURE DURATION (YEARS): | | 1 |
| ED2 | = ADULT EXPOSURE DURATION (YEARS): | | 6 |
| BW1 | = BODY WEIGHT ADOLESCENT (KG): | | 1 |
| BW2 | = BODY WEIGHT ADULT (KG): | | 70 |
| AT1 | = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 365 |
| AT2 | = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 2190 |
| AT3 | = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 3.82E–07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 4.46E–06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Full–Time Employee (Surface Soil), CTE
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Cadmium | 1.9 | 0.01 | 0.00E+00 | 8.48E–08 | 7.27E–09 | ~~1.50E–05~~ 2.5E-5 | |
| 1,2,3,4,7,8–HxCDF | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | ~~1.50E+04~~ 1.73E+4 |
| 1,2,3,6,7,8–HxCDF | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | ~~1.56E+04~~ 1.73E+4* |
| Aroclors | 1.2 | 0.06 | 0.00E+00 | 3.21E–07 | 2.75E–08 | 2.00E–05 | ~~7.70E+00~~ 1E+0* |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/24/97 MS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Full–Time Employee (Surface Soil), CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Cadmium | 0.00E+00 | ~~5.65E–03~~ 3.39E-3 | 0.00E+00 |
| 1,2,3,4,7,8–HxCDF | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,6,7,8–HxCDF | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Aroclors | 0.00E+00 | 1.61E–02 | ~~2.12E–07~~ 2.75E-8 * |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 0.00E+00 | ~~2.17E–02~~ 1.95E-2 | ~~2.12E–07~~ 2.75E-8 |

*Based on new PCB guidance (USEPA, September 1996).

Revisions 02/24/97 KWS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** Site 2 – Area A Landfill
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Full–Time Employee (Surface Soil), RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 100 | IR: | 0 |
| EF: | 150 | EF: | 1 |
| Fi: | 1 | Fi: | 1 |
| ED: | 25 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 9125 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 5.87E–07 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 2.10E–07 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)**
**Site 2 – Area A Landfill**
**EXPOSURE SCENARIO: Full-Time Employee (Surface Soil), RME**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG-DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E-01 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E-01 |
| Benzo(a)pyrene | 0.19 | 1 | 0.00E+00 | 1.12E-07 | 3.98E-08 | | 7.30E+00 |
| Benzo(k)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E-02 |
| 4,4'-DDT | 2.3 | 1 | 0.00E+00 | 1.35E-06 | 4.82E-07 | 5.00E-04 | 3.40E-01 |
| Aroclors | 12 | 1 | 0.00E+00 | 7.05E-06 | 2.52E-06 | 2.00E-05 | ~~7.70E+00~~ 2E+0* |
| 1,2,3,4,7,8-HxCDF | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | ~~4.00E-07~~ 1.56E+4 |
| 1,2,3,6,7,8-HxCDF | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | ~~4.00E-07~~ 1.56E+4 |
| ~~Aluminum~~ | ~~8060~~ | ~~1~~ | ~~0.00E+00~~ | ~~4.73E-03~~ | ~~1.69E-03~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E-04 | |
| Arsenic | 2.5 | 1 | 0.00E+00 | 1.47E-06 | 5.24E-07 | 3.00E-04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E-02 | |
| Beryllium | 1.2 | 1 | 0.00E+00 | 7.05E-07 | 2.52E-07 | | 4.30E+00 |
| Cadmium | 4.7 | 1 | 0.00E+00 | 2.76E-06 | 9.85E-07 | 5.00E-04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E-03 | |
| ~~Copper~~ | ~~794~~ | ~~1~~ | ~~0.00E+00~~ | ~~4.66E-04~~ | ~~1.66E-04~~ | ~~4.00E-02~~ | |
| ~~Iron~~ | ~~12000~~ | ~~1~~ | ~~0.00E+00~~ | ~~7.05E-03~~ | ~~2.52E-03~~ | ~~8.00E-01~~ | |
| Manganese | 212 | 1 | 0.00E+00 | 1.24E-04 | 4.45E-05 | ~~5.00E-03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E-04 | |
| Nickel | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E-02 | |
| Vanadium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E-03 | |
| Zinc | 2140 | 1 | 0.00E+00 | 1.26E-03 | 4.49E-04 | 3.00E-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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions
02/24/97
JMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)**
**Site 2 – Area A Landfill**
**EXPOSURE SCENARIO: Full-Time Employee (Surface Soil), RME**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)anthracene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 2.91E-07 |
| Benzo(k)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 2.70E-03 | 1.64E-07 |
| Aroclors | 0.00E+00 | 3.52E-01 | ~~1.94E-05~~ 5.04E-6 * |
| 1,2,3,4,7,8-HxCDF | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,6,7,8-HxCDF | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~4.73E-03~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 4.89E-03 | 7.86E-07 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 0.00E+00 | 0.00E+00 | 1.08E-06 |
| Cadmium | 0.00E+00 | 5.52E-03 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Copper~~ | ~~0.00E+00~~ | ~~1.17E-02~~ | ~~0.00E+00~~ |
| ~~Iron~~ | ~~0.00E+00~~ | ~~2.85E-02~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~2.49E-02~~ 5.19E-3 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Nickel | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 4.19E-03 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~4.34E-01~~ 3.74E-1 | ~~2.17E-05~~ 7.36E-6 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/24/97 JMS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

**SITE NAME:** Site 2 – Area A Landfill
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Full–Time Employee (Surface Soil), RME**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 3600 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 1 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 150 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 1 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 25 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 1 |
| BW2 = BODY WEIGHT ADULT (KG): | | 70 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 365 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 9125 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 7.97E–06
DOSEadult = (CF2)*(C)*(ABS) CF2 = 2.23E–05

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Full–Time Employee (Surface Soil), RME
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Cadmium | 4.7 | 0.01 | 0.00E+00 | 1.05E–06 | 3.74E–07 | ~~1.50E–05~~ 2.5E-5 | |
| 1,2,3,4,7,8–HxCDF | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | ~~1.50E+04~~ 1.73E+4 |
| 1,2,3,6,7,8–HxCDF | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | ~~1.50E+04~~ 1.73E+4 |
| Aroclors | 12 | 0.06 | 0.00E+00 | 1.61E–05 | 5.74E–06 | 2.00E–05 | 7.70E+00 2E+0 * |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions
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JMS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Full–Time Employee (Surface Soil), RME
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Cadmium | 0.00E+00 | ~~6.09E-02~~ 4.19E-2 | 0.00E+00 |
| 1,2,3,4,7,8–HxCDF | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,6,7,8–HxCDF | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Aroclors | 0.00E+00 | 8.03E–01 | ~~4.42E-05~~ 1.15E-5 * |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 0.00E+00 | ~~8.73E-01~~ 8.45E-1 | ~~4.42E-05~~ 1.16E-5 |

*Based on new PCB guidance (USEPA, September 1996).

Revisions 02/24/97 KHS

000139

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** Site 2 – Area A Landfill
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker (All Soil), CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 240 | IR: | 0 |
| EF: | 80 | EF: | 1 |
| Fi: | 0.5 | Fi: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 3.76E–07 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 5.37E–09 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)**
**Site 2 – Area A Landfill**
**EXPOSURE SCENARIO: Construction Worker (All Soil), CTE**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1.8 | 1 | 0.00E+00 | 6.76E−07 | 9.66E−09 | | 7.30E−01 |
| Benzo(b)fluoranthene | 1.6 | 1 | 0.00E+00 | 6.01E−07 | 8.59E−09 | | 7.30E−01 |
| Benzo(a)pyrene | 1.6 | 1 | 0.00E+00 | 6.01E−07 | 8.59E−09 | | 7.30E+00 |
| Benzo(k)fluoranthene | 1.5 | 1 | 0.00E+00 | 5.64E−07 | 8.05E−09 | | 7.30E−02 |
| 4,4'−DDT | 0.12 | 1 | 0.00E+00 | 4.51E−08 | 6.44E−10 | 5.00E−04 | 3.40E−01 |
| Aroclors | 4.7 | 1 | 0.00E+00 | 1.77E−06 | 2.52E−08 | 2.00E−05 | ~~7.70E+00~~ 1E+0* |
| 1,2,3,4,7,8−HxCDF | 0.00022 | 1 | 0.00E+00 | 8.27E−11 | 1.18E−12 | 1.40E+4 | ~~4.09E−0~~ |
| 1,2,3,6,7,8−HxCDF | 0.00014 | 1 | 0.00E+00 | 5.26E−11 | 7.51E−13 | 1.56E+4 | ~~4.00E−07~~ |
| ~~Aluminum~~ | ~~8800~~ | ~~1~~ | ~~0.00E+00~~ | ~~3.31E−03~~ | ~~4.72E−05~~ | ~~1.00E+00~~ | |
| Antimony | 13.9 | 1 | 0.00E+00 | 5.22E−06 | 7.46E−08 | 4.00E−04 | |
| Arsenic | 3.9 | 1 | 0.00E+00 | 1.47E−06 | 2.09E−08 | 3.00E−04 | 1.50E+00 |
| Barium | 97.1 | 1 | 0.00E+00 | 3.65E−05 | 5.21E−07 | 7.00E−02 | |
| Beryllium | 0.91 | 1 | 0.00E+00 | 3.42E−07 | 4.88E−09 | | 4.30E+00 |
| Cadmium | 3.4 | 1 | 0.00E+00 | 1.28E−06 | 1.82E−08 | 5.00E−04 | |
| Chromium | 32.5 | 1 | 0.00E+00 | 1.22E−05 | 1.74E−07 | 5.00E−03 | |
| ~~Copper~~ | ~~2260~~ | ~~1~~ | ~~0.00E+00~~ | ~~8.49E−04~~ | ~~1.21E−05~~ | ~~4.00E−02~~ | |
| ~~Iron~~ | ~~25100~~ | ~~1~~ | ~~0.00E+00~~ | ~~9.43E−03~~ | ~~1.35E−04~~ | ~~3.00E−01~~ | |
| Manganese | 265 | 1 | 0.00E+00 | 9.96E−05 | 1.42E−06 | ~~5.00E−03~~ 2.4E-2 | |
| Mercury | 0.27 | 1 | 0.00E+00 | 1.01E−07 | 1.45E−09 | 3.00E−04 | |
| Nickel | 81.9 | 1 | 0.00E+00 | 3.08E−05 | 4.40E−07 | 2.00E−02 | |
| Vanadium | 28 | 1 | 0.00E+00 | 1.05E−05 | 1.50E−07 | 7.00E−03 | |
| Zinc | 9850 | 1 | 0.00E+00 | 3.70E−03 | 5.29E−05 | 3.00E−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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA. September 1996).

Revisions 02/24/96

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)**
**Site 2 – Area A Landfill**
**EXPOSURE SCENARIO: Construction Worker (All Soil), CTE**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)anthracene | 0.00E+00 | 0.00E+00 | 7.05E-09 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 6.27E-09 |
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 6.27E-08 |
| Benzo(k)fluoranthene | 0.00E+00 | 0.00E+00 | 5.88E-10 |
| 4,4'-DDT | 0.00E+00 | 9.02E-05 | 2.19E-10 |
| Aroclors | 0.00E+00 | 8.83E-02 | 2.52E-8 ~~1.04E-07~~ |
| 1,2,3,4,7,8-HxCDF | 0.00E+00 | 0.00E+00 | 1.84E-8 ~~4.70E-10~~ |
| 1,2,3,6,7,8-HxCDF | 0.00E+00 | 0.00E+00 | 1.17E-8 ~~3.01E-10~~ |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~3.31E-03~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 1.31E-02 | 0.00E+00 |
| Arsenic | 0.00E+00 | 4.88E-03 | 3.14E-08 |
| Barium | 0.00E+00 | 5.21E-04 | 0.00E+00 |
| Beryllium | 0.00E+00 | 0.00E+00 | 2.10E-08 |
| Cadmium | 0.00E+00 | 2.55E-03 | 0.00E+00 |
| Chromium | 0.00E+00 | 2.44E-03 | 0.00E+00 |
| ~~Copper~~ | ~~0.00E+00~~ | ~~2.12E-02~~ | ~~0.00E+00~~ |
| ~~Iron~~ | ~~0.00E+00~~ | ~~3.14E-02~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~1.00E-02~~ 4.15E-3 | 0.00E+00 |
| Mercury | 0.00E+00 | 3.38E-04 | 0.00E+00 |
| Nickel | 0.00E+00 | 1.54E-03 | 0.00E+00 |
| Vanadium | 0.00E+00 | 1.50E-03 | 0.00E+00 |
| Zinc | 0.00E+00 | 1.23E-02 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~2.00E-01~~ 1.32E-1 | ~~3.50E-07~~ 1.85E-7 |

*Based on new PCB guidance (USEPA, September 1996).

Revisions 02/24/97 JMS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: Site 2 – Area A Landfill
LOCATION: NSB–NLON, Groton, CT
DATE: 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Construction Worker (All Soil), CTE**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 3600 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 0.2 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 80 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 1 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 1 |
| BW2 = BODY WEIGHT ADULT (KG): | | 70 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 365 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 3.40E–08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 2.38E–06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Construction Worker (All Soil), CTE
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Cadmium | 3.4 | 0.01 | 0.00E+00 | 8.09E–08 | 1.16E–09 | ~~1.50E–05~~ 2.5E-5 | |
| 1,2,3,4,7,8–HxCDF | 0.00022 | 0.03 | 0.00E+00 | 1.57E–11 | 2.24E–13 | | ~~1.30E+04~~ 1.73E+4 |
| 1,2,3,6,7,8–HxCDF | 0.00014 | 0.03 | 0.00E+00 | 9.99E–12 | 1.43E–13 | | ~~1.56E+04~~ 1.73E+4 |
| Aroclors | 4.7 | 0.06 | 0.00E+00 | 6.71E–07 | 9.59E–09 | 2.00E–05 | ~~7.70E+00~~ 1E+0 * |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions
03/24/97
AMS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Construction Worker (All Soil), CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Cadmium | 0.00E+00 | ~~5.39E-03~~ 3.23E-3 | 0.00E+00 |
| 1,2,3,4,7,8-HxCDF | 0.00E+00 | 0.00E+00 | ~~3.50E-09~~ 3.88E-9 |
| 1,2,3,6,7,8-HxCDF | 0.00E+00 | 0.00E+00 | ~~2.23E-09~~ 2.47E-9 |
| Aroclors | 0.00E+00 | 3.36E-02 | ~~7.36E-09~~ 9.54E-9 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 0.00E+00 | ~~3.89E-02~~ 3.68E-2 | ~~7.95E-09~~ 1.59E-8 |

*Based on new PCB guidance (USEPA, September 1997)

Revisions 02/24/97 [illegible]

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: Site 2 – Area A Landfill
LOCATION: NSB–NLON, Groton, CT
DATE: 12/21/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: Construction Worker, CTE

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE: DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE: Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY–STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

| | |
|---|---|
| EV: | 1 |
| ED: | 1 |
| EF: | 80 |
| A: | 3800 |
| tevent: | 8 |
| BW: | 70 |
| AT(NON): | 365 |
| AT(CAR): | 25550 |

CONVERSION FACTOR (NONCAR) = 1.19E+01

CONVERSION FACTOR (CARCIN) = 1.70E-01

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Construction Worker, CTE

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Benzene | 0.005 | O | 6.30E –01 | 2.60E –01 | 2.10E –02 | 1.30E –02 | 8.85E –07 |
| Chlorobenzene | 0.038 | O | 1.00E +00 | 4.30E –01 | 4.10E –02 | 6.90E –02 | 1.25E –05 |
| Chloroform | 0.005 | O | 1.10E +00 | 4.70E –01 | 8.90E –03 | 9.30E –03 | 3.95E –07 |
| 1,4 – Dichlorobenzene | 0.008 | O | 3.30E +00 | 6.90E –01 | 6.20E –02 | 2.50E –01 | 4.13E –06 |
| 1,1,2,2 – Tetrachloroethane | 0.01 | O | 2.20E +00 | 9.20E –01 | 9.00E –03 | 2.50E –02 | 8.76E –07 |
| Tetrachloroethene | 0.004 | O | 4.30E +00 | 9.00E –01 | 4.80E –02 | 2.50E –01 | 1.71E –06 |
| 1,2,4 – Trichlorobenzene | 0.007 | O | 9.30E +00 | 1.10E +00 | 1.00E –01 | 9.50E –01 | 5.74E –06 |
| Trichloroethene | 0.006 | O | 1.30E +00 | 5.50E –01 | 1.60E –02 | 2.60E –02 | 8.59E –07 |
| Bis(2 – Ethylhexyl)phthalate | 0.008 | O | 1.00E +02 | 2.10E +01 | 3.30E –02 | 1.30E +01 | 9.46E –06 |
| Methylene chloride | 0.007 | O | 6.90E –01 | 2.90E –01 | 4.50E –03 | 1.80E –03 | 2.70E –07 |
| 4 – Methylphenol | 0.005 | O | 9.60E –01 | 4.00E –01 | 1.00E –02 | 8.70E –03 | 4.37E –07 |
| Aroclors | 0.031 | O | 2.50E +01 | 5.30E +00 | 1.30E +00 | 3.20E +02 | 7.25E –04 |
| ~~Aluminum~~ | ~~5.02~~ | ~~I~~ | | | ~~1.00E –03~~ | | ~~4.56E –05~~ |
| Antimony | 0.0086 | I | | | 1.00E –03 | | 6.88E –08 |
| Arsenic | 0.0043 | I | | | 1.00E –03 | | 3.44E –08 |
| Barium | 0.473 | I | | | 1.00E –03 | | 3.78E –06 |
| Beryllium | 0.00076 | I | | | 1.00E –03 | | 6.08E –09 |
| Boron | 0.18 | I | | | 1.00E –03 | | 1.44E –06 |
| Cadmium | 0.0029 | I | | | 1.00E –03 | | 2.32E –08 |
| Chromium | 0.0119 | I | | | 2.00E –03 | | 1.90E –07 |
| ~~Iron~~ | ~~66~~ | ~~I~~ | | | ~~1.00E –03~~ | | ~~5.28E –04~~ |
| Manganese | 0.996 | I | | | 1.00E –03 | | 7.97E –06 |
| Nickel | 0.0256 | I | | | 1.00E –04 | | 2.05E –08 |
| Thallium | 0.0025 | I | | | 1.00E –03 | | 2.00E –08 |
| Vanadium | 0.0166 | I | | | 1.00E –03 | | 1.33E –07 |
| | | | | | | | 0.00E +00 |
| | | | | | | | 0.00E +00 |
| | | | | | | | 0.00E +00 |
| | | | | | | | 0.00E +00 |
| | | | | | | | 0.00E +00 |
| | | | | | | | 0.00E +00 |
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| | | | | | | | 0.00E +00 |
| | | | | | | | 0.00E +00 |
| | | | | | | | 0.00E +00 |
| | | | | | | | 0.00E +00 |
| | | | | | | | 0.00E +00 |
| | | | | | | | 0.00E +00 |
| | | | | | | | 0.00E +00 |



Revisions 08/1

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER WATER (PAGE THREE)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Construction Worker, CTE
CALCULATE DOSES:

| CHEMICAL | ANNUAL DERMAL DOSE (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX DERMAL |
|---|---|---|---|
| Benzene | 1.05E-05 | | 0.00E+00 |
| Chlorobenzene | 1.48E-04 | 6.00E-03 | 2.47E-02 |
| Chloroform | 4.70E-06 | 1.00E-02 | 4.70E-04 |
| 1,4-Dichlorobenzene | 4.92E-05 | | 0.00E+00 |
| 1,1,2,2-Tetrachloroethane | 1.04E-05 | 2.00E+01 | 5.21E-07 |
| Tetrachloroethene | 2.04E-05 | 1.00E-02 | 2.04E-03 |
| 1,2,4-Trichlorobenzene | 6.83E-05 | 1.00E-02 | 6.83E-03 |
| Trichloroethene | 1.02E-05 | 6.00E-03 | 1.70E-03 |
| Bis(2-Ethylhexyl)phthalate | 1.13E-04 | 1.10E-02 | 1.02E-02 |
| Methylene chloride | 3.21E-06 | 6.00E-02 | 5.35E-05 |
| 4-Methylphenol | 5.20E-06 | 5.00E-03 | 1.04E-03 |
| Aroclors | 8.83E-03 | 2.00E-05 | 4.31E+02 |
| ~~Aluminum~~ | ~~5.85E-04~~ | ~~5.00E-02~~ | ~~1.07E-02~~ |
| Antimony | 6.19E-07 | 4.00E-04 | 2.05E-03 |
| Arsenic | 4.09E-07 | 2.80E-04 | 1.46E-03 |
| Barium | 4.50E-05 | 3.50E-03 | 1.29E-02 |
| Beryllium | 7.23E-08 | 2.50E-04 | 2.89E-04 |
| Boron | 1.71E-05 | 4.50E-03 | 3.81E-03 |
| Cadmium | 2.76E-07 | ~~1.50E-05~~ 2.5E-5 | ~~1.84E-02~~ 1.10E-2 |
| Chromium | 2.27E-06 | 1.00E-04 | 2.27E-02 |
| ~~Iron~~ | ~~6.26E-03~~ | ~~1.50E-02~~ | ~~4.18E-01~~ |
| Manganese | 9.48E-05 | ~~1.50E-04~~ 7.2E-4 | ~~0.32E-01~~ 1.32E-1 |
| Nickel | 2.44E-07 | 2.00E-03 | 1.22E-04 |
| Thallium | 2.38E-07 | 4.00E-06 | 5.95E-02 |
| Vanadium | 1.58E-06 | 3.50E-04 | 4.51E-03 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| TOTAL RISK | | | ~~4.33E+02~~ 4.31E+2 |

Revisions
08/10/96
LAS

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE FOUR)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Construction Worker, CTE
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF DERMAL (KG/DAY/MG) | CANCER RISK DERMAL CONTACT |
|---|---|---|---|
| Benzene | 1.50E-07 | 2.90E-02 | 4.36E-09 |
| Chlorobenzene | 2.12E-06 | | 0.00E+00 |
| Chloroform | 6.72E-08 | 6.10E-03 | 4.10E-10 |
| 1,4-Dichlorobenzene | 7.02E-07 | 2.40E-02 | 1.69E-08 |
| 1,1,2,2-Tetrachloroethane | 1.49E-07 | 2.00E+01 | 2.98E-06 |
| Tetrachloroethene | 2.91E-07 | 5.20E-02 | 1.51E-08 |
| 1,2,4-Trichlorobenzene | 9.76E-07 | | 0.00E+00 |
| Trichloroethene | 1.46E-07 | 1.10E-02 | 1.61E-09 |
| Bis(2-Ethylhexyl)phthalate | 1.61E-06 | 2.50E-02 | 4.02E-08 |
| Methylene chloride | 4.59E-08 | 7.50E-03 | 3.44E-10 |
| 4-Methylphenol | 7.43E-08 | | 0.00E+00 |
| Aroclors | 1.23E-04 | ~~7.70E+00~~ 3E-1 * | ~~9.46E-04~~ 3.69E-5 * |
| ~~Aluminum~~ | ~~7.84E-06~~ | | ~~0.00E+00~~ |
| Antimony | 1.17E-06 | | 0.00E+00 |
| Arsenic | 5.85E-09 | 1.60E+00 | 9.36E-09 |
| Barium | 8.43E-07 | | 0.00E+00 |
| Beryllium | 1.03E-09 | 8.60E+01 | 8.89E-08 |
| Boron | 2.45E-07 | | 0.00E+00 |
| Cadmium | 3.94E-09 | | 0.00E+00 |
| Chromium | 3.24E-08 | | 0.00E+00 |
| ~~Iron~~ | ~~6.97E-05~~ | | ~~0.00E+00~~ |
| Manganese | 1.35E-06 | | 0.00E+00 |
| Nickel | 3.48E-09 | | 0.00E+00 |
| Thallium | 3.40E-09 | | 0.00E+00 |
| Vanadium | 2.26E-08 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| TOTAL RISK | | | ~~9.52E-04~~ 4.01E-5 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions
v: 1/97
AKS

**RISK ASSESSMENT SPREADSHEET -- INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** Site 2 -- Area A Landfill
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 12/21/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker (All Soil), RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 480 | IR: | 0 |
| EF: | 120 | EF: | 1 |
| Fi: | 1 | Fi: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 2.25E-06 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 3.22E-08 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)**
**Site 2 – Area A Landfill**
**EXPOSURE SCENARIO: Construction Worker (All Soil), RME**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 23 | 1 | 0.00E+00 | 5.19E−05 | 7.41E−07 | | 7.30E−01 |
| Benzo(b)fluoranthene | 15 | 1 | 0.00E+00 | 3.38E−05 | 4.83E−07 | | 7.30E−01 |
| Benzo(a)pyrene | 15 | 1 | 0.00E+00 | 3.38E−05 | 4.83E−07 | | 7.30E+00 |
| Benzo(k)fluoranthene | 14 | 1 | 0.00E+00 | 3.16E−05 | 4.51E−07 | | 7.30E−02 |
| 4,4'–DDT | 2.3 | 1 | 0.00E+00 | 5.19E−06 | 7.41E−08 | 5.00E−04 | 3.40E−01 |
| Aroclors | 110 | 1 | 0.00E+00 | 2.48E−04 | 3.54E−06 | 2.00E−05 | ~~7.70E+00~~ 2E+0 * |
| 1,2,3,4,7,8–HxCDF | 0.00031 | 1 | 0.00E+00 | 6.99E−10 | 9.98E−12 | 1.56E+4 | ~~4.00E−07~~ |
| 1,2,3,6,7,8–HxCDF | 0.00015 | 1 | 0.00E+00 | 3.38E−10 | 4.83E−12 | 1.56E+4 | ~~4.00E−07~~ |
| ~~Aluminum~~ | ~~8800~~ | ~~1~~ | ~~0.00E+00~~ | ~~1.08E−02~~ | ~~2.83E−04~~ | ~~1.00E+00~~ | |
| Antimony | 134 | 1 | 0.00E+00 | 3.02E−04 | 4.32E−06 | 4.00E−04 | |
| Arsenic | 3.9 | 1 | 0.00E+00 | 8.79E−06 | 1.26E−07 | 3.00E−04 | 1.50E+00 |
| Barium | 667 | 1 | 0.00E+00 | 1.50E−03 | 2.15E−05 | 7.00E−02 | |
| Beryllium | 3.9 | 1 | 0.00E+00 | 8.79E−06 | 1.26E−07 | | 4.30E+00 |
| Cadmium | 12.1 | 1 | 0.00E+00 | 2.73E−05 | 3.90E−07 | 5.00E−04 | |
| Chromium | 289 | 1 | 0.00E+00 | 6.52E−04 | 9.31E−06 | 5.00E−03 | |
| ~~Copper~~ | ~~2120~~ | ~~1~~ | ~~0.00E+00~~ | ~~4.78E−03~~ | ~~6.83E−05~~ | ~~4.00E−02~~ | |
| ~~Iron~~ | ~~157000~~ | ~~1~~ | ~~0.00E+00~~ | ~~3.54E−01~~ | ~~5.06E−03~~ | ~~3.00E−01~~ | |
| Manganese | 1150 | 1 | 0.00E+00 | 2.59E−03 | 3.70E−05 | ~~5.00E−03~~ 2.4E-2 | |
| Mercury | 3.6 | 1 | 0.00E+00 | 8.12E−06 | 1.16E−07 | 3.00E−04 | |
| Nickel | 1440 | 1 | 0.00E+00 | 3.25E−03 | 4.64E−05 | 2.00E−02 | |
| Vanadium | 138 | 1 | 0.00E+00 | 3.11E−04 | 4.44E−06 | 7.00E−03 | |
| Zinc | 9850 | 1 | 0.00E+00 | 2.22E−02 | 3.17E−04 | 3.00E−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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 12/24/97 SMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)**
**Site 2 – Area A Landfill**
**EXPOSURE SCENARIO: Construction Worker (All Soil), RME**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)anthracene | 0.00E+00 | 0.00E+00 | 5.41E−07 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 3.53E−07 |
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 3.53E−06 |
| Benzo(k)fluoranthene | 0.00E+00 | 0.00E+00 | 3.29E−08 |
| 4,4'−DDT | 0.00E+00 | 1.04E−02 | 2.52E−08 |
| Aroclors | 0.00E+00 | 1.24E+01 | ~~2.78E−05~~ 7.09E-6* |
| 1,2,3,4,7,8−HxCDF | 0.00E+00 | 0.00E+00 | 1.56E-7 ~~3.99E−18~~ |
| 1,2,3,6,7,8−HxCDF | 0.00E+00 | 0.00E+00 | 7.53E-8 ~~1.93E−18~~ |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~1.98E−02~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 7.55E−01 | 0.00E+00 |
| Arsenic | 0.00E+00 | 2.93E−02 | 1.88E−07 |
| Barium | 0.00E+00 | 2.15E−02 | 0.00E+00 |
| Beryllium | 0.00E+00 | 0.00E+00 | 5.40E−07 |
| Cadmium | 0.00E+00 | 5.46E−02 | 0.00E+00 |
| Chromium | 0.00E+00 | 1.30E−01 | 0.00E+00 |
| ~~Copper~~ | ~~0.00E+00~~ | ~~1.19E−01~~ | ~~0.00E+00~~ |
| ~~Iron~~ | ~~0.00E+00~~ | ~~1.18E+00~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~5.19E−01~~ 1.08E-1 | 0.00E+00 |
| Mercury | 0.00E+00 | 2.71E−02 | 0.00E+00 |
| Nickel | 0.00E+00 | 1.62E−01 | 0.00E+00 |
| Vanadium | 0.00E+00 | 4.44E−02 | 0.00E+00 |
| Zinc | 0.00E+00 | 7.40E−02 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~4.00E+00~~ 1.38E+1 | ~~3.27E−05~~ 1.25E-5 |

*Based on new PCB guidance (USEPA, September 1996).

Revisions 03/24/97 JMS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: Site 2 – Area A Landfill
LOCATION: NSB–NLON, Groton, CT
DATE: 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Construction Worker (All Soil), RME**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | | |
|---|---|---|---|
| C | = CONCENTRATION IN SOIL (MG/KG) | | |
| SA1 | = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| SA2 | = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 3800 |
| AF | = ADHERENCE FACTOR (MG/SQ CM): | | 1 |
| ABS | = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | | Dioxins: | 0.03 |
| | | PCBS: | 0.06 |
| EF1 | = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| EF2 | = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 80 |
| ED1 | = YOUTH EXPOSURE DURATION (YEARS): | | 120 |
| ED2 | = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| BW1 | = BODY WEIGHT ADOLESCENT (KG): | | 1 |
| BW2 | = BODY WEIGHT ADULT (KG): | | 70 |
| AT1 | = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 43800 |
| AT2 | = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 | = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.70E–07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 1.19E–05

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Construction Worker (All Soil), RME
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Cadmium | 12.1 | 0.01 | 0.00E+00 | 1.44E–06 | 2.06E–08 | ~~1.50E–05~~ 2.5E-5 | |
| 1,2,3,4,7,8–HxCDF | 0.00031 | 0.03 | 0.00E+00 | 1.11E–10 | 1.58E–12 | | ~~1.56E+04~~ 1.73E+4 |
| 1,2,3,6,7,8–HxCDF | 0.00015 | 0.03 | 0.00E+00 | 5.35E–11 | 7.65E–13 | | ~~1.56E+04~~ 1.73E+4 |
| Aroclors | 110 | 0.06 | 0.00E+00 | 7.85E–05 | 1.12E–06 | 2.00E–05 | ~~7.70E+00~~ 2E+0* |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions
02/24/97
KLS

000178

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Construction Worker (All Soil), RME
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Cadmium | 0.00E+00 | ~~9.60E-02~~ 5.76E-2 | 0.00E+00 |
| 1,2,3,4,7,8-HxCDF | 0.00E+00 | 0.00E+00 | ~~2.47E-08~~ 2.73E-8 |
| 1,2,3,6,7,8-HxCDF | 0.00E+00 | 0.00E+00 | ~~1.19E-08~~ 1.32E-8 |
| Aroclors | 0.00E+00 | 3.93E+00 | ~~8.64E-06~~ 2.24E-6 * |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 0.00E+00 | ~~4.02E+00~~ 3.99 E+0 | ~~8.67E-06~~ 2.28E-6 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/24/97 JAS

300179

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: Site 2 – Area A Landfill
LOCATION: NSB–NLON, Groton, CT
DATE: 12/21/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: Construction Worker, RME

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE: DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE: Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY–STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

| | |
|---|---|
| EV: | 1 |
| ED: | 1 |
| EF: | 120 |
| A: | 3800 |
| tevent: | 8 |
| BW: | 70 |
| AT(NON): | 365 |
| AT(CAR): | 25550 |

CONVERSION FACTOR (NONCAR) = 1.78E+01

CONVERSION FACTOR (CARCIN) = 2.55E–01

000181

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Construction Worker, RME

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Benzene | 0.016 | O | 6.30E-01 | 2.60E-01 | 2.10E-02 | 1.30E-02 | 2.83E-06 |
| Chlorobenzene | 0.57 | O | 1.00E+00 | 4.30E-01 | 4.10E-02 | 6.90E-02 | 1.98E-04 |
| Chloroform | 0.013 | O | 1.10E+00 | 4.70E-01 | 8.90E-03 | 9.30E-03 | 1.03E-06 |
| 1,4-Dichlorobenzene | 0.063 | O | 3.30E+00 | 6.90E-01 | 6.20E-02 | 2.50E-01 | 3.25E-05 |
| 1,1,2,2-Tetrachloroethane | 0.085 | O | 2.20E+00 | 9.20E-01 | 9.00E-03 | 2.50E-02 | 7.45E-06 |
| Tetrachloroethene | 0.004 | O | 4.30E+00 | 9.00E-01 | 4.80E-02 | 2.50E-01 | 1.71E-06 |
| 1,2,4-Trichlorobenzene | 0.047 | O | 9.30E+00 | 1.10E+00 | 1.00E-01 | 9.50E-01 | 3.85E-05 |
| Trichloroethene | 0.012 | O | 1.30E+00 | 5.50E-01 | 1.60E-02 | 2.60E-02 | 1.72E-06 |
| Bis(2-Ethylhexyl)phthalate | 0.023 | O | 1.00E+02 | 2.10E+01 | 3.30E-02 | 1.30E+01 | 2.72E-05 |
| Methylene chloride | 0.006 | O | 6.90E-01 | 2.90E-01 | 4.50E-03 | 1.80E-03 | 2.31E-07 |
| 4-Methylphenol | 0.008 | O | 9.60E-01 | 4.00E-01 | 1.00E-02 | 8.70E-03 | 7.00E-07 |
| Aroclors | 0.39 | O | 2.50E+01 | 5.30E+00 | 1.30E+00 | 3.20E+02 | 9.12E-03 |
| ~~Aluminum~~ | ~~89.3~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~7.14E-04~~ |
| Antimony | 0.013 | I | | | 1.00E-03 | | 1.04E-07 |
| Arsenic | 0.0196 | I | | | 1.00E-03 | | 1.57E-07 |
| Barium | 0.473 | I | | | 1.00E-03 | | 3.78E-06 |
| Beryllium | 0.0042 | I | | | 1.00E-03 | | 3.36E-08 |
| Boron | 1.68 | I | | | 1.00E-03 | | 1.34E-05 |
| Cadmium | 0.0162 | I | | | 1.00E-03 | | 1.30E-07 |
| Chromium | 0.142 | I | | | 2.00E-03 | | 2.27E-06 |
| ~~Iron~~ | ~~66~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~5.28E-04~~ |
| Manganese | 0.996 | I | | | 1.00E-03 | | 7.97E-06 |
| Nickel | 0.0256 | I | | | 1.00E-04 | | 2.05E-08 |
| Thallium | 0.0025 | I | | | 1.00E-03 | | 2.00E-08 |
| Vanadium | 0.182 | I | | | 1.00E-03 | | 1.46E-06 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
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| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |

Revisions
09/96

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER WATER (PAGE THREE)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Construction Worker, RME
CALCULATE DOSES:

| CHEMICAL | ANNUAL DERMAL DOSE (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX DERMAL |
|---|---|---|---|
| Benzene | 5.06E-05 | | 0.00E+00 |
| Chlorobenzene | 3.53E-03 | 6.00E-03 | 5.88E-01 |
| Chloroform | 1.83E-05 | 1.00E-02 | 1.83E-03 |
| 1,4-Dichlorobenzene | 5.81E-04 | | 0.00E+00 |
| 1,1,2,2-Tetrachloroethane | 1.33E-04 | 2.00E+01 | 6.85E-06 |
| Tetrachloroethene | 3.06E-05 | 1.00E-02 | 3.06E-03 |
| 1,2,4-Trichlorobenzene | 6.88E-04 | 1.00E-02 | 6.88E-02 |
| Trichloroethene | 3.07E-05 | 6.00E-03 | 5.11E-03 |
| *Bis(2-Ethylhexyl)phthalate* | 4.85E-04 | 1.10E-02 | 4.41E-02 |
| Methylene chloride | 4.13E-06 | 6.00E-02 | 6.88E-05 |
| 4-Methylphenol | 1.25E-05 | 5.00E-03 | 2.50E-03 |
| Aroclors | 1.63E-01 | 2.00E-05 | 8.14E+03 |
| ~~Aluminum~~ | ~~1.28E-02~~ | ~~5.00E-02~~ | ~~2.55E-01~~ |
| Antimony | 1.86E-06 | 4.00E-04 | 4.64E-03 |
| Arsenic | 2.80E-06 | 2.80E-04 | 9.99E-03 |
| Barium | 6.75E-05 | 3.50E-03 | 1.93E-02 |
| Beryllium | 6.00E-07 | 2.50E-04 | 2.40E-03 |
| Boron | 2.40E-04 | 4.50E-03 | 5.33E-02 |
| Cadmium | 2.31E-06 | ~~1.58E-05~~ 2.5E-5 | ~~1.54E-01~~ 9.24E-2 |
| Chromium | 4.05E-05 | 1.00E-04 | 4.05E-01 |
| ~~Iron~~ | ~~9.42E-03~~ | ~~1.50E-02~~ | ~~6.28E-01~~ |
| Manganese | 1.42E-04 | ~~1.50E-04~~ 7.2E-5 | ~~9.48E-01~~ 1.98E-1 |
| Nickel | 3.66E-07 | 2.00E-03 | 1.83E-04 |
| Thallium | 3.57E-07 | 4.00E-06 | 8.92E-02 |
| Vanadium | 2.60E-05 | 3.50E-04 | 7.42E-02 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| TOTAL RISK | | | ~~8.15E+03~~ 8.14E+3 |

Revisions 08/10/96 AAS

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE FOUR)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Construction Worker, RME
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF DERMAL (KG/DAY/MG) | CANCER RISK DERMAL CONTACT |
|---|---|---|---|
| Benzene | 7.22E-07 | 2.90E-02 | 2.09E-08 |
| Chlorobenzene | 5.04E-05 | | 0.00E+00 |
| Chloroform | 2.62E-07 | 6.10E-03 | 1.60E-09 |
| 1,4-Dichlorobenzene | 8.30E-06 | 2.40E-02 | 1.99E-07 |
| 1,1,2,2-Tetrachloroethane | 1.90E-06 | 2.00E+01 | 3.80E-05 |
| Tetrachloroethene | 4.37E-07 | 5.20E-02 | 2.27E-08 |
| 1,2,4-Trichlorobenzene | 9.83E-06 | | 0.00E+00 |
| Trichloroethene | 4.38E-07 | 1.10E-02 | 4.82E-09 |
| Bis(2-Ethylhexyl)phthalate | 6.93E-06 | 2.50E-02 | 1.73E-07 |
| Methylene chloride | 5.90E-08 | 7.50E-03 | 4.42E-10 |
| 4-Methylphenol | 1.78E-07 | | 0.00E+00 |
| Aroclors | 2.33E-03 | ~~7.70E+00~~ 4E-1 * | ~~1.78E-02~~ 9.32E-4 * |
| ~~Aluminum~~ | ~~1.82E-04~~ | | ~~0.00E+00~~ |
| Antimony | 2.65E-09 | | 0.00E+00 |
| Arsenic | 4.00E-08 | 1.60E+00 | 6.40E-08 |
| Barium | 9.65E-07 | | 0.00E+00 |
| Beryllium | 8.57E-09 | 8.60E+01 | 7.37E-07 |
| Boron | 3.43E-06 | | 0.00E+00 |
| Cadmium | 3.30E-08 | | 0.00E+00 |
| Chromium | 5.79E-07 | | 0.00E+00 |
| ~~Iron~~ | ~~1.35E-04~~ | | ~~0.00E+00~~ |
| Manganese | 2.03E-06 | | 0.00E+00 |
| Nickel | 5.22E-09 | | 0.00E+00 |
| Thallium | 5.10E-09 | | 0.00E+00 |
| Vanadium | 3.71E-07 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| TOTAL RISK | | | ~~1.78E-02~~ 9.71E-4 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/24/97 AS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** Site 2 – Area A Landfill
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 0 | IR: | 50 |
| EF: | 1 | EF: | 52 |
| Fi: | 1 | Fi: | 0.5 |
| ED: | 1 | ED: | 3 |
| BW: | 1 | BW: | 43 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 1095 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 8.28E–08 | (AVG ANNUAL DOSE) | CF: | 3.55E–09 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)**
**Site 2 – Area A Landfill**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), CTE**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Benzo(a)pyrene | 0.19 | 1 | 1.57E–08 | 0.00E+00 | 6.74E–10 | | 7.30E+00 |
| Benzo(k)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–02 |
| 4,4'–DDT | 0.19 | 1 | 1.57E–08 | 0.00E+00 | 6.74E–10 | 5.00E–04 | 3.40E–01 |
| Aroclors | 1.2 | 1 | 9.94E–08 | 0.00E+00 | 4.26E–09 | 2.00E–05 | ~~7.70E+00~~ 1E+0* |
| 1,2,3,4,7,8–HxCDF | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | ~~4.00E–07~~ 1.56E+4 |
| 1,2,3,6,7,8–HxCDF | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | ~~4.00E–07~~ 1.56E+4 |
| ~~Aluminum~~ | ~~8060~~ | ~~1~~ | ~~6.68E–04~~ | ~~0.00E+00~~ | ~~2.86E–05~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E–04 | |
| Arsenic | 2.5 | 1 | 2.07E–07 | 0.00E+00 | 8.87E–09 | 3.00E–04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–02 | |
| Beryllium | 1.2 | 1 | 9.94E–08 | 0.00E+00 | 4.26E–09 | | 4.30E+00 |
| Cadmium | 1.9 | 1 | 1.57E–07 | 0.00E+00 | 6.74E–09 | 5.00E–04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Copper~~ | ~~794~~ | ~~1~~ | ~~6.58E–05~~ | ~~0.00E+00~~ | ~~2.82E–06~~ | ~~4.00E–02~~ | |
| ~~Iron~~ | ~~12000~~ | ~~1~~ | ~~9.94E–04~~ | ~~0.00E+00~~ | ~~4.26E–05~~ | ~~3.00E–01~~ | |
| Manganese | 212 | 1 | 1.76E–05 | 0.00E+00 | 7.53E–07 | ~~5.00E–03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–04 | |
| Nickel | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–02 | |
| Vanadium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–03 | |
| Zinc | 2140 | 1 | 1.77E–04 | 0.00E+00 | 7.60E–06 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 1/24/97 JAS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)**
**Site 2 – Area A Landfill**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), CTE**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)anthracene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 4.92E−09 |
| Benzo(k)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDT | 3.15E−05 | 0.00E+00 | ~~2.29E−10~~ 2.29E-10 |
| Aroclors | 4.97E−03 | 0.00E+00 | ~~3.28E−08~~ 4.26E-9 * |
| 1,2,3,4,7,8−HxCDF | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,6,7,8−HxCDF | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~6.68E−04~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 6.90E−04 | 0.00E+00 | 1.33E−08 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 0.00E+00 | 0.00E+00 | 1.83E−08 |
| Cadmium | 3.15E−04 | 0.00E+00 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Copper~~ | ~~1.64E−03~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| ~~Iron~~ | ~~3.31E−03~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | ~~3.51E−03~~ 7.31E-4 | 0.00E+00 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Nickel | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zinc | 5.91E−04 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~1.57E−02~~ 7.33E-3 | **0.00E+00** | ~~6.06E−08~~ 4.10 E-8 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/24/97 HLS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL

SITE NAME: Site 2 – Area A Landfill
LOCATION: NSB–NLON, Groton, CT
DATE: 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), CTE**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | | |
|---|---|---|---|
| C | = CONCENTRATION IN SOIL (MG/KG) | | |
| SA1 | = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 3150 |
| SA2 | = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| AF | = ADHERENCE FACTOR (MG/SQ CM): | | 0.2 |
| ABS | = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | | Dioxins: | 0.03 |
| | | PCBS: | 0.06 |
| EF1 | = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 52 |
| EF2 | = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| ED1 | = YOUTH EXPOSURE DURATION (YEARS): | | 3 |
| ED2 | = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| BW1 | = BODY WEIGHT ADOLESCENT (KG): | | 43 |
| BW2 | = BODY WEIGHT ADULT (KG): | | 1 |
| AT1 | = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 1095 |
| AT2 | = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 | = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 2.09E–06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 8.95E–08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), CTE
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Cadmium | 1.9 | 0.01 | 3.97E–08 | 0.00E+00 | 1.70E–09 | ~~1.50E–05~~ 2.5E-5 | |
| 1,2,3,4,7,8–HxCDF | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | ~~1.56E+04~~ 1.73E+4 |
| 1,2,3,6,7,8–HxCDF | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | ~~1.56E+04~~ 1.73E+4 |
| Aroclors | 1.2 | 0.06 | 1.50E–07 | 0.00E+00 | 6.44E–09 | 2.00E–05 | ~~7.70E+00~~ 1E+0* |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 1/24/97 JMS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Cadmium | ~~2.64E-03~~ 1.58E-3 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,7,8-HxCDF | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,6,7,8-HxCDF | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Aroclors | 7.51E-03 | 0.00E+00 | ~~4.96E-08~~ 6.44E-9* |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | ~~1.02E-02~~ 9.09E-3 | 0.00E+00 | ~~4.96E-08~~ 6.44E-9 |

*Based on new PCB guidance (USEPA, September 1996).

Revisions 02/24/97 WMS

**RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL**

**SITE NAME:** Site 2 – Area A Landfill
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), RME**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 3150 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 1 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 120 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 10 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 43 |
| BW2 = BODY WEIGHT ADULT (KG): | | 1 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 3650 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 2.41E-05 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 3.44E-06
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE TWO)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), RME
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Cadmium | 4.7 | 0.01 | 1.13E–06 | 0.00E+00 | 1.62E–07 | ~~1.50E–05~~ 2.5E-5 | |
| 1,2,3,4,7,8–HxCDF | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | ~~1.56E+04~~ 1.73E+4 |
| 1,2,3,6,7,8–HxCDF | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | ~~1.56E+04~~ 1.73E+4 |
| Aroclors | 12 | 0.06 | 1.73E–05 | 0.00E+00 | 2.48E–06 | 2.00E–05 | ~~7.70E+00~~ 2E+0 * |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 01/14/97 AS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL (PAGE THREE)
Site 2 – Area A Landfill
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), RME
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Cadmium | ~~7.55E-02~~ 4.53E-2 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,7,8-HxCDF | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,6,7,8-HxCDF | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Aroclors | 8.67E-01 | 0.00E+00 | ~~1.91E-05~~ 4.96E-6 * |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | ~~0.42E-01~~ 9.12E-1 | 0.00E+00 | ~~1.91E-05~~ 4.96E-6 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/24/97 TMQ

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** Site 2 – Area A Landfill
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 12/21/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 0 | IR: | 100 |
| EF: | 1 | EF: | 120 |
| Fi: | 1 | Fi: | 1 |
| ED: | 1 | ED: | 10 |
| BW: | 1 | BW: | 43 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 3650 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 7.65E-07 | (AVG ANNUAL DOSE) | CF: | 1.09E-07 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)**
**Site 2 – Area A Landfill**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), RME**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Benzo(a)pyrene | 0.19 | 1 | 1.45E–07 | 0.00E+00 | 2.08E–08 | | 7.30E+00 |
| Benzo(k)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–02 |
| 4,4'–DDT | 2.3 | 1 | 1.76E–06 | 0.00E+00 | 2.51E–07 | 5.00E–04 | 3.40E–01 |
| Aroclors | 12 | 1 | 9.17E–06 | 0.00E+00 | 1.31E–06 | 2.00E–05 | ~~7.70E+00~~ 2E+0 * |
| 1,2,3,4,7,8–HxCDF | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 4.00E–07 |
| 1,2,3,6,7,8–HxCDF | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 4.00E–07 |
| ~~Aluminum~~ | ~~8060~~ | ~~1~~ | ~~6.16E–03~~ | ~~0.00E+00~~ | ~~8.80E–04~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E–04 | |
| Arsenic | 2.5 | 1 | 1.91E–06 | 0.00E+00 | 2.73E–07 | 3.00E–04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–02 | |
| Beryllium | 1.2 | 1 | 9.17E–07 | 0.00E+00 | 1.31E–07 | | 4.30E+00 |
| Cadmium | 4.7 | 1 | 3.59E–06 | 0.00E+00 | 5.13E–07 | 5.00E–04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Copper~~ | ~~794~~ | ~~1~~ | ~~6.07E–04~~ | ~~0.00E+00~~ | ~~8.67E–05~~ | ~~4.00E–02~~ | |
| ~~Iron~~ | ~~12000~~ | ~~1~~ | ~~9.17E–03~~ | ~~0.00E+00~~ | ~~1.31E–03~~ | ~~3.00E–01~~ | |
| Manganese | 212 | 1 | 1.62E–04 | 0.00E+00 | 2.32E–05 | ~~5.00E–03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–04 | |
| Nickel | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–02 | |
| Vanadium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–03 | |
| Zinc | 2140 | 1 | 1.64E–03 | 0.00E+00 | 2.34E–04 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

*Based on new PCB guidance (USEPA, September 1996).

Revisions 12/24/97 SLS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)**
**Site 2 – Area A Landfill**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil), RME**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)anthracene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 1.51E−07 |
| Benzo(k)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDT | 3.52E−03 | 0.00E+00 | 8.54E−08 |
| Aroclors | 4.59E−01 | 0.00E+00 | ~~1.01E−05~~ 2.62E-6 * |
| 1,2,3,4,7,8−HxCDF | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,6,7,8−HxCDF | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~6.16E−03~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 6.37E−03 | 0.00E+00 | 4.10E−07 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 0.00E+00 | 0.00E+00 | 5.64E−07 |
| Cadmium | 7.19E−03 | 0.00E+00 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Copper~~ | ~~1.52E−02~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| ~~Iron~~ | ~~3.06E−02~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | ~~3.24E−03~~ 6.75E-3 | 0.00E+00 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Nickel | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zinc | 5.45E−03 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~5.66E−01~~ 4.88E-1 | **0.00E+00** | ~~1.13E−05~~ 3.83E-6 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/24/97 JAS

## IEUBK MODEL - EXPOSURE TO LEAD (PAGE 1 OF 2)

**SITE NAME:** Site 2 - Area A Landfill
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 12/27/95

**EXPOSURE SCENARIO: CTE & RME**

LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.100 ug Pb/m3 DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

| Age | Time Outdoors (hr) | Vent. Rate (m3/day) | Lung Abs. (%) |
|---|---|---|---|
| 0-1 | 1.0 | 2.0 | 32.0 |
| 1-2 | 2.0 | 3.0 | 32.0 |
| 2-3 | 3.0 | 5.0 | 32.0 |
| 3-4 | 4.0 | 5.0 | 32.0 |
| 4-5 | 4.0 | 5.0 | 32.0 |
| 5-6 | 4.0 | 7.0 | 32.0 |
| 6-7 | 4.0 | 7.0 | 32.0 |

DIET: DEFAULT

DRINKING WATER Conc: 14.20 ug Pb/L
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: constant conc.

| Age | Soil (ug Pb/g) | House Dust (ug Pb/g) |
|---|---|---|
| 0-1 | 915.0 | 200.0 |
| 1-2 | 915.0 | 200.0 |
| 2-3 | 915.0 | 200.0 |
| 3-4 | 915.0 | 200.0 |
| 4-5 | 915.0 | 200.0 |
| 5-6 | 915.0 | 200.0 |
| 6-7 | 915.0 | 200.0 |

Additional Dust Sources: None DEFAULT

PAINT Intake: 0.00 ug Pb/day DEFAULT

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

CALCULATED BLOOD Pb and Pb UPTAKES:

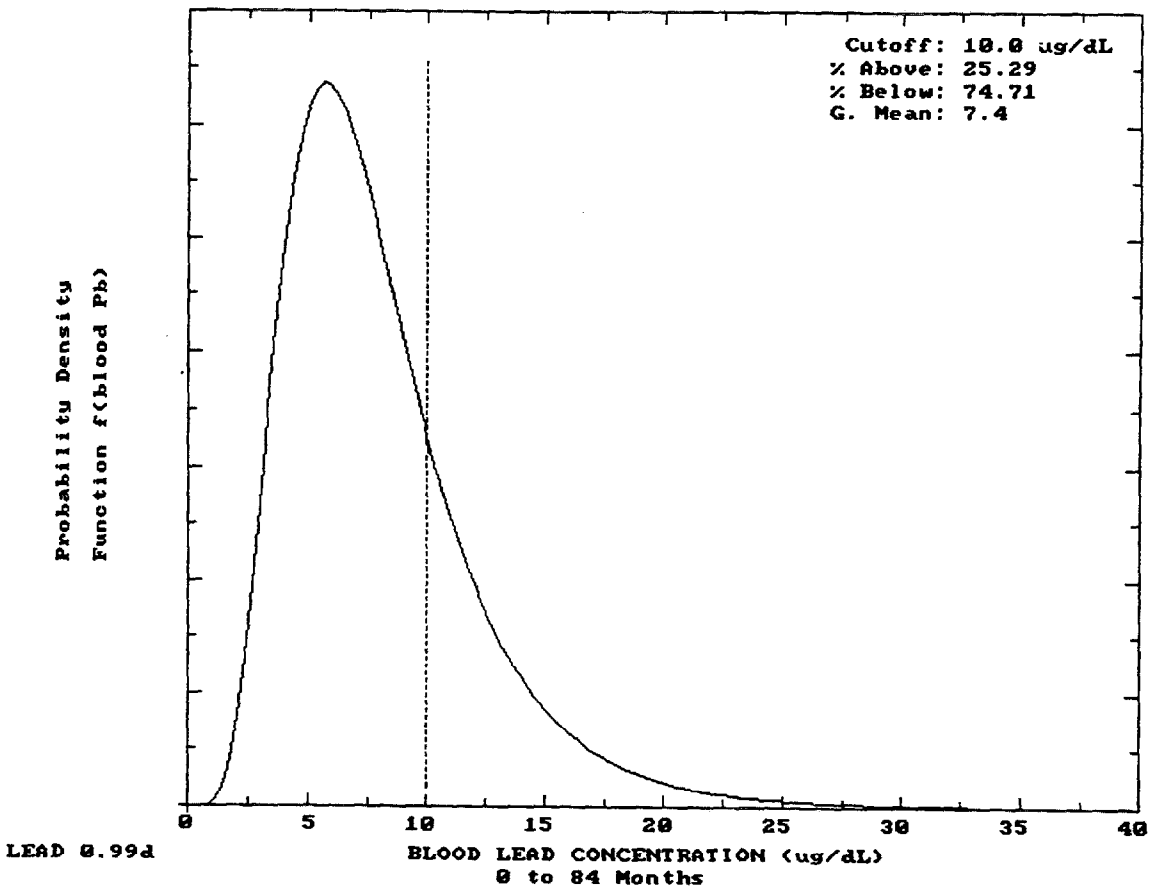
| YEAR | Blood Level (ug/dL) | Total Uptake (ug/day) | Soil+Dust Uptake (ug/day) |
|---|---|---|---|
| 0.5-1: | 7.8 | 14.76 | 11.21 |
| 1-2: | 9.2 | 22.55 | 17.26 |
| 2-3: | 8.7 | 23.53 | 17.67 |
| 3-4: | 8.3 | 24.04 | 18.09 |
| 4-5: | 7.1 | 20.24 | 13.99 |
| 5-6: | 6.1 | 19.52 | 12.80 |
| 6-7: | 5.5 | 19.34 | 12.20 |

| YEAR | Diet Uptake (ug/day) | Water Uptake (ug/day) | Paint Uptake (ug/day) | Air Uptake (ug/day) |
|---|---|---|---|---|
| 0.5-1: | 2.33 | 1.20 | 0.00 | 0.02 |
| 1-2: | 2.36 | 2.90 | 0.00 | 0.03 |
| 2-3: | 2.71 | 3.09 | 0.00 | 0.06 |
| 3-4: | 2.67 | 3.22 | 0.00 | 0.07 |
| 4-5: | 2.69 | 3.49 | 0.00 | 0.07 |
| 5-6: | 2.88 | 3.74 | 0.00 | 0.09 |
| 6-7: | 3.21 | 3.84 | 0.00 | 0.09 |

IEUBK MODEL - EXPOSURE TO LEAD (PAGE 2 OF 2)

SITE NAME: Site 2 - Area A Landfill
LOCATION: NSB-NLON, Groton, CT
DATE: 12/27/95

EXPOSURE SCENARIO: CTE & RME



**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A LANDFILL - SOIL (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| 1,1,2,2-Tetrachloroethane | 0.022 | 0.022 | 3.1 | 29 | 0.01 * | 0.1 |
| 1,1,2-Trichloroethane | 0.011 | 0.011 | 11 | 100 | 0.1 | 1 |
| 2-Butanone | 0.002 | 0.002 | 500 | 1000 | 8 | 80 |
| 4-Methyl-2-pentanone | 0.012 | 0.012 | 500 | 1000 | 7 | 14 |
| Acetone | 0.25 | 0.06 | 500 | 1000 | 14 | 140 |
| Carbon disulfide | 0.005 | 0.005 | - | - | - | - |
| Chlorobenzene | 4.5 | 3.0 | 500 | 1000 | 2 * | 20 |
| Ethylbenzene | 28 | 7 | 500 | 1000 | 10.1 * | 10.1 * |
| Methylene chloride | 0.025 | 0.008 | 82 | 760 | 0.1 | 1.0 |
| Tetrachloroethene | 0.004 | 0.004 | 12 | 110 | 0.1 | 1 |
| Toluene | 3.2 | 0.4 | 500 | 1000 | 20 | 67 |
| Trichloroethene | 0.002 | 0.002 | 56 | 520 | 0.1 | 1 |
| Xylenes (total) | 140 | 27 | 500 | 1000 | 19.5 * | 19.5 * |
| 2,4-Dimethylphenol | 0.19 | 0.19 | - | - | - | - |
| 2-Methylnaphthalene | 1.3 | 0.5 | - | - | - | - |
| 4-Methylphenol | 2 | 1 | - | - | - | - |
| Acenaphthene | 8.4 | 2.5 | - | - | - | - |
| Acenaphthylene | 0.22 | 0.22 | 1000 | 2500 | 8.4 | 84 |
| Anthracene | 19 | 4 | 1000 | 2500 | 40 | 400 |
| Benzo(a)anthracene | 23 | 2 | 1 * | 7.8 * | 1 * | 1 * |
| Benzo(a)pyrene | 15 | 2 | 1 * | 1 * | 1 * | 1 * |
| Benzo(b)fluoranthene | 15 | 2 | 1 * | 7.8 * | 1 * | 1 * |
| Benzo(g,h,i)perylene | 0.59 | 0.28 | - | - | - | - |
| Benzo(k)fluoranthene | 14 | 1 | 8.4 * | 78 | 1 * | 1 * |
| Bis(2-Ethylhexyl)phthalate | 1.9 | 0.9 | 44 | 410 | 1 * | 11 |
| Carbazole | 9.8 | 3.7 | - | - | - | - |
| Chrysene | 19 | 2 | - | - | - | - |
| Di-N-butyl phthalate | 0.076 | 0.069 | 1000 | 2500 | 14 | 140 |
| Dibenzofuran | 13 | 4 | - | - | - | - |

SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)
SITE 2 AREA A LANDFILL - SOIL (MG/KG)
NSB-NLON, GROTON, CONNECTICUT

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| Fluoranthene | 47 | 3 | 1000 | 2500 | 5.6 * | 56 |
| Fluorene | 17 | 5 | 1000 | 2500 | 5.6 * | 56 |
| Indeno(1,2,3-cd)pyrene | 0.64 | 0.37 | - | - | - | - |
| Naphthalene | 20 | 3 | 1000 | 2500 | 5.6 * | 56 |
| Phenanthrene | 61 | 5 | 1000 | 2500 | 4 * | 40 * |
| Pyrene | 40 | 3 | 1000 | 2500 | 4 * | 40 |
| 4,4'-DDD | 0.49 | 0.16 | - | - | - | - |
| 4,4'-DDE | 0.45 | 0.10 | - | - | - | - |
| 4,4'-DDT | 2.3 | 0.2 | - | - | - | - |
| Aldrin | 0.0006 | 0.0006 | - | - | - | - |
| Alpha-Chlordane | 0.039 | 0.016 | 0.49 (5) | 2.2 (5) | 0.066 (5) | 0.066 (5) |
| Aroclor-1242 | 1.7 | 1.7 | 1 * | 10 | - | - |
| Aroclor-1254 | 100 | 11 | 1 * | 10 * | - | - |
| Aroclor-1260 | 12 | 4 | 1 * | 10 * | - | - |
| Dieldrin | 0.0075 | 0.0044 | 0.038 | 0.36 | 0.007 * | 0.007 * |
| Endosulfan I | 0.34 | 0.12 | - | - | - | - |
| Endosulfan II | 0.002 | 0.0020 | - | - | - | - |
| Endrin | 0.47 | 0.09 | 20 | 610 | - | - |
| Endrin aldehyde | 0.091 | 0.058 | - | - | - | - |
| Endrin ketone | 0.57 | 0.29 | - | - | - | - |
| Gamma-Chlordane | 0.061 | 0.024 | 0.49 (5) | 2.2 (5) | 0.066 (5) | 0.066 (5) |
| Heptachlor | 0.079 | 0.028 | 0.14 | 1.3 | 0.013 * | 0.013 * |
| Heptachlor epoxide | 0.0007 | 0.0007 | 0.067 | 0.63 | 0.02 | 0.02 |
| Methoxychlor | 0.019 | 0.019 | 340 | 1E+4 | 0.8 | 8 |
| 1,2,3,4,6,7,8-HPCDF | 0.0002 | 0.0002 | - | - | - | - |
| 1,2,3,4,7,8-HXCDF | 0.0003 | 0.0003 | - | - | - | - |
| 1,2,3,6,7,8-HXCDF | 0.0002 | 0.0002 | - | - | - | - |
| OCDD | 0.0025 | 0.002 | - | - | - | - |
| Aluminum | 15100 | 8063 | - | - | - | - |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A LANDFILL - SOIL (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| Antimony | 134 | 59 | 27 * | 8200 | - | - |
| Arsenic | 10.6 | 2.9 | 10 * | 10 * | - | - |
| Barium | 667 | 98 | 4700 | 1.4E+5 | - | - |
| Beryllium | 3.9 | 0.9 | 2 * | 2 * | - | - |
| Boron | 79.8 | 42.1 | - | - | - | - |
| Cadmium | 12.1 | 4.4 | 34 | 1000 | - | - |
| Calcium | 17200 | 3499 | - | - | - | - |
| Chromium (total) | 289 | 31 | 100 (6) * | 100 (6) * | - | - |
| Cobalt | 122 | 13 | - | - | - | - |
| Copper | 21600 | 911 | 2500 * | 7.6E+4 | - | - |
| Cyanide | 0.53 | 0.23 | 1400 | 4.1E+4 | - | - |
| Iron | 157000 | 23908 | - | - | - | - |
| Lead | 1780 | 222 | 500 * | 1000 * | - | - |
| Magnesium | 9330 | 3141 | - | - | - | - |
| Manganese | 1150 | 262 | - | - | - | - |
| Mercury | 3.6 | 0.7 | 20 | 610 | - | - |
| Nickel | 1440 | 77 | 1400 * | 7500 | - | - |
| Potassium | 3700 | 1473 | - | - | - | - |
| Selenium | 0.81 | 0.51 | 340 | 1E+4 | - | - |
| Silver | 38.9 | 12.0 | 340 | 1E+4 | - | - |
| Sodium | 4120 | 656 | - | - | - | - |
| Vanadium | 138 | 28 | 470 | 1.4E+4 | - | - |
| Zinc | 9850 | 1074 | 2E+4 | 6.1E+5 | - | - |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A LANDFILL - SOIL (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 CTDEP, December 13, 1995.
3 Cis-1,2-dichloroethene.
4 1,3-Dichloropropene (total).
5 Chlordane.
6 Chromium (hexavalent).

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A LANDFILL - UNFILTERED GROUNDWATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | State MCL (2) | Groundwater Protection (3) | Surface Water Protection (3) |
|---|---|---|---|---|---|
| 1,1,2,2-Tetrachloroethane | 140 | 64 | - | .5 * | 110 * |
| 1,2-Dichloroethene (total) | 2 | 2 | 70 (4) | 70 (4) | - |
| 4-Methyl-2-pentanone | 49 | 12 | - | 350 | - |
| Acetone | 10 | 10 | - | 700 | - |
| Benzene | 32 | 14 | 5 * | 1 * | 710 |
| Carbon disulfide | 3 | 1 | - | - | - |
| Chlorobenzene | 1200 | 381 | 100 * | 100 * | 420000 |
| Chloroform | 16 | 16 | 100 | 6 * | 14100 |
| Ethylbenzene | 120 | 32 | 700 | 700 | 580000 |
| Methylene chloride | 22 | 16 | 5 * | 5 * | 48000 |
| Tetrachloroethene | 3 | 3 | 5 | 5 | 88 |
| Toluene | 2 | 2 | 1000 | 1000 | 4000000 |
| Trichloroethene | 23 | 12 | 5 * | 5 * | 2340 |
| Xylenes (total) | 840 | 175 | 10000 | 530 * | - |
| 1,2,4-Trichlorobenzene | 72 | 53 | 70 * | - | - |
| 1,2-Dichlorobenzene | 14 | 11 | 600 | 600 | 170000 |
| 1,3-Dichlorobenzene | 33 | 22 | - | 600 | 26000 |
| 1,4-Dichlorobenzene | 140 | 77 | 75 * | 75 * | 26000 |
| 2,4-Dichlorophenol | 2 | 2 | - | 20 | 15800 |
| 2,4-Dimethylphenol | 19 | 9 | - | - | - |
| 2,4-Dinitrotoluene | 7 | 7 | - | - | - |
| 2-Chlorophenol | 12 | 8 | - | 36 | - |
| 2-Methylnaphthalene | 6 | 3 | - | - | - |
| 4-Chloro-3-methylphenol | 8 | 8 | - | - | - |
| 4-Methylphenol | 22 | 7 | - | - | - |
| Acenaphthene | 1 | 1 | - | - | - |
| Anthracene | 0.5 | 0.50 | - | 2000 | 1100000 |
| Benzoic acid | 14 | 4 | - | - | - |
| Bis(2-Ethylhexyl)phthalate | 62 | 18 | 6 * | 2 * | 59 * |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A LANDFILL - UNFILTERED GROUNDWATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | State MCL (2) | Groundwater Protection (3) | Surface Water Protection (3) |
|---|---|---|---|---|---|
| Butyl benzyl phthalate | 1 | 1 | - | 1000 | - |
| Carbazole | 2 | 1 | - | - | - |
| Di-N-butyl phthalate | 1 | 1 | - | 700 | 120000 |
| Di-N-octyl phthalate | 2 | 2 | - | 100 | - |
| Dibenzofuran | 0.6 | 0.60 | - | - | - |
| Diethyl phthalate | 120 | 22 | - | - | - |
| Fluorene | 1 | 1 | - | 280 | 140000 |
| N-Nitrosodiphenylamine | 1 | 1 | - | - | - |
| Naphthalene | 42 | 10 | - | 280 | - |
| Phenanthrene | 1 | 1 | - | 200 | 0.077 * |
| Phenol | 6 | 2 | - | 4000 | 92000000 |
| Aroclor-1016 | 7.5 | 7.5 | 0.5 * | 0.5 * | 0.5 * |
| Aroclor-1254 | 150 | 140 | 0.5 * | 0.5 * | 0.5 * |
| Aroclor-1260 | 710 | 500 | 0.5 * | 0.5 * | 0.5 * |
| Aluminum | 89300 | 5938 | - | - | - |
| Antimony | 20.6 | 20.6 | 6 * | 6 * | 86000 |
| Arsenic | 37 | 6 | 50 | 50 | 4 * |
| Barium | 956 | 194 | 2000 | 1000 | - |
| Beryllium | 4.2 | 2.0 | 4 * | 4 * | 4 * |
| Boron | 3010 | 594 | - | - | - |
| Cadmium | 44.8 | 11.7 | 5 * | 5 * | 6 * |
| Calcium | 174000 | 47229 | - | - | - |
| Chromium (total) | 142 | 20 | 100 (5) * | 50 (5) * | 110 (6) * |
| Cobalt | 35.5 | 12.0 | - | - | - |
| Copper | 125 | 17 | - | 1300 | 48 * |
| Iron | 193000 | 35343 | - | - | - |
| Lead | 84 | 16 | - | 15 * | 13 * |
| Magnesium | 563000 | 29532 | - | - | - |
| Manganese | 2570 | 612 | 5000 (7) | - | - |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A LANDFILL - UNFILTERED GROUNDWATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | State MCL (2) | Groundwater Protection (3) | Surface Water Protection (3) |
|---|---|---|---|---|---|
| Mercury | 0.36 | 0.33 | 2 | 2 | 0.4 |
| Nickel | 80.9 | 27.5 | 100 | 100 | 880 |
| Potassium | 208000 | 18769 | - | - | - |
| Selenium | 2.9 | 2.0 | 50 | 50 | 50 |
| Silver | 3.5 | 3.0 | 50 | 36 | 12 |
| Sodium | 7280000 | 664731 | 28000 (8) * | - | - |
| Thallium | 4 | 3 | 2 * | 5 | 63 |
| Vanadium | 182 | 49 | - | 50 * | - |
| Zinc | 612 | 76 | - | 5000 | 123 * |

Footnotes:

1 * - Indicates that maximum detection exceed this standard.
2 Maximum Contaminant Level. Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
3 CTDEP, December 13, 1995.
4 Cis-1,2-dichloroethene.
5 Chromium (total).
6 Chromium (hexavalent).
7 Current Connecticut Department of Public Health and Addiction Services Action Level.
8 Notification Level.

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A LANDFILL - FILTERED GROUNDWATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | State MCL (2) | Groundwater Protection (3) | Surface Water Protection (3) |
|---|---|---|---|---|---|
| Aluminum | 62.5 | 26.8 | - | - | - |
| Antimony | 34.1 | 21.1 | 6 * | 6 * | 86000 |
| Arsenic | 7.3 | 3.7 | 50 | 50 | 4 * |
| Barium | 924 | 204 | 2000 | 1000 | - |
| Beryllium | 1.4 | 1.3 | 4 | 4 | 4 |
| Boron | 2670 | 373 | - | - | - |
| Cadmium | 2.1 | 2.1 | 5 | 5 | 6 |
| Calcium | 161000 | 55644 | - | - | - |
| Chromium (total) | 6.7 | 5.3 | 100 (5) | 50 (5) | 110 (6) |
| Cobalt | 14.4 | 8.2 | - | - | - |
| Copper | 30.1 | 11.4 | - | 1300 | 48 |
| Iron | 193000 | 19464 | - | - | - |
| Lead | 20.6 | 7.6 | - | 15 * | 13 * |
| Magnesium | 451000 | 31167 | - | - | - |
| Manganese | 2010 | 615 | 5000 (7) | - | - |
| Mercury | 0.29 | 0.25 | 2 | 2 | 0.4 |
| Nickel | 34.9 | 17.1 | 100 | 100 | 880 |
| Potassium | 172000 | 21443 | - | - | - |
| Selenium | 3.0 | 3.0 | 50 | 50 | 50 |
| Sodium | 6960000 | 824356 | 28000 (8) * | - | - |
| Thallium | 5.8 | 5.8 | 2 * | 5 * | 63 |
| Vanadium | 6.3 | 5.0 | - | 50 | - |
| Zinc | 74.0 | 22.0 | - | 5000 | 123 |

Footnotes:

1 * - Indicates that maximum detection exceed this standard.
2 Maximum Contaminant Level. Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.

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**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A LANDFILL - FILTERED GROUNDWATER (UG/L)**
***NSB-NLON, GROTON, CONNECTICUT***

3 CTDEP, December 13, 1995.
4 Cis-1,2-dichloroethene.
5 Chromium (total).
6 Chromium (hexavalent).
7 Current Connecticut Department of Public Health and Addiction Services Action Level.
8 Notification Level.

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# APPENDIX F.6

## SITE 2 - AREA A WETLAND

## SUMMARY OF COC SELECTION
## SITE 2 WETLAND - SURFACE SOIL/SEDIMENT (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 2-Butanone | 7/32 | 0.005 - 1.4 | T8-B | 0.011 - 0.04 | 4700 | 6900 (7) | - | N | 2 |
| Acetone | 3/32 | 0.037 - 0.85 | 2WTB8 | 0.011 - 0.11 | 780 | 62000 | 8 | N | 2 |
| Carbon disulfide | 4/32 | 0.003 - 0.012 | T10-B | 0.005 - 0.024 | 780 | 11 | 14 | N | 2 |
| Chlorobenzene | 3/33 | 0.002 - 0.014 | T7-B | 0.005 - 0.022 | 160 | 94 | 0.6 | N | 2 |
| Methylene chloride | 2/32 | 0.004 - 0.005 | 2WSD9 | 0.005 - 0.074 | 85 | 7 | 0.01 | N | 2 |
| Tetrachloroethene | 2/32 | 0.007 - 0.011 | 2WSD9 | 0.003 - 0.024 | 12 | 11 | 0.04 | N | 2 |
| Toluene | 8/32 | 0.002 - 0.006 | T8-B | 0.004 - 0.024 | 1600 | 520 | 5 | N | 2 |
| Trichloroethene | 2/32 | 0.004 - 0.006 | 2WSD9 | 0.005 - 0.024 | 58 | 3 | 0.02 | N | 2 |
| Xylenes, total | 1/32 | 0.003 | T6-B | 0.005 - 0.022 | 16000 | 320 | 74 | N | 2 |
| 1,4-Dichlorobenzene | 1/32 | 0.042 | T6-B | 0.35 - 6.6 | 27 | 7700 | 1 | N | 2 |
| 2,4-Dimethylphenol | 1/32 | 0.21 | T8-B | 0.35 - 6.6 | 160 | - | 3 | N | 2 |
| 2-Methylnaphthalene | 4/32 | 0.04 - 0.055 | T3-A | 0.35 - 6.6 | - | - | - | N | 1 |
| 4-Methylphenol | 1/32 | 0.043 | T9-A | 0.35 - 6.6 | 39 | - | - | N | 2 |
| Acenaphthene | 10/33 | 0.03 - 0.38 | T7-B | 0.35 - 6.6 | 470 | - | 200 | N | 2 |
| Acenaphthylene | 7/32 | 0.034 - 0.39 | T3-A | 0.35 - 6.6 | - | - | - | N | 1 |
| Anthracene | 19/32 | 0.034 - 2.4 | 2WSD9 | 0.35 - 2.6 | 2300 | - | 4300 | N | 2 |
| Benzo(a)anthracene | 30/33 | 0.025 - 27 | 2WSD9 | 0.53 - 0.62 | 0.88 | - | 0.7 | Y | 3 |
| Benzo(a)pyrene | 27/33 | 0.03 - 35 | 2WSD9 | 0.53 - 2.6 | 0.088 | - | 4 | Y | 3 |
| Benzo(b)fluoranthene | 27/33 | 0.044 - 55 | 2WSD9 | 0.39 - 2.6 | 0.88 | - | 4 | Y | 3 |
| Benzo(g,h,i)perylene | 22/33 | 0.027 - 23 | 2WSD9 | 0.35 - 2.6 | - | - | - | N | 1 |
| Benzo(k)fluoranthene | 28/33 | 0.062 - 45 | 2WSD9 | 0.38 - 2.6 | 8.8 | - | 4 | Y | 3 |
| Benzoic acid | 4/32 | 0.13 - 32 | 2WSD9 | 1.7 - 13 | 31000 | - | 280 | N | 2 |
| Bis(2-ethylhexyl)phthalate | 7/32 | 0.22 - 3.5 | T10-B | 0.35 - 6.6 | 46 | 210 | 11 | N | 2 |
| Butyl benzyl phthalate | 5/33 | 0.021 - 0.39 | T7-B | 0.35 - 6.6 | 1600 | 530 | 68 | N | 2 |
| Carbazole | 6/21 | 0.025 - 0.13 | T5-A | 0.38 - 0.8 | 32 | - | 0.2 | N | 2 |
| Chrysene | 29/33 | 0.038 - 42 | 2WSD9 | 0.53 - 2.6 | 88 | - | 1 | N | 2 |
| Di-n-butyl phthalate | 9/32 | 0.023 - 0.063 | T3-B | 0.35 - 7.9 | 780 | 100 | 120 | N | 2 |
| Dibenzo(a,h)anthracene | 7/32 | 0.072 - 0.31 | T2-A | 0.35 - 6.6 | 0.088 | - | 11 | Y | 3 |
| Dibenzofuran | 10/33 | 0.035 - 1 | 2WSD9 | 0.35 - 2.6 | 31 | - | - | N | 2 |



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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 WETLAND - SURFACE SOIL/SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Fluoranthene | 32/33 | 0.053 - 80 | 2WSD9 | 0.59 | 310 | - | 980 | N | 2 |
| Fluorene | 13/33 | 0.021 - 1 | 2WSD9 | 0.35 - 2.6 | 310 | - | 160 | N | 2 |
| Indeno(1,2,3-cd)pyrene | 24/33 | 0.022 - 23 | 2WSD9 | 0.35 - 2.6 | 0.88 | - | 35 | Y | 3 |
| Naphthalene | 5/32 | 0.056 - 0.077 | T9-A | 0.35 - 6.6 | 310 | - | 30 | N | 2 |
| Pentachlorophenol | 1/32 | 0.24 | T1-B | 0.93 - 32 | 5.3 | - | 0.2 | N | 2 |
| Phenanthrene | 29/33 | 0.022 - 36 | 2WSD9 | 0.53 - 2.6 | - | - | - | N | 1 |
| Pyrene | 31/33 | 0.046 - 42 | 2WSD9 | 0.53 - 0.59 | 230 | - | 1400 | N | 2 |
| 4,4'-DDD | 18/38 | 0.0045 - 4.8 | 2WSD25 | 0.0038 - 0.064 | 2.7 | - | 0.7 | Y | 3 |
| 4,4'-DDE | 18/42 | 0.0062 - 0.72 | 2WSD25 | 0.0038 - 0.064 | 1.9 | - | 0.5 | N | 2 |
| 4,4'-DDT | 13/34 | 0.0044 - 2.9 | 2WSD25/T3-B | 0.0038 - 0.064 | 1.9 | 80 | 1.0 | Y | 3 |
| Aldrin | 1/40 | 0.0032 | T5-A | 0.002 - 0.032 | 0.038 | 0.5 | 0.005 | N | 2 |
| alpha-Chlordane | 13/42 | 0.0029 - 0.029 | T6-A | 0.002 - 0.32 | 0.49 (8) | 10 (8) | 2 (8) | N | 2 |
| Aroclor-1260 | 8/36 | 0.082 - 1.5 | T6-A | 0.038 - 0.64 | 0.083 | - | - | Y | 3 |
| beta-BHC | 1/41 | 0.0027 | T5-A | 0.002 - 0.032 | 0.35 | 16 | 0.002 | N | 2 |
| delta-BHC | 1/41 | 0.0042 | T5-A | 0.002 - 0.032 | - | - | - | N | 1 |
| Dieldrin | 3/41 | 0.0084 - 0.026 | T6-A | 0.0038 - 0.064 | 0.04 | 2 | 0.001 | N | 2 |
| Endosulfan-I | 4/41 | 0.0021 - 0.011 | T3-A | 0.002 - 0.032 | 47 | - | 4 | N | 2 |
| Endosulfan II | 2/38 | 0.0069 - 0.031 | T2-A | 0.0038 - 0.064 | 47 | - | 3 | N | 2 |
| Endosulfan sulfate | 2/39 | 0.0069 - 0.014 | T3-A | 0.0038 - 0.064 | - | - | - | N | 1 |
| Endrin | 3/41 | 0.0078 - 0.016 | T5-A | 0.0038 - 0.064 | 2.3 | - | 0.4 | N | 2 |
| Endrin aldehyde | 4/29 | 0.0056 - 0.016 | T2-A/T3-B | 0.0038 - 0.048 | - | - | - | N | 1 |
| Endrin ketone | 1/39 | 0.02 | T5-A | 0.0038 - 0.064 | - | - | - | N | 1 |
| gamma-BHC (Lindane) | 1/41 | 0.0035 | T5-A | 0.002 - 0.032 | 0.49 | - | 0.006 | N | 2 |
| gamma-Chlordane | 12/41 | 0.0037 - 0.023 | T6-A | 0.002 - 0.32 | 0.49 (8) | 10 (8) | 2 (8) | N | 2 |
| Heptachlor | 3/41 | 0.0028 - 0.0045 | T5-A | 0.002 - 0.032 | 0.14 | 0.3 | 0.06 | N | 2 |
| Heptachlor epoxide | 4/41 | 0.0022 - 0.0045 | T1-B | 0.002 - 0.032 | 0.07 | 1 | 0.03 | N | 2 |
| Methoxychlor | 1/39 | 0.038 | T5-A | 0.02 - 0.32 | 39 | - | 62 | N | 2 |
| Aluminum | 33/33 | 2690 - 27100 | T7-B | - | 7800 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Antimony | 4/31 | 0.48 - 1.2 | T7-A | 0.47 - 3.4 | 3.1 | - | - | N | 2 |

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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 WETLAND - SURFACE SOIL/SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 33/33 | 1 - 14.1 | T8-B | - | 0.43 | 380 | 15 | Y | 3 |
| Barium | 33/33 | 11.9 - 318 | T7-B | - | 550 | 350000 | 32 | N | 2 |
| Beryllium | 32/33 | 0.14 - 4.1 | T7-B | 0.3 | 0.15 | 690 | 180 | Y | 3 |
| Boron | 5/21 | 14.7 - 39.6 | T9-B | 0.35 - 7.6 | 700 | - | - | N | 2 |
| Cadmium | 29/33 | 0.12 - 7.2 | 2WTB2 | 0.12 - 0.29 | 3.9 | 920 | 6 | Y | 3 |
| Calcium | 33/33 | 868 - 5330 | T7-B | - | - | - | - | N | 1 |
| Chromium (total) | 33/33 | 7 - 102 | 2WTB8 | - | 39 (9) | 140 (9) | 19 (9) | Y | 3 |
| Cobalt | 33/33 | 3 - 13.6 | T7-B | - | 470 | - | - | N | 2 |
| Copper | 33/33 | 14.7 - 173 | T7-B | - | 290 | - | - | N | 2 |
| Cyanide | 8/26 | 0.9 - 6.1 | T7-B | 0.59 - 2.8 | 160 | - | - | N | 2 |
| Iron | 33/33 | 5630 - 198000 | T7-B | - | 2300 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Lead | 33/33 | 11.2 - 241 | 2WSD9 | - | 400 (10) | - | - | N | 2 |
| Magnesium | 33/33 | 1570 - 9150 | T8-B | - | - | - | - | N | 1 |
| Manganese | 33/33 | 55.3 - 376 | 2WTB2 | - | ~~39~~ 190 | - | - | Y | 3 |
| Mercury | 16/26 | 0.15 - 1.2 | T6-B | 0.11 - 0.51 | 2.3 | 7 | 3 | N | 2 |
| Nickel | 33/33 | 6.6 - 61.5 | T2-A | - | 160 | 6900 | 21 | N | 2 |
| Potassium | 33/33 | 659 - 5170 | T8-B | - | - | - | - | N | 1 |
| Selenium | 13/33 | 0.7 - 6.8 | T7-B | 0.44 - 1.3 | 39 | - | 3 | N | 2 |
| Silver | 13/33 | 0.17 - 4.5 | 2WTB8 | 0.12 - 3.2 | 39 | - | - | N | 2 |
| Sodium | 33/33 | 114 - 4980 | T9-B | - | - | - | - | N | 1 |
| Vanadium | 33/33 | 8.9 - 203 | T7-B | - | 55 | - | - | Y | 3 |
| Zinc | 33/33 | 35 - 702 | T7-B | - | 2300 | - | 42000 | N | 2 |

Revisions 08/10/96 [illegible]

A2W_COC.XLS

**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 WETLAND - SURFACE SOIL/SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

Footnotes:

1 Results in mg/kg unless otherwise noted. Surface soil designated as soil from depths of 0 to 2 feet.
2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment.
3 Sample-specific.
4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
5 Soil screening level guidance (USEPA, December 1994).
6 Soil screening level guidance (USEPA, December 1994) with a dilution and attenuation factor of 10.
7 Calculated using SSL guidance (See Appendix F.3).
8 Total chlordane.
9 Hexavalent chromium.
10 OSWER soil screening level for residential land use (USEPA, July 14, 1994).

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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Revisions
08/10/96
AMS

## SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS
## SITE 2 WETLAND - SURFACE SOIL/SEDIMENT
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| 2-Butanone | 1400 | 85.8148 |
| Acetone | 850 | 69.0741 |
| Carbon disulfide | 12 | 7.1667 |
| Chlorobenzene | 14 | 6.9821 |
| Methylene chloride | 5 | 11.2593 |
| Tetrachloroethene | 11 | 7.3889 |
| Toluene | 6 | 6.2593 |
| Trichloroethene | 6 | 7.1296 |
| Xylenes, total | 3 | 6.9444 |
| 1,4-Dichlorobenzene | 42 | 412.2963 |
| 2,4-Dimethylphenol | 210 | 419.8148 |
| 2-Methylnaphthalene | 55 | 393.5185 |
| 4-Methylphenol | 43 | 416.5926 |
| Acenaphthene | 380 | 369.6071 |
| Acenaphthylene | 390 | 385.6296 |
| Anthracene | 2400 | 282.2222 |
| Benzo(a)anthracene | 27000 | 1291.7857 |
| Benzo(a)pyrene | 35000 | 16.13.9286 |
| Benzo(b)fluoranthene | 55000 | 2249.1786 |
| Benzo(g,h,i)perylene | 23000 | 1139.0357 |
| Benzo(k)fluoranthene | 45000 | 2008.5 |
| Benzoic acid | 32000 | 2568.8889 |
| Bis(2-ethylhexyl)phthalate | 3500 | 593.333 |
| Butyl benzyl phthalate | 390 | 394.9286 |
| Carbazole | 130 | 212.3158 |
| Chrysene | 42000 | 1950.8214 |
| Di-n-butyl phthalate | 63 | 388.4074 |
| Dibenzo(a,h)anthracene | 310 | 394.4444 |
| Dibenzofuran | 1000 | 271.8214 |
| Fluoranthene | 80000 | 3348.5 |
| Fluorene | 1000 | 268.9643 |
| Indeno(1,2,3-cd)pyrene | 23000 | 1102.4286 |
| Naphthalene | 77 | 389.963 |
| Pentachlorophenol | 240 | 1600.9259 |
| Phenanthrene | 36000 | 1600.25 |
| Pyrene | 42000 | 2148.2143 |
| 4,4'-DDD | 4800 | 407.2 |
| 4,4'-DDE | 720 | 59.5 |
| 4,4'-DDT | 2900 | 257.31 |
| Aldrin | 3.2 | 3.9429 |
| alpha-Chlordane | 29 | 20.4905 |
| Aroclor-1260 | 1500 | 187.5 |
| beta-BHC | 2.7 | 4.0556 |

**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS (Continued)**
**SITE 2 WETLAND - SURFACE SOIL/SEDIMENT**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg) (Continued)** | | |
| delta-BHC | 4.2 | 4.0972 |
| Dieldrin | 26 | 8.6708 |
| Endosulfan-I | 11 | 4.3431 |
| Endosulfan II | 31 | 9.3618 |
| Endosulfan sulfate | 14 | 7.9757 |
| Endrin | 16 | 8.3875 |
| Endrin aldehyde | 16 | 6.4589 |
| Endrin ketone | 20 | 8.5071 |
| gamma-BHC (Lindane) | 3.5 | 4.0778 |
| gamma-Chlordane | 23 | 20.1125 |
| Heptachlor | 4.5 | 4.1986 |
| Heptachlor epoxide | 4.5 | 4.2764 |
| Methoxychlor | 38 | 41.5571 |
| **Inorganics (mg/kg)** | | |
| Aluminum | 27100 | 11219.2857 |
| Antimony | 1.2 | 0.6904 |
| Arsenic | 14.1 | 5.7107 |
| Barium | 318 | 68.275 |
| Beryllium | 4.1 | 0.8118 |
| Boron | 39.6 | 8.4224 |
| Cadmium | 7.2 | 1.7368 |
| Calcium | 5330 | 2118.2857 |
| Chromium (total) | 102 | 41.2714 |
| Cobalt | 13.6 | 7.5143 |
| Copper | 173 | 52.1607 |
| Cyanide | 6.1 | 1.277 |
| Iron | 198000 | 27429.2857 |
| Lead | 241 | 60.7143 |
| Magnesium | 9150 | 4573.9286 |
| Manganese | 376 | 212.1143 |
| Mercury | 1.2 | 0.3089 |
| Nickel | 61.5 | 20.4429 |
| Potassium | 5170 | 2518.8571 |
| Selenium | 6.8 | 1.1048 |
| Silver | 4.5 | 0.7741 |
| Sodium | 4980 | 1344.9286 |
| Vanadium | 203 | 58.3964 |
| Zinc | 702 | 128.2571 |

## SUMMARY OF COC SELECTION
## SITE 2 WETLAND - ALL SOIL/SEDIMENT (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 2-Butanone | 9/41 | 0.005 - 1.4 | T8-B | 0.011 - 0.04 | 4700 | 6900 (10) | - | N | 2 |
| Acetone | 10/41 | 0.037 - 0.85 | 2WTB8 | 0.011 - 0.11 | 780 | 62000 | 8 | N | 2 |
| Carbon disulfide | 13/41 | 0.002 - 0.042 | 2WTB2 | 0.005 - 0.024 | 780 | 11 | 14 | N | 2 |
| Chlorobenzene | 3/42 | 0.002 - 0.014 | T7-B | 0.005 - 0.022 | 160 | 94 | 0.6 | N | 2 |
| Methylene chloride | 4/41 | 0.002 - 0.005 | 2WSD9 | 0.005 - 0.074 | 85 | 7 | 0.01 | N | 2 |
| Tetrachloroethene | 3/41 | 0.003 - 0.011 | 2WSD9 | 0.003 - 0.024 | 12 | 11 | 0.04 | N | 2 |
| Toluene | 8/41 | 0.002 - 0.006 | T8-B | 0.004 - 0.024 | 1600 | 520 | 5 | N | 2 |
| Trichloroethene | 2/41 | 0.004 - 0.006 | 2WSD9 | 0.005 - 0.024 | 58 | 3 | 0.02 | N | 2 |
| Xylenes, total | 1/41 | 0.003 | T6-B | 0.005 - 0.022 | 16000 | 320 | 74 | N | 2 |
| 1,4-Dichlorobenzene | 1/41 | 0.042 | T6-B | 0.35 - 6.6 | 27 | 7700 | 1 | N | 2 |
| 2,4-Dimethylphenol | 1/41 | 0.21 | T8-B | 0.35 - 6.6 | 160 | - | 3 | N | 2 |
| 2-Methylnaphthalene | 4/41 | 0.04 - 0.055 | T3-A | 0.35 - 6.6 | - | - | - | N | 1 |
| 4-Methylphenol | 1/41 | 0.043 | T9-A | 0.35 - 6.6 | 39 | - | - | N | 2 |
| Acenaphthene | 10/42 | 0.03 - 0.38 | T7-B | 0.35 - 6.6 | 470 | - | 200 | N | 2 |
| Acenaphthylene | 7/41 | 0.034 - 0.39 | T3-A | 0.35 - 6.6 | - | - | - | N | 1 |
| Anthracene | 20/41 | 0.034 - 2.4 | 2WSD9 | 0.35 - 2.6 | 2300 | - | 4300 | N | 2 |
| Benzo(a)anthracene | 34/42 | 0.025 - 27 | 2WSD9 | 0.37 - 0.66 | 0.88 | - | 0.7 | Y | 3 |
| Benzo(a)pyrene | 27/42 | 0.03 - 35 | 2WSD9 | 0.37 - 2.6 | 0.088 | - | 4 | Y | 3 |
| Benzo(b)fluoranthene | 30/42 | 0.044 - 55 | 2WSD9 | 0.37 - 2.6 | 0.88 | - | 4 | Y | 3 |
| Benzo(g,h,i)perylene | 22/42 | 0.027 - 23 | 2WSD9 | 0.35 - 2.6 | - | - | - | N | 1 |
| Benzo(k)fluoranthene | 30/42 | 0.062 - 45 | 2WSD9 | 0.37 - 2.6 | 8.8 | - | 4 | Y | 3 |
| Benzoic acid | 4/41 | 0.13 - 32 | 2WSD9 | 1.7 - 13 | 31000 | - | 280 | N | 2 |
| Bis(2-ethylhexyl)phthalate | 12/41 | 0.1 - 3.5 | T10-B | 0.35 - 6.6 | 46 | 210 | 11 | N | 2 |
| Butyl benzyl phthalate | 5/42 | 0.021 - 0.39 | T7-B | 0.35 - 6.6 | 1600 | 530 | 68 | N | 2 |
| Carbazole | 6/21 | 0.025 - 0.13 | T5-A | 0.37 - 0.8 | 32 | - | 0.2 | N | 2 |
| Chrysene | 34/42 | 0.038 - 42 | 2WSD9 | 0.37 - 2.6 | 88 | - | 1 | N | 2 |
| Di-n-butyl phthalate | 9/41 | 0.023 - 0.063 | T3-B | 0.35 - 7.9 | 780 | 100 | 120 | N | 2 |
| Dibenzo(a,h)anthracene | 7/41 | 0.072 - 0.31 | T2-A | 0.35 - 6.6 | 0.088 | - | 11 | Y | 3 |
| Dibenzofuran | 10/42 | 0.035 - 1 | 2WSD9 | 0.35 - 2.6 | 31 | - | - | N | 2 |



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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 WETLAND - ALL SOIL/SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Fluoranthene | 38/42 | 0.053 - 80 | 2WSD9 | 0.37 - 0.66 | 310 | - | 980 | N | 2 |
| Fluorene | 13/42 | 0.021 - 1 | 2WSD9 | 0.35 - 2.6 | 310 | - | 160 | N | 2 |
| Indeno(1,2,3-cd)pyrene | 24/42 | 0.022 - 23 | 2WSD9 | 0.35 - 2.6 | 0.88 | - | 35 | Y | 3 |
| Naphthalene | 5/41 | 0.056 - 0.077 | T9-A | 0.35 - 6.6 | 310 | - | 30 | N | 2 |
| Pentachlorophenol | 1/41 | 0.24 | T1-B | 0.9 - 32 | 5.3 | - | 0.2 | N | 2 |
| Phenanthrene | 32/42 | 0.022 - 36 | 2WSD9 | 0.37 - 2.6 | - | - | - | N | 1 |
| Pyrene | 39/42 | 0.046 - 42 | 2WSD9 | 0.37 - 0.66 | 230 | - | 1400 | N | 2 |
| 4,4'-DDD | 18/48 | 0.0045 - 4.8 | 2WSD25 | 0.0037 - 0.064 | 2.7 | - | 0.7 | Y | 3 |
| 4,4'-DDE | 18/52 | 0.0062 - 0.72 | 2WSD25 | 0.0037 - 0.064 | 1.9 | - | 0.5 | N | 2 |
| 4,4'-DDT | 13/44 | 0.0044 - 2.9 | 2WSD25/T3-B | 0.0037 - 0.064 | 1.9 | 80 | 1.0 | Y | 3 |
| Aldrin | 1/50 | 0.0032 | T5-A | 0.0019 - 0.032 | 0.038 | 0.5 | 0.005 | N | 2 |
| alpha-Chlordane | 13/52 | 0.0029 - 0.029 | T6-A | 0.0019 - 0.32 | 0.49 (7) | 10 (7) | 2 (7) | N | 2 |
| Aroclor-1260 | 8/46 | 0.082 - 1.5 | T6-A | 0.037 - 0.64 | 0.083 | - | - | Y | 3 |
| beta-BHC | 1/51 | 0.0027 | T5-A | 0.0019 - 0.032 | 0.35 | 16 | 0.002 | N | 2 |
| delta-BHC | 1/51 | 0.0042 | T5-A | 0.0019 - 0.032 | - | - | - | N | 2 |
| Dieldrin | 3/51 | 0.0084 - 0.026 | T6-A | 0.0037 - 0.064 | 0.04 | 2 | 0.001 | N | 2 |
| Endosulfan sulfate | 2/49 | 0.0069 - 0.014 | T3-A | 0.0037 - 0.064 | - | - | - | N | 2 |
| Endosulfan-I | 4/51 | 0.0021 - 0.011 | T3-A | 0.0019 - 0.032 | 47 | - | 4 | N | 2 |
| Endosulfan II | 2/48 | 0.0069 - 0.031 | T2-A | 0.0037 - 0.064 | 47 | - | 3 | N | 2 |
| Endrin | 3/51 | 0.0078 - 0.016 | T5-A | 0.0037 - 0.064 | 2.3 | - | 0.4 | N | 2 |
| Endrin aldehyde | 4/29 | 0.0056 - 0.016 | T2-A/T3-B | 0.0037 - 0.048 | - | - | - | N | 1 |
| Endrin ketone | 1/49 | 0.02 | T5-A | 0.0037 - 0.064 | - | - | - | N | 1 |
| gamma-BHC (Lindane) | 1/51 | 0.0035 | T5-A | 0.0019 - 0.032 | 0.49 | - | 0.006 | N | 2 |
| gamma-Chlordane | 12/51 | 0.0037 - 0.023 | T6-A | 0.0019 - 0.32 | 0.49 (7) | 10 (7) | 2 (7) | N | 2 |
| Heptachlor | 3/51 | 0.0028 - 0.0045 | T5-A | 0.0019 - 0.032 | 0.14 | 0.3 | 0.06 | N | 2 |
| Heptachlor epoxide | 4/51 | 0.0022 - 0.0045 | T1-B | 0.0019 - 0.032 | 0.07 | 1 | 0.03 | N | 2 |
| Methoxychlor | 1/49 | 0.038 | T5-A | 0.019 - 0.32 | 39 | - | 62 | N | 2 |
| Aluminum | 42/42 | 2690 - 27100 | T7-B | - | 7800 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Antimony | 4/39 | 0.48 - 1.2 | T7-A | 0.47 - 3.4 | 3.1 | - | - | N | 2 |

Revisions
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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 WETLAND - ALL SOIL/SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 42/42 | 1 - 14.1 | T8-B | - | 0.43 | 380 | 15 | Y | 3 |
| Barium | 4//42 | 11.9 - 318 | T7-B | - | 550 | 350000 | 32 | N | 2 |
| Beryllium | 41/42 | 0.14 - 4.1 | T7-B | 0.3 | 0.15 | 690 | 180 | Y | 3 |
| Boron | 5/21 | 14.7 - 39.6 | T9-B | 0.35 - 7.6 | 700 | - | - | N | 2 |
| Cadmium | 36/42 | 0.12 - 11.5 | 2WTB3 | 0.12 - 0.37 | 3.9 | 920 | 6 | Y | 3 |
| Calcium | 42/42 | 868 - 6290 | 2WTB8 | - | - | - | - | N | 1 |
| Chromium (total) | 42/42 | 7 - 102 | 2WTB8 | - | 39 (8) | 140 (8) | 19 (8) | Y | 3 |
| Cobalt | 42/42 | 3 - 13.6 | T7-B | - | 470 | - | - | N | 2 |
| Copper | 42/42 | 14.7 - 173 | T7-B | - | 290 | - | - | N | 2 |
| Cyanide | 8/35 | 0.9 - 6.1 | T7-B | 0.54 - 2.8 | 160 | - | - | N | 2 |
| Iron | 42/42 | 5630 - 198000 | T7-B | - | 2300 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Lead | 42/42 | 11.2 - 298 | 2WMW6S | - | 400 (9) | - | - | N | 2 |
| Magnesium | 42/42 | 1570 - 9150 | T8-B | - | - | - | - | N | 1 |
| Manganese | 42/42 | 55.3 - 376 | 2WTB2 | - | ~~39~~ 190 | - | - | Y | 3 |
| Mercury | 19/34 | 0.15 - 1.2 | T6-B | 0.11 - 0.51 | 2.3 | 7 | 3 | N | 2 |
| Nickel | 42/42 | 6.6 - 61.5 | T2-A | - | 160 | 6900 | 21 | N | 2 |
| Potassium | 42/42 | 659 - 5170 | T8-B | - | - | - | - | N | 1 |
| Selenium | 17/42 | 0.7 - 6.8 | T7-B | 0.44 - 1.3 | 39 | - | 3 | N | 2 |
| Silver | 15/41 | 0.17 - 6.6 | 2WTB8 | 0.12 - 3.2 | 39 | - | - | N | 2 |
| Sodium | 42/42 | 114 - 9590 | 2WTB3 | - | - | - | - | N | 1 |
| Vanadium | 42/42 | 8.9 - 203 | T7-B | - | 55 | - | - | Y | 3 |
| Zinc | 42/42 | 35 - 702 | T7-B | - | 2300 | - | 42000 | N | 2 |

Revisions
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B2W_COC.XLS

**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 WETLAND - ALL SOIL/SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

Footnotes:

1 Results in mg/kg unless otherwise noted. All soil designated as soil from depths of 0 to 10 feet.
2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment.
3 Sample-specific.
4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
5 Soil screening level guidance (USEPA, December 1994).
6 Soil screening level guidance (USEPA, December 1994) with a dilution and attenuation factor of 10.
7 Total chlordane.
8 Hexavalent chromium.
9 OSWER soil screening level for residential land use (USEPA, July 14, 1994).
10 Calculated using SSL guidance (See Appendix F.3).

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

Revisions
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## SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS
## SITE 2 WETLAND - ALL SOIL/SEDIMENT
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| 2-Butanone | 1400 | 78.0571 |
| Acetone | 850 | 84.7429 |
| Carbon disulfide | 42 | 9.5 |
| Chlorobenzene | 14 | 6.375 |
| Methylene chloride | 5 | 9.5857 |
| Tetrachloroethene | 11 | 6.6429 |
| Toluene | 6 | 5.8 |
| Trichloroethene | 6 | 6.4714 |
| Xylenes, total | 3 | 6.3286 |
| 1,4-Dichlorobenzene | 42 | 415.9143 |
| 2,4-Dimethylphenol | 210 | 421.7143 |
| 2-Methylnaphthalene | 55 | 401.4286 |
| 4-Methylphenol | 43 | 419.2286 |
| Acenaphthene | 380 | 382.6111 |
| Acenaphthylene | 390 | 395.3429 |
| Anthracene | 2400 | 308.9714 |
| Benzo(a)anthracene | 27000 | 1066.111 |
| Benzo(a)pyrene | 35000 | 1350.4167 |
| Benzo(b)fluoranthene | 55000 | 1832.1389 |
| Benzo(g,h,i)perylene | 23000 | 981.0556 |
| Benzo(k)fluoranthene | 45000 | 1646.9444 |
| Benzoic acid | 32000 | 2448.8571 |
| Bis(2-ethylhexyl)phthalate | 3500 | 554.8571 |
| Butyl benzyl phthalate | 390 | 402.3056 |
| Carbazole | 130 | 212.3158 |
| Chrysene | 42000 | 1572.3056 |
| Di-n-butyl phthalate | 63 | 397.4857 |
| Dibenzo(a,h)anthracene | 310 | 402.1429 |
| Dibenzofuran | 1000 | 306.5556 |
| Fluoranthene | 80000 | 2657.1667 |
| Fluorene | 1000 | 304.3333 |
| Indeno(1,2,3-cd)pyrene | 23000 | 952.5833 |
| Naphthalene | 77 | 398.6857 |
| Pentachlorophenol | 240 | 1702.1429 |
| Phenanthrene | 36000 | 1327.8889 |
| Pyrene | 42000 | 1715.3611 |
| 4,4'-DDD | 4800 | 325.286 |
| 4,4'-DDE | 720 | 50.9837 |
| 4,4'-DDT | 2900 | 201.5846 |
| Aldrin | 3.2 | 4.75 |
| Alpha-Chlordane | 29 | 31.9163 |
| Aroclor-1260 | 1500 | 180.9375 |
| beta-BHC | 2.7 | 4.8222 |

**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS (Continued)**
**SITE 2 WETLAND - ALL SOIL/SEDIMENT**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg) (Continued)** | | |
| delta-BHC | 4.2 | 4.8556 |
| Dieldrin | 26 | 10.1033 |
| Endosulfan-I | 11 | 5.0522 |
| Endosulfan II | 31 | 10.7163 |
| Endosulfan sulfate | 14 | 9.583 |
| Endrin | 16 | 9.8767 |
| Endrin aldehyde | 16 | 6.4589 |
| Endrin ketone | 20 | 10.0057 |
| gamma-BHC (Lindane) | 3.5 | 4.84 |
| gamma-Chlordane | 23 | 31.8678 |
| Heptachlor | 4.5 | 4.9367 |
| Heptachlor epoxide | 4.5 | 4.9989 |
| Methoxychlor | 38 | 49.1932 |
| **Inorganics (mg/kg)** | | |
| Aluminum | 27100 | 11815 |
| Antimony | 1.2 | 0.8485 |
| Arsenic | 14.1 | 6.0889 |
| Barium | 318 | 62.6306 |
| Beryllium | 4.1 | 0.9128 |
| Boron | 39.6 | 8.4224 |
| Cadmium | 11.5 | 2.4415 |
| Calcium | 6290 | 2652.8333 |
| Chromium (total) | 102 | 42.1944 |
| Cobalt | 13.6 | 7.9889 |
| Copper | 173 | 46.0306 |
| Cyanide | 6.1 | 1.2332 |
| Iron | 198000 | 26753.333 |
| Lead | 298 | 59.4556 |
| Magnesium | 9150 | 5221.9444 |
| Manganese | 376 | 228.1167 |
| Mercury | 1.2 | 0.3009 |
| Nickel | 61.5 | 20.8528 |
| Potassium | 5170 | 2759.3889 |
| Selenium | 6.8 | 0.9853 |
| Silver | 6.6 | 1.1236 |
| Sodium | 9590 | 2235.4722 |
| Vanadium | 203 | 56.1639 |
| Zinc | 702 | 115.6861 |

## SUMMARY OF COC SELECTION
## SITE 2 WETLAND - UNFILTERED GROUNDWATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Federal MCL (4) | State MCL (5) | Risk-based COC Screening Level (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 1/27 | 2 | 2WGW21S | 5 - 10 | - | - | 100 | N | 2 |
| Xylenes, total | 1/27 | 1 | 2WGW5S | 5 - 10 | 10000 | 10000 | 1200 | N | 2 |
| 2-Methylphenol | 1/27 | 2 | 2WGW22D | 10 | - | - | 180 | N | 2 |
| 4-Methylphenol | 1/27 | 3 | 2WGW22D | 10 | - | - | 18 | N | 2 |
| Benzoic acid | 6/27 | 0.5 - 12 | 2WGW3D | 25 - 50 | - | - | 15000 | N | 2 |
| Bis(2-ethylhexyl)phthalate | 4/27 | 11 - 31 | 2WGW6D | 10 | 6 | 6 | 4.8 | Y | 3 |
| Di-n-butyl phthalate | 1/27 | 1 | 2WGW3S | 10 | - | - | 370 | N | 2 |
| Di-n-octyl phthalate | 2/27 | 0.6 - 3 | 2WGW3D | 10 | - | - | 73 | N | 2 |
| Diethyl phthalate | 2/27 | 1 | 2WGW3D/2WGW3S | 10 | - | - | 2900 | N | 2 |
| Phenol | 1/27 | 14 | 2WGW22D | 10 | - | - | 2200 | N | 2 |
| Aluminum | 17/27 | 39.6 - 9910 | 2WGW6D | 30 - 306 | 50 - 200 (7) | - | 3700 | ~~Y~~ N | ~~3~~ 5 |
| Arsenic | 12/26 | 1.9 - 109 | 2WGW21S | 2 - 5 | 50 | 50 | 0.045 | Y | 3 |
| Barium | 27/27 | 15.5 - 904 | 2WGW3D | - | 2000 | 2000 | 260 | Y | 3 |
| Beryllium | 4/27 | 1 - 3.6 | 2WGW6D | 1 | 4 | 4 | 0.016 | Y | 3 |
| Boron | 13/19 | 89.7 - 3260 | 2WGW21S | 21.3 - 43 | - | - | 330 | Y | 3 |
| Cadmium | 9/26 | 1.2 - 10.9 | 2WGW3D | 1 - 4.8 | 5 | 5 | 1.8 | Y | 3 |
| Calcium | 27/27 | 5920 - 296000 | 2WGW21S | - | - | - | - | N | 1 |
| Chromium (total) | 5/27 | 2.9 - 13.8 | 2WGW21S | 3 - 5 | 100 | 100 | 18 (8) | N | 2 |
| Cobalt | 12/27 | 2.1 - 37.5 | 2WGW6D | 3 - 19.9 | - | - | 220 | N | 2 |
| Copper | 14/27 | 2.8 - 44.6 | 2WGW21S | 1.1 - 17.2 | 1300 (9) | - | 150 | N | 2 |
| Cyanide | 1/7 | 5 | 2WGW5S | 5 | 200 | 200 | 73 | N | 2 |
| Iron | 26/27 | 85.1 - 131000 | 2WGW5S | 105 | 300 (7) | - | 1100 | ~~Y~~ N | ~~3~~ 5 |
| Lead | 14/27 | 1.3 - 32.7 | 2WGW2D | 1 - 15.1 | 15 (9) | - | - | Y | 4 |
| Magnesium | 27/27 | 1340 - 1080000 | 2WGW21S | - | - | - | - | N | 1 |
| Manganese | 27/27 | 2.3 - 9270 | 2WGW5S | - | 50 (7) | - | ~~18~~ 88 | Y | 3 |
| Nickel | 8/27 | 9.3 - 116 | 2WGW6D | 7 - 25.6 | 100 | 100 | 73 | Y | 3 |
| Potassium | 25/27 | 557 - 815000 | 2WGW21S | 1650 - 2290 | - | - | - | N | 1 |
| Selenium | 5/27 | 2.2 - 5.1 | 2WGW6D | 1 - 5 | 50 | 50 | 18 | N | 2 |
| Silver | 1/27 | 1.5 | 2WGW3S | 1 - 7.2 | 100 (7) | 50 | 18 | N | 2 |

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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 WETLAND - UNFILTERED GROUNDWATER (UG/L) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Federal MCL (4) | State MCL (5) | Risk-based COC Screening Level (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Sodium | 27/27 | 7580 - 8500000 | 2WGW21S | - | - | - | - | N | 1 |
| Thallium | 5/22 | 4.6 - 15.2 | 2WGW21S | 1 - 20 | 2 | 2 | 0.26 (10) | Y | 3 |
| Vanadium | 4/27 | 2.7 - 26 | 2WGW21S | 3 - 20 | - | - | 26 | Y | 3 |
| Zinc | 18/27 | 6.8 - 274 | 2WGW6D | 2 - 26.7 | 5000 (7) | - | 1100 | N | 2 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as separate samples. Non-validated and rejected results are not used in risk assessment.
3 Sample-specific.
4 Maximum contaminant level. (USEPA, May 1995).
5 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II EnvironmentalHealth.
6 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
7 Secondary MCL (SMCL) based on aesthetic water qualities.
8 Hexavalent chromium.
9 Action Level.
10 Thallic oxide.

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 No COC screening level available; maximum is greater than or equal to Federal Action Level.
5 USEPA Region I does not advocate quantitative evaluation of this chemical.

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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS**
**SITE 2 WETLAND - UNFILTERED GROUNDWATER**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/L)** | | |
| Carbon disulfide | 3.5 | 4.144 |
| Xylenes, total | 3.6667 | 4.2349 |
| 2-Methylphenol | 3.5 | 4.8636 |
| 4-Methylphenol | 4 | 4.9091 |
| Benzoic acid | 20.6667 | 18.6788 |
| Bis(2-ethylhexyl)phthalate | 16.1667 | 6.197 |
| Di-n-butyl phthalate | 3.6667 | 4.8788 |
| Di-n-octyl phthalate | 4.3333 | 4.7394 |
| Diethyl phthalate | 3.6667 | 4.7576 |
| Phenol | 9.5 | 5.4091 |
| **Inorganics (ug/L)** | | |
| Aluminum | 3553.4 | 903.447 |
| Arsenic | 82.55 | 10.3318 |
| Barium | 609.6667 | 173.5606 |
| Beryllium | 1.5333 | 0.703 |
| Boron | 3165 | 442.69 |
| Cadmium | 6.6 | 2.5826 |
| Calcium | 281000 | 66057.2727 |
| Chromium (total) | 8.7 | 2.7621 |
| Cobalt | 17.5 | 7.2144 |
| Copper | 44.15 | 7.6636 |
| Cyanide | 5 | 2.8571 |
| Iron | 86066.6667 | 26270.8879 |
| Lead | 21.6333 | 4.7197 |
| Magnesium | 1016000 | 124483.1818 |
| Manganese | 8433.3333 | 2548.7061 |
| Nickel | 44.5833 | 15.0621 |
| Potassium | 570000 | 63194.3788 |
| Selenium | 2.0333 | 1.4439 |
| Silver | 2.3 | 1.8939 |
| Sodium | 8195000 | 1022727.424 |
| Thallium | 8.9 | 3.9358 |
| Vanadium | 25.55 | 6.5492 |
| Zinc | 159 | 34.9417 |

## SUMMARY OF COC SELECTION
## SITE 2 WETLAND - FILTERED GROUNDWATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Federal MCL (4) | State MCL (5) | Risk-based COC Screening Level (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 6/20 | 28.9 - 7520 | 2WGW6D | 14 - 120 | 50 - 200 (7) | - | 3700 | N | 1 |
| Antimony | 1/16 | 13.4 | 2WGW6D | 12 - 15 | 6 | 6 | 1.5 | Y | 2 |
| Arsenic | 9/20 | 2.4 - 138 | 2WGW21S | 2 - 6.1 | 50 | 50 | 0.045 | N | 1 |
| Barium | 20/20 | 13.9 - 805 | 2WGW3D | - | 2000 | 2000 | 260 | N | 1 |
| Beryllium | 3/20 | 1.2 - 4.2 | 2WGW6D | 1 - 1.3 | 4 | 4 | 0.016 | N | 1 |
| Boron | 14/20 | 61.1 - 3340 | 2WGW21S | 21.2 - 50 | - | - | 330 | N | 1 |
| Cadmium | 3/18 | 5.2 - 30.6 | 2WGW3S | 2 - 4.5 | 5 | 5 | 1.8 | N | 1 |
| Calcium | 20/20 | 5980 - 291000 | 2WGW21S | - | - | - | - | N | 1 |
| Cobalt | 3/20 | 17.7 - 40.9 | 2WGW6D | 3 - 29.2 | - | - | 220 | N | 1 |
| Copper | 2/20 | 3.7 - 37 | 2WGW21S | 2 - 12 | 1300 (8) | - | 150 | N | 1 |
| Iron | 15/20 | 114 - 123000 | 2WGW3S | 18.6 - 89.5 | 300 (7) | - | 1100 | N | 1 |
| Lead | 7/19 | 1.6 - 13.3 | 2WGW2D | 1 - 2 | 15 (8) | - | - | N | 1 |
| Magnesium | 20/20 | 1340 - 1050000 | 2WGW21S | - | - | - | - | N | 1 |
| Manganese | 20/20 | 6.8 - 9360 | 2WGW5S | - | 50 (7) | - | ~~18~~ 88 | N | 1 |
| Nickel | 4/20 | 10.4 - 101 | 2WGW6D | 7 - 45.5 | 100 | 100 | 73 | N | 1 |
| Potassium | 18/20 | 488 - 843000 | 2WGW21S | 1230 - 2510 | - | - | - | N | 1 |
| Silver | 3/20 | 3.9 - 9.8 | 2WGW3S | 2 - 2.4 | 100 | 50 | 18 | N | 1 |
| Sodium | 20/20 | 7560 - 8180000 | 2WGW21S | - | - | - | - | N | 1 |
| Thallium | 4/18 | 1.3 - 8.8 | 2WGW5D | 1 - 20 | 2 | 2 | 0.26 (9) | N | 1 |
| Vanadium | 1/20 | 32 | 2WGW21S | 1 - 11.3 | - | - | 26 | N | 1 |
| Zinc | 10/20 | 3 - 262 | 2WGW6D | 2 - 21.6 | 5000 (7) | - | 1100 | N | 1 |

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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 WETLAND - FILTERED GROUNDWATER (UG/L) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as separate samples. Non-validated and rejected results are not used in risk assessment.
3 Sample-specific.
4 Maximum contaminant level. (USEPA, May 1995).
5 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II EnvironmentalHealth.
6 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
7 Secondary MCL (SMCL) based on aesthetic water qualities.
8 Action Level.
9 Thallic oxide.

Rationale Designations:

1 Chemical detected in unfiltered samples; filtered results are not used in risk assessment.
2 Chemical not detected in unfiltered samples; maximum is greater than or equal to COC screening level.

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## SUMMARY OF COC SELECTION
## SITE 2 WETLAND - UNFILTERED SURFACE WATER (1) (UG/L)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Federal AWQC (4) | Risk-based COC Screening Level (5) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 1/12 | 2 | 2WSW12 | 2.5 - 5 | 0.80 | 1.1 | Y | 3 |
| Diethyl phthalate | 1/4 | 2 | 2WSW3 | 5 | 23000 | 2900 | N | 2 |
| Aluminum | 11/12 | 66.9 - 20900 | 2WSW1 | 58.5 | - | 3700 | ~~Y~~ N | ~~3~~ 4 |
| Arsenic | 3/12 | 2.8 - 2.9 | 2WSW1 | 1 - 1.5 | 0.018 | 0.045 | Y | 3 |
| Barium | 5/12 | 22.3 - 115 | 2WSW2 | 4 - 38 | - | 260 | N | 2 |
| Boron | 5/9 | 121 - 369 | 2WSW2 | 25 | - | 330 | Y | 3 |
| Cadmium | 3/12 | 7.1 - 126 | 2WSW2 | 1 - 2.2 | 16.0 | 1.8 | Y | 3 |
| Calcium | 12/12 | 272 - 46500 | 2WSW12 | - | - | - | N | 1 |
| Chromium (total) | 1/12 | 6.8 | 2WSW1 | 1.5 - 3.25 | 33000 | 18 (6) | N | 2 |
| Cobalt | 2/12 | 63.9 - 66.8 | 2WSW6 | 2.5 | - | 220 | N | 2 |
| Copper | 6/12 | 6.1 - 29.3 | 2WSW1 | 1 - 8.4 | 1300 | 150 | N | 2 |
| Iron | 9/12 | 293 - 11300 | 2WSW12 | 2.85 - 5.95 | - | 1100 | ~~Y~~ N | ~~3~~ 4 |
| Lead | 6/8 | 2 - 7.8 | 2WSW1 | 0.5 - 1 | 50 | 15 (7) | N | 2 |
| Magnesium | 11/12 | 443 - 18500 | 2WSW1 | 47 | - | - | N | 1 |
| Manganese | 9/12 | 43.7 - 1870 | 2WSW6 | 3 - 3.2 | - | ~~18~~ 88 | Y | 3 |
| Mercury | 1/10 | 0.21 | 2WSW9 | 0.1 | 0.14 | 1.1 | N | 2 |
| Nickel | 4/12 | 7.3 - 84.7 | 2WSW1 | 3.5 - 5.5 | 610 | 73 | Y | 3 |
| Potassium | 12/12 | 447 - 15300 | 2WSW2 | - | - | - | N | 1 |
| Sodium | 10/12 | 19700 - 143000 | 2WSW2 | 575 - 820 | - | - | N | 1 |
| Vanadium | 1/12 | 4.3 | 2WSW10 | 1.5 - 10 | - | 26 | N | 2 |
| Zinc | 7/12 | 10.3 - 334 | 2WSW6 | 1.5 - 8.45 | - | 1100 | N | 2 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as two samples. Non-validated and rejected results not used in risk assessment.
3 Sample quantitation limits.
4 Ambient water quality criteria for the consumption of water and organisms (USEPA, June 15, 1990).
5 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
6 Hexavalent chromium.
7 Federal Action Level for drinking water.

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS**
**SITE 2 WETLAND - UNFILTERED SURFACE WATER**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/L)** | | |
| Tetrachloroethene | 2 | 4.2727 |
| Diethyl phthalate | 3.5 | 4.5 |
| **Inorganics (ug/L)** | | |
| Aluminum | 20900 | 4012.6727 |
| Arsenic | 2.9 | 1.5909 |
| Barium | 115 | 35.1182 |
| Boron | 369 | 134.5556 |
| Cadmium | 66.55 | 8.2591 |
| Calcium | 46500 | 18884.7273 |
| Chromium (total) | 6.8 | 2.3273 |
| Cobalt | 66.8 | 13.9273 |
| Copper | 29.3 | 7.4091 |
| Iron | 11300 | 4212.8864 |
| Lead | 7.8 | 3.3429 |
| Magnesium | 18500 | 7180.4545 |
| Manganese | 1870 | 525.1773 |
| Mercury | 0.21 | 0.1122 |
| Nickel | 84.7 | 19.9818 |
| Potassium | 15300 | 5984.7273 |
| Sodium | 143000 | 46854.0909 |
| Vanadium | 4.3 | 3.3 |
| Zinc | 334 | 74.6636 |

## SUMMARY OF COC SELECTION
## SITE 2 WETLAND - FILTERED SURFACE WATER (1) (UG/L)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Federal AWQC (4) | Risk-based COC Screening Level (5) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 5/6 | 86.3 - 259 | 2WSW6 | 136 | - | 3700 | N | 1 |
| Barium | 2/6 | 83.3 - 91.2 | 2WSW2 | 8 - 30.1 | - | 260 | N | 1 |
| Boron | 4/6 | 75.9 - 222 | 2WSW6 | 50 | - | 330 | N | 1 |
| Calcium | 6/6 | 256 - 45300 | 2WSW12 | - | - | - | N | 1 |
| Copper | 1/6 | 4.5 | 2WSW7 | 2 - 5.3 | 1300 | 150 | N | 1 |
| Iron | 6/6 | 110 - 19400 | 2WSW12 | - | - | 1100 | N | 1 |
| Lead | 2/5 | 1.8 - 6.1 | 2WSW7 | 1 | 50 | 15 (6) | N | 1 |
| Magnesium | 6/6 | 103 - 10800 | 2WSW2 | - | - | - | N | 1 |
| Manganese | 6/6 | 9.6 - 571 | 2WSW12 | - | - | ~~18~~ 88 | N | 1 |
| Mercury | 1/6 | 0.22 | 2WSW12 | 0.2 | 0.14 | 1.1000 | N | 1 |
| Potassium | 6/6 | 542 - 14700 | 2WSW2 | - | - | - | N | 1 |
| Sodium | 5/6 | 32300 - 133000 | 2WSW2 | 720 | - | - | N | 1 |
| Vanadium | 1/6 | 3.3 | 2WSW7 | 3 | - | 26 | N | 1 |
| Zinc | 3/6 | 27.7 - 31.4 | 2WSW1 | 3 - 17.9 | - | 1100 | N | 1 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as two samples. Non-validated and rejected results not used in risk assessment.
3 Sample quantitation limits.
4 Ambient water quality criteria for the consumption of water and organisms (USEPA, June 15, 1990).
5 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
6 Federal Action Level for drinking water.

Rationale Designations:

1 Chemical detected in unfiltered samples; filtered results not used in risk assessment.

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000423

Soil Data (0-2') - Area A Wetland (Combined with Sediment)

~~Table X~~

Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALUMINUM | 28/28 | 2690.0000<br>27100.0000 | Norm ✓ | 11219.2857 | 13,400 (a) | na | na | na | na | na | |
| ARSENIC | 28/28 | 1.0000<br>14.1000 | Und | 5.7107 | 14.1 (d) | na | na | na | na | na | |
| BARIUM | 28/28 | 11.9000<br>318.0000 | Log ✓ | 68.2750 | 85.2 (b) | na | na | na | na | na | |
| BERYLLIUM | 27/28 | 0.1400<br>4.1000 | Log ✓ | 0.8363 | 1.2 (b) | na | na | na | na | na | |
| CADMIUM | 24/28 | 0.1200<br>7.2000 | Und ✓ | 2.0121 | 7.2 (d) | na | na | na | na | na | |
| CALCIUM | 28/28 | 868.0000<br>5330.0000 | Log ✓ | 2118.2857 | 2580 (b) | na | na | na | na | na | |
| CHROMIUM | 28/28 | 7.0000<br>102.0000 | Und | 41.2714 | 102 (d) | na | na | na | na | na | |
| COBALT | 28/28 | 3.0000<br>13.6000 | Norm ✓ | 7.5143 | 8.5 (a) | na | na | na | na | na | |
| COPPER | 28/28 | 14.7000<br>173.0000 | Log ✓ | 52.1607 | 64.9 (b) | na | na | na | na | na | |
| IRON | 28/28 | 5630.0000<br>*****.**** | Log ✓ | 27429.2857 | 37,300 (b) | na | na | na | na | na | |
| LEAD | 28/28 | 11.2000<br>241.0000 | Log ✓ | 60.7143 | 84.3 (b) | na | na | na | na | na | |
| MAGNESIUM | 28/28 | 1570.0000<br>9150.0000 | Und ✓ | 4573.9286 | 9150 (d) | na | na | na | na | na | |

Table X
Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MANGANESE | 28/28 | 55.3000<br>376.0000 | Log ✓ | 212.1143 | 265(b) | na | na | na | na | na | |
| MERCURY | 13/22 | 0.1500<br>1.2000 | Log ✓ | 0.4277 | 0.44(b) | na | na | na | na | na | |
| NICKEL | 28/28 | 6.6000<br>61.5000 | Log ✓ | 20.4429 | 25.2(b) | na | na | na | na | na | |
| POTASSIUM | 28/28 | 659.0000<br>5170.0000 | ~~Norm~~ Und | 2518.8571 | 5170(d) | na | na | na | na | na | |
| SODIUM | 28/28 | 114.0000<br>4980.0000 | Log ✓ | 1344.9286 | 2540(b) | na | na | na | na | na | |
| VANADIUM | 28/28 | 8.9000<br>203.0000 | Log | 58.3964 | 85.1(b) | na | na | na | na | na | |
| ZINC | 28/28 | 35.0000<br>702.0000 | Und ✓ | 128.2571 | 702(d) | na | na | na | na | na | |
| ANTHRACENE | 17/27 | 34.0000<br>2400.0000 | Und ✓ | 225.5882 | 2400(d) | na | na | na | na | na | |
| BENZO(A)ANTHRACENE | 27/28 | 25.0000<br>27000.0000 | Und ✓ | 1328.1481 | 27,000(d) | na | na | na | na | na | |
| BENZO(A)PYRENE | 25/28 | 30.0000<br>35000.0000 | Und ✓ | 1732.0000 | 35,000(d) | na | na | na | na | na | |
| BENZO(B)FLUORANTHENE | 24/28 | 44.0000<br>55000.0000 | Und ✓ | 2537.3750 | 55,000(d) | na | na | na | na | na | |
| BENZO(G,H,I)PERYLENE | 20/28 | 27.0000<br>23000.0000 | Und ✓ | 1425.1500 | 23,000(d) | na | na | na | na | na | |

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Table X
Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BENZO(K)FLUORANTHENE | 25/28 | 62.0000<br>45000.0000 | Und ✓ | 2177.5200 | 45000(d) | na | na | na | na | na | |
| CHRYSENE | 26/28 | 38.0000<br>42000.0000 | Und ✓ | 2038.9615 | 42000(d) | na | na | na | na | na | |
| FLUORANTHENE | 28/28 | 56.0000<br>80000.0000 | Und ✓ | 3348.5000 | 80000(d) | na | na | na | na | na | |
| INDENO(1,2,3-CD)PYRENE | 22/28 | 22.0000<br>23000.0000 | Und ✓ | 1280.8182 | 23000(d) | na | na | na | na | na | |
| PHENANTHRENE | 26/28 | 22.0000<br>36000.0000 | Und ✓ | 1661.4231 | 36000(d) | na | na | na | na | na | |
| PYRENE | 28/28 | 46.0000<br>42000.0000 | Und ✓ | 2148.2143 | 42000(d) | na | na | na | na | na | |
| TOTAL ORGANIC CARBON (MG/KG) | 24/24 | 8420.0000<br>91000.0000 | Norm | 42678.7500 | 51,400(a) | na | na | na | na | na | |

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Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : ALUMINUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 28.0000 | |
| Average | 11219.2857 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 2690.0000 | |
| Positive Hits - Maximum | 27100.0000 | |
| Average Of Positive Hits | 11219.2857 | |
| Standard Deviation | ~~6630.5220~~ | |
| Upper Confidence Limit - Normal | 13353.2314 ucl | |
| Upper Confidence Limit - Lognormal | 15379.8172 | |
| 95th Percentile - Nonparametric | 27100.0000 | |
| 95th Percentile - Normal | 22126.4944 | |
| 95th Percentile - Lognormal | 28476.4568 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9653 | |
| Corr Coeff - Detected - Lognormal | 0.9635 | |
| Corr Coeff - Total - Normal | 0.9653 | |
| Corr Coeff - Total - Lognormal | 0.9635 | |
| Corr Coeff - Crit Val - Detected | 0.9620 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.9214 | NA |
| W-Test - Lognormal | 0.9109 | NA |
| Type of Distribution | NORMAL ✓ | |

Test Results:

000629

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : ARSENIC (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 28.0000 | |
| Average | 5.7107 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | ~~1.0000~~ | |
| Positive Hits - Maximum | 14.1000 UCL | |
| Average Of Positive Hits | ~~5.7107~~ | |
| Standard Deviation | 3.7789 | |
| Upper Confidence Limit - Normal | 6.9269 | |
| Upper Confidence Limit - Lognormal | 8.3313 | |
| 95th Percentile - Nonparametric | 14.1000 | |
| 95th Percentile - Normal | 11.9270 | |
| 95th Percentile - Lognormal | 15.9161 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9562 | |
| Corr Coeff - Detected - Lognormal | 0.9631 | |
| Corr Coeff - Total - Normal | 0.9562 | |
| Corr Coeff - Total - Lognormal | 0.9631 | |
| Corr Coeff - Crit Val - Detected | 0.9620 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.9003 | NA |
| W-Test - Lognormal | 0.9111 | NA |
| Type of Distribution | ~~LOGNORMAL~~ Undefined | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : BARIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 28.0000 | |
| Average | 68.2750 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 11.9000 | |
| Positive Hits - Maximum | 318.0000 | |
| Average Of Positive Hits | 68.2750 | |
| Standard Deviation | 55.6940 | |
| Upper Confidence Limit - Normal | ~~86.1994~~ | |
| Upper Confidence Limit - Lognormal | 85.1787 UCL | |
| 95th Percentile - Nonparametric | ~~318.0000~~ | |
| 95th Percentile - Normal | 159.8917 | |
| 95th Percentile - Lognormal | 150.7379 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7723 | |
| Corr Coeff - Detected - Lognormal | 0.9625 | |
| Corr Coeff - Total - Normal | 0.7723 | |
| Corr Coeff - Total - Lognormal | 0.9625 | |
| Corr Coeff - Crit Val - Detected | 0.9620 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.6337 | NA |
| W-Test - Lognormal | 0.9551 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000031

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : BERYLLIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 27.0000 | |
| Average | 0.8118 | |
| Detection Limit - Minimum | 0.1500 | |
| Detection Limits - Maximum | 0.1500 | |
| Positive Hits - Minimum | 0.1400 | |
| Positive Hits - Maximum | 4.1000 | |
| Average Of Positive Hits | 0.8363 | |
| Standard Deviation | 0.8349 | |
| Upper Confidence Limit - Normal | 1.0805 | |
| Upper Confidence Limit - Lognormal | 1.2568 UCL | |
| 95th Percentile - Nonparametric | 4.1000 | |
| 95th Percentile - Normal | 2.1853 | |
| 95th Percentile - Lognormal | 2.4577 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8327 | |
| Corr Coeff - Detected - Lognormal | 0.9730 | |
| Corr Coeff - Total - Normal | 0.8471 | |
| Corr Coeff - Total - Lognormal | 0.9798 | |
| Corr Coeff - Crit Val - Detected | 0.9600 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.7377 | NA |
| W-Test - Lognormal | 0.9477 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000032

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : CADMIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 24.0000 | |
| Average | 1.7368 | |
| Detection Limit - Minimum | 0.0600 | |
| Detection Limits - Maximum | 0.1450 | |
| Positive Hits - Minimum | 0.1200 | |
| Positive Hits - Maximum | 7.2000 UCL | |
| Average Of Positive Hits | 2.0121 | |
| Standard Deviation | 2.5464 | |
| Upper Confidence Limit - Normal | 2.5563 | |
| Upper Confidence Limit - Lognormal | 4.5075 | |
| 95th Percentile - Nonparametric | 7.2000 | |
| 95th Percentile - Normal | 5.9257 | |
| 95th Percentile - Lognormal | 6.9953 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8054 | |
| Corr Coeff - Detected - Lognormal | 0.9356 | |
| Corr Coeff - Total - Normal | 0.8042 | |
| Corr Coeff - Total - Lognormal | 0.9610 | |
| Corr Coeff - Crit Val - Detected | 0.9570 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.6354 | NA |
| W-Test - Lognormal | 0.9041 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : CALCIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 28.0000 | |
| Average | 2118.2857 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 868.0000 | |
| Positive Hits - Maximum | 5330.0000 | |
| Average Of Positive Hits | 2118.2857 | |
| Standard Deviation | 1163.4832 | |
| Upper Confidence Limit - Normal | ~~2492.7374~~ | |
| Upper Confidence Limit - Lognormal | 2580.0531 UCL | |
| 95th Percentile - Nonparametric | ~~5330.0000~~ | |
| 95th Percentile - Normal | 4032.2156 | |
| 95th Percentile - Lognormal | 4353.7997 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9378 | |
| Corr Coeff - Detected - Lognormal | 0.9770 | |
| Corr Coeff - Total - Normal | 0.9378 | |
| Corr Coeff - Total - Lognormal | 0.9770 | |
| Corr Coeff - Crit Val - Detected | 0.9620 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.8750 | NA |
| W-Test - Lognormal | 0.9389 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000034

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : CHROMIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 28.0000 | |
| Average | 41.2714 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | ~~7.0000~~ | |
| Positive Hits - Maximum | 102.0000 UCL | |
| Average Of Positive Hits | ~~41.2714~~ | |
| Standard Deviation | 32.0859 | |
| Upper Confidence Limit - Normal | 51.5978 | |
| Upper Confidence Limit - Lognormal | 67.3783 | |
| 95th Percentile - Nonparametric | 102.0000 | |
| 95th Percentile - Normal | 94.0527 | |
| 95th Percentile - Lognormal | 131.7972 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9472 | |
| Corr Coeff - Detected - Lognormal | 0.9622 | |
| Corr Coeff - Total - Normal | 0.9472 | |
| Corr Coeff - Total - Lognormal | 0.9622 | |
| Corr Coeff - Crit Val - Detected | 0.9620 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.8738 | NA |
| W-Test - Lognormal | 0.8990 | NA |
| Type of Distribution | ~~LOGNORMAL~~ Undefined | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : COBALT (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 28.0000 | |
| Average | 7.5143 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 3.0000 | |
| Positive Hits - Maximum | 13.6000 | |
| Average Of Positive Hits | 7.5143 | |
| Standard Deviation | 3.0692 | |
| Upper Confidence Limit - Normal | 8.5021 nce | |
| Upper Confidence Limit - Lognormal | 9.0027 | |
| 95th Percentile - Nonparametric | 13.6000 | |
| 95th Percentile - Normal | 12.5631 | |
| 95th Percentile - Lognormal | 14.5482 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9694 | |
| Corr Coeff - Detected - Lognormal | 0.9557 | |
| Corr Coeff - Total - Normal | 0.9694 | |
| Corr Coeff - Total - Lognormal | 0.9557 | |
| Corr Coeff - Crit Val - Detected | 0.9620 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.9244 | NA |
| W-Test - Lognormal | 0.8962 | NA |
| Type of Distribution | NORMAL ✓ | |

Test Results:

000036

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : COPPER (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 28.0000 | |
| Average | 52.1607 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 14.7000 | |
| Positive Hits - Maximum | 173.0000 | |
| Average Of Positive Hits | 52.1607 | |
| Standard Deviation | 35.3910 | |
| Upper Confidence Limit - Normal | ~~63.5508~~ | |
| Upper Confidence Limit - Lognormal | 64.8857 uCL | |
| 95th Percentile - Nonparametric | 173.0000 | |
| 95th Percentile - Normal | 110.3788 | |
| 95th Percentile - Lognormal | 113.4668 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8825 | |
| Corr Coeff - Detected - Lognormal | 0.9869 | |
| Corr Coeff - Total - Normal | 0.8825 | |
| Corr Coeff - Total - Lognormal | 0.9869 | |
| Corr Coeff - Crit Val - Detected | 0.9620 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.7924 | NA |
| W-Test - Lognormal | 0.9750 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

00037

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : IRON (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 28.0000 | |
| Average | 27429.2857 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 5630.0000 | |
| Positive Hits - Maximum | 198000.0000 | |
| Average Of Positive Hits | 27429.2857 | |
| Standard Deviation | 35663.5995 | |
| Upper Confidence Limit - Normal | 38907.1426 | |
| Upper Confidence Limit - Lognormal | 37289.1298 UCL | |
| 95th Percentile - Nonparametric | ~~198000.0000~~ | |
| 95th Percentile - Normal | 86095.9070 | |
| 95th Percentile - Lognormal | 71811.5359 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6823 | |
| Corr Coeff - Detected - Lognormal | 0.9644 | |
| Corr Coeff - Total - Normal | 0.6823 | |
| Corr Coeff - Total - Lognormal | 0.9644 | |
| Corr Coeff - Crit Val - Detected | 0.9620 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.5029 | NA |
| W-Test - Lognormal | 0.9346 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : LEAD (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 28.0000 | |
| Average | 60.7143 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 11.2000 | |
| Positive Hits - Maximum | 241.0000 | |
| Average Of Positive Hits | 60.7143 | |
| Standard Deviation | 51.4463 | |
| Upper Confidence Limit - Normal | ~~77.2716~~ | |
| Upper Confidence Limit - Lognormal | 84.2622 ucl | |
| 95th Percentile - Nonparametric | ~~241.0000~~ | |
| 95th Percentile - Normal | 145.3434 | |
| 95th Percentile - Lognormal | 160.1003 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8862 | |
| Corr Coeff - Detected - Lognormal | 0.9921 | |
| Corr Coeff - Total - Normal | 0.8862 | |
| Corr Coeff - Total - Lognormal | 0.9921 | |
| Corr Coeff - Crit Val - Detected | 0.9620 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.7980 | NA |
| W-Test - Lognormal | 0.9787 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : MAGNESIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 28.0000 | |
| Average | 4573.9286 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | ~~1570.0000~~ | |
| Positive Hits - Maximum | 9150.0000 UCL | |
| Average Of Positive Hits | ~~4573.9286~~ | |
| Standard Deviation | 2463.0820 | |
| Upper Confidence Limit - Normal | 5366.6389 | |
| Upper Confidence Limit - Lognormal | 5887.8659 | |
| 95th Percentile - Nonparametric | 9150.0000 | |
| 95th Percentile - Normal | 8625.6984 | |
| 95th Percentile - Lognormal | 10429.8693 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9585 | |
| Corr Coeff - Detected - Lognormal | 0.9574 | |
| Corr Coeff - Total - Normal | 0.9585 | |
| Corr Coeff - Total - Lognormal | 0.9574 | |
| Corr Coeff - Crit Val - Detected | 0.9620 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.8962 | NA |
| W-Test - Lognormal | 0.8914 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : MANGANESE (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 28.0000 | |
| Average | 212.1143 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 55.3000 | |
| Positive Hits - Maximum | 376.0000 | |
| Average Of Positive Hits | 212.1143 | |
| Standard Deviation | 102.0281 | |
| Upper Confidence Limit - Normal | ~~244.9507~~ | |
| Upper Confidence Limit - Lognormal | 265.3497 UCL | |
| 95th Percentile - Nonparametric | 376.0000 | |
| 95th Percentile - Normal | 379.9504 | |
| 95th Percentile - Lognormal | 454.3833 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9669 | |
| Corr Coeff - Detected - Lognormal | 0.9683 | |
| Corr Coeff - Total - Normal | 0.9669 | |
| Corr Coeff - Total - Lognormal | 0.9683 | |
| Corr Coeff - Crit Val - Detected | 0.9620 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.9128 ≈ | NA |
| W-Test - Lognormal | 0.9237 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

000041

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : MERCURY (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 22.0000 | No samples |
| Number of Detects | 13.0000 | |
| Average | 0.3089 | |
| Detection Limit - Minimum | 0.0550 | |
| Detection Limits - Maximum | 0.2550 | |
| Positive Hits - Minimum | 0.1500 | |
| Positive Hits - Maximum | 1.2000 | |
| Average Of Positive Hits | 0.4277 | |
| Standard Deviation | 0.2632 | |
| Upper Confidence Limit - Normal | 0.4055 | |
| Upper Confidence Limit - Lognormal | 0.4437 UCL | |
| 95th Percentile - Nonparametric | 1.2000 | |
| 95th Percentile - Normal | 0.7419 | |
| 95th Percentile - Lognormal | 0.7954 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.4831 | |
| Corr Coeff - Detected - Lognormal | 0.3855 | |
| Corr Coeff - Total - Normal | 0.8715 | |
| Corr Coeff - Total - Lognormal | 0.9924 | |
| Corr Coeff - Crit Val - Detected | 0.9310 | |
| Corr Coeff - Crit Val - Total | 0.9540 | |
| W-Test - Table Value | 0.9110 | NA |
| W-Test - Normal | 0.7753 | NA |
| W-Test - Lognormal | 0.9876 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

00042

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : NICKEL (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 28.0000 | |
| Average | 20.4429 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 6.6000 | |
| Positive Hits - Maximum | 61.5000 | |
| Average Of Positive Hits | 20.4429 | |
| Standard Deviation | 11.9348 | |
| Upper Confidence Limit - Normal | ~~24.2839~~ | |
| Upper Confidence Limit - Lognormal | 25.2405 UCL | |
| 95th Percentile - Nonparametric | ~~61.5000~~ | |
| 95th Percentile - Normal | 40.0757 | |
| 95th Percentile - Lognormal | 43.1894 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9057 | |
| Corr Coeff - Detected - Lognormal | 0.9841 | |
| Corr Coeff - Total - Normal | 0.9057 | |
| Corr Coeff - Total - Lognormal | 0.9841 | |
| Corr Coeff - Crit Val - Detected | 0.9620 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.8346 | NA |
| W-Test - Lognormal | 0.9664 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : POTASSIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 28.0000 | No samples |
| Number of Detects ..... | 28.0000 | |
| Average ..... | 2518.8571 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | ~~659.0000~~ | |
| Positive Hits - Maximum ..... | 5170.0000 UCL | |
| Average Of Positive Hits ..... | ~~2518.8571~~ | |
| Standard Deviation ..... | 1352.5158 | |
| Upper Confidence Limit - Normal ..... | 2954.1464 | |
| Upper Confidence Limit - Lognormal ... | 3308.6054 | |
| 95th Percentile - Nonparametric..... | 5170.0000 | |
| 95th Percentile - Normal..... | 4743.7456 | |
| 95th Percentile - Lognormal ..... | 5939.6563 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9648 | |
| Corr Coeff - Detected - Lognormal .... | 0.9611 | |
| Corr Coeff - Total - Normal ..... | 0.9648 | |
| Corr Coeff - Total - Lognormal ..... | 0.9611 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9620 | |
| Corr Coeff - Crit Val - Total ..... | 0.9620 | |
| W-Test - Table Value ..... | 0.9240 | NA |
| W-Test - Normal ..... | 0.9131 | NA |
| W-Test - Lognormal ..... | 0.9057 | NA |
| Type of Distribution ..... | ~~NORMAL~~ Undefined | |

Test Results:

000474

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : SODIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 28.0000 | No samples |
| Number of Detects ..... | 28.0000 | |
| Average ..... | 1344.9286 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 114.0000 | |
| Positive Hits - Maximum ..... | 4980.0000 | |
| Average Of Positive Hits ..... | 1344.9286 | |
| Standard Deviation ..... | 1298.7965 | |
| Upper Confidence Limit - Normal ..... | 1762.9290 | |
| Upper Confidence Limit - Lognormal ... | 2535.1941 uα | |
| 95th Percentile - Nonparametric..... | 4980.0000 | |
| 95th Percentile - Normal..... | 3481.4488 | |
| 95th Percentile - Lognormal ..... | 4888.7080 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9215 | |
| Corr Coeff - Detected - Lognormal .... | 0.9875 | |
| Corr Coeff - Total - Normal ..... | 0.9215 | |
| Corr Coeff - Total - Lognormal ..... | 0.9875 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9620 | |
| Corr Coeff - Crit Val - Total ..... | 0.9620 | |
| W-Test - Table Value ..... | 0.9240 | NA |
| W-Test - Normal ..... | 0.8447 | NA |
| W-Test - Lognormal ..... | 0.9578 | NA |
| Type of Distribution ..... | LOGNORMAL ✓ | |

Test Results:

000045

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : VANADIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 28.0000 | |
| Average | 58.3964 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 8.9000 | |
| Positive Hits - Maximum | 203.0000 | |
| Average Of Positive Hits | 58.3964 | |
| Standard Deviation | 51.3086 | |
| Upper Confidence Limit - Normal | 74.9094 | |
| Upper Confidence Limit - Lognormal | 85.1195 ucl | |
| 95th Percentile - Nonparametric | ~~203.0000~~ | |
| 95th Percentile - Normal | 142.7990 | |
| 95th Percentile - Lognormal | 164.1942 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8683 | |
| Corr Coeff - Detected - Lognormal | 0.9763 | |
| Corr Coeff - Total - Normal | 0.8683 | |
| Corr Coeff - Total - Lognormal | 0.9763 | |
| Corr Coeff - Crit Val - Detected | 0.9620 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.7554 | NA |
| W-Test - Lognormal | 0.9451 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

00049

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : ZINC (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 28.0000 | |
| Average | 128.2571 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | ~~35.0000~~ | |
| Positive Hits - Maximum | 702.0000 ucl | |
| Average Of Positive Hits | ~~128.2571~~ | |
| Standard Deviation | 135.2896 | |
| Upper Confidence Limit - Normal | 171.7983 | |
| Upper Confidence Limit - Lognormal | 158.8918 | |
| 95th Percentile - Nonparametric | 702.0000 | |
| 95th Percentile - Normal | 350.8086 | |
| 95th Percentile - Lognormal | 291.0707 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7480 | |
| Corr Coeff - Detected - Lognormal | 0.9452 | |
| Corr Coeff - Total - Normal | 0.7480 | |
| Corr Coeff - Total - Lognormal | 0.9452 | |
| Corr Coeff - Crit Val - Detected | 0.9620 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.5882 | NA |
| W-Test - Lognormal | 0.9028 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

00047

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : ANTHRACENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 27.0000 | No samples |
| Number of Detects ..... | 17.0000 | |
| Average ..... | 282.2222 | |
| Detection Limit - Minimum ..... | 175.0000 | |
| Detection Limits - Maximum ..... | 1300.0000 | |
| Positive Hits - Minimum ..... | ~~34.0000~~ | |
| Positive Hits - Maximum ..... | 2400.0000 UCL | |
| Average Of Positive Hits ..... | ~~225.5882~~ | |
| Standard Deviation ..... | 493.6501 | |
| Upper Confidence Limit - Normal ..... | 444.2973 | |
| Upper Confidence Limit - Lognormal ... | 453.8217 | |
| 95th Percentile - Nonparametric..... | 2400.0000 | |
| 95th Percentile - Normal..... | 1094.2766 | |
| 95th Percentile - Lognormal ..... | 855.6066 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.5729 | |
| Corr Coeff - Detected - Lognormal .... | 0.8308 | |
| Corr Coeff - Total - Normal ..... | 0.6948 | |
| Corr Coeff - Total - Lognormal ..... | 0.9554 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9420 | |
| Corr Coeff - Crit Val - Total ..... | 0.9600 | |
| W-Test - Table Value ..... | 0.9230 | NA |
| W-Test - Normal ..... | 0.5113 | NA |
| W-Test - Lognormal ..... | 0.9066 | NA |
| Type of Distribution ..... | UNDEFINED ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : BENZO(A)ANTHRACENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 27.0000 | |
| Average | 1291.7857 | |
| Detection Limit - Minimum | 310.0000 | |
| Detection Limits - Maximum | 310.0000 | |
| Positive Hits - Minimum | ~~25.0000~~ | |
| Positive Hits - Maximum | 27000.0000 UCL | |
| Average Of Positive Hits | ~~1328.1481~~ | |
| Standard Deviation | 5067.2937 | |
| Upper Confidence Limit - Normal | 2922.6271 | |
| Upper Confidence Limit - Lognormal | 1133.0036 | |
| 95th Percentile - Nonparametric | 27000.0000 | |
| 95th Percentile - Normal | 9627.4839 | |
| 95th Percentile - Lognormal | 2044.1823 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.4311 | |
| Corr Coeff - Detected - Lognormal | 0.8867 | |
| Corr Coeff - Total - Normal | 0.4565 | |
| Corr Coeff - Total - Lognormal | 0.8958 | |
| Corr Coeff - Crit Val - Detected | 0.9600 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.2433 | NA |
| W-Test - Lognormal | 0.8350 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : BENZO(A)PYRENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 25.0000 | |
| Average | 1613.9286 | |
| Detection Limit - Minimum | 280.0000 | |
| Detection Limits - Maximum | 1300.0000 | |
| Positive Hits - Minimum | 30.0000 | |
| Positive Hits - Maximum | 35000.0000 UCL | |
| Average Of Positive Hits | ~~1732.0000~~ | |
| Standard Deviation | 6562.0560 | |
| Upper Confidence Limit - Normal | 3725.8393 | |
| Upper Confidence Limit - Lognormal | 1372.0701 | |
| 95th Percentile - Nonparametric | 35000.0000 | |
| 95th Percentile - Normal | 12408.5107 | |
| 95th Percentile - Lognormal | 2442.9130 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.3895 | |
| Corr Coeff - Detected - Lognormal | 0.8352 | |
| Corr Coeff - Total - Normal | 0.4480 | |
| Corr Coeff - Total - Lognormal | 0.9015 | |
| Corr Coeff - Crit Val - Detected | 0.9580 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.2353 | NA |
| W-Test - Lognormal | 0.8439 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

000050

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : BENZO(B)FLUORANTHENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 24.0000 | |
| Average | 2249.1786 | |
| Detection Limit - Minimum | 195.0000 | |
| Detection Limits - Maximum | 1300.0000 | |
| Positive Hits - Minimum | ~~44.0000~~ | |
| Positive Hits - Maximum | 55000.0000 UCL | |
| Average Of Positive Hits | ~~2537.3750~~ | |
| Standard Deviation | 10341.0845 | |
| Upper Confidence Limit - Normal | 5577.3196 | |
| Upper Confidence Limit - Lognormal | 1246.0304 | |
| 95th Percentile - Nonparametric | 55000.0000 | |
| 95th Percentile - Normal | 19260.2626 | |
| 95th Percentile - Lognormal | 2247.7726 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.3614 | |
| Corr Coeff - Detected - Lognormal | 0.7716 | |
| Corr Coeff - Total - Normal | 0.4195 | |
| Corr Coeff - Total - Lognormal | 0.8487 | |
| Corr Coeff - Crit Val - Detected | 0.9570 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.2095 | NA |
| W-Test - Lognormal | 0.7569 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

000051

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : BENZO(G,H,I)PERYLENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 20.0000 | |
| Average | 1139.0357 | |
| Detection Limit - Minimum | 175.0000 | |
| Detection Limits - Maximum | 1300.0000 | |
| Positive Hits - Minimum | ~~27.0000~~ | |
| Positive Hits - Maximum | 23000.0000 UCL | |
| Average Of Positive Hits | ~~1425~~.1500 | |
| Standard Deviation | 4293.2579 | |
| Upper Confidence Limit - Normal | 2520.7639 | |
| Upper Confidence Limit - Lognormal | 1065.1553 | |
| 95th Percentile - Nonparametric | 23000.0000 | |
| 95th Percentile - Normal | 8201.4450 | |
| 95th Percentile - Lognormal | 2005.8595 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.3970 | |
| Corr Coeff - Detected - Lognormal | 0.8199 | |
| Corr Coeff - Total - Normal | 0.4486 | |
| Corr Coeff - Total - Lognormal | 0.8883 | |
| Corr Coeff - Crit Val - Detected | 0.9500 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.2361 | NA |
| W-Test - Lognormal | 0.8272 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : BENZO(K)FLUORANTHENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 25.0000 | |
| Average | 2008.5000 | |
| Detection Limit - Minimum | 190.0000 | |
| Detection Limits - Maximum | 1300.0000 | |
| Positive Hits - Minimum | ~~62.0000~~ | |
| Positive Hits - Maximum | 45000.0000 ucl | |
| Average Of Positive Hits | 2177.5200 | |
| Standard Deviation | 8453.3285 | |
| Upper Confidence Limit - Normal | 4729.0918 | |
| Upper Confidence Limit - Lognormal | 1426.3962 | |
| 95th Percentile - Nonparametric | 45000.0000 | |
| 95th Percentile - Normal | 15914.2254 | |
| 95th Percentile - Lognormal | 2555.2653 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.3831 | |
| Corr Coeff - Detected - Lognormal | 0.7847 | |
| Corr Coeff - Total - Normal | 0.4441 | |
| Corr Coeff - Total - Lognormal | 0.8634 | |
| Corr Coeff - Crit Val - Detected | 0.9580 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.2317 | NA |
| W-Test - Lognormal | 0.7725 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : CHRYSENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 26.0000 | |
| Average | 1950.8214 | |
| Detection Limit - Minimum | 310.0000 | |
| Detection Limits - Maximum | 1300.0000 | |
| Positive Hits - Minimum | 38.0000 | |
| Positive Hits - Maximum | 42000.0000 arc | |
| Average Of Positive Hits | 2038.9615 | |
| Standard Deviation | 7878.4905 | |
| Upper Confidence Limit - Normal | 4486.4092 | |
| Upper Confidence Limit - Lognormal | 1657.3487 | |
| 95th Percentile - Nonparametric | 42000.0000 | |
| 95th Percentile - Normal | 14910.9383 | |
| 95th Percentile - Lognormal | 2954.6199 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.4243 | |
| Corr Coeff - Detected - Lognormal | 0.8594 | |
| Corr Coeff - Total - Normal | 0.4504 | |
| Corr Coeff - Total - Lognormal | 0.8970 | |
| Corr Coeff - Crit Val - Detected | 0.9590 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.2376 | NA |
| W-Test - Lognormal | 0.8356 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

000054

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : FLUORANTHENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 28.0000 | |
| Average | 3348.5000 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 56.0000 | |
| Positive Hits - Maximum | 80000.0000 | |
| Average Of Positive Hits | 3348.5000 | |
| Standard Deviation | 15041.5375 | |
| Upper Confidence Limit - Normal | 8189.4195 | |
| Upper Confidence Limit - Lognormal | 2150.6052 | |
| 95th Percentile - Nonparametric | 80000.0000 | |
| 95th Percentile - Normal | 28091.8292 | |
| 95th Percentile - Lognormal | 3680.6585 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.4299 | |
| Corr Coeff - Detected - Lognormal | 0.8774 | |
| Corr Coeff - Total - Normal | 0.4299 | |
| Corr Coeff - Total - Lognormal | 0.8774 | |
| Corr Coeff - Crit Val - Detected | 0.9620 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.2188 | NA |
| W-Test - Lognormal | 0.8001 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : INDENO(1,2,3-CD)PYRENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 22.0000 | |
| Average | 1102.4286 | |
| Detection Limit - Minimum | 175.0000 | |
| Detection Limits - Maximum | 1300.0000 | |
| Positive Hits - Minimum | ~~22.0000~~ | |
| Positive Hits - Maximum | 23000.0000 UCL | |
| Average Of Positive Hits | ~~1280.8182~~ | |
| Standard Deviation | 4300.1269 | |
| Upper Confidence Limit - Normal | 2486.3674 | |
| Upper Confidence Limit - Lognormal | 1017.9019 | |
| 95th Percentile - Nonparametric | 23000.0000 | |
| 95th Percentile - Normal | 8176.1373 | |
| 95th Percentile - Lognormal | 1873.5542 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.3893 | |
| Corr Coeff - Detected - Lognormal | 0.8291 | |
| Corr Coeff - Total - Normal | 0.4472 | |
| Corr Coeff - Total - Lognormal | 0.9048 | |
| Corr Coeff - Crit Val - Detected | 0.9540 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.2348 | NA |
| W-Test - Lognormal | 0.8538 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

000036

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : PHENANTHRENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 26.0000 | |
| Average | 1600.2500 | |
| Detection Limit - Minimum | 310.0000 | |
| Detection Limits - Maximum | 1300.0000 | |
| Positive Hits - Minimum | 22.0000 | |
| Positive Hits - Maximum | 36000.0000 | |
| Average Of Positive Hits | 1661.4231 | |
| Standard Deviation | 6752.8510 | |
| Upper Confidence Limit - Normal | 3773.5656 | |
| Upper Confidence Limit - Lognormal | 1265.7428 | |
| 95th Percentile - Nonparametric | 36000.0000 | |
| 95th Percentile - Normal | 12708.6900 | |
| 95th Percentile - Lognormal | 2232.7048 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.4227 | |
| Corr Coeff - Detected - Lognormal | 0.8516 | |
| Corr Coeff - Total - Normal | 0.4393 | |
| Corr Coeff - Total - Lognormal | 0.8859 | |
| Corr Coeff - Crit Val - Detected | 0.9590 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.2274 | NA |
| W-Test - Lognormal | 0.8207 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

000037

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : PYRENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 28.0000 | No samples |
| Number of Detects | 28.0000 | |
| Average | 2148.2143 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | ~~46.0000~~ | |
| Positive Hits - Maximum | ~~42000.0000~~ | |
| Average Of Positive Hits | 2148.2143 | |
| Standard Deviation | 7858.3476 | |
| Upper Confidence Limit - Normal | 4677.3193 | |
| Upper Confidence Limit - Lognormal | 2271.1179 | |
| 95th Percentile - Nonparametric | 42000.0000 | |
| 95th Percentile - Normal | 15075.1962 | |
| 95th Percentile - Lognormal | 4093.7258 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.4694 | |
| Corr Coeff - Detected - Lognormal | 0.9267 | |
| Corr Coeff - Total - Normal | 0.4694 | |
| Corr Coeff - Total - Lognormal | 0.9267 | |
| Corr Coeff - Crit Val - Detected | 0.9620 | |
| Corr Coeff - Crit Val - Total | 0.9620 | |
| W-Test - Table Value | 0.9240 | NA |
| W-Test - Normal | 0.2557 | NA |
| W-Test - Lognormal | 0.8866 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

000058

Dataset: UTMP_RES
Media : SOIL DATA (0 - 2') - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : TOTAL ORGANIC CARBON (MG/KG) ~~(MG/KG)~~

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 24.0000 | No samples |
| Number of Detects ..... | 24.0000 | |
| Average ..... | 42678.7500 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 8420.0000 | |
| Positive Hits - Maximum ..... | 91000.0000 | |
| Average Of Positive Hits ..... | 42678.7500 | |
| Standard Deviation ..... | 25023.5361 | |
| Upper Confidence Limit - Normal ..... | 51433.7042 UCL | |
| Upper Confidence Limit - Lognormal ... | ~~61893.5906~~ | |
| 95th Percentile - Nonparametric..... | 91000.0000 | |
| 95th Percentile - Normal..... | 83842.4669 | |
| 95th Percentile - Lognormal ..... | 112268.2738 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9761 | |
| Corr Coeff - Detected - Lognormal .... | 0.9687 | |
| Corr Coeff - Total - Normal ..... | 0.9761 | |
| Corr Coeff - Total - Lognormal ..... | 0.9687 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9570 | |
| Corr Coeff - Crit Val - Total ..... | 0.9570 | |
| W-Test - Table Value ..... | 0.9160 | NA |
| W-Test - Normal ..... | 0.9381 | NA |
| W-Test - Lognormal ..... | 0.9252 | NA |
| Type of Distribution ..... | NORMAL ✓ | |

Test Results:

000039

Soil / Sediment Data (0-2') - Area A Wetland

1/18/96

~~Table~~ X

Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 17/34 | 4.5000Und 4800.0000 | ✓ 806.2059 | 4800(d) | na | na | na | na | na | |

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA(0-2') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : 4,4'-DDD (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 34.0000 | No samples |
| Number of Detects | 17.0000 | |
| Average | 407.2000 | |
| Detection Limit - Minimum | 1.9000 | |
| Detection Limits - Maximum | 32.0000 | |
| Positive Hits - Minimum | 4.5000 | |
| Positive Hits - Maximum | 4800.0000 ucl | |
| Average Of Positive Hits | 806.2059 | |
| Standard Deviation | 985.7479 | |
| Upper Confidence Limit - Normal | 693.4260 | |
| Upper Confidence Limit - Lognormal | 3737.5259 | |
| 95th Percentile - Nonparametric | 4800.0000 | |
| 95th Percentile - Normal | 2028.7553 | |
| 95th Percentile - Lognormal | 1761.2139 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7447 | |
| Corr Coeff - Detected - Lognormal | 0.4594 | |
| Corr Coeff - Total - Normal | 0.6707 | |
| Corr Coeff - Total - Lognormal | 0.9566 | |
| Corr Coeff - Crit Val - Detected | 0.9420 | |
| Corr Coeff - Crit Val - Total | 0.9670 | |
| W-Test - Table Value | 0.9330 | NA |
| W-Test - Normal | 0.4771 | NA |
| W-Test - Lognormal | 0.8941 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

000063

Soil Data (0-10') - Area A Wetland



~~Table X~~

Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALUMINUM | 37/37 | 2690.0000<br>27100.0000 | Norm ✓ | 11760.0000 | 13400(a) | na | na | na | na | na | |
| ARSENIC | 37/37 | 0.9400<br>14.1000 | Norm ✓ | 5.9497 | 6.9(a) | na | na | na | na | na | |
| BARIUM | 37/37 | 11.9000<br>318.0000 | Log ✓ | 64.0189 | 75.0(b) | na | na | na | na | na | |
| BERYLLIUM | 36/37 | 0.1400<br>4.1000 | Log ✓ | 0.9167 | 1.31(b) | na | na | na | na | na | |
| CADMIUM | 30/37 | 0.1200<br>11.5000 | Und ✓ | 2.9063 | 11.5(d) | na | na | na | na | na | |
| CALCIUM | 37/37 | 868.0000<br>6290.0000 | ~~Log~~ Und. | 2626.0000 | 6290(d) | na | na | na | na | na | |
| CHROMIUM | 37/37 | 7.0000<br>102.0000 | Und ✓ | 41.5351 | 102(d) | na | na | na | na | na | |
| COBALT | 37/37 | 3.0000<br>13.6000 | ~~Norm~~ Und | 8.0081 | 13.6(d) | na | na | na | na | na | |
| COPPER | 37/37 | 13.1000<br>173.0000 | Log ✓ | 45.1405 | 54.9(b) | na | na | na | na | na | |
| IRON | 37/37 | 5630.0000<br>*****.**** | Und ✓ | 26441.0811 | 198000(d) | na | na | na | na | na | |
| LEAD | 37/37 | 8.1000<br>298.0000 | Log ✓ | 58.0676 | 80.0(b) | na | na | na | na | na | |
| MAGNESIUM | 37/37 | 1570.0000<br>9150.0000 | Und ✓ | 5209.1892 | 9150(d) | na | na | na | na | na | |

Table X
Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MANGANESE | 37/37 | 55.3000<br>376.0000 | Und ✓ | 230.0054 | 376(d) | na | na | na | na | na | |
| MERCURY | 15/30 | 0.1500<br>1.2000 | ~~Und~~ LOS | 0.4713 | 0.42(b) | na | na | na | na | na | |
| NICKEL | 37/37 | 6.6000<br>61.5000 | Log ✓ | 20.5459 | 24.2(b) | na | na | na | na | na | |
| POTASSIUM | 37/37 | 659.0000<br>5170.0000 | Und ✓ | 2784.8108 | 5170(d) | na | na | na | na | na | |
| SODIUM | 37/37 | 99.9000<br>9590.0000 | Log ✓ | 2177.7541 | 4870(b) | na | na | na | na | na | |
| VANADIUM | 37/37 | 8.9000<br>203.0000 | Und ✓ | 55.4324 | 203(d) | na | na | na | na | na | |
| ZINC | 37/37 | 35.0000<br>702.0000 | Und ✓ | 113.8486 | 702(d) | na | na | na | na | na | |
| ANTHRACENE | 18/36 | 34.0000<br>2400.0000 | Und ✓ | 217.4444 | 2400(d) | na | na | na | na | na | |
| BENZO(A)ANTHRACENE | 30/37 | 25.0000<br>27000.0000 | Und ✓ | 1218.0000 | 27000(d) | na | na | na | na | na | |
| BENZO(A)PYRENE | 25/37 | 30.0000<br>35000.0000 | Und | 1732.0000 | 35000(d) | na | na | na | na | na | |
| BENZO(B)FLUORANTHENE | 27/37 | 44.0000<br>55000.0000 | Und | 2271.7407 | 55000(d) | na | na | na | na | na | |
| BENZO(G,H,I)PERYLENE | 20/37 | 27.0000<br>23000.0000 | Und | 1425.1500 | 45000(d) | na | na | na | na | na | |

000009

Table X
Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BENZO(K)FLUORANTHENE | 27/37 | 62.0000<br>45000.0000 | Und ✓ | 2024.6296 | 48000(d) | na | na | na | na | na | |
| CHRYSENE | 30/37 | 38.0000<br>42000.0000 | Und ✓ | 1791.7667 | 42000(d) | na | na | na | na | na | |
| FLUORANTHENE | 33/37 | 56.0000<br>80000.0000 | Und ✓ | 2870.5455 | 80000(d) | na | na | na | na | na | |
| INDENO(1,2,3-CD)PYRENE | 22/37 | 22.0000<br>23000.0000 | Und ✓ | 1280.8182 | 23000(d) | na | na | na | na | na | |
| PHENANTHRENE | 28/37 | 22.0000<br>36000.0000 | Und ✓ | 1548.8929 | 36000(d) | na | na | na | na | na | |
| PYRENE | 35/37 | 46.0000<br>42000.0000 | Und ✓ | 1754.9429 | 42000(d) | na | na | na | na | na | |
| TOTAL ORGANIC CARBON (MG/KG) | 24/24 | 8420.0000<br>91000.0000 | Norm ✓ | 42678.7500 | 51,400(a) | na | na | na | na | na | |

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : ALUMINUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 37.0000 | |
| Average | 11760.0000 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 2690.0000 | |
| Positive Hits - Maximum | 27100.0000 | |
| Average Of Positive Hits | 11760.0000 | |
| Standard Deviation | 5895.5416 | |
| Upper Confidence Limit - Normal | 13397.2082 ucl | |
| Upper Confidence Limit - Lognormal | 15004.2292 | |
| 95th Percentile - Nonparametric | 27100.0000 | |
| 95th Percentile - Normal | 21458.1660 | |
| 95th Percentile - Lognormal | 27971.5836 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9731 | |
| Corr Coeff - Detected - Lognormal | 0.9488 | |
| Corr Coeff - Total - Normal | 0.9731 | |
| Corr Coeff - Total - Lognormal | 0.9488 | |
| Corr Coeff - Crit Val - Detected | 0.9690 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.9402 | NA |
| W-Test - Lognormal | 0.8873 | NA |
| Type of Distribution | NORMAL | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : ARSENIC (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 37.0000 | |
| Average | 5.9497 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 0.9400 | |
| Positive Hits - Maximum | 14.1000 | |
| Average Of Positive Hits | 5.9497 | |
| Standard Deviation | 3.5657 | |
| Upper Confidence Limit - Normal | 6.9399 ucl | |
| Upper Confidence Limit - Lognormal | 8.2709 | |
| 95th Percentile - Nonparametric | 14.1000 | |
| 95th Percentile - Normal | 11.8153 | |
| 95th Percentile - Lognormal | 16.5410 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9726 | |
| Corr Coeff - Detected - Lognormal | 0.9578 | |
| Corr Coeff - Total - Normal | 0.9726 >0.969 | |
| Corr Coeff - Total - Lognormal | 0.9578 | |
| Corr Coeff - Crit Val - Detected | 0.9690 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 ≈ | NA |
| W-Test - Normal | 0.9303 | NA |
| W-Test - Lognormal | 0.9002 | NA |

Type of Distribution ..... NORMAL ✓

Test Results:

000070

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : BARIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 37.0000 | |
| Average | 64.0189 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 11.9000 | |
| Positive Hits - Maximum | 318.0000 | |
| Average Of Positive Hits | 64.0189 | |
| Standard Deviation | 50.1119 | |
| Upper Confidence Limit - Normal | ~~77.9351~~ | |
| Upper Confidence Limit - Lognormal | 75.0493 UCL | |
| 95th Percentile - Nonparametric | ~~318.0000~~ | |
| 95th Percentile - Normal | 146.4529 | |
| 95th Percentile - Lognormal | 132.9152 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7596 | |
| Corr Coeff - Detected - Lognormal | 0.9532 | |
| Corr Coeff - Total - Normal | 0.7596 | |
| Corr Coeff - Total - Lognormal | 0.9532 | |
| Corr Coeff - Crit Val - Detected | 0.9690 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.6191 | NA |
| W-Test - Lognormal | 0.9416 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : BERYLLIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 36.0000 | |
| Average | 0.8959 | |
| Detection Limit - Minimum | 0.1500 | |
| Detection Limits - Maximum | 0.1500 | |
| Positive Hits - Minimum | 0.1400 | |
| Positive Hits - Maximum | 4.1000 | |
| Average Of Positive Hits | 0.9167 | |
| Standard Deviation | 0.8046 | |
| Upper Confidence Limit - Normal | ~~1.1194~~ | |
| Upper Confidence Limit - Lognormal | 1.3103 nc | |
| 95th Percentile - Nonparametric | ~~4.1000~~ | |
| 95th Percentile - Normal | 2.2195 | |
| 95th Percentile - Lognormal | 2.7316 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8794 | |
| Corr Coeff - Detected - Lognormal | 0.9729 | |
| Corr Coeff - Total - Normal | 0.8886 | |
| Corr Coeff - Total - Lognormal | 0.9804 | |
| Corr Coeff - Crit Val - Detected | 0.9680 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.8048 | NA |
| W-Test - Lognormal | 0.9453 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000072

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : CADMIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 30.0000 | |
| Average | 2.3785 | |
| Detection Limit - Minimum | 0.0600 | |
| Detection Limits - Maximum | 0.1850 | |
| Positive Hits - Minimum | 0.1200 | |
| Positive Hits - Maximum | 11.5000 uel | |
| Average Of Positive Hits | 2.9063 | |
| Standard Deviation | 3.0495 | |
| Upper Confidence Limit - Normal | 3.2254 | |
| Upper Confidence Limit - Lognormal | 7.1711 | |
| 95th Percentile - Nonparametric | 11.5000 | |
| 95th Percentile - Normal | 7.3950 | |
| 95th Percentile - Lognormal | 11.5660 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8430 | |
| Corr Coeff - Detected - Lognormal | 0.9304 | |
| Corr Coeff - Total - Normal | 0.8614 | |
| Corr Coeff - Total - Lognormal | 0.9576 | |
| Corr Coeff - Crit Val - Detected | 0.9640 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.7381 | NA |
| W-Test - Lognormal | 0.8933 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : CALCIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 37.0000 | No samples |
| Number of Detects ..... | 37.0000 | |
| Average ..... | 2626.0000 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 868.0000 | |
| Positive Hits - Maximum ..... | 6290.0000 | |
| Average Of Positive Hits ..... | 2626.0000 | |
| Standard Deviation ..... | 1562.7253 | |
| Upper Confidence Limit - Normal ..... | 3059.9731 | |
| Upper Confidence Limit - Lognormal ... | 3228.6937 | |
| 95th Percentile - Nonparametric..... | 6290.0000 | |
| 95th Percentile - Normal..... | 5196.6830 | |
| 95th Percentile - Lognormal ..... | 5934.4979 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9487 | |
| Corr Coeff - Detected - Lognormal .... | 0.9745 | |
| Corr Coeff - Total - Normal ..... | 0.9487 | |
| Corr Coeff - Total - Lognormal ..... | 0.9745 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9690 | |
| Corr Coeff - Crit Val - Total ..... | 0.9690 | |
| W-Test - Table Value ..... | 0.9360 | NA |
| W-Test - Normal ..... | 0.8825 | NA |
| W-Test - Lognormal ..... | 0.9256 | NA |
| Type of Distribution ..... | ~~LOGNORMAL~~ Undefined | |

Test Results:

000074

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : CHROMIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 37.0000 | |
| Average | 41.5351 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | ~~7.0000~~ | |
| Positive Hits - Maximum | 102.0000 UCL | |
| Average Of Positive Hits | ~~41.5351~~ | |
| Standard Deviation | 28.5455 | |
| Upper Confidence Limit - Normal | 49.4623 | |
| Upper Confidence Limit - Lognormal | 59.9302 | |
| 95th Percentile - Nonparametric | 102.0000 | |
| 95th Percentile - Normal | 88.4924 | |
| 95th Percentile - Lognormal | 122.7784 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9629 | |
| Corr Coeff - Detected - Lognormal | 0.9665 | |
| Corr Coeff - Total - Normal | 0.9629 | |
| Corr Coeff - Total - Lognormal | 0.9665 | |
| Corr Coeff - Crit Val - Detected | 0.9690 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.9056 | NA |
| W-Test - Lognormal | 0.9096 | NA |
| Type of Distribution | UNDEFINED✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : COBALT (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 37.0000 | |
| Average | 8.0081 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 3.0000 | |
| Positive Hits - Maximum | 13.6000 null | |
| Average Of Positive Hits | ~~8.0081~~ | |
| Standard Deviation | 2.8568 | |
| Upper Confidence Limit - Normal | 8.8015 | |
| Upper Confidence Limit - Lognormal | 9.2582 | |
| 95th Percentile - Nonparametric | 13.6000 | |
| 95th Percentile - Normal | 12.7075 | |
| 95th Percentile - Lognormal | 14.9304 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9711 | |
| Corr Coeff - Detected - Lognormal | 0.9380 | |
| Corr Coeff - Total - Normal | 0.9711 | |
| Corr Coeff - Total - Lognormal | 0.9380 | |
| Corr Coeff - Crit Val - Detected | 0.9690 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.9282 | NA |
| W-Test - Lognormal | 0.8654 | NA |
| Type of Distribution | ~~NORMAL~~ Undefined | |

Test Results:

00076

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : COPPER (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 37.0000 | |
| Average | 45.1405 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 13.1000 | |
| Positive Hits - Maximum | 173.0000 | |
| Average Of Positive Hits | 45.1405 | |
| Standard Deviation | 33.4884 | |
| Upper Confidence Limit - Normal | 54.4404 | |
| Upper Confidence Limit - Lognormal | 54.9033 UCL | |
| 95th Percentile - Nonparametric | 173.0000 | |
| 95th Percentile - Normal | 100.2289 | |
| 95th Percentile - Lognormal | 101.7887 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8713 | |
| Corr Coeff - Detected - Lognormal | 0.9875 | |
| Corr Coeff - Total - Normal | 0.8713 | |
| Corr Coeff - Total - Lognormal | 0.9875 | |
| Corr Coeff - Crit Val - Detected | 0.9690 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.7738 | NA |
| W-Test - Lognormal | 0.9684 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000077

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : IRON (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 37.0000 | |
| Average | 26441.0811 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 5630.0000 | |
| Positive Hits - Maximum | 198000.0000 UCL | |
| Average Of Positive Hits | 26441.0811 | |
| Standard Deviation | 30985.2674 | |
| Upper Confidence Limit - Normal | 35045.7756 | |
| Upper Confidence Limit - Lognormal | 32786.6517 | |
| 95th Percentile - Nonparametric | 198000.0000 | |
| 95th Percentile - Normal | 77411.8459 | |
| 95th Percentile - Lognormal | 64153.2885 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6572 | |
| Corr Coeff - Detected - Lognormal | 0.9512 | |
| Corr Coeff - Total - Normal | 0.6572 | |
| Corr Coeff - Total - Lognormal | 0.9512 | |
| Corr Coeff - Crit Val - Detected | 0.9690 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.4765 | NA |
| W-Test - Lognormal | 0.9171 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : LEAD (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 37.0000 | |
| Average | 58.0676 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 8.1000 | |
| Positive Hits - Maximum | 298.0000 | |
| Average Of Positive Hits | 58.0676 | |
| Standard Deviation | 62.9291 | |
| Upper Confidence Limit - Normal | 75.5432 | |
| Upper Confidence Limit - Lognormal | 80.0502 wcl | |
| 95th Percentile - Nonparametric | ~~298.0000~~ | |
| 95th Percentile - Normal | 161.5860 | |
| 95th Percentile - Lognormal | 166.3747 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8353 | |
| Corr Coeff - Detected - Lognormal | 0.9894 | |
| Corr Coeff - Total - Normal | 0.8353 | |
| Corr Coeff - Total - Lognormal | 0.9894 | |
| Corr Coeff - Crit Val - Detected | 0.9690 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.7118 | NA |
| W-Test - Lognormal | 0.9690 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

00079

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : MAGNESIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 37.0000 | No samples |
| Number of Detects ..... | 37.0000 | |
| Average ..... | 5209.1892 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 1570.0000 | |
| Positive Hits - Maximum ..... | 9150.0000 UCL | |
| Average Of Positive Hits ..... | 5209.1892 | |
| Standard Deviation ..... | 2502.4459 | |
| Upper Confidence Limit - Normal ..... | 5904.1253 | |
| Upper Confidence Limit - Lognormal ... | 6495.0346 | |
| 95th Percentile - Nonparametric..... | 9150.0000 | |
| 95th Percentile - Normal..... | 9325.7127 | |
| 95th Percentile - Lognormal ..... | 11839.5626 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9602 | |
| Corr Coeff - Detected - Lognormal .... | 0.9404 | |
| Corr Coeff - Total - Normal ..... | 0.9602 | |
| Corr Coeff - Total - Lognormal ..... | 0.9404 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9690 | |
| Corr Coeff - Crit Val - Total ..... | 0.9690 | |
| W-Test - Table Value ..... | 0.9360 | NA |
| W-Test - Normal ..... | 0.8942 | NA |
| W-Test - Lognormal ..... | 0.8583 | NA |
| Type of Distribution ..... | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : MANGANESE (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 37.0000 | |
| Average | 230.0054 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | ~~55.3000~~ | |
| Positive Hits - Maximum | 376.0000 ucl | |
| Average Of Positive Hits | 230.0054 | |
| Standard Deviation | 96.3170 | |
| Upper Confidence Limit - Normal | 256.7529 | |
| Upper Confidence Limit - Lognormal | 276.3200 | |
| 95th Percentile - Nonparametric | 376.0000 | |
| 95th Percentile - Normal | 388.4469 | |
| 95th Percentile - Lognormal | 476.9680 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9666 | |
| Corr Coeff - Detected - Lognormal | 0.9463 | |
| Corr Coeff - Total - Normal | 0.9666 | |
| Corr Coeff - Total - Lognormal | 0.9463 | |
| Corr Coeff - Crit Val - Detected | 0.9690 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.9118 | NA |
| W-Test - Lognormal | 0.8837 | NA |

Type of Distribution ..... UNDEFINED ✓

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : MERCURY (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 30.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 0.2927 | |
| Detection Limit - Minimum | 0.0550 | |
| Detection Limits - Maximum | 0.2550 | |
| Positive Hits - Minimum | 0.1500 | |
| Positive Hits - Maximum | 1.2000 | |
| Average Of Positive Hits | 0.4713 | |
| Standard Deviation | 0.2877 | |
| Upper Confidence Limit - Normal | ~~0.3819~~ | |
| Upper Confidence Limit - Lognormal | 0.4163 uel | |
| 95th Percentile - Nonparametric | ~~1.2000~~ | |
| 95th Percentile - Normal | 0.7660 | |
| 95th Percentile - Lognormal | 0.8213 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.5340 | |
| Corr Coeff - Detected - Lognormal | 0.3977 | |
| Corr Coeff - Total - Normal | 0.8633 | |
| Corr Coeff - Total - Lognormal | 0.9856 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9640 | |
| W-Test - Table Value | 0.9270 | NA |
| W-Test - Normal | 0.7496 | NA |
| W-Test - Lognormal | 0.9568 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : NICKEL (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 37.0000 | |
| Average | 20.5459 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 6.6000 | |
| Positive Hits - Maximum | 61.5000 | |
| Average Of Positive Hits | 20.5459 | |
| Standard Deviation | 10.6646 | |
| Upper Confidence Limit - Normal | 23.5075 | |
| Upper Confidence Limit - Lognormal | 24.1905 uca | |
| 95th Percentile - Nonparametric | 61.5000 | |
| 95th Percentile - Normal | 38.0893 | |
| 95th Percentile - Lognormal | 41.2871 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9074 | |
| Corr Coeff - Detected - Lognormal | 0.9754 | |
| Corr Coeff - Total - Normal | 0.9074 | |
| Corr Coeff - Total - Lognormal | 0.9754 | |
| Corr Coeff - Crit Val - Detected | 0.9690 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.8424 | NA |
| W-Test - Lognormal | 0.9524 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : POTASSIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 37.0000 | |
| Average | 2784.8108 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 659.0000 | |
| Positive Hits - Maximum | 5170.0000 ucl | |
| Average Of Positive Hits | 2784.8108 | |
| Standard Deviation | 1274.5107 | |
| Upper Confidence Limit - Normal | 3138.7460 | |
| Upper Confidence Limit - Lognormal | 3491.4364 | |
| 95th Percentile - Nonparametric | 5170.0000 | |
| 95th Percentile - Normal | 4881.3809 | |
| 95th Percentile - Lognormal | 6366.6413 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9574 | |
| Corr Coeff - Detected - Lognormal | 0.9291 | |
| Corr Coeff - Total - Normal | 0.9574 | |
| Corr Coeff - Total - Lognormal | 0.9291 | |
| Corr Coeff - Crit Val - Detected | 0.9690 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.8994 | NA |
| W-Test - Lognormal | 0.8483 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

000045

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : SODIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 37.0000 | |
| Average | 2177.7541 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 99.9000 | |
| Positive Hits - Maximum | 9590.0000 | |
| Average Of Positive Hits | 2177.7541 | |
| Standard Deviation | 2348.6334 | |
| Upper Confidence Limit - Normal | 2829.9761 | |
| Upper Confidence Limit - Lognormal | 4871.0484 UCL | |
| 95th Percentile - Nonparametric | 9590.0000 | |
| 95th Percentile - Normal | 6041.2561 | |
| 95th Percentile - Lognormal | 9627.1888 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9100 | |
| Corr Coeff - Detected - Lognormal | 0.9819 | |
| Corr Coeff - Total - Normal | 0.9100 | |
| Corr Coeff - Total - Lognormal | 0.9819 | |
| Corr Coeff - Crit Val - Detected | 0.9690 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.8254 | NA |
| W-Test - Lognormal | 0.9419 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : VANADIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 37.0000 | |
| Average | 55.4324 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | ~~8.9000~~ | |
| Positive Hits - Maximum | 203.0000 ucl | |
| Average Of Positive Hits | ~~55.4324~~ | |
| Standard Deviation | 44.9835 | |
| Upper Confidence Limit - Normal | 67.9245 | |
| Upper Confidence Limit - Lognormal | 71.9326 | |
| 95th Percentile - Nonparametric | 203.0000 | |
| 95th Percentile - Normal | 129.4303 | |
| 95th Percentile - Lognormal | 141.0660 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8428 | |
| Corr Coeff - Detected - Lognormal | 0.9643 | |
| Corr Coeff - Total - Normal | 0.8428 | |
| Corr Coeff - Total - Lognormal | 0.9643 | |
| Corr Coeff - Crit Val - Detected | 0.9690 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.7192 | NA |
| W-Test - Lognormal | 0.9290 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : ZINC (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 37.0000 | |
| Average | 113.8486 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 35.0000 | |
| Positive Hits - Maximum | 702.0000 ucl | |
| Average Of Positive Hits | 113.8486 | |
| Standard Deviation | 120.2238 | |
| Upper Confidence Limit - Normal | 147.2351 | |
| Upper Confidence Limit - Lognormal | 130.9976 | |
| 95th Percentile - Nonparametric | 702.0000 | |
| 95th Percentile - Normal | 311.6169 | |
| 95th Percentile - Lognormal | 241.7240 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7092 | |
| Corr Coeff - Detected - Lognormal | 0.9224 | |
| Corr Coeff - Total - Normal | 0.7092 | |
| Corr Coeff - Total - Lognormal | 0.9224 | |
| Corr Coeff - Crit Val - Detected | 0.9690 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.5378 | NA |
| W-Test - Lognormal | 0.8649 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

000087

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : BENZO(A)PYRENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 25.0000 | |
| Average | 1318.9189 | |
| Detection Limit - Minimum | 185.0000 | |
| Detection Limits - Maximum | 1300.0000 | |
| Positive Hits - Minimum | 30.0000 | |
| Positive Hits - Maximum | 35000.0000 UCL | |
| Average Of Positive Hits | 1732.0000 | |
| Standard Deviation | 5709.5839 | |
| Upper Confidence Limit - Normal | 2904.4862 | |
| Upper Confidence Limit - Lognormal | 958.2290 | |
| 95th Percentile - Nonparametric | 35000.0000 | |
| 95th Percentile - Normal | 10711.1844 | |
| 95th Percentile - Lognormal | 2002.5528 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.4000 | |
| Corr Coeff - Detected - Lognormal | 0.8265 | |
| Corr Coeff - Total - Normal | 0.4147 | |
| Corr Coeff - Total - Lognormal | 0.8887 | |
| Corr Coeff - Crit Val - Detected | 0.9580 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.2101 | NA |
| W-Test - Lognormal | 0.8284 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

060000

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : BENZO(A)ANTHRACENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 30.0000 | |
| Average | 1042.2973 | |
| Detection Limit - Minimum | 185.0000 | |
| Detection Limits - Maximum | 330.0000 | |
| Positive Hits - Minimum | 25.0000 | |
| Positive Hits - Maximum | 27000.0000 | |
| Average Of Positive Hits | 1218.0000 | |
| Standard Deviation | 4411.1917 | |
| Upper Confidence Limit - Normal | 2267.2975 | |
| Upper Confidence Limit - Lognormal | 751.9995 | |
| 95th Percentile - Nonparametric | 27000.0000 | |
| 95th Percentile - Normal | 8298.7077 | |
| 95th Percentile - Lognormal | 1580.2519 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.3862 | |
| Corr Coeff - Detected - Lognormal | 0.8346 | |
| Corr Coeff - Total - Normal | 0.4181 | |
| Corr Coeff - Total - Lognormal | 0.8780 | |
| Corr Coeff - Crit Val - Detected | 0.9640 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.2130 | NA |
| W-Test - Lognormal | 0.8124 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

000039

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : BENZO(G,H,I)PERYLENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 37.0000 | No samples |
| Number of Detects ..... | 20.0000 | |
| Average ..... | 959.5405 | |
| Detection Limit - Minimum ..... | 175.0000 | |
| Detection Limits - Maximum ..... | 1300.0000 | |
| Positive Hits - Minimum ..... | ~~27.0000~~ | |
| Positive Hits - Maximum ..... | 23000.0000 UCL | |
| Average Of Positive Hits ..... | 1425.1500 | |
| Standard Deviation ..... | 3735.3310 | |
| Upper Confidence Limit - Normal ..... | 1996.8523 | |
| Upper Confidence Limit - Lognormal ... | 802.5501 | |
| 95th Percentile - Nonparametric..... | 23000.0000 | |
| 95th Percentile - Normal..... | 7104.1600 | |
| 95th Percentile - Lognormal ..... | 1694.7957 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.3890 | |
| Corr Coeff - Detected - Lognormal .... | 0.8092 | |
| Corr Coeff - Total - Normal ..... | 0.4193 | |
| Corr Coeff - Total - Lognormal ..... | 0.8731 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9500 | |
| Corr Coeff - Crit Val - Total ..... | 0.9690 | |
| W-Test - Table Value ..... | 0.9360 | NA |
| W-Test - Normal ..... | 0.2143 | NA |
| W-Test - Lognormal ..... | 0.8074 | NA |
| Type of Distribution ..... | UNDEFINED✓ | |

Test Results:

000032

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : BENZO(B)FLUORANTHENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 27.0000 | |
| Average | 1787.6216 | |
| Detection Limit - Minimum | 185.0000 | |
| Detection Limits - Maximum | 1300.0000 | |
| Positive Hits - Minimum | 44.0000 | |
| Positive Hits - Maximum | 55000.0000 UCL | |
| Average Of Positive Hits | 2271.7407 | |
| Standard Deviation | 8995.2356 | |
| Upper Confidence Limit - Normal | 4285.6235 | |
| Upper Confidence Limit - Lognormal | 873.1335 | |
| 95th Percentile - Nonparametric | 55000.0000 | |
| 95th Percentile - Normal | 16584.7842 | |
| 95th Percentile - Lognormal | 1824.9627 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.4009 | |
| Corr Coeff - Detected - Lognormal | 0.8131 | |
| Corr Coeff - Total - Normal | 0.3864 | |
| Corr Coeff - Total - Lognormal | 0.8569 | |
| Corr Coeff - Crit Val - Detected | 0.9600 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.1859 | NA |
| W-Test - Lognormal | 0.7750 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

000031

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : CHRYSENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 30.0000 | |
| Average | 1534.8108 | |
| Detection Limit - Minimum | 185.0000 | |
| Detection Limits - Maximum | 1300.0000 | |
| Positive Hits - Minimum | 38.0000 | |
| Positive Hits - Maximum | 42000.0000 UCL | |
| Average Of Positive Hits | 1791.7667 | |
| Standard Deviation | 6863.5691 | |
| Upper Confidence Limit - Normal | 3440.8430 | |
| Upper Confidence Limit - Lognormal | 1033.8953 | |
| 95th Percentile - Nonparametric | 42000.0000 | |
| 95th Percentile - Normal | 12825.3820 | |
| 95th Percentile - Lognormal | 2151.4639 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.3396 | |
| Corr Coeff - Detected - Lognormal | 0.7947 | |
| Corr Coeff - Total - Normal | 0.4118 | |
| Corr Coeff - Total - Lognormal | 0.8852 | |
| Corr Coeff - Crit Val - Detected | 0.9640 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.2075 | NA |
| W-Test - Lognormal | 0.8192 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

000034

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : BENZO(K)FLUORANTHENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 27.0000 | |
| Average | 1607.4324 | |
| Detection Limit - Minimum | 185.0000 | |
| Detection Limits - Maximum | 1300.0000 | |
| Positive Hits - Minimum | ~~62.0000~~ | |
| Positive Hits - Maximum | 45000.0000 | |
| Average Of Positive Hits | 2024.6296 | |
| Standard Deviation | 7357.8363 | |
| Upper Confidence Limit - Normal | 3650.7239 | |
| Upper Confidence Limit - Lognormal | 987.5448 | |
| 95th Percentile - Nonparametric | 45000.0000 | |
| 95th Percentile - Normal | 13711.0731 | |
| 95th Percentile - Lognormal | 2055.4092 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.3873 | |
| Corr Coeff - Detected - Lognormal | 0.7940 | |
| Corr Coeff - Total - Normal | 0.4100 | |
| Corr Coeff - Total - Lognormal | 0.8694 | |
| Corr Coeff - Crit Val - Detected | 0.9600 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.2059 | NA |
| W-Test - Lognormal | 0.7857 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

000033

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : INDENO(1,2,3-CD)PYRENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 22.0000 | |
| Average | 931.8378 | |
| Detection Limit - Minimum | 175.0000 | |
| Detection Limits - Maximum | 1300.0000 | |
| Positive Hits - Minimum | 22.0000 | |
| Positive Hits - Maximum | 23000.0000 UCL | |
| Average Of Positive Hits | 1280.8182 | |
| Standard Deviation | 3739.9199 | |
| Upper Confidence Limit - Normal | 1970.4239 | |
| Upper Confidence Limit - Lognormal | 779.5452 | |
| 95th Percentile - Nonparametric | 23000.0000 | |
| 95th Percentile - Normal | 7084.0060 | |
| 95th Percentile - Lognormal | 1640.2531 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.4447 | |
| Corr Coeff - Detected - Lognormal | 0.8829 | |
| Corr Coeff - Total - Normal | 0.4191 | |
| Corr Coeff - Total - Lognormal | 0.8950 | |
| Corr Coeff - Crit Val - Detected | 0.9540 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.2141 | NA |
| W-Test - Lognormal | 0.8425 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

9E0003

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : FLUORANTHENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 33.0000 | |
| Average | 2590.3514 | |
| Detection Limit - Minimum | 185.0000 | |
| Detection Limits - Maximum | 330.0000 | |
| Positive Hits - Minimum | 56.0000 | |
| Positive Hits - Maximum | 80000.0000 | |
| Average Of Positive Hits | 2870.5455 | |
| Standard Deviation | 13096.8430 | |
| Upper Confidence Limit - Normal | 6227.3809 | |
| Upper Confidence Limit - Lognormal | 1263.4310 | |
| 95th Percentile - Nonparametric | 80000.0000 | |
| 95th Percentile - Normal | 24134.6580 | |
| 95th Percentile - Lognormal | 2583.2448 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.3291 | |
| Corr Coeff - Detected - Lognormal | 0.8184 | |
| Corr Coeff - Total - Normal | 0.3920 | |
| Corr Coeff - Total - Lognormal | 0.8729 | |
| Corr Coeff - Crit Val - Detected | 0.9670 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.1905 | NA |
| W-Test - Lognormal | 0.7955 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

000035

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : PYRENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 35.0000 | |
| Average | 1674.0000 | |
| Detection Limit - Minimum | 185.0000 | |
| Detection Limits - Maximum | 330.0000 | |
| Positive Hits - Minimum | 46.0000 | |
| Positive Hits - Maximum | 42000.0000 ucl | |
| Average Of Positive Hits | ~~1754.9429~~ | |
| Standard Deviation | 6858.4792 | |
| Upper Confidence Limit - Normal | 3578.6187 | |
| Upper Confidence Limit - Lognormal | 1488.5060 | |
| 95th Percentile - Nonparametric | 42000.0000 | |
| 95th Percentile - Normal | 12956.1983 | |
| 95th Percentile - Lognormal | 3025.5257 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.3871 | |
| Corr Coeff - Detected - Lognormal | 0.9166 | |
| Corr Coeff - Total - Normal | 0.4334 | |
| Corr Coeff - Total - Lognormal | 0.9391 | |
| Corr Coeff - Crit Val - Detected | 0.9680 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.2267 | NA |
| W-Test - Lognormal | 0.9034 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

000038

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : PHENANTHRENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 37.0000 | No samples |
| Number of Detects | 28.0000 | |
| Average | 1297.0000 | |
| Detection Limit - Minimum | 185.0000 | |
| Detection Limits - Maximum | 1300.0000 | |
| Positive Hits - Minimum | 22.0000 | |
| Positive Hits - Maximum | 36000.0000 ucl | |
| Average Of Positive Hits | 1548.8929 | |
| Standard Deviation | 5875.7837 | |
| Upper Confidence Limit - Normal | 2928.7214 | |
| Upper Confidence Limit - Lognormal | 899.2002 | |
| 95th Percentile - Nonparametric | 36000.0000 | |
| 95th Percentile - Normal | 10962.6642 | |
| 95th Percentile - Lognormal | 1859.3188 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.4145 | |
| Corr Coeff - Detected - Lognormal | 0.8578 | |
| Corr Coeff - Total - Normal | 0.4077 | |
| Corr Coeff - Total - Lognormal | 0.8953 | |
| Corr Coeff - Crit Val - Detected | 0.9620 | |
| Corr Coeff - Crit Val - Total | 0.9690 | |
| W-Test - Table Value | 0.9360 | NA |
| W-Test - Normal | 0.2040 | NA |
| W-Test - Lognormal | 0.8400 | NA |
| Type of Distribution | UNDEFINED✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL DATA (0 - 10') - (NSB-NLON)
Group : AREA A WETLAND

Parameter : TOTAL ORGANIC CARBON (MG/KG) (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 24.0000 | No samples |
| Number of Detects ..... | 24.0000 | |
| Average ..... | 42678.7500 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 8420.0000 | |
| Positive Hits - Maximum ..... | 91000.0000 | |
| Average Of Positive Hits ..... | 42678.7500 | |
| Standard Deviation ..... | 25023.5361 | |
| Upper Confidence Limit - Normal ..... | 51433.7042 UCL | |
| Upper Confidence Limit - Lognormal ... | 61893.5906 | |
| 95th Percentile - Nonparametric..... | 91000.0000 | |
| 95th Percentile - Normal..... | 83842.4669 | |
| 95th Percentile - Lognormal ..... | 112268.2738 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9761 | |
| Corr Coeff - Detected - Lognormal .... | 0.9687 | |
| Corr Coeff - Total - Normal ..... | 0.9761 | |
| Corr Coeff - Total - Lognormal ..... | 0.9687 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9570 | |
| Corr Coeff - Crit Val - Total ..... | 0.9570 | |
| W-Test - Table Value ..... | 0.9160 | NA |
| W-Test - Normal ..... | 0.9381 | NA |
| W-Test - Lognormal ..... | 0.9252 | NA |
| Type of Distribution ..... | NORMAL ✓ | |

Test Results:

000039

Unfiltered Surface Water - Area A Wetland



~~Table X~~
Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALUMINUM | 10/11 | 66.9000 ~~Log~~ 20900.0000 Und | | 4408.0900 | 20,900 (d) | na | na | na | na | na | |
| CALCIUM | 11/11 | 272.0000 46500.0000 | Norm ✓ | 18884.7273 | 27,400 (a) | na | na | na | na | na | |
| IRON | 8/11 | 293.0000 11300.0000 | Und ✓ | 5791.0000 | 11,300 (d) | na | na | na | na | na | |
| MAGNESIUM | 10/11 | 443.0000 18500.0000 | Norm ✓ | 7893.8000 | 10,900 (a) | na | na | na | na | na | |
| MANGANESE | 8/11 | 43.7000 1870.0000 | Log ✓ | 720.9625 | 1870 (c) | na | na | na | na | na | |
| POTASSIUM | 11/11 | 447.0000 15300.0000 | Norm ✓ | 5984.7273 | 8480 (a) | na | na | na | na | na | |
| SODIUM | 9/11 | 19700.0000 ***** .**** | Und ✓ | 57111.1111 | 143,000 (d) | na | na | na | na | na | |
| ZINC | 6/11 | 14.9500 334.0000 | Log ✓ | 132.9417 | 334 (c) | na | na | na | na | na | |

Dataset: UTMP_RES
Media : SURFACE WATER DATA (UNFILTERED) - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : CALCIUM (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 11.0000 | No samples |
| Number of Detects | 11.0000 | |
| Average | 18884.7273 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 272.0000 | |
| Positive Hits - Maximum | 46500.0000 | |
| Average Of Positive Hits | 18884.7273 | |
| Standard Deviation | ~~15529.6936~~ | |
| Upper Confidence Limit - Normal | 27369.1976 ucl | |
| Upper Confidence Limit - Lognormal | ~~302174.3287~~ | |
| 95th Percentile - Nonparametric | 46500.0000 | |
| 95th Percentile - Normal | 44431.0732 | |
| 95th Percentile - Lognormal | 135833.6480 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9609 | |
| Corr Coeff - Detected - Lognormal | 0.9087 | |
| Corr Coeff - Total - Normal | 0.9609 | |
| Corr Coeff - Total - Lognormal | 0.9087 | |
| Corr Coeff - Crit Val - Detected | 0.9220 | |
| Corr Coeff - Crit Val - Total | 0.9220 | |
| W-Test - Table Value | 0.8500 | NA |
| W-Test - Normal | 0.9081 | NA |
| W-Test - Lognormal | 0.8298 | NA |
| Type of Distribution | NORMAL ✓ | |

Test Results:

000134

Dataset: UTMP_RES
Media : SURFACE WATER DATA (UNFILTERED) - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : ALUMINUM (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 11.0000 | No samples |
| Number of Detects | 10.0000 | |
| Average | 4012.6727 | |
| Detection Limit - Minimum | 58.5000 | |
| Detection Limits - Maximum | 58.5000 | |
| Positive Hits - Minimum | 66.9000 | |
| Positive Hits - Maximum | 20900.0000 UCL | |
| Average Of Positive Hits | 4408.0900 | |
| Standard Deviation | 8331.7633 | |
| Upper Confidence Limit - Normal | 8564.6362 | |
| Upper Confidence Limit - Lognormal | 219184.8585 | |
| 95th Percentile - Nonparametric | 20900.0000 | |
| 95th Percentile - Normal | 17718.4233 | |
| 95th Percentile - Lognormal | 13727.1453 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7549 | |
| Corr Coeff - Detected - Lognormal | 0.9196 | |
| Corr Coeff - Total - Normal | 0.7145 | |
| Corr Coeff - Total - Lognormal | 0.8833 | |
| Corr Coeff - Crit Val - Detected | 0.9170 | |
| Corr Coeff - Crit Val - Total | 0.9220 | |
| W-Test - Table Value | 0.8500 | NA |
| W-Test - Normal | 0.5132 | NA |
| W-Test - Lognormal | 0.7653 | NA |
| Type of Distribution | ~~LOGNORMAL~~ Undefined | |

Test Results:

Dataset: UTMP_RES
Media : SURFACE WATER DATA (UNFILTERED) - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : MAGNESIUM (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 11.0000 | No samples |
| Number of Detects ..... | 10.0000 | |
| Average ..... | 7180.4545 | |
| Detection Limit - Minimum ..... | 47.0000 | |
| Detection Limits - Maximum ..... | 47.0000 | |
| Positive Hits - Minimum ..... | 443.0000 | |
| Positive Hits - Maximum ..... | 18500.0000 | |
| Average Of Positive Hits ..... | 7893.8000 | |
| Standard Deviation ..... | ~~6765.4008~~ | |
| Upper Confidence Limit - Normal ..... | 10876.6539 UCL | |
| Upper Confidence Limit - Lognormal ... | ~~237432.0312~~ | |
| 95th Percentile - Nonparametric..... | 18500.0000 | |
| 95th Percentile - Normal..... | 18309.5389 | |
| 95th Percentile - Lognormal ..... | 61797.4423 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9712 | |
| Corr Coeff - Detected - Lognormal .... | 0.9529 | |
| Corr Coeff - Total - Normal ..... | 0.9453 | |
| Corr Coeff - Total - Lognormal ..... | 0.9241 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9170 | |
| Corr Coeff - Crit Val - Total ..... | 0.9220 | |
| W-Test - Table Value ..... | 0.8500 | NA |
| W-Test - Normal ..... | 0.8707 | NA |
| W-Test - Lognormal ..... | 0.8596 | NA |
| Type of Distribution ..... | NORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SURFACE WATER DATA (UNFILTERED) - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : IRON (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 11.0000 | No samples |
| Number of Detects | 8.0000 | |
| Average | 4212.8864 | |
| Detection Limit - Minimum | 2.8500 | |
| Detection Limits - Maximum | 5.9500 | |
| Positive Hits - Minimum | 293.0000 | |
| Positive Hits - Maximum | 11300.0000 | |
| Average Of Positive Hits | 5791.0000 | |
| Standard Deviation | 4527.2930 | |
| Upper Confidence Limit - Normal | 6686.3211 | |
| Upper Confidence Limit - Lognormal | 850793219.0674 | |
| 95th Percentile - Nonparametric | 11300.0000 | |
| 95th Percentile - Normal | 11660.2833 | |
| 95th Percentile - Lognormal | 135391.9084 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7275 | |
| Corr Coeff - Detected - Lognormal | 0.8088 | |
| Corr Coeff - Total - Normal | 0.9303 | |
| Corr Coeff - Total - Lognormal | 0.9086 | |
| Corr Coeff - Crit Val - Detected | 0.9050 | |
| Corr Coeff - Crit Val - Total | 0.9220 | |
| W-Test - Table Value | 0.8500 | NA |
| W-Test - Normal | 0.8349 | NA |
| W-Test - Lognormal | 0.7990 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : SURFACE WATER DATA (UNFILTERED) - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : POTASSIUM (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 11.0000 | No samples |
| Number of Detects | 11.0000 | |
| Average | 5984.7273 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 447.0000 | |
| Positive Hits - Maximum | 15300.0000 | |
| Average Of Positive Hits | 5984.7273 | |
| Standard Deviation | 4576.5223 | |
| Upper Confidence Limit - Normal | 8485.0579 UCL | |
| Upper Confidence Limit - Lognormal | 21463.1236 | |
| 95th Percentile - Nonparametric | 15300.0000 | |
| 95th Percentile - Normal | 13513.1065 | |
| 95th Percentile - Lognormal | 23852.0392 | |

*Shapiro-Wilk and Probabilty Plot Results:*

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9668 | |
| Corr Coeff - Detected - Lognormal | 0.9589 | |
| Corr Coeff - Total - Normal | 0.9668 | |
| Corr Coeff - Total - Lognormal | 0.9589 | |
| Corr Coeff - Crit Val - Detected | 0.9220 | |
| Corr Coeff - Crit Val - Total | 0.9220 | |
| W-Test - Table Value | 0.8500 | NA |
| W-Test - Normal | 0.9301 | NA |
| W-Test - Lognormal | 0.9168 | NA |

Type of Distribution ..... NORMAL ✓

Test Results:

00108

Dataset: UTMP_RES
Media : SURFACE WATER DATA (UNFILTERED) - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : MANGANESE (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 11.0000 | No samples |
| Number of Detects | 8.0000 | |
| Average | 525.1773 | |
| Detection Limit - Minimum | 3.0000 | |
| Detection Limits - Maximum | 3.2000 | |
| Positive Hits - Minimum | ~~43.7000~~ | |
| Positive Hits - Maximum | 1870.0000 ucl | |
| Average Of Positive Hits | ~~720.9625~~ | |
| Standard Deviation | 709.8066 | |
| Upper Confidence Limit - Normal | ~~912.9720~~ | |
| Upper Confidence Limit - Lognormal | 416487.8978 > max | |
| 95th Percentile - Nonparametric | 1870.0000 | |
| 95th Percentile - Normal | 1692.8090 | |
| 95th Percentile - Lognormal | 6247.4411 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6775 | |
| Corr Coeff - Detected - Lognormal | 0.8296 | |
| Corr Coeff - Total - Normal | 0.8619 | |
| Corr Coeff - Total - Lognormal | 0.9477 | |
| Corr Coeff - Crit Val - Detected | 0.9050 | |
| Corr Coeff - Crit Val - Total | 0.9220 | |
| W-Test - Table Value | 0.8500 | NA |
| W-Test - Normal | 0.7301 | NA |
| W-Test - Lognormal | 0.8663 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SURFACE WATER DATA (UNFILTERED) - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : ZINC (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 11.0000 | No samples |
| Number of Detects | 6.0000 | |
| Average | 74.6636 | |
| Detection Limit - Minimum | 1.5000 | |
| Detection Limits - Maximum | 8.4500 | |
| Positive Hits - Minimum | ~~14.9500~~ | |
| Positive Hits - Maximum | 334.0000 ucl | |
| Average Of Positive Hits | 132.9417 | |
| Standard Deviation | 125.7600 | |
| Upper Confidence Limit - Normal | 143.3712 | |
| Upper Confidence Limit - Lognormal | 1727.4742 > max hit | |
| 95th Percentile - Nonparametric | 334.0000 | |
| 95th Percentile - Normal | 281.5388 | |
| 95th Percentile - Lognormal | 384.3526 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.5078 | |
| Corr Coeff - Detected - Lognormal | 0.3583 | |
| Corr Coeff - Total - Normal | 0.7809 | |
| Corr Coeff - Total - Lognormal | 0.9803 | |
| Corr Coeff - Crit Val - Detected | 0.8900 | |
| Corr Coeff - Crit Val - Total | 0.9220 | |
| W-Test - Table Value | 0.8500 | NA |
| W-Test - Normal | 0.6092 | NA |
| W-Test - Lognormal | 0.9410 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SURFACE WATER DATA (UNFILTERED) - CTO 129 (NSB-NLON)
Group : AREA 2W: AREA A WETLAND

Parameter : SODIUM (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 11.0000 | No samples |
| Number of Detects | 9.0000 | |
| Average | 46854.0909 | |
| Detection Limit - Minimum | 575.0000 | |
| Detection Limits - Maximum | 820.0000 | |
| Positive Hits - Minimum | 19700.0000 | |
| Positive Hits - Maximum | 143000.0000 uCL | |
| Average Of Positive Hits | 57111.1111 | |
| Standard Deviation | 47563.8296 | |
| Upper Confidence Limit - Normal | 72840.0449 | |
| Upper Confidence Limit - Lognormal | 1637962.6901 | |
| 95th Percentile - Nonparametric | 143000.0000 | |
| 95th Percentile - Normal | 125096.5906 | |
| 95th Percentile - Lognormal | 400337.9875 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8382 | |
| Corr Coeff - Detected - Lognormal | 0.8941 | |
| Corr Coeff - Total - Normal | 0.9196 | |
| Corr Coeff - Total - Lognormal | 0.9078 | |
| Corr Coeff - Crit Val - Detected | 0.9120 | |
| Corr Coeff - Crit Val - Total | 0.9220 | |
| W-Test - Table Value | 0.8500 | NA |
| W-Test - Normal | 0.8385 | NA |
| W-Test - Lognormal | 0.8210 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

000109

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Wetland
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 01/19/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE**

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 240 | IR: | 0 |
| EF: | 80 | EF: | 1 |
| FI: | 0.5 | FI: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 3.76E-07 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 5.37E-09 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE TWO)**
**Site 2 – Area A Wetland**
**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG-DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1.1 | 1 | 0.00E+00 | 4.13E-07 | 5.90E-09 | | 7.30E-01 |
| Benzo(b)fluoranthene | 1.8 | 1 | 0.00E+00 | 6.76E-07 | 9.66E-09 | | 7.30E-01 |
| Benzo(k)fluoranthene | 1.6 | 1 | 0.00E+00 | 6.01E-07 | 8.59E-09 | | 7.30E-02 |
| Benzo(a)pyrene | 1.4 | 1 | 0.00E+00 | 5.26E-07 | 7.51E-09 | | 7.30E+00 |
| Dibenz(a,h)anthracene | 0.31 | 1 | 0.00E+00 | 1.16E-07 | 1.66E-09 | | 7.30E+00 |
| Indeno(1,2,3-cd)pyrene | 0.95 | 1 | 0.00E+00 | 3.57E-07 | 5.10E-09 | | 7.30E-01 |
| 4,4'-DDD | 0.33 | 1 | 0.00E+00 | 1.24E-07 | 1.77E-09 | | 2.40E-01 |
| 4,4'-DDT | 0.2 | 1 | 0.00E+00 | 7.51E-08 | 1.07E-09 | 5.00E-04 | 3.40E-01 |
| Aroclor-1260 | 0.18 | 1 | 0.00E+00 | 6.76E-08 | 9.66E-10 | 2.00E-05 | ~~7.70E+00~~ 1E+0 * |
| ~~Aluminum~~ | ~~13400~~ | ~~1~~ | ~~0.00E+00~~ | ~~5.03E-03~~ | ~~7.19E-05~~ | ~~1.00E+00~~ | |
| Arsenic | 6.9 | 1 | 0.00E+00 | 2.59E-06 | 3.70E-08 | 3.00E-04 | 1.50E+00 |
| Beryllium | 1.3 | 1 | 0.00E+00 | 4.88E-07 | 6.98E-09 | 5.00E-03 | 4.30E+00 |
| Cadmium | 2.4 | 1 | 0.00E+00 | 9.02E-07 | 1.29E-08 | 5.00E-04 | |
| Chromium | 42.2 | 1 | 0.00E+00 | 1.59E-05 | 2.27E-07 | 5.00E-03 | |
| ~~Iron~~ | ~~26800~~ | ~~1~~ | ~~0.00E+00~~ | ~~1.01E-02~~ | ~~1.44E-04~~ | ~~3.00E-01~~ | |
| Manganese | 228 | 1 | 0.00E+00 | 8.57E-05 | 1.22E-06 | ~~5.00E-03~~ 2.4 E-2 | |
| Vanadium | 56.2 | 1 | 0.00E+00 | 2.11E-05 | 3.02E-07 | 7.00E-03 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |



* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/24/97 KLS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT

SITE NAME: Site 2 – Area A Wetland
LOCATION: NSB–NLON, Groton, CT
DATE: 01/20/96

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

| WHERE: | | | |
|---|---|---|---|
| | C = CONCENTRATION IN SOIL/SEDIMENT (MG/KG) | | |
| | SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| | SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 3600 |
| | AF = ADHERENCE FACTOR (MG/SQ CM): | | 0.2 |
| | ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | | Dioxins: | 0.03 |
| | | PCBS: | 0.06 |
| | EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| | EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 80 |
| | ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 1 |
| | ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| | Fd = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 0.5 |
| | BW1 = BODY WEIGHT ADOLESCENT (KG): | | 1 |
| | BW2 = BODY WEIGHT ADULT (KG): | | 70 |
| | AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 365 |
| | AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| | AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

| | | | | | |
|---|---|---|---|---|---|
| DOSEyouth = (CF1)*(C)*(ABS) | CF1 = | 0.00E+00 | CANCER RISK = (CF3)*(C)*(ABS) | CF3 = | 1.70E-08 |
| DOSEadult = (CF2)*(C)*(ABS) | CF2 = | 1.19E-06 | | | |

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE TWO)
Site 2 – Area A Wetland
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0.18 | 0.06 | 0.00E+00 | 1.29E−08 | 1.84E−10 | 2.00E−05 | ~~7.70E+00~~ 1E+0 * |
| Cadmium | 2.4 | 0.01 | 0.00E+00 | 2.86E−08 | 4.08E−10 | ~~1.50E−05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/25/97 KMS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE THREE)
Site 2 – Area A Wetland
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 6.43E-04 | ~~1.41E-09~~ 1.84E-10 * |
| Cadmium | 0.00E+00 | ~~1.90E-03~~ 1.14E-3 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 0.00E+00 | ~~2.55E-03~~ 1.78E-3 | ~~1.41E-09~~ 1.84E-10 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/25/97 KMK

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: Site 2 – Area A Wetland
LOCATION: NSB--NLON, Groton, CT
DATE: 01/19/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: Construction Worker, CTE

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE: DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE: Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1 L/1000 CM**3)
t* = TIME IT TAKES TO REACH STEADY-STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

| | |
|---|---|
| EV: | 1 |
| ED: | 1 |
| EF: | 60 |
| A | 3800 |
| tevent | 8 |
| BW: | 70 |
| AT(NON): | 365 |
| AT(CAR): | 25550 |

CONVERSION FACTOR (NONCAR) = 1.19E+01

CONVERSION FACTOR (CARCIN) = 1.70E-01

000119

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
Site 2 – Area A Wetland
EXPOSURE SCENARIO: Construction Worker, CTE

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Bis(2-ethylhexyl)phthalate | 0.006 | O | 1.00E +02 | 2.10E +01 | 3.30E -02 | 1.30E +01 | 7.09E -06 |
| ~~Aluminum~~ | ~~0.903~~ | I | | | ~~1.00E -03~~ | | ~~7.22E -08~~ |
| Antimony | 0.0068 | I | | | 1.00E -03 | | 5.44E -08 |
| Arsenic | 0.0103 | I | | | 1.00E -03 | | |
| Barium | 0.174 | I | | | 1.00E -03 | | 1.39E -06 |
| Beryllium | 0.0007 | I | | | 1.00E -03 | | 5.60E -09 |
| Boron | 0.443 | I | | | 1.00E -03 | | 3.54E -06 |
| Cadmium | 0.0026 | I | | | 1.00E -03 | | 2.08E -08 |
| ~~Iron~~ | ~~26.9~~ | I | | | ~~1.00E -03~~ | | ~~2.10E -04~~ |
| Manganese | 2.55 | I | | | 1.00E -03 | | 2.04E -05 |
| Nickel | 0.0151 | I | | | 1.00E -03 | | 1.21E -07 |
| Thallium | 0.0039 | I | | | 1.00E -03 | | 3.12E -08 |
| Vanadium | 0.0065 | I | | | 1.00E -03 | | 5.20E -08 |
| | | | | | | | 0.00E +00 |
| | | | | | | | 0.00E +00 |
| | | | | | | | 0.00E +00

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER WATER (PAGE THREE)
Site 2 – Area A Wetland
EXPOSURE SCENARIO: Construction Worker, CTE
CALCULATE DOSES:

| CHEMICAL | ANNUAL DERMAL DOSE (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX DERMAL |
|---|---|---|---|
| Bis(2-ethylhexyl)phthalate | 8.44E-05 | 1.10E-02 | 7.67E-03 |
| ~~Aluminum~~ | ~~8.60E-05~~ | ~~5.00E-02~~ | ~~1.72E-03~~ |
| Antimony | 6.47E-07 | 4.00E-04 | 1.62E-03 |
| Arsenic | 0.00E+00 | 2.80E-04 | 0.00E+00 |
| Barium | 1.66E-05 | 3.50E-03 | 4.73E-03 |
| Beryllium | 6.66E-08 | 2.50E-04 | 2.67E-04 |
| Boron | 4.22E-05 | 4.50E-03 | 9.37E-03 |
| Cadmium | 2.47E-07 | ~~1.50E-05~~ 2.5E-5 | ~~1.65E-02~~ 9.90E-3 |
| ~~Iron~~ | ~~2.50E-03~~ | ~~1.50E-02~~ | ~~1.67E-01~~ |
| Manganese | 2.43E-04 | ~~1.50E-04~~ 7.2E-4 | ~~1.62E+00~~ 3.30E-1 |
| Nickel | 1.44E-08 | 2.00E-03 | 7.19E-04 |
| Thallium | 3.71E-07 | 4.00E-08 | 9.28E-02 |
| Vanadium | 6.19E-07 | 3.50E-04 | 1.77E-03 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE TWO)
Site 2 – Area A Wetland
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 1.5 | 0.06 | 0.00E+00 | 1.61E−06 | 2.29E−08 | 2.00E−05 | ~~7.70E+00~~ 2E+0 * |
| Cadmium | 11.5 | 0.01 | 0.00E+00 | 2.05E−06 | 2.93E−08 | ~~1.50E−05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions
02/25/97
KMS

**RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Wetland
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/20/96

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL/SEDIMENT (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 3800 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 1 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 120 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 1 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 1 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 1 |
| BW2 = BODY WEIGHT ADULT (KG): | | 70 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 365 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 2.55E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 1.78E-05

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE THREE)
**Site 2 – Area A Wetland**
EXPOSURE SCENARIO: **Construction Worker (All Soil/Sediment), RME**
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 8.03E-02 | ~~1.77E-07~~ 4.60E-8 * |
| Cadmium | 0.00E+00 | ~~1.37E-01~~ 8.22E-2 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~2.17E-01~~ 1.63E-1 | ~~1.77E-07~~ 4.60E-8 |

* Based on new, PCB guidance (USEPA, September 9, 1996).

Revisions 02/25/97 JMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE TWO)**
**Site 2 – Area A Wetland**
**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 27 | 1 | 0.00E+00 | 6.09E–05 | 8.70E–07 | | 7.30E–01 |
| Benzo(b)fluoranthene | 55 | 1 | 0.00E+00 | 1.24E–04 | 1.77E–06 | | 7.30E–01 |
| Benzo(k)fluoranthene | 45 | 1 | 0.00E+00 | 1.01E–04 | 1.45E–06 | | 7.30E–02 |
| Benzo(a)pyrene | 35 | 1 | 0.00E+00 | 7.89E–05 | 1.13E–06 | | 7.30E+00 |
| Dibenz(a,h)anthracene | 0.31 | 1 | 0.00E+00 | 6.99E–07 | 9.98E–09 | | 7.30E+00 |
| Indeno(1,2,3–cd)pyrene | 23 | 1 | 0.00E+00 | 5.19E–05 | 7.41E–07 | | 7.30E–01 |
| 4,4'–DDD | 4.8 | 1 | 0.00E+00 | 1.08E–05 | 1.55E–07 | | 2.40E–01 |
| 4,4'–DDT | 2.9 | 1 | 0.00E+00 | 6.54E–06 | 9.34E–08 | 5.00E–04 | 3.40E–01 |
| Aroclor–1260 | 1.5 | 1 | 0.00E+00 | 3.38E–06 | 4.83E–08 | 2.00E–05 | ~~7.70E+00~~ 2E+0* |
| ~~Aluminum~~ | ~~13400~~ | ~~1~~ | ~~0.00E+00~~ | ~~3.02E–02~~ | ~~4.32E–04~~ | ~~1.00E+00~~ | |
| Arsenic | 6.9 | 1 | 0.00E+00 | 1.56E–05 | 2.22E–07 | 3.00E–04 | 1.50E+00 |
| Beryllium | 1.3 | 1 | 0.00E+00 | 2.93E–06 | 4.19E–08 | 5.00E–03 | 4.30E+00 |
| Cadmium | 11.5 | 1 | 0.00E+00 | 2.59E–05 | 3.70E–07 | 5.00E–04 | |
| Chromium | 102 | 1 | 0.00E+00 | 2.30E–04 | 3.28E–06 | 5.00E–03 | |
| ~~Iron~~ | ~~198000~~ | ~~1~~ | ~~0.00E+00~~ | ~~4.46E–01~~ | ~~6.38E–03~~ | ~~3.00E–01~~ | |
| Manganese | 376 | 1 | 0.00E+00 | 8.48E–04 | 1.21E–05 | ~~5.00E–03~~ 2.4E-2 | |
| Vanadium | 203 | 1 | 0.00E+00 | 4.58E–04 | 6.54E–06 | 7.00E–03 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions 02/25/97 AMS

*Based on new PCB (USEPA, Sept

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Wetland
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 01/19/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME**

RELEVANT EQUATION: IEX = (C x IR x FI x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
FI = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 480 | IR: | 0 |
| EF: | 120 | EF: | 1 |
| FI: | 1 | FI: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 2.25E-06 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 3.22E-08 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE THREE)**
**Site 2 – Area A Wetland**
**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Banzo(a)anthracene | 0.00E+00 | 0.00E+00 | 6.35E-07 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 1.29E-06 |
| Benzo(k)fluoranthene | 0.00E+00 | 0.00E+00 | 1.06E-07 |
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 8.23E-06 |
| Dibenz(a,h)anthracene | 0.00E+00 | 0.00E+00 | 7.29E-08 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 5.41E-07 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 3.71E-08 |
| 4,4'-DDT | 0.00E+00 | 1.31E-02 | 3.18E-08 |
| Aroclor-1260 | 0.00E+00 | 1.69E-01 | ~~3.72E-07~~ 9.66E-8 * |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~3.02E-02~~ | ~~0.00E+00~~ |
| Arsenic | 0.00E+00 | 5.19E-02 | 3.33E-07 |
| Beryllium | 0.00E+00 | 5.86E-04 | 1.80E-07 |
| Cadmium | 0.00E+00 | 5.19E-02 | 0.00E+00 |
| Chromium | 0.00E+00 | 4.60E-02 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~1.49E+00~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~1.70E-01~~ 3.54E-2 | 0.00E+00 |
| Vanadium | 0.00E+00 | 6.54E-02 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~1.00E+00~~ 4.33E-1 | **1.18E-05** 1.16E-5 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/25/97 KMS

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
Site 2 – Area A Wetland
EXPOSURE SCENARIO: Construction Worker, RME

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Bis(2-ethylhexyl)phthalate | 0.016 | O | 1.00E +02 | 2.10E +01 | 3.30E -02 | 1.30E +01 | 1.89E -05 |
| ~~Aluminum~~ | ~~3.55~~ | ~~I~~ | | | ~~1.00E -03~~ | | ~~2.84E -05~~ |
| Antimony | 0.0086 | I | | | 1.00E -03 | | 6.88E -08 |
| Arsenic | 0.0826 | I | | | 1.00E -03 | | |
| Barium | 0.61 | I | | | 1.00E -03 | | 4.88E -06 |
| Beryllium | 0.0015 | I | | | 1.00E -03 | | 1.20E -08 |
| Boron | 3.17 | I | | | 1.00E -03 | | 2.54E -05 |
| Cadmium | 0.0066 | I | | | 1.00E -03 | | 5.28E -08 |
| ~~Iron~~ | ~~66.1~~ | ~~I~~ | | | ~~1.00E -03~~ | | ~~6.89E -04~~ |
| Manganese | 8.43 | I | | | 1.00E -03 | | 6.74E -05 |
| Nickel | 0.0446 | I | | | 1.00E -03 | | 3.57E -07 |
| Thallium | 0.0089 | I | | | 1.00E -03 | | 7.12E -08 |
| Vanadium | 0.0255 | I | | | 1.00E -03 | | 2.04E -07 |
| | | | | | | | 0.00E +00 |
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Revisions
08/10/96
KHS

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: Site 2 – Area A Wetland
LOCATION: NSB–NLON, Groton, CT
DATE: 01/19/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: Construction Worker, RME

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE: DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE: Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1 L/1000 CM**3)
t* = TIME IT TAKES TO REACH STEADY–STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS

| | |
|---|---|
| EV: | 1 |
| ED: | 1 |
| EF: | 120 |
| A | 3800 |
| tevent | 8 |
| BW | 70 |
| AT(NON): | 365 |
| AT(CAR): | 25550 |

CONVERSION FACTOR (NONCAR) = 1.78E+01

CONVERSION FACTOR (CARCIN) = 2.55E-01

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE FOUR)
Site 2 – Area A Wetland
EXPOSURE SCENARIO: Construction Worker, RME
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF DERMAL (KG/DAY/MG) | CANCER RISK DERMAL CONTACT |
|---|---|---|---|
| Bis(2-ethylhexyl)phthalate | 4.82E -06 | 2.50E -02 | 1.21E -07 |
| ~~Aluminum~~ | ~~7.24E -06~~ | | ~~0.00E +00~~ |
| Antimony | 1.75E -08 | | 0.00E +00 |
| Arsenic | 0.00E +00 | 1.60E +00 | 0.00E +00 |
| Barium | 1.24E -08 | | 0.00E +00 |
| Beryllium | 3.08E -09 | 8.60E +01 | 2.83E -07 |
| Boron | 6.47E -06 | | 0.00E +00 |
| Cadmium | 1.35E -08 | | 0.00E +00 |
| ~~Iron~~ | ~~1.76E -04~~ | | ~~0.00E +00~~ |
| Manganese | 1.72E -05 | | 0.00E +00 |
| Nickel | 9.10E -08 | | 0.00E +00 |
| Thallium | 1.82E -08 | | 0.00E +00 |
| Vanadium | 5.20E -08 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER WATER (PAGE THREE)
Site 2 – Area A Wetland
EXPOSURE SCENARIO: Construction Worker, RME
CALCULATE DOSES:

| CHEMICAL | ANNUAL DERMAL DOSE (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX DERMAL |
|---|---|---|---|
| Bis(2-ethylhexyl)phthalate | 3.38E-04 | 1.10E-02 | 3.07E-02 |
| ~~Aluminum~~ | ~~5.87E-04~~ | ~~5.00E-02~~ | ~~1.01E-02~~ |
| Antimony | 1.23E-06 | 4.00E-04 | 3.07E-03 |
| Arsenic | 0.00E+00 | 2.80E-04 | 0.00E+00 |
| Barium | 8.71E-05 | 3.50E-03 | 2.49E-02 |
| Beryllium | 2.14E-07 | 2.50E-04 | 8.57E-04 |
| Boron | 4.53E-04 | 4.50E-03 | 1.01E-01 |
| Cadmium | 9.42E-07 | ~~1.50E-05~~ 2.5E-5 | ~~6.28E-02~~ 3.77E-2 |
| ~~Iron~~ | ~~1.23E-02~~ | ~~1.50E-02~~ | ~~8.20E-01~~ |
| Manganese | 1.20E-03 | ~~1.50E-04~~ 7.2E-4 | ~~8.02E+00~~ 1.67E+0 |
| Nickel | 6.37E-06 | 2.00E-03 | 3.18E-03 |
| Thallium | 1.27E-06 | 4.00E-06 | 3.18E-01 |
| Vanadium | 3.64E-06 | 3.50E-04 | 1.04E-02 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Wetland
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 01/19/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 0 | IR: | 50 |
| EF: | 1 | EF: | 52 |
| Fi: | 1 | Fi: | 0.5 |
| ED: | 1 | ED: | 3 |
| BW: | 1 | BW: | 43 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 1095 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 8.28E-08 | (AVG ANNUAL DOSE) | CF: | 3.55E-09 |



00135

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE TWO)**
**Site 2 – Area A Wetland**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), CTE**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 1.3 | 1 | 1.08E–07 | 0.00E+00 | 4.61E–09 | | 7.30E–01 |
| Benzo(b)fluoranthene | 2.2 | 1 | 1.82E–07 | 0.00E+00 | 7.81E–09 | | 7.30E–01 |
| Benzo(k)fluoranthene | 2 | 1 | 1.66E–07 | 0.00E+00 | 7.10E–09 | | 7.30E–02 |
| Benzo(a)pyrene | 1.6 | 1 | 1.33E–07 | 0.00E+00 | 5.68E–09 | | 7.30E+00 |
| Dibenz(a,h)anthracene | 0.31 | 1 | 2.57E–08 | 0.00E+00 | 1.10E–09 | | 7.30E+00 |
| Indeno(1,2,3–cd)pyrene | 1.1 | 1 | 9.11E–08 | 0.00E+00 | 3.90E–09 | | 7.30E–01 |
| 4,4'–DDD | 0.41 | 1 | 3.40E–08 | 0.00E+00 | 1.46E–09 | | 2.40E–01 |
| 4,4'–DDT | 0.26 | 1 | 2.15E–08 | 0.00E+00 | 9.23E–10 | 5.00E–04 | 3.40E–01 |
| Aroclor–1260 | 0.19 | 1 | 1.57E–08 | 0.00E+00 | 6.74E–10 | 2.00E–05 | ~~7.70E+00~~ 1E+0 * |
| ~~Aluminum~~ | ~~13400~~ | ~~1~~ | ~~1.11E–03~~ | ~~0.00E+00~~ | ~~4.76E–05~~ | ~~1.00E+00~~ | |
| Arsenic | 5.7 | 1 | 4.72E–07 | 0.00E+00 | 2.02E–08 | 3.00E–04 | 1.50E+00 |
| Beryllium | 1.2 | 1 | 9.94E–08 | 0.00E+00 | 4.26E–09 | 5.00E–03 | 4.30E+00 |
| Cadmium | 1.7 | 1 | 1.41E–07 | 0.00E+00 | 6.03E–09 | 5.00E–04 | |
| Chromium | 41.3 | 1 | 3.42E–06 | 0.00E+00 | 1.47E–07 | 5.00E–03 | |
| ~~Iron~~ | ~~37300~~ | ~~1~~ | ~~3.09E–03~~ | ~~0.00E+00~~ | ~~1.32E–04~~ | ~~3.00E–01~~ | |
| Manganese | 265 | 1 | 2.19E–05 | 0.00E+00 | 9.41E–07 | ~~5.00E–03~~ 2.4E-2 | |
| Vanadium | 85.1 | 1 | 7.05E–06 | 0.00E+00 | 3.02E–07 | 7.00E–03 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions
03/25/97
KMS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT

SITE NAME: Site 2 – Area A Wetland
LOCATION: NSB–NLON, Groton, CT
DATE: 01/19/96

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/SEDIMENT), CTE

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 3150 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 0.2 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 52 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 3 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 0.5 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 43 |
| BW2 = BODY WEIGHT ADULT (KG): | | 1 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 1095 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 1.04E–06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 4.47E–08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL /SEDIMENT (PAGE TWO)
Site 2 – Area A Wetland
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil /SEDIMENT), CTE
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0.19 | 0.06 | 1.19E–08 | 0.00E+00 | 5.10E–10 | 2.00E–05 | ~~7.70E+00~~ 1E+0 * |
| Cadmium | 1.7 | 0.01 | 1.77E–08 | 0.00E+00 | 7.60E–10 | ~~1.50E–05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions
02/25/97
MS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL / SEDIMENT (PAGE THREE)
Site 2 – Area A Wetland
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil / SEDIMENT), CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 5.95E-04 | 0.00E+00 | ~~8.93E-09~~ 5.10E-10 * |
| Cadmium | ~~1.18E-03~~ 7.08E-4 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | ~~1.76E-03~~ 1.30E-3 | 0.00E+00 | ~~3.03E-09~~ 5.10E-10 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/25/97 KMS

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES**

SITE NAME: Site 2 Area A Wetlands
LOCATION: NSB–NLON, Groton, CT
DATE: 01/09/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
TWO EXPOSURE ROUTES ARE CONSIDERED INCIDENTAL INGESTION AND DERMAL CONTACT
ASSUMPTIONS ARE OUTLINED BELOW

**EXPOSURE SCENARIO: Older Child Trespasser; CTE**

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (L/HR)
ET = EXPOSURE TIME (HRS/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY–STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

INGESTION:

| | | | |
|---|---|---|---|
| CR: | 0.05 | CONVERSION FACTOR (NONCAR) = | 3.31E–04 |
| ET: | 2 | | |
| EF: | 52 | | |
| ED: | 3 | CONVERSION FACTOR (CARCIN) = | 1.42E–05 |
| BW: | 43 | | |
| AT(NOCN): | 1095 | | |
| AT(CAR): | 25550 | | |

DERMAL CONTACT:

| | | | |
|---|---|---|---|
| EV: | 1 | CONVERSION FACTOR (NONCAR) = | 1.04E+01 |
| ED: | 3 | | |
| EF: | 52 | | |
| A: | 3150 | CONVERSION FACTOR (CARCIN) = | 4.47E–01 |
| tevent: | 2 | | |
| BW: | 43 | | |
| AT(NON): | 1095 | | |
| AT(CAR): | 25550 | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
Site 2 Area A Wetlands
EXPOSURE SCENARIO: Older Child Trespasser; CTE

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 0.002 | O | 4.30E+00 | 9.00E-01 | 4.80E-02 | 2.50E-01 | 3.56E-07 |
| ~~Aluminum~~ | ~~4.01~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~8.88E-08~~ |
| Arsenic | 0.0016 | I | | | 1.00E-03 | | 3.20E-09 |
| Boron | 0.135 | I | | | 1.00E-03 | | 2.70E-07 |
| Cadmium | 0.0083 | I | | | 1.00E-03 | | 1.66E-08 |
| ~~Iron~~ | ~~4.21~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~8.42E-08~~ |
| Manganese | 1.87 | I | | | 1.00E-03 | | 3.74E-06 |
| Nickel | 0.02 | I | | | 1.00E-03 | | 4.00E-08 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)**
**Site 2 Area A Wetlands**
EXPOSURE SCENARIO: Older Child Trespasser; CTE
CALCULATE DOSES:

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 6.63E-07 | 3.72E-08 | 1.00E-02 | 1.00E-02 | 6.63E-05 | 3.72E-04 | 4.38E-04 |
| ~~Aluminum~~ | ~~1.88E-03~~ | ~~8.87E-05~~ | ~~1.00E+00~~ | ~~5.00E-02~~ | ~~1.88E-03~~ | ~~1.07E-03~~ | ~~3.00E-03~~ |
| Arsenic | 5.30E-07 | 3.34E-08 | 3.00E-04 | 2.80E-04 | 1.77E-03 | 1.19E-04 | 1.89E-03 |
| Boron | 4.47E-05 | 2.62E-06 | 9.00E-02 | 4.50E-03 | 4.97E-04 | 6.26E-04 | 1.12E-03 |
| Cadmium | 2.75E-06 | 1.73E-07 | 5.00E-04 | ~~1.50E-05~~ 2.5E-5 | 5.50E-03 | ~~1.15E-02~~ 6.90E-3 | ~~1.70E-02~~ 1.24E-2 |
| ~~Iron~~ | ~~1.39E-03~~ | ~~8.79E-05~~ | ~~3.00E-01~~ | ~~1.50E-02~~ | ~~4.65E-03~~ | ~~5.86E-03~~ | ~~1.05E-02~~ |
| Manganese | 6.20E-04 | 3.90E-05 | ~~5.00E-03~~ 2.1E-2 | ~~1.50E-04~~ 7.2E-4 | ~~1.24E-01~~ 2.58E-2 | ~~2.60E-01~~ 5.42E-2 | ~~3.84E-01~~ 8.00E-2 |
| Nickel | 6.63E-06 | 4.17E-07 | 2.00E-02 | 2.00E-03 | 3.31E-04 | 2.09E-04 | 5.40E-04 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL RISK** | | | | | ~~1.98E-01~~ 3.40E-2 | ~~2.81E-01~~ 6.24E-2 | ~~4.10E-01~~ 9.64E-2 |

00145

Revisions
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KMS

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)**
**Site 2 Area A Wetlands**
EXPOSURE SCENARIO: Older Child Trespasser; CTE
CALCULATE INCREMENTAL CANCER RISKS

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 2.84E-08 | 1.59E-07 | 5.20E-02 | 5.20E-02 | 1.48E-09 | 8.28E-09 | 9.76E-09 |
| ~~Aluminum~~ | ~~5.69E-05~~ | ~~3.50E-08~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Arsenic | 2.27E-08 | 1.43E-09 | 1.50E+00 | 1.60E+00 | 3.41E-08 | 2.29E-09 | 3.64E-08 |
| Boron | 1.92E-08 | 1.21E-07 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 1.18E-07 | 7.42E-09 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~5.08E-05~~ | ~~3.77E-08~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | 2.68E-05 | 1.67E-08 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Nickel | 2.84E-07 | 1.79E-08 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL RISK** | | | | | **3.56E-08** | **1.06E-08** | **4.61E-08** |

00146

Revisions
08/10/96

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Wetland
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/19/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 0 | IR: | 100 |
| EF: | 1 | EF: | 120 |
| Fi: | 1 | Fi: | 1 |
| ED: | 1 | ED: | 10 |
| BW: | 1 | BW: | 43 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 3650 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 7.65E–07 | (AVG ANNUAL DOSE) | CF: | 1.09E–07 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE TWO)**
**Site 2 – Area A Wetland**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), RME**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG-DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 27 | 1 | 2.06E-05 | 0.00E+00 | 2.95E-06 | | 7.30E-01 |
| Benzo(b)fluoranthene | 55 | 1 | 4.21E-05 | 0.00E+00 | 6.01E-06 | | 7.30E-01 |
| Benzo(k)fluoranthene | 45 | 1 | 3.44E-05 | 0.00E+00 | 4.92E-06 | | 7.30E-02 |
| Benzo(a)pyrene | 35 | 1 | 2.68E-05 | 0.00E+00 | 3.82E-06 | | 7.30E+00 |
| Dibenz(a,h)anthracene | 0.31 | 1 | 2.37E-07 | 0.00E+00 | 3.39E-08 | | 7.30E+00 |
| Indeno(1,2,3-cd)pyrene | 23 | 1 | 1.76E-05 | 0.00E+00 | 2.51E-06 | | 7.30E-01 |
| 4,4'-DDD | 4.8 | 1 | 3.67E-06 | 0.00E+00 | 5.24E-07 | | 2.40E-01 |
| 4,4'-DDT | 2.9 | 1 | 2.22E-06 | 0.00E+00 | 3.17E-07 | 5.00E-04 | 3.40E-01 |
| Aroclor-1260 | 1.5 | 1 | 1.15E-06 | 0.00E+00 | 1.64E-07 | 2.00E-05 | ~~7.70E+00~~ 2E+0* |
| ~~Aluminum~~ | ~~13400~~ | ~~1~~ | ~~1.02E-02~~ | ~~0.00E+00~~ | ~~1.46E-03~~ | ~~1.00E+00~~ | |
| Arsenic | 14.1 | 1 | 1.08E-05 | 0.00E+00 | 1.54E-06 | 3.00E-04 | 1.50E+00 |
| Beryllium | 1.2 | 1 | 9.17E-07 | 0.00E+00 | 1.31E-07 | 5.00E-03 | 4.30E+00 |
| Cadmium | 7.2 | 1 | 5.50E-06 | 0.00E+00 | 7.86E-07 | 5.00E-04 | |
| Chromium | 102 | 1 | 7.80E-05 | 0.00E+00 | 1.11E-05 | 5.00E-03 | |
| ~~Iron~~ | ~~37300~~ | ~~1~~ | ~~2.85E-02~~ | ~~0.00E+00~~ | ~~4.07E-03~~ | ~~3.00E-01~~ | |
| Manganese | 265 | 1 | 2.03E-04 | 0.00E+00 | 2.89E-05 | ~~5.00E-03~~ 2.4E-2 | |
| Vanadium | 85.1 | 1 | 6.51E-05 | 0.00E+00 | 9.30E-06 | 7.00E-03 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions
02/25/97
KLS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE THREE)**
**Site 2 – Area A Wetland**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), RME**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)anthracene | 0.00E+00 | 0.00E+00 | 2.15E-06 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 4.39E-06 |
| Benzo(k)fluoranthene | 0.00E+00 | 0.00E+00 | 3.59E-07 |
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 2.79E-05 |
| Dibenz(a,h)anthracene | 0.00E+00 | 0.00E+00 | 2.47E-07 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 1.83E-06 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 1.26E-07 |
| 4,4'-DDT | 4.43E-03 | 0.00E+00 | 1.08E-07 |
| Aroclor-1260 | 5.73E-02 | 0.00E+00 | ~~1.26E-06~~ 3.27E-7 * |
| ~~Aluminum~~ | ~~1.02E-02~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Arsenic | 3.59E-02 | 0.00E+00 | 2.31E-06 |
| Beryllium | 1.83E-04 | 0.00E+00 | 5.64E-07 |
| Cadmium | 1.10E-02 | 0.00E+00 | 0.00E+00 |
| Chromium | 1.56E-02 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~9.51E-02~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | ~~4.05E-02~~ 8.44E-3 | 0.00E+00 | 0.00E+00 |
| Vanadium | 9.30E-03 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~2.80E-01~~ 1.42E-1 | **0.00E+00** | ~~4.13E-05~~ 4.03E-5 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/25/97 KMS

RISK ASSESSMENT SPREADSHEET -- DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT

**SITE NAME:** Site 2 -- Area A Wetland
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 01/19/96

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/SEDIMENT), RME**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 3150 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 1 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 120 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 10 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 1 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 43 |
| BW2 = BODY WEIGHT ADULT (KG): | | 1 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 3650 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 2.41E-05 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 3.44E-06
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE TWO)
Site 2 – Area A Wetland
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/SEDIMENT), RME
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 1.5 | 0.06 | 2.17E–06 | 0.00E+00 | 3.10E–07 | 2.00E–05 | ~~7.70E+00~~ 2E+0 * |
| Cadmium | 7.2 | 0.01 | 1.73E–06 | 0.00E+00 | 2.48E–07 | ~~1.50E–05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/25/97 LMS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL /SEDIMENT (PAGE THREE)
Site 2 – Area A Wetland
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil /SEDIMENT), RME
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 1.08E-01 | 0.00E+00 | ~~2.38E-00~~ 6.18E-7 * |
| Cadmium | ~~1.16E-01~~ 6.96E-2 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | ~~2.24E-01~~ 1.78E-1 | 0.00E+00 | ~~2.38E-00~~ 6.18E-7 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/25/97

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES**

SITE NAME: Site 2 Area A Wetlands
LOCATION: NSB-NLON, Groton, CT
DATE: 01/09/98

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
TWO EXPOSURE ROUTES ARE CONSIDERED: INCIDENTAL INGESTION AND DERMAL CONTACT
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser; RME**

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (L/HR)
ET = EXPOSURE TIME (HRS/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY-STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

INGESTION:

| | | | |
|---|---|---|---|
| CR: | 0.05 | CONVERSION FACTOR (NONCAR) = | 1.53E-03 |
| ET: | 4 | | |
| EF: | 120 | | |
| ED: | 10 | CONVERSION FACTOR (CARCIN) = | 2.18E-04 |
| BW: | 43 | | |
| AT(NOCN): | 3650 | | |
| AT(CAR): | 25550 | | |

DERMAL CONTACT:

| | | | |
|---|---|---|---|
| EV: | 1 | CONVERSION FACTOR (NONCAR) = | 2.41E+01 |
| ED: | 10 | | |
| EF: | 120 | | |
| A: | 3150 | CONVERSION FACTOR (CARCIN) = | 3.44E+00 |
| tevent: | 4 | | |
| BW: | 43 | | |
| AT(NON): | 3650 | | |
| AT(CAR): | 25550 | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
Site 2 Area A Wetlands
EXPOSURE SCENARIO: Older Child Trespasser; RME

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 0.002 | O | 4.30E+00 | 9.00E-01 | 4.80E-02 | 2.50E-01 | 5.03E-07 |
| ~~Aluminum~~ | ~~29.9~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~8.36E-05~~ |
| Arsenic | 0.0029 | I | | | 1.00E-03 | | 1.16E-08 |
| Boron | 0.369 | I | | | 1.00E-03 | | 1.48E-06 |
| Cadmium | 0.0666 | I | | | 1.00E-03 | | 2.66E-07 |
| ~~Iron~~ | ~~11.3~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~4.52E-05~~ |
| Manganese | 1.87 | I | | | 1.00E-03 | | 7.48E-06 |
| Nickel | 0.0847 | I | | | 1.00E-03 | | 3.39E-07 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)**
**Site 2 Area A Wetlands**
EXPOSURE SCENARIO: Older Child Trespasser; RME
CALCULATE DOSES:

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 3.06E-06 | 1.21E-05 | 1.00E-02 | 1.00E-02 | 3.06E-04 | 1.21E-03 | 1.52E-03 |
| ~~Aluminum~~ | ~~3.20E-02~~ | ~~3.01E-03~~ | ~~1.00E+00~~ | ~~5.00E-02~~ | ~~3.20E-02~~ | ~~4.03E-02~~ | ~~7.22E-02~~ |
| Arsenic | 4.43E-06 | 2.79E-07 | 3.00E-04 | 2.80E-04 | 1.48E-02 | 9.98E-04 | 1.58E-02 |
| Boron | 5.64E-04 | 3.55E-05 | 9.00E-02 | 4.50E-03 | 6.27E-03 | 7.90E-03 | 1.42E-02 |
| Cadmium | 1.02E-04 | 6.42E-06 | 5.00E-04 | ~~1.58E-05~~ 2.3E-5 | 2.04E-01 | ~~4.28E-01~~ 2.57E-1 | ~~6.31E-01~~ 4.61E-1 |
| ~~Iron~~ | ~~1.73E-02~~ | ~~1.09E-03~~ | ~~3.00E-01~~ | ~~1.50E-03~~ | ~~5.76E-02~~ | ~~7.26E-02~~ | ~~1.00E-01~~ |
| Manganese | 2.86E-03 | 1.80E-04 | ~~5.00E-03~~ 2.4E-2 | ~~1.58E-04~~ 7.2E-4 | ~~5.72E-01~~ 1.19E-1 | ~~1.26E+00~~ 2.50E-1 | ~~1.77E+00~~ 3.69E-1 |
| Nickel | 1.30E-04 | 8.16E-06 | 2.00E-02 | 2.00E-03 | 6.48E-03 | 4.08E-03 | 1.06E-02 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL RISK** | | | | | ~~8.88E-01~~ 3.51E-1 | ~~1.76E+00~~ 5.21E-1 | ~~2.65E+00~~ 8.72E-1 |

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Revisions
08/10/96

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)**
**Site 2 Area A Wetlands**
EXPOSURE SCENARIO: Older Child Trespasser; RME
CALCULATE INCREMENTAL CANCER RISKS

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 4.37E-07 | 1.73E-08 | 5.20E-02 | 5.20E-02 | 2.27E-08 | 9.01E-08 | 1.13E-07 |
| ~~Aluminum~~ | ~~4.57E-03~~ | ~~2.88E-04~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Arsenic | 8.34E-07 | 3.99E-08 | 1.50E+00 | 1.60E+00 | 9.50E-07 | 6.39E-08 | 1.01E-06 |
| Boron | 8.08E-05 | 5.08E-06 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 1.45E-05 | 9.17E-07 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~2.47E-03~~ | ~~1.56E-04~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | 4.09E-04 | 2.57E-05 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Nickel | 1.85E-05 | 1.17E-06 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL RISK** | | | | | **9.73E-07** | **1.54E-07** | **1.13E-06** |

Revisions
08/w/

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A WETLANDS - SOIL/SEDIMENT (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| 2-Butanone | 1.4 | 0.3 | 500 | 1000 | 8 | 80 |
| Acetone | 0.85 | 0.25 | 500 | 1000 | 14 | 140 |
| Carbon disulfide | 0.042 | 0.014 | - | - | - | - |
| Chlorobenzene | 0.014 | 0.006 | 500 | 1000 | 2 | 20 |
| Methylene chloride | 0.005 | 0.004 | 82 | 760 | 0.1 | 1.0 |
| Tetrachloroethene | 0.011 | 0.007 | 12 | 110 | 0.1 | 1 |
| Toluene | 0.006 | 0.004 | 500 | 1000 | 20 | 67 |
| Trichloroethene | 0.006 | 0.005 | 56 | 520 | 0.1 | 1 |
| Xylenes (total) | 0.003 | 0.003 | 500 | 1000 | 19.5 | 19.5 |
| 1,4-Dichlorobenzene | 0.042 | 0.042 | 26 | 240 | 1.5 | 15 |
| 2,4-Dimethylphenol | 0.21 | 0.21 | - | - | - | - |
| 2-Methylnaphthalene | 0.055 | 0.049 | - | - | - | - |
| 4-Methylphenol | 0.043 | 0.043 | - | - | - | - |
| Acenaphthene | 0.38 | 0.12 | - | - | - | - |
| Acenaphthylene | 0.39 | 0.11 | 1000 | 2500 | 8.4 | 84 |
| Anthracene | 2.4 | 0.2 | 1000 | 2500 | 40 | 400 |
| Benzo(a)anthracene | 27 | 1 | 1 * | 7.8 * | 1 * | 1 * |
| Benzo(a)pyrene | 35 | 2 | 1 * | 1 * | 1 * | 1 * |
| Benzo(b)fluoranthene | 55 | 2 | 1 * | 7.8 * | 1 * | 1 * |
| Benzo(g,h,i)perylene | 23 | 1 | - | - | - | - |
| Benzo(k)fluoranthene | 45 | 2 | 8.4 * | 78 | 1 * | 1 * |
| Benzoic acid | 32 | 8 | - | - | - | - |
| Bis(2-Ethylhexyl)phthalate | 3.5 | 0.7 | 44 | 410 | 1 * | 11 |
| Butyl benzyl phthalate | 0.39 | 0.11 | 1000 | 2500 | 20 | 200 |
| Carbazole | 0.13 | 0.05 | - | - | - | - |
| Chrysene | 42 | 2 | - | - | - | - |
| Di-N-butyl phthalate | 0.063 | 0.037 | 1000 | 2500 | 14 | 140 |
| Dibenzo(a,h)anthracene | 0.31 | 0.14 | - | - | - | - |
| Dibenzofuran | 1 | 0.17 | - | - | - | - |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A WETLANDS - FILTERED SURFACE WATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Water Quality Standards (7) | | | |
|---|---|---|---|---|---|---|
| | | | Aquatic Life | | Human Health | |
| | | | Freshwater | Saltwater | Organisms | Water and Organisms |
| Aluminum | 259 | 138 | - | - | - | - |
| Barium | 91.2 | 87.3 | - | - | - | - |
| Boron | 222 | 132 | - | - | - | - |
| Calcium | 45300 | 20319 | - | - | - | - |
| Copper | 4.5 | 4.5 | 4.8 | 2.9 * | - | - |
| Iron | 19400 | 3988 | - | - | - | - |
| Lead | 6.1 | 4.0 | 1.3 * | 8.5 | - | 50 |
| Magnesium | 10800 | 5567 | - | - | - | - |
| Manganese | 571 | 275 | - | - | - | - |
| Mercury | 0.22 | 0.22 | 0.012 * | 0.025 * | 0.15 * | 0.14 * |
| Potassium | 14700 | 6329 | - | - | - | - |
| Sodium | 133000 | 77060 | - | - | - | - |
| Vanadium | 3.3 | 3.3 | - | - | - | - |
| Zinc | 31.4 | 29.6 | 12.3 * | 86 | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 Connecticut Water Quality Standards, 1992.
3 Chromium (hexavalent).

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A WETLANDS - SOIL/SEDIMENT (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| Arsenic | 14.1 | 6.2 | 10 * | 10 * | - | - |
| Barium | 318 | 62 | 4700 | 1.4E+5 | - | - |
| Beryllium | 4.1 | 1.0 | 2 * | 2 * | - | - |
| Boron | 39.6 | 30.4 | - | - | - | - |
| Cadmium | 11.5 | 3.1 | 34 | 1000 | - | - |
| Calcium | 6290 | 2620 | - | - | - | - |
| Chromium (total) | 102 | 42 | 100 (6) * | 100 (6) * | - | - |
| Cobalt | 13.6 | 8.1 | - | - | - | - |
| Copper | 173 | 48 | 2500 | 7.6E+4 | - | - |
| Cyanide | 6.1 | 2.3 | 1400 | 4.1E+4 | - | - |
| Iron | 198000 | 26486 | - | - | - | - |
| Lead | 298 | 58 | 500 | 1000 | - | - |
| Magnesium | 9150 | 5283 | - | - | - | - |
| Manganese | 376 | 226 | - | - | - | - |
| Mercury | 1.2 | 0.4 | 20 | 610 | - | - |
| Nickel | 61.5 | 21.7 | 1400 | 7500 | - | - |
| Potassium | 5170 | 2744 | - | - | - | - |
| Selenium | 6.8 | 1.7 | 340 | 1E+4 | - | - |
| Silver | 6.6 | 1.6 | 340 | 1E+4 | - | - |
| Sodium | 9590 | 2264 | - | - | - | - |
| Vanadium | 203 | 61 | 470 | 1.4E+4 | - | - |
| Zinc | 702 | 116 | 2E+4 | 6.1E+5 | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 CTDEP, December 13, 1995.
3 Cis-1,2-dichloroethene.
4 1,3-Dichloropropene (total).
5 Chlordane.
6 Chromium (hexavalent).

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A WETLANDS - FILTERED GROUNDWATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | State MCL (2) | Groundwater Protection (3) | Surface Water Protection (3) |
|---|---|---|---|---|---|
| Aluminum | 7520 | 1650 | - | - | - |
| Antimony | 13.4 | 13.4 | 6 * | 6 * | 86000 |
| Arsenic | 138 | 28 | 50 * | 50 * | 4 * |
| Barium | 805 | 181 | 2000 | 1000 | - |
| Beryllium | 4.2 | 2.6 | 4 * | 4 * | 4 * |
| Boron | 3340 | 628 | - | - | - |
| Cadmium | 30.6 | 18.0 | 5 * | 5 * | 6 * |
| Calcium | 291000 | 75859 | - | - | - |
| Cobalt | 40.9 | 25.4 | - | - | - |
| Copper | 37 | 20 | - | 1300 | 48 |
| Iron | 123000 | 28667 | - | - | - |
| Lead | 13.3 | 4.8 | - | 15 | 13 * |
| Magnesium | 1050000 | 138715 | - | - | - |
| Manganese | 9360 | 2872 | 5000 (7) * | - | - |
| Nickel | 101 | 34 | 100 * | 100 * | 880 |
| Potassium | 843000 | 78420 | - | - | - |
| Silver | 9.8 | 6.1 | 50 | 36 | 12 |
| Sodium | 8180000 | 1139758 | 28000 (8) * | - | - |
| Thallium | 8.8 | 4.6 | 2 * | 5 * | 63 |
| Vanadium | 32 | 32 | - | 50 | - |
| Zinc | 262 | 57 | - | 5000 | 123 * |

Footnotes:

1 * - Indicates that maximum detection exceed this standard.
2 Maximum Contaminant Level. Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
3 CTDEP, December 13, 1995.
4 Cis-1,2-dichloroethene.
5 Chromium (total).
6 Chromium (hexavalent).
7 Current Connecticut Department of Public Health and Addiction Services Action Level.
8 Notification Level.

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A WETLANDS - UNFILTERED GROUNDWATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | State MCL (2) | Groundwater Protection (3) | Surface Water Protection (3) |
|---|---|---|---|---|---|
| Sodium | 8500000 | 929088 | 28000 (8) * | - | - |
| Thallium | 15.2 | 8.7 | 2 * | 5 * | 63 |
| Vanadium | 26 | 15 | - | 50 | - |
| Zinc | 274 | 52 | . | 5000 | 123 * |

Footnotes:

1 * - Indicates that maximum detection exceed this standard.
2 Maximum Contaminant Level. Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
3 CTDEP, December 13, 1995.
4 Cis-1,2-dichloroethene.
5 Chromium (total).
6 Chromium (hexavalent).
7 Current Connecticut Department of Public Health and Addiction Services Action Level.
8 Notification Level.

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A WETLANDS - UNFILTERED GROUNDWATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | State MCL (2) | Groundwater Protection (3) | Surface Water Protection (3) |
|---|---|---|---|---|---|
| Carbon disulfide | 2 | 2 | - | - | - |
| Xylenes (total) | 1 | 1 | 10000 | 530 | - |
| 2-Methylphenol | 2 | 2 | - | - | - |
| 4-Methylphenol | 3 | 3 | - | - | - |
| Benzoic acid | 12 | 3 | - | - | - |
| Bis(2-Ethylhexyl)phthalate | 31 | 21 | 6 * | 2 * | 59 |
| Di-N-butyl phthalate | 1 | 1 | - | 700 | 120000 |
| Di-N-octyl phthalate | 3 | 2 | - | 100 | - |
| Diethyl phthalate | 1 | 1 | - | - | - |
| Phenol | 14 | 14 | - | 4000 | 92000000 |
| Aluminum | 9910 | 1494 | - | - | - |
| Arsenic | 109 | 19 | 50 * | 50 * | 4 * |
| Barium | 904 | 191 | 2000 | 1000 | - |
| Beryllium | 3.6 | 1.9 | 4 | 4 | 4 |
| Boron | 3260 | 672 | - | - | - |
| Cadmium | 10.9 | 6.2 | 5 * | 5 * | 6 * |
| Calcium | 296000 | 65855 | - | - | - |
| Chromium (total) | 13.8 | 5.7 | 100 (5) | 50 (5) | 110 (6) |
| Cobalt | 37.5 | 12.8 | - | - | - |
| Copper | 44.6 | 11.8 | - | 1300 | 48 |
| Cyanide | 5 | 5 | 200 | 200 | 52 |
| Iron | 131000 | 32004 | - | - | - |
| Lead | 32.7 | 7.3 | - | 15 * | 13 * |
| Magnesium | 1080000 | 112991 | - | - | - |
| Manganese | 9270 | 2778 | 5000 (7) * | - | - |
| Nickel | 116 | 37 | 100 * | 100 * | 880 |
| Potassium | 815000 | 59938 | - | - | - |
| Selenium | 5.1 | 3.2 | 50 | 50 | 50 |
| Silver | 1.5 | 1.5 | 50 | 36 | 12 |

## SUMMARY OF COMPARISON TO STATE STANDARDS (1)
## SITE 2 AREA A WETLANDS - UNFILTERED SURFACE WATER (UG/L)
## NSB-NLON, GROTON, CONNECTICUT

| Parameter | Maximum | Average of Positive Hits | Water Quality Standards (2) | | | |
|---|---|---|---|---|---|---|
| | | | Aquatic Life | | Human Health | |
| | | | Freshwater | Saltwater | Organisms | Water and Organisms |
| Tetrachloroethene | 2 | 2 | - | - | 8.85 | 0.8 * |
| Diethyl phthalate | 2 | 2 | - | - | 120000 | 23000 |
| Aluminum | 20900 | 4019 | - | - | - | - |
| Arsenic | 2.9 | 2.8 | 190 | 36 | 0.14 * | 0.018 * |
| Barium | 115 | 57 | - | - | - | - |
| Boron | 369 | 222 | - | - | - | - |
| Cadmium | 126 | 49 | 660 | 9.3 * | 170 | 16 * |
| Calcium | 46500 | 18224 | - | - | - | - |
| Chromium (total) | 6.8 | 6.8 | 11 (13) | 50 (3) | 3400 (3) | 170 (3) |
| Cobalt | 66.8 | 65.4 | - | - | - | - |
| Copper | 29.3 | 13.2 | 4.8 * | 2.9 * | - | - |
| Iron | 11300 | 5527 | - | - | - | - |
| Lead | 7.8 | 3.9 | 1.3 * | 8.5 | - | 50 |
| Magnesium | 18500 | 7598 | - | - | - | - |
| Manganese | 1870 | 655 | - | - | - | - |
| Mercury | 0.21 | 0.21 | 0.012 * | 0.025 * | 0.15 * | 0.14 * |
| Nickel | 84.7 | 46.3 | 88 | 8.3 * | 4600 | 610 |
| Potassium | 15300 | 6192 | - | - | - | - |
| Sodium | 143000 | 57640 | - | - | - | - |
| Vanadium | 4.3 | 4.3 | - | - | - | - |
| Zinc | 334 | 116 | 12.3 * | 86 * | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 Connecticut Water Quality Standards, 1992.
3 Chromium (hexavalent).

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**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A WETLANDS - SOIL/SEDIMENT (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| Fluoranthene | 80 | 3 | 1000 | 2500 | 5.6 * | 56 * |
| Fluorene | 1 | 0.16 | 1000 | 2500 | 5.6 | 56 |
| Indeno(1,2,3-Cd)pyrene | 23 | 1 | - | - | - | - |
| Naphthalene | 0.077 | 0.068 | 1000 | 2500 | 5.6 | 56 |
| Pentachlorophenol | 0.24 | 0.24 | 5.1 | 48 | 1 | 1 |
| Phenanthrene | 36 | 1 | 1000 | 2500 | 4 * | 40 |
| Pyrene | 42 | 2 | 1000 | 2500 | 4 * | 40 * |
| 4,4'-DDD | 4.8 | 0.8 | - | - | - | - |
| 4,4'-DDE | 0.72 | 0.11 | - | - | - | - |
| 4,4'-DDT | 2.9 | 0.6 | - | - | - | - |
| Aldrin | 0.0032 | 0.0032 | - | - | - | - |
| Alpha-Chlordane | 0.029 | 0.012 | 0.49 (5) | 2.2 (5) | 0.066 (5) | 0.066 (5) |
| Aroclor-1260 | 1.5 | 0.6 | 1 * | 10 | - | - |
| Beta-BHC | 0.0027 | 0.0027 | - | - | - | - |
| Delta-BHC | 0.0042 | 0.0042 | - | - | - | - |
| Dieldrin | 0.026 | 0.019 | 0.038 | 0.36 | 0.007 * | 0.007 * |
| Endosulfan I | 0.011 | 0.005 | - | - | - | - |
| Endosulfan II | 0.031 | 0.019 | - | - | - | - |
| Endosulfan sulfate | 0.014 | 0.010 | - | - | - | - |
| Endrin | 0.016 | 0.011 | 20 | 610 | - | - |
| Endrin aldehyde | 0.016 | 0.012 | - | - | - | - |
| Endrin ketone | 0.02 | 0.020 | - | - | - | - |
| Gamma-Bhc (lindane) | 0.0035 | 0.0035 | 20 | 610 | 0.02 | 0.04 |
| Gamma-Chlordane | 0.023 | 0.010 | 0.49 (5) | 2.2 (5) | 0.066 (5) | 0.066 (5) |
| Heptachlor | 0.0045 | 0.0035 | 0.14 | 1.3 | 0.013 | 0.013 |
| Heptachlor epoxide | 0.0045 | 0.0035 | 0.067 | 0.63 | 0.02 | 0.02 |
| Methoxychlor | 0.038 | 0.038 | 340 | 1E+4 | 0.8 | 8 |
| Aluminum | 27100 | 11872 | - | - | - | - |
| Antimony | 1.2 | 0.9 | 27 | 8200 | - | - |

# APPENDIX F.7

## SITE 20 - AREA A WEAPONS CENTER

## SUMMARY OF COC SELECTION
## SITE 2 AREA A WEAPONS CENTER - SURFACE SOIL (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 1/5 | 0.054 | 2WCTB1-0002 | 0.175 - 0.55 | - | - | - | N | 1 |
| Acenaphthene | 1/5 | 0.14 | 2WCTB2-0002 | 0.175 - 0.55 | 470 | - | 200 | N | 2 |
| Acenaphthylene | 1/5 | 0.031 | 2WCTB1-0002 | 0.175 - 0.55 | - | - | - | N | 1 |
| Anthracene | 3/5 | 0.066 - 0.8 | 2WCTB2-0002-D | 0.175 | 2300 | - | 4300 | N | 2 |
| Benzo(a)anthracene | 3/5 | 0.27 - 2.1 | 2WCTB2-0002-D | 0.175 | 0.88 | - | 0.7 | Y | 3 |
| Benzo(a)pyrene | 3/5 | 0.27 - 1.8 | 2WCTB2-0002-D | 0.175 | 0.088 | - | 4 | Y | 3 |
| Benzo(b)fluoranthene | 3/5 | 0.27 - 3.2 | 2WCTB2-0002-D | 0.175 | 0.88 | - | 4 | Y | 3 |
| Benzo(g,h,i)perylene | 3/5 | 0.2 - 0.96 | 2WCTB2-0002-D | 0.175 | - | - | - | N | 1 |
| Benzo(k)fluoranthene | 1/5 | 0.22 | 2WCTB1-0002 | 0.175 - 0.55 | 8.8 | - | 4 | N | 2 |
| Bis(2-ethylhexyl)phthalate | 1/5 | 0.035 | 2WMW4(0-2) | 0.175 - 0.375 | 46 | 210 | 11 | N | 2 |
| Carbazole | 2/4 | 0.4 - 0.72 | 2WCTB2-0002-D | 0.175 | 32 | - | 0.2 | N | 2 |
| Chrysene | 3/5 | 0.28 - 2.3 | 2WCTB2-0002-D | 0.175 | 88 | - | 1 | N | 2 |
| Dibenzo(a,h)anthracene | 2/5 | 0.45 - 0.57 | 2WCTB2-0002-D | 0.175 | 0.088 | - | 11 | Y | 3 |
| Dibenzofuran | 2/5 | 0.031 - 0.084 | 2WCTB2-0002 | 0.175 - 0.55 | 31 | - | - | N | 2 |
| Fluoranthene | 3/5 | 0.55 - 5.7 | 2WCTB2-0002-D | 0.175 | 310 | - | 980 | N | 2 |
| Fluorene | 3/5 | 0.085 - 0.18 | 2WCTB2-0002 | 0.175 | 310 | - | 160 | N | 2 |
| Indeno(1,2,3-cd)pyrene | 3/5 | 0.17 - 1 | 2WCTB2-0002-D | 0.175 | 0.88 | - | 35 | Y | 3 |
| Phenanthrene | 3/5 | 0.44 - 4.2 | 2WCTB2-0002-D | 0.175 | - | - | - | N | 1 |
| Pyrene | 3/5 | 0.56 - 4 | 2WCTB2-0002-D | 0.175 | 230 | - | 1400 | N | 2 |
| 4,4'-DDE | 2/4 | 0.004 - 0.0074 | 2WCTB2-0002-D | 0.0085 - 0.0175 | 1.9 | - | 0.5 | N | 2 |
| Aroclor-1260 | 1/4 | 0.05 | 2WMW4(0-2) | 0.175 - 0.185 | 0.083 | - | - | N | 2 |
| Endrin | 3/4 | 0.011 - 0.014 | 2WCTB2-0002-D | 0.0085 | 2.3 | - | 0.4 | N | 2 |
| Endrin aldehyde | 1/3 | 0.007 | 2WCTB2-0002 | 0.0175 - 0.0185 | - | - | - | N | 1 |
| Aluminum | 5/5 | 4810 - 9560 | 2WCTB2-0002-D | - | 7800 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Antimony | 2/4 | 4.7 - 5.4 | 2WCTB1-0002 | 3.35 - 4.9 | 3.1 | - | - | Y | 3 |
| Arsenic | 3/5 | 0.77 - 3.5 | 2WCTB2-0002-D | 0.9 - 0.95 | 0.43 | 380 | 15 | Y | 3 |
| Barium | 5/5 | 27.4 - 60.8 | 2WCTB1-0002 | - | 550 | 350000 | 32 | N | 2 |
| Beryllium | 4/5 | 0.23 - 0.48 | 2WCTB2-0002-D | 0.105 | 0.15 | 690 | 180 | Y | 3 |

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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A WEAPONS CENTER - SURFACE SOIL (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Cadmium | 2/5 | 0.43 - 1.2 | 2WMW4(0-2) | 0.21 - 0.235 | 3.9 | 920 | 6 | N | 2 |
| Calcium | 4/5 | 758 - 1870 | 2WCTB1-0002 | 655 | - | - | - | N | 1 |
| Chromium (total) | 5/5 | 5.9 - 11.7 | 2WCTB2-0002-D | - | 39 (7) | 140 (7) | 19 (7) | N | 2 |
| Cobalt | 5/5 | 2.7 - 4.6 | 2WCTB1-0002 | - | 470 | - | - | N | 2 |
| Copper | 5/5 | 6.7 - 11.3 | 2WCTB2-0002-D | - | 290 | - | - | N | 2 |
| Iron | 5/5 | 6540 - 10800 | 2WCTB1-0002 | - | 2300 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Lead | 5/5 | 3.5 - 13.7 | 2WCTB2-0002-D | - | 400 (8) | - | - | N | 2 |
| Magnesium | 5/5 | 1660 - 3520 | 2WCTB1-0002 | - | - | - | - | N | 1 |
| Manganese | 5/5 | 121 - 257 | 2WCTB1-0002 | - | ~~39~~ 190 | - | - | Y | 3 |
| Nickel | 5/5 | 4.4 - 8.4 | 2WCTB1-0002 | - | 160 | 6900 | 21 | N | 2 |
| Potassium | 5/5 | 1170 - 2900 | 2WCTB1-0002 | - | - | - | - | N | 1 |
| Sodium | 5/5 | 152 - 268 | 2WCTB2-0002-D | - | - | - | - | N | 1 |
| Vanadium | 5/5 | 9.8 - 18 | 2WCTB2-0002-D | - | 55 | - | - | N | 2 |
| Zinc | 5/5 | 17.8 - 46.5 | 2WCTB1-0002 | - | 2300 | - | 42000 | N | 2 |

Footnotes:

1 Results in mg/kg unless otherwise noted. Surface soil designated as soil from depths of 0 to 2 feet.
2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment.
3 Sample-specific.
4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
5 Soil screening level guidance (USEPA, December 1994).
6 Soil screening level guidance (USEPA, December 1994) with a dilution and attenuation factor of 10.
7 Hexavalent chromium.
8 OSWER soil screening level for residential land use (USEPA, July 14, 1994).

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

Revisions
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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS**
**SITE 2 AREA A WEAPONS CENTER - SURFACE SOIL**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| 2-Methylnaphthalene | 54 | 238.5 |
| Acenaphthene | 140 | 166.25 |
| Acenaphthylene | 31 | 232.75 |
| Anthracene | 800 | 304 |
| Benzo(a)anthracene | 2100 | 680 |
| Benzo(a)pyrene | 1800 | 605 |
| Benzo(b)fluoranthene | 3200 | 955 |
| Benzo(g,h,i)perylene | 960 | 377.5 |
| Benzo(k)fluoranthene | 220 | 280 |
| Bis(2-ethylhexyl)phthalate | 35 | 190 |
| Carbazole | 720 | 356.6667 |
| Chrysene | 2300 | 732.5 |
| Dibenzo(a,h)anthracene | 570 | 273.75 |
| Dibenzofuran | 84 | 116.25 |
| Fluoranthene | 5700 | 1650 |
| Fluorene | 180 | 153.75 |
| Indeno(1,2,3-cd)pyrene | 1000 | 380 |
| Phenanthrene | 4200 | 1247.5 |
| Pyrene | 4000 | 1227.5 |
| 4,4'-DDE | 7.4 | 11.1333 |
| Aroclor-1260 | 50 | 136.6667 |
| Endrin | 14 | 11.1667 |
| Endrin aldehyde | 7 | 12.25 |
| **Inorganics (mg/kg)** | | |
| Aluminum | 9560 | 6692.5 |
| Antimony | 5.4 | 5 |
| Arsenic | 3.5 | 1.53 |
| Barium | 60.8 | 38.625 |
| Beryllium | 0.48 | 0.2838 |
| Cadmium | 1.2 | 0.5188 |
| Calcium | 1870 | 1205.25 |
| Chromium (total) | 11.7 | 9.825 |
| Cobalt | 4.6 | 4.325 |
| Copper | 11.3 | 9.35 |
| Iron | 10800 | 9105 |
| Lead | 13.7 | 7.275 |
| Magnesium | 3520 | 2442.5 |
| Manganese | 257 | 171.75 |
| Nickel | 8.4 | 6.5 |
| Potassium | 2900 | 1740 |
| Sodium | 268 | 211.75 |
| Vanadium | 18 | 14.7 |
| Zinc | 46.5 | 28.5 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A WEAPONS CENTER - ALL SOIL (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 2-Butanone | 3/10 | 0.04 - 0.24 | 2WCTB6-0810 | 0.01 - 0.013 | 4700 | 6900 (9) | - | N | 2 |
| Acetone | 1/10 | 0.69 | 2WCTB6-0810 | 0.006 - 0.16 | 780 | 62000 | 8 | N | 2 |
| Toluene | 2/10 | 0.002 - 0.008 | 2WCTB6-0810 | 0.005 - 0.017 | 1600 | 520 | 5 | N | 2 |
| Trichloroethene | 1/10 | 0.003 | 2WCTB6-0810 | 0.005 - 0.017 | 58 | 3 | 0.02 | N | 2 |
| 2-Methylnaphthalene | 2/10 | 0.038 - 0.054 | 2WCTB1-0002 | 0.35 - 1.1 | - | - | - | N | 1 |
| Acenaphthene | 1/10 | 0.14 | 2WCTB2-0002 | 0.34 - 1.1 | 470 | - | 200 | N | 2 |
| Acenaphthylene | 1/10 | 0.031 | 2WCTB1-0002 | 0.34 - 1.1 | - | - | - | N | 1 |
| Anthracene | 5/10 | 0.03 - 0.8 | 2WCTB2-0002-D | 0.34 - 0.57 | 2300 | - | 4300 | N | 2 |
| Benzo(a)anthracene | 6/10 | 0.079 - 2.1 | 2WCTB2-0002-D | 0.34 - 0.42 | 0.88 | - | 0.7 | Y | 3 |
| Benzo(a)pyrene | 7/10 | 0.022 - 1.8 | 2WCTB2-0002-D | 0.34 - 0.35 | 0.088 | - | 4 | Y | 3 |
| Benzo(b)fluoranthene | 6/10 | 0.2 - 3.2 | 2WCTB2-0002-D | 0.34 - 0.42 | 0.88 | - | 4 | Y | 3 |
| Benzo(g,h,i)perylene | 6/10 | 0.06 - 0.96 | 2WCTB2-0002-D | 0.34 - 0.42 | - | - | - | N | 1 |
| Benzo(k)fluoranthene | 3/10 | 0.2 - 0.26 | 2WCTB6-0810 | 0.34 - 1.1 | 8.8 | - | 4 | N | 2 |
| Benzoic acid | 4/10 | 0.047 - 0.48 | 2WCTB5-0608 | 1.7 - 5.4 | 31000 | - | 280 | N | 2 |
| Bis(2-ethylhexyl)phthalate | 1/10 | 0.035 | 2WMW4(0-2) | 0.35 - 0.75 | 46 | 210 | 11 | N | 2 |
| Carbazole | 2/9 | 0.4 - 0.72 | 2WCTB2-0002-D | 0.34 - 0.57 | 32 | - | 0.2 | N | 2 |
| Chrysene | 6/10 | 0.13 - 2.3 | 2WCTB2-0002-D | 0.34 - 0.42 | 88 | - | 1 | N | 2 |
| Di-n-octyl phthalate | 3/10 | 0.029 - 0.089 | 2WCTB4-0204 | 0.35 - 1.1 | 160 | - | - | N | 2 |
| Dibenzo(a,h)anthracene | 3/10 | 0.068 - 0.57 | 2WCTB2-0002-D | 0.34 - 0.57 | 0.088 | - | 11 | Y | 3 |
| Dibenzofuran | 2/10 | 0.031 - 0.084 | 2WCTB2-0002 | 0.34 - 1.1 | 31 | - | - | N | 2 |
| Diethyl phthalate | 2/10 | 0.028 - 0.032 | 2WCTB6-0810 | 0.34 - 1.1 | 6300 | 520 | 110 | N | 2 |
| Fluoranthene | 6/10 | 0.16 - 5.7 | 2WCTB2-0002-D | 0.34 - 0.42 | 310 | - | 980 | N | 2 |
| Fluorene | 3/10 | 0.085 - 0.18 | 2WCTB2-0002 | 0.34 - 0.57 | 310 | - | 160 | N | 2 |
| Indeno(1,2,3-cd)pyrene | 6/10 | 0.056 - 1 | 2WCTB2-0002-D | 0.34 - 0.42 | 0.88 | - | 35 | Y | 3 |
| Phenanthrene | 6/10 | 0.097 - 4.2 | 2WCTB2-0002-D | 0.34 - 0.42 | - | - | - | N | 1 |
| Pyrene | 6/10 | 0.19 - 4 | 2WCTB2-0002-D | 0.34 - 0.42 | 230 | - | 1400 | N | 2 |
| 4,4'-DDE | 2/6 | 0.004 - 0.0074 | 2WCTB2-0002-D | 0.017 - 0.042 | 1.9 | - | 0.5 | N | 2 |
| Aroclor-1260 | 1/6 | 0.05 | 2WMW4(0-2) | 0.34 - 0.42 | 0.083 | - | - | N | 2 |
| Endrin | 3/6 | 0.011 - 0.014 | 2WCTB2-0002-D | 0.017 - 0.042 | 2.3 | - | 0.4 | N | 2 |
| Endrin aldehyde | 2/5 | 0.0064 - 0.007 | 2WCTB2-0002 | 0.034 - 0.037 | - | - | - | N | 1 |

**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A WEAPONS CENTER - ALL SOIL (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 10/10 | 4810 - 18200 | 2WCTB3-0406 | - | 7800 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Antimony | 2/8 | 4.7 - 5.4 | 2WCTB1-0002 | 6.7 - 24 | 3.1 | - | - | Y | 3 |
| Arsenic | 7/10 | 0.77 - 10.8 | 2WCTB3-0406 | 1.6 - 1.9 | 0.43 | 380 | 15 | Y | 3 |
| Barium | 10/10 | 27.4 - 131 | 2WCTB4-0204 | - | 550 | 350000 | 32 | N | 2 |
| Beryllium | 9/10 | 0.23 - 0.68 | 2WCTB3-0406 | 0.21 | 0.15 | 690 | 180 | Y | 3 |
| Boron | 3/9 | 16.6 - 30.7 | 2WCTB5-0608 | 10.4 - 13.1 | 700 | - | - | N | 2 |
| Cadmium | 2/10 | 0.43 - 1.2 | 2WMW4(0-2) | 0.42 - 0.67 | 3.9 | 920 | 6 | N | 2 |
| Calcium | 9/10 | 758 - 3020 | 2WCTB5-0608 | 1310 | - | - | - | N | 1 |
| Chromium (total) | 10/10 | 5.9 - 78.7 | 2WCTB3-0406 | - | 39 (7) | 140 (7) | 19 (7) | Y | 3 |
| Cobalt | 10/10 | 2.7 - 8.6 | 2WCTB4-0204 | - | 470 | - | - | N | 2 |
| Copper | 10/10 | 6.7 - 41.4 | 2WCTB3-0406 | - | 290 | - | - | N | 2 |
| Iron | 10/10 | 6540 - 28600 | 2WCTB3-0406 | - | 2300 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Lead | 10/10 | 2.4 - 66.1 | 2WCTB3-0406 | - | 400 (8) | - | - | N | 2 |
| Magnesium | 10/10 | 1660 - 7170 | 2WCTB3-0406 | - | - | - | - | N | 1 |
| Manganese | 10/10 | 121 - 390 | 2WCTB4-0204 | - | ~~39~~ 190 | - | - | Y | 3 |
| Mercury | 2/10 | 0.19 - 0.29 | 2WCTB3-0406 | 0.1 - 0.17 | 2.3 | 7 | 3 | N | 2 |
| Nickel | 10/10 | 4.4 - 22.7 | 2WCTB3-0406/WCTB-0608 | - | 160 | 6900 | 21 | N | 2 |
| Potassium | 10/10 | 849 - 6300 | 2WCTB4-0204 | - | - | - | - | N | 1 |
| Silver | 3/10 | 0.65 - 1.5 | 2WCTB3-0406 | 0.42 - 1.7 | 39 | - | - | N | 2 |
| Sodium | 10/10 | 152 - 1450 | 2WCTB5-0608 | - | - | - | - | N | 1 |
| Vanadium | 10/10 | 9.8 - 49.6 | 2WCTB3-0406 | - | 55 | - | - | N | 2 |
| Zinc | 10/10 | 17.8 - 67.5 | 2WCTB5-0608 | - | 2300 | - | 42000 | N | 2 |

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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A WEAPONS CENTER - ALL SOIL (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

Footnotes:

1 Results in mg/kg unless otherwise noted. ~~Surface~~ All soil designated as soil from depths of 0 to ~~2~~ 10 feet.
2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment.
3 Sample-specific.
4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
5 Soil screening level guidance (USEPA, December 1994).
6 Soil screening level guidance (USEPA, December 1994) with a dilution and attenuation factor of 10.
7 Hexavalent chromium.
8 OSWER soil screening level for residential land use (USEPA, July 14, 1994).
9 Calculated using SSL guidance (see Appendix F.3).

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS**
**SITE 2 AREA A WEAPONS CENTER - ALL SOIL**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| 2-Butanone | 240 | 39.8889 |
| Acetone | 690 | 99.1111 |
| Toluene | 8 | 5.3889 |
| Trichloroethene | 3 | 5.5556 |
| 2-Methylnaphthalene | 54 | 222.4444 |
| Acenaphthene | 140 | 205 |
| Acenaphthylene | 31 | 234.5556 |
| Anthracene | 800 | 217.8889 |
| Benzo(a)anthracene | 2100 | 393.2222 |
| Benzo(a)pyrene | 1800 | 350.2222 |
| Benzo(b)fluoranthene | 3200 | 553.3333 |
| Benzo(g,h,i)perylene | 960 | 243.1111 |
| Benzo(k)fluoranthene | 260 | 249.4444 |
| Benzoic acid | 480 | 810.7778 |
| Bis(2-ethylhexyl)phthalate | 35 | 223.8889 |
| Carbazole | 720 | 281.25 |
| Chrysene | 2300 | 442.2222 |
| Di-n-octyl phthalate | 89 | 194.1111 |
| Dibenzo(a,h)anthracene | 570 | 233.6667 |
| Dibenzofuran | 84 | 182.7778 |
| Diethyl phthalate | 32 | 200 |
| Fluoranthene | 5700 | 862.2222 |
| Fluorene | 180 | 199.4444 |
| Indeno(1,2,3-cd)pyrene | 1000 | 247.3333 |
| Phenanthrene | 4200 | 640.7778 |
| Pyrene | 4000 | 698.8889 |
| 4,4'-DDE | 7.4 | 14.28 |
| Aroclor-1260 | 50 | 158 |
| Endrin | 14 | 14.3 |
| Endrin aldehyde | 7 | 11.975 |
| **Inorganics (mg/kg)** | | |
| Aluminum | 18200 | 11296.6667 |
| Antimony | 5.4 | 7.8786 |
| Arsenic | 10.8 | 4.68 |
| Barium | 131 | 54.4778 |
| Beryllium | 0.68 | 0.4361 |
| Boron | 30.7 | 12.6625 |
| Cadmium | 1.2 | 0.3917 |
| Calcium | 3020 | 1795.6667 |
| Chromium (total) | 78.7 | 30.7222 |
| Cobalt | 8.6 | 5.4889 |
| Copper | 41.4 | 19.1111 |
| Iron | 28600 | 16502.2222 |

**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS (Continued)**
**SITE 2 AREA A WEAPONS CENTER - ALL SOIL**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Inorganics (mg/kg) (Continued)** | | |
| Lead | 66.1 | 18.7222 |
| Magnesium | 7170 | 4370 |
| Manganese | 390 | 211.3333 |
| Mercury | 0.29 | 0.0994 |
| Nickel | 22.7 | 12.4 |
| Potassium | 6300 | 2939.8889 |
| Silver | 1.5 | 0.5572 |
| Sodium | 1450 | 535.1111 |
| Vanadium | 49.6 | 29.1444 |
| Zinc | 67.5 | 41.8222 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A WEAPONS CENTER - UNFILTERED GROUNDWATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Federal MCL (4) | State MCL (5) | Risk-based COC Screening Level (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 1/10 | 2 | 2WGW4D | 5 - 10 | 5 | 5 | 0.19 | Y | 3 |
| 1,2-Dichloroethane | 1/10 | 1 | 2WGW4D | 5 - 10 | 5 | 5 | 0.12 | Y | 3 |
| 2-Butanone | 1/10 | 4 | 2WGW4D | 10 | - | - | 190 | N | 2 |
| 2-Hexanone | 1/10 | 12 | 2WGW4D | 10 | - | - | - | N | 1 |
| 4-Methyl-2-pentanone | 1/10 | 12 | 2WGW4D | 10 | - | - | 290 | N | 2 |
| Trichloroethene | 1/10 | 2 | 2WGW4D | 5 - 10 | 5 | 5 | 1.6 | Y | 3 |
| 1,3-Dichlorobenzene | 1/10 | 0.6 | 2WCGW1S | 10 | 60 | - | 54 | N | 2 |
| Benzo(g,h,i)perylene | 1/10 | 1 | 2WCGW1S | 10 | - | - | - | N | 1 |
| Benzoic Acid | 1/10 | 7 | 2WGW4D | 50 | - | - | 15000 | N | 2 |
| Bis(2-ethylhexyl)phthalate | 5/10 | 2 - 3 | 2WCGW1S | 10 - 42 | 6 | 6 | 4.8 | N | 2 |
| Di-n-octylphthalate | 1/10 | 2 | 2WGW4D | 10 | - | - | 73 | N | 2 |
| Dibenzo(a,h)anthracene | 1/10 | 0.8 | 2WCGW1S | 10 | - | - | 0.0092 | Y | 3 |
| Indeno(1,2,3-cd)pyrene | 1/10 | 1 | 2WCGW1S | 10 | - | - | 0.092 | Y | 3 |
| Aluminum | 6/10 | 291 - 9210 | 2WCGW3S | 30 - 182 | 50 - 200 (7) | - | 3700 | ~~Y~~ N | ~~3~~ 5 |
| Arsenic | 6/10 | 4.9 - 19.9 | 2WCGW3S | 2 - 5 | 50 | 50 | 0.045 | Y | 3 |
| Barium | 10/10 | 42.3 - 189 | 2WCGW1S | - | 2000 | 2000 | 260 | N | 2 |
| Beryllium | 4/10 | 1 - 1.4 | 2WCGW3S | 1 | 4 | 4 | 0.016 | Y | 3 |
| Boron | 6/9 | 82.4 - 3550 | 2WCGW1S | 17.3 - 75.1 | - | - | 330 | Y | 3 |
| Calcium | 10/10 | 26500 - 264000 | 2WCGW3S | - | - | - | - | N | 1 |
| Chromium (total) | 5/10 | 4.2 - 24.9 | 2WCGW3S | 3 - 5 | 100 | 100 | 18 (8) | Y | 3 |
| Cobalt | 6/10 | 4.8 - 15.5 | 2WCGW1S | 3 - 5 | - | - | 220 | N | 2 |
| Copper | 5/10 | 3.9 - 38.5 | 2WCGW3S | 2 - 5 | 1300 (9) | - | 150 | N | 2 |
| Iron | 10/10 | 65.2 - 68000 | 2WCGW2S | - | 300 (7) | - | 1100 | ~~Y~~ N | ~~3~~ 5 |
| Lead | 4/9 | 2.7 - 16.8 | 2WCGW3S | 2 - 5.1 | 15 (9) | - | - | Y | 4 |
| Magnesium | 10/10 | 2850 - 448000 | 2WCGW3S | - | - | - | - | N | 1 |
| Manganese | 10/10 | 31.1 - 6500 | 2WCGW3S | - | 50 (7) | - | ~~18~~ 88 | Y | 3 |
| Nickel | 2/10 | 18.6 - 20 | 2WCGW3S | 7 - 11 | 100 | 100 | 73 | N | 2 |
| Potassium | 10/10 | 1170 - 173000 | 2WCGW3S | - | - | - | - | N | 1 |

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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A WEAPONS CENTER - UNFILTERED GROUNDWATER (UG/L) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Federal MCL (4) | State MCL (5) | Risk-based COC Screening Level (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Selenium | 1/10 | 6 | 2WGW4D | 1 - 5 | 50 | 50 | 18 | N | 2 |
| Sodium | 10/10 | 8270 - 3570000 | 2WCGW3S | - | - | - | - | N | 1 |
| Thallium | 3/9 | 5.6 - 13.8 | 2WCGW2S | 1 - 10 | 2 | 2 | 0.26 (10) | Y | 3 |
| Vanadium | 3/10 | 9.8 - 25.3 | 2WCGW3S | 3 - 20 | - | - | 26 | N | 2 |
| Zinc | 7/10 | 5.4 - 52 | 2WCGW3S | 3.4 - 20 | 5000 (7) | - | 1100 | N | 2 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as separate samples. Non-validated and rejected results are not used in risk assessment.
3 Sample-specific.
4 Maximum contaminant level. (USEPA, May 1995).
5 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II EnvironmentalHealth.
6 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
7 Secondary MCL (SMCL) based on aesthetic water qualities.
8 Hexavalent chromium.
9 Action Level.
10 Thallic oxide.

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 No COC screening level available; maximum is greater than Federal Action Level.
5 USEPA Region I does not advocate quantitative evaluation of this chemical.

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## SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS
## SITE 2 AREA A WEAPONS CENTER - UNFILTERED GROUNDWATER
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/L)** | | |
| 1,1,2-Trichloroethane | 3.1667 | 4.5417 |
| 1,2-Dichloroethane | 2.8333 | 4.4583 |
| 2-Butanone | 4.6667 | 4.9167 |
| 2-Hexanone | 7.3333 | 5.5833 |
| 4-Methyl-2-pentanone | 7.3333 | 5.5833 |
| Trichloroethene | 3.1667 | 4.5417 |
| 1,3-Dichlorobenzene | 2.8 | 4.45 |
| Benzo(g,h,i)perylene | 3 | 4.5 |
| Benzoic acid | 19 | 23.5 |
| Bis(2-ethylhexyl)phthalate | 8 | 5.5833 |
| Di-n-octyl phthalate | 4 | 4.75 |
| Dibenzo(a,h)anthracene | 2.9 | 4.475 |
| Indeno(1,2,3-cd)pyrene | 3 | 4.5 |
| **Inorganics (ug/L)** | | |
| Aluminum | 8770 | 2663.6833 |
| Arsenic | 15.9 | 7.2667 |
| Barium | 138.475 | 105.9271 |
| Beryllium | 1.2 | 0.8188 |
| Boron | 2455 | 1139.4438 |
| Calcium | 184000 | 91116.6667 |
| Chromium (total) | 23.15 | 8.2563 |
| Cobalt | 9.95 | 6.4917 |
| Copper | 36 | 12.5292 |
| Iron | 55550 | 26709.6 |
| Lead | 8.9 | 3.9063 |
| Magnesium | 290000 | 101884.1667 |
| Manganese | 5065 | 3415.3833 |
| Nickel | 11.75 | 7.4875 |
| Potassium | 120700 | 46495.4167 |
| Selenium | 2.3333 | 1.8333 |
| Sodium | 2259000 | 839229.1667 |
| Thallium | 8.15 | 4.5125 |
| Vanadium | 23.45 | 8.9 |
| Zinc | 41.25 | 18.9229 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A WEAPONS CENTER - FILTERED GROUNDWATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Federal MCL (4) | State MCL (5) | Risk-based COC Screening Level (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 2/9 | 15.2 - 16.9 | 2WGW4D | 12 - 16.4 | 6 | 6 | 1.5 | Y | 3 |
| Arsenic | 6/9 | 3.1 - 8.4 | 2WCGW3S | 2 - 5 | 50 | 50 | 0.045 | N | 1 |
| Barium | 9/9 | 44.3 - 210 | 2WCGW1S | - | 2000 | 2000 | 260 | N | 1 |
| Beryllium | 1/9 | 1.2 | 2WCGW3S | 1 - 1.2 | 4 | 4 | 0.016 | N | 1 |
| Boron | 7/9 | 72.2 - 3810 | 2WCGW3S | 15.2 - 50 | - | - | 330 | N | 1 |
| Calcium | 9/9 | 26400 - 298000 | 2WCGW3S | - | - | - | - | N | 1 |
| Copper | 1/9 | 23 | 2WCGW3S | 2 - 7.9 | 1300 (8) | - | 150 | N | 1 |
| Iron | 7/9 | 4610 - 69200 | 2WCGW2S | 25.3 - 67.7 | 300 (7) | - | 1100 | N | 1 |
| Magnesium | 9/9 | 3110 - 471000 | 2WCGW3S | - | - | - | - | N | 1 |
| Manganese | 9/9 | 33.6 - 6540 | 2WCGW3S | - | 50 (7) | - | ~~18~~ 88 | N | 1 |
| Nickel | 2/9 | 10.3 - 14 | 2WCGW1S | 7 - 11 | 100 | 100 | 73 | N | 1 |
| Potassium | 8/9 | 1390 - 182000 | 2WCGW3S | 1920 | - | - | - | N | 1 |
| Silver | 1/9 | 3.7 | 2WCGW2S | 2 | 100 (7) | 50 | 18 | N | 2 |
| Sodium | 9/9 | 8420 - 3580000 | 2WCGW3S | - | - | - | - | N | 1 |
| Vanadium | 2/9 | 2.9 - 3.1 | 2WCGW3S | 1 - 4 | - | - | 26 | N | 1 |
| Zinc | 1/9 | 14.2 | 2WCGW3S | 2 - 19.6 | 5000 (7) | - | 1100 | N | 1 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as separate samples. Non-validated and rejected results are not used in risk assessment.
3 Sample-specific.
4 Maximum contaminant level. (USEPA, May 1995).
5 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II EnvironmentalHealth.
6 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
7 Secondary MCL (SMCL) based on aesthetic water qualities.
8 Action Level.

Rationale Designations:

1 Chemical detected in unfiltered samples; filtered results not used in risk assessment.
2 Chemical not detected in unfiltered samples; maximum is less than COC screening level.
3 Chemical not detected in unfiltered samples; maximum is greater than COC screening level.

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## SUMMARY OF COC SELECTION
## SITE 2 AREA A WEAPONS CENTER - FILTERED SURFACE WATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | AWQC (4) | Risk-based COC Screening Level (5) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|
| Arsenic | 1/1 | 2.1 | 2WCSW3 | - | 0.018 | 0.045 | N | 1 |
| Cadmium | 1/1 | 5.6 | 2WCSW3 | - | 16 | 1.8 | N | 1 |
| Calcium | 1/1 | 1540 | 2WCSW3 | - | - | - | N | 1 |
| Lead | 1/1 | 1 | 2WCSW3 | - | 50 | 15(6) | N | 1 |
| Magnesium | 1/1 | 344 | 2WCSW3 | - | - | - | N | 1 |
| Manganese | 1/1 | 24.7 | 2WCSW3 | - | - | ~~18~~ 88 | N | 1 |
| Sodium | 1/1 | 2750 | 2WCSW3 | - | - | - | N | 1 |
| Zinc | 1/1 | 120 | 2WCSW3 | - | - | 1100 | N | 1 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as two samples. Non-validated and rejected results not used in risk assessment.
3 Sample-specific.
4 Ambient water quality criteria for the consumption of water and organisms (USEPA, June 15, 1990).
5 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
6 Federal Action Level for drinking water.

Rationale Designations:

1 Chemical detected in unfiltered samples; filtered results not used in risk assessment.

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## SUMMARY OF COC SELECTION
## SITE 2 AREA A WEAPONS CENTER - UNFILTERED SURFACE WATER (1) (UG/L)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | AWQC (4) | Risk-based COC Screening Level (5) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|
| Butyl benzyl phthalate | 1/2 | 2 | 2WCSW3 | 10 | 3000 | 730 | N | 2 |
| Di-n-octyl phthalate | 1/2 | 1 | 2WCSW3 | 10 | - | 370 | N | 2 |
| Arsenic | 1/2 | 2.6 | 2WCSW3 | 2.0 | 0.018 | 0.045 | Y | 3 |
| Barium | 1/2 | 6.8 | 2WCSW5 | 5.0 | - | 260 | N | 2 |
| Cadmium | 1/2 | 6.6 | 2WCSW3 | 2.0 | 16 | 1.8 | Y | 3 |
| Calcium | 2/2 | 1490 - 3310 | 2WCSW5 | - | - | - | N | 1 |
| Iron | 2/2 | 217 - 1100 | 2WCSW5 | - | - | 1100 | ~~Y~~ N | ~~3~~ 4 |
| Lead | 2/2 | 3.9 - 7 | 2WCSW5 | - | 50 | 15 (6) | N | 2 |
| Magnesium | 2/2 | 366 - 618 | 2WCSW5 | - | - | - | N | 1 |
| Manganese | 2/2 | 28.1 - 48 | 2WCSW5 | - | - | ~~18~~ 88 | ~~Y~~ N | ~~3~~ 2 |
| Sodium | 2/2 | 2620 - 2990 | 2WCSW5 | - | - | - | N | 1 |
| Zinc | 1/2 | 135 | 2WCSW3 | 27.0 | - | 1100 | N | 1 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as two samples. Non-validated and rejected results not used in risk assessment.
3 Sample quantitation limits.
4 Ambient water quality criteria for the consumption of water and organisms (USEPA, June 15, 1990).
5 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
6 Federal Action Level for drinking water.

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS**
**SITE 2 - AREA A WEAPONS CENTER - UNFILTERED SURFACE WATER**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/L)** | | |
| Butyl benzyl phthalate | 2 | 2.25 |
| Di-n-octyl phthalate | 1 | 1.75 |
| **Inorganics (ug/L)** | | |
| Arsenic | 2.6 | 1.55 |
| Barium | 6.8 | 4.025 |
| Cadmium | 6.6 | 3.55 |
| Calcium | 3310 | 2400 |
| Iron | 1100 | 658.5 |
| Lead | 7 | 5.45 |
| Magnesium | 618 | 492 |
| Manganese | 48 | 38.05 |
| Sodium | 2990 | 2805 |
| Zinc | 135 | 70.875 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A WEAPONS CENTER - SEDIMENT (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|
| 1,1,1-Trichloroethane | 1/6 | 0.013 | 2WCSD5 | 0.011 - 0.018 | 700 | N | 2 |
| Methylene Chloride | 4/6 | 0.01 - 0.022 | 2WCSD4 | 0.017 | 85 | N | 2 |
| Tetrachloroethane | 1/6 | 0.008 | 2WCSD5 | 0.011 - 0.018 | 12 | N | 2 |
| Toluene | 2/6 | 0.002 - 0.004 | 2WCSD5 | 0.011 - 0.018 | 1600 | N | 2 |
| Trichloroethene | 1/6 | 0.022 | 2WCSD5 | 0.011 - 0.018 | 58 | N | 2 |
| 2-Methylnaphthalene | 1/16 | 0.031 | 2WCSD4 | 0.255 - 0.72 | - | N | 1 |
| Acenaphthene | 6/16 | 0.036 - 0.079 | 2WCSD3 | 0.255 - 0.7 | 470 | N | 2 |
| Acenaphthylene | 4/16 | 0.047 - 0.09 | 2WCSD4 | 0.255 - 0.72 | - | N | 1 |
| Anthracene | 9/16 | 0.022 - 0.4 | 2WCSD3 | 0.255 - 0.63 | 2300 | N | 2 |
| Benzo(a)anthracene | 15/16 | 0.063 - 3.4 | 2WCSD3 | 0.41 | 0.88 | Y | 3 |
| Benzo(a)pyrene | 13/16 | 0.073 - 4.4 | 2WCSD3 | 0.41 - 0.7 | 0.088 | Y | 3 |
| Benzo(b)fluoranthene | 15/16 | 0.14 - 4.9 | 2WCSD3 | 0.41 | 0.88 | Y | 3 |
| Benzo(g,h,i)perylene | 13/16 | 0.047 - 3.5 | 2WCSD3 | 0.255 - 0.72 | - | N | 1 |
| Benzo(k)fluoranthene | 9/16 | 0.12 - 2.1 | 2WCSD4/2WCSD14 | 0.255 - 5.1 | 8.8 | N | 2 |
| Benzoic acid | 10/16 | 0.061 - 0.19 | 2WCSD4/2WCSD14 | 0.43 - 0.7 | 31000 | N | 2 |
| Bis(2-ethylhexyl)phthalate | 1/16 | 1.1 | 2WCSD11 | 0.265 - 1.4 | 46 | N | 2 |
| Butyl benzyl phthalate | 1/16 | 0.052 | 2WCSD14 | 0.255 - 0.72 | 1600 | N | 2 |
| Carbazole | 7/16 | 0.031 - 0.66 | 2WCSD14 | 0.255 - 0.7 | 32 | N | 2 |
| Chrysene | 15/16 | 0.11 - 4.3 | 2WCSD3 | 0.41 | 88 | N | 2 |
| Di-n-butylphthalate | 1/16 | 0.18 | 2WCSD11 | 0.255 - 0.72 | 780 | N | 2 |
| Di-n-octylphthalate | 2/16 | 0.026 - 0.072 | 2WCSD4 | 0.255 - 0.72 | 160 | N | 2 |
| Dibenzo(a,h)anthracene | 5/16 | 0.052 - 0.87 | 2WCSD14D | 0.255 - 0.7 | 0.088 | Y | 3 |
| Dibenzofuran | 4/16 | 0.045 - 0.087 | 2WCSD14 | 0.255 - 0.72 | 31 | N | 2 |
| Fluoranthene | 15/16 | 0.1 - 6.9 | 2WCSD3 | 0.41 | 310 | N | 2 |
| Fluorene | 6/16 | 0.046 - 0.14 | 2WCSD3 | 0.255 - 0.7 | 310 | N | 2 |
| Indeno(1,2,3-cd)pyrene | 15/16 | 0.049 - 3.3 | 2WCSD3 | 0.41 | 0.88 | Y | 3 |
| Naphthalene | 3/16 | 0.036 - 0.16 | 2WCSD5 | 0.255 - 0.72 | 310 | N | 2 |
| Phenanthrene | 14/16 | 0.077 - 2.3 | 2WCSD14/2WCSD14D | 0.43 - 0.6 | - | N | 1 |
| Phenol | 1/16 | 0.032 | 2WCSD11 | 0.255 - 0.72 | 4700 | N | 2 |
| Pyrene | 15/16 | 0.12 - 6.9 | 2WCSD3 | 0.41 | 230 | N | 2 |



000023

**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A WEAPONS CENTER - SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 3/6 | 0.0065 - 0.032 | 2WCSD1 | 0.035 - 0.063 | 2.7 | N | 2 |
| 4,4'-DDE | 1/6 | 0.052 | 2WCSD1 | 0.035 - 0.063 | 1.9 | N | 2 |
| 4,4'-DDT | 4/6 | 0.01 - 0.06 | 2WCSD4 | 0.035 - 0.041 | 1.9 | N | 2 |
| Alpha-chlordane | 1/6 | 0.0064 | 2WCSD5 | 0.018 - 0.031 | 0.49 (5) | N | 2 |
| Endosulfan sulfate | 2/6 | 0.0068 - 0.0076 | 2WCSD5 | 0.035 - 0.06 | - | N | 1 |
| Endrin | 3/6 | 0.01 - 0.018 | 2WCSD5 | 0.035 - 0.057 | 2.3 | N | 2 |
| Endrin aldehyde | 2/6 | 0.059 - 0.14 | 2WCSD5 | 0.035 - 0.057 | - | N | 1 |
| Gamma-chlordane | 1/6 | 0.007 | 2WCSD5 | 0.018 - 0.031 | 0.49 (5) | N | 2 |
| Heptachlor | 1/6 | 0.0028 | 2WCSD1 | 0.018 - 0.033 | 0.14 | N | 2 |
| Methoxychlor | 1/6 | 0.037 | 2WCSD5 | 0.18 - 0.31 | 39 | N | 2 |
| Aluminum | 16/16 | 2560 - 26400 | 2WCSD14 | - | 7800 | ~~Y~~ N | ~~3~~ 4 |
| Antimony | 4/16 | 5.1 - 15 | 2WCSD2 | 3.2 - 18.4 | 3.1 | Y | 3 |
| Arsenic | 16/16 | 1.2 - 13.5 | 2WCSD6 | - | 0.43 | Y | 3 |
| Barium | 16/16 | 17 - 103 | 2WCSD14 | - | 550 | N | 2 |
| Beryllium | 4/16 | 0.53 - 1.1 | 2WCSD2 | 0.55 - 2.3 | 0.15 | Y | 3 |
| Boron | 10/16 | 11 - 39.7 | 2WCSD4 | 7.95 - 28.2 | 700 | N | 2 |
| Cadmium | 3/16 | 1 - 29.5 | 2WCSD5 | 0.32 - 1.1 | 3.9 | Y | 3 |
| Calcium | 16/16 | 680 - 3290 | 2WCSD5 | - | - | N | 1 |
| Chromium (total) | 15/16 | 8 - 97.5 | 2WCSD6 | 5.7 | 39 (6) | Y | 3 |
| Cobalt | 16/16 | 2.2 - 14.4 | 2WCSD5 | - | 470 | N | 2 |
| Copper | 13/16 | 16.2 - 57.2 | 2WCSD5 | 4.6 - 6.1 | 290 | N | 2 |
| Iron | 16/16 | 6430 - 51600 | 2WCSD2 | - | 2300 | ~~Y~~ N | ~~3~~ 4 |
| Lead | 16/16 | 3.5 - 204 | 2WCSD5 | - | 400 (7) | N | 2 |
| Magnesium | 16/16 | 1160 - 6140 | 2WCSD6 | - | - | N | 1 |
| Manganese | 16/16 | 79.8 - 2640 | 2WCSD5 | - | ~~39~~ 190 | Y | 3 |
| Mercury | 9/16 | 0.14 - 0.6 | 2WCSD6 | 0.11 - 0.28 | 2.3 | N | 2 |
| Nickel | 16/16 | 3.3 - 31.5 | 2WCSD5 | - | 160 | N | 2 |
| Potassium | 14/16 | 1410 - 4020 | 2WCSD6/2WCSD13 | 822 - 870 | - | N | 1 |
| Selenium | 1/16 | 0.67 | 2WCSD10 | 0.43 - 1.7 | 39 | N | 2 |
| Silver | 2/16 | 1.7 - 1.9 | 2WCSD2 | 0.32 - 1.1 | 39 | N | 2 |
| Sodium | 6/16 | 163 - 1120 | 2WCSD6 | 28.4 - 334 | - | N | 1 |

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Revisions
08/18/96
-XMS

**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A WEAPONS CENTER - SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|
| Thallium | 2/16 | 0.34 - 0.36 | 2WCSD14D | 0.21 - 0.56 | 0.55 (8) | N | 2 |
| Vanadium | 16/16 | 8 - 62.2 | 2WCSD14 | - | 55 | Y | 3 |
| Zinc | 15/16 | 17.3 - 292 | 2WCSD5 | 10.3 | 2300 | N | 2 |

Footnotes:

1 Results presented in mg/kg unless otherwise noted.
2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment
3 Sample-specific.
4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
5 Total chlordane.
6 Hexavalent chromium.
7 OSWER soil screening level for residential land use (USEPA, July 14, 1994).
8 Thallic oxide.

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

Reviewed
08/18/96
KLS

## SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS
## SITE 2 AREA A WEAPONS CENTER - SEDIMENT
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| 1,1,1-Trichloroethane | 13 | 8.4167 |
| Methylene chloride | 22 | 12 |
| Tetrachloroethene | 8 | 7.5833 |
| Toluene | 4 | 5.8333 |
| Trichloroethene | 22 | 9.9167 |
| 2-Methylnaphthalene | 31 | 265.7333 |
| Acenaphthene | 79 | 204.7333 |
| Acenaphthylene | 90 | 236.7333 |
| Anthracene | 400 | 207.2 |
| Benzo(a)anthracene | 3400 | 2270 |
| Benzo(a)pyrene | 4400 | 2690 |
| Benzo(b)fluoranthene | 4900 | 4900 |
| Benzo(g,h,i)perylene | 3500 | 570.2 |
| Benzo(k)fluoranthene | 2100 | 689 |
| Benzo(k)fluoranthene | 2100 | 689 |
| Benzoic acid | 190 | 179.5333 |
| Benzoic acid | 190 | 179.5333 |
| Bis(2-ethylhexyl)phthalate | 1100 | 388.6667 |
| Butyl benzyl phthalate | 52 | 265.1333 |
| Carbazole | 660 | 271.4 |
| Chrysene | 4300 | 1023 |
| Di-n-butyl phthalate | 180 | 282 |
| Di-n-octyl phthalate | 72 | 256.5333 |
| Dibenzo(a,h)anthracene | 870 | 294.1333 |
| Dibenzofuran | 87 | 245.5333 |
| Fluoranthene | 6900 | 1349.6667 |
| Fluorene | 140 | 217.1333 |
| Indeno(1,2,3-cd)pyrene | 3300 | 1940 |
| Naphthalene | 160 | 249.8667 |
| Phenanthrene | 2300 | 586.1333 |
| Phenol | 32 | 272.1333 |
| Pyrene | 6900 | 1559 |
| 4,4'-DDD | 32 | 19.1 |
| 4,4'-DDE | 52 | 30 |
| 4,4'-DDT | 60 | 23.6667 |
| alpha-Chlordane | 6.4 | 11.65 |
| Endosulfan sulfate | 7.6 | 18.3167 |
| Endrin | 18 | 19.4167 |
| Endrin aldehyde | 140 | 48.8333 |
| gamma-Chlordane | 7 | 11.75 |
| Heptachlor | 2.8 | 11.4667 |
| Methoxychlor | 37 | 112 |

**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS (Continued)**
**SITE 2 AREA A WEAPONS CENTER - SEDIMENT**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Inorganics (mg/kg)** | | |
| Aluminum | 26400 | 15400 |
| Antimony | 15 | 5.2467 |
| Arsenic | 13.5 | 8.4 |
| Barium | 103 | 63.6667 |
| Beryllium | 1.1 | 0.6483 |
| Boron | 39.7 | 20.8467 |
| Cadmium | 29.5 | 2.3867 |
| Calcium | 3290 | 1801.4667 |
| Chromium (total) | 97.5 | 49.5 |
| Cobalt | 14.4 | 6.48 |
| Copper | 57.2 | 25.3367 |
| Iron | 51600 | 31200 |
| Lead | 204 | 49.0133 |
| Magnesium | 6140 | 4134.6667 |
| Manganese | 2640 | 458.7867 |
| Mercury | 0.6 | 0.2327 |
| Nickel | 31.5 | 15.3467 |
| Potassium | 4020 | 2435.0667 |
| Selenium | 0.67 | 0.4707 |
| Silver | 1.9 | 0.5463 |
| Sodium | 1120 | 231.19 |
| Thallium | 0.36 | 0.2177 |
| Vanadium | 62.2 | 42.7 |
| Zinc | 292 | 97.71 |

Sediment Data - Area A Weapons Center



~~Table N~~

Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALUMINUM | 15/15 | 2560.0000<br>26400.0000 | Norm ✓ | 12578.6667 | 15400(a) | na | na | na | na | na | |
| ARSENIC | 15/15 | 1.2000<br>13.5000 | Norm ✓ | 6.6733 | 8.4(a) | na | na | na | na | na | |
| BARIUM | 15/15 | 17.0000<br>103.0000 | Norm ✓ | 63.6667 | 75.0(a) | na | na | na | na | na | |
| BORON | 9/15 | 11.0000<br>39.7000 | Und ✓ | 29.1667 | 39.7(d) | na | na | na | na | na | |
| CALCIUM | 15/15 | 680.0000<br>3290.0000 | Log ✓ | 1801.4667 | 2280(b) | na | na | na | na | na | |
| CHROMIUM | 14/15 | 8.0000<br>97.5000 | Norm ✓ | 40.0857 | 49.5(a) | na | na | na | na | na | |
| COBALT | 15/15 | 2.2000<br>14.4000 | Log ✓ | 6.4800 | 9.3(b) | na | na | na | na | na | |
| COPPER | 12/15 | 16.2000<br>57.2000 | Norm ✓ | 31.0167 | 32.9(a) | na | na | na | na | na | |
| IRON | 15/15 | 6430.0000<br>51600.0000 | Norm ✓ | 25279.3333 | 31200(a) | na | na | na | na | na | |
| LEAD | 15/15 | 3.5000<br>204.0000 | Log ✓ | 49.0133 | 123(b) | na | na | na | na | na | |
| MAGNESIUM | 15/15 | 1160.0000<br>6140.0000 | Norm | 4134.6667 | 4820(a) | na | na | na | na | na | |
| MANGANESE | 15/15 | 79.8000<br>2640.0000 | Und ✓ | 458.7867 | 2640(d) | na | na | na | na | na | |

Table X
Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MERCURY | 9/15 | 0.1400<br>0.6000 | Log ✓ | 0.3311 | 0.40(b) | na | na | na | na | na | |
| NICKEL | 15/15 | 3.3000<br>31.5000 | Norm ✓ | 15.3467 | 18.8(a) | na | na | na | na | na | |
| POTASSIUM | 13/15 | 1410.0000<br>4020.0000 | Norm ✓ | 2744.6154 | 2980(a) | na | na | na | na | na | |
| VANADIUM | 15/15 | 8.0000<br>62.2000 | Norm ✓ | 35.2467 | 42.7(a) | na | na | na | na | na | |
| ZINC | 14/15 | 17.3000<br>292.0000 | Log ✓ | 104.3214 | 246(b) | na | na | na | na | na | |
| ANTHRACENE | 8/15 | 22.0000<br>400.0000 | Norm ✓ | 159.1250 | 257(a) | na | na | na | na | na | |
| BENZO(A)ANTHRACENE | 14/15 | 63.0000<br>3400.0000 | Log ✓ | 764.8571 | 2270(b) | na | na | na | na | na | |
| BENZO(A)PYRENE | 12/15 | 73.0000<br>4400.0000 | Log ✓ | 980.9167 | 2680(b) | na | na | na | na | na | |
| BENZO(B)FLUORANTHENE | 14/15 | 140.0000<br>4900.0000 | Und ✓ | 1148.5714 | 4900(d) | na | na | na | na | na | |
| BENZO(G,H,I)PERYLENE | 12/15 | 47.0000<br>3500.0000 | Log ✓ | 644.4167 | 1710(b) | na | na | na | na | na | |
| BENZO(K)FLUORANTHENE | 8/15 | 120.0000<br>2100.0000 | Log ✓ | 777.5000 | 1380(b) | na | na | na | na | na | |
| BENZOIC ACID | 10/15 | 61.0000<br>190.0000 | Log ✓ | 121.8000 | 190(c) | na | na | na | na | na | |

000030

C - UCL exceeded maximum detection. Therefore, the maximum is used as the UCL concentration

Table X
Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CHRYSENE | 14/15 | 110.0000 4300.0000 | Log ✓ | 1081.4286 | 2920(b) | na | na | na | na | na | |
| FLUORANTHENE | 14/15 | 100.0000 6900.0000 | Log ✓ | 1431.4286 | 4790(b) | na | na | na | na | na | |
| INDENO(1,2,3-CD)PYRENE | 14/15 | 49.0000 3300.0000 | Log ✓ | 627.1429 | 1940(b) | na | na | na | na | na | |
| PHENANTHRENE | 13/15 | 77.0000 2300.0000 | Log ✓ | 636.6923 | 1330(b) | na | na | na | na | na | |
| PYRENE | 14/15 | 120.0000 6900.0000 | Log ✓ | 1655.7143 | 5510(b) | na | na | na | na | na | |

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : ALUMINUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 12578.6667 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 2560.0000 | |
| Positive Hits - Maximum | 26400.0000 | |
| Average Of Positive Hits | 12578.6667 | |
| Standard Deviation | ~~6230.7588~~ | |
| Upper Confidence Limit - Normal | 15411.7198 | |
| Upper Confidence Limit - Lognormal | 19587.4750 | |
| 95th Percentile - Nonparametric | 26400.0000 | |
| 95th Percentile - Normal | 22828.2649 | |
| 95th Percentile - Lognormal | 31286.8530 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9738 | |
| Corr Coeff - Detected - Lognormal | 0.9314 | |
| Corr Coeff - Total - Normal | 0.9738 | |
| Corr Coeff - Total - Lognormal | 0.9314 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.9547 | NA |
| W-Test - Lognormal | 0.8716 | NA |
| Type of Distribution | NORMAL | |

Test Results:

000033

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : ARSENIC (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 6.6733 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 1.2000 | |
| Positive Hits - Maximum | 13.5000 | |
| Average Of Positive Hits | 6.6733 | |
| Standard Deviation | 3.7375 | |
| Upper Confidence Limit - Normal | 8.3728 UCL | |
| Upper Confidence Limit - Lognormal | 11.8185 | |
| 95th Percentile - Nonparametric | 13.5000 | |
| 95th Percentile - Normal | 12.8216 | |
| 95th Percentile - Lognormal | 19.0239 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9815 | |
| Corr Coeff - Detected - Lognormal | 0.9315 | |
| Corr Coeff - Total - Normal | 0.9815 | |
| Corr Coeff - Total - Lognormal | 0.9315 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.9514 | NA |
| W-Test - Lognormal | 0.8582 | NA |
| Type of Distribution | NORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : BARIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 15.0000 | No samples |
| Number of Detects ..... | 15.0000 | |
| Average ..... | 63.6667 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 17.0000 | |
| Positive Hits - Maximum ..... | 103.0000 | |
| Average Of Positive Hits ..... | 63.6667 | |
| Standard Deviation ..... | 25.0284 | |
| Upper Confidence Limit - Normal ..... | 75.0468 UCL | |
| Upper Confidence Limit - Lognormal ... | 89.6407 | |
| 95th Percentile - Nonparametric..... | 103.0000 | |
| 95th Percentile - Normal..... | 104.8384 | |
| 95th Percentile - Lognormal ..... | 138.7875 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9788 | |
| Corr Coeff - Detected - Lognormal .... | 0.9033 | |
| Corr Coeff - Total - Normal ..... | 0.9788 | |
| Corr Coeff - Total - Lognormal ..... | 0.9033 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9370 | |
| Corr Coeff - Crit Val - Total ..... | 0.9370 | |
| W-Test - Table Value ..... | 0.8810 | NA |
| W-Test - Normal ..... | 0.9516 | NA |
| W-Test - Lognormal ..... | 0.8163 | NA |
| Type of Distribution ..... | NORMAL✓ | |

Test Results:

000035

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : BORON (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 15.0000 | No samples |
| Number of Detects ..... | 9.0000 | |
| Average ..... | 20.8467 | |
| Detection Limit - Minimum ..... | 6.1500 | |
| Detection Limits - Maximum ..... | 14.1000 | |
| Positive Hits - Minimum ..... | 11.0000 | |
| Positive Hits - Maximum ..... | 39.7000 | |
| Average Of Positive Hits ..... | 29.1667 | |
| Standard Deviation ..... | 12.4384 | |
| Upper Confidence Limit - Normal ..... | 26.5023 | |
| Upper Confidence Limit - Lognormal ... | 33.8407 | |
| 95th Percentile - Nonparametric..... | 39.7000 | |
| 95th Percentile - Normal..... | 41.3079 | |
| 95th Percentile - Lognormal ..... | 54.4626 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.3564 | |
| Corr Coeff - Detected - Lognormal .... | 0.3061 | |
| Corr Coeff - Total - Normal ..... | 0.9485 | |
| Corr Coeff - Total - Lognormal ..... | 0.9395 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9120 | |
| Corr Coeff - Crit Val - Total ..... | 0.9370 | |
| W-Test - Table Value ..... | 0.8810 | NA |
| W-Test - Normal ..... | 0.8719 | NA |
| W-Test - Lognormal ..... | 0.8536 | NA |
| Type of Distribution ..... | UNDEFINED | |

Test Results:

00036

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : CALCIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 1801.4667 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 680.0000 | |
| Positive Hits - Maximum | 3290.0000 | |
| Average Of Positive Hits | 1801.4667 | |
| Standard Deviation | 745.5224 | |
| Upper Confidence Limit - Normal | 2140.4470 | |
| Upper Confidence Limit - Lognormal | 2283.5087 HCL | |
| 95th Percentile - Nonparametric | 3290.0000 | |
| 95th Percentile - Normal | 3027.8511 | |
| 95th Percentile - Lognormal | 3350.7097 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9667 | |
| Corr Coeff - Detected - Lognormal | 0.9852 | |
| Corr Coeff - Total - Normal | 0.9667 | |
| Corr Coeff - Total - Lognormal | 0.9852 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.9321 | NA |
| W-Test - Lognormal | 0.9719 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : CHROMIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 37.6033 | |
| Detection Limit - Minimum | 2.8500 | |
| Detection Limits - Maximum | 2.8500 | |
| Positive Hits - Minimum | 8.0000 | |
| Positive Hits - Maximum | 97.5000 | |
| Average Of Positive Hits | 40.0857 | |
| Standard Deviation | 26.1427 | |
| Upper Confidence Limit - Normal | 49.490 | UCL |
| Upper Confidence Limit - Lognormal | 83.4944 | |
| 95th Percentile - Nonparametric | 97.5000 | |
| 95th Percentile - Normal | 80.6080 | |
| 95th Percentile - Lognormal | 129.3345 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9630 | |
| Corr Coeff - Detected - Lognormal | 0.9665 | |
| Corr Coeff - Total - Normal | 0.9757 | |
| Corr Coeff - Total - Lognormal | 0.9624 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.9504 | NA |
| W-Test - Lognormal | 0.9308 | NA |
| Type of Distribution | NORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : COBALT (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 15.0000 | No samples |
| Number of Detects ..... | 15.0000 | |
| Average ..... | 6.4800 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 2.2000 | |
| Positive Hits - Maximum ..... | 14.4000 | |
| Average Of Positive Hits ..... | 6.4800 | |
| Standard Deviation ..... | 3.6696 | |
| Upper Confidence Limit - Normal ..... | ~~8.1485~~ | |
| Upper Confidence Limit - Lognormal ... | 9.2618 UCL | |
| 95th Percentile - Nonparametric..... | ~~14.4000~~ | |
| 95th Percentile - Normal..... | 12.5165 | |
| 95th Percentile - Lognormal ..... | 14.5637 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9416 | |
| Corr Coeff - Detected - Lognormal .... | 0.9685 | |
| Corr Coeff - Total - Normal ..... | 0.9416 | |
| Corr Coeff - Total - Lognormal ..... | 0.9685 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9370 | |
| Corr Coeff - Crit Val - Total ..... | 0.9370 | |
| W-Test - Table Value ..... | 0.8810 | NA |
| W-Test - Normal ..... | 0.8818 | NA |
| W-Test - Lognormal ..... | 0.9262 | NA |
| Type of Distribution ..... | LOGNORMAL ✓ | |

Test Results:

000039

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : COPPER (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 12.0000 | |
| Average | 25.3367 | |
| Detection Limit - Minimum | 2.3000 | |
| Detection Limits - Maximum | 3.0500 | |
| Positive Hits - Minimum | 16.2000 | |
| Positive Hits - Maximum | 57.2000 | |
| Average Of Positive Hits | 31.0167 | |
| Standard Deviation | ~~16.6283~~ | |
| Upper Confidence Limit - Normal | 32.8973 UCL | |
| Upper Confidence Limit - Lognormal | 69.5362 | |
| 95th Percentile - Nonparametric | 57.2000 | |
| 95th Percentile - Normal | 52.6901 | |
| 95th Percentile - Lognormal | 101.3486 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8392 | |
| Corr Coeff - Detected - Lognormal | 0.8989 | |
| Corr Coeff - Total - Normal | 0.9762 | |
| Corr Coeff - Total - Lognormal | 0.9047 | |
| Corr Coeff - Crit Val - Detected | 0.9260 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.9426 | NA |
| W-Test - Lognormal | 0.8091 | NA |
| Type of Distribution | NORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : IRON (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 25279.3333 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 6430.0000 | |
| Positive Hits - Maximum | 51600.0000 | |
| Average Of Positive Hits | 25279.3333 | |
| Standard Deviation | 13052.2425 | |
| Upper Confidence Limit - Normal | 31214.0346 UCL | |
| Upper Confidence Limit - Lognormal | ~~39757.9604~~ | |
| 95th Percentile - Nonparametric | 51600.0000 | |
| 95th Percentile - Normal | 46750.2723 | |
| 95th Percentile - Lognormal | 63654.9523 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9782 | |
| Corr Coeff - Detected - Lognormal | 0.9344 | |
| Corr Coeff - Total - Normal | 0.9782 | |
| Corr Coeff - Total - Lognormal | 0.9344 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.9507 | NA |
| W-Test - Lognormal | 0.8626 | NA |
| Type of Distribution | NORMAL ✓ | |

Test Results:

000041

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : LEAD (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 49.0133 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 3.5000 | |
| Positive Hits - Maximum | 204.0000 | |
| Average Of Positive Hits | 49.0133 | |
| Standard Deviation | 52.8214 | |
| Upper Confidence Limit - Normal | ~~73.0306~~ | |
| Upper Confidence Limit - Lognormal | 123.4231 null | |
| 95th Percentile - Nonparametric | ~~204.0000~~ | |
| 95th Percentile - Normal | 135.9045 | |
| 95th Percentile - Lognormal | 177.8542 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8525 | |
| Corr Coeff - Detected - Lognormal | 0.9812 | |
| Corr Coeff - Total - Normal | 0.8525 | |
| Corr Coeff - Total - Lognormal | 0.9812 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.7450 | NA |
| W-Test - Lognormal | 0.9672 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

00042

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : MAGNESIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 15.0000 | No samples |
| Number of Detects ..... | 15.0000 | |
| Average ..... | 4134.6667 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 1160.0000 | |
| Positive Hits - Maximum ..... | 6140.0000 | |
| Average Of Positive Hits ..... | 4134.6667 | |
| Standard Deviation ..... | 1509.9142 | |
| Upper Confidence Limit - Normal ..... | 4821.2069 UCL | |
| Upper Confidence Limit - Lognormal ... | ~~5596.7625~~ | |
| 95th Percentile - Nonparametric..... | 6140.0000 | |
| 95th Percentile - Normal..... | 6618.4756 | |
| 95th Percentile - Lognormal ..... | 8506.2369 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9580 | |
| Corr Coeff - Detected - Lognormal .... | 0.9003 | |
| Corr Coeff - Total - Normal ..... | 0.9580 | |
| Corr Coeff - Total - Lognormal ..... | 0.9003 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9370 | |
| Corr Coeff - Crit Val - Total ..... | 0.9370 | |
| W-Test - Table Value ..... | 0.8810 | NA |
| W-Test - Normal ..... | 0.9088 | NA |
| W-Test - Lognormal ..... | 0.8114 | NA |
| Type of Distribution ..... | NORMAL ✓ | |

Test Results:

000043

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : MANGANESE (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 458.7867 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 79.8000 | |
| Positive Hits - Maximum | 2640.0000 | |
| Average Of Positive Hits | 458.7867 | |
| Standard Deviation | 695.2260 | |
| Upper Confidence Limit - Normal | 774.8977 | |
| Upper Confidence Limit - Lognormal | 812.9856 | |
| 95th Percentile - Nonparametric | 2640.0000 | |
| 95th Percentile - Normal | 1602.4334 | |
| 95th Percentile - Lognormal | 1248.1072 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7289 | |
| Corr Coeff - Detected - Lognormal | 0.9179 | |
| Corr Coeff - Total - Normal | 0.7289 | |
| Corr Coeff - Total - Lognormal | 0.9179 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.5559 | NA |
| W-Test - Lognormal | 0.8497 | NA |
| Type of Distribution | UNDEFINED✓ | |

Test Results:

00044

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : MERCURY (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 15.0000 | No samples |
| Number of Detects ..... | 9.0000 | |
| Average ..... | 0.2327 | |
| Detection Limit - Minimum ..... | 0.0550 | |
| Detection Limits - Maximum ..... | 0.1400 | |
| Positive Hits - Minimum ..... | 0.1400 | |
| Positive Hits - Maximum ..... | 0.6000 | |
| Average Of Positive Hits ..... | 0.3311 | |
| Standard Deviation ..... | 0.1750 | |
| Upper Confidence Limit - Normal ..... | 0.3122 | |
| Upper Confidence Limit - Lognormal ... | 0.4023 ucl | |
| 95th Percentile - Nonparametric..... | 0.6000 | |
| 95th Percentile - Normal..... | 0.5206 | |
| 95th Percentile - Lognormal ..... | 0.6466 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.2317 | |
| Corr Coeff - Detected - Lognormal .... | 0.0916 | |
| Corr Coeff - Total - Normal ..... | 0.9447 | |
| Corr Coeff - Total - Lognormal ..... | 0.9851 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9120 | |
| Corr Coeff - Crit Val - Total ..... | 0.9370 | |
| W-Test - Table Value ..... | 0.8810 | NA |
| W-Test - Normal ..... | 0.8792 | NA |
| W-Test - Lognormal ..... | 0.9483 | NA |
| Type of Distribution ..... | LOGNORMAL | |

Test Results:

000045

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : NICKEL (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 15.3467 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 3.3000 | |
| Positive Hits - Maximum | 31.5000 | |
| Average Of Positive Hits | 15.3467 | |
| Standard Deviation | 7.6769 | |
| Upper Confidence Limit - Normal | 18.8373 | |
| Upper Confidence Limit - Lognormal | ~~23.3533~~ | |
| 95th Percentile - Nonparametric | 31.5000 | |
| 95th Percentile - Normal | 27.9752 | |
| 95th Percentile - Lognormal | 37.1609 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9779 | |
| Corr Coeff - Detected - Lognormal | 0.9419 | |
| Corr Coeff - Total - Normal | 0.9779 | |
| Corr Coeff - Total - Lognormal | 0.9419 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.9577 | NA |
| W-Test - Lognormal | 0.8900 | NA |
| Type of Distribution | NORMAL | |

Test Results:

00046

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : POTASSIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 13.0000 | |
| Average | 2435.0667 | |
| Detection Limit - Minimum | 411.0000 | |
| Detection Limits - Maximum | 435.0000 | |
| Positive Hits - Minimum | 1410.0000 | |
| Positive Hits - Maximum | 4020.0000 | |
| Average Of Positive Hits | 2744.6154 | |
| Standard Deviation | ~~1202.0905~~ | |
| Upper Confidence Limit - Normal | 2981.6437 ucl | |
| Upper Confidence Limit - Lognormal | ~~4141.5669~~ | |
| 95th Percentile - Nonparametric | 4020.0000 | |
| 95th Percentile - Normal | 4412.5055 | |
| 95th Percentile - Lognormal | 6668.3200 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9848 | |
| Corr Coeff - Detected - Lognormal | 0.9815 | |
| Corr Coeff - Total - Normal | 0.9805 | |
| Corr Coeff - Total - Lognormal | 0.9092 | |
| Corr Coeff - Crit Val - Detected | 0.9310 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.9398 | NA |
| W-Test - Lognormal | 0.8203 | NA |
| Type of Distribution | NORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : VANADIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 15.0000 | No samples |
| Number of Detects ..... | 15.0000 | |
| Average ..... | 35.2467 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 8.0000 | |
| Positive Hits - Maximum ..... | 62.2000 | |
| Average Of Positive Hits ..... | 35.2467 | |
| Standard Deviation ..... | ~~16.4931~~ | |
| Upper Confidence Limit - Normal ..... | 42.7459 UCL | |
| Upper Confidence Limit - Lognormal ... | ~~51.5855~~ | |
| 95th Percentile - Nonparametric..... | 62.2000 | |
| 95th Percentile - Normal..... | 62.3778 | |
| 95th Percentile - Lognormal ..... | 81.2752 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9931 | |
| Corr Coeff - Detected - Lognormal .... | 0.9588 | |
| Corr Coeff - Total - Normal ..... | 0.9931 | |
| Corr Coeff - Total - Lognormal ..... | 0.9588 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9370 | |
| Corr Coeff - Crit Val - Total ..... | 0.9370 | |
| W-Test - Table Value ..... | 0.8810 | NA |
| W-Test - Normal ..... | 0.9719 | NA |
| W-Test - Lognormal ..... | 0.9157 | NA |
| Type of Distribution ..... | NORMAL | |

Test Results:

000048

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : ZINC (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 97.7100 | |
| Detection Limit - Minimum | 5.1500 | |
| Detection Limits - Maximum | 5.1500 | |
| Positive Hits - Minimum | 17.3000 | |
| Positive Hits - Maximum | 292.0000 | |
| Average Of Positive Hits | 104.3214 | |
| Standard Deviation | 93.4722 | |
| Upper Confidence Limit - Normal | 140.2107 | |
| Upper Confidence Limit - Lognormal | 246.2815 ucl | |
| 95th Percentile - Nonparametric | 292.0000 | |
| 95th Percentile - Normal | 251.4718 | |
| 95th Percentile - Lognormal | 357.9302 | |

*Shapiro-Wilk and Probabilty Plot Results:*

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9090 | |
| Corr Coeff - Detected - Lognormal | 0.9684 | |
| Corr Coeff - Total - Normal | 0.8891 | |
| Corr Coeff - Total - Lognormal | 0.9575 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.7837 | NA |
| W-Test - Lognormal | 0.9243 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : ANTHRACENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 15.0000 | No samples |
| Number of Detects ..... | 8.0000 | |
| Average ..... | 207.2000 | |
| Detection Limit - Minimum ..... | 205.0000 | |
| Detection Limits - Maximum ..... | 315.0000 | |
| Positive Hits - Minimum ..... | 22.0000 | |
| Positive Hits - Maximum ..... | 400.0000 | |
| Average Of Positive Hits ..... | 159.1250 | |
| Standard Deviation ..... | ~~109.9618~~ | |
| Upper Confidence Limit - Normal ..... | 257.1983 UCL | |
| Upper Confidence Limit - Lognormal ... | 395.4510 | |
| 95th Percentile - Nonparametric..... | 400.0000 | |
| 95th Percentile - Normal..... | 388.0872 | |
| 95th Percentile - Lognormal ..... | 633.6863 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9574 | |
| Corr Coeff - Detected - Lognormal .... | 0.9907 | |
| Corr Coeff - Total - Normal ..... | 0.9817 | |
| Corr Coeff - Total - Lognormal ..... | 0.9153 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9050 | |
| Corr Coeff - Crit Val - Total ..... | 0.9370 | |
| W-Test - Table Value ..... | 0.8810 | NA |
| W-Test - Normal ..... | 0.9556 | NA |
| W-Test - Lognormal ..... | 0.8419 | NA |
| Type of Distribution ..... | NORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : BENZO(A)ANTHRACENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 727.5333 | |
| Detection Limit - Minimum | 205.0000 | |
| Detection Limits - Maximum | 205.0000 | |
| Positive Hits - Minimum | 63.0000 | |
| Positive Hits - Maximum | 3400.0000 | |
| Average Of Positive Hits | 764.8571 | |
| Standard Deviation | 1064.3559 | |
| Upper Confidence Limit - Normal | ~~1211.4834~~ | |
| Upper Confidence Limit - Lognormal | ~~2274.3398~~ uCL | |
| 95th Percentile - Nonparametric | 3400.0000 | |
| 95th Percentile - Normal | 2478.3987 | |
| 95th Percentile - Lognormal | 2631.8869 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8182 | |
| Corr Coeff - Detected - Lognormal | 0.9642 | |
| Corr Coeff - Total - Normal | 0.8140 | |
| Corr Coeff - Total - Lognormal | 0.9546 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.6662 | NA |
| W-Test - Lognormal | 0.8944 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : BENZO(A)PYRENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 12.0000 | |
| Average | 844.7333 | |
| Detection Limit - Minimum | 205.0000 | |
| Detection Limits - Maximum | 350.0000 | |
| Positive Hits - Minimum | 73.0000 | |
| Positive Hits - Maximum | 4400.0000 | |
| Average Of Positive Hits | 980.9167 | |
| Standard Deviation | 1285.0944 | |
| Upper Confidence Limit - Normal | ~~1429.0507~~ | |
| Upper Confidence Limit - Lognormal | 2691.2265 UCL | |
| 95th Percentile - Nonparametric | ~~4400.0000~~ | |
| 95th Percentile - Normal | 2958.7136 | |
| 95th Percentile - Lognormal | 3051.7641 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6874 | |
| Corr Coeff - Detected - Lognormal | 0.8843 | |
| Corr Coeff - Total - Normal | 0.8011 | |
| Corr Coeff - Total - Lognormal | 0.9555 | |
| Corr Coeff - Crit Val - Detected | 0.9260 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.6524 | NA |
| W-Test - Lognormal | 0.8972 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000052

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : BENZO(B)FLUORANTHENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 1085.6667 | |
| Detection Limit - Minimum | 205.0000 | |
| Detection Limits - Maximum | 205.0000 | |
| Positive Hits - Minimum | 140.0000 | |
| Positive Hits - Maximum | 4900.0000 | |
| Average Of Positive Hits | 1148.5714 | |
| Standard Deviation | 1644.2963 | |
| Upper Confidence Limit - Normal | 1833.3089 | |
| Upper Confidence Limit - Lognormal | 2901.0507 | |
| 95th Percentile - Nonparametric | 4900.0000 | |
| 95th Percentile - Normal | 3790.5340 | |
| 95th Percentile - Lognormal | 3615.9953 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7857 | |
| Corr Coeff - Detected - Lognormal | 0.9292 | |
| Corr Coeff - Total - Normal | 0.7845 | |
| Corr Coeff - Total - Lognormal | 0.9206 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.6160 | NA |
| W-Test - Lognormal | 0.8296 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

000053

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : BENZO(G,H,I)PERYLENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 12.0000 | |
| Average | 570.2000 | |
| Detection Limit - Minimum | 205.0000 | |
| Detection Limits - Maximum | 360.0000 | |
| Positive Hits - Minimum | 47.0000 | |
| Positive Hits - Maximum | 3500.0000 | |
| Average Of Positive Hits | 644.4167 | |
| Standard Deviation | 1004.6840 | |
| Upper Confidence Limit - Normal | 1027.0180 | |
| Upper Confidence Limit - Lognormal | 1708.8132 UCL | |
| 95th Percentile - Nonparametric | 3500.0000 | |
| 95th Percentile - Normal | 2222.9053 | |
| 95th Percentile - Lognormal | 1924.9480 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7035 | |
| Corr Coeff - Detected - Lognormal | 0.9023 | |
| Corr Coeff - Total - Normal | 0.7401 | |
| Corr Coeff - Total - Lognormal | 0.9550 | |
| Corr Coeff - Crit Val - Detected | 0.9260 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.5658 | NA |
| W-Test - Lognormal | 0.9017 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000054

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : BENZO(K)FLUORANTHENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 15.0000 | No samples |
| Number of Detects ..... | 8.0000 | |
| Average ..... | 689.0000 | |
| Detection Limit - Minimum ..... | 205.0000 | |
| Detection Limits - Maximum ..... | 2550.0000 | |
| Positive Hits - Minimum ..... | 120.0000 | |
| Positive Hits - Maximum ..... | 2100.0000 | |
| Average Of Positive Hits ..... | 777.5000 | |
| Standard Deviation ..... | 826.9743 | |
| Upper Confidence Limit - Normal ..... | ~~1065.0155~~ | |
| Upper Confidence Limit - Lognormal ... | 1382.3994 UCL | |
| 95th Percentile - Nonparametric..... | 2550.0000 | |
| 95th Percentile - Normal..... | 2049.3727 | |
| 95th Percentile - Lognormal ..... | 2088.5099 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.8272 | |
| Corr Coeff - Detected - Lognormal .... | 0.9287 | |
| Corr Coeff - Total - Normal ..... | 0.8148 | |
| Corr Coeff - Total - Lognormal ..... | 0.9338 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9050 | |
| Corr Coeff - Crit Val - Total ..... | 0.9370 | |
| W-Test - Table Value ..... | 0.8810 | NA |
| W-Test - Normal ..... | 0.6618 | NA |
| W-Test - Lognormal ..... | 0.8593 | NA |
| Type of Distribution ..... | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : BENZOIC ACID (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 15.0000 | No samples |
| Number of Detects ..... | 10.0000 | |
| Average ..... | 179.5333 | |
| Detection Limit - Minimum ..... | 215.0000 | |
| Detection Limits - Maximum ..... | 350.0000 | |
| Positive Hits - Minimum ..... | 61.0000 | |
| Positive Hits - Maximum ..... | 190.0000 | |
| Average Of Positive Hits ..... | 121.8000 | |
| Standard Deviation ..... | 97.6333 | |
| Upper Confidence Limit - Normal ..... | ~~223.9261~~ | |
| Upper Confidence Limit - Lognormal ... | 253.3049 > max hit | |
| 95th Percentile - Nonparametric..... | ~~350.0000~~ | |
| 95th Percentile - Normal..... | 340.1402 | |
| 95th Percentile - Lognormal ..... | 396.5684 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9630 | |
| Corr Coeff - Detected - Lognormal .... | 0.9776 | |
| Corr Coeff - Total - Normal ..... | 0.9647 | |
| Corr Coeff - Total - Lognormal ..... | 0.9842 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9170 | |
| Corr Coeff - Crit Val - Total ..... | 0.9370 | |
| W-Test - Table Value ..... | 0.8810 | NA |
| W-Test - Normal ..... | 0.9098 | NA |
| W-Test - Lognormal ..... | 0.9480 | NA |
| Type of Distribution ..... | LOGNORMAL ✓ | |

Test Results:

000056

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : CHRYSENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 1023.0000 | |
| Detection Limit - Minimum | 205.0000 | |
| Detection Limits - Maximum | 205.0000 | |
| Positive Hits - Minimum | 110.0000 | |
| Positive Hits - Maximum | 4300.0000 | |
| Average Of Positive Hits | 1081.4286 | |
| Standard Deviation | 1380.8458 | |
| Upper Confidence Limit - Normal | ~~1650.8543~~ | |
| Upper Confidence Limit - Lognormal | ~~2925.1263~~ UCL | |
| 95th Percentile - Nonparametric | 4300.0000 | |
| 95th Percentile - Normal | 3294.4913 | |
| 95th Percentile - Lognormal | 3670.4235 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8235 | |
| Corr Coeff - Detected - Lognormal | 0.9659 | |
| Corr Coeff - Total - Normal | 0.8261 | |
| Corr Coeff - Total - Lognormal | 0.9564 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.6816 | NA |
| W-Test - Lognormal | 0.8946 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000057

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : FLUORANTHENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 15.0000 | No samples |
| Number of Detects ..... | 14.0000 | |
| Average ..... | 1349.6667 | |
| Detection Limit - Minimum ..... | 205.0000 | |
| Detection Limits - Maximum ..... | 205.0000 | |
| Positive Hits - Minimum ..... | 100.0000 | |
| Positive Hits - Maximum ..... | 6900.0000 | |
| Average Of Positive Hits ..... | 1431.4286 | |
| Standard Deviation ..... | 2076.2023 | |
| Upper Confidence Limit - Normal ..... | ~~2293.6914~~ | |
| Upper Confidence Limit - Lognormal ... | 4787.3531 UCL | |
| 95th Percentile - Nonparametric..... | ~~6900.0000~~ | |
| 95th Percentile - Normal..... | 4765.0194 | |
| 95th Percentile - Lognormal ..... | 5034.8870 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.7950 | |
| Corr Coeff - Detected - Lognormal .... | 0.9554 | |
| Corr Coeff - Total - Normal ..... | 0.8051 | |
| Corr Coeff - Total - Lognormal ..... | 0.9473 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9340 | |
| Corr Coeff - Crit Val - Total ..... | 0.9370 | |
| W-Test - Table Value ..... | 0.8810 | NA |
| W-Test - Normal ..... | 0.6564 | NA |
| W-Test - Lognormal ..... | 0.8816 | NA |
| Type of Distribution ..... | LOGNORMAL ✓ | |

Test Results:

000058

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : INDENO(1,2,3-CD)PYRENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 599.0000 | |
| Detection Limit - Minimum | 205.0000 | |
| Detection Limits - Maximum | 205.0000 | |
| Positive Hits - Minimum | 49.0000 | |
| Positive Hits - Maximum | 3300.0000 | |
| Average Of Positive Hits | 627.1429 | |
| Standard Deviation | 976.1532 | |
| Upper Confidence Limit - Normal | ~~1042.8454~~ | |
| Upper Confidence Limit - Lognormal | 1945.0933 UCL | |
| 95th Percentile - Nonparametric | ~~3300.0000~~ | |
| 95th Percentile - Normal | 2204.7720 | |
| 95th Percentile - Lognormal | 2119.9355 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7883 | |
| Corr Coeff - Detected - Lognormal | 0.9603 | |
| Corr Coeff - Total - Normal | 0.7801 | |
| Corr Coeff - Total - Lognormal | 0.9493 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.6206 | NA |
| W-Test - Lognormal | 0.8868 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000039

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : PHENANTHRENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 13.0000 | |
| Average | 586.1333 | |
| Detection Limit - Minimum | 215.0000 | |
| Detection Limits - Maximum | 300.0000 | |
| Positive Hits - Minimum | 77.0000 | |
| Positive Hits - Maximum | 2300.0000 | |
| Average Of Positive Hits | 636.6923 | |
| Standard Deviation | 714.8461 | |
| Upper Confidence Limit - Normal | ~~911.1655~~ | |
| Upper Confidence Limit - Lognormal | 1327.5048 UCL | |
| 95th Percentile - Nonparametric | ~~2300.0000~~ | |
| 95th Percentile - Normal | 1762.0552 | |
| 95th Percentile - Lognormal | 1913.6642 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7981 | |
| Corr Coeff - Detected - Lognormal | 0.9508 | |
| Corr Coeff - Total - Normal | 0.8412 | |
| Corr Coeff - Total - Lognormal | 0.9614 | |
| Corr Coeff - Crit Val - Detected | 0.9310 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.7077 | NA |
| W-Test - Lognormal | 0.9105 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

Dataset: UTMP_RES
Media : SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2WC: AREA A WEAPONS CENTER

Parameter : PYRENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 1559.0000 | |
| Detection Limit - Minimum | 205.0000 | |
| Detection Limits - Maximum | 205.0000 | |
| Positive Hits - Minimum | 120.0000 | |
| Positive Hits - Maximum | 6900.0000 | |
| Average Of Positive Hits | 1655.7143 | |
| Standard Deviation | 2206.5489 | |
| Upper Confidence Limit - Normal | 2562.2918 | |
| Upper Confidence Limit - Lognormal | 5513.5769 UCL | |
| 95th Percentile - Nonparametric | 6900.0000 | |
| 95th Percentile - Normal | 5188.7729 | |
| 95th Percentile - Lognormal | 5950.9773 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8256 | |
| Corr Coeff - Detected - Lognormal | 0.9542 | |
| Corr Coeff - Total - Normal | 0.8308 | |
| Corr Coeff - Total - Lognormal | 0.9481 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.6899 | NA |
| W-Test - Lognormal | 0.8799 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** Site 2 – Area A Weapons Center
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/26/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Full–Time Employee (Surface Soil), CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 50 | IR: | 0 |
| EF: | 150 | EF: | 1 |
| Fi: | 0.5 | Fi: | 1 |
| ED: | 6 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 2190 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 1.47E–07 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 1.26E–08 |

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
Site 2 – Area A Weapons Center
EXPOSURE SCENARIO: Full–Time Employee (Surface Soil), CTE
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 0.68 | 1 | 0.00E+00 | 9.98E–08 | 8.55E–09 | | 7.30E–01 |
| Benzo(a)pyrene | 0.61 | 1 | 0.00E+00 | 8.95E–08 | 7.67E–09 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0.96 | 1 | 0.00E+00 | 1.41E–07 | 1.21E–08 | | 7.30E–01 |
| Dibenzo(a,h)anthracene | 0.27 | 1 | 0.00E+00 | 3.96E–08 | 3.40E–09 | | 7.30E+00 |
| Indeno(1,2,3–cd)pyrene | 0.38 | 1 | 0.00E+00 | 5.58E–08 | 4.78E–09 | | 7.30E–01 |
| ~~Aluminum~~ | ~~6690~~ | ~~1~~ | ~~0.00E+00~~ | ~~9.82E–04~~ | ~~8.42E–05~~ | ~~1.00E+00~~ | |
| Antimony | 5 | 1 | 0.00E+00 | 7.34E–07 | 6.29E–08 | 4.00E–04 | |
| Arsenic | 1.5 | 1 | 0.00E+00 | 2.20E–07 | 1.89E–08 | 3.00E–04 | 1.50E+00 |
| Beryllium | 0.28 | 1 | 0.00E+00 | 4.11E–08 | 3.52E–09 | 5.00E–03 | 4.30E+00 |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Iron~~ | ~~9110~~ | ~~1~~ | ~~0.00E+00~~ | ~~1.34E–03~~ | ~~1.15E–04~~ | ~~3.00E–01~~ | |
| Manganese | 172 | 1 | 0.00E+00 | 2.52E–05 | 2.16E–06 | ~~5.00E–03~~ 2.4E-2 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

000094

Revisions
08/19/96

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)**
**Site 2 – Area A Weapons Center**
**EXPOSURE SCENARIO: Full–Time Employee (Surface Soil), CTE**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)anthracene | 0.00E+00 | 0.00E+00 | 6.24E–09 |
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 5.60E–08 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 8.82E–09 |
| Dibenzo(a,h)anthracene | 0.00E+00 | 0.00E+00 | 2.48E–08 |
| Indeno(1,2,3–cd)pyrene | 0.00E+00 | 0.00E+00 | 3.49E–09 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~3.82E–04~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 1.83E–03 | 0.00E+00 |
| Arsenic | 0.00E+00 | 7.34E–04 | 2.83E–08 |
| Beryllium | 0.00E+00 | 8.22E–06 | 1.51E–08 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~4.46E–03~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~5.05E–03~~ 1.05E-3 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~**1.31E–02**~~ 3.62E-3 | **1.43E–07** |

Revisions
08/19/96
KMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** Site 2 – Area A Weapons Center
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/26/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Full–Time Employee (Surface Soil), RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 100 | IR: | 0 |
| EF: | 150 | EF: | 1 |
| Fi: | 1 | Fi: | 1 |
| ED: | 25 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 9125 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 5.87E–07 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 2.10E–07 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)**
**Site 2 – Area A Weapons Center**
**EXPOSURE SCENARIO: Full–Time Employee (Surface Soil), RME**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 2.1 | 1 | 0.00E+00 | 1.23E–06 | 4.40E–07 | | 7.30E–01 |
| Benzo(a)pyrene | 1.8 | 1 | 0.00E+00 | 1.06E–06 | 3.77E–07 | | 7.30E+00 |
| Benzo(b)fluoranthene | 3.2 | 1 | 0.00E+00 | 1.88E–06 | 6.71E–07 | | 7.30E–01 |
| Dibenzo(a,h)anthracene | 0.57 | 1 | 0.00E+00 | 3.35E–07 | 1.20E–07 | | 7.30E+00 |
| Indeno(1,2,3–cd)pyrene | 1 | 1 | 0.00E+00 | 5.87E–07 | 2.10E–07 | | 7.30E–01 |
| ~~Aluminum~~ | ~~9560~~ | ~~1~~ | ~~0.00E+00~~ | ~~5.61E–03~~ | ~~2.00E–03~~ | ~~1.00E+00~~ | |
| Antimony | 5.4 | 1 | 0.00E+00 | 3.17E–06 | 1.13E–06 | 4.00E–04 | |
| Arsenic | 3.5 | 1 | 0.00E+00 | 2.05E–06 | 7.34E–07 | 3.00E–04 | 1.50E+00 |
| Beryllium | 0.48 | 1 | 0.00E+00 | 2.82E–07 | 1.01E–07 | 5.00E–03 | 4.30E+00 |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Iron~~ | ~~10800~~ | ~~1~~ | ~~0.00E+00~~ | ~~6.34E–03~~ | ~~2.26E–03~~ | ~~3.00E–01~~ | |
| Manganese | 257 | 1 | 0.00E+00 | 1.51E–04 | 5.39E–05 | ~~5.00E–03~~ 2.4E-2 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
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| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

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**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)**
**Site 2 – Area A Weapons Center**
**EXPOSURE SCENARIO: Full-Time Employee (Surface Soil), RME**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)anthracene | 0.00E+00 | 0.00E+00 | 3.21E-07 |
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 2.76E-06 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 4.90E-07 |
| Dibenzo(a,h)anthracene | 0.00E+00 | 0.00E+00 | 8.72E-07 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 1.53E-07 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~5.61E-03~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 7.93E-03 | 0.00E+00 |
| Arsenic | 0.00E+00 | 6.85E-03 | 1.10E-06 |
| Beryllium | 0.00E+00 | 5.64E-05 | 4.33E-07 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~2.11E-02~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~3.02E-02~~ 6.29E-3 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~7.18E-02~~ 2.11E-2 | **6.13E-06** |

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Revisions
08/19/96
-SMS

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**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** Site 2 – Area A Weapons Center
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/26/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker (All Soil), CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 240 | IR: | 0 |
| EF: | 80 | EF: | 1 |
| Fi: | 0.5 | Fi: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 3.76E–07 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 5.37E–09 |

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
Site 2 – Area A Weapons Center
EXPOSURE SCENARIO: Construction Worker (All Soil), CTE
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 0.39 | 1 | 0.00E+00 | 1.47E−07 | 2.09E−09 | | 7.30E−01 |
| Benzo(a)pyrene | 0.35 | 1 | 0.00E+00 | 1.32E−07 | 1.88E−09 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0.55 | 1 | 0.00E+00 | 2.07E−07 | 2.95E−09 | | 7.30E−01 |
| Dibenzo(a,h)anthracene | 0.23 | 1 | 0.00E+00 | 8.64E−08 | 1.23E−09 | | 7.30E+00 |
| Indeno(1,2,3−cd)pyrene | 0.25 | 1 | 0.00E+00 | 9.39E−08 | 1.34E−09 | | 7.30E−01 |
| ~~Aluminum~~ | ~~11300~~ | ~~1~~ | ~~0.00E+00~~ | ~~4.25E−08~~ | ~~6.07E−05~~ | ~~1.00E+00~~ | |
| Antimony | 5.4 | 1 | 0.00E+00 | 2.03E−06 | 2.90E−08 | 4.00E−04 | |
| Arsenic | 4.7 | 1 | 0.00E+00 | 1.77E−06 | 2.52E−08 | 3.00E−04 | 1.50E+00 |
| Beryllium | 0.44 | 1 | 0.00E+00 | 1.65E−07 | 2.36E−09 | 5.00E−03 | 4.30E+00 |
| Chromium | 30.7 | 1 | 0.00E+00 | 1.15E−05 | 1.65E−07 | 5.00E−03 | |
| ~~Iron~~ | ~~16500~~ | ~~1~~ | ~~0.00E+00~~ | ~~6.20E−03~~ | ~~8.86E−05~~ | ~~3.00E−01~~ | |
| Manganese | 211 | 1 | 0.00E+00 | 7.93E−05 | 1.13E−06 | ~~5.00E−03~~ 2.4E-2 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
08/19/96

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)**
**Site 2 – Area A Weapons Center**
**EXPOSURE SCENARIO: Construction Worker (All Soil), CTE**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)anthracene | 0.00E+00 | 0.00E+00 | 1.53E−09 |
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 1.37E−08 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 2.16E−09 |
| Dibenzo(a,h)anthracene | 0.00E+00 | 0.00E+00 | 9.01E−09 |
| Indeno(1,2,3−cd)pyrene | 0.00E+00 | 0.00E+00 | 9.80E−10 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~4.25E−03~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 5.07E−03 | 0.00E+00 |
| Arsenic | 0.00E+00 | 5.89E−03 | 3.78E−08 |
| Beryllium | 0.00E+00 | 3.31E−05 | 1.02E−08 |
| Chromium | 0.00E+00 | 2.31E−03 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~2.07E−02~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~1.59E−02~~ 3.31E-3 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~5.41E−02~~ 1.66E-2 | **7.54E−08** |

Revisions
08/19/96
KMS

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: Site 2 – Area A Weapons Center
LOCATION: NSB–NLON, Groton, CT
DATE: 12/26/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: Construction Worker, CTE

REFERENCES: , EPA, DECEMBER 1989 AND JANUARY 1992

DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE: DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE: Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY–STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

| | |
|---|---|
| EV: | 1 |
| ED: | 1 |
| EF: | 80 |
| A: | 3800 |
| tevent: | 8 |
| BW: | 70 |
| AT(NON): | 365 |
| AT(CAR): | 25550 |

CONVERSION FACTOR (NONCAR) = 1.19E+01

CONVERSION FACTOR (CARCIN) = 1.70E–01

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
Site 2 – Area A Weapons Center
EXPOSURE SCENARIO: Construction Worker, CTE

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| 1,2-Dichloroethane | 0.003 | O | 8.40E-01 | 3.50E-01 | 5.30E-03 | 3.00E-03 | 1.38E-07 |
| 1,1,2-Trichloroethane | 0.003 | O | 1.40E+00 | 5.70E-01 | 8.40E-03 | 1.10E-02 | 2.29E-07 |
| Trichloroethene | 0.003 | O | 1.30E+00 | 5.50E-01 | 1.60E-02 | 2.60E-02 | 4.30E-07 |
| Dibenzo(a,h)anthracene | 0.003 | O | 2.10E+01 | 4.40E+00 | 2.70E+00 | 5.90E+02 | 1.33E-04 |
| Indeno(1,2,3-cd)pyrene | 0.003 | O | 2.00E+01 | 4.20E+00 | 1.90E+00 | 3.80E+02 | 9.13E-05 |
| ~~Aluminum~~ | ~~2.66~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~2.13E-05~~ |
| Antimony | 0.009 | I | | | 1.00E-03 | | 7.20E-08 |
| Arsenic | 0.0073 | I | | | 1.00E-03 | | 5.84E-08 |
| Beryllium | 0.00082 | I | | | 1.00E-03 | | 6.56E-09 |
| Boron | 1.14 | I | | | 1.00E-03 | | 9.12E-06 |
| Chromium | 0.0083 | I | | | 2.00E-03 | | 1.33E-07 |
| ~~Iron~~ | ~~26.7~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~2.14E-04~~ |
| Manganese | 3.42 | I | | | 1.00E-03 | | 2.74E-05 |
| Thallium | 0.0045 | I | | | 1.00E-03 | | 3.60E-08 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
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| | | | | | | | 0.00E+00 |

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Revisions
08/19/96
KLS

**RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER WATER (PAGE THREE)**
**Site 2 – Area A Weapons Center**
EXPOSURE SCENARIO: Construction Worker, CTE
*CALCULATE DOSES:*

| CHEMICAL | ANNUAL DERMAL DOSE (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX DERMAL |
|---|---|---|---|
| 1,2-Dichloroethane | 1.64E-06 | | 0.00E+00 |
| 1,1,2-Trichloroethane | 2.72E-06 | 4.00E-03 | 6.80E-04 |
| Trichloroethene | 5.11E-06 | 6.00E-03 | 8.52E-04 |
| Dibenzo(a,h)anthracene | 1.58E-03 | | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 1.09E-03 | | 0.00E+00 |
| ~~Aluminum~~ | ~~2.53E-04~~ | ~~5.00E-02~~ | ~~5.06E-03~~ |
| Antimony | 8.57E-07 | 4.00E-04 | 2.14E-03 |
| Arsenic | 6.95E-07 | 2.80E-04 | 2.48E-03 |
| Beryllium | 7.81E-08 | 2.50E-04 | 3.12E-04 |
| Boron | 1.09E-04 | 4.50E-03 | 2.41E-02 |
| Chromium | 1.58E-06 | 1.00E-04 | 1.58E-02 |
| ~~Iron~~ | ~~2.54E-03~~ | ~~1.50E-02~~ | ~~1.69E-01~~ |
| Manganese | 3.26E-04 | ~~1.50E-04~~ 7.2E-4 | ~~2.17E+00~~ 4.52E-1 |
| Thallium | 4.28E-07 | 4.00E-06 | 1.07E-01 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
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| 0 | 0.00E+00 | | 0.00E+00 |
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| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| TOTAL RISK | | | ~~2.50E+00~~ 6.05E-1 |

Revisions
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RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE FOUR)
Site 2 – Area A Weapons Center
EXPOSURE SCENARIO: Construction Worker, CTE
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF DERMAL (KG/DAY/MG) | CANCER RISK DERMAL CONTACT |
|---|---|---|---|
| 1,2-Dichloroethane | 2.35E-08 | 9.10E-02 | 2.13E-09 |
| 1,1,2-Trichloroethane | 3.89E-08 | 5.70E-02 | 2.22E-09 |
| Trichloroethene | 7.30E-08 | 1.10E-02 | 8.04E-10 |
| Dibenzo(a,h)anthracene | 2.28E-05 | | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 1.55E-05 | | 0.00E+00 |
| ~~Aluminum~~ | ~~3.62E-06~~ | | ~~0.00E+00~~ |
| Antimony | 1.22E-08 | | 0.00E+00 |
| Arsenic | 9.93E-09 | 1.60E+00 | 1.59E-08 |
| Beryllium | 1.12E-09 | 8.60E+01 | 9.59E-08 |
| Boron | 1.55E-06 | | 0.00E+00 |
| Chromium | 2.28E-08 | | 0.00E+00 |
| ~~Iron~~ | ~~3.63E-05~~ | | ~~0.00E+00~~ |
| Manganese | 4.65E-06 | | 0.00E+00 |
| Thallium | 6.12E-09 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| TOTAL RISK | | | 1.17E-07 |

Revisions
8/19/96
KAS

00078

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** Site 2 – Area A Weapons Center
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 12/26/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker (All Soil), RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 480 | IR: | 0 |
| EF: | 120 | EF: | 1 |
| Fi: | 1 | Fi: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 2.25E-06 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 3.22E-08 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)**
**Site 2 – Area A Weapons Center**
**EXPOSURE SCENARIO: Construction Worker (All Soil), RME**
*CALCULATE DOSES:*

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 2.1 | 1 | 0.00E+00 | 4.73E−06 | 6.76E−08 | | 7.30E−01 |
| Benzo(a)pyrene | 1.8 | 1 | 0.00E+00 | 4.06E−06 | 5.80E−08 | | 7.30E+00 |
| Benzo(b)fluoranthene | 3.2 | 1 | 0.00E+00 | 7.21E−06 | 1.03E−07 | | 7.30E−01 |
| Dibenzo(a,h)anthracene | 0.57 | 1 | 0.00E+00 | 1.29E−06 | 1.84E−08 | | 7.30E+00 |
| Indeno(1,2,3−cd)pyrene | 1 | 1 | 0.00E+00 | 2.25E−06 | 3.22E−08 | | 7.30E−01 |
| ~~Aluminum~~ | ~~18200~~ | ~~1~~ | ~~0.00E+00~~ | ~~4.10E−02~~ | ~~5.86E−04~~ | ~~1.00E+00~~ | |
| Antimony | 5.4 | 1 | 0.00E+00 | 1.22E−05 | 1.74E−07 | 4.00E−04 | |
| Arsenic | 10.8 | 1 | 0.00E+00 | 2.43E−05 | 3.48E−07 | 3.00E−04 | 1.50E+00 |
| Beryllium | 0.68 | 1 | 0.00E+00 | 1.53E−06 | 2.19E−08 | 5.00E−03 | 4.30E+00 |
| Chromium | 78.7 | 1 | 0.00E+00 | 1.77E−04 | 2.53E−06 | 5.00E−03 | |
| ~~Iron~~ | ~~28600~~ | ~~1~~ | ~~0.00E+00~~ | ~~0.45E−02~~ | ~~9.21E−04~~ | ~~3.00E−01~~ | |
| Manganese | 390 | 1 | 0.00E+00 | 8.79E−04 | 1.26E−05 | ~~5.00E−03~~ 2.4E-2 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |



Revisions
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**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)**
**Site 2 – Area A Weapons Center**
**EXPOSURE SCENARIO: Construction Worker (All Soil), RME**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)anthracene | 0.00E+00 | 0.00E+00 | 4.94E-08 |
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 4.23E-07 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 7.52E-08 |
| Dibenzo(a,h)anthracene | 0.00E+00 | 0.00E+00 | 1.34E-07 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 2.35E-08 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~4.10E-02~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 3.04E-02 | 0.00E+00 |
| Arsenic | 0.00E+00 | 8.12E-02 | 5.22E-07 |
| Beryllium | 0.00E+00 | 3.07E-04 | 9.42E-08 |
| Chromium | 0.00E+00 | 3.55E-02 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~2.15E-01~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~1.76E-01~~ 3.67E-2 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~**5.79E-01**~~ 1.84E-1 | **1.32E-06** |

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RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: Site 2 – Area A Weapons Center
LOCATION: NSB–NLON, Groton, CT
DATE: 12/26/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: **Construction Worker, RME**

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE: DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE: Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY–STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

| | | |
|---|---|---|
| EV: | 1 | CONVERSION |
| ED: | 1 | FACTOR (NONCAR) = 1.78E+01 |
| EF: | 120 | |
| A: | 3800 | CONVERSION |
| tevent: | 8 | FACTOR (CARCIN) = 2.55E–01 |
| BW: | 70 | |
| AT(NON): | 365 | |
| AT(CAR): | 25550 | |

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
Site 2 – Area A Weapons Center
EXPOSURE SCENARIO: Construction Worker, RME

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| 1,2-Dichloroethane | 0.003 | O | 8.40E-01 | 3.50E-01 | 5.30E-03 | 3.00E-03 | 1.38E-07 |
| 1,1,2-Trichloroethane | 0.003 | O | 1.40E+00 | 5.70E-01 | 8.40E-03 | 1.10E-02 | 2.29E-07 |
| Trichloroethene | 0.003 | O | 1.30E+00 | 5.50E-01 | 1.60E-02 | 2.60E-02 | 4.30E-07 |
| Dibenzo(a,h)anthracene | 0.003 | O | 2.10E+01 | 4.40E+00 | 2.70E+00 | 5.90E+02 | 1.33E-04 |
| Indeno(1,2,3-cd)pyrene | 0.003 | O | 2.00E+01 | 4.20E+00 | 1.90E+00 | 3.80E+02 | 9.13E-05 |
| ~~Aluminum~~ | ~~8.77~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~7.02E-05~~ |
| Antimony | 0.0117 | I | | | 1.00E-03 | | 9.36E-08 |
| Arsenic | 0.0159 | I | | | 1.00E-03 | | 1.27E-07 |
| Beryllium | 0.0012 | I | | | 1.00E-03 | | 9.60E-09 |
| Boron | 2.46 | I | | | 1.00E-03 | | 1.97E-05 |
| Chromium | 0.0232 | I | | | 2.00E-03 | | 3.71E-07 |
| ~~Iron~~ | ~~55.6~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~4.45E-04~~ |
| Manganese | 5.07 | I | | | 1.00E-03 | | 4.06E-05 |
| Thallium | 0.0082 | I | | | 1.00E-03 | | 6.56E-08 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
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RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER WATER (PAGE THREE)
Site 2 – Area A Weapons Center
EXPOSURE SCENARIO: Construction Worker, RME
CALCULATE DOSES:

| CHEMICAL | ANNUAL DERMAL DOSE (MG/KG/DAY) | DERMAL RID (MG/KG/DAY) | HAZARD INDEX DERMAL |
|---|---|---|---|
| 1,2-Dichloroethane | 2.46E-06 | | 0.00E+00 |
| 1,1,2-Trichloroethane | 4.08E-06 | 4.00E-03 | 1.02E-03 |
| Trichloroethene | 7.67E-06 | 6.00E-03 | 1.28E-03 |
| Dibenzo(a,h)anthracene | 2.37E-03 | | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 1.63E-03 | | 0.00E+00 |
| ~~Aluminum~~ | ~~1.25E-03~~ | ~~5.00E-02~~ | ~~2.50E-02~~ |
| Antimony | 1.67E-06 | 4.00E-04 | 4.18E-03 |
| Arsenic | 2.27E-06 | 2.80E-04 | 8.11E-03 |
| Beryllium | 1.71E-07 | 2.50E-04 | 6.85E-04 |
| Boron | 3.51E-04 | 4.50E-03 | 7.81E-02 |
| Chromium | 6.62E-06 | 1.00E-04 | 6.62E-02 |
| ~~Iron~~ | ~~7.94E-06~~ | ~~1.50E-02~~ | ~~5.29E-01~~ |
| Manganese | 7.24E-04 | ~~4.50E-04~~ 7.2E-4 | ~~1.93E+00~~ 1.01E+0 |
| Thallium | 1.17E-06 | 4.00E-06 | 2.93E-01 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| TOTAL RISK | | | ~~5.88E+00~~ 1.46E+0 |

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08/19/96
AMS

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE FOUR)
*Site 2 – Area A Weapons Center*
EXPOSURE SCENARIO: Construction Worker, RME
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF DERMAL (KG/DAY/MG) | CANCER RISK DERMAL CONTACT |
|---|---|---|---|
| 1,2-Dichloroethane | 3.52E-08 | 9.10E-02 | 3.20E-09 |
| 1,1,2-Trichloroethane | 5.83E-08 | 5.70E-02 | 3.32E-09 |
| Trichloroethene | 1.10E-07 | 1.10E-02 | 1.21E-09 |
| Dibenzo(a,h)anthracene | 3.39E-05 | | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 2.33E-05 | | 0.00E+00 |
| ~~Aluminum~~ | ~~1.70E-05~~ | | ~~0.00E+00~~ |
| Antimony | 2.39E-08 | | 0.00E+00 |
| Arsenic | 3.24E-08 | 1.60E+00 | 5.19E-08 |
| Beryllium | 2.45E-09 | 8.60E+01 | 2.10E-07 |
| Boron | 5.02E-08 | | 0.00E+00 |
| Chromium | 9.46E-08 | | 0.00E+00 |
| ~~Iron~~ | ~~1.13E-04~~ | | ~~0.00E+00~~ |
| Manganese | 1.03E-05 | | 0.00E+00 |
| Thallium | 1.67E-08 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** Site 2 – Area A Weapons Center
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 12/26/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS FOR RESIDENTS ARE CALCULATED BY THIS SPREADSHEET USING AGE-ADJUSTED EXPOSURE FACTORS. EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED. ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Future Resident (Adult/Child) (All Soil), CTE**

RELEVANT EQUATIONS: IEX = (C x IFadj x FI x BIO x EF)/(AT x CF) IFadj = (IRc x EDc)/BWc + (IRa x EDa)/BWa

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IFadj = AGE-ADJUSTED SOIL INGESTION FACTOR (MG YEAR/KG DAY)
FI = FRACTION FROM CONTAMINATED SOURCE (UNITLESS)
BIO = BIOAVAILABILITY (UNITLESS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
AT = AVERAGING TIME (DAYS)
CF = CONVERSION FACTOR (1E+6 MG/KG)
IRc = CHILD INGESTION RATE (MG/DAY)
EDc = CHILD EXPOSURE DURATION (YEARS)
BWc = CHILD BODY WEIGHT (KG)
IRa = ADULT INGESTION RATE (MG/DAY)
EDa = ADULT EXPOSURE DURATION (YEARS)
BWa = ADULT BODY WEIGHT (KG)

ENTER INPUT PARAMETERS:

| | |
|---|---|
| IRc: | 100 |
| EDc: | 2 |
| BWc: | 15 |
| IRa: | 50 |
| EDa: | 7 |
| BWa: | 70 |
| IFadj: | 18.33333 |
| FI: | 0.5 |
| EF: | 150 |
| AT(NONC): | 3285 |
| AT(CARC): | 25550 |

DETERMINE CONVERSION FACTORS:

NONCARC = 4.2E-07 CARCIN = 5.4E-08

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RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
Site 2 – Area A Weapons Center
EXPOSURE SCENARIO: Future Resident (Adult/Child) (All Soil), CTE

| CHEMICAL | C (MG/KG) | BIOAVAILABILITY | ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG/DAY/MG) | HAZARD INDEX | INCREMENTAL CANCER RISK |
|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 0.39 | 1 | 1.63E−07 | 2.10E−08 | | 7.30E−01 | 0.00E+00 | 1.53E−08 |
| Benzo(a)pyrene | 0.35 | 1 | 1.46E−07 | 1.88E−08 | | 7.30E+00 | 0.00E+00 | 1.38E−07 |
| Benzo(b)fluoranthene | 0.55 | 1 | 2.30E−07 | 2.96E−08 | | 7.30E−01 | 0.00E+00 | 2.16E−08 |
| Dibenzo(a,h)anthracene | 0.23 | 1 | 9.63E−08 | 1.24E−08 | | 7.30E+00 | 0.00E+00 | 9.04E−08 |
| Indeno(1,2,3−cd)pyrene | 0.25 | 1 | 1.05E−07 | 1.35E−08 | | 7.30E−01 | 0.00E+00 | 9.82E−09 |
| ~~Aluminum~~ | ~~11300~~ | ~~1~~ | ~~4.78E−03~~ | ~~6.08E−04~~ | ~~1.00E+00~~ | | ~~4.73E−03~~ | ~~0.00E+00~~ |
| Antimony | 5.4 | 1 | 2.26E−06 | 2.91E−07 | 4.00E−04 | | 5.65E−03 | 0.00E+00 |
| Arsenic | 4.7 | 1 | 1.97E−06 | 2.53E−07 | 3.00E−04 | 1.50E+00 | 6.56E−03 | 3.79E−07 |
| Beryllium | 0.44 | 1 | 1.84E−07 | 2.37E−08 | 5.00E−03 | 4.30E+00 | 3.68E−05 | 1.02E−07 |
| Chromium | 30.7 | 1 | 1.29E−05 | 1.65E−06 | 5.00E−03 | | 2.57E−03 | 0.00E+00 |
| ~~Iron~~ | ~~16500~~ | ~~1~~ | ~~6.91E−03~~ | ~~8.88E−04~~ | ~~3.00E−01~~ | | ~~2.30E−02~~ | ~~0.00E+00~~ |
| Manganese | 211 | 1 | 8.83E−05 | 1.14E−05 | ~~5.00E−03~~ 2.4E-2 | | ~~1.77E−02~~ 3.69E-3 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | | | ~~6.02E−02~~ 1.05E-2 | 7.56E−07 |

Revisions
3/19/96
JMS

RISK ASSESSMENT SPREADSHEET – EXPOSURES THROUGH HOUSEHOLD USE OF GROUNDWATER

SITE NAME: Site 2 – Area A Weapons Center
LOCATION: NSB–NLON, Groton, CT
DATE: 12/26/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS. THREE EXPOSURE ROUTES ARE CONSIDERED: INGESTION OF GROUNDWATER, DERMAL CONTACT WHILE SHOWERING/BATHING, AND INHALATION OF VOLATILES WHILE SHOWERING/BATHING. ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: Future Resident (Adult/Child), CTE

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

INGESTION: IEX = (C x IR x EF x ED)/(BW x AT)

WHERE:
C = GROUNDWATER CONCENTRATION (MG/L)
IR = INGESTION RATE (LITERS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

INHALATION: ADDRESSED QUALITATIVELY; INHALATION RISK ASSOCIATED WITH VOCS IS ASSUMED TO BE EQUAL TO INGESTION RISK FOR VOCS.

DERMAL CONTACT: DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS:
IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1 L/1000 CM**3)
t* = TIME IT TAKES TO REACH STEADY–STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

INGESTION:

| | | | |
|---|---|---|---|
| IR: | 1.4 | CONVERSION FACTOR (NONCAR) = | 1.28E–02 |
| EF: | 234 | | |
| ED: | 9 | | |
| BW: | 70 | CONVERSION FACTOR (CARCIN) = | 1.65E–03 |
| AT(NON): | 3285 | | |
| AT(CAR): | 25550 | | |

DERMAL CONTACT:

| | | | |
|---|---|---|---|
| EV: | 1 | CONVERSION FACTOR (NONCAR) = | 1.63E+02 |
| ED: | 9 | | |
| EF: | 234 | | |
| A: | 20000 | CONVERSION FACTOR (CARCIN) = | 2.36E+01 |
| tevent: | 0.166667 | | |
| BW: | 70 | | |
| AT(NON): | 3285 | | |
| AT(CAR): | 25550 | | |

RISK ASSESSMENT SPREADSHEET – HOUSEHOLD USE OF GROUNDWATER (PAGE TWO)
Site 2 – Area A Weapons Center
EXPOSURE SCENARIO: Future Resident (Adult/Child), CTE

| CHEMICAL | GW CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| 1,2-Dichloroethane | 0.003 | O | 6.40E-01 | 3.50E-01 | 5.30E-03 | 3.00E-03 | 1.06E-08 |
| 1,1,2-Trichloroethane | 0.003 | O | 1.40E+00 | 5.70E-01 | 8.40E-03 | 1.10E-02 | 2.15E-08 |
| Trichloroethene | 0.003 | O | 1.30E+00 | 5.50E-01 | 1.60E-02 | 2.60E-02 | 4.02E-08 |
| Dibenzo(a,h)anthracene | 0.003 | O | 2.10E+01 | 4.40E+00 | 2.70E+00 | 6.90E+02 | 1.92E-05 |
| Indeno(1,2,3-cd)pyrene | 0.003 | O | 2.00E+01 | 4.20E+00 | 1.90E+00 | 3.80E+02 | 1.32E-05 |
| ~~Aluminum~~ | ~~2.88~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~4.48E-07~~ |
| Antimony | 0.009 | I | | | 1.00E-03 | | 1.50E-09 |
| Arsenic | 0.0073 | I | | | 1.00E-03 | | 1.22E-09 |
| Berillium | 0.00082 | I | | | 1.00E-03 | | 1.37E-10 |
| Boron | 1.14 | I | | | 1.00E-03 | | 1.90E-07 |
| Chromium | 0.0083 | I | | | 2.00E-03 | | 2.77E-09 |
| ~~Iron~~ | ~~26.7~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~4.45E-06~~ |
| Manganese | 3.42 | I | | | 1.00E-03 | | 5.70E-07 |
| Thallium | 0.0045 | I | | | 1.00E-03 | | 7.50E-10 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
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| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |



Revisions
08/19/96

**RISK ASSESSMENT SPREADSHEET – HOUSEHOLD USE OF GROUNDWATER (PAGE THREE)**
**Site 2 – Area A Weapons Center**
**EXPOSURE SCENARIO: Future Resident (Adult/Child), CTE**
**CALCULATE DOSES:**

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | HAZARD INDEX INHALATION | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|---|
| 1,2-Dichloroethane | 3.85E-05 | 1.94E-08 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,1,2-Trichloroethane | 3.85E-05 | 3.93E-06 | 4.00E-03 | 4.00E-03 | 9.62E-03 | 9.83E-04 | 9.62E-03 | 2.02E-02 |
| Trichloroethene | 3.85E-05 | 7.38E-06 | 6.00E-03 | 6.00E-03 | 6.41E-03 | 1.23E-03 | 6.41E-03 | 1.40E-02 |
| Dibenzo(a,h)anthracene | 3.85E-05 | 3.51E-03 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 3.85E-05 | 2.41E-03 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~3.41E-02~~ | ~~8.12E-05~~ | ~~1.00E+00~~ | ~~5.00E-02~~ | ~~3.41E-02~~ | ~~1.62E-03~~ | ~~0.00E+00~~ | ~~3.57E-02~~ |
| Antimony | 1.15E-04 | 2.75E-07 | 4.00E-04 | 4.00E-04 | 2.88E-01 | 6.87E-04 | 0.00E+00 | 2.89E-01 |
| Arsenic | 9.36E-05 | 2.23E-07 | 3.00E-04 | 2.80E-04 | 3.12E-01 | 7.96E-04 | 0.00E+00 | 3.13E-01 |
| Berillium | 1.05E-05 | 2.50E-08 | 5.00E-03 | 2.50E-04 | 2.10E-03 | 1.00E-04 | 0.00E+00 | 2.20E-03 |
| Boron | 1.46E-02 | 3.48E-05 | 9.00E-02 | 4.50E-03 | 1.62E-01 | 7.73E-03 | 0.00E+00 | 1.70E-01 |
| Chromium | 1.06E-04 | 5.07E-07 | 5.00E-03 | 1.00E-04 | 2.13E-02 | 5.07E-03 | 0.00E+00 | 2.64E-02 |
| ~~Iron~~ | ~~3.42E-01~~ | ~~8.15E-04~~ | ~~3.00E-01~~ | ~~1.50E-02~~ | ~~1.14E+00~~ | ~~5.43E-02~~ | ~~0.00E+00~~ | ~~1.20E+00~~ |
| Manganese | 4.39E-02 | 1.04E-04 | ~~5.00E-03~~ 2.4E-2 | ~~1.50E-04~~ 7.2E-4 | ~~8.77E+00~~ 1.83E+0 | ~~8.98E-01~~ 1.45E-1 | 0.00E+00 | ~~9.47E+00~~ 1.98E+0 |
| Thallium | 5.77E-05 | 1.37E-07 | 8.00E-05 | 4.00E-06 | 7.21E-01 | 3.43E-02 | 0.00E+00 | 7.56E-01 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | ~~1.15E+01~~ 3.35E+0 | ~~8.03E-01~~ 1.96E-1 | 1.60E-02 | ~~1.20E+01~~ 3.57E+0 |

00091

Revisions
08/19/96

RISK ASSESSMENT SPREADSHEET – HOUSEHOLD USE OF GROUNDWATER (PAGE FOUR)
Site 2 – Area A Weapons Center
EXPOSURE SCENARIO: Future Resident (Adult/Child), CTE
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | CANCER RISK INHALATION | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|---|
| 1,2-Dichloroethane | 4.95E-06 | 2.50E-07 | 9.10E-02 | 9.10E-02 | 4.50E-07 | 2.27E-08 | 4.50E-07 | 9.23E-07 |
| 1,1,2-Trichloroethane | 4.95E-06 | 5.06E-07 | 5.70E-02 | 5.70E-02 | 2.82E-07 | 2.88E-08 | 2.82E-07 | 5.93E-07 |
| Trichloroethene | 4.95E-06 | 9.48E-07 | 1.10E-02 | 1.10E-02 | 5.44E-08 | 1.04E-08 | 5.44E-08 | 1.19E-07 |
| Dibenzo(a,h)anthracene | 4.95E-06 | 4.52E-04 | 7.30E+00 | | 3.61E-05 | 0.00E+00 | 0.00E+00 | 3.61E-05 |
| Indeno(1,2,3-cd)pyrene | 4.95E-06 | 3.10E-04 | 7.30E-01 | | 3.61E-06 | 0.00E+00 | 0.00E+00 | 3.61E-06 |
| ~~Aluminum~~ | ~~4.39E-03~~ | ~~1.04E-05~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 1.48E-05 | 3.53E-06 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 1.20E-05 | 2.87E-08 | 1.50E+00 | 1.60E+00 | 1.81E-05 | 4.58E-08 | 0.00E+00 | 1.81E-05 |
| Berllium | 1.35E-06 | 3.22E-09 | 4.30E+00 | 8.60E+01 | 5.81E-06 | 2.77E-07 | 0.00E+00 | 6.09E-06 |
| Boron | 1.88E-03 | 4.47E-06 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Chromium | 1.37E-05 | 6.52E-08 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~4.49E-02~~ | ~~1.05E-04~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | 5.64E-03 | 1.34E-05 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Thallium | 7.42E-06 | 1.77E-08 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | 6.44E-05 | 3.85E-07 | 7.86E-07 | 6.55E-05 |

Revisions
08/19/96

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** Site 2 – Area A Weapons Center
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 12/26/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS FOR RESIDENTS ARE CALCULATED BY THIS SPREADSHEET USING AGE-ADJUSTED EXPOSURE FACTORS. EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED. ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Future Resident (Adult/Child) (All Soil), RME**

RELEVANT EQUATIONS: IEX = (C x IFadj x Fi x BIO x EF)/(AT x CF) IFadj = (IRc x EDc)/BWc + (IRa x EDa)/BWa

WHERE:

C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IFadj = AGE-ADJUSTED SOIL INGESTION FACTOR (MG YEAR/KG DAY)
Fi = FRACTION FROM CONTAMINATED SOURCE (UNITLESS)
BIO = BIOAVALABILITY (UNITLESS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
AT = AVERAGING TIME (DAYS)
CF = CONVERSION FACTOR (1E+6 MG/KG)
IRc = CHILD INGESTION RATE (MG/DAY)
EDc = CHILD EXPOSURE DURATION (YEARS)
BWc = CHILD BODY WEIGHT (KG)
IRa = ADULT INGESTION RATE (MG/DAY)
EDa = ADULT EXPOSURE DURATION (YEARS)
BWa = ADULT BODY WEIGHT (KG)

ENTER INPUT PARAMETERS:

| | |
|---|---|
| IRc: | 200 |
| EDc: | 6 |
| BWc: | 15 |
| IRa: | 100 |
| EDa: | 24 |
| BWa: | 70 |
| IFadj: | 114.2857 |
| Fi: | 1 |
| EF: | 150 |
| AT(NONC): | 10950 |
| AT(CARC): | 25550 |

DETERMINE CONVERSION FACTORS:

NONCARC = 1.6E-06 CARCIN = 6.7E-07

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)
Site 2 – Area A Weapons Center
EXPOSURE SCENARIO: Future Resident (Adult/Child) (All Soil), RME

| CHEMICAL | C (MG/KG) | BIOAVAILABILITY | ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG/DAY/MG) | HAZARD INDEX | INCREMENTAL CANCER RISK |
|---|---|---|---|---|---|---|---|---|
| Benzo(a)anthracene | 2.1 | 1 | 3.29E-06 | 1.41E-06 | | 7.30E-01 | 0.00E+00 | 1.03E-06 |
| Benzo(a)pyrene | 1.8 | 1 | 2.82E-06 | 1.21E-06 | | 7.30E+00 | 0.00E+00 | 8.82E-06 |
| Benzo(b)fluoranthene | 3.2 | 1 | 5.01E-06 | 2.15E-06 | | 7.30E-01 | 0.00E+00 | 1.57E-06 |
| Dibenzo(a,h)anthracene | 0.57 | 1 | 8.92E-07 | 3.82E-07 | | 7.30E+00 | 0.00E+00 | 2.79E-06 |
| Indeno(1,2,3-cd)pyrene | 1 | 1 | 1.57E-06 | 6.71E-07 | | 7.30E-01 | 0.00E+00 | 4.90E-07 |
| ~~Aluminum~~ | ~~18200~~ | ~~1~~ | ~~2.85E-02~~ | ~~1.22E-02~~ | ~~1.00E+00~~ | | ~~2.85E-02~~ | ~~0.00E+00~~ |
| Antimony | 5.4 | 1 | 8.45E-06 | 3.62E-06 | 4.00E-04 | | 2.11E-02 | 0.00E+00 |
| Arsenic | 10.8 | 1 | 1.69E-05 | 7.25E-06 | 3.00E-04 | 1.50E+00 | 5.64E-02 | 1.09E-05 |
| Beryllium | 0.68 | 1 | 1.06E-06 | 4.56E-07 | 5.00E-03 | 4.30E+00 | 2.13E-04 | 1.96E-06 |
| Chromium | 78.7 | 1 | 1.23E-04 | 5.28E-05 | 5.00E-03 | | 2.46E-02 | 0.00E+00 |
| ~~Iron~~ | ~~28600~~ | ~~1~~ | ~~4.48E-02~~ | ~~1.92E-02~~ | ~~3.00E-01~~ | | ~~1.49E-01~~ | ~~0.00E+00~~ |
| Manganese | 390 | 1 | 6.11E-04 | 2.62E-04 | ~~5.00E-03~~ 2.4E-2 | | ~~1.22E-01~~ 2.54E-2 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| | | | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | | | ~~4.02E-01~~ 1.28E-1 | 2.75E-05 |

Revisions
08/19/96

RISK ASSESSMENT SPREADSHEET – EXPOSURES THROUGH HOUSEHOLD USE OF GROUNDWATER

SITE NAME: Site 2 – Area A Weapons Center
LOCATION: NSB-NLON, Groton, CT
DATE: 12/26/95

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS. THREE EXPOSURE ROUTES ARE CONSIDERED: INGESTION OF GROUNDWATER, DERMAL CONTACT WHILE SHOWERING/BATHING, AND INHALATION OF VOLATILES WHILE SHOWERING/BATHING. ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: Future Resident (Adult/Child), RME

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

INGESTION: IEX = (C x IR x EF x ED)/(BW x AT)

WHERE:
C = GROUNDWATER CONCENTRATION (MG/L)
IR = INGESTION RATE (LITERS/DAY)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

INHALATION: ADDRESSED QUALITATIVELY; INHALATION RISK ASSOCIATED WITH VOCS IS ASSUMED TO BE EQUAL TO INGESTION RISK FOR VOCS.

DERMAL CONTACT: DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1 L/1000 CM**3)
t* = TIME IT TAKES TO REACH STEADY-STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

INGESTION:

| | | |
|---|---|---|
| IR: | 2 | CONVERSION |
| EF: | 350 | FACTOR (NONCAR) = 2.74E-02 |
| ED: | 30 | |
| BW: | 70 | CONVERSION |
| AT(NON): | 10950 | FACTOR (CARCIN) = 1.17E-02 |
| AT(CAR): | 25550 | |

DERMAL CONTACT:

| | | |
|---|---|---|
| EV: | 1 | CONVERSION |
| ED: | 30 | FACTOR (NONCAR) = 2.74E+02 |
| EF: | 350 | |
| A: | 20000 | CONVERSION |
| tevent: | 0.25 | FACTOR (CARCIN) = 1.17E+02 |
| BW: | 70 | |
| AT(NON): | 10950 | |
| AT(CAR): | 25550 | |

RISK ASSESSMENT SPREADSHEET -- HOUSEHOLD USE OF GROUNDWATER (PAGE TWO)
Site 2 -- Area A Weapons Center
EXPOSURE SCENARIO: Future Resident (Adult/Child), RME

| CHEMICAL | GW CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| 1,2-Dichloroethane | 0.003 | O | 8.40E-01 | 3.50E-01 | 5.30E-03 | 3.00E-03 | 1.30E-08 |
| 1,1,2-Trichloroethane | 0.003 | O | 1.40E+00 | 5.70E-01 | 8.40E-03 | 1.10E-02 | 2.63E-08 |
| Trichloroethene | 0.003 | O | 1.30E+00 | 5.50E-01 | 1.60E-02 | 2.60E-02 | 4.92E-08 |
| Dibenzo(a,h)anthracene | 0.003 | O | 2.10E+01 | 4.40E+00 | 2.70E+00 | 6.90E+02 | 2.35E-05 |
| Indeno(1,2,3-cd)pyrene | 0.003 | O | 2.00E+01 | 4.20E+00 | 1.90E+00 | 3.80E+02 | 1.61E-05 |
| ~~Aluminum~~ | ~~8.77~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~2.19E-08~~ |
| Antimony | 0.0117 | I | | | 1.00E-03 | | 2.93E-09 |
| Arsenic | 0.0159 | I | | | 1.00E-03 | | 3.98E-09 |
| Berllium | 0.0012 | I | | | 1.00E-03 | | 3.00E-10 |
| Boron | 2.46 | I | | | 1.00E-03 | | 6.15E-07 |
| Chromium | 0.0232 | I | | | 2.00E-03 | | 1.16E-08 |
| ~~Iron~~ | ~~55.8~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~1.39E-05~~ |
| Manganese | 5.07 | I | | | 1.00E-03 | | 1.27E-06 |
| Thallium | 0.0082 | I | | | 1.00E-03 | | 2.05E-09 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00

**RISK ASSESSMENT SPREADSHEET – HOUSEHOLD USE OF GROUNDWATER (PAGE THREE)**
Site 2 – Area A Weapons Center
EXPOSURE SCENARIO: Future Resident (Adult/Child), RME
CALCULATE DOSES:

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | HAZARD INDEX INHALATION | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|---|
| 1,2-Dichloroethane | 8.22E-05 | 3.56E-06 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,1,2-Trichloroethane | 8.22E-05 | 7.20E-06 | 4.00E-03 | 4.00E-03 | 2.05E-02 | 1.80E-03 | 2.05E-02 | 4.29E-02 |
| Trichloroethene | 8.22E-05 | 1.35E-05 | 6.00E-03 | 6.00E-03 | 1.37E-02 | 2.25E-03 | 1.37E-02 | 2.96E-02 |
| Dibenzo(a,h)anthracene | 8.22E-05 | 6.43E-03 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 8.22E-05 | 4.42E-03 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~2.40E-01~~ | ~~6.01E-04~~ | ~~1.00E+00~~ | ~~5.00E-02~~ | ~~2.40E-01~~ | ~~1.20E-02~~ | ~~0.00E+00~~ | ~~2.52E-01~~ |
| Antimony | 3.21E-04 | 8.01E-07 | 4.00E-04 | 4.00E-04 | 8.01E-01 | 2.00E-03 | 0.00E+00 | 8.03E-01 |
| Arsenic | 4.36E-04 | 1.09E-06 | 3.00E-04 | 2.60E-04 | 1.45E+00 | 3.89E-03 | 0.00E+00 | 1.46E+00 |
| Berillum | 3.29E-05 | 8.22E-08 | 5.00E-03 | 2.50E-04 | 6.58E-03 | 3.29E-04 | 0.00E+00 | 6.90E-03 |
| Boron | 6.74E-02 | 1.68E-04 | 9.00E-02 | 4.50E-03 | 7.49E-01 | 3.74E-02 | 0.00E+00 | 7.86E-01 |
| Chromium | 6.36E-04 | 3.18E-06 | 5.00E-03 | 1.00E-04 | 1.27E-01 | 3.18E-02 | 0.00E+00 | 1.59E-01 |
| ~~Iron~~ | ~~1.52E+00~~ | ~~3.81E-03~~ | ~~3.00E-01~~ | ~~1.50E-02~~ | ~~5.06E+00~~ | ~~2.54E-01~~ | ~~0.00E+00~~ | ~~5.32E+00~~ |
| Manganese | 1.39E-01 | 3.47E-04 | ~~5.00E-03~~ 2.4E-2 | ~~1.50E-04~~ 7.2E-4 | ~~2.78E+01~~ 5.77E+0 | ~~2.32E+00~~ 4.83E-1 | 0.00E+00 | ~~3.01E+01~~ 6.27E+0 |
| Thallium | 2.25E-04 | 5.62E-07 | 8.00E-05 | 4.00E-06 | 2.81E+00 | 1.40E-01 | 0.00E+00 | 2.95E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | ~~3.01E+01~~ 1.18E+1 | ~~2.80E+00~~ 7.02E-1 | 3.42E-02 | ~~4.18E+01~~ 1.25E+1 |

Revisions
08/19/96

RISK ASSESSMENT SPREADSHEET – HOUSEHOLD USE OF GROUNDWATER (PAGE FOUR)
Site 2 – Area A Weapons Center
EXPOSURE SCENARIO: Future Resident (Adult/Child), RME
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | CANCER RISK INHALATION | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|---|
| 1,2-Dichloroethane | 3.52E-05 | 1.53E-06 | 9.10E-02 | 9.10E-02 | 3.21E-06 | 1.39E-07 | 3.21E-06 | 6.55E-06 |
| 1,1,2-Trichloroethane | 3.52E-05 | 3.09E-06 | 5.70E-02 | 5.70E-02 | 2.01E-06 | 1.76E-07 | 2.01E-06 | 4.19E-06 |
| Trichloroethene | 3.52E-05 | 5.78E-06 | 1.10E-02 | 1.10E-02 | 3.87E-07 | 6.35E-08 | 3.87E-07 | 8.38E-07 |
| Dibenzo(a,h)anthracene | 3.52E-05 | 2.76E-03 | 7.30E+00 | | 2.57E-04 | 0.00E+00 | 0.00E+00 | 2.57E-04 |
| Indeno(1,2,3-cd)pyrene | 3.52E-05 | 1.90E-03 | 7.30E-01 | | 2.57E-05 | 0.00E+00 | 0.00E+00 | 2.57E-05 |
| ~~Aluminum~~ | ~~1.03E-01~~ | ~~2.57E-04~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 1.37E-04 | 3.43E-07 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 1.87E-04 | 4.67E-07 | 1.50E+00 | 1.60E+00 | 2.80E-04 | 7.47E-07 | 0.00E+00 | 2.81E-04 |
| Berllium | 1.41E-05 | 3.52E-08 | 4.30E+00 | 8.60E+01 | 6.08E-05 | 3.03E-06 | 0.00E+00 | 6.38E-05 |
| Boron | 2.89E-02 | 7.22E-05 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Chromium | 2.72E-04 | 1.36E-06 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~8.53E-01~~ | ~~1.63E-03~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | 5.95E-02 | 1.49E-04 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Thallium | 9.63E-05 | 2.41E-07 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | 6.29E-04 | 4.15E-06 | 5.60E-06 | 6.39E-04 |

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Revisions
08/19/96

## IEUBK MODEL - EXPOSURE TO LEAD (PAGE 1 OF 2)

**SITE NAME:** Site 2 - Area A Weapons Center
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 12/27/95

**EXPOSURE SCENARIO: CTE**

LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.100 ug Pb/m3 DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

| Age | Time Outdoors (hr) | Vent. Rate (m3/day) | Lung Abs. (%) |
|---|---|---|---|
| 0-1 | 1.0 | 2.0 | 32.0 |
| 1-2 | 2.0 | 3.0 | 32.0 |
| 2-3 | 3.0 | 5.0 | 32.0 |
| 3-4 | 4.0 | 5.0 | 32.0 |
| 4-5 | 4.0 | 5.0 | 32.0 |
| 5-6 | 4.0 | 7.0 | 32.0 |
| 6-7 | 4.0 | 7.0 | 32.0 |

DIET: DEFAULT

DRINKING WATER Conc: 3.90 ug Pb/L
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: constant conc.

| Age | Soil (ug Pb/g) | House Dust (ug Pb/g) |
|---|---|---|
| 0-1 | 18.7 | 18.7 |
| 1-2 | 18.7 | 18.7 |
| 2-3 | 18.7 | 18.7 |
| 3-4 | 18.7 | 18.7 |
| 4-5 | 18.7 | 18.7 |
| 5-6 | 18.7 | 18.7 |
| 6-7 | 18.7 | 18.7 |

Additional Dust Sources: None DEFAULT

PAINT Intake: 0.00 ug Pb/day DEFAULT

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

CALCULATED BLOOD Pb and Pb UPTAKES:

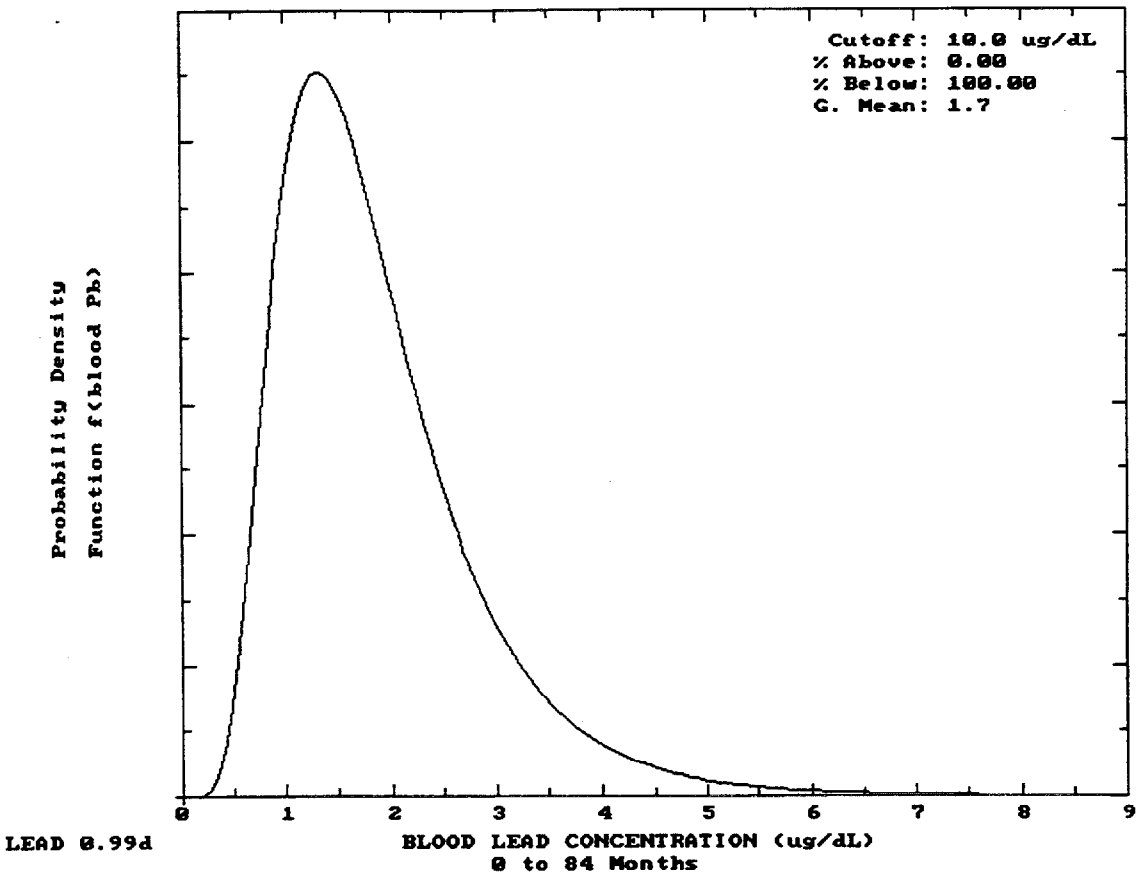
| YEAR | Blood Level (ug/dL) | Total Uptake (ug/day) | Soil+Dust Uptake (ug/day) |
|---|---|---|---|
| 0.5-1: | 1.9 | 3.51 | 0.46 |
| 1-2: | 1.9 | 4.48 | 0.73 |
| 2-3: | 1.8 | 4.90 | 0.73 |
| 3-4: | 1.7 | 4.83 | 0.73 |
| 4-5: | 1.6 | 4.59 | 0.55 |
| 5-6: | 1.5 | 4.79 | 0.49 |
| 6-7: | 1.4 | 5.11 | 0.47 |

| YEAR | Diet Uptake (ug/day) | Water Uptake (ug/day) | Paint Uptake (ug/day) | Air Uptake (ug/day) |
|---|---|---|---|---|
| 0.5-1: | 2.66 | 0.37 | 0.00 | 0.02 |
| 1-2: | 2.78 | 0.94 | 0.00 | 0.03 |
| 2-3: | 3.13 | 0.98 | 0.00 | 0.06 |
| 3-4: | 3.03 | 1.00 | 0.00 | 0.07 |
| 4-5: | 2.93 | 1.05 | 0.00 | 0.07 |
| 5-6: | 3.10 | 1.11 | 0.00 | 0.09 |
| 6-7: | 3.42 | 1.13 | 0.00 | 0.09 |

IEUBK MODEL - EXPOSURE TO LEAD (PAGE 2 OF 2)

SITE NAME: Site 2 - Area A Weapons Center
LOCATION: NSB-NLON, Groton, CT
DATE: 12/27/95

EXPOSURE SCENARIO: CTE



## IEUBK MODEL - EXPOSURE TO LEAD (PAGE 1 OF 2)

**SITE NAME:** Site 2 - Area A Weapons Center
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 12/27/95

**EXPOSURE SCENARIO: RME**

LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.100 ug Pb/m3 DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

| Age | Time Outdoors (hr) | Vent. Rate (m3/day) | Lung Abs. (%) |
|---|---|---|---|
| 0-1 | 1.0 | 2.0 | 32.0 |
| 1-2 | 2.0 | 3.0 | 32.0 |
| 2-3 | 3.0 | 5.0 | 32.0 |
| 3-4 | 4.0 | 5.0 | 32.0 |
| 4-5 | 4.0 | 5.0 | 32.0 |
| 5-6 | 4.0 | 7.0 | 32.0 |
| 6-7 | 4.0 | 7.0 | 32.0 |

DIET: DEFAULT

DRINKING WATER Conc: 8.90 ug Pb/L
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: constant conc.

| Age | Soil (ug Pb/g) | House Dust (ug Pb/g) |
|---|---|---|
| 0-1 | 66.1 | 66.1 |
| 1-2 | 66.1 | 66.1 |
| 2-3 | 66.1 | 66.1 |
| 3-4 | 66.1 | 66.1 |
| 4-5 | 66.1 | 66.1 |
| 5-6 | 66.1 | 66.1 |
| 6-7 | 66.1 | 66.1 |

Additional Dust Sources: None DEFAULT

PAINT Intake: 0.00 ug Pb/day DEFAULT

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

CALCULATED BLOOD Pb and Pb UPTAKES:

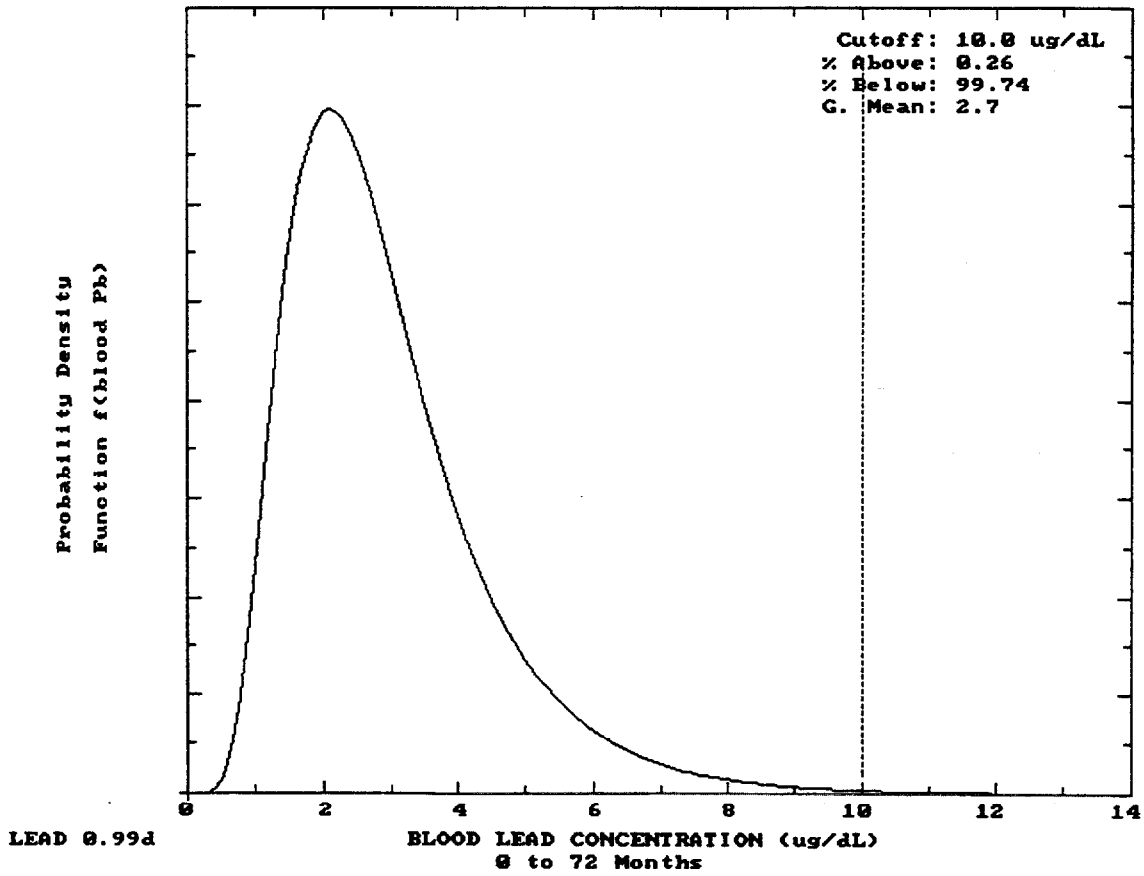
| YEAR | Blood Level (ug/dL) | Total Uptake (ug/day) | Soil+Dust Uptake (ug/day) |
|---|---|---|---|
| 0.5-1: | 2.8 | 5.06 | 1.59 |
| 1-2: | 3.1 | 7.34 | 2.51 |
| 2-3: | 2.9 | 7.84 | 2.53 |
| 3-4: | 2.8 | 7.83 | 2.55 |
| 4-5: | 2.5 | 7.22 | 1.91 |
| 5-6: | 2.3 | 7.37 | 1.72 |
| 6-7: | 2.2 | 7.65 | 1.63 |

| YEAR | Diet Uptake (ug/day) | Water Uptake (ug/day) | Paint Uptake (ug/day) | Air Uptake (ug/day) |
|---|---|---|---|---|
| 0.5-1: | 2.61 | 0.84 | 0.00 | 0.02 |
| 1-2: | 2.71 | 2.09 | 0.00 | 0.03 |
| 2-3: | 3.06 | 2.18 | 0.00 | 0.06 |
| 3-4: | 2.97 | 2.25 | 0.00 | 0.07 |
| 4-5: | 2.89 | 2.35 | 0.00 | 0.07 |
| 5-6: | 3.06 | 2.49 | 0.00 | 0.09 |
| 6-7: | 3.38 | 2.54 | 0.00 | 0.09 |

IEUBK MODEL - EXPOSURE TO LEAD (PAGE 2 OF 2)

SITE NAME: Site 2 - Area A Weapons Center
LOCATION: NSB-NLON, Groton, CT
DATE: 12/27/95

EXPOSURE SCENARIO: RME



**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A WEAPONS CENTER - SOIL (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| 2-Butanone | 0.24 | 0.11 | 500 | 1000 | 8 | 80 |
| Acetone | 0.69 | 0.69 | 500 | 1000 | 14 | 140 |
| Toluene | 0.008 | 0.005 | 500 | 1000 | 20 | 67 |
| Trichloroethene | 0.003 | 0.003 | 56 | 520 | 0.1 | 1 |
| 2-Methylnaphthalene | 0.054 | 0.046 | - | - | - | - |
| Acenaphthene | 0.14 | 0.14 | - | - | - | - |
| Acenaphthylene | 0.031 | 0.031 | 1000 | 2500 | 8.4 | 84 |
| Anthracene | 0.8 | 0.30 | 1000 | 2500 | 40 | 400 |
| Benzo(a)anthracene | 2.1 | 0.7 | 1 * | 7.8 | 1 * | 1 * |
| Benzo(a)pyrene | 1.8 | 0.6 | 1 * | 1 * | 1 * | 1 * |
| Benzo(b)fluoranthene | 3.2 | 1.1 | 1 * | 7.8 | 1 * | 1 * |
| Benzo(g,h,i)perylene | 0.96 | 0.37 | - | - | - | - |
| Benzo(k)fluoranthene | 0.26 | 0.23 | 8.4 | 78 | 1 | 1 |
| Benzoic acid | 0.48 | 0.30 | - | - | - | - |
| Bis(2-Ethylhexyl)phthalate | 0.035 | 0.035 | 44 | 410 | 1 | 11 |
| Carbazole | 0.72 | 0.56 | - | - | - | - |
| Chrysene | 2.3 | 0.8 | - | - | - | - |
| Di-N-octyl phthalate | 0.089 | 0.062 | 1000 | 2500 | 2 | 20 |
| Dibenzo(a,h)anthracene | 0.57 | 0.36 | - | - | - | - |
| Dibenzofuran | 0.084 | 0.058 | - | - | - | - |
| Diethyl phthalate | 0.032 | 0.030 | - | - | - | - |
| Fluoranthene | 5.7 | 1.7 | 1000 | 2500 | 5.6 * | 56 |
| Fluorene | 0.18 | 0.14 | 1000 | 2500 | 5.6 | 56 |
| Indeno(1,2,3-Cd)pyrene | 1 | 0.38 | - | - | - | - |
| Phenanthrene | 4.2 | 1.2 | 1000 | 2500 | 4 * | 40 |
| Pyrene | 4 | 1 | 1000 | 2500 | 4 | 40 |
| 4,4'-DDE | 0.0074 | 0.0057 | - | - | - | - |
| Aroclor-1260 | 0.05 | 0.050 | 1 | 10 | - | - |
| Endrin | 0.014 | 0.012 | 20 | 610 | - | - |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A WEAPONS CENTER - SOIL (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| Endrin aldehyde | 0.007 | 0.0067 | - | - | - | - |
| Aluminum | 18200 | 11087 | - | - | - | - |
| Antimony | 5.4 | 5.1 | 27 | 8200 | - | - |
| Arsenic | 10.8 | 6.1 | 10 * | 10 * | - | - |
| Barium | 131 | 53 | 4700 | 1.4E+5 | - | - |
| Beryllium | 0.68 | 0.47 | 2 | 2 | - | - |
| Boron | 30.7 | 24.4 | - | - | - | - |
| Cadmium | 1.2 | 0.8 | 34 | 1000 | - | - |
| Calcium | 3020 | 1796 | - | - | - | - |
| Chromium (total) | 78.7 | 28.7 | 100 (6) | 100 (6) | - | - |
| Cobalt | 8.6 | 5.2 | - | - | - | - |
| Copper | 41.4 | 18.2 | 2500 | 7.6E+4 | - | - |
| Iron | 28600 | 15820 | - | - | - | - |
| Lead | 66.1 | 18.1 | 500 | 1000 | - | - |
| Magnesium | 7170 | 4161 | - | - | - | - |
| Manganese | 390 | 207 | - | - | - | - |
| Mercury | 0.29 | 0.24 | 20 | 610 | - | - |
| Nickel | 22.7 | 11.8 | 1400 | 7500 | - | - |
| Potassium | 6300 | 2777 | - | - | - | - |
| Silver | 1.5 | 1.0 | 340 | 1E+4 | - | - |
| Sodium | 1450 | 508 | - | - | - | - |
| Vanadium | 49.6 | 28.0 | 470 | 1.4E+4 | - | - |
| Zinc | 67.5 | 40.5 | 2E+4 | 6.1E+5 | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 CTDEP, December 13, 1995.
3 Cis-1,2-dichloroethene.
4 1,3-Dichloropropene (total).
5 Chlordane.
6 Chromium (hexavalent).

## SUMMARY OF COMPARISON TO STATE STANDARDS (1)
## SITE 2 AREA A WEAPONS CENTER - UNFILTERED GROUNDWATER (UG/L)
## NSB-NLON, GROTON, CONNECTICUT

| Parameter | Maximum | Average of Positive Hits | State MCL (2) | Groundwater Protection (3) | Surface Water Protection (3) |
|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | 2 | 2 | 5 | 5 | 1260 |
| 1,2-Dichloroethane | 1 | 1 | 5 | 1 | 2970 |
| 2-Butanone | 4 | 4 | - | 400 | - |
| 2-Hexanone | 12 | 12 | - | - | - |
| 4-Methyl-2-pentanone | 12 | 12 | - | 350 | - |
| Trichloroethene | 2 | 2 | 5 | 5 | 2340 |
| 1,3-Dichlorobenzene | 0.6 | 0.60 | - | 600 | 26000 |
| Benzo(g,h,i)perylene | 1 | 1 | - | - | - |
| Benzoic acid | 7 | 7 | - | - | - |
| Bis(2-Ethylhexyl)phthalate | 3 | 2 | 6 | 2 * | 59 |
| Di-N-octyl phthalate | 2 | 2 | - | 100 | - |
| Dibenzo(a,h)anthracene | 0.8 | 0.80 | - | - | - |
| Indeno(1,2,3-Cd)pyrene | 1 | 1 | - | - | - |
| Aluminum | 9210 | 3932 | - | - | - |
| Arsenic | 19.9 | 9.9 | 50 | 50 | 4 * |
| Barium | 189 | 104 | 2000 | 1000 | - |
| Beryllium | 1.4 | 1.2 | 4 | 4 | 4 |
| Boron | 3550 | 1593 | - | - | - |
| Calcium | 264000 | 88190 | - | - | - |
| Chromium (total) | 24.9 | 12.8 | 100 (5) | 50 (5) | 110 (6) |
| Cobalt | 15.5 | 10.2 | - | - | - |
| Copper | 38.5 | 19.6 | - | 1300 | 48 |
| Iron | 68000 | 25657 | - | - | - |
| Lead | 16.8 | 6.7 | - | 15 * | 13 * |
| Magnesium | 448000 | 85218 | - | - | - |
| Manganese | 6500 | 3204 | 5000 (7) * | - | - |
| Nickel | 20 | 19 | 100 | 100 | 880 |
| Potassium | 173000 | 38927 | - | - | - |
| Selenium | 6 | 6 | 50 | 50 | 50 |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A WEAPONS CENTER - UNFILTERED GROUNDWATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | State MCL (2) | Groundwater Protection (3) | Surface Water Protection (3) |
|---|---|---|---|---|---|
| Sodium | 3570000 | 689010 | 28000 (8) * | - | - |
| Thallium | 13.8 | 8.4 | 2 * | 5 * | 63 |
| Vanadium | 25.3 | 18.9 | - | 50 | - |
| Zinc | 52 | 26 | - | 5000 | 123 |

Footnotes:

1 * - Indicates that maximum detection exceed this standard.
2 Maximum Contaminant Level. Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
3 CTDEP, December 13, 1995.
4 Cis-1,2-dichloroethene.
5 Chromium (total).
6 Chromium (hexavalent).
7 Current Connecticut Department of Public Health and Addiction Services Action Level.
8 Notification Level.

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A WEAPONS CENTER - FILTERED GROUNDWATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | State MCL (2) | Groundwater Protection (3) | Surface Water Protection (3) |
|---|---|---|---|---|---|
| Antimony | 16.9 | 16.1 | 6 * | 6 * | 86000 |
| Arsenic | 8.4 | 6.5 | 50 | 50 | 4 * |
| Barium | 210 | 93 | 2000 | 1000 | - |
| Beryllium | 1.2 | 1.2 | 4 | 4 | 4 |
| Boron | 3810 | 1438 | - | - | - |
| Calcium | 298000 | 95389 | - | - | - |
| Copper | 23 | 23 | - | 1300 | 48 |
| Iron | 69200 | 29650 | - | - | - |
| Magnesium | 471000 | 94579 | - | - | - |
| Manganese | 6540 | 3636 | 5000 (7) * | - | - |
| Nickel | 14 | 12 | 100 | 100 | 880 |
| Potassium | 182000 | 48886 | - | - | - |
| Silver | 3.7 | 3.7 | 50 | 36 | 12 |
| Sodium | 3580000 | 744698 | 28000 (8) * | - | - |
| Vanadium | 3.1 | 3.0 | - | 50 | - |
| Zinc | 14.2 | 14.2 | - | 5000 | 123 |

Footnotes:

1 * - Indicates that maximum detection exceed this standard.
2 Maximum Contaminant Level. Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
3 CTDEP, December 13, 1995.
4 Cis-1,2-dichloroethene.
5 Chromium (total).
6 Chromium (hexavalent).
7 Current Connecticut Department of Public Health and Addiction Services Action Level.
8 Notification Level.

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A WEAPONS CENTER - UNFILTERED SURFACE WATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Water Quality Standards (2) | | | |
|---|---|---|---|---|---|---|
| | | | Aquatic Life | | Human Health | |
| | | | Freshwater | Saltwater | Organisms | Water and Organisms |
| Butyl benzyl phthalate | 2 | 2 | - | - | - | - |
| Di-N-octyl phthalate | 1 | 1 | - | - | - | - |
| Arsenic | 2.6 | 2.6 | 190 | 36 | 0.14 * | 0.018 * |
| Barium | 6.8 | 6.8 | - | - | - | - |
| Cadmium | 6.6 | 6.6 | 660 | 9.3 | 170 | 16 |
| Calcium | 3310 | 2400 | - | - | - | - |
| Iron | 1100 | 659 | - | - | - | - |
| Lead | 7 | 5 | 1.3 * | 8.5 | - | 50 |
| Magnesium | 618 | 492 | - | - | - | - |
| Manganese | 48 | 38 | - | - | - | - |
| Sodium | 2990 | 2805 | - | - | - | - |
| Zinc | 135 | 135 | 12.3 * | 86 * | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 Connecticut Water Quality Standards, 1992.
3 Chromium (hexavalent).

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A WEAPONS CENTER - FILTERED SURFACE WATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Water Quality Standards (2) | | | |
|---|---|---|---|---|---|---|
| | | | Aquatic Life | | Human Health | |
| | | | Freshwater | Saltwater | Organisms | Water and Organisms |
| Arsenic | 2.1 | 2.1 | 190 | 36 | 0.14 * | 0.018 * |
| Cadmium | 5.6 | 5.6 | 660 | 9.3 | 170 | 16 |
| Calcium | 1540 | 1540 | - | - | - | - |
| Lead | 1 | 1 | 1.3 | 8.5 | - | 50 |
| Magnesium | 344 | 344 | - | - | - | - |
| Manganese | 24.7 | 24.7 | - | - | - | - |
| Sodium | 2750 | 2750 | - | - | - | - |
| Zinc | 120 | 120 | 12.3 * | 86 * | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 Connecticut Water Quality Standards, 1992.
3 Chromium (hexavalent).

001109

SUMMARY OF COMPARISON TO STATE STANDARDS (1)
SITE 2 AREA A WEAPONS CENTER - SEDIMENT (MG/KG)
NSB-NLON, GROTON, CONNECTICUT

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| 1,1,1-Trichloroethane | 0.013 | 0.013 | 500 | 1000 | 4 | 40 |
| Methylene chloride | 0.022 | 0.014 | 82 | 760 | 0.1 | 1.0 |
| Tetrachloroethene | 0.008 | 0.008 | 12 | 110 | 0.1 | 1 |
| Toluene | 0.004 | 0.003 | 500 | 1000 | 20 | 67 |
| Trichloroethene | 0.022 | 0.022 | 56 | 520 | 0.1 | 1 |
| 2-Methylnaphthalene | 0.031 | 0.031 | - | - | - | - |
| Acenaphthene | 0.079 | 0.054 | - | - | - | - |
| Acenaphthylene | 0.09 | 0.069 | 1000 | 2500 | 8.4 | 84 |
| Anthracene | 0.4 | 0.17 | 1000 | 2500 | 40 | 400 |
| Benzo(a)anthracene | 3.4 | 0.8 | 1 * | 7.8 | 1 * | 1 * |
| Benzo(a)pyrene | 4.4 | 1.1 | 1 * | 1 * | 1 * | 1 * |
| Benzo(b)fluoranthene | 4.9 | 1.4 | 1 * | 7.8 | 1 * | 1 * |
| Benzo(g,h,i)perylene | 3.5 | 0.7 | - | - | - | - |
| Benzo(k)fluoranthene | 2.1 | 0.9 | 8.4 | 78 | 1 * | 1 * |
| Benzoic acid | 0.19 | 0.12 | - | - | - | - |
| Bis(2-Ethylhexyl)phthalate | 1.1 | 1.1 | 44 | 410 | 1 * | 11 |
| Butyl benzyl phthalate | 0.052 | 0.052 | 1000 | 2500 | 20 | 200 |
| Carbazole | 0.66 | 0.31 | - | - | - | - |
| Chrysene | 4.3 | 1.2 | - | - | - | - |
| Di-N-butyl phthalate | 0.18 | 0.18 | 1000 | 2500 | 14 | 140 |
| Di-N-octyl phthalate | 0.072 | 0.049 | 1000 | 2500 | 2 | 20 |
| Dibenzo(a,h)anthracene | 0.87 | 0.42 | - | - | - | - |
| Dibenzofuran | 0.087 | 0.075 | - | - | - | - |
| Fluorene | 0.14 | 0.09 | 1000 | 2500 | 5.6 | 56 |
| Indeno(1,2,3-Cd)pyrene | 3.3 | 0.7 | - | - | - | - |
| Naphthalene | 0.16 | 0.09 | 1000 | 2500 | 5.6 | 56 |
| Phenanthrene | 2.3 | 0.8 | 1000 | 2500 | 4 | 40 |
| Phenol | 0.032 | 0.032 | 1000 | 2500 | 80 | 800 |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A WEAPONS CENTER - SEDIMENT (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| Pyrene | 6.9 | 1.8 | 1000 | 2500 | 4 * | 40 |
| 4,4'-DDD | 0.032 | 0.015 | - | - | - | - |
| 4,4'-DDE | 0.052 | 0.052 | - | - | - | - |
| 4,4'-DDT | 0.06 | 0.026 | - | - | - | - |
| Alpha-Chlordane | 0.0064 | 0.0064 | 0.49 (5) | 2.2 (5) | 0.066 (5) | 0.066 (5) |
| Endosulfan sulfate | 0.0076 | 0.0072 | - | - | - | - |
| Endrin | 0.018 | 0.014 | 20 | 610 | - | - |
| Endrin aldehyde | 0.14 | 0.10 | - | - | - | - |
| Gamma-Chlordane | 0.007 | 0.0070 | 0.49 (5) | 2.2 (5) | 0.066 (5) | 0.066 (5) |
| Heptachlor | 0.0028 | 0.0028 | 0.14 | 1.3 | 0.013 | 0.013 |
| Methoxychlor | 0.037 | 0.037 | 340 | 1E+4 | 0.8 | 8 |
| Aluminum | 26400 | 12949 | - | - | - | - |
| Antimony | 15 | 9 | 27 | 8200 | - | - |
| Arsenic | 13.5 | 6.8 | 10 * | 10 * | - | - |
| Barium | 103 | 65 | 4700 | 1.4E+5 | - | - |
| Beryllium | 1.1 | 0.8 | 2 | 2 | - | - |
| Boron | 39.7 | 28.9 | - | - | - | - |
| Cadmium | 29.5 | 10.5 | 34 | 1000 | - | - |
| Calcium | 3290 | 1870 | - | - | - | - |
| Chromium (total) | 97.5 | 39.3 | 100 (6) | 100 (6) | - | - |
| Cobalt | 14.4 | 6.7 | - | - | - | - |
| Copper | 57.2 | 30.8 | 2500 | 7.6E+4 | - | - |
| Iron | 51600 | 25512 | - | - | - | - |
| Lead | 204 | 51 | 500 | 1000 | - | - |
| Magnesium | 6140 | 4171 | - | - | - | - |
| Manganese | 2640 | 490 | - | - | - | - |
| Mercury | 0.6 | 0.33 | 20 | 610 | - | - |
| Nickel | 31.5 | 15.6 | 1400 | 7500 | - | - |
| Potassium | 4020 | 2766 | - | - | - | - |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A WEAPONS CENTER - SEDIMENT (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| Selenium | 0.67 | 0.67 | 340 | 1E+4 | - | - |
| Silver | 1.9 | 1.8 | 340 | 1E+4 | - | - |
| Sodium | 1120 | 458 | - | - | - | - |
| Thallium | 0.36 | 0.35 | 5.4 | 160 | - | - |
| Vanadium | 62.2 | 35.9 | 470 | 1.4E+4 | - | - |
| Zinc | 292 | 106 | 2E+4 | 6.1E+5 | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 CTDEP, December 13, 1995.
3 Cis-1,2-dichloroethene.
4 1,3-Dichloropropene (total).
5 Chlordane.
6 Chromium (hexavalent).

000112

# APPENDIX F.8

## SITE 3 - AREA A DOWNSTREAM WATER COURSES/OBDA

## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 1 - SURFACE SOIL/SEDIMENT (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 2-Butanone | 10/16 | 0.004 - 0.12 | EC-SDS102 | 0.012 - 0.079 | 4700 | 6900 (10) | - | N | 2 |
| Acetone | 7/17 | 0.054 - 0.32 | EC-SDOP05 | 0.012 - 0.45 | 780 | 62000 | 8 | N | 2 |
| Carbon disulfide | 7/17 | 0.002 - 0.011 | 3SD5 | 0.006 - 0.079 | 780 | 11 | 14 | N | 2 |
| Ethylbenzene | 1/16 | 0.002 | 3SD3 | 0.006 - 0.079 | 780 | 260 | 5 | N | 2 |
| Methylene chloride | 3/17 | 0.002 - 0.045 | EC-SDOP05 | 0.006 - 0.079 | 85 | 7 | 0.01 | N | 2 |
| Tetrachloroethene | 1/16 | 0.004 | 3SD5 | 0.006 - 0.079 | 12 | 11 | 0.04 | N | 2 |
| Toluene | 1/16 | 0.004 | 3SD4 | 0.006 - 0.079 | 1600 | 520 | 5 | N | 2 |
| Xylenes, total | 1/16 | 0.003 | 3SD3 | 0.006 - 0.079 | 16000 | 320 | 74 | N | 2 |
| 4-Methylphenol | 2/17 | 0.12 - 0.23 | EC-SDOP05 | 0.43 - 7.9 | 39 | - | - | N | 2 |
| Acenaphthene | 2/17 | 0.1 - 0.14 | 3SD1 | 0.43 - 7.9 | 470 | - | 200 | N | 2 |
| Anthracene | 2/16 | 0.33 - 0.39 | 3SD5 | 0.43 - 7.9 | 2300 | - | 4300 | N | 2 |
| Benzo(a)anthracene | 8/17 | 0.045 - 0.85 | 3SD1 | 0.43 - 7.9 | 0.88 | - | 0.7 | N | 2 |
| Benzo(a)pyrene | 5/17 | 0.098 - 0.59 | 3SD5 | 0.43 - 7.9 | 0.088 | - | 4 | Y | 3 |
| Benzo(b)fluoranthene | 5/17 | 0.086 - 0.75 | 3SD1 | 0.43 - 7.9 | 0.88 | - | 4 | N | 2 |
| Benzo(g,h,i)perylene | 3/17 | 0.081 - 0.26 | 3SD1 | 0.43 - 7.9 | - | - | - | N | 1 |
| Benzo(k)fluoranthene | 5/17 | 0.1 - 0.29 | 3SD1 | 0.43 - 7.9 | 8.8 | - | 4 | N | 2 |
| Chrysene | 8/17 | 0.075 - 0.72 | 3SD5 | 0.43 - 7.9 | 88 | - | 1 | N | 2 |
| Di-n-butyl phthalate | 1/16 | 0.053 | EC-SDS102 | 0.43 - 7.9 | 780 | 100 | 120 | N | 2 |
| Di-n-octyl phthalate | 1/17 | 0.081 | EC-SDOP05 | 0.43 - 7.9 | 160 | - | 1000000 | N | 2 |
| Dibenzofuran | 1/16 | 0.1 | 3SD1 | 0.43 - 7.9 | 31 | - | - | N | 2 |
| Fluoranthene | 11/17 | 0.073 - 1.5 | 3SD5 | 0.43 - 3.9 | 310 | - | 980 | N | 2 |
| Fluorene | 2/16 | 0.18 - 0.2 | 3SD5 | 0.43 - 7.9 | 310 | - | 160 | N | 2 |
| Indeno(1,2,3-cd)pyrene | 3/17 | 0.062 - 0.36 | 3SD1 | 0.43 - 7.9 | 0.88 | - | 35 | N | 2 |
| Naphthalene | 1/16 | 0.08 | 3SD1 | 0.43 - 7.9 | 310 | - | 30 | N | 2 |
| Phenanthrene | 7/17 | 0.077 - 1.6 | 3SD5 | 0.43 - 7.9 | - | - | - | N | 1 |
| Pyrene | 11/17 | 0.14 - 1.9 | 2DSD5 | 0.43 - 3.9 | 230 | - | 1400 | N | 2 |
| 4,4'-DDD | 25/25 | 0.017 - 300 | 3SD3 | - | 2.7 | - | 0.7 | Y | 3 |
| 4,4'-DDE | 24/26 | 0.012 - 24 | MCLL1 | 0.22 - 0.64 | 1.9 | - | 0.5 | Y | 3 |
| 4,4'-DDT | 20/26 | 0.029 - 1400 | MCLL1 | 0.027 - 1.7 | 1.9 | 80 | 1.0 | Y | 3 |



000401

**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A DOWNSTREAM, ZONE 1 - SURFACE SOIL/SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| alpha-Chlordane | 5/23 | 0.0012 - 0.29 | EC-SDOP06 | 0.0021 - 180 | 0.49 (7) | 10 (7) | 2 (7) | N | 2 |
| Dieldrin | 2/20 | 0.002 - 0.37 | EC-SDS103 | 0.004 - 37 | 0.04 | 2 | 0.001 | Y | 3 |
| Endosulfan-I | 1/20 | 0.0037 | 3DSD4A | 0.0021 - 18 | 47 | - | 4 | N | 2 |
| gamma-Chlordane | 1/21 | 0.081 | EC-SDOP06 | 0.0021 - 180 | 0.49 (7) | 10 (7) | 2 (7) | N | 2 |
| Heptachlor | 1/20 | 0.016 | EC-SDOP06 | 0.0021 - 18 | 0.14 | 0.3 | 0.06 | N | 2 |
| 1,2,3,4,6,7,8-HPCDD | 1/2 | 0.0005 | 3SD6 | 0.0003 | 0.0004 | - | - | Y | 3 |
| OCDD | 1/2 | 0.0054 | 3SD6 | 0.0013 | 0.004 | - | - | Y | 3 |
| OCDF | 1/2 | 0.0006 | 3SD6 | 0.0003 | 0.004 | - | - | N | 2 |
| Aluminum | 17/17 | 4190 - 18800 | 3SD3 | - | 7800 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Arsenic | 17/17 | 1.9 - 39.9 | 3SD4 | - | 0.43 | 380 | 15 | Y | 3 |
| Barium | 17/17 | 27.2 - 154 | 3SD4 | - | 550 | 350000 | 32 | N | 2 |
| Beryllium | 17/17 | 0.37 - 1.8 | 3SD4 | - | 0.15 | 690 | 180 | Y | 3 |
| Boron | 2/4 | 13 - 26.3 | EC-SDOP05 | 4.9 - 14.9 | 700 | - | - | N | 2 |
| Cadmium | 14/15 | 1.1 - 30.1 | 3SD4 | 0.59 | 3.9 | 920 | 6 | Y | 3 |
| Calcium | 17/17 | 1390 - 5720 | 3SD4 | - | - | - | - | N | 1 |
| Chromium (total) | 17/17 | 9.4 - 43.4 | 3SD5 | - | 39 (8) | 140 (8) | 19 (8) | Y | 3 |
| Cobalt | 17/17 | 3.7 - 26.6 | 3SD2 | - | 470 | - | - | N | 2 |
| Copper | 17/17 | 10.6 - 118 | 3SD2 | - | 290 | - | - | N | 2 |
| Cyanide | 2/15 | 0.23 - 3.4 | 3SD2 | 0.13 - 5.7 | 160 | - | - | N | 2 |
| Iron | 17/17 | 8430 - 195000 | 3SD4 | - | 2300 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Lead | 17/17 | 5 - 223 | 3SD2 | - | 400 (9) | - | - | N | 2 |
| Magnesium | 17/17 | 1940 - 9640 | 3SD2 | - | - | - | - | N | 1 |
| Manganese | 17/17 | 104 - 2850 | EC-SDS102 | - | ~~39~~ 190 | - | - | Y | 3 |
| Mercury | 1/15 | 0.33 | 3SD1 | 0.06 - 0.4 | 2.3 | 7 | 3 | N | 2 |
| Nickel | 17/17 | 6.8 - 44.6 | 3SD2 | - | 160 | 6900 | 21 | N | 2 |
| Potassium | 15/17 | 534 - 3620 | 3SD5 | 457 - 3230 | - | - | - | N | 1 |
| Selenium | 12/15 | 0.29 - 3.2 | 3SD4 | 0.27 - 1.7 | 39 | - | 3 | N | 2 |
| Silver | 1/15 | 4.3 | 3SD1 | 0.49 - 6.4 | 39 | - | - | N | 2 |
| Sodium | 16/16 | 190 - 2070 | 3SD3 | - | - | - | - | N | 1 |

Revisions
08/23/96
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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A DOWNSTREAM, ZONE 1 - SURFACE SOIL/SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Vanadium | 17/17 | 13.1 - 64.9 | 3SD4 | - | 55 | - | - | Y | 3 |
| Zinc | 17/17 | 18.2 - 2720 | 3SD2 | - | 2300 | - | 42000 | Y | 3 |

Footnotes:

1 Results in mg/kg unless otherwise noted. Surface soil designated as soil from depths of 0 to 2 feet.
2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment.
3 Sample-specific.
4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
5 Soil screening level guidance (USEPA, December 1994).
6 Soil screening level guidance (USEPA, December 1994) with a dilution and
7 Total chlordane.
8 Hexavalent chromium.
9 OSWER soil screening level for residential land use (USEPA, July 14, 1994).
10 Calculated using soil screening level guidance (See appendix F.3).

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

000003

Revisions
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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION**
**SITE 2 AREA A DOWNSTREAM, ZONE 1 - SURFACE SOIL/SEDIMENT**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| 2-Butanone | 120 | 31.8571 |
| Acetone | 320 | 140 |
| Carbon disulfide | 11 | 8.3 |
| Ethylbenzene | 2 | 8.2143 |
| Methylene chloride | 45 | 10.6 |
| Tetrachloroethene | 4 | 8.4286 |
| Toluene | 4 | 8.0357 |
| Xylenes, total | 3 | 8.2857 |
| 4-Methylphenol | 230 | 1140.6667 |
| Acenaphthene | 140 | 1133.3333 |
| Anthracene | 390 | 1180.7143 |
| Benzo(a)anthracene | 850 | 1091.3333 |
| Benzo(a)pyrene | 590 | 1115.5333 |
| Benzo(b)fluoranthene | 750 | 1107.0667 |
| Benzo(g,h,i)perylene | 260 | 1118.4 |
| Benzo(k)fluoranthene | 290 | 1062.3333 |
| Chrysene | 720 | 1102.6667 |
| Di-n-butyl phthalate | 53 | 1388.4286 |
| Di-n-octyl phthalate | 81 | 1149.4 |
| Dibenzofuran | 100 | 1204.2857 |
| Fluoranthene | 1500 | 864.8667 |
| Fluorene | 200 | 1156.4286 |
| Indeno(1,2,3-cd)pyrene | 360 | 1121.8667 |
| Naphthalene | 80 | 1202.8571 |
| Phenanthrene | 1600 | 1209.4667 |
| Pyrene | 1900 | 922 |
| 4,4'-DDD | 300000 | 46459.5455 |
| 4,4'-DDE | 24000 | 3017.3478 |
| 4,4'-DDT | 1400000 | 67672.6522 |
| Alpha-Chlordane | 290 | 7007.78 |
| Dieldrin | 370 | 2149.3389 |
| Endosulfan-I | 3.7 | 1052.925 |
| Gamma-Chlordane | 81 | 7355.3395 |
| Heptachlor | 16 | 1052.8861 |
| **Dioxins (ug/kg)** | | |
| 1,2,3,4,6,7,8-HPCDD | 0.494 | 0.317 |
| OCDD | 5.366 | 3.008 |
| OCDF | 0.552 | 0.3435 |
| **Inorganics (mg/kg)** | | |
| Aluminum | 18800 | 11314.6667 |
| Arsenic | 39.9 | 10.8 |
| Barium | 154 | 69.0667 |
| Beryllium | 1.8 | 0.9427 |

**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION (Continued)**
**SITE 2 AREA A DOWNSTREAM, ZONE 1 - SURFACE SOIL/SEDIMENT**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Inorganics (mg/kg) (Continued)** | | |
| Boron | 26.3 | 12.3 |
| Cadmium | 30.1 | 7.615 |
| Calcium | 5720 | 3345.3333 |
| Chromium (total) | 43.4 | 23.8067 |
| Cobalt | 26.6 | 11.44 |
| Copper | 118 | 34.96 |
| Cyanide | 3.4 | 1.3188 |
| Iron | 195000 | 60868.6667 |
| Lead | 223 | 59.9867 |
| Magnesium | 9640 | 4402.6667 |
| Manganese | 2850 | 632 |
| Mercury | 0.33 | 0.1181 |
| Nickel | 44.6 | 18.6 |
| Potassium | 3620 | 1570.5667 |
| Selenium | 3.2 | 1.14 |
| Silver | 4.3 | 1.6962 |
| Sodium | 2070 | 881.7857 |
| Vanadium | 64.9 | 34.4667 |
| Zinc | 2720 | 297.1933 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 1 - ALL SOIL/SEDIMENT (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 2-Butanone | 11/19 | 0.004 - 0.12 | EC-SDS102 | 0.011 - 0.079 | 4700 | 6900 (10) | - | N | 2 |
| Acetone | 7/20 | 0.054 - 0.32 | EC-SDOP05 | 0.006 - 0.45 | 780 | 62000 | 8 | N | 2 |
| Acetone | 7/20 | 0.054 - 0.32 | EC-SDOP05 | 0.006 - 0.45 | 780 | 62000 | 8 | N | 2 |
| Carbon disulfide | 7/22 | 0.002 - 0.011 | 3SD5 | 0.006 - 0.079 | 780 | 11 | 14 | N | 2 |
| Ethylbenzene | 1/19 | 0.002 | 3SD3 | 0.006 - 0.079 | 780 | 260 | 5 | N | 2 |
| Methylene chloride | 3/20 | 0.002 - 0.045 | EC-SDOP05 | 0.006 - 0.079 | 85 | 7 | 0.01 | N | 2 |
| Tetrachloroethene | 1/19 | 0.004 | 3SD5 | 0.006 - 0.079 | 12 | 11 | 0.04 | N | 2 |
| Toluene | 1/19 | 0.004 | 3SD4 | 0.006 - 0.079 | 1600 | 520 | 5 | N | 2 |
| Xylenes, total | 1/19 | 0.003 | 3SD3 | 0.006 - 0.079 | 16000 | 320 | 74 | N | 2 |
| 4-Methylphenol | 2/20 | 0.12 - 0.23 | EC-SDOP05 | 0.37 - 7.9 | 39 | - | - | N | 2 |
| Acenaphthene | 2/20 | 0.1 - 0.14 | 3SD1 | 0.37 - 7.9 | 470 | - | 200 | N | 2 |
| Anthracene | 2/19 | 0.33 - 0.39 | 3SD5 | 0.37 - 7.9 | 2300 | - | 4300 | N | 2 |
| Benzo(a)anthracene | 8/20 | 0.045 - 0.85 | 3SD1 | 0.37 - 7.9 | 0.88 | - | 0.7 | N | 2 |
| Benzo(a)pyrene | 5/20 | 0.098 - 0.59 | 3SD5 | 0.37 - 7.9 | 0.088 | - | 4 | Y | 3 |
| Benzo(b)fluoranthene | 5/20 | 0.086 - 0.75 | 3SD1 | 0.37 - 7.9 | 0.88 | - | 4 | N | 2 |
| Benzo(g,h,i)perylene | 3/20 | 0.081 - 0.26 | 3SD1 | 0.37 - 7.9 | - | - | - | N | 1 |
| Benzo(k)fluoranthene | 6/20 | 0.05 - 0.29 | 3SD1 | 0.37 - 7.9 | 8.8 | - | 4 | N | 2 |
| Benzoic acid | 1/17 | 0.082 | 3MW12S | 1.8 - 38 | 31000 | - | 280 | N | 2 |
| Bis(2-ethylhexyl)phthalate | 2/19 | 0.14 - 0.16 | 3MW12S | 0.4 - 7.9 | 46 | 210 | 11 | N | 2 |
| Chrysene | 8/20 | 0.075 - 0.72 | 3SD5 | 0.37 - 7.9 | 88 | - | 1 | N | 2 |
| Di-n-butyl phthalate | 1/19 | 0.053 | EC-SDS102 | 0.37 - 7.9 | 780 | 100 | 120 | N | 2 |
| Di-n-octyl phthalate | 1/20 | 0.081 | EC-SDOP05 | 0.37 - 7.9 | 160 | - | 1000000 | N | 2 |
| Dibenzofuran | 1/19 | 0.1 | 3SD1 | 0.37 - 7.9 | 31 | - | - | N | 2 |
| Fluoranthene | 12/20 | 0.067 - 1.5 | 3SD5 | 0.37 - 3.9 | 310 | - | 980 | N | 2 |
| Fluorene | 2/19 | 0.18 - 0.2 | 3SD5 | 0.37 - 7.9 | 310 | - | 160 | N | 2 |
| Indeno(1,2,3-cd)pyrene | 3/20 | 0.062 - 0.36 | 3SD1 | 0.37 - 7.9 | 0.88 | - | 35 | N | 2 |
| Naphthalene | 1/19 | 0.08 | 3SD1 | 0.37 - 7.9 | 310 | - | 30 | N | 2 |
| Phenanthrene | 7/20 | 0.077 - 1.6 | 3SD5 | 0.37 - 7.9 | - | - | - | N | 1 |
| Pyrene | 12/20 | 0.054 - 1.9 | 2DSD5 | 0.37 - 3.9 | 230 | - | 1400 | N | 2 |



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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A DOWNSTREAM, ZONE 1 - ALL SOIL/SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 26/28 | 0.017 - 300 | 3SD3 | 0.018 - 0.022 | 2.7 | - | 0.7 | Y | 3 |
| 4,4'-DDE | 26/29 | 0.012 - 24 | MCLL1 | 0.022 - 0.64 | 1.9 | - | 0.5 | Y | 3 |
| 4,4'-DDT | 22/29 | 0.024 - 1400 | MCLL1 | 0.022 - 1.7 | 1.9 | 80 | 1.0 | Y | 3 |
| alpha-Chlordane | 5/26 | 0.0012 - 0.29 | EC-SDOP06 | 0.0021 - 180 | 0.49 (7) | 10 (7) | 2 (7) | N | 2 |
| Dieldrin | 2/23 | 0.002 - 0.37 | EC-SDS103 | 0.004 - 37 | 0.04 | 2 | 0.001 | Y | 3 |
| Endosulfan I | 1/23 | 0.0037 | 3DSD4A | 0.0021 - 18 | 47 | - | 4 | N | 2 |
| gamma-Chlordane | 1/24 | 0.081 | EC-SDOP06 | 0.0021 - 180 | 0.49 (7) | 10 (7) | 2 (7) | N | 2 |
| Heptachlor | 1/23 | 0.016 | EC-SDOP06 | 0.0021 - 18 | 0.14 | 0.3 | 0.06 | N | 2 |
| 1,2,3,4,6,7,8-HPCDD | 1/2 | 0.0005 | 3SD6 | 0.00028 | 0.0004 | - | - | Y | 3 |
| OCDD | 1/2 | 0.0054 | 3SD6 | 0.0013 | 0.004 | - | - | Y | 3 |
| OCDF | 1/2 | 0.0006 | 3SD6 | 0.00027 | 0.004 | - | - | N | 2 |
| Aluminum | 20/20 | 4080 - 18800 | 3SD3 | - | 7800 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Arsenic | 20/20 | 0.58 - 39.9 | 3SD4 | - | 0.43 | 380 | 15 | Y | 3 |
| Barium | 20/20 | 23.1 - 154 | 3SD4 | - | 550 | 350000 | 32 | N | 2 |
| Beryllium | 19/20 | 0.37 - 1.8 | 3SD4 | 0.21 | 0.15 | 690 | 180 | Y | 3 |
| Boron | 2/4 | 13 - 26.3 | EC-SDOP05 | 4.9 - 14.9 | 700 | - | - | N | 2 |
| Cadmium | 16/18 | 1.1 - 30.1 | 3SD4 | 0.59 - 1 | 3.9 | 920 | 6 | Y | 3 |
| Calcium | 20/20 | 534 - 5720 | 3SD4 | - | - | - | - | N | 1 |
| Chromium (total) | 20/20 | 6.5 - 43.4 | 3SD5 | - | 39 (8) | 140 (8) | 19 (8) | Y | 3 |
| Cobalt | 18/20 | 3.7 - 26.6 | 3SD2 | 4.1 - 6.5 | 470 | - | - | N | 2 |
| Copper | 20/20 | 10.6 - 118 | 3SD2 | - | 290 | - | - | N | 2 |
| Cyanide | 2/18 | 0.23 - 3.4 | 3SD2 | 0.13 - 5.7 | 160 | - | - | N | 2 |
| Iron | 20/20 | 7220 - 195000 | 3SD4 | - | 2300 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Lead | 20/20 | 5 - 223 | 3SD2 | - | 400 (9) | - | - | N | 2 |
| Magnesium | 20/20 | 1300 - 9640 | 3SD2 | - | - | - | - | N | 1 |
| Manganese | 20/20 | 94.6 - 2850 | EC-SDS102 | - | ~~39~~ 190 | - | - | Y | 3 |
| Mercury | 1/18 | 0.33 | 3SD1 | 0.06 - 0.4 | 2.3 | 7 | 3 | N | 2 |
| Nickel | 20/20 | 4.4 - 44.6 | 3SD2 | - | 160 | 6900 | 21 | N | 2 |
| Potassium | 18/20 | 323 - 3620 | 3SD5 | 457 - 3230 | - | - | - | N | 1 |

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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A DOWNSTREAM, ZONE 1 - ALL SOIL/SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Selenium | 12/18 | 0.29 - 3.2 | 3SD4 | 0.27 - 1.7 | 39 | - | 3 | N | 2 |
| Silver | 1/18 | 4.3 | 3SD1 | 0.49 - 6.4 | 39 | - | - | N | 2 |
| Sodium | 19/19 | 92.2 - 2070 | 3SD3 | - | - | - | - | N | 1 |
| Vanadium | 20/20 | 13.1 - 64.9 | 3SD4 | - | 55 | - | - | Y | 3 |
| Zinc | 20/20 | 18.2 - 2720 | 3SD2 | - | 2300 | - | 42000 | Y | 3 |

Footnotes:

1 Results in mg/kg unless otherwise noted. ~~Surface~~ All soil designated as soil from depths of 0 to ~~2~~ 10 feet.
2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment.
3 Sample-specific.
4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
5 Soil screening level guidance (USEPA, December 1994).
6 Soil screening level guidance (USEPA, December 1994) with a dilution and attenuation factor of 10.
7 Total chlordane.
8 Hexavalent chromium.
9 OSWER soil screening level for residential land use (USEPA, July 14, 1994).
10 Calculated using soil screening guidance (See Appendix F.3).

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS**
**SITE 2 AREA A DOWNSTREAM, ZONE 1 - ALL SOIL/SEDIMENT**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| 2-Butanone | 120 | 28.8529 |
| Acetone | 320 | 118.1111 |
| Carbon disulfide | 11 | 9.325 |
| Ethylbenzene | 2 | 7.3824 |
| Methylene chloride | 45 | 9.4167 |
| Tetrachloroethene | 4 | 7.5588 |
| Toluene | 4 | 7.2353 |
| Xylenes, total | 3 | 7.4412 |
| 4-Methylphenol | 230 | 987.5 |
| Acenaphthene | 140 | 981.3889 |
| Anthracene | 390 | 1011.4706 |
| Benzo(a)anthracene | 850 | 946.3889 |
| Benzo(a)pyrene | 590 | 966.5556 |
| Benzo(b)fluoranthene | 750 | 959.5 |
| Benzo(g,h,i)perylene | 260 | 968.9444 |
| Benzo(k)fluoranthene | 290 | 911.1111 |
| Benzoic acid | 82 | 5408.8 |
| Bis(2-ethylhexyl)phthalate | 160 | 1038.8235 |
| Chrysene | 720 | 955.8333 |
| Di-n-butyl phthalate | 53 | 1182.5294 |
| Di-n-octyl phthalate | 81 | 994.7778 |
| Dibenzofuran | 100 | 1030.8824 |
| Fluoranthene | 1500 | 747.5 |
| Fluorene | 200 | 991.4706 |
| Indeno(1,2,3-cd)pyrene | 360 | 971.8333 |
| Naphthalene | 80 | 1029.7059 |
| Phenanthrene | 1600 | 1044.8333 |
| Pyrene | 1900 | 794.3889 |
| 4,4'-DDD | 300000 | 40887.64 |
| 4,4'-DDE | 24000 | 2671.7308 |
| 4,4'-DDT | 1400000 | 59868.4615 |
| alpha-Chlordane | 290 | 6100.7 |
| Dieldrin | 370 | 1843.8143 |
| Endosulfan-I | 3.7 | 907.2714 |
| gamma-Chlordane | 81 | 6359.6341 |
| Heptachlor | 16 | 903.2381 |
| **Dioxins (ug/kg)** | | |
| 1,2,3,4,6,7,8-HPCDD | 0.494 | 0.317 |
| OCDD | 5.366 | 3.008 |
| OCDF | 0.552 | 0.3435 |

**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATIONS (Continued)**
**SITE 2 AREA A DOWNSTREAM, ZONE 1 - ALL SOIL/SEDIMENT**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Inorganics (mg/kg)** | | |
| Aluminum | 18800 | 11377.7778 |
| Arsenic | 39.9 | 9.2989 |
| Barium | 154 | 64.5056 |
| Beryllium | 1.8 | 0.8619 |
| Boron | 26.3 | 12.3 |
| Cadmium | 30.1 | 6.8497 |
| Calcium | 5720 | 3009.3889 |
| Chromium (total) | 43.4 | 22.9667 |
| Cobalt | 26.6 | 10.1667 |
| Copper | 118 | 31.1278 |
| Cyanide | 3.4 | 1.2278 |
| Iron | 195000 | 52686.1111 |
| Lead | 223 | 53.3778 |
| Magnesium | 9640 | 4096.1111 |
| Manganese | 2850 | 551.9222 |
| Mercury | 0.33 | 0.1081 |
| Nickel | 44.6 | 17.45 |
| Potassium | 3620 | 1431.9722 |
| Selenium | 3.2 | 0.9775 |
| Silver | 4.3 | 1.5844 |
| Sodium | 2070 | 787.3647 |
| Vanadium | 64.9 | 33.0611 |
| Zinc | 2720 | 258.3889 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 2 - SURFACE SOIL/SEDIMENT (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 2-Butanone | 3/6 | 0.072 - 0.28 | EC-SDLP11 | 0.018 - 0.16 | 4700 | 6900 (10) | - | N | 2 |
| Acetone | 1/6 | 0.9 | EC-SDLP11 | 0.083 - 0.59 | 780 | 62000 | 8 | N | 2 |
| 4-Chloro-3-methylphenol | 1/4 | 0.42 | EC-SDLP11 | 0.56 - 0.69 | - | - | - | N | 1 |
| 4-Methylphenol | 2/5 | 0.6 - 1.1 | EC-SDLP11 | 0.56 - 0.69 | 39 | - | - | N | 2 |
| Acenaphthene | 1/4 | 0.21 | EC-SDLP11 | 0.56 - 0.69 | 470 | - | 200 | N | 2 |
| Benzo(a)anthracene | 1/4 | 0.34 | EC-SDLP11 | 0.56 - 0.69 | 0.88 | - | 0.7 | N | 2 |
| Benzo(a)pyrene | 2/5 | 0.14 - 0.28 | EC-SDLP11 | 0.56 - 0.69 | 0.088 | - | 4 | Y | 3 |
| Benzo(b)fluoranthene | 2/5 | 0.15 - 0.46 | EC-SDLP11 | 0.56 - 0.69 | 0.88 | - | 4 | N | 2 |
| Benzo(g,h,i)perylene | 2/5 | 0.14 - 0.29 | EC-SDLP11 | 0.56 - 0.69 | - | - | - | N | 1 |
| Benzo(k)fluoranthene | 2/5 | 0.17 - 0.29 | EC-SDLP11 | 0.56 - 0.69 | 8.8 | - | 4 | N | 2 |
| Benzoic acid | 2/4 | 0.16 - 3.2 | EC-SDLP11 | 6.7 - 14 | 31000 | - | 280 | N | 2 |
| Chrysene | 2/5 | 0.22 - 0.63 | EC-SDLP11 | 0.56 - 0.69 | 88 | - | 1 | N | 2 |
| Di-n-butyl phthalate | 1/4 | 0.18 | EC-SDS209 | 0.56 - 2.6 | 780 | 100 | 120 | N | 2 |
| Fluoranthene | 3/5 | 0.097 - 1 | EC-SDLP11 | 0.56 - 0.69 | 310 | - | 980 | N | 2 |
| Indeno(1,2,3-cd)pyrene | 1/4 | 0.24 | EC-SDLP11 | 0.56 - 0.69 | 0.88 | - | 35 | N | 2 |
| Pentachlorophenol | 1/4 | 0.31 | EC-SDLP11 | 1.4 - 2.9 | 5.3 | - | 0.2 | N | 2 |
| Phenanthrene | 3/5 | 0.13 - 0.62 | EC-SDLP11 | 0.56 - 0.69 | - | - | - | N | 1 |
| Pyrene | 3/5 | 0.19 - 1 | EC-SDLP11 | 0.56 - 0.69 | 230 | - | 1400 | N | 2 |
| 4,4'-DDD | 12/13 | 0.11 - 850 | EC-SDLP12 | 0.1 | 2.7 | - | 0.7 | Y | 3 |
| 4,4'-DDE | 12/13 | 0.45 - 24 | EC-SDLP12 | 0.1 | 1.9 | - | 0.5 | Y | 3 |
| 4,4'-DDT | 12/13 | 0.32 - 59 | EC-SDLP10 | 0.1 | 1.9 | 80 | 1.0 | Y | 3 |
| Alpha-chlordane | 1/6 | 0.0013 | 2DSS19 | 0.0075 - 0.5 | 0.49 (7) | 10 (7) | 2 (7) | N | 2 |
| Dieldrin | 5/10 | 0.0066 - 0.86 | EC-SDS209 | 0.0056 - 0.13 | 0.04 | 2 | 0.001 | Y | 3 |
| Endrin aldehyde | 1/6 | 0.24 | EC-SDS207 | 0.0056 - 0.13 | - | - | - | N | 1 |
| Endrin ketone | 1/7 | 0.28 | EC-SDLP10 | 0.0056 - 0.13 | - | - | - | N | 1 |
| Gamma-chlordane | 1/7 | 0.023 | EC-SDS208 | 0.0029 - 0.5 | 0.49 (7) | 10 (7) | 2 (7) | N | 2 |
| Heptachlor epoxide | 1/6 | 0.0006 | 2DSS13 | 0.0029 - 0.069 | 0.07 | 1 | 0.03 | N | 2 |
| Aluminum | 6/6 | 4410 - 11500 | 2DSD4 | - | 7800 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Antimony | 1/3 | 11.4 | EC-SDS209 | 4 - 6 | 3.1 | - | - | Y | 3 |
| Arsenic | 2/5 | 5.9 - 9.5 | EC-SDS209 | 0.59 - 5.7 | 0.43 | 380 | 15 | Y | 3 |
| Barium | 6/6 | 10.6 - 111 | EC-SDS209 | - | 550 | 350000 | 32 | N | 2 |
| Beryllium | 2/3 | 0.15 - 0.28 | 2DSD27 | 1.9 | 0.15 | 690 | 180 | Y | 3 |

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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A DOWNSTREAM, ZONE 2 - SURFACE SOIL/SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Boron | 2/5 | 15.1 - 19.1 | EC-SDS209 | 2.9 - 6.9 | 700 | - | - | N | 2 |
| Cadmium | 1/3 | 4 | 2DSD4 | 0.56 - 0.84 | 3.9 | 920 | 6 | Y | 3 |
| Calcium | 6/6 | 836 - 11300 | EC-SDS209 | - | - | - | - | N | 1 |
| Chromium | 6/6 | 4.6 - 12.8 | 2DSD4 | - | 39 (8) | 140 (8) | 19 (8) | N | 2 |
| Cobalt | 3/6 | 2.9 - 4.1 | EC-SDS209 | 0.46 - 9.5 | 470 | - | - | N | 2 |
| Copper | 4/6 | 21.7 - 45.5 | EC-SDS209 | 0.87 - 1.7 | 290 | - | - | N | 2 |
| Cyanide | 1/3 | 0.2 | 2DSD27 | 0.15 - 12.3 | 160 | - | - | N | 2 |
| Iron | 6/6 | 818 - 23200 | EC-SDS209 | - | 2300 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Lead | 6/6 | 7.7 - 661 | EC-SDS209 | - | 400 (9) | - | - | Y | 3 |
| Magnesium | 6/6 | 233 - 1910 | EC-SDS209 | - | - | - | - | N | 1 |
| Manganese | 6/6 | 33.6 - 399 | EC-SDS209 | - | ~~39~~ 190 | - | - | Y | 3 |
| Nickel | 4/6 | 9.3 - 25.2 | 2DSD4 | 2.1 - 3.1 | 160 | 6900 | 21 | N | 2 |
| Potassium | 2/4 | 121 - 347 | EC-SDLP11 | 49.2 - 1030 | - | - | - | N | 1 |
| Selenium | 1/3 | 3 | 2DSD4 | 0.58 - 1.8 | 39 | - | 3 | N | 2 |
| Sodium | 5/6 | 149 - 2220 | 2DSD4 | 223 | - | - | - | N | 1 |
| Vanadium | 6/6 | 2.6 - 86.9 | EC-SDS209 | - | 55 | - | - | Y | 3 |
| Zinc | 4/6 | 16.9 - 111 | EC-SDS209 | 3.9 - 6.7 | 2300 | - | 42000 | N | 2 |

Footnotes:

1 Results in mg/kg unless otherwise noted. Surface soil designated as soil from depths of 0 to 2 feet.
2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment.
3 Sample-specific.
4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
5 Soil screening level guidance (USEPA, December 1994).
6 Soil screening level guidance (USEPA, December 1994) with a dilution and attenuation factor of 10.
7 Total chlordane.
8 Hexavalent chromium.
9 OSWER soil screening level for residential land use (USEPA, July 14, 1994).
10 Calculated using soil screening guidance (See Appendix F.3).

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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## SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION
## SITE 2 AREA A DOWNSTREAM, ZONE 2 - SURFACE SOIL/SEDIMENT
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| 2-Butanone | 280 | 111.5 |
| Acetone | 900 | 365 |
| 4-Chloro-3-methylphenol | 420 | 355 |
| 4-Methylphenol | 1100 | 586.25 |
| Acenaphthene | 210 | 285 |
| Benzo(a)anthracene | 340 | 328.3333 |
| Benzo(a)pyrene | 280 | 266.25 |
| Benzo(b)fluoranthene | 460 | 313.75 |
| Benzo(g,h,i)perylene | 290 | 268.75 |
| Benzo(k)fluoranthene | 290 | 276.25 |
| Benzoic acid | 3200 | 3453.3333 |
| Chrysene | 630 | 373.75 |
| Di-n-butyl phthalate | 180 | 608.3333 |
| Fluoranthene | 1000 | 455.5 |
| Indeno(1,2,3-Cd)pyrene | 240 | 295 |
| Pentachlorophenol | 310 | 870 |
| Phenanthrene | 620 | 331.25 |
| Pyrene | 1000 | 466.25 |
| 4,4'-DDD | 850000 | 177035 |
| 4,4'-DDE | 24000 | 6579 |
| 4,4'-DDT | 59000 | 15673 |
| alpha-Chlordane | 1.3 | 72.3875 |
| Dieldrin | 860 | 182.7286 |
| Endrin aldehyde | 240 | 81.5 |
| Endrin ketone | 280 | 83.2 |
| gamma-Chlordane | 23 | 63.65 |
| Heptachlor epoxide | 0.57 | 15.955 |
| **Inorganics (mg/kg)** | | |
| Aluminum | 11500 | 7507.5 |
| Antimony | 11.4 | 7.2 |
| Arsenic | 9.5 | 4.2633 |
| Barium | 111 | 64.075 |
| Beryllium | 0.28 | 0.615 |
| Boron | 19.1 | 8.2333 |
| Cadmium | 4 | 2.21 |
| Calcium | 11300 | 5517.5 |
| Chromium (total) | 12.8 | 9.725 |
| Cobalt | 4.1 | 3.0875 |
| Copper | 45.5 | 23.0625 |
| Cyanide | 0.2 | 3.175 |
| Iron | 23200 | 15887.5 |
| Lead | 661 | 206.625 |
| Magnesium | 1910 | 1092.25 |

**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION (Continued)**
**SITE 2 AREA A DOWNSTREAM, ZONE 2 - SURFACE SOIL/SEDIMENT**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Inorganics (mg/kg) (Continued)** | | |
| Manganese | 399 | 231.575 |
| Nickel | 25.2 | 15.1125 |
| Potassium | 347 | 327.6667 |
| Selenium | 3 | 1.95 |
| Sodium | 2220 | 1399.75 |
| Vanadium | 86.9 | 42.45 |
| Zinc | 111 | 54.1625 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 2 - ALL SOIL/SEDIMENT (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Dichloroethene | 1/6 | 0.016 | 2DMW15S | 0.012 - 0.031 | 1.1 | 0.04 | 0.03 | N | 2 |
| 2-Butanone | 3/9 | 0.072 - 0.28 | EC-SDLP11 | 0.012 - 0.16 | 4700 | 6900 (10) | - | N | 2 |
| Acetone | 2/9 | 0.079 - 0.9 | EC-SDLP11 | 0.02 - 0.59 | 780 | 62000 | 8 | N | 2 |
| Carbon disulfide | 1/10 | 0.007 | 2DMW15S | 0.012 - 0.031 | 780 | 11 | 14 | N | 2 |
| Tetrachloroethene | 1/6 | 0.058 | 2DMW15S | 0.012 - 0.031 | 12 | 11 | 0.04 | N | 2 |
| Toluene | 1/6 | 0.1 | 2DMW15S | 0.012 - 0.031 | 1600 | 520 | 5 | N | 2 |
| Trichloroethene | 1/6 | 0.024 | 2DMW15S | 0.012 - 0.031 | 58 | 3 | 0.02 | N | 2 |
| 4-Chloro-3-methylphenol | 1/7 | 0.42 | EC-SDLP11 | 0.4 - 0.69 | - | - | - | N | 1 |
| 4-Methylphenol | 2/8 | 0.6 - 1.1 | EC-SDLP11 | 0.4 - 0.69 | 39 | - | - | N | 2 |
| Acenaphthene | 1/7 | 0.21 | EC-SDLP11 | 0.4 - 0.69 | 470 | - | 200 | N | 2 |
| Benzo(a)anthracene | 1/7 | 0.34 | EC-SDLP11 | 0.4 - 0.69 | 0.88 | - | 0.7 | N | 2 |
| Benzo(a)pyrene | 2/8 | 0.14 - 0.28 | EC-SDLP11 | 0.4 - 0.69 | 0.088 | - | 4 | Y | 3 |
| Benzo(b)fluoranthene | 2/8 | 0.15 - 0.46 | EC-SDLP11 | 0.4 - 0.69 | 0.88 | - | 4 | N | 2 |
| Benzo(g,h,i)perylene | 2/8 | 0.14 - 0.29 | EC-SDLP11 | 0.4 - 0.69 | - | - | - | N | 1 |
| Benzo(k)fluoranthene | 2/8 | 0.17 - 0.29 | EC-SDLP11 | 0.4 - 0.69 | 8.8 | - | 4 | N | 2 |
| Benzoic acid | 2/5 | 0.16 - 3.2 | EC-SDLP11 | 2 - 14 | 31000 | - | 280 | N | 2 |
| Chrysene | 2/8 | 0.22 - 0.63 | EC-SDLP11 | 0.4 - 0.69 | 88 | - | 1 | N | 2 |
| Di-n-butyl phthalate | 1/7 | 0.18 | EC-SDS209 | 0.4 - 2.6 | 780 | 100 | 120 | N | 2 |
| Fluoranthene | 3/8 | 0.097 - 1 | EC-SDLP11 | 0.4 - 0.69 | 310 | - | 980 | N | 2 |
| Indeno(1,2,3-cd)pyrene | 1/7 | 0.24 | EC-SDLP11 | 0.4 - 0.69 | 0.88 | - | 35 | N | 2 |
| Pentachlorophenol | 1/7 | 0.31 | EC-SDLP11 | 0.98 - 2.9 | 5.3 | - | 0.2 | N | 2 |
| Phenanthrene | 3/8 | 0.13 - 0.62 | EC-SDLP11 | 0.4 - 0.69 | - | - | - | N | 1 |
| Pyrene | 3/8 | 0.19 - 1 | EC-SDLP11 | 0.4 - 0.69 | 230 | - | 1400 | N | 2 |
| 4,4'-DDD | 12/16 | 0.11 - 850 | EC-SDLP12 | 0.02 - 0.15 | 2.7 | - | 0.7 | Y | 3 |
| 4,4'-DDE | 15/17 | 0.0053 - 24 | EC-SDLP12 | 0.02 - 0.1 | 1.9 | - | 0.5 | Y | 3 |
| 4,4'-DDT | 12/17 | 0.32 - 59 | EC-SDLP10 | 0.005 - 0.1 | 1.9 | 80 | 1.0 | Y | 3 |
| Alpha-chlordane | 1/10 | 0.0013 | 2DSS19 | 0.0021 - 0.5 | 0.49 (7) | 10 (7) | 2 (7) | N | 2 |
| Dieldrin | 5/14 | 0.0066 - 0.86 | EC-SDS209 | 0.004 - 0.13 | 0.04 | 2 | 0.001 | Y | 3 |
| Endrin aldehyde | 1/9 | 0.24 | EC-SDS207 | 0.004 - 0.13 | - | - | - | N | 1 |



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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A DOWNSTREAM, ZONE 2 - ALL SOIL/SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Endrin ketone | 1/11 | 0.28 | EC-SDLP10 | 0.004 - 0.13 | - | - | - | N | 1 |
| Gamma-chlordane | 1/11 | 0.023 | EC-SDS208 | 0.0021 - 0.5 | 0.49 (7) | 10 (7) | 2 (7) | N | 2 |
| Heptachlor epoxide | 1/10 | 0.0006 | 2DSS13 | 0.0021 - 0.069 | 0.07 | 1 | 0.03 | N | 2 |
| Aluminum | 9/9 | 4410 - 26200 | 2DMW15S | - | 7800 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Antimony | 1/5 | 11.4 | EC-SDS209 | 2.5 - 6 | 3.1 | - | - | Y | 3 |
| Arsenic | 5/8 | 0.58 - 9.5 | EC-SDS209 | 0.59 - 5.7 | 0.43 | 380 | 15 | Y | 3 |
| Barium | 9/9 | 10.6 - 111 | EC-SDS209 | - | 550 | 350000 | 32 | N | 2 |
| Beryllium | 5/6 | 0.15 - 0.72 | 2DMW15S | 1.9 | 0.15 | 690 | 180 | Y | 3 |
| Boron | 2/7 | 15.1 - 19.1 | EC-SDS209 | 1.8 - 6.9 | 700 | - | - | N | 2 |
| Cadmium | 2/6 | 2.4 - 4 | 2DSD4 | 0.35 - 0.84 | 3.9 | 920 | 6 | Y | 3 |
| Calcium | 9/9 | 521 - 11300 | EC-SDS209 | - | - | - | - | N | 1 |
| Chromium | 9/9 | 4.6 - 28.6 | 2DMW15S | - | 39 (8) | 140 (8) | 19 (8) | N | 2 |
| Cobalt | 6/9 | 2.2 - 13.4 | 2DMW15S | 0.46 - 9.5 | 470 | - | - | N | 2 |
| Copper | 5/9 | 14.3 - 45.5 | EC-SDS209 | 0.87 - 3.9 | 290 | - | - | N | 2 |
| Cyanide | 1/6 | 0.2 | 2DSD27 | 0.1 - 12.3 | 160 | - | - | N | 2 |
| Iron | 9/9 | 818 - 23200 | EC-SDS209 | - | 2300 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Lead | 9/9 | 4 - 661 | EC-SDS209 | - | 400 (9) | - | - | Y | 3 |
| Magnesium | 9/9 | 233 - 3920 | 2DMW15S | - | - | - | - | N | 1 |
| Manganese | 9/9 | 33.6 - 399 | EC-SDS209 | - | ~~39~~ 190 | - | - | Y | 3 |
| Nickel | 7/9 | 3 - 25.2 | 2DSD4 | 2.1 - 3.1 | 160 | 6900 | 21 | N | 2 |
| Potassium | 5/7 | 121 - 724 | 2DMW15S | 49.2 - 1030 | - | - | - | N | 1 |
| Selenium | 1/6 | 3 | 2DSD4 | 0.35 - 1.8 | 39 | - | 3 | N | 2 |
| Sodium | 7/9 | 102 - 2220 | 2DSD4 | 87.2 - 223 | - | - | - | N | 1 |
| Vanadium | 9/9 | 2.6 - 86.9 | EC-SDS209 | - | 55 | - | - | Y | 3 |
| Zinc | 7/9 | 12.2 - 111 | EC-SDS209 | 3.9 - 6.7 | 2300 | - | 42000 | N | 2 |

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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A DOWNSTREAM, ZONE 2 - ALL SOIL/SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

Footnotes:

1 Results in mg/kg unless otherwise noted. ~~Surface~~ All soil designated as soil from depths of 0 to ~~2~~ 10 feet.
2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment.
3 Sample-specific.
4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
5 Soil screening level guidance (USEPA, December 1994).
6 Soil screening level guidance (USEPA, December 1994) with a dilution and attenuation factor of 10.
7 Total chlordane.
8 Hexavalent chromium.
9 OSWER soil screening level for residential land use (USEPA, July 14, 1994).
10 Calculated using soil screening guidance (See Appendix F.3).

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION**
**SITE 2 AREA A DOWNSTREAM, ZONE 2 - ALL SOIL/SEDIMENT**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| 1,1-Dichloroethene | 16 | 10.9 |
| 2-Butanone | 280 | 70.0714 |
| Acetone | 900 | 224.2143 |
| Carbon disulfide | 7 | 8.3571 |
| Tetrachloroethene | 58 | 19.3 |
| Toluene | 100 | 27.7 |
| Trichloroethene | 24 | 12.5 |
| 4-Chloro-3-methylphenol | 420 | 281.6667 |
| 4-Methylphenol | 1100 | 424.2857 |
| Acenaphthene | 210 | 246.6667 |
| Benzo(a)anthracene | 340 | 268.3333 |
| Benzo(a)pyrene | 280 | 241.4286 |
| Benzo(b)fluoranthene | 460 | 268.5714 |
| Benzo(g,h,i)perylene | 290 | 242.8571 |
| Benzo(k)fluoranthene | 290 | 247.1429 |
| Benzoic acid | 3200 | 2840 |
| Chrysene | 630 | 302.8571 |
| Di-n-butyl phthalate | 180 | 515 |
| Fluoranthene | 1000 | 349.5714 |
| Indeno(1,2,3-cd)pyrene | 240 | 251.6667 |
| Pentachlorophenol | 310 | 766.6667 |
| Phenanthrene | 620 | 278.5714 |
| Pyrene | 1000 | 355.7143 |
| 4,4'-DDD | 850000 | 136190.3846 |
| 4,4'-DDE | 24000 | 4703.1571 |
| 4,4'-DDT | 59000 | 11197.1071 |
| alpha-Chlordane | 1.3 | 42.8625 |
| Dieldrin | 860 | 117.7773 |
| Endrin aldehyde | 240 | 47.4929 |
| Endrin ketone | 280 | 48.05 |
| gamma-Chlordane | 23 | 41.2889 |
| Heptachlor epoxide | 0.57 | 9.0213 |
| **Inorganics (mg/kg)** | | |
| Aluminum | 26200 | 10468.5714 |
| Antimony | 11.4 | 4.35 |
| Arsenic | 9.5 | 2.8817 |
| Barium | 111 | 57.0286 |
| Beryllium | 0.72 | 0.528 |
| Boron | 19.1 | 5.38 |
| Cadmium | 4 | 1.448 |
| Calcium | 11300 | 3437.5714 |
| Chromium (total) | 28.6 | 12.8286 |
| Cobalt | 13.4 | 4.45 |

**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION (Continued)**
**SITE 2 AREA A DOWNSTREAM, ZONE 2 - ALL SOIL/SEDIMENT**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Inorganic (mg/kg)** | | |
| Copper | 45.5 | 15.7714 |
| Cyanide | 0.2 | 1.442 |
| Iron | 23200 | 14027.1429 |
| Lead | 661 | 120.5143 |
| Magnesium | 3920 | 1638.4286 |
| Manganese | 399 | 186.5857 |
| Nickel | 25.2 | 12.0071 |
| Potassium | 724 | 404.3333 |
| Selenium | 3 | 0.91 |
| Sodium | 2220 | 840.8 |
| Vanadium | 86.9 | 35.6286 |
| Zinc | 111 | 41.75 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 3 - SURFACE SOIL/SEDIMENT (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 1/6 | 0.004 | 2DSD2 | 0.008 - 0.074 | 780 | 11 | 14 | N | 2 |
| Methylene chloride | 3/7 | 0.003 - 0.07 | EC-SDUP18 | 0.013 - 0.074 | 85 | 7 | 0.01 | N | 2 |
| Trichloroethene | 1/5 | 0.003 | 2DSD2 | 0.008 - 0.074 | 58 | 3 | 0.02 | N | 2 |
| 2-Nitroaniline | 1/5 | 3.1 | 2DSD2 | 1 - 47 | 0.47 | 4 | - | Y | 3 |
| 4,6-Dinitro-2-methylphenol | 1/5 | 6.2 | 2DSD2 | 1 - 47 | - | - | - | N | 1 |
| Benzo(b)fluoranthene | 1/6 | 0.16 | EC-SDUP18 | 0.42 - 19 | 0.88 | - | 4 | N | 2 |
| Fluoranthene | 1/6 | 0.06 | EC-SDS313 | 0.42 - 19 | 310 | - | 980 | N | 2 |
| Pyrene | 2/7 | 0.063 - 0.14 | EC-SDUP18 | 0.42 - 19 | 230 | - | 1400 | N | 2 |
| 4,4'-DDD | 15/15 | 0.025 - 120 | EC-SDS421 | - | 2.7 | - | 0.7 | Y | 3 |
| 4,4'-DDE | 17/17 | 0.05 - 9 | 2DSD21 | - | 1.9 | - | 0.5 | Y | 3 |
| 4,4'-DDT | 13/17 | 0.033 - 29 | 2DSS16 | 0.025 - 11 | 1.9 | 80 | 1.0 | Y | 3 |
| Alpha-chlordane | 10/17 | 0.0012 - 0.49 | EC-SDS421 | 0.03 - 2.2 | 0.49 (7) | 10 (7) | 2 (7) | Y | 3 |
| Aroclor-1254 | 1/9 | 0.035 | 2DSS2 | 0.25 - 43 | 0.16 | - | - | N | 2 |
| Dieldrin | 5/11 | 0.0024 - 0.9 | EC-SDS421 | 0.025 - 1.1 | 0.04 | 2 | 0.001 | Y | 3 |
| Endosulfan sulfate | 1/12 | 0.0039 | 2DSS2 | 0.025 - 4.8 | - | - | - | N | 1 |
| Endrin | 1/12 | 0.084 | EC-SDUP16 | 0.0048 - 4.8 | 2.3 | - | 0.4 | N | 2 |
| Gamma-chlordane | 1/13 | 0.18 | EC-SDUP17 | 0.0025 - 2.5 | 0.49 (7) | 10 (7) | 2 (7) | N | 2 |
| Heptachlor | 1/14 | 0.046 | EC-SDUP17 | 0.0025 - 2.5 | 0.14 | 0.3 | 0.06 | N | 2 |
| Heptachlor epoxide | 1/13 | 0.0014 | 2DSS2 | 0.012 - 2.5 | 0.07 | 1 | 0.03 | N | 2 |
| Aluminum | 7/7 | 3270 - 33100 | 2DSD2 | - | 7800 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Antimony | 1/3 | 6.1 | EC-SDUP18 | 0.85 - 4 | 3.1 | - | - | Y | 3 |
| Arsenic | 7/7 | 3.9 - 17.7 | EC-SDUP18 | - | 0.43 | 380 | 15 | Y | 3 |
| Barium | 7/7 | 28 - 635 | EC-SDUP18 | - | 550 | 350000 | 32 | Y | 3 |
| Beryllium | 7/7 | 0.51 - 5.6 | EC-SDUP18 | - | 0.15 | 690 | 180 | Y | 3 |
| Boron | 3/4 | 4 - 23.8 | EC-SDUP18 | 7.1 | 700 | - | - | N | 2 |
| Cadmium | 3/5 | 4.2 - 13.8 | 2DSD1 | 0.28 - 0.57 | 3.9 | 920 | 6 | Y | 3 |
| Calcium | 7/7 | 1290 - 92200 | EC-SDS420 | - | - | - | - | N | 1 |
| Chromium (total) | 7/7 | 9.5 - 48.9 | 2DSD1 | - | 39 (8) | 140 (8) | 19 (8) | Y | 3 |
| Cobalt | 7/7 | 5.6 - 26.7 | EC-SDUP18 | - | 470 | - | - | N | 2 |

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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A DOWNSTREAM, ZONE 3 - SURFACE SOIL/SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Copper | 7/7 | 18.1 - 94.3 | 2DSD1 | - | 290 | - | - | N | 2 |
| Cyanide | 4/7 | 0.12 - 21.4 | EC-SDUP18 | 2.5 - 4.2 | 160 | - | - | N | 2 |
| Iron | 7/7 | 18900 - 639000 | EC-SDUP18 | - | 2300 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Lead | 7/7 | 18.7 - 82 | EC-SDUP18 | - | 400 (9) | - | - | N | 2 |
| Magnesium | 7/7 | 1320 - 2980 | 2DSD1 | - | - | - | - | N | 1 |
| Manganese | 7/7 | 129 - 1300 | EC-SDUP18 | - | ~~99~~ 190 | - | - | Y | 3 |
| Nickel | 7/7 | 10.1 - 46.7 | EC-SDUP18 | - | 160 | 6900 | 21 | N | 2 |
| Potassium | 6/7 | 910 - 2390 | EC-SDS313 | 4470 | - | - | - | N | 1 |
| Selenium | 1/6 | 17.8 | EC-SDUP18 | 0.4 - 1.4 | 39 | - | 3 | N | 2 |
| Sodium | 7/7 | 208 - 1930 | EC-SDUP18 | - | - | - | - | N | 1 |
| Vanadium | 7/7 | 11.6 - 56.7 | EC-SDUP18 | - | 55 | - | - | Y | 3 |
| Zinc | 7/7 | 48.4 - 617 | 2DSD1 | - | 2300 | - | 42000 | N | 2 |

Footnotes:

1 Results in mg/kg unless otherwise noted. Surface soil designated as soil from depths of 0 to 2 feet.
2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment.
3 Sample-specific.
4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
5 Soil screening level guidance (USEPA, December 1994).
6 Soil screening level guidance (USEPA, December 1994) with a dilution and attenuation factor of 10.
7 Total chlordane.
8 Hexavalent chromium.
9 OSWER soil screening level for residential land use (USEPA, July 14, 1994).

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level..
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION**
**SITE 2 AREA A DOWNSTREAM, ZONE 3 - SURFACE SOIL/SEDIMENT**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| Carbon disulfide | 4 | 19.75 |
| Methylene chloride | 70 | 24.9286 |
| Trichloroethene | 3 | 16.8 |
| 2-Nitroaniline | 3100 | 9520 |
| 4,6-Dinitro-2-methylphenol | 6200 | 10140 |
| Benzo(b)fluoranthene | 160 | 3595 |
| Fluoranthene | 60 | 3578.3333 |
| Pyrene | 140 | 3087.5714 |
| 4,4'-DDD | 120000 | 31403 |
| 4,4'-DDE | 9000 | 2061.6471 |
| 4,4'-DDT | 29000 | 3687.9706 |
| alpha-Chlordane | 490 | 192.5412 |
| Aroclor-1254 | 35 | 3618.3333 |
| Dieldrin | 900 | 171.2182 |
| Endosulfan sulfate | 3.9 | 530.2 |
| Endrin | 84 | 330.5333 |
| gamma-Chlordane | 180 | 270.4038 |
| Heptachlor | 46 | 244.6607 |
| Heptachlor epoxide | 1.4 | 259.9538 |
| **Inorganics (mg/kg)** | | |
| Aluminum | 33100 | 17770 |
| Antimony | 6.1 | 2.8417 |
| Arsenic | 17.7 | 7.1857 |
| Barium | 635 | 172.3857 |
| Beryllium | 5.6 | 3.3157 |
| Boron | 23.8 | 11.3125 |
| Cadmium | 13.8 | 6.145 |
| Calcium | 92200 | 18805.7143 |
| Chromium (total) | 48.9 | 26.8429 |
| Cobalt | 26.7 | 12.3 |
| Copper | 94.3 | 51.8857 |
| Cyanide | 21.4 | 5.2671 |
| Iron | 639000 | 134200 |
| Lead | 82 | 41.5429 |
| Magnesium | 2980 | 2067.1429 |
| Manganese | 1300 | 517.2857 |
| Nickel | 46.7 | 26.3571 |
| Potassium | 2390 | 1619 |
| Selenium | 17.8 | 3.3033 |
| Sodium | 1930 | 753.8571 |
| Vanadium | 56.7 | 32.1 |
| Zinc | 617 | 272.6143 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 3 - ALL SOIL/SEDIMENT (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 1/7 | 0.004 | 2DSD2 | 0.006 - 0.074 | 780 | 11 | 14 | N | 2 |
| Methylene chloride | 3/8 | 0.003 - 0.07 | EC-SDUP18 | 0.006 - 0.074 | 85 | 7 | 0.01 | N | 2 |
| Trichloroethene | 1/6 | 0.003 | 2DSD2 | 0.006 - 0.074 | 58 | 3 | 0.02 | N | 2 |
| 2-Nitroaniline | 1/6 | 3.1 | 2DSD2 | 1 - 47 | 0.47 | 4 | - | Y | 3 |
| 4,6-Dinitro-2-methylphenol | 1/6 | 6.2 | 2DSD2 | 1 - 47 | - | - | - | N | 1 |
| Benzo(b)fluoranthene | 1/7 | 0.16 | EC-SDUP18 | 0.42 - 19 | 0.88 | - | 4 | N | 2 |
| Fluoranthene | 1/7 | 0.06 | EC-SDS313 | 0.42 - 19 | 310 | - | 980 | N | 2 |
| Pyrene | 2/8 | 0.063 - 0.14 | EC-SDUP18 | 0.42 - 19 | 230 | - | 1400 | N | 2 |
| 4,4'-DDD | 16/17 | 0.025 - 120 | EC-SDS421 | 0.02 | 2.7 | - | 0.7 | Y | 3 |
| 4,4'-DDE | 18/19 | 0.05 - 9 | 2DSD21 | 0.02 | 1.9 | - | 0.5 | Y | 3 |
| 4,4'-DDT | 13/19 | 0.033 - 29 | 2DSS16 | 0.02 - 11 | 1.9 | 80 | 1.0 | Y | 3 |
| Alpha-chlordane | 10/19 | 0.0012 - 0.49 | EC-SDS421 | 0.03 - 2.2 | 0.49 (7) | 10 (7) | 2 (7) | Y | 3 |
| Aroclor-1254 | 1/11 | 0.035 | 2DSS2 | 0.2 - 43 | 0.16 | - | - | N | 2 |
| Dieldrin | 5/13 | 0.0024 - 0.9 | EC-SDS421 | 0.02 - 1.1 | 0.04 | 2 | 0.001 | Y | 3 |
| Endosulfan sulfate | 1/14 | 0.0039 | 2DSS2 | 0.02 - 4.8 | - | - | - | N | 1 |
| Endrin | 1/14 | 0.084 | EC-SDUP16 | 0.0048 - 4.8 | 2.3 | - | 0.4 | N | 2 |
| Gamma-chlordane | 1/15 | 0.18 | EC-SDUP17 | 0.0025 - 2.5 | 0.49 (7) | 10 (7) | 2 (7) | N | 2 |
| Heptachlor | 1/16 | 0.046 | EC-SDUP17 | 0.0025 - 2.5 | 0.14 | 0.3 | 0.06 | N | 2 |
| Heptachlor epoxide | 1/15 | 0.0014 | 2DSS2 | 0.01 - 2.5 | 0.07 | 1 | 0.03 | N | 2 |
| Aluminum | 8/8 | 3270 - 33100 | 2DSD2 | - | 7800 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Antimony | 1/3 | 6.1 | EC-SDUP18 | 0.85 - 4 | 3.1 | - | - | Y | 3 |
| Arsenic | 8/8 | 2.5 - 17.7 | EC-SDUP18 | - | 0.43 | 380 | 15 | Y | 3 |
| Barium | 8/8 | 28 - 635 | EC-SDUP18 | - | 550 | 350000 | 32 | Y | 3 |
| Beryllium | 8/8 | 0.42 - 5.6 | EC-SDUP18 | - | 0.15 | 690 | 180 | Y | 3 |
| Boron | 3/4 | 4 - 23.8 | EC-SDUP18 | 7.1 | 700 | - | - | N | 2 |
| Cadmium | 4/6 | 1.8 - 13.8 | 2DSD1 | 0.28 - 0.57 | 3.9 | 920 | 6 | Y | 3 |
| Calcium | 8/8 | 978 - 92200 | EC-SDS420 | - | - | - | - | N | 1 |
| Chromium (total) | 8/8 | 9.5 - 48.9 | 2DSD1 | - | 39 (8) | 140 (8) | 19 (8) | Y | 3 |
| Cobalt | 8/8 | 5.6 - 26.7 | EC-SDUP18 | - | 470 | - | - | N | 2 |

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B2D3_COC.XLS

000027

**SUMMARY OF COC SELECTION (Continue)**
**SITE 2 AREA A DOWNSTREAM, ZONE 3 - ALL SOIL/SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | SSL Inhalation (5) | SSL Migration to Groundwater (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Copper | 8/8 | 18.1 - 94.3 | 2DSD1 | - | 290 | - | - | N | 2 |
| Cyanide | 4/8 | 0.12 - 21.4 | EC-SDUP18 | 1.4 - 4.2 | 160 | - | - | N | 2 |
| Iron | 8/8 | 18900 - 639000 | EC-SDUP18 | - | 2300 | - | - | ~~Y~~ N | ~~3~~ 4 |
| Lead | 8/8 | 5.1 - 82 | EC-SDUP18 | - | 400 (9) | - | - | N | 2 |
| Magnesium | 8/8 | 1320 - 4420 | 2DMW10S | - | - | - | - | N | 1 |
| Manganese | 8/8 | 129 - 1300 | EC-SDUP18 | - | ~~39~~ 190 | - | - | Y | 3 |
| Nickel | 8/8 | 10.1 - 46.7 | EC-SDUP18 | - | 160 | 6900 | 21 | N | 2 |
| Potassium | 7/8 | 910 - 2390 | EC-SDS313 | 4470 | - | - | - | N | 1 |
| Selenium | 1/7 | 17.8 | EC-SDUP18 | 0.4 - 1.4 | 39 | - | 3 | N | 2 |
| Sodium | 8/8 | 141 - 1930 | EC-SDUP18 | - | - | - | - | N | 1 |
| Vanadium | 8/8 | 11.6 - 56.7 | EC-SDUP18 | - | 55 | - | - | Y | 3 |
| Zinc | 8/8 | 47.2 - 617 | 2DSD1 | - | 2300 | - | 42000 | N | 2 |

000028

Footnotes:

1 Results in mg/kg unless otherwise noted. ~~Surface~~ All soil designated as soil from depths of 0 to ~~2~~ 10 feet.
2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment.
3 Sample-specific.
4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
5 Soil screening level guidance (USEPA, December 1994).
6 Soil screening level guidance (USEPA, December 1994) with a dilution and attenuation factor of 10.
7 Total chlordane.
8 Hexavalent chromium.
9 OSWER soil screening level for residential land use (USEPA, July 14, 1994).

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION**
**SITE 2 AREA A DOWNSTREAM, ZONE 3 - ALL SOIL/SEDIMENT**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| Carbon disulfide | 4 | 17.3571 |
| Methylene chloride | 70 | 22.1875 |
| Trichloroethene | 3 | 14.5 |
| 2-Nitroaniline | 3100 | 8100 |
| 4,6-Dinitro-2-methylphenol | 6200 | 8616.6667 |
| Benzo(b)fluoranthene | 160 | 3111.4286 |
| Fluoranthene | 60 | 3097.1429 |
| Pyrene | 140 | 2727.875 |
| 4,4'-DDD | 120000 | 34179.7059 |
| 4,4'-DDE | 9000 | 2008.3158 |
| 4,4'-DDT | 29000 | 3329.2368 |
| Alpha-chlordane | 490 | 189.1158 |
| Aroclor-1254 | 35 | 3469.5455 |
| Dieldrin | 900 | 187.9538 |
| Endosulfan sulfate | 3.9 | 494.4571 |
| Endrin | 84 | 323.3143 |
| Gamma-chlordane | 180 | 255.6833 |
| Heptachlor | 46 | 231.2656 |
| Heptachlor epoxide | 1.4 | 243.6267 |
| **Inorganics (mg/kg)** | | |
| Aluminum | 33100 | 17486.25 |
| Antimony | 6.1 | 2.8417 |
| Arsenic | 17.7 | 6.6 |
| Barium | 635 | 158.175 |
| Beryllium | 5.6 | 2.9538 |
| Boron | 23.8 | 11.3125 |
| Cadmium | 13.8 | 5.4208 |
| Calcium | 92200 | 16577.25 |
| Chromium (total) | 48.9 | 26.4375 |
| Cobalt | 26.7 | 11.8 |
| Copper | 94.3 | 48.225 |
| Cyanide | 21.4 | 4.6963 |
| Iron | 639000 | 119900 |
| Lead | 82 | 36.9875 |
| Magnesium | 4420 | 2361.25 |
| Manganese | 1300 | 488 |
| Nickel | 46.7 | 24.475 |
| Potassium | 2390 | 1709.125 |
| Selenium | 17.8 | 2.8657 |
| Sodium | 1930 | 677.25 |
| Vanadium | 56.7 | 32.85 |
| Zinc | 617 | 244.4375 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 4 - SEDIMENT (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 3/4 | 0.008 - 0.014 | 2DSD30 | 0.006 | 85 | N | 2 |
| Benzo(b)fluoranthene | 1/4 | 0.047 | 2DSD10 | 0.38 - 0.4 | 0.88 | N | 2 |
| Fluoranthene | 1/4 | 0.068 | 2DSD10 | 0.38 - 0.4 | 310 | N | 2 |
| Pyrene | 1/4 | 0.064 | 2DSD10 | 0.38 - 0.4 | 230 | N | 2 |
| Aluminum | 4/4 | 2060 - 8830 | 2DSD10 | - | 7800 | ~~Y~~ N | ~~3~~ 4 |
| Arsenic | 4/4 | 1.1 - 4.5 | 2DSD10 | - | 0.43 | Y | 3 |
| Barium | 4/4 | 10.1 - 41.9 | 2DSD10 | - | 550 | N | 2 |
| Beryllium | 1/4 | 0.36 | 2DSD10 | 0.24 - 0.25 | 0.15 | Y | 3 |
| Cadmium | 1/4 | 1.7 | 2DSD10 | 0.48 - 0.51 | 3.9 | N | 2 |
| Calcium | 4/4 | 527 - 1150 | 2DSD10 | - | - | N | 1 |
| Chromium (total) | 4/4 | 4.2 - 12.5 | 2DSD10 | - | 39 (7) | N | 2 |
| Cobalt | 1/4 | 5.5 | 2DSD10 | 1.2 - 1.3 | 470 | N | 2 |
| Copper | 4/4 | 7 - 36.5 | 2DSD10 | - | 290 | N | 2 |
| Iron | 4/4 | 3510 - 9930 | 2DSD10 | - | 2300 | ~~Y~~ N | ~~3~~ 4 |
| Lead | 4/4 | 4 - 13.1 | 2DSD10 | - | 400 (8) | N | 2 |
| Magnesium | 4/4 | 811 - 2350 | 2DSD10 | - | - | N | 1 |
| Manganese | 4/4 | 52.9 - 177 | 2DSD10 | - | ~~39~~ 190 | ~~Y~~ N | ~~3~~ 2 |
| Mercury | 2/4 | 0.15 - 7 | 2DSD31 | 0.11 - 0.12 | 2.3 | Y | 3 |
| Nickel | 2/4 | 5.2 - 8.6 | 2DSD10 | 2.6 - 2.8 | 160 | N | 2 |
| Potassium | 4/4 | 406 - 1310 | 2DSD10 | - | - | N | 1 |
| Sodium | 1/4 | 375 | 2DSD10 | 288 - 355 | - | N | 1 |
| Vanadium | 4/4 | 5.2 - 21.4 | 2DSD10 | - | 55 | N | 2 |
| Zinc | 4/4 | 10.9 - 37.7 | 2DSD10 | - | 2300 | N | 2 |

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000031

**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A DOWNSTREAM, ZONE 4 - SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

Footnotes:

1 Results in mg/kg unless otherwise noted.
2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment.
3 Sample-specific.
4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
5 Hexavalent chromium.
6 OSWER soil screening level for residential land use (USEPA, July 14, 1994).

Rationale Designations:

1 No toxicity criteria available; exposure to che uncertainty section of risk assessment.
2 Maximum is less than the COC screening lev
3 Maximum is greater than or equal to the COC
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION**
**SITE 2 AREA A DOWNSTREAM, ZONE 4 - SEDIMENT**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| Methylene chloride | 14 | 9.25 |
| Benzo(b)fluoranthene | 47 | 158 |
| Fluoranthene | 68 | 163.25 |
| Pyrene | 64 | 162.25 |
| **Inorganics (mg/kg)** | | |
| Aluminum | 8830 | 4175 |
| Arsenic | 4.5 | 2.025 |
| Barium | 41.9 | 22.475 |
| Beryllium | 0.36 | 0.1825 |
| Cadmium | 1.7 | 0.61 |
| Calcium | 1150 | 820.25 |
| Chromium (total) | 12.5 | 8.35 |
| Cobalt | 5.5 | 1.8375 |
| Copper | 36.5 | 15.9 |
| Iron | 9930 | 5545 |
| Lead | 13.1 | 7.75 |
| Magnesium | 2350 | 1397.75 |
| Manganese | 177 | 88.5 |
| Mercury | 7 | 1.8163 |
| Nickel | 8.6 | 4.125 |
| Potassium | 1310 | 763.5 |
| Sodium | 375 | 214.375 |
| Vanadium | 21.4 | 10.3 |
| Zinc | 37.7 | 19.3 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 5 - SEDIMENT (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|
| Carbon disulfide | 1/4 | 0.002 | 2DSD7 | 6 - 39 | 780 | N | 2 |
| 4-Chloroaniline | 1/4 | 0.51 | 2DSD7 | 400 - 10000 | 31 | N | 2 |
| Acenaphthylene | 1/4 | 0.071 | 2DSD12 | 450 - 10000 | - | N | 1 |
| Anthracene | 1/4 | 0.068 | 2DSD12 | 450 - 10000 | 2300 | N | 2 |
| Benzo(a)anthracene | 2/4 | 0.23 - 0.7 | 2DSD12 | 3500 - 10000 | 0.88 | N | 2 |
| Benzo(a)pyrene | 2/4 | 0.18 - 0.41 | 2DSD12 | 3500 - 10000 | 0.088 | Y | 3 |
| Benzo(b)fluoranthene | 2/4 | 0.34 - 0.5 | 2DSD12 | 3500 - 10000 | 0.88 | N | 2 |
| Benzo(g,h,i)perylene | 1/4 | 0.73 | 2DSD12 | 450 - 10000 | - | N | 1 |
| Benzo(k)fluoranthene | 2/4 | 0.11 - 0.17 | 2DSD12 | 3500 - 10000 | 8.8 | N | 2 |
| Benzoic acid | 1/4 | 0.091 | 2DSD12 | 2200 - 50000 | 31000 | N | 2 |
| Chrysene | 3/4 | 0.22 - 1.2 | 2DSD8 | 3500 | 88 | N | 2 |
| Fluoranthene | 3/4 | 0.34 - 1 | 2DSD7 | 10000 | 310 | N | 2 |
| Indeno(1,2,3-cd)pyrene | 1/4 | 0.75 | 2DSD12 | 450 - 10000 | 0.88 | N | 2 |
| Phenanthrene | 3/4 | 0.16 - 0.98 | 2DSD7 | 10000 | - | N | 1 |
| Pyrene | 4/4 | 0.56 - 2.7 | 2DSD12 | - | 230 | N | 2 |
| 4,4'-DDD | 3/4 | 1.4 - 12 | 2DSD9 | 21 | 2.7 | Y | 3 |
| 4,4'-DDE | 2/4 | 0.17 - 0.35 | 2DSD8 | 21 - 2100 | 1.9 | N | 2 |
| 4,4'-DDT | 4/4 | 0.068 - 7 | 2DSD9 | - | 1.9 | Y | 3 |
| Aroclor-1260 | 1/4 | 0.28 | 2DSD12 | 250 - 21000 | 0.083 | Y | 3 |
| Aluminum | 4/4 | 4060 - 15300 | 2DSD8 | - | 7800 | ~~Y~~ N | ~~3~~ 4 |
| Arsenic | 4/4 | 0.83 - 3.8 | 2DSD8 | - | 0.43 | Y | 3 |
| Barium | 4/4 | 16.1 - 60.5 | 2DSD8 | - | 550 | N | 2 |
| Beryllium | 3/4 | 0.46 - 1.5 | 2DSD7/2DSD8 | 0.26 | 0.15 | Y | 3 |
| Cadmium | 4/4 | 1.2 - 6.1 | 2DSD7 | - | 3.9 | Y | 3 |
| Calcium | 4/4 | 912 - 2160 | 2DSD8 | - | - | N | 1 |
| Chromium (total) | 4/4 | 6.4 - 23.9 | 2DSD8 | - | 39 (5) | N | 2 |
| Cobalt | 4/4 | 3.7 - 9.3 | 2DSD8 | - | 470 | N | 2 |
| Copper | 4/4 | 13.1 - 45.7 | 2DSD8 | - | 290 | N | 2 |

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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A DOWNSTREAM, ZONE 5 - SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|
| Iron | 4/4 | 8960 - 33200 | 2DSD7 | - | 2300 | ~~Y~~ N | ~~3~~ 4 |
| Lead | 4/4 | 10.9 - 64.2 | 2DSD7 | - | 400 (6) | N | 2 |
| Magnesium | 4/4 | 1540 - 3790 | 2DSD8 | - | - | N | 1 |
| Manganese | 4/4 | 102 - 236 | 2DSD8 | - | ~~30~~ 190 | Y | 3 |
| Mercury | 2/4 | 0.15 - 0.26 | 2DSD7 | 0.13 | 2.3 | N | 2 |
| Nickel | 4/4 | 6.5 - 19.1 | 2DSD8 | - | 160 | N | 2 |
| Potassium | 4/4 | 729 - 2080 | 2DSD8 | - | - | N | 1 |
| Silver | 1/4 | 7.8 | 2DSD7 | 1.8 - 2.2 | 39 | N | 2 |
| Sodium | 4/4 | 182 - 3500 | 2DSD12 | - | - | N | 1 |
| Vanadium | 4/4 | 14.2 - 42.8 | 2DSD8 | - | 55 | N | 2 |
| Zinc | 4/4 | 41.9 - 135 | 2DSD8 | - | 2300 | N | 2 |

Footnotes:

1 Results in mg/kg unless otherwise noted.
2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment.
3 Sample-specific.
4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
5 Hexavalent chromium.
6 OSWER soil screening level for residential land use (USEPA, July 14, 1994).

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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000036

**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION**
**SITE 2 AREA A DOWNSTREAM, ZONE 5 - SEDIMENT**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| Carbon disulfide | 2 | 7 |
| 4-Chloroaniline | 510 | 1483.75 |
| Acenaphthylene | 71 | 1761.5 |
| Anthracene | 68 | 1760.75 |
| Benzo(a)anthracene | 700 | 1920 |
| Benzo(a)pyrene | 410 | 1835 |
| Benzo(b)fluoranthene | 500 | 1897.5 |
| Benzo(g,h,i)perylene | 730 | 1926.25 |
| Benzo(k)fluoranthene | 170 | 1757.5 |
| Benzoic acid | 91 | 8672.75 |
| Chrysene | 1200 | 927.5 |
| Fluoranthene | 1000 | 1732.5 |
| Indeno(1,2,3-cd)pyrene | 750 | 1931.25 |
| Phenanthrene | 980 | 1602.5 |
| Pyrene | 2700 | 1317.5 |
| 4,4'-DDD | 12000 | 4177.625 |
| 4,4'-DDE | 350 | 395.125 |
| 4,4'-DDT | 7000 | 2269.5 |
| Aroclor-1260 | 280 | 2768.75 |
| **Inorganics (mg/kg)** | | |
| Aluminum | 15300 | 8480 |
| Arsenic | 3.8 | 2.2325 |
| Barium | 60.5 | 39.575 |
| Beryllium | 1.5 | 0.8975 |
| Cadmium | 6.1 | 3.35 |
| Calcium | 2160 | 1665.5 |
| Chromium (total) | 23.9 | 14.975 |
| Cobalt | 9.3 | 5.675 |
| Copper | 45.7 | 25.9 |
| Iron | 33200 | 17940 |
| Lead | 64.2 | 29.075 |
| Magnesium | 3790 | 2570 |
| Manganese | 236 | 158 |
| Mercury | 0.26 | 0.135 |
| Nickel | 19.1 | 10.775 |
| Potassium | 2080 | 1304.75 |
| Silver | 7.8 | 2.7 |
| Sodium | 3500 | 1090.75 |
| Vanadium | 42.8 | 24.55 |
| Zinc | 135 | 84.825 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 6 - SEDIMENT (MG/KG) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 1/3 | 0.001 | 2DSD13 | 6 | 85 | N | 2 |
| Acenaphthene | 1/3 | 0.041 | 2DSD11 | 400 - 430 | 470 | N | 2 |
| Acenaphthylene | 2/3 | 0.065 - 0.15 | 2DSD11 | 430 | - | N | 1 |
| Anthracene | 2/3 | 0.091 - 0.16 | 2DSD11 | 430 | 2300 | N | 2 |
| Benzo(a)anthracene | 3/3 | 0.21 - 0.78 | 2DSD11 | - | 0.88 | N | 2 |
| Benzo(a)pyrene | 3/3 | 0.16 - 0.64 | 2DSD11 | - | 0.088 | Y | 3 |
| Benzo(b)fluoranthene | 3/3 | 0.2 - 0.52 | 2DSD11 | - | 0.88 | N | 2 |
| Benzo(g,h,i)perylene | 1/3 | 1.2 | 2DSD11 | 400 - 430 | - | N | 1 |
| Benzo(k)fluoranthene | 3/3 | 0.12 - 0.32 | 2DSD13 | - | 8.8 | N | 2 |
| Benzoic acid | 1/3 | 0.046 | 2DSD11 | 2000 - 2100 | 31000 | N | 2 |
| Chrysene | 3/3 | 0.22 - 0.95 | 2DSD11 | - | 88 | N | 2 |
| Fluoranthene | 3/3 | 0.41 - 1.3 | 2DSD11 | - | 310 | N | 2 |
| Fluorene | 2/3 | 0.051 - 0.13 | 2DSD11 | 430 | 310 | N | 2 |
| Indeno(1,2,3- cd)pyrene | 2/3 | 0.11 - 1.2 | 2DSD11 | 430 | 0.88 | Y | 3 |
| Phenanthrene | 3/3 | 0.23 - 1.6 | 2DSD11 | - | - | N | 1 |
| Pyrene | 3/3 | 0.37 - 4.7 | 2DSD11 | - | 230 | N | 2 |
| 4,4'-DDE | 1/3 | 0.12 | 2DSD11 | 20 - 21 | 1.9 | N | 2 |
| 4,4'-DDT | 1/3 | 0.12 | 2DSD13 | 20 - 21 | 1.9 | N | 2 |
| Aluminum | 3/3 | 1710 - 4000 | 2DSD13 | - | 7800 | N | 2 |
| Arsenic | 3/3 | 0.95 - 1.1 | 2DSD11/2DSD13 | - | 0.43 | Y | 3 |
| Barium | 3/3 | 13.9 - 32.1 | 2DSD13 | - | 550 | N | 2 |
| Cadmium | 3/3 | 1.4 - 2 | 2DSD13 | - | 3.9 | N | 2 |
| Calcium | 3/3 | 573 - 2750 | 2DSD13 | - | - | N | 1 |
| Chromium (total) | 3/3 | 4.1 - 6 | 2DSD11 | - | 39 (5) | N | 2 |
| Cobalt | 3/3 | 3.2 - 6 | 2DSD13 | - | 470 | N | 2 |
| Copper | 3/3 | 8.8 - 16 | 2DSD11 | - | 290 | N | 2 |
| Iron | 3/3 | 8000 - 10500 | 2DSD13 | - | 2300 | ~~Y~~ N | ~~3~~ 4 |
| Lead | 3/3 | 8.7 - 38.2 | 2DSD11 | - | 400 (6) | N | 2 |
| Magnesium | 3/3 | 877 - 2320 | 2DSD13 | - | - | N | 1 |

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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A DOWNSTREAM, ZONE 6 - SEDIMENT (MG/KG) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Risk-based COC Screening Level (4) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|
| Manganese | 3/3 | 191 - 877 | 2DSD13 | - | ~~39~~ 190 | Y | 3 |
| Nickel | 3/3 | 4.1 - 6.1 | 2DSD13 | - | 160 | N | 2 |
| Potassium | 3/3 | 394 - 787 | 2DSD13 | - | - | N | 1 |
| Sodium | 3/3 | 171 - 230 | 2DSD11 | - | - | N | 1 |
| Vanadium | 3/3 | 9.7 - 12.4 | 2DSD13 | - | 55 | N | 2 |
| Zinc | 3/3 | 41 - 53.3 | 2DSD13 | - | 2300 | N | 2 |

Footnotes:

1 Results in mg/kg unless otherwise noted.
2 Sample and duplicate counted as separate samples. Non-validated, rejected, composite, and excavated samples/results not used in risk assessment.
3 Sample-specific.
4 For residential use, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
5 Hexavalent chromium.
6 OSWER soil screening level for residential land use (USEPA, July 14, 1994).

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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## SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION
## SITE 2 AREA A DOWNSTREAM, ZONE 6 - SEDIMENT
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| Methylene chloride | 1 | 2 |
| Acenaphthene | 41 | 128 |
| Acenaphthylene | 150 | 107.5 |
| Anthracene | 160 | 125.5 |
| Benzo(a)anthracene | 780 | 605 |
| Benzo(a)pyrene | 640 | 475 |
| Benzo(b)fluoranthene | 520 | 420 |
| Benzo(g,h,i)perylene | 1200 | 707.5 |
| Benzo(k)fluoranthene | 320 | 310 |
| Benzoic acid | 46 | 548 |
| Chrysene | 950 | 685 |
| Fluoranthene | 1300 | 1025 |
| Fluorene | 130 | 90.5 |
| Indeno(1,2,3-cd)pyrene | 1200 | 655 |
| Phenanthrene | 1600 | 1050 |
| Pyrene | 4700 | 2670 |
| 4,4'-DDE | 120 | 65.25 |
| 4,4'-DDT | 120 | 65.25 |
| **Inorganics (mg/kg)** | | |
| Aluminum | 4000 | 2855 |
| Arsenic | 1.1 | 1.1 |
| Barium | 32.1 | 23 |
| Cadmium | 2 | 1.7 |
| Calcium | 2750 | 1661.5 |
| Chromium (Total) | 6 | 5.2 |
| Cobalt | 6 | 4.6 |
| Copper | 16 | 13.35 |
| Iron | 10500 | 9530 |
| Lead | 38.2 | 25.8 |
| Magnesium | 2320 | 1598.5 |
| Manganese | 877 | 534 |
| Nickel | 6.1 | 5.1 |
| Potassium | 787 | 590.5 |
| Sodium | 230 | 222 |
| Vanadium | 12.4 | 11.05 |
| Zinc | 53.3 | 48.75 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 1 - UNFILTERED SURFACE WATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | AWQC (4) | Risk-based COC Screening Level (5) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 2/7 | 1 - 3 | 2DSW5 | 10 | - | 100 | N | 2 |
| Methylene chloride | 2/7 | 17 - 20 | 2DSW5 | 5 - 10 | 5.7 | 4.1 | Y | 3 |
| 4,4'-DDD | 7/12 | 0.12 - 0.39 | 121090-2DSW5 | 0.1 | 8.30E-04 | 0.28 | Y | 3 |
| Aluminum | 6/7 | 15.4 - 2090 | 2DSW14 | 43.9 | - | 3700 | N | 2 |
| Arsenic | 1/7 | 19.4 | 121090-2DSW5 | 2 - 3 | 0.018 | 0.045 | Y | 3 |
| Barium | 4/7 | 41.1 - 53.6 | ED-SWOP05-02 | 20.7 - 52 | - | 260 | N | 2 |
| Boron | 4/5 | 101 - 152 | 2DSW5 | 50 | - | 330 | N | 2 |
| Calcium | 7/7 | 2440 - 37400 | 2DSW5 | - | - | - | N | 1 |
| Copper | 4/7 | 1.1 - 10.4 | 2DSW14 | 1.8 - 2 | 1300 | 150 | N | 2 |
| Iron | 7/7 | 867 - 5220 | ED-SWOP05-02 | - | - | 1100 | ~~Y~~ N | ~~3~~ 4 |
| Lead | 2/5 | 2.2 - 13.6 | 2DSW14 | 1 - 2 | 50 | 15 (6) | N | 2 |
| Magnesium | 7/7 | 778 - 23000 | 2DSW5 | - | - | - | N | 1 |
| Manganese | 7/7 | 95.3 - 1740 | 2DSW5 | - | - | ~~18~~ 88 | Y | 3 |
| Nickel | 1/7 | 1.3 | ED-SWOP05-02 | 1.3 - 11 | 610 | 73 | N | 2 |
| Potassium | 7/7 | 1490 - 8520 | 2DSW5 | - | - | - | N | 1 |
| Sodium | 7/7 | 9850 - 207000 | 2DSW5 | - | - | - | N | 1 |
| Vanadium | 1/7 | 5.7 | 2DSW14 | 1 - 20 | - | 26 | N | 2 |
| Zinc | 4/7 | 14.5 - 58.3 | 2DSW14 | 3 - 14.7 | - | 1100 | N | 2 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as two samples. Non-validated and rejected results not used in risk assessment.
3 Sample-specific.
4 Ambient water quality criteria for the consumption of water and organisms (USEPA, June 15, 1990).
5 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
6 Federal action level for drinking water.

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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## SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION
## SITE 2 AREA A DOWNSTREAM, ZONE 1 - UNFILTERED SURFACE WATER
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/kg)** | | |
| Carbon disulfide | 2 | 4.4 |
| Methylene chloride | 18.5 | 7.2 |
| 4,4'-DDD | 0.27 | 0.1465 |
| **Inorganics (mg/kg)** | | |
| Aluminum | 2090 | 452.09 |
| Arsenic | 10.45 | 2.97 |
| Barium | 53.6 | 35.615 |
| Boron | 149 | 97 |
| Calcium | 36800 | 25948 |
| Copper | 10.4 | 4.24 |
| Iron | 5220 | 2681.7 |
| Lead | 13.6 | 4.05 |
| Magnesium | 22600 | 13765.6 |
| Manganese | 1720 | 1128.06 |
| Nickel | 1.3 | 3.29 |
| Potassium | 8465 | 6848 |
| Sodium | 203500 | 127570 |
| Vanadium | 5.7 | 3.64 |
| Zinc | 58.3 | 21.12 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 1 - FILTERED SURFACE WATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | AWQC (4) | Risk-based COC Screening Level (5) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 2/4 | 90 - 96.1 | 2DSW5 | 15 - 16.6 | - | 3700 | N | 1 |
| Arsenic | 2/4 | 2.2 | EC-SWOP05/EC-SWS102 | 2 | 0.018 | 0.045 | N | 1 |
| Barium | 2/4 | 46.6 - 49.9 | EC-SWOP05 | 45.9 - 47.1 | - | 260 | N | 1 |
| Boron | 4/4 | 109 - 149 | 2DSW5 | - | - | 330 | N | 1 |
| Calcium | 4/4 | 28100 - 36900 | 2DSW5 | - | - | - | N | 1 |
| Cobalt | 1/4 | 1 | EC-SWS102 | 1 - 5 | - | 220 | N | 2 |
| Iron | 4/4 | 631 - 4140 | EC-SWOP05 | - | - | 1100 | N | 1 |
| Magnesium | 4/4 | 13700 - 22500 | 2DSW5 | - | - | - | N | 1 |
| Manganese | 4/4 | 1170 - 1700 | 2DSW5 | - | - | ~~18~~ 88 | N | 1 |
| Mercury | 1/4 | 0.29 | 2DSW5 | 0.2 | 0.14 | 1.1 | N | 2 |
| Nickel | 2/4 | 1.9 | EC-SWOP05/EC-SWS102 | 11 | 610 | 73 | N | 1 |
| Potassium | 4/4 | 7390 - 8360 | EC-SWOP05 | - | - | - | N | 1 |
| Sodium | 4/4 | 133000 - 203000 | 2DSW5 | - | - | - | N | 1 |
| Zinc | 1/4 | 21.1 | EC-SWOP05 | 3 - 16 | - | 1100 | N | 1 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as two samples. Non-validated and rejected results not used in risk assessment.
3 Sample-specific.
4 Ambient water quality criteria for the consumption of water and organisms (USEPA, June 15, 1990).
5 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).

Rationale Designations:

1 Chemical detected in unfiltered samples; filtered results not used in risk assessment.
2 Chemical not detected in unfiltered samples; maximum is less than action level.
3 Chemical not detected in unfiltered samples; maximum is greater than or equal to the COC screening level.

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## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 2 - UNFILTERED SURFACE WATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | AWQC (4) | Risk-based COC Screening Level (5) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 9/9 | 0.58 - 5.9 | EC-SWS209-02-D | - | 8.30E-04 | 0.28 | Y | 3 |
| 4,4'-DDE | 3/9 | 0.1 - 0.35 | EC-SWS209-02-D | 0.1 | 5.90E-04 | 0.2 | Y | 3 |
| 4,4'-DDT | 4/9 | 0.13 - 1.5 | EC-SWLP12-2/EC-SWS209-02-D | 0.1 | 5.90E-04 | 0.2 | Y | 3 |
| Aluminum | 5/5 | 104 - 781 | 2DSW4 | - | - | 3700 | N | 2 |
| Barium | 4/5 | 29.8 - 36.6 | EC-SWLP11-2 | 41.8 | - | 260 | N | 2 |
| Boron | 4/4 | 75.3 - 90.8 | 2DSW4 | - | - | 330 | N | 2 |
| Cadmium | 1/5 | 2.1 | 2DSW4 | 1 - 2 | 16 | 1.8 | Y | 3 |
| Calcium | 5/5 | 15000 - 22400 | 2DSW4 | - | - | - | N | 1 |
| Cobalt | 2/5 | 1.2 - 5.4 | 2DSW4 | 1 - 5 | - | 220 | N | 2 |
| Copper | 3/5 | 1.3 - 9.4 | 2DSW4 | 2 | 1300 | 150 | N | 2 |
| Iron | 5/5 | 2470 - 6660 | 2DSW4 | - | - | 1100 | ~~Y~~ N | ~~3~~ 4 |
| Lead | 1/5 | 2.8 | 2DSW4 | 2 - 3.2 | 50 | 15 (6) | N | 2 |
| Magnesium | 5/5 | 5350 - 8600 | 2DSW4 | - | - | - | N | 1 |
| Manganese | 5/5 | 629 - 1060 | 2DSW4 | - | - | ~~18~~ 88 | Y | 3 |
| Potassium | 5/5 | 4000 - 6040 | EC-SWS209-02 | - | - | - | N | 1 |
| Sodium | 5/5 | 81500 - 126000 | EC-SWS209-02 | - | - | - | N | 1 |
| Vanadium | 3/5 | 1.7 - 2.4 | EC-SWS209-02 | 4.6 - 20 | - | 26 | N | 2 |
| Zinc | 2/5 | 12 - 34.6 | 2DSW4 | 5.4 - 12.2 | - | 1100 | N | 2 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as two samples. Non-validated and rejected results not used in risk assessment.
3 Sample-specific.
4 Ambient water quality criteria for the consumption of water and organisms (USEPA, June 15, 1990).
5 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
6 Federal Action Level for drinking water.

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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## SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION
## SITE 2 AREA A DOWNSTREAM, ZONE 2 - UNFILTERED SURFACE WATER
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/L)** | | |
| 4,4'-DDD | 5.6 | 2.1989 |
| 4,4'-DDE | 0.32 | 0.1022 |
| 4,4'-DDT | 1.5 | 0.3406 |
| **Inorganics (ug/L)** | | |
| Aluminum | 781 | 262.5 |
| Barium | 36.6 | 31.32 |
| Boron | 90.8 | 82.45 |
| Cadmium | 2.1 | 0.92 |
| Calcium | 22400 | 17620 |
| Cobalt | 5.4 | 2.02 |
| Copper | 9.4 | 2.8 |
| Iron | 6660 | 4382 |
| Lead | 2.8 | 1.54 |
| Magnesium | 8600 | 6481 |
| Manganese | 1060 | 729.4 |
| Potassium | 6040 | 5283 |
| Sodium | 126000 | 110300 |
| Vanadium | 2.4 | 3.73 |
| Zinc | 34.6 | 12.12 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 2 - FILTERED SURFACE WATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | AWQC (4) | Risk-based COC Screening Level (5) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 3/3 | 33.5 - 45.3 | EC-SWLP11 | - | - | 3700 | N | 1 |
| Barium | 3/3 | 32.2 - 33.6 | EC-SWLP11 | - | - | 260 | N | 1 |
| Boron | 3/3 | 82.1 - 90.2 | EC-SWLP11 | - | - | 330 | N | 1 |
| Calcium | 3/3 | 16500 - 17300 | EC-SWLP11 | - | - | - | N | 1 |
| Cobalt | 2/3 | 1.1 - 1.2 | EC-SWLP11 | 1 | - | 220 | N | 1 |
| Iron | 3/3 | 407 - 998 | EC-SWLP11 | - | - | 1100 | N | 1 |
| Magnesium | 3/3 | 5910 - 6660 | EC-SWLP11 | - | - | - | N | 1 |
| Manganese | 3/3 | 625 - 668 | EC-SWLP11 | - | - | ~~18~~ 88 | N | 1 |
| Nickel | 2/3 | 1.1 - 1.5 | EC-SWLP11 | 1 | 610 | 73 | N | 2 |
| Potassium | 3/3 | 5430 - 6330 | EC-SWS209 | - | - | - | N | 1 |
| Sodium | 3/3 | 123000 - 126000 | EC-SWS209 | - | - | - | N | 1 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as two samples. Non-validated and rejected results not used in risk assessment.
3 Sample-specific.
4 Ambient water quality criteria for the consumption of water and organisms (USEPA, June 15, 1990).
5 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).

Rationale Designations:

1 Chemical detected in unfiltered samples; filtered results not used in risk assessment.
2 Chemical not detected in unfiltered samples; maximum is less than action level.
3 Chemical not detected in unfiltered samples; maximum is greater than or equal to the COC screening level.

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## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 3 - UNFILTERED SURFACE WATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | AWQC (4) | Risk-based COC Screening Level (5) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|
| Methylene chloride | 2/9 | 6 | 2DSW3/2DSW2 | 5 - 10 | 4.7 | 4.1 | Y | 3 |
| 4,4'-DDD | 6/15 | 0.1 - 0.35 | EC-SWS419-02 | 0.1 | 8.30E-04 | 0.28 | Y | 3 |
| Aluminum | 9/9 | 87 - 508 | EC-SWUP18-02 | - | - | 3700 | N | 2 |
| Barium | 6/9 | 35.6 - 61.5 | EC-SWUP18-02 | 36 - 66.5 | - | 260 | N | 2 |
| Boron | 6/6 | 69.2 - 285 | 2DSW15 | - | - | 330 | N | 2 |
| Calcium | 9/9 | 13000 - 32800 | 2DSW15 | - | - | - | N | 1 |
| Cobalt | 3/9 | 3.1 - 3.5 | EC-SWS420-02 | 5 | - | 220 | N | 2 |
| Copper | 4/9 | 1.3 - 12.6 | 2DSW2 | 1 - 11.6 | 1300 | 150 | N | 2 |
| Cyanide | 1/6 | 11.3 | EC-SWUP18-02 | 5 - 10 | 700 | 73 | N | 2 |
| Iron | 9/9 | 776 - 6560 | EC-SWUP18-02 | - | - | 1100 | ~~Y~~ N | ~~3~~ 4 |
| Lead | 2/6 | 3.6 - 5.6 | 2DSW2 | 1 - 2 | 50 | 15 (6) | N | 2 |
| Magnesium | 9/9 | 4490 - 18600 | 2DSW15 | - | - | - | N | 1 |
| Manganese | 9/9 | 172 - 488 | 2DSW3 | - | - | ~~18~~ 88 | Y | 3 |
| Nickel | 3/9 | 5.8 - 6.4 | EC-SWUP18-02 | 7 - 11 | 610 | 73 | N | 2 |
| Potassium | 9/9 | 4940 - 14200 | 2DSW2 | - | - | - | N | 1 |
| Sodium | 9/9 | 87500 - 145000 | 2DSW3 | - | - | - | N | 1 |
| Zinc | 7/9 | 13.2 - 70.3 | 2DSW3 | 27.4 - 28.6 | - | 1100 | N | 2 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as two samples. Non-validated and rejected results not used in risk assessment.
3 Sample-specific.
4 Ambient water quality criteria for the consumption of water and organisms (USEPA, June 15, 1990).
5 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
6 Federal Action Level for drinking water.

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION**
**SITE 2 AREA A DOWNSTREAM, ZONE 3 - UNFILTERED SURFACE WATER**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/L)** | | |
| Methylene chloride | 6 | 4.3889 |
| 4,4'-DDD | 0.35 | 0.0987 |
| **Inorganics (ug/L)** | | |
| Aluminum | 508 | 287.7778 |
| Barium | 61.5 | 39.4722 |
| Boron | 285 | 136.2833 |
| Calcium | 32800 | 20488.8889 |
| Cobalt | 3.5 | 2.7667 |
| Copper | 12.6 | 4.5111 |
| Cyanide | 11.3 | 4.8 |
| Iron | 6560 | 2921.2222 |
| Lead | 5.6 | 1.95 |
| Magnesium | 18600 | 7903.3333 |
| Manganese | 488 | 356.6667 |
| Nickel | 6.4 | 5.0111 |
| Potassium | 14200 | 8785.5556 |
| Sodium | 145000 | 108100 |
| Zinc | 70.3 | 31.3778 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 3 - FILTERED SURFACE WATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | AWQC (4) | Risk-based COC Screening Level (5) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 2/3 | 64.6 - 66.3 | EC-SWS420 | 40.5 | - | 3700 | N | 1 |
| Arsenic | 2/3 | 2.1 - 2.6 | EC-SWUP18 | 2 | 0.018 | 0.045 | Y | 3 |
| Barium | 3/3 | 46.9 - 56.9 | EC-SWUP18 | - | - | 260 | N | 1 |
| Boron | 3/3 | 75.2 - 78.4 | EC-SWUP18 | - | - | 330 | N | 1 |
| Calcium | 3/3 | 19400 - 20900 | EC-SWUP18 | - | - | - | N | 1 |
| Cobalt | 3/3 | 3 - 3.5 | EC-SWUP18 | - | - | 220 | N | 1 |
| Iron | 3/3 | 1980 - 2800 | EC-SWS420 | - | - | 1100 | N | 1 |
| Lead | 1/3 | 5.2 | EC-SWS420 | 1 | 50 | 15 (6) | N | 1 |
| Magnesium | 3/3 | 5630 - 5860 | EC-SWUP18 | - | - | - | N | 1 |
| Manganese | 3/3 | 429 - 454 | EC-SWUP18 | - | - | ~~18~~ 88 | N | 1 |
| Nickel | 3/3 | 5.6 - 6.7 | EC-SWUP18 | - | 610 | 73 | N | 1 |
| Potassium | 3/3 | 5340 - 7560 | EC-SWUP18 | - | - | - | N | 1 |
| Sodium | 3/3 | 97700 - 111000 | EC-SWUP18 | - | - | - | N | 1 |
| Zinc | 1/3 | 29 | EC-SWUP18 | 23.5 - 27 | - | 1100 | N | 1 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as two samples. Non-validated and rejected results not used in risk assessment.
3 Sample-specific.
4 Ambient water quality criteria for the consumption of water and organisms (USEPA, June 15, 1990).
5 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).

Rationale Designations:

1 Chemical detected in unfiltered samples; filtered results not used in risk assessment.
2 Chemical not detected in unfiltered samples; maximum is less than action level.
3 Chemical not detected in unfiltered samples; maximum is greater than or equal to the COC screening level.

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## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 4 - UNFILTERED SURFACE WATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (1) | Range of Detection (1) | Location of Maximum | Range of Nondetects (2) | AWQC (3) | Risk-based COC Screening Level (5) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|
| Aluminum | 5/5 | 148 - 1670 | 2DSW32 | - | - | 3700 | N | 2 |
| Boron | 4/4 | 151 - 215 | 2DSW31 | - | - | 330 | N | 2 |
| Calcium | 5/5 | 9240 - 13700 | 2DSW10 | - | - | - | N | 1 |
| Copper | 1/5 | 10 | 2DSW10 | 2 - 12.6 | 1300 | 150 | N | 2 |
| Iron | 5/5 | 153 - 2040 | 2DSW32 | - | - | 1100 | ~~Y~~ N | ~~3~~ 4 |
| Lead | 5/5 | 1.2 - 10.6 | 2DSW32 | - | 50 | 15 (6) | N | 2 |
| Magnesium | 5/5 | 1600 - 2220 | 2DSW32 | - | - | - | N | 1 |
| Manganese | 4/5 | 21 - 136 | 2DSW10 | 15.8 | - | ~~18~~ 88 | Y | 3 |
| Potassium | 5/5 | 1740 - 2680 | 2DSW10 | - | - | - | N | 1 |
| Sodium | 5/5 | 30200 - 38700 | 2DSW10 | - | - | - | N | 1 |
| Zinc | 2/5 | 17.1 - 19.9 | 2DSW32 | 4.9 - 10.3 | - | 1100 | N | 2 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as two samples. Non-validated and rejected results not used in risk assessment.
3 Sample quantitation limits.
4 Ambient water quality criteria for the consumption of water and organisms (USEPA, June 15, 1990).
5 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
6 Federal action level for drinking water.

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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## SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION
## SITE 2 AREA A DOWNSTREAM, ZONE 4 - UNFILTERED SURFACE WATER
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Maximum | Average |
|---|---|---|
| **Inorganics (ug/L)** | | |
| Aluminum | 1670 | 491 |
| Boron | 215 | 175.25 |
| Calcium | 13700 | 12388 |
| Copper | 10 | 3.86 |
| Iron | 2040 | 699.2 |
| Lead | 10.6 | 4.04 |
| Magnesium | 2220 | 1818 |
| Manganese | 136 | 51.54 |
| Potassium | 2680 | 2074 |
| Sodium | 38700 | 35620 |
| Zinc | 19.9 | 9.55 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 5 - UNFILTERED SURFACE WATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | AWQC (4) | Risk-based COC Screening Level (5) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|
| Carbon disulfide | 1/8 | 2 | 2DSW12 | 5 - 10 | - | 100 | N | 2 |
| Ethylbenzene | 2/8 | 1 - 3 | 2DSW8 | 5 - 10 | 3100 | 130 | N | 2 |
| Styrene | 1/8 | 2 | 2DSW8 | 5 - 10 | - | 160 | N | 2 |
| Tetrachloroethene | 1/8 | 3 | 2DSW8 | 5 - 10 | 0.8 | 1.1 | Y | 3 |
| Xylenes, total | 2/8 | 4 - 6 | 2DSW8 | 5 - 10 | - | 1200 | N | 2 |
| 4,4'-DDD | 2/8 | 0.12 - 0.15 | 2DSW7 | 0.1 | 8.30E-04 | 0.28 | N | 2 |
| Aluminum | 8/8 | 71.2 - 396 | 2DSW7 | - | - | 3700 | N | 2 |
| Barium | 8/8 | 23.4 - 87 | 2DSW7 | - | - | 260 | N | 2 |
| Boron | 3/3 | 234 - 238 | 2DSW9 | - | - | 330 | N | 2 |
| Calcium | 8/8 | 14000 - 31900 | 2DSW7 | - | - | - | N | 1 |
| Copper | 5/8 | 5.4 - 11.7 | 2DSW7 | 2 | 1300 | 150 | N | 2 |
| Iron | 8/8 | 298 - 2980 | 2DSW9 | - | - | 1100 | ~~Y~~ N | ~~3~~ 4 |
| Lead | 5/6 | 2.4 - 7 | 2DSW9 | 2 | 50 | 15 (6) | N | 2 |
| Magnesium | 8/8 | 4350 - 51600 | 2DSW12 | - | - | - | N | 1 |
| Manganese | 8/8 | 115 - 533 | 2DSW7 | - | - | ~~18~~ 88 | Y | 3 |
| Mercury | 1/8 | 1.5 | 2DSW9 | 0.2 | 0.14 | 1.1 | Y | 3 |
| Nickel | 1/8 | 12.9 | 2DSW7 | 7 - 11 | 610 | 73 | N | 2 |
| Potassium | 8/8 | 7030 - 20300 | 2DSW12 | - | - | - | N | 1 |
| Sodium | 8/8 | 82900 - 444000 | 2DSW12 | - | - | - | N | 1 |
| Zinc | 8/8 | 16.9 - 71.6 | 2DSW7 | - | - | 1100 | N | 2 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as two samples. Non-validated and rejected results not used in risk assessment.
3 Sample-specific.
4 Ambient water quality criteria for the consumption of water and organisms (USEPA, June 15, 1990).
5 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
6 Federal action level for drinking water.

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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U2D5_COC.XLS

**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION**
**SITE 2 AREA A DOWNSTREAM, ZONE 5 - UNFILTERED SURFACE WATER**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/L)** | | |
| Carbon disulfide | 2 | 3.25 |
| Ethylbenzene | 3 | 3.1667 |
| Styrene | 2 | 3.25 |
| Tetrachloroethene | 3 | 3.4167 |
| Xylenes, total | 6 | 4.1667 |
| 4,4'-DDD | 0.15 | 0.0725 |
| **Inorganics (ug/L)** | | |
| Aluminum | 396 | 189.4583 |
| Barium | 87 | 49.6333 |
| Boron | 236 | 235 |
| Calcium | 31900 | 22183.3333 |
| Copper | 11.4 | 6.9917 |
| Iron | 2980 | 1870.25 |
| Lead | 7 | 4.5 |
| Magnesium | 51600 | 15076.6667 |
| Manganese | 533 | 245.5 |
| Mercury | 1.5 | 0.3333 |
| Nickel | 12.9 | 5.4 |
| Potassium | 20300 | 12045 |
| Sodium | 444000 | 168633.3333 |
| Zinc | 71.6 | 34.3 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM, ZONE 6 - UNFILTERED SURFACE WATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | AWQC (4) | Risk-based COC Screening Level (5) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|
| Di-n-butyl phthalate | 1/4 | 0.6 | 2DSW13 | 10 | 2700 | 370 | N | 2 |
| Xylenes, total | 1/4 | 2 | 2DSW13 | 5 - 10 | - | 1200 | N | 2 |
| 4,4'-DDD | 1/4 | 0.19 | 2DSW11 | 0.1 | 8.30E-04 | 0.28 | N | 2 |
| Aluminum | 4/4 | 27.2 - 104 | 2DSW11 | - | - | 3700 | N | 2 |
| Barium | 2/3 | 23.4 - 34.1 | 2DSW11 | 44.2 | - | 260 | N | 2 |
| Boron | 2/2 | 276 - 1540 | 2DSW13 | - | - | 330 | Y | 3 |
| Calcium | 4/4 | 27200 - 124000 | 2DSW13 | - | - | - | N | 1 |
| Copper | 2/3 | 9.2 - 11.4 | 2DSW11 | 2 | 1300 | 150 | N | 2 |
| Iron | 4/4 | 119 - 2340 | 2DSW11 | - | - | 1100 | ~~Y~~ N | ~~3~~ 4 |
| Lead | 2/3 | 2 - 2.8 | 2DSW11 | 10 | 50 | 15 (6) | N | 2 |
| Magnesium | 4/4 | 13600 - 400000 | 2DSW13 | - | - | - | N | 1 |
| Manganese | 4/4 | 22.7 - 1140 | 2DSW11 | - | - | 18 | Y | 3 |
| Mercury | 1/4 | 0.3 | 2DSW13 | 0.2 | 0.14 | 1.1 | N | 2 |
| Potassium | 4/4 | 7040 - 175000 | 2DSW13 | - | - | - | N | 1 |
| Selenium | 1/4 | 1.4 | 2DSW13 | 1 - 2 | 100 | 18 | N | 2 |
| Sodium | 4/4 | 126000 - 902000 | 2DSW13 | - | - | - | N | 1 |
| Vanadium | 1/4 | 6.1 | 2DSW13 | 3 - 20 | - | 26 | N | 2 |
| Zinc | 2/4 | 13.9 - 18 | 2DSW11 | 2 - 6.7 | - | 1100 | N | 2 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as two samples. Non-validated and rejected results not used in risk assessment.
3 Sample-specific.
4 Ambient water quality criteria for the consumption of water and organisms (USEPA, June 15, 1990).
5 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
6 Federal action level for drinking water.

Rationale Designations:

1 No toxicity criteria available; exposure to chemical will be be addressed in uncertainty section of risk assessment.
2 Maximum is less than the COC screening level.
3 Maximum is greater than or equal to the COC screening level.
4 USEPA Region I does not advocate quantitative evaluation of this chemical.

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**SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION**
**SITE 2 AREA A DOWNSTREAM, ZONE 6 - UNFILTERED SURFACE WATER**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/L)** | | |
| Di-n-butyl phthalate | 0.6 | 3.9 |
| Xylenes, total | 2 | 3.625 |
| 4,4'-DDD | 0.19 | 0.085 |
| **Inorganics (ug/L)** | | |
| Aluminum | 104 | 67.95 |
| Barium | 34.1 | 26.5333 |
| Boron | 1540 | 908 |
| Calcium | 124000 | 58750 |
| Copper | 11.4 | 7.2 |
| Iron | 2340 | 889 |
| Lead | 2.8 | 3.2667 |
| Magnesium | 400000 | 133400 |
| Manganese | 1140 | 695.425 |
| Mercury | 0.3 | 0.15 |
| Potassium | 175000 | 55507.5 |
| Selenium | 1.4 | 0.975 |
| Sodium | 902000 | 403500 |
| Vanadium | 6.1 | 6.9 |
| Zinc | 18 | 9.0625 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM - UNFILTERED GROUNDWATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Federal MCL (4) | State MCL (5) | Risk-based COC Screening Level (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2,2-Tetrachloroethane | 1/55 | 7 | 2DGW16D | 5 - 10 | - | - | 0.052 | Y | 3 |
| 1,2-Dichloroethene (total) | 5/55 | 2 - 28 | 2DGW29S | 5 - 10 | 70/100 (7) | 70/100 (7) | 5.5 | Y | 3 |
| Benzene | 1/55 | 1 | 2DGW26S | 5 - 10 | 5 | 5 | 0.36 | Y | 3 |
| Bromodichloromethane | 1/55 | 2 | 2DGW29S | 5 - 10 | 100 (8) | 100 (8) | 0.17 | Y | 3 |
| Chloroform | 4/55 | 3 - 12 | 2DGW29S | 5 - 10 | 100 (8) | 100 (8) | 0.15 | Y | 3 |
| Chloromethane | 1/55 | 2 | 2DGW26D | 10 | - | - | 1.4 | Y | 3 |
| Methylene chloride | 3/55 | 7 - 11 | 2DGW29S | 5 - 37 | 5 | 5 | 4.1 | Y | 3 |
| Trichloroethene | 4/55 | 1 - 17 | 2DGW16D | 5 - 10 | 5 | 5 | 1.6 | Y | 3 |
| Vinyl chloride | 2/55 | 53 - 130 | 2DGW29S | 10 | 2 | 2 | 0.019 | Y | 3 |
| Benzo(a)pyrene | 1/55 | 1 | 3GW12D | 10 | 0.2 | 0.2 | 0.0092 | Y | 3 |
| Benzo(b)fluoranthene | 1/55 | 1 | 3GW12D | 10 | - | - | 0.092 | Y | 3 |
| Benzo(g,h,i)perylene | 1/55 | 4 | 3GW12D | 10 | - | - | - | N | 1 |
| Benzo(k)fluoranthene | 1/55 | 1 | 3GW12D | 10 | - | - | 0.92 | Y | 3 |
| Benzoic acid | 6/54 | 0.5 - 0.9 | 2DGW16D | 50 | - | - | 15000 | N | 2 |
| Bis(2-ethylhexyl)phthalate | 11/55 | 2 - 59 | 2DGW26D | 10 | 6 | 6 | 4.8 | Y | 3 |
| Di-n-octyl phthalate | 2/55 | 1 - 5 | 2DGW27D | 10 | - | - | 73 | N | 2 |
| Dibenzo(a,h)anthracene | 1/55 | 3 | 3GW12D | 10 | - | - | 0.0092 | Y | 3 |
| Diethyl phthalate | 2/53 | 0.7 - 0.8 | 2DGW25D | 10 | - | - | 2900 | N | 2 |
| Indeno(1,2,3-cd)pyrene | 1/55 | 3 | 3GW12D | 10 | - | - | 0.092 | Y | 3 |
| Phenol | 1/54 | 3 | 2DGW24D | 10 | - | - | 2200 | N | 2 |
| Aluminum | 29/55 | 43.3 - 97400 | 2DGW30S | 14 - 442 | 50 - 200 (9) | - | 3700 | Y | 3 |
| Arsenic | 22/47 | 1.4 - 23.9 | 2DGW30S | 1 - 5 | 50 | 50 | 0.045 | ~~Y~~ N | ~~3~~ 5 |
| Barium | 53/55 | 10.3 - 835 | 2DGW30S | 8.6 - 38.4 | 2000 | 2000 | 260 | Y | 3 |
| Beryllium | 4/55 | 1 - 4.4 | 2DGW30S | 1 - 2.4 | 4 | 4 | 0.016 | Y | 3 |
| Boron | 26/46 | 53.8 - 374 | 3GW12S | 22 - 57.5 | - | - | 330 | Y | 3 |
| Cadmium | 10/54 | 2.2 - 16 | 3GW12D | 1 - 3 | 5 | 5 | 1.8 | Y | 3 |
| Calcium | 55/55 | 7340 - 196000 | 2DGW16D | - | - | - | - | N | 1 |
| Chromium (total) | 19/55 | 1.5 - 84.6 | 2DGW24S | 3 - 13.2 | 100 | 100 | 18 (11) | Y | 3 |
| Cobalt | 16/55 | 4.6 - 60.3 | 2DGW30S | 1 - 48.7 | - | - | 220 | N | 2 |
| Copper | 27/55 | 2.5 - 370 | 2DGW30S | 1 - 11.5 | 1300 (10) | - | 150 | ~~Y~~ N | ~~3~~ 5 |
| Iron | 51/55 | 53.5 - 121000 | 2DGW30S | 8.4 - 25.6 | 300 (9) | - | 1100 | ~~Y~~ N | ~~3~~ 5 |

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**SUMMARY OF COC SELECTION (Continued)**
**SITE 2 AREA A DOWNSTREAM - UNFILTERED GROUNDWATER (UG/L) (1)**
**NSB-NLON, GROTON, CONNECTICUT**

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Federal MCL (4) | State MCL (5) | Risk-based COC Screening Level (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 12/52 | 1.5 - 220 | 2DGW30S | 1 - 10 | 15 (10) | - | - | Y | 4 |
| Magnesium | 55/55 | 1350 - 62200 | 3GW12S | - | - | - | - | N | 1 |
| Manganese | 54/55 | 5.6 - 7110 | 3GW12D | 2.7 | 50 (9) | - | ~~18~~ 88 | Y | 3 |
| Mercury | 1/55 | 1.1 | 2DGW30S | 0.2 | 2 | 2 | 1.1 | Y | 3 |
| Nickel | 22/55 | 8.4 - 61.5 | 2DGW16D | 7 - 19.9 | 100 | 100 | 73 | N | 2 |
| Potassium | 54/55 | 714 - 46300 | 2DGW30S | 1430 | - | - | - | N | 1 |
| Selenium | 7/52 | 1.8 - 6.3 | 3GW12D | 1 - 5 | 50 | 50 | 18 | N | 2 |
| Silver | 5/55 | 2.1 - 3.3 | 3GW12D | 1 - 7 | 100 (9) | 50 | 18 | N | 2 |
| Sodium | 54/55 | 5250 - 569000 | 3GW12S | 4740 | - | - | - | N | 1 |
| Thallium | 8/35 | 3.3 - 10 | 2DGW27S/3GW12D | 1 - 10 | 2 | 2 | 0.26 (12) | Y | 3 |
| Vanadium | 14/55 | 3.8 - 229 | 2DGW30S | 1 - 20 | - | - | 26 | Y | 3 |
| Zinc | 30/55 | 3.1 - 800 | 2DGW30S | 2 - 27.8 | 5000 (9) | - | 1100 | N | 2 |

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as separate samples. Non-validated and rejected results are not used in risk assessment.
3 Sample-specific.
4 Maximum contaminant level. (USEPA, May 1995).
5 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II EnvironmentalHealth.
6 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
7 Lower MCL associated with cis- isomer; higher MCL associated with trans- isomer.
8 Total trilahomethanes.
9 Secondary MCL based on aesthetic water qualities.
10 Action Level.
11 Hexavalent chromium.
12 Thallic oxide.

Rationale Designations:

1 Chemical detected in unfiltered samples; filtered results not used in risk assessment.
2 Chemical not detected in unfiltered samples; maximum is less than COC screening level.
3 Chemical not detected in unfiltered samples; maximum is greater than COC screening level.
4 No COC screening level available; maximum is greater than or equal to the action level.
5 USEPA Region I does not advocate quantitative evaluation of this chemical.

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## SUMMARY OF MAXIMUM AND AVERAGE CONCENTRATION
## SITE 2 AREA A DOWNSTREAM - UNFILTERED GROUNDWATER
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Maximum | Average |
|---|---|---|
| **Organics (ug/L)** | | |
| 1,1,2,2-Tetrachloroethane | 5.6667 | 4.7341 |
| 1,2-Dichloroethene (total) | 19.5 | 5.4881 |
| Benzene | 3 | 4.5675 |
| Bromodichloromethane | 3.5 | 4.5913 |
| Chloroform | 6.75 | 4.7222 |
| Chloromethane | 3.5 | 4.9286 |
| Methylene chloride | 8 | 5.4841 |
| Trichloroethene | 9 | 4.7976 |
| Vinyl chloride | 79.5 | 8.5476 |
| Benzo(a)pyrene | 3.6667 | 4.9365 |
| Benzo(b)fluoranthene | 3.6667 | 4.9365 |
| Benzo(g,h,i)perylene | 4.6667 | 4.9841 |
| Benzo(k)fluoranthene | 3.6667 | 4.9365 |
| Benzoic acid | 16.9667 | 22.2937 |
| Bis(2-ethylhexyl)phthalate | 42 | 6.9048 |
| Di-n-octyl phthalate | 5 | 4.9048 |
| Dibenzo(a,h)anthracene | 4.3333 | 4.9683 |
| Diethyl phthalate | 2.9 | 4.7976 |
| Indeno(1,2,3-cd)pyrene | 4.3333 | 4.9683 |
| Phenol | 4 | 4.9524 |
| **Inorganics (ug/L)** | | |
| Aluminum | 48776.5 | 5680.1048 |
| Arsenic | 13.2 | 3.323 |
| Barium | 446.8 | 106.3349 |
| Beryllium | 2.45 | 0.6802 |
| Boron | 357.5 | 93.9506 |
| Cadmium | 7.7667 | 1.7349 |
| Calcium | 171666.6667 | 40939.9603 |
| Chromium (total) | 43.05 | 9.123 |
| Cobalt | 31.15 | 7.9571 |
| Copper | 186.4 | 20.2772 |
| Iron | 60630 | 18722.4734 |
| Lead | 110.25 | 10.5234 |
| Magnesium | 57366.6667 | 13598.7103 |
| Manganese | 6983.3333 | 1730.8921 |
| Mercury | 0.6 | 0.1238 |
| Nickel | 34.95 | 13.0599 |
| Potassium | 26270 | 7940.7897 |
| Selenium | 3.6833 | 1.523 |
| Silver | 2.65 | 1.4559 |
| Sodium | 530500 | 139185.2778 |
| Thallium | 10 | 3.5532 |
| Vanadium | 115.75 | 15.7472 |
| Zinc | 409.75 | 48.0913 |

## SUMMARY OF COC SELECTION
## SITE 2 AREA A DOWNSTREAM - FILTERED GROUNDWATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

| Chemical | Frequency of Detection (2) | Range of Detection (2) | Location of Maximum | Range of Nondetects (3) | Federal MCL (4) | State MCL (5) | Risk-based COC Screening Level (6) | Selected as COC? | Rationale |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 7/46 | 12.4 - 4050 | 2DGW24S | 10 - 82.6 | 50 - 200 (7) | - | 3700 | N | 1 |
| Antimony | 2/46 | 14.8 - 20.9 | 2DGW23D | 12 - 24 | 6 | 6 | 1.5 | Y | 3 |
| Arsenic | 12/46 | 2.7 - 6 | 2DGW29S | 1 - 5 | 50 | 50 | 0.045 | N | 1 |
| Barium | 42/46 | 7.4 - 363 | 2DGW27S | 5 - 34.6 | 2000 | 2000 | 260 | N | 1 |
| Beryllium | 2/46 | 1 | 3GW12D/2DGW27S | 1 - 1.5 | 4 | 4 | 0.016 | N | 1 |
| Boron | 25/46 | 53.8 - 359 | 3GW12S | 29.4 - 58.4 | - | - | 330 | N | 1 |
| Cadmium | 2/46 | 2.5 - 4.3 | 3GW12S | 2 - 6.1 | 5 | 5 | 1.8 | N | 1 |
| Calcium | 46/46 | 8120 - 176000 | 2DGW16D | - | - | - | - | N | 1 |
| Cobalt | 3/46 | 6.1 - 27.4 | 2DGW27S | 3 - 26.6 | - | - | 220 | N | 1 |
| Copper | 3/46 | 2.2 - 3.4 | 2DGW27D | 2 - 16.5 | 1300 (8) | - | 150 | N | 1 |
| Iron | 33/46 | 17.2 - 35700 | 3GW12D | 9.3 - 62.1 | 300 (7) | - | 1100 | N | 1 |
| Lead | 8/46 | 1 - 5.8 | 2DGW16S | 1 - 2 | 15 (8) | - | - | N | 1 |
| Magnesium | 46/46 | 1110 - 61000 | 3GW12S | - | - | - | - | N | 1 |
| Manganese | 45/46 | 6.5 - 7630 | 3GW12D | 4.5 | 50 (7) | - | ~~18~~ 88 | N | 1 |
| Mercury | 1/46 | 0.4 | 2DGW15D | 0.2 | 2 | 2 | 1.1 | N | 1 |
| Nickel | 4/46 | 9 - 56.3 | 2DGW27S | 7 - 18.1 | 100 | 100 | 73 | N | 1 |
| Potassium | 44/46 | 745 - 20900 | 3GW12S | 1170 - 2690 | - | - | - | N | 1 |
| Silver | 1/46 | 2 | 2DGW24S | 2 - 3.7 | 100 (7) | 50 | 18 | N | 1 |
| Sodium | 46/46 | 4580 - 3560000 | 2DGW16D | - | - | - | - | N | 1 |
| Thallium | 9/35 | 5.1 - 7.7 | 2DGW26S | 1 - 20 | 2 | 2 | 0.26 (9) | N | 1 |
| Zinc | 14/46 | 2.2 - 39.3 | 2DGW30S | 2 - 23.7 | 5000 (7) | - | 1100 | N | 1 |

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## SUMMARY OF COC SELECTION (Continued)
## SITE 2 AREA A DOWNSTREAM - FILTERED GROUNDWATER (UG/L) (1)
## NSB-NLON, GROTON, CONNECTICUT

Footnotes:

1 Results in ug/L unless otherwise noted.
2 Sample and duplicate counted as separate samples. Non-validated and rejected results are not used in risk assessment.
3 Sample-specific.
4 Maximum contaminant level. (USEPA, May 1995).
5 Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II EnvironmentalHealth.
6 For tap water, based on a target hazard quotient of 0.1 or an incremental cancer risk of 1E-6 (USEPA Region III, October 20, 1995).
7 Secondary MCL (SMCL) based on aesthetic water qualities.
8 Action Level.
9 Thallic oxide.

Rationale Designations:

1 Chemical detected in unfiltered samples; filtered results not used in risk assessment.
2 Chemical not detected in unfiltered samples; maximum is less than COC screening level.
3 Chemical not detected in unfiltered samples; maximum is greater than or equal to the COC screening level.

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Soil/Sediment Data - Zone 1: Downstream Water Courses (0-2')



~~Table X~~

Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| ALUMINUM | 15/15 | 4190.0000Norm 18800.0000 | 11314.6667 | 13400(a) | na | na | na | na | na | |
| ARSENIC | 15/15 | 1.9000Log 39.9000 | 10.8000 | 17.2(b) | na | na | na | na | na | |
| BARIUM | 15/15 | 27.2000Log 154.0000 | 69.0667 | 88.1(b) | na | na | na | na | na | |
| BERYLLIUM | 15/15 | 0.3700Log 1.8000 | 0.9427 | 1.20(b) | na | na | na | na | na | |
| CADMIUM | 12/13 | 1.1000Log 30.1000 | 8.2250 | 29.3(b) | na | na | na | na | na | |
| CALCIUM | 15/15 | 1390.0000Log 5720.0000 | 3345.3333 | 4420(b) | na | na | na | na | na | |
| CHROMIUM | 15/15 | 9.4000Log 43.4000 | 23.8067 | 31.4(b) | na | na | na | na | na | |
| COBALT | 15/15 | 3.7000Log 26.6000 | 11.4400 | 14.9(b) | na | na | na | na | na | |
| COPPER | 15/15 | 10.6000Und 118.0000 | 34.9600 | 118(b) | na | na | na | na | na | |
| IRON | 15/15 | 8430.0000Log ******.**** | 60868.6667 | 118000(b) | na | na | na | na | na | |
| LEAD | 15/15 | 5.0000Log 223.0000 | 59.9867 | 128(b) | na | na | na | na | na | |
| MAGNESIUM | 15/15 | 2170.0000Log 9640.0000 | 4402.6667 | 5450(b) | na | na | na | na | na | |

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Table X
Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MANGANESE | 15/15 | 104.0000<br>2850.0000 | Log | 632.0000 | 1130(b) | na | na | na | na | na | |
| NICKEL | 15/15 | 6.8000<br>44.6000 | Log | 18.6000 | 23.8(b) | na | na | na | na | na | |
| POTASSIUM | 13/15 | 534.0000<br>3620.0000 | Log | 1670.3846 | 2860(b) | na | na | na | na | na | |
| SELENIUM | 10/13 | 0.3300<br>3.2000 | Log | 1.3540 | 2.4(b) | na | na | na | na | na | |
| SODIUM | 14/14 | 200.0000<br>2070.0000 | Norm | 881.7857 | 1130(a) | na | na | na | na | na | |
| VANADIUM | 15/15 | 15.0000<br>64.9000 | Norm | 34.4667 | 41.3(a) | na | na | na | na | na | |
| ZINC | 15/15 | 18.2000<br>2720.0000 | Log | 297.1933 | 580(b) | na | na | na | na | na | |
| 2-BUTANONE | 10/14 | 4.0000<br>120.0000 | Log | 35.5000 | 75.2(b) | na | na | na | na | na | |
| FLUORANTHENE | 9/15 | 73.0000<br>1500.0000 | Log | 780.3333 | 1500(c) | na | na | na | na | na | |
| PYRENE | 9/15 | 140.0000<br>1900.0000 | Log | 875.5556 | 1900(d) | na | na | na | na | na | |
| [redacted] | [redacted] | [redacted] | | 46446 | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | |
| [redacted] | [redacted] | [redacted] | | 3283 | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | [redacted] | |
| | 21/23 | | | | | | | | | | |

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Table X
Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| [redacted] | 19/23 | *****.**** | | 81859 | | | | | | | |
| TOTAL ORGANIC CARBON | ~~13/23~~ 12/12 | 1400.0000 *****.**** | Log | ~~20802.0000~~ 31930 | 160,000 (C) | na | na | na | na | na | |

Soil Data (0-2') - Downstream Watercourses - Zone 1

~~Table X~~

Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 22/22 | 17.0000Log<br>*****.**** | ✓46459.5455 | 300,000(c) | na | na | na | na | na | |
| 4,4'-DDE | 21/23 | 17.0000Log<br>24000.0000 | ✓ 3284.2381 | 24,000(c) | na | na | na | na | na | |
| 4,4'-DDT | 19/23 | 29.0000Und<br>*****.**** | 81866.4737 | 1,400,000(d) | na | na | na | na | na | |

000082

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : ALUMINUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 15.0000 | No samples |
| Number of Detects ..... | 15.0000 | |
| Average ..... | 11314.6667 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 4190.0000 | |
| Positive Hits - Maximum ..... | 18800.0000 | |
| Average Of Positive Hits ..... | 11314.6667 | |
| Standard Deviation ..... | 5097.0620 | |
| Upper Confidence Limit - Normal ..... | 13632.2408 UCL | |
| Upper Confidence Limit - Lognormal ... | 15412.7977 | |
| 95th Percentile - Nonparametric..... | 18800.0000 | |
| 95th Percentile - Normal..... | 19699.3336 | |
| 95th Percentile - Lognormal ..... | 23657.8024 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9774 | |
| Corr Coeff - Detected - Lognormal .... | 0.9651 | |
| Corr Coeff - Total - Normal ..... | 0.9774 | |
| Corr Coeff - Total - Lognormal ..... | 0.9651 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9370 | |
| Corr Coeff - Crit Val - Total ..... | 0.9370 | |
| W-Test - Table Value ..... | 0.8810 | NA |
| W-Test - Normal ..... | 0.9293 | NA |
| W-Test - Lognormal ..... | 0.9085 | NA |
| Type of Distribution ..... | NORMAL | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : ARSENIC (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 10.8000 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 1.9000 | |
| Positive Hits - Maximum | 39.9000 | |
| Average Of Positive Hits | 10.8000 | |
| Standard Deviation | 9.4003 | |
| Upper Confidence Limit - Normal | 15.0742 | |
| Upper Confidence Limit - Lognormal | 17.2499 UCL | |
| 95th Percentile - Nonparametric | 39.9000 | |
| 95th Percentile - Normal | 26.2635 | |
| 95th Percentile - Lognormal | 27.7812 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8456 | |
| Corr Coeff - Detected - Lognormal | 0.9773 | |
| Corr Coeff - Total - Normal | 0.8456 | |
| Corr Coeff - Total - Lognormal | 0.9773 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.7403 | NA |
| W-Test - Lognormal | 0.9716 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000084

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : BARIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 69.0667 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 27.2000 | |
| Positive Hits - Maximum | 154.0000 | |
| Average Of Positive Hits | 69.0667 | |
| Standard Deviation | 34.9952 | |
| Upper Confidence Limit - Normal | 84.9786 | |
| Upper Confidence Limit - Lognormal | 88.0620 UCL | |
| 95th Percentile - Nonparametric | 154.0000 | |
| 95th Percentile - Normal | 126.6337 | |
| 95th Percentile - Lognormal | 130.8379 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8949 | |
| Corr Coeff - Detected - Lognormal | 0.9568 | |
| Corr Coeff - Total - Normal | 0.8949 | |
| Corr Coeff - Total - Lognormal | 0.9568 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.8105 | NA |
| W-Test - Lognormal | 0.9257 | NA |
| Type of Distribution | LOGNORMAL✓ | |

Test Results:

000035

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : BERYLLIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 0.9427 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 0.3700 | |
| Positive Hits - Maximum | 1.8000 | |
| Average Of Positive Hits | 0.9427 | |
| Standard Deviation | 0.3990 | |
| Upper Confidence Limit - Normal | 1.1241 | |
| Upper Confidence Limit - Lognormal | 1.1974 UCL | |
| 95th Percentile - Nonparametric | 1.8000 | |
| 95th Percentile - Normal | 1.5990 | |
| 95th Percentile - Lognormal | 1.7616 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9709 | |
| Corr Coeff - Detected - Lognormal | 0.9897 | |
| Corr Coeff - Total - Normal | 0.9709 | |
| Corr Coeff - Total - Lognormal | 0.9897 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.9414 | NA |
| W-Test - Lognormal | 0.9785 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

000036

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : CADMIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 13.0000 | No samples |
| Number of Detects | 12.0000 | |
| Average | 7.6150 | |
| Detection Limit - Minimum | 0.2950 | |
| Detection Limits - Maximum | 0.2950 | |
| Positive Hits - Minimum | 1.1000 | |
| Positive Hits - Maximum | 30.1000 | |
| Average Of Positive Hits | 8.2250 | |
| Standard Deviation | 9.0693 | |
| Upper Confidence Limit - Normal | ~~12.0974~~ | |
| Upper Confidence Limit - Lognormal | 29.3306 UCL | |
| 95th Percentile - Nonparametric | 30.1000 | |
| 95th Percentile - Normal | 22.5340 | |
| 95th Percentile - Lognormal | 31.9054 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8495 | |
| Corr Coeff - Detected - Lognormal | 0.9695 | |
| Corr Coeff - Total - Normal | 0.8439 | |
| Corr Coeff - Total - Lognormal | 0.9720 | |
| Corr Coeff - Crit Val - Detected | 0.9260 | |
| Corr Coeff - Crit Val - Total | 0.9310 | |
| W-Test - Table Value | 0.8660 | NA |
| W-Test - Normal | 0.7215 | NA |
| W-Test - Lognormal | 0.9534 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000037

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : CALCIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 15.0000 | No samples |
| Number of Detects ..... | 15.0000 | |
| Average ..... | 3345.3333 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 1390.0000 | |
| Positive Hits - Maximum ..... | 5720.0000 | |
| Average Of Positive Hits ..... | 3345.3333 | |
| Standard Deviation ..... | 1523.9510 | |
| Upper Confidence Limit - Normal ..... | 4038.2559 | |
| Upper Confidence Limit - Lognormal ... | 4424.6269 UCL | |
| 95th Percentile - Nonparametric..... | 5720.0000 | |
| 95th Percentile - Normal..... | 5852.2327 | |
| 95th Percentile - Lognormal ..... | 6697.5194 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9676 | |
| Corr Coeff - Detected - Lognormal .... | 0.9724 | |
| Corr Coeff - Total - Normal ..... | 0.9676 | |
| Corr Coeff - Total - Lognormal ..... | 0.9724 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9370 | |
| Corr Coeff - Crit Val - Total ..... | 0.9370 | |
| W-Test - Table Value ..... | 0.8810 | NA |
| W-Test - Normal ..... | 0.9105 | NA |
| W-Test - Lognormal ..... | 0.9212 | NA |
| Type of Distribution ..... | LOGNORMAL | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : CHROMIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 23.8067 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 9.4000 | |
| Positive Hits - Maximum | 43.4000 | |
| Average Of Positive Hits | 23.8067 | |
| Standard Deviation | 10.9363 | |
| Upper Confidence Limit - Normal | 28.7793 | |
| Upper Confidence Limit - Lognormal | 31.5778 UCL | |
| 95th Percentile - Nonparametric | 43.4000 | |
| 95th Percentile - Normal | 41.7969 | |
| 95th Percentile - Lognormal | 47.8873 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9736 | |
| Corr Coeff - Detected - Lognormal | 0.9773 | |
| Corr Coeff - Total - Normal | 0.9736 | |
| Corr Coeff - Total - Lognormal | 0.9773 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.9298 | NA |
| W-Test - Lognormal | 0.9368 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000039

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : COBALT (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 11.4400 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 3.7000 | |
| Positive Hits - Maximum | 26.6000 | |
| Average Of Positive Hits | 11.4400 | |
| Standard Deviation | 5.8648 | |
| Upper Confidence Limit - Normal | ~~14.1066~~ | |
| Upper Confidence Limit - Lognormal | 14.8892 UCL | |
| 95th Percentile - Nonparametric | 26.6000 | |
| 95th Percentile - Normal | 21.0875 | |
| 95th Percentile - Lognormal | 22.3891 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8775 | |
| Corr Coeff - Detected - Lognormal | 0.9419 | |
| Corr Coeff - Total - Normal | 0.8775 | |
| Corr Coeff - Total - Lognormal | 0.9419 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.7901 | NA |
| W-Test - Lognormal | 0.9094 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000030

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : COPPER (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 34.9600 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 10.6000 | |
| Positive Hits - Maximum | 118.0000 | |
| Average Of Positive Hits | 34.9600 | |
| Standard Deviation | 31.7949 | |
| Upper Confidence Limit - Normal | 49.4168 | |
| Upper Confidence Limit - Lognormal | 49.5421 | |
| 95th Percentile - Nonparametric | 118.0000 | |
| 95th Percentile - Normal | 87.2627 | |
| 95th Percentile - Lognormal | 79.0045 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7737 | |
| Corr Coeff - Detected - Lognormal | 0.9103 | |
| Corr Coeff - Total - Normal | 0.7737 | |
| Corr Coeff - Total - Lognormal | 0.9103 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.6130 | NA |
| W-Test - Lognormal | 0.8410 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : IRON (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 15.0000 | No samples |
| Number of Detects ..... | 15.0000 | |
| Average ..... | 60868.6667 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 8430.0000 | |
| Positive Hits - Maximum ..... | 195000.0000 | |
| Average Of Positive Hits ..... | 60868.6667 | |
| Standard Deviation ..... | 53031.8410 | |
| Upper Confidence Limit - Normal ..... | ~~84981.6214~~ | |
| Upper Confidence Limit - Lognormal ... | 118047.8377 UCL | |
| 95th Percentile - Nonparametric..... | ~~195000.0000~~ | |
| 95th Percentile - Normal..... | 148106.0450 | |
| 95th Percentile - Lognormal ..... | 185934.2636 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9199 | |
| Corr Coeff - Detected - Lognormal .... | 0.9873 | |
| Corr Coeff - Total - Normal ..... | 0.9199 | |
| Corr Coeff - Total - Lognormal ..... | 0.9873 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9370 | |
| Corr Coeff - Crit Val - Total ..... | 0.9370 | |
| W-Test - Table Value ..... | 0.8810 | NA |
| W-Test - Normal ..... | 0.8484 | NA |
| W-Test - Lognormal ..... | 0.9682 | NA |
| Type of Distribution ..... | LOGNORMAL ✓ | |

Test Results:

000032

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : LEAD (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 59.9867 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 5.0000 | |
| Positive Hits - Maximum | 223.0000 | |
| Average Of Positive Hits | 59.9867 | |
| Standard Deviation | 63.9287 | |
| Upper Confidence Limit - Normal | 89.0543 | |
| Upper Confidence Limit - Lognormal | 128.0909 UCL | |
| 95th Percentile - Nonparametric | 223.0000 | |
| 95th Percentile - Normal | 165.1494 | |
| 95th Percentile - Lognormal | 194.6694 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8521 | |
| Corr Coeff - Detected - Lognormal | 0.9809 | |
| Corr Coeff - Total - Normal | 0.8521 | |
| Corr Coeff - Total - Lognormal | 0.9809 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.7337 | NA |
| W-Test - Lognormal | 0.9687 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000033

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : MAGNESIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 4402.6667 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 2170.0000 | |
| Positive Hits - Maximum | 9640.0000 | |
| Average Of Positive Hits | 4402.6667 | |
| Standard Deviation | 2124.5318 | |
| Upper Confidence Limit - Normal | 5368.6663 | |
| Upper Confidence Limit - Lognormal | 5654.4425 | |
| 95th Percentile - Nonparametric | 9640.0000 | |
| 95th Percentile - Normal | 7897.5214 | |
| 95th Percentile - Lognormal | 8428.1455 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9393 | |
| Corr Coeff - Detected - Lognormal | 0.9766 | |
| Corr Coeff - Total - Normal | 0.9393 | |
| Corr Coeff - Total - Lognormal | 0.9766 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.8815 | NA |
| W-Test - Lognormal | 0.9405 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000034

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : MANGANESE (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 632.0000 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 104.0000 | |
| Positive Hits - Maximum | 2850.0000 | |
| Average Of Positive Hits | 632.0000 | |
| Standard Deviation | 669.8001 | |
| Upper Confidence Limit - Normal | ~~936.5502~~ | |
| Upper Confidence Limit - Lognormal | 1131.0174 UCL | |
| 95th Percentile - Nonparametric | 2850.0000 | |
| 95th Percentile - Normal | 1733.8211 | |
| 95th Percentile - Lognormal | 1801.0260 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7918 | |
| Corr Coeff - Detected - Lognormal | 0.9738 | |
| Corr Coeff - Total - Normal | 0.7918 | |
| Corr Coeff - Total - Lognormal | 0.9738 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.6574 | NA |
| W-Test - Lognormal | 0.9571 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

000535

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : NICKEL (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 18.6000 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 6.8000 | |
| Positive Hits - Maximum | 44.6000 | |
| Average Of Positive Hits | 18.6000 | |
| Standard Deviation | 8.9234 | |
| Upper Confidence Limit - Normal | 22.6574 | |
| Upper Confidence Limit - Lognormal | 23.8361 wcl | |
| 95th Percentile - Nonparametric | 44.6000 | |
| 95th Percentile - Normal | 33.2790 | |
| 95th Percentile - Lognormal | 35.4082 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9111 | |
| Corr Coeff - Detected - Lognormal | 0.9772 | |
| Corr Coeff - Total - Normal | 0.9111 | |
| Corr Coeff - Total - Lognormal | 0.9772 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.8552 | NA |
| W-Test - Lognormal | 0.9719 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000036

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : POTASSIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 15.0000 | No samples |
| Number of Detects ..... | 13.0000 | |
| Average ..... | 1570.5667 | |
| Detection Limit - Minimum ..... | 228.5000 | |
| Detection Limits - Maximum ..... | 1615.0000 | |
| Positive Hits - Minimum ..... | 534.0000 | |
| Positive Hits - Maximum ..... | 3620.0000 | |
| Average Of Positive Hits ..... | 1670.3846 | |
| Standard Deviation ..... | 1045.8226 | |
| Upper Confidence Limit - Normal ..... | ~~2046.0899~~ | |
| Upper Confidence Limit - Lognormal ... | 2856.7475 UCL | |
| 95th Percentile - Nonparametric..... | 3620.0000 | |
| 95th Percentile - Normal..... | 3290.9449 | |
| 95th Percentile - Lognormal ..... | 4581.2170 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9606 | |
| Corr Coeff - Detected - Lognormal .... | 0.9736 | |
| Corr Coeff - Total - Normal ..... | 0.9684 | |
| Corr Coeff - Total - Lognormal ..... | 0.9686 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9310 | |
| Corr Coeff - Crit Val - Total ..... | 0.9370 | |
| W-Test - Table Value ..... | 0.8810 | NA |
| W-Test - Normal ..... | 0.9243 | NA |
| W-Test - Lognormal ..... | 0.9299 | NA |
| Type of Distribution ..... | LOGNORMAL ✓ | |

Test Results:

00037

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : SELENIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 13.0000 | No samples |
| Number of Detects ..... | 10.0000 | |
| Average ..... | 1.1400 | |
| Detection Limit - Minimum ..... | 0.1350 | |
| Detection Limits - Maximum ..... | 0.8500 | |
| Positive Hits - Minimum ..... | 0.3300 | |
| Positive Hits - Maximum ..... | 3.2000 | |
| Average Of Positive Hits ..... | 1.3540 | |
| Standard Deviation ..... | 0.8795 | |
| Upper Confidence Limit - Normal ..... | 1.5747 | |
| Upper Confidence Limit - Lognormal ... | 2.4180 UCL | |
| 95th Percentile - Nonparametric..... | 3.2000 | |
| 95th Percentile - Normal..... | 2.5868 | |
| 95th Percentile - Lognormal ..... | 3.5603 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.7968 | |
| Corr Coeff - Detected - Lognormal .... | 0.8931 | |
| Corr Coeff - Total - Normal ..... | 0.9366 | |
| Corr Coeff - Total - Lognormal ..... | 0.9788 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9170 | |
| Corr Coeff - Crit Val - Total ..... | 0.9310 | |
| W-Test - Table Value ..... | 0.8660 | NA |
| W-Test - Normal ..... | 0.8819 | NA |
| W-Test - Lognormal ..... | 0.9616 | NA |
| Type of Distribution ..... | LOGNORMAL ✓ | |

Test Results:

000038

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : SODIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 881.7857 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 200.0000 | |
| Positive Hits - Maximum | 2070.0000 | |
| Average Of Positive Hits | 881.7857 | |
| Standard Deviation | 523.7811 | |
| Upper Confidence Limit - Normal | 1129.7016 UCL | |
| Upper Confidence Limit - Lognormal | ~~1494.2344~~ | |
| 95th Percentile - Nonparametric | 2070.0000 | |
| 95th Percentile - Normal | 1743.4056 | |
| 95th Percentile - Lognormal | 2347.6821 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9709 | |
| Corr Coeff - Detected - Lognormal | 0.9605 | |
| Corr Coeff - Total - Normal | 0.9709 | |
| Corr Coeff - Total - Lognormal | 0.9605 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.9426 | NA |
| W-Test - Lognormal | 0.9135 | NA |
| Type of Distribution | NORMAL ✓ | |

Test Results:

00039

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : VANADIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 15.0000 | No samples |
| Number of Detects ..... | 15.0000 | |
| Average ..... | 34.4667 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 15.0000 | |
| Positive Hits - Maximum ..... | 64.9000 | |
| Average Of Positive Hits ..... | 34.4667 | |
| Standard Deviation ..... | 14.9851 | |
| Upper Confidence Limit - Normal ..... | 41.2802 UCL | |
| Upper Confidence Limit - Lognormal ... | 44.9940 | |
| 95th Percentile - Nonparametric..... | 64.9000 | |
| 95th Percentile - Normal..... | 59.1172 | |
| 95th Percentile - Lognormal ..... | 67.4461 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9704 | |
| Corr Coeff - Detected - Lognormal .... | 0.9690 | |
| Corr Coeff - Total - Normal ..... | 0.9704 | |
| Corr Coeff - Total - Lognormal ..... | 0.9690 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9370 | |
| Corr Coeff - Crit Val - Total ..... | 0.9370 | |
| W-Test - Table Value ..... | 0.8810 | NA |
| W-Test - Normal ..... | 0.9325 | NA |
| W-Test - Lognormal ..... | 0.9237 | NA |
| Type of Distribution ..... | NORMAL ✓ | |

Test Results:

00100

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : ZINC (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 15.0000 | |
| Average | 297.1933 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 18.2000 | |
| Positive Hits - Maximum | 2720.0000 | |
| Average Of Positive Hits | 297.1933 | |
| Standard Deviation | 677.4188 | |
| Upper Confidence Limit - Normal | ~~605.2077~~ | |
| Upper Confidence Limit - Lognormal | ~~580.2880~~ ucl | |
| 95th Percentile - Nonparametric | ~~2720.0000~~ | |
| 95th Percentile - Normal | 1411.5473 | |
| 95th Percentile - Lognormal | 787.8892 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6024 | |
| Corr Coeff - Detected - Lognormal | 0.9371 | |
| Corr Coeff - Total - Normal | 0.6024 | |
| Corr Coeff - Total - Lognormal | 0.9371 | |
| Corr Coeff - Crit Val - Detected | 0.9370 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.3986 | NA |
| W-Test - Lognormal | 0.9047 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000101

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : 2-BUTANONE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 10.0000 | |
| Average | 31.8571 | |
| Detection Limit - Minimum | 7.5000 | |
| Detection Limits - Maximum | 39.5000 | |
| Positive Hits - Minimum | 4.0000 | |
| Positive Hits - Maximum | 120.0000 | |
| Average Of Positive Hits | 35.5000 | |
| Standard Deviation | 31.2456 | |
| Upper Confidence Limit - Normal | 46.6463 | |
| Upper Confidence Limit - Lognormal | 75.2524 UCL | |
| 95th Percentile - Nonparametric | 120.0000 | |
| 95th Percentile - Normal | 83.2561 | |
| 95th Percentile - Lognormal | 108.3782 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7447 | |
| Corr Coeff - Detected - Lognormal | 0.9320 | |
| Corr Coeff - Total - Normal | 0.8890 | |
| Corr Coeff - Total - Lognormal | 0.9864 | |
| Corr Coeff - Crit Val - Detected | 0.9170 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.8047 | NA |
| W-Test - Lognormal | 0.9641 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : FLUORANTHENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 9.0000 | |
| Average | 864.8667 | |
| Detection Limit - Minimum | 215.0000 | |
| Detection Limits - Maximum | 1950.0000 | |
| Positive Hits - Minimum | 73.0000 | |
| Positive Hits - Maximum | 1500.0000 UCL | |
| Average Of Positive Hits | 780.3333 | |
| Standard Deviation | 649.3713 | |
| Upper Confidence Limit - Normal | 1160.1282 | |
| Upper Confidence Limit - Lognormal | 2292.4647 | |
| 95th Percentile - Nonparametric | 1950.0000 > max hit | |
| 95th Percentile - Normal | 1933.0825 | |
| 95th Percentile - Lognormal | 3319.3380 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8318 | |
| Corr Coeff - Detected - Lognormal | 0.9402 | |
| Corr Coeff - Total - Normal | 0.9547 | |
| Corr Coeff - Total - Lognormal | 0.9528 | |
| Corr Coeff - Crit Val - Detected | 0.9120 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 | NA |
| W-Test - Normal | 0.8886 | NA |
| W-Test - Lognormal | 0.8916 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : PYRENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 15.0000 | No samples |
| Number of Detects | 9.0000 | |
| Average | 922.0000 | |
| Detection Limit - Minimum | 215.0000 | |
| Detection Limits - Maximum | 1950.0000 | |
| Positive Hits - Minimum | 140.0000 | |
| Positive Hits - Maximum | 1900.0000 | |
| Average Of Positive Hits | 875.5556 | |
| Standard Deviation | 689.7406 | |
| Upper Confidence Limit - Normal | 1235.6170 | |
| Upper Confidence Limit - Lognormal | 2130.8376 | |
| 95th Percentile - Nonparametric | 1950.0000 | |
| 95th Percentile - Normal | 2056.6233 | |
| 95th Percentile - Lognormal | 3223.0179 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9006 | |
| Corr Coeff - Detected - Lognormal | 0.9538 | |
| Corr Coeff - Total - Normal | 0.9382 | |
| Corr Coeff - Total - Lognormal | 0.9351 | |
| Corr Coeff - Crit Val - Detected | 0.9120 | |
| Corr Coeff - Crit Val - Total | 0.9370 | |
| W-Test - Table Value | 0.8810 < | NA |
| W-Test - Normal | 0.8517 | NA |
| W-Test - Lognormal | 0.8468 | NA |
| Type of Distribution | ~~LOGNORMAL~~ Undefined | |

Test Results:

000104

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : 4,4'-DDD (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 22.0000 | No samples |
| Number of Detects ..... | 22.0000 | |
| Average ..... | 46446.0000 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 17.0000 | |
| Positive Hits - Maximum ..... | 300000.0000 UCL | |
| Average Of Positive Hits ..... | 46446.0000 | |
| Standard Deviation ..... | 80589.1750 | |
| Upper Confidence Limit - Normal ..... | 76015.6538 | |
| Upper Confidence Limit - Lognormal ... | 23108457.9672 >max | |
| 95th Percentile - Nonparametric..... | 300000.0000 | |
| 95th Percentile - Normal..... | 179015.1929 | |
| 95th Percentile - Lognormal ..... | 588403.3221 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.7933 | |
| Corr Coeff - Detected - Lognormal .... | 0.9751 | |
| Corr Coeff - Total - Normal ..... | 0.7933 | |
| Corr Coeff - Total - Lognormal ..... | 0.9751 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9540 | |
| Corr Coeff - Crit Val - Total ..... | 0.9540 | |
| W-Test - Table Value ..... | 0.9110 | NA |
| W-Test - Normal ..... | 0.6386 | NA |
| W-Test - Lognormal ..... | 0.9334 | NA |
| Type of Distribution ..... | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : 4,4'-DDE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 23.0000 | No samples |
| Number of Detects | 21.0000 | |
| Average | 3016.5652 | |
| Detection Limit - Minimum | 110.0000 | |
| Detection Limits - Maximum | 320.0000 | |
| Positive Hits - Minimum | 17.0000 | |
| Positive Hits - Maximum | 24000.0000 ucl | |
| Average Of Positive Hits | ~~3283.3810~~ | |
| Standard Deviation | 5899.4019 | |
| Upper Confidence Limit - Normal | 5128.6647 | |
| Upper Confidence Limit - Lognormal | 35993.2050 > max | |
| 95th Percentile - Nonparametric | 24000.0000 | |
| 95th Percentile - Normal | 12721.0814 | |
| 95th Percentile - Lognormal | 17266.3120 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6901 | |
| Corr Coeff - Detected - Lognormal | 0.9887 | |
| Corr Coeff - Total - Normal | 0.7425 | |
| Corr Coeff - Total - Lognormal | 0.9910 | |
| Corr Coeff - Crit Val - Detected | 0.9520 | |
| Corr Coeff - Crit Val - Total | 0.9550 | |
| W-Test - Table Value | 0.9140 | NA |
| W-Test - Normal | 0.5687 | NA |
| W-Test - Lognormal | 0.9673 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : 4,4'-DDT (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 23.0000 | No samples |
| Number of Detects | 19.0000 | |
| Average | 67662.4348 | |
| Detection Limit - Minimum | 18.5000 | |
| Detection Limits - Maximum | 850.0000 | |
| Positive Hits - Minimum | 25.0000 | |
| Positive Hits - Maximum | 1400000.0000 UCL | |
| Average Of Positive Hits | ~~81854.1053~~ | |
| Standard Deviation | 291163.9957 | |
| Upper Confidence Limit - Normal | 171904.7498 | |
| Upper Confidence Limit - Lognormal | 1431173.9447 | |
| 95th Percentile - Nonparametric | 1400000.0000 | |
| 95th Percentile - Normal | 546627.2077 | |
| 95th Percentile - Lognormal | 68654.7907 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.4135 | |
| Corr Coeff - Detected - Lognormal | 0.8430 | |
| Corr Coeff - Total - Normal | 0.4648 | |
| Corr Coeff - Total - Lognormal | 0.9477 | |
| Corr Coeff - Crit Val - Detected | 0.9470 | |
| Corr Coeff - Crit Val - Total | 0.9550 | |
| W-Test - Table Value | 0.9140 | NA |
| W-Test - Normal | 0.2471 | NA |
| W-Test - Lognormal | 0.8969 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : TOTAL ORGANIC CARBON (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 12.0000 | No samples |
| Number of Detects | 12.0000 | |
| Average | 31930.5000 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | ~~1775.0000~~ | |
| Positive Hits - Maximum | 160000.0000 4cc | |
| Average Of Positive Hits | ~~31930.5000~~ | |
| Standard Deviation | 47750.5199 | |
| Upper Confidence Limit - Normal | 56687.2604 | |
| Upper Confidence Limit - Lognormal | 254279.3527 >mg | |
| 95th Percentile - Nonparametric | 160000.0000 | |
| 95th Percentile - Normal | 110480.1053 | |
| 95th Percentile - Lognormal | 144864.6008 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8243 | |
| Corr Coeff - Detected - Lognormal | 0.9598 | |
| Corr Coeff - Total - Normal | 0.8243 | |
| Corr Coeff - Total - Lognormal | 0.9598 | |
| Corr Coeff - Crit Val - Detected | 0.9260 | |
| Corr Coeff - Crit Val - Total | 0.9260 | |
| W-Test - Table Value | 0.8590 | NA |
| W-Test - Normal | 0.6934 | NA |
| W-Test - Lognormal | 0.8998 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

00018

Dataset: UTMP_RES
Media : SEDIMENT/SOIL DATA(0-2') - (NSB-NLON)
Group : DOWNSTREAM WATER COURSES - ZONE 1

Parameter : 4,4'-DDD (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 22.0000 | No samples |
| Number of Detects | 22.0000 | |
| Average | 46459.5455 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 17.0000 | |
| Positive Hits - Maximum | 300000.0000 | |
| Average Of Positive Hits | 46459.5455 | |
| Standard Deviation | 80581.0322 | |
| Upper Confidence Limit - Normal | 76026.2115 | |
| Upper Confidence Limit - Lognormal | 15225623.0143 > max hit | |
| 95th Percentile - Nonparametric | 300000.0000 | |
| 95th Percentile - Normal | 179015.3434 | |
| 95th Percentile - Lognormal | 549236.3954 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7933 | |
| Corr Coeff - Detected - Lognormal | 0.9798 | |
| Corr Coeff - Total - Normal | 0.7933 | |
| Corr Coeff - Total - Lognormal | 0.9798 | |
| Corr Coeff - Crit Val - Detected | 0.9540 | |
| Corr Coeff - Crit Val - Total | 0.9540 | |
| W-Test - Table Value | 0.9110 | NA |
| W-Test - Normal | 0.6385 | NA |
| W-Test - Lognormal | 0.9443 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

00019

Dataset: UTMP_RES
Media : SEDIMENT/SOIL DATA(0-2') - (NSB-NLON)
Group : DOWNSTREAM WATER COURSES - ZONE 1

Parameter : 4,4'-DDE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 23.0000 | No samples |
| Number of Detects | 21.0000 | |
| Average | 3017.3478 | |
| Detection Limit - Minimum | 110.0000 | |
| Detection Limits - Maximum | 320.0000 | |
| Positive Hits - Minimum | ~~17.0000~~ | |
| Positive Hits - Maximum | 24000.0000 use | |
| Average Of Positive Hits | ~~3284.2381~~ | |
| Standard Deviation | 5898.9875 | |
| Upper Confidence Limit - Normal | 5129.2989 | |
| Upper Confidence Limit - Lognormal | 31749.9734 > max | |
| 95th Percentile - Nonparametric | 24000.0000 nR | |
| 95th Percentile - Normal | 12721.1823 | |
| 95th Percentile - Lognormal | 16608.8782 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6900 | |
| Corr Coeff - Detected - Lognormal | 0.9884 | |
| Corr Coeff - Total - Normal | 0.7424 | |
| Corr Coeff - Total - Lognormal | 0.9907 | |
| Corr Coeff - Crit Val - Detected | 0.9520 | |
| Corr Coeff - Crit Val - Total | 0.9550 | |
| W-Test - Table Value | 0.9140 | NA |
| W-Test - Normal | 0.5685 | NA |
| W-Test - Lognormal | 0.9681 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

0010

Dataset: UTMP_RES
Media : SEDIMENT/SOIL DATA(0-2') - (NSB-NLON)
Group : DOWNSTREAM WATER COURSES - ZONE 1

Parameter : 4,4'-DDT (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 23.0000 | No samples |
| Number of Detects | 19.0000 | |
| Average | 67672.6522 | |
| Detection Limit - Minimum | 18.5000 | |
| Detection Limits - Maximum | 850.0000 | |
| Positive Hits - Minimum | 29.0000 | |
| Positive Hits - Maximum | 1400000.0000 | |
| Average Of Positive Hits | ~~81866.4737~~ | |
| Standard Deviation | 291161.5184 | |
| Upper Confidence Limit - Normal | 171914.0803 | |
| Upper Confidence Limit - Lognormal | 1089186.7384 | |
| 95th Percentile - Nonparametric | 1400000.0000 | |
| 95th Percentile - Normal | 546633.3500 | |
| 95th Percentile - Lognormal | 67480.4597 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.4183 | |
| Corr Coeff - Detected - Lognormal | 0.8374 | |
| Corr Coeff - Total - Normal | 0.4648 | |
| Corr Coeff - Total - Lognormal | 0.9492 | |
| Corr Coeff - Crit Val - Detected | 0.9470 | |
| Corr Coeff - Crit Val - Total | 0.9550 | |
| W-Test - Table Value | 0.9140 | NA |
| W-Test - Normal | 0.2471 | NA |
| W-Test - Lognormal | 0.9016 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

000-11

Sediment/Soil Data (0-10') - Downstream Watercourses - Zone 1

~~Table X~~

Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 23/25 | 17.0000Log<br>*****.**** | ✓ 44442.2174 | 500,000(c) | na | na | na | na | na | |
| 4,4'-DDE | 23/26 | 17.0000Log<br>24000.0000 | ✓ 3001.0435 | 24,000(c) | na | na | na | na | na | |
| 4,4'-DDT | 21/26 | 24.0000Und<br>*****.**** | ✓ 74074.3333 | 1,400,000(d) | na | na | na | na | na | |

Dataset: UTMP_RES
Media : SEDIMENT/SOIL DATA(0-10') - (NSB-NLON)
Group : DOWNSTREAM WATER COURSES - ZONE 1

Parameter : 4,4'-DDD (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 25.0000 | No samples |
| Number of Detects | 23.0000 | |
| Average | 40887.6400 | |
| Detection Limit - Minimum | 9.0000 | |
| Detection Limits - Maximum | 11.0000 | |
| Positive Hits - Minimum | 17.0000 | |
| Positive Hits - Maximum | 300000.0000 ucl | |
| Average Of Positive Hits | ~~44442.2174~~ | |
| Standard Deviation | 76933.7242 | |
| Upper Confidence Limit - Normal | 67214.3604 | |
| Upper Confidence Limit - Lognormal | 38635357.7376 > max hit | |
| 95th Percentile - Nonparametric | 300000.0000 | |
| 95th Percentile - Normal | 167443.6163 | |
| 95th Percentile - Lognormal | 509702.0735 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7628 | |
| Corr Coeff - Detected - Lognormal | 0.9757 | |
| Corr Coeff - Total - Normal | 0.7677 | |
| Corr Coeff - Total - Lognormal | 0.9784 | |
| Corr Coeff - Crit Val - Detected | 0.9550 | |
| Corr Coeff - Crit Val - Total | 0.9580 | |
| W-Test - Table Value | 0.9180 | NA |
| W-Test - Normal | 0.6013 | NA |
| W-Test - Lognormal | 0.9355 | NA |
| Type of Distribution | LOGNORMAL✓ | |

Test Results:

0001-15

Dataset: UTMP_RES
Media : SEDIMENT/SOIL DATA(0-10') - (NSB-NLON)
Group : DOWNSTREAM WATER COURSES - ZONE 1

Parameter : 4,4'-DDE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 26.0000 | No samples |
| Number of Detects | 23.0000 | |
| Average | 2671.7308 | |
| Detection Limit - Minimum | 11.0000 | |
| Detection Limits - Maximum | 320.0000 | |
| Positive Hits - Minimum | ~~17.0000~~ | |
| Positive Hits - Maximum | 24000.0000 UCL | |
| Average Of Positive Hits | ~~3001.0435~~ | |
| Standard Deviation | 5619.1386 | |
| Upper Confidence Limit - Normal | 4553.9532 | |
| Upper Confidence Limit - Lognormal | 31941.5912 > not hit | |
| 95th Percentile - Nonparametric | 24000.0000 | |
| 95th Percentile - Normal | 11915.2138 | |
| 95th Percentile - Lognormal | 14454.3645 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6431 | |
| Corr Coeff - Detected - Lognormal | 0.9735 | |
| Corr Coeff - Total - Normal | 0.7193 | |
| Corr Coeff - Total - Lognormal | 0.9852 | |
| Corr Coeff - Crit Val - Detected | 0.9550 | |
| Corr Coeff - Crit Val - Total | 0.9590 | |
| W-Test - Table Value | 0.9200 | NA |
| W-Test - Normal | 0.5375 | NA |
| W-Test - Lognormal | 0.9543 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SEDIMENT/SOIL DATA(0-10') - (NSB-NLON)
Group : DOWNSTREAM WATER COURSES - ZONE 1

Parameter : 4,4'-DDT (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 26.0000 | No samples |
| Number of Detects | 21.0000 | |
| Average | 59868.4615 | |
| Detection Limit - Minimum | 11.0000 | |
| Detection Limits - Maximum | 850.0000 | |
| Positive Hits - Minimum | ~~24.0000~~ | |
| Positive Hits - Maximum | 1400000.0000 wa | |
| Average Of Positive Hits | ~~74074.3333~~ | |
| Standard Deviation | 274021.2497 | |
| Upper Confidence Limit - Normal | 151656.3618 | |
| Upper Confidence Limit - Lognormal | 628837.5113 | |
| 95th Percentile - Nonparametric | 1400000.0000 | |
| 95th Percentile - Normal | 510633.4173 | |
| 95th Percentile - Lognormal | 48772.1853 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.3896 | |
| Corr Coeff - Detected - Lognormal | 0.8550 | |
| Corr Coeff - Total - Normal | 0.4457 | |
| Corr Coeff - Total - Lognormal | 0.9476 | |
| Corr Coeff - Crit Val - Detected | 0.9520 | |
| Corr Coeff - Crit Val - Total | 0.9590 | |
| W-Test - Table Value | 0.9200 | NA |
| W-Test - Normal | 0.2315 | NA |
| W-Test - Lognormal | 0.8992 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

Soil/Sediment Data (0-10') - Zone 1 : Downstream Water Courses



Table X
Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ALUMINUM | 18/18 | 4080.0000<br>18800.0000 | Norm ✓ | 11377.7778 | 13500(a) | na | na | na | na | na | |
| ARSENIC | 18/18 | 0.5800<br>39.9000 | Log ✓ | 9.2989 | 18.7(b) | na | na | na | na | na | |
| BARIUM | 18/18 | 23.1000<br>154.0000 | Log ✓ | 64.5056 | 82.6(b) | na | na | na | na | na | |
| BERYLLIUM | 17/18 | 0.3700<br>1.8000 | Norm ✓ | 0.9065 | 1.0(a) | na | na | na | na | na | |
| CADMIUM | 14/16 | 1.1000<br>30.1000 | Log ✓ | 7.7714 | 21.4(b) | na | na | na | na | na | |
| CALCIUM | 18/18 | 534.0000<br>5720.0000 | Norm ✓ | 3009.3889 | 3680(a) | na | na | na | na | na | |
| CHROMIUM | 18/18 | 6.5000<br>43.4000 | Norm ✓ | 22.9667 | 27.4(a) | na | na | na | na | na | |
| COBALT | 16/18 | 3.7000<br>26.6000 | Log ✓ | 11.1063 | 14.5(b) | na | na | na | na | na | |
| COPPER | 18/18 | 10.6000<br>118.0000 | Und ✓ | 31.1278 | 118(d) | na | na | na | na | na | |
| IRON | 18/18 | 7220.0000<br>*****.**** | Log ✓ | 52686.1111 | 101,000(b) | na | na | na | na | na | |
| LEAD | 18/18 | 5.0000<br>223.0000 | Log ✓ | 53.3778 | 95.6(b) | na | na | na | na | na | |
| MAGNESIUM | 18/18 | 1300.0000<br>9640.0000 | Log ✓ | 4096.1111 | 5250(b) | na | na | na | na | na | |

Table X
Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MANGANESE | 18/18 | 94.6000<br>2850.0000 | Log ✓ | 551.9222 | 972(b) | na | na | na | na | na | |
| NICKEL | 18/18 | 4.4000<br>44.6000 | Log ✓ | 17.4500 | 22.9(b) | na | na | na | na | na | |
| POTASSIUM | 16/18 | 323.0000<br>3620.0000 | Log ✓ | 1495.7500 | 2380(b) | na | na | na | na | na | |
| SELENIUM | 10/16 | 0.3300<br>3.2000 | Log ✓ | 1.3540 | 1.9(b) | na | na | na | na | na | |
| SODIUM | 17/17 | 92.2000<br>2070.0000 | Log ✓ | 787.3647 | 1420(b) | na | na | na | na | na | |
| VANADIUM | 18/18 | 15.0000<br>64.9000 | Norm ✓ | 33.0611 | 38.9(a) | na | na | na | na | na | |
| ZINC | 18/18 | 18.2000<br>2720.0000 | Log ✓ | 258.3889 | 411(b) | na | na | na | na | na | |
| 2-BUTANONE | 11/17 | 4.0000<br>120.0000 | Log ✓ | 35.1818 | 60(b) | na | na | na | na | na | |
| FLUORANTHENE | 10/18 | 67.0000<br>1500.0000 | Log ✓ | 709.0000 | 1500(c) | na | na | na | na | na | |
| PYRENE | 10/18 | 54.0000<br>1900.0000 | Und ✓ | 793.4000 | 1900(d) | na | na | na | na | na | |
| 4,4'-DDD | 24/26 | 17.0000<br>*****.**** | Log | 42593.0417 | 300,000(c) | na | na | na | na | na | |
| 4,4'-DDE | 24/27 | 17.0000<br>24000.0000 | Log | 2876.8333 | 24,000(c) | na | na | na | na | na | |

000120

Table X
Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDT | 22/27 | 24.0000<br>*****.**** | Und | 70708.4545 | 1,400,000(d) | na | na | na | na | na | |
| TOTAL ORGANIC CARBON | 13/13 | 1400.0000<br>*****.**** | Log | 29582.0000 | 100,000(c) | na | na | na | na | na | |

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : ALUMINUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 11377.7778 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 4080.0000 | |
| Positive Hits - Maximum | 18800.0000 | |
| Average Of Positive Hits | 11377.7778 | |
| Standard Deviation | ~~5176.4359~~ | |
| Upper Confidence Limit - Normal | 13500.747 Mcc | |
| Upper Confidence Limit - Lognormal | ~~15266.5627~~ | |
| 95th Percentile - Nonparametric | 18800.0000 | |
| 95th Percentile - Normal | 19893.0149 | |
| 95th Percentile - Lognormal | 24451.1729 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9711 | |
| Corr Coeff - Detected - Lognormal | 0.9519 | |
| Corr Coeff - Total - Normal | 0.9711 | |
| Corr Coeff - Total - Lognormal | 0.9519 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.9170 | NA |
| W-Test - Lognormal | 0.8825 | NA |
| Type of Distribution | NORMAL✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : ARSENIC (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 9.2989 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 0.5800 | |
| Positive Hits - Maximum | 39.9000 | |
| Average Of Positive Hits | 9.2989 | |
| Standard Deviation | 9.2106 | |
| Upper Confidence Limit - Normal | 13.0764 | |
| Upper Confidence Limit - Lognormal | 18.7486 UCL | |
| 95th Percentile - Nonparametric | 39.9000 | |
| 95th Percentile - Normal | 24.4504 | |
| 95th Percentile - Lognormal | 31.1737 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8540 | |
| Corr Coeff - Detected - Lognormal | 0.9776 | |
| Corr Coeff - Total - Normal | 0.8540 | |
| Corr Coeff - Total - Lognormal | 0.9776 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.7522 | NA |
| W-Test - Lognormal | 0.9700 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000124

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : BARIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 64.5056 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 23.1000 | |
| Positive Hits - Maximum | 154.0000 | |
| Average Of Positive Hits | 64.5056 | |
| Standard Deviation | 34.5601 | |
| Upper Confidence Limit - Normal | ~~78.6794~~ | |
| Upper Confidence Limit - Lognormal | 82.5906 UCL | |
| 95th Percentile - Nonparametric | ~~154.0000~~ | |
| 95th Percentile - Normal | 121.3570 | |
| 95th Percentile - Lognormal | 129.3859 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9154 | |
| Corr Coeff - Detected - Lognormal | 0.9778 | |
| Corr Coeff - Total - Normal | 0.9154 | |
| Corr Coeff - Total - Lognormal | 0.9778 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.8451 | NA |
| W-Test - Lognormal | 0.9582 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : BERYLLIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 17.0000 | |
| Average | 0.8619 | |
| Detection Limit - Minimum | 0.1050 | |
| Detection Limits - Maximum | 0.1050 | |
| Positive Hits - Minimum | 0.3700 | |
| Positive Hits - Maximum | 1.8000 | |
| Average Of Positive Hits | 0.9065 | |
| Standard Deviation | 0.4221 | |
| Upper Confidence Limit - Normal | 1.0351 UCL | |
| Upper Confidence Limit - Lognormal | 1.2752 | |
| 95th Percentile - Nonparametric | 1.8000 | |
| 95th Percentile - Normal | 1.5563 | |
| 95th Percentile - Lognormal | 2.1217 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9661 | |
| Corr Coeff - Detected - Lognormal | 0.9837 | |
| Corr Coeff - Total - Normal | 0.9764 | |
| Corr Coeff - Total - Lognormal | 0.9193 | |
| Corr Coeff - Crit Val - Detected | 0.9420 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.9597 | NA |
| W-Test - Lognormal | 0.8680 | NA |

Type of Distribution ..... NORMAL ✓

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : CADMIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 16.0000 | No samples |
| Number of Detects | 14.0000 | |
| Average | 6.8497 | |
| Detection Limit - Minimum | 0.2950 | |
| Detection Limits - Maximum | 0.5000 | |
| Positive Hits - Minimum | 1.1000 | |
| Positive Hits - Maximum | 30.1000 | |
| Average Of Positive Hits | 7.7714 | |
| Standard Deviation | 8.3324 | |
| Upper Confidence Limit - Normal | ~~10.5014~~ | |
| Upper Confidence Limit - Lognormal | 21.4209 UCL | |
| 95th Percentile - Nonparametric | ~~30.1000~~ | |
| 95th Percentile - Normal | 20.5566 | |
| 95th Percentile - Lognormal | 28.3036 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7338 | |
| Corr Coeff - Detected - Lognormal | 0.9022 | |
| Corr Coeff - Total - Normal | 0.8235 | |
| Corr Coeff - Total - Lognormal | 0.9696 | |
| Corr Coeff - Crit Val - Detected | 0.9340 | |
| Corr Coeff - Crit Val - Total | 0.9400 | |
| W-Test - Table Value | 0.8870 | NA |
| W-Test - Normal | 0.6913 | NA |
| W-Test - Lognormal | 0.9433 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000127

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : CALCIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 18.0000 | No samples |
| Number of Detects ..... | 18.0000 | |
| Average ..... | 3009.3889 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 534.0000 | |
| Positive Hits - Maximum ..... | 5720.0000 | |
| Average Of Positive Hits ..... | 3009.3889 | |
| Standard Deviation ..... | 1628.9422 | |
| Upper Confidence Limit - Normal ..... | 3677.453 BUCL | |
| Upper Confidence Limit - Lognormal ... | ~~4457.0706~~ | |
| 95th Percentile - Nonparametric..... | 5720.0000 | |
| 95th Percentile - Normal..... | 5688.9988 | |
| 95th Percentile - Lognormal ..... | 7455.8322 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9801 | |
| Corr Coeff - Detected - Lognormal .... | 0.9693 | |
| Corr Coeff - Total - Normal ..... | 0.9801 | |
| Corr Coeff - Total - Lognormal ..... | 0.9693 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9450 | |
| Corr Coeff - Crit Val - Total ..... | 0.9450 | |
| W-Test - Table Value ..... | 0.8970 | NA |
| W-Test - Normal ..... | 0.9431 | NA |
| W-Test - Lognormal ..... | 0.9352 | NA |
| Type of Distribution ..... | NORMAL ✓ | |

Test Results:

00128

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : CHROMIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 22.9667 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 6.5000 | |
| Positive Hits - Maximum | 43.4000 | |
| Average Of Positive Hits | 22.9667 | |
| Standard Deviation | 10.7967 | |
| Upper Confidence Limit - Normal | 27.3940 UCL | |
| Upper Confidence Limit - Lognormal | ~~30.5711~~ | |
| 95th Percentile - Nonparametric | 43.4000 | |
| 95th Percentile - Normal | 40.7272 | |
| 95th Percentile - Lognormal | 48.7854 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9855 | |
| Corr Coeff - Detected - Lognormal | 0.9798 | |
| Corr Coeff - Total - Normal | 0.9855 | |
| Corr Coeff - Total - Lognormal | 0.9798 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.9590 | NA |
| W-Test - Lognormal | 0.9529 | NA |
| Type of Distribution | NORMAL✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : COBALT (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 16.0000 | |
| Average | 10.1667 | |
| Detection Limit - Minimum | 2.0500 | |
| Detection Limits - Maximum | 3.2500 | |
| Positive Hits - Minimum | 3.7000 | |
| Positive Hits - Maximum | 26.6000 | |
| Average Of Positive Hits | 11.1063 | |
| Standard Deviation | 6.1171 | |
| Upper Confidence Limit - Normal | ~~12.6754~~ | |
| Upper Confidence Limit - Lognormal | 14.5444 ucl | |
| 95th Percentile - Nonparametric | ~~26.6000~~ | |
| 95th Percentile - Normal | 20.2292 | |
| 95th Percentile - Lognormal | 24.1345 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7938 | |
| Corr Coeff - Detected - Lognormal | 0.8764 | |
| Corr Coeff - Total - Normal | 0.9098 | |
| Corr Coeff - Total - Lognormal | 0.9577 | |
| Corr Coeff - Crit Val - Detected | 0.9400 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.8413 | NA |
| W-Test - Lognormal | 0.9277 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

000130

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : COPPER (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 31.1278 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 10.6000 | |
| Positive Hits - Maximum | 118.0000 UCL | |
| Average Of Positive Hits | 31.1278 | |
| Standard Deviation | 30.1708 | |
| Upper Confidence Limit - Normal | 43.5015 | |
| Upper Confidence Limit - Lognormal | 42.5760 | |
| 95th Percentile - Nonparametric | 118.0000 | |
| 95th Percentile - Normal | 80.7587 | |
| 95th Percentile - Lognormal | 71.3565 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7672 | |
| Corr Coeff - Detected - Lognormal | 0.9259 | |
| Corr Coeff - Total - Normal | 0.7672 | |
| Corr Coeff - Total - Lognormal | 0.9259 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.6028 | NA |
| W-Test - Lognormal | 0.8592 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

000131

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : IRON (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 52686.1111 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 7220.0000 | |
| Positive Hits - Maximum | 195000.0000 | |
| Average Of Positive Hits | 52686.1111 | |
| Standard Deviation | 51699.7268 | |
| Upper Confidence Limit - Normal | ~~73889.3030~~ | |
| Upper Confidence Limit - Lognormal | 101163.4110 UCL | |
| 95th Percentile - Nonparametric | 195000.0000 | |
| 95th Percentile - Normal | 137732.1618 | |
| 95th Percentile - Lognormal | 168580.0765 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8984 | |
| Corr Coeff - Detected - Lognormal | 0.9878 | |
| Corr Coeff - Total - Normal | 0.8984 | |
| Corr Coeff - Total - Lognormal | 0.9878 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.8104 | NA |
| W-Test - Lognormal | 0.9631 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : LEAD (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 53.3778 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 5.0000 | |
| Positive Hits - Maximum | 223.0000 | |
| Average Of Positive Hits | 53.3778 | |
| Standard Deviation | 60.0203 | |
| Upper Confidence Limit - Normal | ~~77.9934~~ | |
| Upper Confidence Limit - Lognormal | 95.6031 UCL | |
| 95th Percentile - Nonparametric | ~~223.0000~~ | |
| 95th Percentile - Normal | 152.1112 | |
| 95th Percentile - Lognormal | 160.7479 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8231 | |
| Corr Coeff - Detected - Lognormal | 0.9744 | |
| Corr Coeff - Total - Normal | 0.8231 | |
| Corr Coeff - Total - Lognormal | 0.9744 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.6887 | NA |
| W-Test - Lognormal | 0.9568 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : MAGNESIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 4096.1111 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 1300.0000 | |
| Positive Hits - Maximum | 9640.0000 | |
| Average Of Positive Hits | 4096.1111 | |
| Standard Deviation | 2089.7682 | |
| Upper Confidence Limit - Normal | ~~4953.1709~~ | |
| Upper Confidence Limit - Lognormal | 5254.9586 UCL | |
| 95th Percentile - Nonparametric | ~~9640.0000~~ | |
| 95th Percentile - Normal | 7533.7798 | |
| 95th Percentile - Lognormal | 8225.0227 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9421 | |
| Corr Coeff - Detected - Lognormal | 0.9850 | |
| Corr Coeff - Total - Normal | 0.9421 | |
| Corr Coeff - Total - Lognormal | 0.9850 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.8955 | NA |
| W-Test - Lognormal | 0.9756 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

001134

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : MANGANESE (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 551.9222 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 94.6000 | |
| Positive Hits - Maximum | 2850.0000 | |
| Average Of Positive Hits | 551.9222 | |
| Standard Deviation | 635.8913 | |
| Upper Confidence Limit - Normal | 812.7152 | |
| Upper Confidence Limit - Lognormal | 971.8448 UCL | |
| 95th Percentile - Nonparametric | 2850.0000 | |
| 95th Percentile - Normal | 1597.9635 | |
| 95th Percentile - Lognormal | 1642.4330 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7844 | |
| Corr Coeff - Detected - Lognormal | 0.9767 | |
| Corr Coeff - Total - Normal | 0.7844 | |
| Corr Coeff - Total - Lognormal | 0.9767 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.6436 | NA |
| W-Test - Lognormal | 0.9515 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : NICKEL (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 17.4500 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 4.4000 | |
| Positive Hits - Maximum | 44.6000 | |
| Average Of Positive Hits | 17.4500 | |
| Standard Deviation | 8.7982 | |
| Upper Confidence Limit - Normal | 21.0583 | |
| Upper Confidence Limit - Lognormal | 22.9193 | |
| 95th Percentile - Nonparametric | 44.6000 | |
| 95th Percentile - Normal | 31.9231 | |
| 95th Percentile - Lognormal | 36.3024 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9220 | |
| Corr Coeff - Detected - Lognormal | 0.9651 | |
| Corr Coeff - Total - Normal | 0.9220 | |
| Corr Coeff - Total - Lognormal | 0.9651 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.8754 | NA |
| W-Test - Lognormal | 0.9516 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000139

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : POTASSIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 16.0000 | |
| Average | 1431.9722 | |
| Detection Limit - Minimum | 228.5000 | |
| Detection Limits - Maximum | 1615.0000 | |
| Positive Hits - Minimum | 323.0000 | |
| Positive Hits - Maximum | 3620.0000 | |
| Average Of Positive Hits | 1495.7500 | |
| Standard Deviation | 1009.0388 | |
| Upper Confidence Limit - Normal | 1845.8012 | |
| Upper Confidence Limit - Lognormal | 2384.8307 UCL | |
| 95th Percentile - Nonparametric | 3620.0000 | |
| 95th Percentile - Normal | 3091.8411 | |
| 95th Percentile - Lognormal | 4072.7231 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9589 | |
| Corr Coeff - Detected - Lognormal | 0.9870 | |
| Corr Coeff - Total - Normal | 0.9597 | |
| Corr Coeff - Total - Lognormal | 0.9846 | |
| Corr Coeff - Crit Val - Detected | 0.9400 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.9102 | NA |
| W-Test - Lognormal | 0.9584 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000137

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : SELENIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 16.0000 | No samples |
| Number of Detects | 10.0000 | |
| Average | 0.9775 | |
| Detection Limit - Minimum | 0.1350 | |
| Detection Limits - Maximum | 0.8500 | |
| Positive Hits - Minimum | 0.3300 | |
| Positive Hits - Maximum | 3.2000 | |
| Average Of Positive Hits | 1.3540 | |
| Standard Deviation | 0.8611 | |
| Upper Confidence Limit - Normal | 1.3549 | |
| Upper Confidence Limit - Lognormal | 1.8970 UCL | |
| 95th Percentile - Nonparametric | 3.2000 | |
| 95th Percentile - Normal | 2.3940 | |
| 95th Percentile - Lognormal | 3.0536 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6952 | |
| Corr Coeff - Detected - Lognormal | 0.5856 | |
| Corr Coeff - Total - Normal | 0.9145 | |
| Corr Coeff - Total - Lognormal | 0.9872 | |
| Corr Coeff - Crit Val - Detected | 0.9170 | |
| Corr Coeff - Crit Val - Total | 0.9400 | |
| W-Test - Table Value | 0.8870 | NA |
| W-Test - Normal | 0.8392 | NA |
| W-Test - Lognormal | 0.9656 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : SODIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 17.0000 | No samples |
| Number of Detects ..... | 17.0000 | |
| Average ..... | 787.3647 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | 92.2000 | |
| Positive Hits - Maximum ..... | 2070.0000 | |
| Average Of Positive Hits ..... | 787.3647 | |
| Standard Deviation ..... | 525.5736 | |
| Upper Confidence Limit - Normal ..... | ~~1009.9279~~ | |
| Upper Confidence Limit - Lognormal ... | 1418.108 UCL | |
| 95th Percentile - Nonparametric..... | ~~2070.0000~~ | |
| 95th Percentile - Normal..... | 1651.9333 | |
| 95th Percentile - Lognormal ..... | 2372.2061 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9684 | |
| Corr Coeff - Detected - Lognormal .... | 0.9699 | |
| Corr Coeff - Total - Normal ..... | 0.9684 | |
| Corr Coeff - Total - Lognormal ..... | 0.9699 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9420 | |
| Corr Coeff - Crit Val - Total ..... | 0.9420 | |
| W-Test - Table Value ..... | 0.8920 | NA |
| W-Test - Normal ..... | 0.9383 | NA |
| W-Test - Lognormal ..... | 0.9404 | NA |
| Type of Distribution ..... | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : VANADIUM (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 33.0611 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 15.0000 | |
| Positive Hits - Maximum | 64.9000 | |
| Average Of Positive Hits | 33.0611 | |
| Standard Deviation | 14.3371 | |
| Upper Confidence Limit - Normal | 38.9411 UCL | |
| Upper Confidence Limit - Lognormal | 41.6055 | |
| 95th Percentile - Nonparametric | 64.9000 | |
| 95th Percentile - Normal | 56.6456 | |
| 95th Percentile - Lognormal | 63.7058 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9652 | |
| Corr Coeff - Detected - Lognormal | 0.9682 | |
| Corr Coeff - Total - Normal | 0.9652 | |
| Corr Coeff - Total - Lognormal | 0.9682 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.9246 | NA |
| W-Test - Lognormal | 0.9227 | NA |
| Type of Distribution | NORMAL ✓ | |

Test Results:

0-100

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : ZINC (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 18.0000 | |
| Average | 258.3889 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 18.2000 | |
| Positive Hits - Maximum | 2720.0000 | |
| Average Of Positive Hits | 258.3889 | |
| Standard Deviation | 621.2957 | |
| Upper Confidence Limit - Normal | ~~513.1959~~ | |
| Upper Confidence Limit - Lognormal | 410.6095 UCL | |
| 95th Percentile - Nonparametric | 2720.0000 | |
| 95th Percentile - Normal | 1280.4203 | |
| 95th Percentile - Lognormal | 644.8572 | |

Shapiro-Wilk and Probability Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.5750 | |
| Corr Coeff - Detected - Lognormal | 0.9344 | |
| Corr Coeff - Total - Normal | 0.5750 | |
| Corr Coeff - Total - Lognormal | 0.9344 | |
| Corr Coeff - Crit Val - Detected | 0.9450 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.3654 | NA |
| W-Test - Lognormal | 0.8971 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000141

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : 2-BUTANONE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 17.0000 | No samples |
| Number of Detects | 11.0000 | |
| Average | 28.8529 | |
| Detection Limit - Minimum | 5.5000 | |
| Detection Limits - Maximum | 39.5000 | |
| Positive Hits - Minimum | 4.0000 | |
| Positive Hits - Maximum | 120.0000 | |
| Average Of Positive Hits | 35.1818 | |
| Standard Deviation | 29.4224 | |
| Upper Confidence Limit - Normal | 41.3124 | |
| Upper Confidence Limit - Lognormal | 59.6711 UCL | |
| 95th Percentile - Nonparametric | ~~120.0000~~ | |
| 95th Percentile - Normal | 77.2529 | |
| 95th Percentile - Lognormal | 95.8065 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7300 | |
| Corr Coeff - Detected - Lognormal | 0.9014 | |
| Corr Coeff - Total - Normal | 0.8730 | |
| Corr Coeff - Total - Lognormal | 0.9776 | |
| Corr Coeff - Crit Val - Detected | 0.9220 | |
| Corr Coeff - Crit Val - Total | 0.9420 | |
| W-Test - Table Value | 0.8920 | NA |
| W-Test - Normal | 0.7772 | NA |
| W-Test - Lognormal | 0.9444 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : FLUORANTHENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 10.0000 | |
| Average | 747.5000 | |
| Detection Limit - Minimum | 185.0000 | |
| Detection Limits - Maximum | 1950.0000 | |
| Positive Hits - Minimum | 67.0000 | |
| Positive Hits - Maximum | 1500.0000 UCL | |
| Average Of Positive Hits | 709.0000 | |
| Standard Deviation | 648.8669 | |
| Upper Confidence Limit - Normal | 1013.6146 | |
| Upper Confidence Limit - Lognormal | 1880.0432 > max | |
| 95th Percentile - Nonparametric | 1950.0000 | |
| 95th Percentile - Normal | 1814.8861 | |
| 95th Percentile - Lognormal | 2911.2181 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6750 | |
| Corr Coeff - Detected - Lognormal | 0.8015 | |
| Corr Coeff - Total - Normal | 0.9335 | |
| Corr Coeff - Total - Lognormal | 0.9629 | |
| Corr Coeff - Crit Val - Detected | 0.9170 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.8512 | NA |
| W-Test - Lognormal | 0.9060 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : PYRENE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 18.0000 | No samples |
| Number of Detects | 10.0000 | |
| Average | 794.3889 | |
| Detection Limit - Minimum | 185.0000 | |
| Detection Limits - Maximum | 1950.0000 | |
| Positive Hits - Minimum | ~~54.0000~~ | |
| Positive Hits - Maximum | 1900.0000 UCL | |
| Average Of Positive Hits | ~~793.4000~~ | |
| Standard Deviation | 692.0865 | |
| Upper Confidence Limit - Normal | 1078.2288 | |
| Upper Confidence Limit - Lognormal | 1939.4425 | |
| 95th Percentile - Nonparametric | 1950.0000 | |
| 95th Percentile - Normal | 1932.8712 | |
| 95th Percentile - Lognormal | 3029.4476 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7945 | |
| Corr Coeff - Detected - Lognormal | 0.8670 | |
| Corr Coeff - Total - Normal | 0.9213 | |
| Corr Coeff - Total - Lognormal | 0.9506 | |
| Corr Coeff - Crit Val - Detected | 0.9170 | |
| Corr Coeff - Crit Val - Total | 0.9450 | |
| W-Test - Table Value | 0.8970 | NA |
| W-Test - Normal | 0.8260 | NA |
| W-Test - Lognormal | 0.8894 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

000147

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : 4,4'-DDD (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 26.0000 | No samples |
| Number of Detects | 24.0000 | |
| Average | 39317.4231 | |
| Detection Limit - Minimum | 9.0000 | |
| Detection Limits - Maximum | 11.0000 | |
| Positive Hits - Minimum | ~~17.0000~~ | |
| Positive Hits - Maximum | 300000.0000 uca | |
| Average Of Positive Hits | ~~42593.0417~~ | |
| Standard Deviation | 75803.3714 | |
| Upper Confidence Limit - Normal | 64709.0024 | |
| Upper Confidence Limit - Lognormal | 30749805.6493 > max | |
| 95th Percentile - Nonparametric | 300000.0000 | |
| 95th Percentile - Normal | 164013.9690 | |
| 95th Percentile - Lognormal | 449052.0554 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.7594 | |
| Corr Coeff - Detected - Lognormal | 0.9715 | |
| Corr Coeff - Total - Normal | 0.7598 | |
| Corr Coeff - Total - Lognormal | 0.9766 | |
| Corr Coeff - Crit Val - Detected | 0.9570 | |
| Corr Coeff - Crit Val - Total | 0.9590 | |
| W-Test - Table Value | 0.9200 | NA |
| W-Test - Normal | 0.5901 | NA |
| W-Test - Lognormal | 0.9316 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : 4,4'-DDE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 27.0000 | No samples |
| Number of Detects | 24.0000 | |
| Average | 2573.5185 | |
| Detection Limit - Minimum | 11.0000 | |
| Detection Limits - Maximum | 320.0000 | |
| Positive Hits - Minimum | ~~17.0000~~ | |
| Positive Hits - Maximum | ~~24000.0000~~ UCL | |
| Average Of Positive Hits | ~~2876.8333~~ | |
| Standard Deviation | 5533.6009 | |
| Upper Confidence Limit - Normal | 4390.3095 | |
| Upper Confidence Limit - Lognormal | 30068.2571 >max | |
| 95th Percentile - Nonparametric | 24000.0000 | |
| 95th Percentile - Normal | 11676.2920 | |
| 95th Percentile - Lognormal | 13556.5392 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6457 | |
| Corr Coeff - Detected - Lognormal | 0.9720 | |
| Corr Coeff - Total - Normal | 0.7122 | |
| Corr Coeff - Total - Lognormal | 0.9819 | |
| Corr Coeff - Crit Val - Detected | 0.9570 | |
| Corr Coeff - Crit Val - Total | 0.9600 | |
| W-Test - Table Value | 0.9230 | NA |
| W-Test - Normal | 0.5282 | NA |
| W-Test - Lognormal | 0.9468 | NA |
| Type of Distribution | LOGNORMAL✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : 4,4'-DDT (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 27.0000 | No samples |
| Number of Detects | 22.0000 | |
| Average | 57652.0370 | |
| Detection Limit - Minimum | 11.0000 | |
| Detection Limits - Maximum | 850.0000 | |
| Positive Hits - Minimum | ~~24.0000~~ | |
| Positive Hits - Maximum | 1400000.0000 UCL | |
| Average Of Positive Hits | 70708.4545 | |
| Standard Deviation | 268946.6443 | |
| Upper Confidence Limit - Normal | 145952.5598 | |
| Upper Confidence Limit - Lognormal | 508106.6351 | |
| 95th Percentile - Nonparametric | 1400000.0000 | |
| 95th Percentile - Normal | 500069.2668 | |
| 95th Percentile - Lognormal | 43632.5662 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.3833 | |
| Corr Coeff - Detected - Lognormal | 0.8603 | |
| Corr Coeff - Total - Normal | 0.4399 | |
| Corr Coeff - Total - Lognormal | 0.9438 | |
| Corr Coeff - Crit Val - Detected | 0.9540 | |
| Corr Coeff - Crit Val - Total | 0.9600 | |
| W-Test - Table Value | 0.9230 | NA |
| W-Test - Normal | 0.2269 | NA |
| W-Test - Lognormal | 0.8920 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : TOTAL ORGANIC CARBON (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 13.0000 | No samples |
| Number of Detects | 13.0000 | |
| Average | 29582.0000 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | ~~1400.0000~~ | |
| Positive Hits - Maximum | 160000.0000 | |
| Average Of Positive Hits | ~~29582.0000~~ | |
| Standard Deviation | 46495.2007 | |
| Upper Confidence Limit - Normal | 52561.6892 | |
| Upper Confidence Limit - Lognormal | 219735.6904 >max | |
| 95th Percentile - Nonparametric | 160000.0000 | |
| 95th Percentile - Normal | 106066.6051 | |
| 95th Percentile - Lognormal | 131612.8550 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8095 | |
| Corr Coeff - Detected - Lognormal | 0.9590 | |
| Corr Coeff - Total - Normal | 0.8095 | |
| Corr Coeff - Total - Lognormal | 0.9590 | |
| Corr Coeff - Crit Val - Detected | 0.9310 | |
| Corr Coeff - Crit Val - Total | 0.9310 | |
| W-Test - Table Value | 0.8660 | NA |
| W-Test - Normal | 0.6708 | NA |
| W-Test - Lognormal | 0.9004 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

0001-8

Soil / Sediment Data (0-2') - Zone 2 : Downstream Water Courses



~~Table X~~

Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 9/10 | 110.0000 ***** | Log ***** | ***** | 850,000(C) | na | na | na | na | na | |
| 4,4'-DDE | 9/10 | 470.0000 24000.0000 | Log | 7304.4444 | 24,000(c) | na | na | na | na | na | |
| 4,4'-DDT | 9/10 | 440.0000 59000.0000 | Log | 17408.8889 | 59000(c) | na | na | na | na | na | |

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 2)

Parameter : 4,4'-DDD (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 10.0000 | No samples |
| Number of Detects | 9.0000 | |
| Average | 177030.0000 | |
| Detection Limit - Minimum | 50.0000 | |
| Detection Limits - Maximum | 50.0000 | |
| Positive Hits - Minimum | 110.0000 | |
| Positive Hits - Maximum | 850000.0000 | |
| Average Of Positive Hits | 196694.4444 | |
| Standard Deviation | 299827.6959 | |
| Upper Confidence Limit - Normal | 350823.7733 | |
| Upper Confidence Limit - Lognormal | 586759088812.7 >mdl | |
| 95th Percentile - Nonparametric | 850000.0000 | |
| 95th Percentile - Normal | 670246.5598 | |
| 95th Percentile - Lognormal | 4002139.8016 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8272 | |
| Corr Coeff - Detected - Lognormal | 0.9531 | |
| Corr Coeff - Total - Normal | 0.8106 | |
| Corr Coeff - Total - Lognormal | 0.9579 | |
| Corr Coeff - Crit Val - Detected | 0.9120 | |
| Corr Coeff - Crit Val - Total | 0.9170 | |
| W-Test - Table Value | 0.8420 | NA |
| W-Test - Normal | 0.6625 | NA |
| W-Test - Lognormal | 0.8929 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000151

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON) 2
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 3)

Parameter : 4,4'-DDE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 10.0000 | No samples |
| Number of Detects | 9.0000 | |
| Average | 6579.0000 | |
| Detection Limit - Minimum | 50.0000 | |
| Detection Limits - Maximum | 50.0000 | |
| Positive Hits - Minimum | 470.0000 | |
| Positive Hits - Maximum | 24000.0000 wcl | |
| Average Of Positive Hits | 7304.4444 | |
| Standard Deviation | 8612.9224 | |
| Upper Confidence Limit - Normal | 11571.4417 | |
| Upper Confidence Limit - Lognormal | 291885.6638 > max | |
| 95th Percentile - Nonparametric | 24000.0000 | |
| 95th Percentile - Normal | 20747.2573 | |
| 95th Percentile - Lognormal | 48098.9065 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8938 | |
| Corr Coeff - Detected - Lognormal | 0.9967 | |
| Corr Coeff - Total - Normal | 0.8714 | |
| Corr Coeff - Total - Lognormal | 0.9748 | |
| Corr Coeff - Crit Val - Detected | 0.9120 | |
| Corr Coeff - Crit Val - Total | 0.9170 | |
| W-Test - Table Value | 0.8420 | NA |
| W-Test - Normal | 0.7538 | NA |
| W-Test - Lognormal | 0.9528 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON) c
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 3)

Parameter : 4,4'-DDT (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 10.0000 | No samples |
| Number of Detects ..... | 9.0000 | |
| Average ..... | 15673.0000 | |
| Detection Limit - Minimum ..... | 50.0000 | |
| Detection Limits - Maximum ..... | 50.0000 | |
| Positive Hits - Minimum ..... | 440.0000 | |
| Positive Hits - Maximum ..... | 59000.0000 ucl | |
| Average Of Positive Hits ..... | 17408.8889 | |
| Standard Deviation ..... | 22620.9746 | |
| Upper Confidence Limit - Normal ..... | 28785.1460 | |
| Upper Confidence Limit - Lognormal ... | 3996456.4368 > max | |
| 95th Percentile - Nonparametric..... | 59000.0000 | |
| 95th Percentile - Normal..... | 52884.5031 | |
| 95th Percentile - Lognormal ..... | 132588.2724 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.8740 | |
| Corr Coeff - Detected - Lognormal .... | 0.9766 | |
| Corr Coeff - Total - Normal ..... | 0.8453 | |
| Corr Coeff - Total - Lognormal ..... | 0.9743 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9120 | |
| Corr Coeff - Crit Val - Total ..... | 0.9170 | |
| W-Test - Table Value ..... | 0.8420 | NA |
| W-Test - Normal ..... | 0.7049 | NA |
| W-Test - Lognormal ..... | 0.9419 | NA |
| Type of Distribution ..... | LOGNORMAL ✓ | |

Test Results:

Soil/Sediment Data (0-10') - Zone 2 : Downstream Water Courses

~~Table X.~~

Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 9/13 | 110.0000 ***** | Log ✓ | *****.**** | 850,000(c) | na | na | na | na | na | |
| 4,4'-DDE | 12/14 | 5.3000 24000.0000 | Log ✓ | 5482.0167 | 24,000(c) | na | na | na | na | na | |
| 4,4'-DDT | 9/14 | 440.0000 59000.0000 | Log ✓ | 17408.8889 | 59,000(c) | na | na | na | na | na | |
| TOTAL ORGANIC CARBON | 10/10 | 3557.0000 52000.0000 | Und ✓ | 15201.5000 | 52,000(d) | na | na | na | na | na | |

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 2)

Parameter : 4,4'-DDD (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 13.0000 | No samples |
| Number of Detects | 9.0000 | |
| Average | 136190.3846 | |
| Detection Limit - Minimum | 10.0000 | |
| Detection Limits - Maximum | 75.0000 | |
| Positive Hits - Minimum | 110.0000 | |
| Positive Hits - Maximum | 850000.0000 ucl | |
| Average Of Positive Hits | 196700.0000 | |
| Standard Deviation | 271008.0544 | |
| Upper Confidence Limit - Normal | 270132.8295 | |
| Upper Confidence Limit - Lognormal | 503102531646.5 >max | |
| 95th Percentile - Nonparametric | 850000.0000 | |
| 95th Percentile - Normal | 581998.6342 | |
| 95th Percentile - Lognormal | 2170192.6918 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.5358 | |
| Corr Coeff - Detected - Lognormal | 0.6049 | |
| Corr Coeff - Total - Normal | 0.7537 | |
| Corr Coeff - Total - Lognormal | 0.9603 | |
| Corr Coeff - Crit Val - Detected | 0.9120 | |
| Corr Coeff - Crit Val - Total | 0.9310 | |
| W-Test - Table Value | 0.8660 | NA |
| W-Test - Normal | 0.5815 | NA |
| W-Test - Lognormal | 0.8971 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 2)

Parameter : 4,4'-DDE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 12.0000 | |
| Average | 4703.1571 | |
| Detection Limit - Minimum | 10.0000 | |
| Detection Limits - Maximum | 50.0000 | |
| Positive Hits - Minimum | 5.3000 | |
| Positive Hits - Maximum | 24000.0000 UCL | |
| Average Of Positive Hits | 5482.0167 | |
| Standard Deviation | 7799.4074 | |
| Upper Confidence Limit - Normal | 8394.7700 | |
| Upper Confidence Limit - Lognormal | 10240523.1532 >max | |
| 95th Percentile - Nonparametric | 24000.0000 | |
| 95th Percentile - Normal | 17533.1824 | |
| 95th Percentile - Lognormal | 64904.9883 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6912 | |
| Corr Coeff - Detected - Lognormal | 0.9716 | |
| Corr Coeff - Total - Normal | 0.8103 | |
| Corr Coeff - Total - Lognormal | 0.9676 | |
| Corr Coeff - Crit Val - Detected | 0.9260 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.6607 | NA |
| W-Test - Lognormal | 0.9111 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

000138

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 2)

Parameter : 4,4'-DDT (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 14.0000 | No samples |
| Number of Detects | 9.0000 | |
| Average | 11197.1071 | |
| Detection Limit - Minimum | 2.5000 | |
| Detection Limits - Maximum | 50.0000 | |
| Positive Hits - Minimum | ~~440.0000~~ | |
| Positive Hits - Maximum | 59000.0000 ULL | |
| Average Of Positive Hits | 17408.8889 | |
| Standard Deviation | 20203.8706 | |
| Upper Confidence Limit - Normal | 20759.9963 | |
| Upper Confidence Limit - Lognormal | 420148374.4478 mf | |
| 95th Percentile - Nonparametric | 59000.0000 | |
| 95th Percentile - Normal | 44432.4743 | |
| 95th Percentile - Lognormal | 165626.8019 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.4617 | |
| Corr Coeff - Detected - Lognormal | 0.3874 | |
| Corr Coeff - Total - Normal | 0.7790 | |
| Corr Coeff - Total - Lognormal | 0.9702 | |
| Corr Coeff - Crit Val - Detected | 0.9120 | |
| Corr Coeff - Crit Val - Total | 0.9340 | |
| W-Test - Table Value | 0.8740 | NA |
| W-Test - Normal | 0.6094 | NA |
| W-Test - Lognormal | 0.9176 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

0001-09

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 2)

Parameter : TOTAL ORGANIC CARBON (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 10.0000 | No samples |
| Number of Detects | 10.0000 | |
| Average | 15201.5000 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 3557.0000 | |
| Positive Hits - Maximum | 52000.0000 uck | |
| Average Of Positive Hits | 15201.5000 | |
| Standard Deviation | 17984.8046 | |
| Upper Confidence Limit - Normal | 25626.3110 | |
| Upper Confidence Limit - Lognormal | 44927.3386 | |
| 95th Percentile - Nonparametric | 52000.0000 | |
| 95th Percentile - Normal | 44786.5036 | |
| 95th Percentile - Lognormal | 48367.3986 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8373 | |
| Corr Coeff - Detected - Lognormal | 0.9139 | |
| Corr Coeff - Total - Normal | 0.8373 | |
| Corr Coeff - Total - Lognormal | 0.9139 | |
| Corr Coeff - Crit Val - Detected | 0.9170 | |
| Corr Coeff - Crit Val - Total | 0.9170 | |
| W-Test - Table Value | 0.8420 | NA |
| W-Test - Normal | 0.6970 | NA |
| W-Test - Lognormal | 0.8142 | NA |
| Type of Distribution | UNDEFINED ✓ | |

Test Results:

Soil/Sediment Data (0-2') - Zone 3: Downstream Water Courses



~~Table X~~

Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 9/9 | 1500.0000<br>*****.**** | Log | 39200.0000 | 120,000(c) | na | na | na | na | na | |
| 4,4'-DDE | 9/9 | 68.0000<br>2900.0000 | Log | 988.6667 | 2900(c) | na | na | na | na | na | |
| 4,4'-DDT | 8/9 | 33.0000<br>14000.0000 | Log | 2911.6250 | 14,000(c) | na | na | na | na | na | |
| ALPHA-CHLORDANE | 9/9 | 12.0000<br>490.0000 | Log | 165.7778 | 490(c) | na | na | na | na | na | |
| TOTAL ORGANIC CARBON | 9/9 | 804.0000<br>19246.0000 | Norm | 7485.6667 | 11500(a) | na | na | na | na | na | |

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 3)

Parameter : 4,4'-DDD (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 9.0000 | No samples |
| Number of Detects | 9.0000 | |
| Average | 39200.0000 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 1500.0000 | |
| Positive Hits - Maximum | 120000.0000 | |
| Average Of Positive Hits | 39200.0000 | |
| Standard Deviation | 42141.5175 | |
| Upper Confidence Limit - Normal | 65327.7409 | |
| Upper Confidence Limit - Lognormal | 1215326.5163 >mx | |
| 95th Percentile - Nonparametric | 120000.0000 | |
| 95th Percentile - Normal | 108522.7963 | |
| 95th Percentile - Lognormal | 251067.5191 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9378 | |
| Corr Coeff - Detected - Lognormal | 0.9657 | |
| Corr Coeff - Total - Normal | 0.9378 | |
| Corr Coeff - Total - Lognormal | 0.9657 | |
| Corr Coeff - Crit Val - Detected | 0.9120 | |
| Corr Coeff - Crit Val - Total | 0.9120 | |
| W-Test - Table Value | 0.8290 | NA |
| W-Test - Normal | 0.8666 | NA |
| W-Test - Lognormal | 0.9045 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 3)

Parameter : 4,4'-DDE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 9.0000 | No samples |
| Number of Detects ..... | 9.0000 | |
| Average ..... | 988.6667 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | ~~68.0000~~ | |
| Positive Hits - Maximum ..... | 2900.0000 UCL | |
| Average Of Positive Hits ..... | ~~988.6667~~ | |
| Standard Deviation ..... | 977.5331 | |
| Upper Confidence Limit - Normal ..... | 1594.7372 | |
| Upper Confidence Limit - Lognormal ... | 9434.5182 > max | |
| 95th Percentile - Nonparametric..... | 2900.0000 | |
| 95th Percentile - Normal..... | 2596.7086 | |
| 95th Percentile - Lognormal ..... | 4801.5195 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9397 | |
| Corr Coeff - Detected - Lognormal .... | 0.9689 | |
| Corr Coeff - Total - Normal ..... | 0.9397 | |
| Corr Coeff - Total - Lognormal ..... | 0.9689 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9120 | |
| Corr Coeff - Crit Val - Total ..... | 0.9120 | |
| W-Test - Table Value ..... | 0.8290 | NA |
| W-Test - Normal ..... | 0.8738 | NA |
| W-Test - Lognormal ..... | 0.9177 | NA |
| Type of Distribution ..... | LOGNORMAL | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 3)

Parameter : 4,4'-DDT (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 9.0000 | No samples |
| Number of Detects | 8.0000 | |
| Average | 2682.5556 | |
| Detection Limit - Minimum | 850.0000 | |
| Detection Limits - Maximum | 850.0000 | |
| Positive Hits - Minimum | 33.0000 | |
| Positive Hits - Maximum | 14000.000 acc | |
| Average Of Positive Hits | ~~2911.6250~~ | |
| Standard Deviation | 4357.3451 | |
| Upper Confidence Limit - Normal | 5384.1095 | |
| Upper Confidence Limit - Lognormal | 74682.6702 > max | |
| 95th Percentile - Nonparametric | 14000.0000 | |
| 95th Percentile - Normal | 9850.3882 | |
| 95th Percentile - Lognormal | 15779.4334 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.6532 | |
| Corr Coeff - Detected - Lognormal | 0.9335 | |
| Corr Coeff - Total - Normal | 0.7522 | |
| Corr Coeff - Total - Lognormal | 0.9565 | |
| Corr Coeff - Crit Val - Detected | 0.9050 | |
| Corr Coeff - Crit Val - Total | 0.9120 | |
| W-Test - Table Value | 0.8290 | NA |
| W-Test - Normal | 0.5980 | NA |
| W-Test - Lognormal | 0.9433 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 3)

Parameter : ALPHA-CHLORDANE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 9.0000 | No samples |
| Number of Detects | 9.0000 | |
| Average | 165.7778 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 12.0000 | |
| Positive Hits - Maximum | 490.0000 | |
| Average Of Positive Hits | ~~165.7778~~ | |
| Standard Deviation | 163.8061 | |
| Upper Confidence Limit - Normal | 267.3376 | |
| Upper Confidence Limit - Lognormal | 1718.7447 > max | |
| 95th Percentile - Nonparametric | 490.0000 | |
| 95th Percentile - Normal | 435.2388 | |
| 95th Percentile - Lognormal | 826.9211 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9443 | |
| Corr Coeff - Detected - Lognormal | 0.9688 | |
| Corr Coeff - Total - Normal | 0.9443 | |
| Corr Coeff - Total - Lognormal | 0.9688 | |
| Corr Coeff - Crit Val - Detected | 0.9120 | |
| Corr Coeff - Crit Val - Total | 0.9120 | |
| W-Test - Table Value | 0.8290 | NA |
| W-Test - Normal | 0.8829 | NA |
| W-Test - Lognormal | 0.9136 | NA |
| Type of Distribution | LOGNORMAL | |

Test Results:

00016

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 3)

Parameter : TOTAL ORGANIC CARBON (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 9.0000 | No samples |
| Number of Detects | 9.0000 | |
| Average | 7485.6667 | |
| Detection Limit - Minimum | NA | |
| Detection Limits - Maximum | NA | |
| Positive Hits - Minimum | 804.0000 | |
| Positive Hits - Maximum | 19246.0000 | |
| Average Of Positive Hits | 7485.6667 | |
| Standard Deviation | 6461.1902 | |
| Upper Confidence Limit - Normal | 11491.6046 UCL | |
| Upper Confidence Limit - Lognormal | ~~50407.0850~~ | |
| 95th Percentile - Nonparametric | 19246.0000 | |
| 95th Percentile - Normal | 18114.3246 | |
| 95th Percentile - Lognormal | 33661.0743 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9647 | |
| Corr Coeff - Detected - Lognormal | 0.9546 | |
| Corr Coeff - Total - Normal | 0.9647 | |
| Corr Coeff - Total - Lognormal | 0.9546 | |
| Corr Coeff - Crit Val - Detected | 0.9120 | |
| Corr Coeff - Crit Val - Total | 0.9120 | |
| W-Test - Table Value | 0.8290 | NA |
| W-Test - Normal | 0.9147 | NA |
| W-Test - Lognormal | 0.8833 | NA |
| Type of Distribution | NORMAL ✓ | |

Test Results:

000187

Soil/Sediment Data (0-10') - Zone 3 : Downstream Water Courses



Table X
Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection | Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 16/17 | 25.0000<br>*****.**** | Und | 36315.3125 | 120,000(d) | na | na | na | na | na | |
| 4,4'-DDE | 18/19 | 50.0000<br>9000.0000 | Log✓ | 2119.3333 | 9000(c) | na | na | na | na | na | |
| 4,4'-DDT | 13/19 | 33.0000<br>29000.0000 | Log✓ | 4267.9231 | 29000(c) | na | na | na | na | na | |
| ALPHA-CHLORDANE | 10/19 | 1.2000<br>490.0000 | Log✓ | 149.3200 | 490(c) | na | na | na | na | na | |
| TOTAL ORGANIC CARBON | 15/15 | 804.0000<br>57000.0000 | Log✓ | 15571.4000 | 57000(c) | na | na | na | na | na | |

000-09

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 3)

Parameter : 4,4'-DDD (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 17.0000 | No samples |
| Number of Detects | 16.0000 | |
| Average | 34179.7059 | |
| Detection Limit - Minimum | 10.0000 | |
| Detection Limits - Maximum | 10.0000 | |
| Positive Hits - Minimum | 25.0000 | |
| Positive Hits - Maximum | 120000.0000 | |
| Average Of Positive Hits | 36315.3125 | |
| Standard Deviation | 42514.6123 | |
| Upper Confidence Limit - Normal | 52183.2498 | |
| Upper Confidence Limit - Lognormal | 35771735.5843 | |
| 95th Percentile - Nonparametric | 120000.0000 | |
| 95th Percentile - Normal | 104116.2431 | |
| 95th Percentile - Lognormal | 663147.4643 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.9358 | |
| Corr Coeff - Detected - Lognormal | 0.9328 | |
| Corr Coeff - Total - Normal | 0.8971 | |
| Corr Coeff - Total - Lognormal | 0.9465 | |
| Corr Coeff - Crit Val - Detected | 0.9400 | |
| Corr Coeff - Crit Val - Total | 0.9420 | |
| W-Test - Table Value | 0.8920 | NA |
| W-Test - Normal | 0.7880 | NA |
| W-Test - Lognormal | 0.8843 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 3)

Parameter : 4,4'-DDE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 19.0000 | No samples |
| Number of Detects ..... | 18.0000 | |
| Average ..... | 2008.3158 | |
| Detection Limit - Minimum ..... | 10.0000 | |
| Detection Limits - Maximum ..... | 10.0000 | |
| Positive Hits - Minimum ..... | 50.0000 | |
| Positive Hits - Maximum ..... | 9000.0000 ucl | |
| Average Of Positive Hits ..... | 2119.3333 | |
| Standard Deviation ..... | 2358.0949 | |
| Upper Confidence Limit - Normal ..... | 2946.3822 | |
| Upper Confidence Limit - Lognormal ... | 24226.2679 > max | |
| 95th Percentile - Nonparametric..... | 9000.0000 | |
| 95th Percentile - Normal..... | 5887.3819 | |
| 95th Percentile - Lognormal ..... | 15496.4606 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.8955 | |
| Corr Coeff - Detected - Lognormal .... | 0.9504 | |
| Corr Coeff - Total - Normal ..... | 0.8875 | |
| Corr Coeff - Total - Lognormal ..... | 0.9528 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9450 | |
| Corr Coeff - Crit Val - Total ..... | 0.9470 | |
| W-Test - Table Value ..... | 0.9010 | NA |
| W-Test - Normal ..... | 0.7907 | NA |
| W-Test - Lognormal ..... | 0.9194 | NA |
| Type of Distribution ..... | LOGNORMAL | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 3)

Parameter : 4,4'-DDT (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 19.0000 | No samples |
| Number of Detects | 13.0000 | |
| Average | 3329.2368 | |
| Detection Limit - Minimum | 10.0000 | |
| Detection Limits - Maximum | 5500.0000 | |
| Positive Hits - Minimum | 33.0000 | |
| Positive Hits - Maximum | 29000.0000 ucl | |
| Average Of Positive Hits | 4267.9231 | |
| Standard Deviation | 7002.4036 | |
| Upper Confidence Limit - Normal | 6114.8412 | |
| Upper Confidence Limit - Lognormal | 70025.2112 >max | |
| 95th Percentile - Nonparametric | 29000.0000 | |
| 95th Percentile - Normal | 14848.1907 | |
| 95th Percentile - Lognormal | 23016.2238 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.5606 | |
| Corr Coeff - Detected - Lognormal | 0.8745 | |
| Corr Coeff - Total - Normal | 0.7098 | |
| Corr Coeff - Total - Lognormal | 0.9710 | |
| Corr Coeff - Crit Val - Detected | 0.9310 | |
| Corr Coeff - Crit Val - Total | 0.9470 | |
| W-Test - Table Value | 0.9010 | NA |
| W-Test - Normal | 0.5067 | NA |
| W-Test - Lognormal | 0.9512 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 3)

Parameter : ALPHA-CHLORDANE (UG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count | 19.0000 | No samples |
| Number of Detects | 10.0000 | |
| Average | 189.1158 | |
| Detection Limit - Minimum | 15.0000 | |
| Detection Limits - Maximum | 1100.0000 | |
| Positive Hits - Minimum | ~~1.2000~~ | |
| Positive Hits - Maximum | 490.0000 UCL | |
| Average Of Positive Hits | ~~149.3200~~ | |
| Standard Deviation | 257.2796 | |
| Upper Confidence Limit - Normal | 291.4634 | |
| Upper Confidence Limit - Lognormal | 1118.8304 >max | |
| 95th Percentile - Nonparametric | 1100.0000 | |
| 95th Percentile - Normal | 612.3408 | |
| 95th Percentile - Lognormal | 1112.0309 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.8903 | |
| Corr Coeff - Detected - Lognormal | 0.9533 | |
| Corr Coeff - Total - Normal | 0.8154 | |
| Corr Coeff - Total - Lognormal | 0.9608 | |
| Corr Coeff - Crit Val - Detected | 0.9170 | |
| Corr Coeff - Crit Val - Total | 0.9470 | |
| W-Test - Table Value | 0.9010 | NA |
| W-Test - Normal | 0.6820 | NA |
| W-Test - Lognormal | 0.9511 | NA |
| Type of Distribution | LOGNORMAL ✓ | |

Test Results:

Dataset: UTMP_RES
Media : SOIL/SEDIMENT DATA (0-10') - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 3)

Parameter : TOTAL ORGANIC CARBON (MG/KG)

| | Sample Results | Background Results |
|---|---|---|
| Count ..... | 15.0000 | No samples |
| Number of Detects ..... | 15.0000 | |
| Average ..... | 15571.4000 | |
| Detection Limit - Minimum ..... | NA | |
| Detection Limits - Maximum ..... | NA | |
| Positive Hits - Minimum ..... | ~~804.0000~~ | |
| Positive Hits - Maximum ..... | 57000.0000 ucl | |
| Average Of Positive Hits ..... | ~~15571.4000~~ | |
| Standard Deviation ..... | 15321.5656 | |
| Upper Confidence Limit - Normal ..... | 22537.9358 | |
| Upper Confidence Limit - Lognormal ... | 64619.0614 > max | |
| 95th Percentile - Nonparametric..... | 57000.0000 | |
| 95th Percentile - Normal..... | 40775.3754 | |
| 95th Percentile - Lognormal ..... | 74858.8214 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal ..... | 0.9178 | |
| Corr Coeff - Detected - Lognormal .... | 0.9642 | |
| Corr Coeff - Total - Normal ..... | 0.9178 | |
| Corr Coeff - Total - Lognormal ..... | 0.9642 | |
| Corr Coeff - Crit Val - Detected ..... | 0.9370 | |
| Corr Coeff - Crit Val - Total ..... | 0.9370 | |
| W-Test - Table Value ..... | 0.8810 | NA |
| W-Test - Normal ..... | 0.8493 | NA |
| W-Test - Lognormal ..... | 0.9184 | NA |
| Type of Distribution ..... | LOGNORMAL ✓ | |

Test Results:

Unfiltered Surface Water - Zone 1 & Downstream Water Courses



~~Table X~~

Selection of Constituents of Potential Concern

| Constituent | Frequency of Detection | Range of Detection Dist | Average Positive Hits | Represent. Concent. | T-Test Y-reject Ho N-accept Ho na-not applicable | WRS Test Y-reject Ho N-accept Ho na-not applicable | Test of Proportions Y-reject Ho N-accept Ho na-not applicable | Exceed the 95th Percentile Y-Yes N-No na-not applicable | Above Back-ground Y-Yes N-No | Comment |
|---|---|---|---|---|---|---|---|---|---|---|
| 4,4'-DDD | 6/10 | 0.0850Und ✓ 0.2700 | 0.2108 | 0.27(d) | na | na | na | na | na | |

Dataset: UTMP_RES
Media : SURFACE WATER DATA (UNFILTERED) - CTO 129 (NSB-NLON)
Group : AREA 2D: DOWNSTREAM WATER COURSES (ZONE 1)

Parameter : 4,4'-DDD (UG/L)

| | Sample Results | Background Results |
|---|---|---|
| Count | 10.0000 | No samples |
| Number of Detects | 6.0000 | |
| Average | 0.1465 | |
| Detection Limit - Minimum | 0.0500 | |
| Detection Limits - Maximum | 0.0500 | |
| Positive Hits - Minimum | 0.0850 | |
| Positive Hits - Maximum | 0.2700 uc | |
| Average Of Positive Hits | 0.2108 | |
| Standard Deviation | 0.0959 | |
| Upper Confidence Limit - Normal | 0.2021 | |
| Upper Confidence Limit - Lognormal | 0.3099 | |
| 95th Percentile - Nonparametric | 0.2700 | |
| 95th Percentile - Normal | 0.3043 | |
| 95th Percentile - Lognormal | 0.4118 | |

Shapiro-Wilk and Probabilty Plot Results:

| | | |
|---|---|---|
| Corr Coeff - Detected - Normal | 0.1387 | |
| Corr Coeff - Detected - Lognormal | 0.0822 | |
| Corr Coeff - Total - Normal | 0.9000 | |
| Corr Coeff - Total - Lognormal | 0.8904 | |
| Corr Coeff - Crit Val - Detected | 0.8900 | |
| Corr Coeff - Crit Val - Total | 0.9170 | |
| W-Test - Table Value | 0.8420 | NA |
| W-Test - Normal | 0.7762 | NA |
| W-Test - Lognormal | 0.7551 | NA |
| Type of Distribution | UNDEFINED | |

Test Results:

000179

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 1
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 240 | IR: | 0 |
| EF: | 80 | EF: | 1 |
| Fi: | 0.5 | Fi: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 3.76E-07 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 5.37E-09 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE TWO)**
**Site 2 – Area A Downstream, Zone 1**
**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0.59 | 1 | 0.00E+00 | 2.22E−07 | 3.17E−09 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E−01 |
| Indeno(1,2,3−cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E−01 |
| 2−Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E−05 | |
| Alpha−chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E−05 | 1.30E+00 |
| 4,4'−DDD | 300 | 1 | 0.00E+00 | 1.13E−04 | 1.61E−06 | | 2.40E−01 |
| 4,4'−DDE | 24 | 1 | 0.00E+00 | 9.02E−06 | 1.29E−07 | | 3.40E−01 |
| 4,4'−DDT | 60 | 1 | 0.00E+00 | 2.25E−05 | 3.22E−07 | 5.00E−04 | 3.40E−01 |
| Dieldrin | 0.37 | 1 | 0.00E+00 | 1.39E−07 | 1.99E−09 | 5.00E−05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E−05 | ~~7.70E+00~~ 1E+0 * |
| 1,2,3,4,6,7,8−HpCDD | 0.00032 | 1 | 0.00E+00 | 1.20E−10 | 1.72E−12 | | 1.56E+~~07~~ 03 |
| OCDD | 0.003 | 1 | 0.00E+00 | 1.13E−09 | 1.61E−11 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~13500~~ | ~~1~~ | ~~0.00E+00~~ | ~~5.07E−03~~ | ~~7.25E−05~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E−04 | |
| Arsenic | 18.7 | 1 | 0.00E+00 | 7.03E−06 | 1.00E−07 | 3.00E−04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E−02 | |
| Beryllium | 1 | 1 | 0.00E+00 | 3.76E−07 | 5.37E−09 | 5.00E−03 | 4.30E+00 |
| Cadmium | 21.4 | 1 | 0.00E+00 | 8.04E−06 | 1.15E−07 | 5.00E−04 | |
| Chromium | 27.4 | 1 | 0.00E+00 | 1.03E−05 | 1.47E−07 | 5.00E−03 | |
| ~~Iron~~ | ~~101000~~ | ~~1~~ | ~~0.00E+00~~ | ~~3.79E−02~~ | ~~5.42E−04~~ | ~~3.00E−01~~ | |
| Manganese | 972 | 1 | 0.00E+00 | 3.65E−04 | 5.22E−06 | ~~5.00E−03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E−04 | |
| Vanadium | 38.9 | 1 | 0.00E+00 | 1.46E−05 | 2.09E−07 | 7.00E−03 | |
| Zinc | 411 | 1 | 0.00E+00 | 1.54E−04 | 2.21E−06 | 3.00E−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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KAS

* Based on new PCB guidance (USEPA, September 1996).

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 1
*EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE*
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 2.31E-08 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2-Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha-chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 3.86E-07 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 4.38E-08 |
| 4,4'-DDT | 0.00E+00 | 4.51E-02 | 1.09E-07 |
| Dieldrin | 0.00E+00 | 2.78E-03 | 3.18E-08 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 2.68E-~~05~~ 09 |
| OCDD | 0.00E+00 | 0.00E+00 | 2.51E-~~08~~ 09 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~5.07E-03~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 2.34E-02 | 1.51E-07 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 0.00E+00 | 7.51E-05 | 2.31E-08 |
| Cadmium | 0.00E+00 | 1.61E-02 | 0.00E+00 |
| Chromium | 0.00E+00 | 2.06E-03 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~1.26E-01~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~7.80E-02~~ 1.52E-2 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 2.09E-03 | 0.00E+00 |
| Zinc | 0.00E+00 | 5.15E-04 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~2.97E-01~~ 1.07E-1 | ~~2.54E-03~~ 7.73E-7 |

Revisions
02/28/97
KMS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT

SITE NAME: Site 2 – Area A Downstream, Zone 1
LOCATION: NSB–NLON, Groton, CT
DATE: 01/08/96

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 3800 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 0.2 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 80 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 1 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 0.5 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 1 |
| BW2 = BODY WEIGHT ADULT (KG): | | 70 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 365 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.70E-08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 1.19E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL /SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 1
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0 | 0.06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 1E+0 * |
| 1,2,3,4,7,8–HpCDD | 0.00032 | 0.03 | 0.00E+00 | 1.14E–11 | 1.63E–13 | | 1.73E+03 |
| OCDD | 0.003 | 0.03 | 0.00E+00 | 1.07E–10 | 1.53E–12 | | 1.73E+02 |
| Cadmium | 21.4 | 0.01 | 0.00E+00 | 2.55E–07 | 3.64E–09 | ~~1.50E–05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KMS

* Based on new PCB guidance (USEPA, September 1996).

000186

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 1
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 2.82E-10 |
| OCDD | 0.00E+00 | 0.00E+00 | 2.65E-10 |
| Cadmium | 0.00E+00 | ~~1.70E-02~~ 1.02E-2 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 0.00E+00 | ~~1.70E-02~~ 1.02E-2 | 5.47E-10 |

Revisions
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KMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 1
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 480 | IR: | 0 |
| EF: | 120 | EF: | 1 |
| Fi: | 1 | Fi: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 2.25E-06 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 3.22E-08 |

000180

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL /SEDIMENT (PAGE TWO)**
**Site 2 – Area A Downstream, Zone 1**
**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0.59 | 1 | 0.00E+00 | 1.33E–06 | 1.90E–08 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Indeno(1,2,3–cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| 2–Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | |
| Alpha–chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | 1.30E+00 |
| 4,4'–DDD | 300 | 1 | 0.00E+00 | 6.76E–04 | 9.66E–06 | | 2.40E–01 |
| 4,4'–DDE | 24 | 1 | 0.00E+00 | 5.41E–05 | 7.73E–07 | | 3.40E–01 |
| 4,4'–DDT | 1400 | 1 | 0.00E+00 | 3.16E–03 | 4.51E–05 | 5.00E–04 | 3.40E–01 |
| Dieldrin | 0.37 | 1 | 0.00E+00 | 8.34E–07 | 1.19E–08 | 5.00E–05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 2E+0* |
| 1,2,3,4,6,7,8–HpCDD | 0.00049 | 1 | 0.00E+00 | 1.10E–09 | 1.56E–11 | | 1.56E+~~07~~ 03 |
| OCDD | 0.005 | 1 | 0.00E+00 | 1.13E–08 | 1.61E–10 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~13500~~ | ~~1~~ | ~~0.00E+00~~ | ~~3.04E–02~~ | ~~4.35E–04~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E–04 | |
| Arsenic | 18.7 | 1 | 0.00E+00 | 4.22E–05 | 6.02E–07 | 3.00E–04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–02 | |
| Beryllium | 1 | 1 | 0.00E+00 | 2.25E–06 | 3.22E–08 | 5.00E–03 | 4.30E+00 |
| Cadmium | 21.4 | 1 | 0.00E+00 | 4.82E–05 | 6.89E–07 | 5.00E–04 | |
| Chromium | 27.4 | 1 | 0.00E+00 | 6.18E–05 | 8.82E–07 | 5.00E–03 | |
| ~~Iron~~ | ~~101000~~ | ~~1~~ | ~~0.00E+00~~ | ~~2.28E–01~~ | ~~3.25E–03~~ | ~~3.00E–01~~ | |
| Manganese | 972 | 1 | 0.00E+00 | 2.19E–03 | 3.13E–05 | ~~5.00E–03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–04 | |
| Vanadium | 38.9 | 1 | 0.00E+00 | 8.77E–05 | 1.25E–06 | 7.00E–03 | |
| Zinc | 411 | 1 | 0.00E+00 | 9.27E–04 | 1.32E–05 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KNS

* Based on new PCB guid
(USEPA, September 1996.

000190

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 1
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 1.39E-07 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2-Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha-chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 2.32E-06 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 2.63E-07 |
| 4,4'-DDT | 0.00E+00 | 6.31E+00 | 1.53E-05 |
| Dieldrin | 0.00E+00 | 1.67E-02 | 1.91E-07 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 2.46E-~~04~~ 08 |
| OCDD | 0.00E+00 | 0.00E+00 | 2.51E-~~02~~ 08 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~3.04E-02~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 1.41E-01 | 9.03E-07 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 0.00E+00 | 4.51E-04 | 1.38E-07 |
| Cadmium | 0.00E+00 | 9.65E-02 | 0.00E+00 |
| Chromium | 0.00E+00 | 1.24E-02 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~7.59E-01~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~4.88E-01~~ 9.13E-2 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 1.25E-02 | 0.00E+00 |
| Zinc | 0.00E+00 | 3.09E-03 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 0.00E+00 | ~~7.02E+00~~ 6.68E+0 | ~~2.54E-02~~ 1.93E-5 |

Revisions
02/28/97
KMS

**RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 1
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 3800 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 1 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 120 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 1 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 1 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 1 |
| BW2 = BODY WEIGHT ADULT (KG): | | 70 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 365 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 2.55E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 1.78E-05

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 1
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0 | 0.06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 2E+0* |
| 1,2,3,4,7,8–HpCDD | 0.00049 | 0.03 | 0.00E+00 | 2.62E–10 | 3.75E–12 | | 1.73E+03 |
| OCDD | 0.005 | 0.03 | 0.00E+00 | 2.68E–09 | 3.82E–11 | | 1.73E+02 |
| Cadmium | 21.4 | 0.01 | 0.00E+00 | 3.82E–06 | 5.46E–08 | ~~1.50E–05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
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* Based on new PCB guidance (USEPA, September 1996).

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 1
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 6.48E-09 |
| OCDD | 0.00E+00 | 0.00E+00 | 6.62E-09 |
| Cadmium | 0.00E+00 | ~~2.55E-01~~ 1.53E-1 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 0.00E+00 | ~~2.55E-01~~ 1.53E-1 | 1.31E-08 |

Revisions
02/28/97
KMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 1
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 0 | IR: | 50 |
| EF: | 1 | EF: | 52 |
| Fi: | 1 | Fi: | 0.5 |
| ED: | 1 | ED: | 3 |
| BW: | 1 | BW: | 43 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 1095 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 8.28E–08 | (AVG ANNUAL DOSE) | CF: | 3.55E–09 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE TWO)**
**Site 2 – Area A Downstream, Zone 1**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), CTE**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG-DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0.59 | 1 | 4.89E-08 | 0.00E+00 | 2.09E-09 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E-01 |
| Indeno(1,2,3-cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E-01 |
| 2-Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E-05 | |
| Alpha-chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E-05 | 1.30E+00 |
| 4,4'-DDD | 300 | 1 | 2.48E-05 | 0.00E+00 | 1.06E-06 | | 2.40E-01 |
| 4,4'-DDE | 24 | 1 | 1.99E-06 | 0.00E+00 | 8.52E-08 | | 3.40E-01 |
| 4,4'-DDT | 68 | 1 | 5.63E-06 | 0.00E+00 | 2.41E-07 | 5.00E-04 | 3.40E-01 |
| Dieldrin | 0.37 | 1 | 3.06E-08 | 0.00E+00 | 1.31E-09 | 5.00E-05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E-05 | ~~7.70E+00~~ 1E+04* |
| 1,2,3,4,6,7,8-HpCDD | 0.00032 | 1 | 2.65E-11 | 0.00E+00 | 1.14E-12 | | 1.56E+~~07~~ 03 |
| OCDD | 0.003 | 1 | 2.48E-10 | 0.00E+00 | 1.06E-11 | | 1.56E+~~00~~ 02 |
| ~~Aluminum~~ | ~~13600~~ | ~~1~~ | ~~1.13E-03~~ | ~~0.00E+00~~ | ~~4.83E-05~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E-04 | |
| Arsenic | 17.2 | 1 | 1.42E-06 | 0.00E+00 | 6.11E-08 | 3.00E-04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E-02 | |
| Beryllium | 1.2 | 1 | 9.94E-08 | 0.00E+00 | 4.26E-09 | 5.00E-03 | 4.30E+00 |
| Cadmium | 29.3 | 1 | 2.43E-06 | 0.00E+00 | 1.04E-07 | 5.00E-04 | |
| Chromium | 31.6 | 1 | 2.62E-06 | 0.00E+00 | 1.12E-07 | 5.00E-03 | |
| ~~Iron~~ | ~~118000~~ | ~~1~~ | ~~9.77E-03~~ | ~~0.00E+00~~ | ~~4.19E-04~~ | ~~3.00E-01~~ | |
| Manganese | 1130 | 1 | 9.36E-05 | 0.00E+00 | 4.01E-06 | ~~5.00E-03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E-04 | |
| Vanadium | 41.3 | 1 | 3.42E-06 | 0.00E+00 | 1.47E-07 | 7.00E-03 | |
| Zinc | 580 | 1 | 4.80E-05 | 0.00E+00 | 2.06E-06 | 3.00E-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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KMG

* Based on new PCB guidance (USEPA, September 1[illegible]).

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE THREE)**
**Site 2 – Area A Downstream, Zone 1**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), CTE**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 1.53E−08 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3−cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2−Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha−chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDD | 0.00E+00 | 0.00E+00 | 2.56E−07 |
| 4,4'−DDE | 0.00E+00 | 0.00E+00 | 2.90E−08 |
| 4,4'−DDT | 1.13E−02 | 0.00E+00 | 8.21E−08 |
| Dieldrin | 6.13E−04 | 0.00E+00 | 2.10E−08 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8−HpCDD | 0.00E+00 | 0.00E+00 | 1.77E−~~05~~ 09 |
| OCDD | 0.00E+00 | 0.00E+00 | 1.66E−~~03~~ 09 |
| ~~Aluminum~~ | ~~1.13E−03~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 4.75E−03 | 0.00E+00 | 9.16E−08 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 1.99E−05 | 0.00E+00 | 1.83E−08 |
| Cadmium | 4.85E−03 | 0.00E+00 | 0.00E+00 |
| Chromium | 5.23E−04 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~3.26E−03~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | ~~1.87E−02~~ 3.9E-3 | 0.00E+00 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 4.89E−04 | 0.00E+00 | 0.00E+00 |
| Zinc | 1.60E−04 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~7.51E−02~~ 2.66E-2 | **0.00E+00** | ~~1.68E−03~~ 5.17E-7 |

Revisions
02/28/97
KMS

**RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 1
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), CTE**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 3150 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 0.2 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 52 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 3 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 0.5 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 43 |
| BW2 = BODY WEIGHT ADULT (KG): | | 1 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 1095 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 1.04E-06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 4.47E-08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 1
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), CTE
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0 | 0.06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 1E+0 * |
| 1,2,3,4,7,8–HpCDD | 0.00032 | 0.03 | 1.00E–11 | 0.00E+00 | 4.29E–13 | | 1.73E+03 |
| OCDD | 0.003 | 0.03 | 9.39E–11 | 0.00E+00 | 4.03E–12 | | 1.73E+02 |
| Cadmium | 29.3 | 0.01 | 3.06E–07 | 0.00E+00 | 1.31E–08 | ~~1.50E–05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KK

* Based on new PCB guidance (USEPA, Sept 1996).

000202

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 1
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 7.43E-10 |
| OCDD | 0.00E+00 | 0.00E+00 | 6.96E-10 |
| Cadmium | ~~2.04E-02~~ 1.22E-2 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | ~~2.04E-02~~ 1.22E-2 | 0.00E+00 | 1.44E-09 |

Revisions
02/28/97
MS

000203

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES**

SITE NAME: Site 2 – Area A Downstream, Zone 1
LOCATION: NSB – NLON, Groton, CT
DATE: 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
TWO EXPOSURE ROUTES ARE CONSIDERED: INCIDENTAL INGESTION AND DERMAL CONTACT.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser; CTE**

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (L/HR)
ET = EXPOSURE TIME (HRS/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY-STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

INGESTION:

| | | | |
|---|---|---|---|
| CR: | 0.05 | CONVERSION FACTOR (NONCAR) = | 3.31E-04 |
| ET: | 2 | | |
| EF: | 52 | | |
| ED: | 3 | CONVERSION FACTOR (CARCIN) = | 1.42E-05 |
| BW: | 43 | | |
| AT(NOCN): | 1095 | | |
| AT(CAR): | 25550 | | |

DERMAL CONTACT:

| | | | |
|---|---|---|---|
| EV: | 1 | CONVERSION FACTOR (NONCAR) = | 1.04E+01 |
| ED: | 3 | | |
| EF: | 52 | | |
| A: | 3150 | CONVERSION FACTOR (CARCIN) = | 4.47E-01 |
| tevent: | 2 | | |
| BW: | 43 | | |
| AT(NON): | 1095 | | |
| AT(CAR): | 25550 | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
Site 2 – Area A Downstream, Zone 1
EXPOSURE SCENARIO: Older Child Trespasser; CTE

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.007 | O | 6.90E–01 | 2.90E–01 | 4.50E–03 | 1.80E–03 | 8.12E–08 |
| Tetrachloroethene | 0 | O | 4.30E+00 | 9.00E–01 | 4.80E–02 | 2.50E–01 | 0.00E+00 |
| 4,4'–DDD | 0.00015 | O | 3.70E+01 | 7.80E+00 | 2.80E–01 | 6.30E+01 | 4.59E–07 |
| 4,4'–DDE | 0 | O | 3.60E+01 | 7.60E+00 | 2.40E–01 | 4.90E+01 | 0.00E+00 |
| 4,4'–DDT | 0 | O | 6.00E+01 | 1.30E+01 | 4.30E–01 | 2.30E+02 | 0.00E+00 |
| Arsenic | 0.003 | I | | | 1.00E–03 | | 8.00E–09 |
| Boron | 0 | I | | | 1.00E–03 | | 0.00E+00 |
| Cadmium | 0 | I | | | 1.00E–03 | | 0.00E+00 |
| ~~Iron~~ | ~~2.68~~ | ~~I~~ | | | ~~1.00E–03~~ | | ~~5.36E–06~~ |
| Manganese | 1.13 | I | | | 1.00E–03 | | 2.26E–06 |
| Mercury | 0 | I | | | 1.00E–03 | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
Site 2 – Area A Downstream, Zone 1
EXPOSURE SCENARIO: Older Child Trespasser; CTE
CALCULATE DOSES:

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 2.32E-06 | 8.48E-07 | 6.00E-02 | 6.00E-02 | 3.87E-05 | 1.41E-05 | 5.28E-05 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 1.00E-02 | 1.00E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 4.97E-08 | 4.79E-06 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 5.00E-04 | 4.00E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 9.94E-07 | 6.26E-08 | 3.00E-04 | 2.80E-04 | 3.31E-03 | 2.24E-04 | 3.54E-03 |
| Boron | 0.00E+00 | 0.00E+00 | 9.00E-02 | 4.50E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | 0.00E+00 | 5.00E-04 | ~~1.50E-05~~ 2.5E-5 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~8.88E-04~~ | ~~5.59E-05~~ | ~~3.00E-01~~ | ~~1.50E-02~~ | ~~2.96E-03~~ | ~~3.73E-03~~ | ~~6.69E-03~~ |
| Manganese | 3.74E-04 | 2.36E-05 | ~~5.00E-03~~ 2.4E-2 | ~~1.50E-04~~ 7.2E-4 | ~~7.48E-02~~ 1.56E-2 | ~~1.57E-01~~ 3.27E-2 | ~~2.32E-01~~ 4.83E-2 |
| Mercury | 0.00E+00 | 0.00E+00 | 3.00E-04 | 1.50E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | ~~8.12E-02~~ 1.89E-2 | ~~1.61E-01~~ 3.29E-2 | ~~2.42E-01~~ 5.19E-2 |

000207

Revisions
08/23/96
KMS

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
Site 2 – Area A Downstream, Zone 1
EXPOSURE SCENARIO: Older Child Trespasser; CTE
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 9.94E-08 | 3.63E-08 | 7.50E-03 | 7.50E-03 | 7.45E-10 | 2.72E-10 | 1.02E-09 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 5.20E-05 | 5.20E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 2.13E-09 | 2.05E-07 | 2.40E-01 | 3.00E-01 | 5.11E-10 | 6.15E-08 | 6.20E-08 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 3.40E-01 | 4.20E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 3.40E-01 | 4.20E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 4.26E-08 | 2.68E-09 | 1.50E+00 | 1.60E+00 | 6.39E-08 | 4.29E-09 | 6.82E-08 |
| Boron | 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 |
| Iron | 3.81E-05 | 2.40E-06 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Manganese | 1.60E-05 | 1.01E-06 | | | 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 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | 6.52E-08 | 6.61E-08 | 1.31E-07 |

000208

Revisions
08/23/96
KHD

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 1
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 0 | IR: | 100 |
| EF: | 1 | EF: | 120 |
| Fi: | 1 | Fi: | 1 |
| ED: | 1 | ED: | 10 |
| BW: | 1 | BW: | 43 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 3650 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 7.65E–07 | (AVG ANNUAL DOSE) | CF: | 1.09E–07 |

000209

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE TWO)**
**Site 2 – Area A Downstream, Zone 1**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), RME**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0.59 | 1 | 4.51E–07 | 0.00E+00 | 6.44E–08 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Indeno(1,2,3–cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| 2–Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | |
| Alpha–chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | 1.30E+00 |
| 4,4'–DDD | 300 | 1 | 2.29E–04 | 0.00E+00 | 3.28E–05 | | 2.40E–01 |
| 4,4'–DDE | 24 | 1 | 1.83E–05 | 0.00E+00 | 2.62E–06 | | 3.40E–01 |
| 4,4'–DDT | 1400 | 1 | 1.07E–03 | 0.00E+00 | 1.53E–04 | 5.00E–04 | 3.40E–01 |
| Dieldrin | 0.37 | 1 | 2.83E–07 | 0.00E+00 | 4.04E–08 | 5.00E–05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 2E+0 * |
| 1,2,3,4,6,7,8–HpCDD | 0.00049 | 1 | 3.75E–10 | 0.00E+00 | 5.35E–11 | | 1.56E+~~07~~ 03 |
| OCDD | 0.005 | 1 | 3.82E–09 | 0.00E+00 | 5.46E–10 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~13600~~ | ~~1~~ | ~~1.04E–02~~ | ~~0.00E+00~~ | ~~1.40E–03~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E–04 | |
| Arsenic | 17.2 | 1 | 1.32E–05 | 0.00E+00 | 1.88E–06 | 3.00E–04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–02 | |
| Beryllium | 1.2 | 1 | 9.17E–07 | 0.00E+00 | 1.31E–07 | 5.00E–03 | 4.30E+00 |
| Cadmium | 29.3 | 1 | 2.24E–05 | 0.00E+00 | 3.20E–06 | 5.00E–04 | |
| Chromium | 31.6 | 1 | 2.42E–05 | 0.00E+00 | 3.45E–06 | 5.00E–03 | |
| ~~Iron~~ | ~~118000~~ | ~~1~~ | ~~9.02E–02~~ | ~~0.00E+00~~ | ~~1.29E–02~~ | ~~3.00E–01~~ | |
| Manganese | 1130 | 1 | 8.64E–04 | 0.00E+00 | 1.23E–04 | ~~5.00E–03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–04 | |
| Vanadium | 41.3 | 1 | 3.16E–05 | 0.00E+00 | 4.51E–06 | 7.00E–03 | |
| Zinc | 580 | 1 | 4.43E–04 | 0.00E+00 | 6.34E–05 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KMS

* Based on new PCB guidance (USEPA, September 1996).

000210

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE THREE)**
**Site 2 – Area A Downstream, Zone 1**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), RME**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 4.70E-07 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2-Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha-chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 7.86E-06 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 8.91E-07 |
| 4,4'-DDT | 2.14E+00 | 0.00E+00 | 5.20E-05 |
| Dieldrin | 5.66E-03 | 0.00E+00 | 6.47E-07 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 8.35E-~~04~~ 08 |
| OCDD | 0.00E+00 | 0.00E+00 | 8.52E-~~02~~ 08 |
| ~~Aluminum~~ | ~~1.04E-02~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 4.38E-02 | 0.00E+00 | 2.82E-06 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 1.83E-04 | 0.00E+00 | 5.64E-07 |
| Cadmium | 4.48E-02 | 0.00E+00 | 0.00E+00 |
| Chromium | 4.83E-03 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~3.01E-01~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | ~~1.73E-01~~ 3.60E-2 | 0.00E+00 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 4.51E-03 | 0.00E+00 | 0.00E+00 |
| Zinc | 1.48E-03 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~2.73E+00~~ 2.28E+0 | 0.00E+00 | ~~8.61E-02~~ 6.54E-5 |

000211

Revisions
02/28/97
KAS

**RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 1
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), RME**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | | |
|---|---|---|---|
| C | = CONCENTRATION IN SOIL (MG/KG) | | |
| SA1 | = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 3150 |
| SA2 | = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| AF | = ADHERENCE FACTOR (MG/SQ CM): | | 1 |
| ABS | = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | | Dioxins: | 0.03 |
| | | PCBS: | 0.06 |
| EF1 | = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 120 |
| EF2 | = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| ED1 | = YOUTH EXPOSURE DURATION (YEARS): | | 10 |
| ED2 | = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd | = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 1 |
| BW1 | = BODY WEIGHT ADOLESCENT (KG): | | 43 |
| BW2 | = BODY WEIGHT ADULT (KG): | | 1 |
| AT1 | = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 3650 |
| AT2 | = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 | = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 2.41E-05 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 3.44E-06
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 1
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), RME
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0 | 0.06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 2E+0* |
| 1,2,3,4,7,8–HpCDD | 0.00049 | 0.03 | 3.54E–10 | 0.00E+00 | 5.06E–11 | | 1.73E+03 |
| OCDD | 0.005 | 0.03 | 3.61E–09 | 0.00E+00 | 5.16E–10 | | 1.73E+02 |
| Cadmium | 29.3 | 0.01 | 7.06E–06 | 0.00E+00 | 1.01E–06 | ~~1.50E–05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KMC

* based on new PCB guidance USEPA, Sept. 1996

000214

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 1
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), RME
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 8.75E-08 |
| OCDD | 0.00E+00 | 0.00E+00 | 8.93E-08 |
| Cadmium | ~~4.70E-01~~ 2.826-1 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | ~~4.70E-01~~ 2.826-1 | 0.00E+00 | 1.77E-07 |

Revisions
02/28/96
KMS

000215

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES**

SITE NAME: Site 2 – Area A Downstream, Zone 1
LOCATION: NSB–NLON, Groton, CT
DATE: 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
TWO EXPOSURE ROUTES ARE CONSIDERED: INCIDENTAL INGESTION AND DERMAL CONTACT.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser; RME**

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (L/HR)
ET = EXPOSURE TIME (HRS/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY-STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

INGESTION:

| | | | |
|---|---|---|---|
| CR: | 0.05 | CONVERSION FACTOR (NONCAR) = | 1.53E–03 |
| ET: | 4 | | |
| EF: | 120 | | |
| ED: | 10 | CONVERSION FACTOR (CARCIN) = | 2.18E–04 |
| BW: | 43 | | |
| AT(NOCN): | 3650 | | |
| AT(CAR): | 25550 | | |

DERMAL CONTACT:

| | | | |
|---|---|---|---|
| EV: | 1 | CONVERSION FACTOR (NONCAR) = | 2.41E+01 |
| ED: | 10 | | |
| EF: | 120 | | |
| A: | 3150 | CONVERSION FACTOR (CARCIN) = | 3.44E+00 |
| tevent: | 4 | | |
| BW: | 43 | | |
| AT(NON): | 3650 | | |
| AT(CAR): | 25550 | | |

000217

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
Site 2 – Area A Downstream, Zone 1
EXPOSURE SCENARIO: Older Child Trespasser; RME

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.019 | O | 6.90E-01 | 2.90E-01 | 4.50E-03 | 1.80E-03 | 3.91E-07 |
| Tetrachloroethene | 0 | O | 4.30E+00 | 9.00E-01 | 4.80E-02 | 2.50E-01 | 0.00E+00 |
| 4,4'-DDD | 0.00027 | O | 3.70E+01 | 7.80E+00 | 2.80E-01 | 6.30E+01 | 1.17E-08 |
| 4,4'-DDE | 0 | O | 3.60E+01 | 7.60E+00 | 2.40E-01 | 4.90E+01 | 0.00E+00 |
| 4,4'-DDT | 0 | O | 6.00E+01 | 1.30E+01 | 4.30E-01 | 2.30E+02 | 0.00E+00 |
| Arsenic | 0.00105 | I | | | 1.00E-03 | | 4.20E-09 |
| Boron | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Cadmium | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Iron | 5.22 | I | | | 1.00E-03 | | 2.09E-05 |
| Manganese | 1.72 | I | | | 1.00E-03 | | 6.88E-06 |
| Mercury | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | |

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)**
Site 2 – Area A Downstream, Zone 1
EXPOSURE SCENARIO: Older Child Trespasser; RME
CALCULATE DOSES:

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 2.91E−05 | 9.42E−06 | 6.00E−02 | 6.00E−02 | 4.84E−04 | 1.57E−04 | 6.41E−04 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 1.00E−02 | 1.00E−02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDD | 4.13E−07 | 2.81E−05 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDE | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDT | 0.00E+00 | 0.00E+00 | 5.00E−04 | 4.00E−04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 1.61E−06 | 1.01E−07 | 3.00E−04 | 2.80E−04 | 5.35E−03 | 3.61E−04 | 5.71E−03 |
| Boron | 0.00E+00 | 0.00E+00 | 9.00E−02 | 4.50E−03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | 0.00E+00 | 5.00E−04 | ~~1.50E−05~~ 2.5E-5 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~7.98E−03~~ | ~~5.03E−04~~ | ~~3.00E−01~~ | ~~1.50E−02~~ | ~~2.66E−02~~ | ~~3.35E−02~~ | ~~6.01E−02~~ |
| Manganese | 2.63E−03 | 1.66E−04 | ~~5.00E−03~~ 2.4E-2 | ~~1.50E−04~~ 7.2E-4 | ~~5.26E−01~~ 1.10E-1 | ~~1.10E+00~~ 2.29E-1 | ~~1.63E+00~~ 3.39E-1 |
| Mercury | 0.00E+00 | 0.00E+00 | 3.00E−04 | 1.50E−05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL RISK** | | | | | ~~5.58E−01~~ 1.16E-1 | ~~1.14E+00~~ 2.30E-1 | ~~1.70E+00~~ 3.45E-1 |

Revisions
08/23/96
KMS

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
Site 2 – Area A Downstream, Zone 1
EXPOSURE SCENARIO: Older Child Trespasser; RME
CALCULATE INCREMENTAL CANCER RISKS

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 4.15E-06 | 1.35E-06 | 7.50E-03 | 7.50E-03 | 3.11E-08 | 1.01E-08 | 4.12E-08 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 5.20E-05 | 5.20E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 5.90E-08 | 4.02E-06 | 2.40E-01 | 3.00E-01 | 1.42E-08 | 1.20E-06 | 1.22E-06 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 3.40E-01 | 4.20E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 3.40E-01 | 4.20E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 2.29E-07 | 1.45E-08 | 1.50E+00 | 1.60E+00 | 3.44E-07 | 2.31E-08 | 3.67E-07 |
| Boron | 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 |
| Iron | 1.14E-03 | 7.18E-05 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Manganese | 3.76E-04 | 2.37E-05 | | | 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 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | 3.89E-07 | 1.24E-06 | 1.63E-06 |

000220

Revisions
08/23/96
KAS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT**

**SITE NAME:** *Site 2 – Area A Downstream, Zone 2*
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment); CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 0 | IR: | 50 |
| EF: | 1 | EF: | 52 |
| Fi: | 1 | Fi: | 0.5 |
| ED: | 1 | ED: | 3 |
| BW: | 1 | BW: | 43 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 1095 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 8.28E–08 | (AVG ANNUAL DOSE) | CF: | 3.55E–09 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE TWO)**
**Site 2 – Area A Downstream, Zone 2**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment); CTE**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0.27 | 1 | 2.24E–08 | 0.00E+00 | 9.58E–10 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Indeno(1,2,3–cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| 2–Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | |
| Alpha–chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | 1.30E+00 |
| 4,4'–DDD | 850 | 1 | 7.04E–05 | 0.00E+00 | 3.02E–06 | | 2.40E–01 |
| 4,4'–DDE | 24 | 1 | 1.99E–06 | 0.00E+00 | 8.52E–08 | | 3.40E–01 |
| 4,4'–DDT | 59 | 1 | 4.89E–06 | 0.00E+00 | 2.09E–07 | 5.00E–04 | 3.40E–01 |
| Dieldrin | 0.18 | 1 | 1.49E–08 | 0.00E+00 | 6.39E–10 | 5.00E–05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 1E+0* |
| 1,2,3,4,6,7,8–HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~ 03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~7510~~ | ~~1~~ | ~~6.22E–04~~ | ~~0.00E+00~~ | ~~2.67E–05~~ | ~~1.00E+00~~ | |
| Antimony | 7.2 | 1 | 5.96E–07 | 0.00E+00 | 2.56E–08 | 4.00E–04 | |
| Arsenic | 4.3 | 1 | 3.56E–07 | 0.00E+00 | 1.53E–08 | 3.00E–04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–02 | |
| Beryllium | 0.28 | 1 | 2.32E–08 | 0.00E+00 | 9.94E–10 | 5.00E–03 | 4.30E+00 |
| Cadmium | 2.2 | 1 | 1.82E–07 | 0.00E+00 | 7.81E–09 | 5.00E–04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Iron~~ | ~~15900~~ | ~~1~~ | ~~1.32E–03~~ | ~~0.00E+00~~ | ~~5.64E–05~~ | ~~3.00E–01~~ | |
| Manganese | 232 | 1 | 1.92E–05 | 0.00E+00 | 8.24E–07 | ~~5.00E–03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–04 | |
| Vanadium | 42.5 | 1 | 3.52E–06 | 0.00E+00 | 1.51E–07 | 7.00E–03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KMS

* Based on new PCB guidance (USEPA, September 1996).

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE THREE)**
**Site 2 – Area A Downstream, Zone 2**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment); CTE**
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX CHILD | HAZARD INDEX YOUTH | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 7.00E-09 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2-Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha-chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 7.24E-07 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 2.90E-08 |
| 4,4'-DDT | 9.77E-03 | 0.00E+00 | 7.12E-08 |
| Dieldrin | 2.98E-04 | 0.00E+00 | 1.02E-08 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~6.22E-04~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 1.49E-03 | 0.00E+00 | 0.00E+00 |
| Arsenic | 1.19E-03 | 0.00E+00 | 2.29E-08 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 4.64E-06 | 0.00E+00 | 4.27E-09 |
| Cadmium | 3.64E-04 | 0.00E+00 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~4.39E-03~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | ~~3.84E-08~~ 8.00E-4 | 0.00E+00 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 5.03E-04 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~2.25E-02~~ 1.44E-2 | **0.00E+00** | **8.69E-07** |

Revisions
02/28/97
KMS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT

SITE NAME: Site 2 – Area A Downstream, Zone 2
LOCATION: NSB–NLON, Groton, CT
DATE: 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), CTE**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | | |
|---|---|---|---|
| C | = CONCENTRATION IN SOIL/SEDIMENT (MG/KG) | | |
| SA1 | = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 3150 |
| SA2 | = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| AF | = ADHERENCE FACTOR (MG/SQ CM): | | 0.2 |
| ABS | = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | | Dioxins: | 0.03 |
| | | PCBS: | 0.06 |
| EF1 | = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 52 |
| EF2 | = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| ED1 | = YOUTH EXPOSURE DURATION (YEARS): | | 3 |
| ED2 | = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd | = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 0.5 |
| BW1 | = BODY WEIGHT ADOLESCENT (KG): | | 43 |
| BW2 | = BODY WEIGHT ADULT (KG): | | 1 |
| AT1 | = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 1095 |
| AT2 | = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 | = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 1.04E–06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 4.47E–08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 2
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), CTE
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0 | 0.06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 1E+0 * |
| 1,2,3,4,6,7,8–HpCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+03 |
| OCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+02 |
| Cadmium | 2.2 | 0.01 | 2.30E–08 | 0.00E+00 | 9.84E–10 | ~~1.50E–05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions 02/28/97 KMS

* Based on new PCB guidance (USEPA, September 1996).

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 2
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | ~~1.53E-03~~ 9.18E-4 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | ~~1.53E-03~~ 9.18E-4 | 0.00E+00 | 0.00E+00 |

Revisions
02/28/97
KMS

000227

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES**

SITE NAME: Site 2 – Area A Downstream, Zone 2
LOCATION: NSB-NLON, Groton, CT
DATE: 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
TWO EXPOSURE ROUTES ARE CONSIDERED: INCIDENTAL INGESTION AND DERMAL CONTACT.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser; CTE**

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (L/HR)
ET = EXPOSURE TIME (HRS/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY-STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

INGESTION:

| | | | |
|---|---|---|---|
| CR: | 0.05 | CONVERSION FACTOR (NONCAR) = | 3.31E-04 |
| ET: | 2 | | |
| EF: | 52 | | |
| ED: | 3 | CONVERSION FACTOR (CARCIN) = | 1.42E-05 |
| BW: | 43 | | |
| AT(NOCN): | 1095 | | |
| AT(CAR): | 25550 | | |

DERMAL CONTACT:

| | | | |
|---|---|---|---|
| EV: | 1 | CONVERSION FACTOR (NONCAR) = | 1.04E+01 |
| ED: | 3 | | |
| EF: | 52 | | |
| A: | 3150 | CONVERSION FACTOR (CARCIN) = | 4.47E-01 |
| tevent: | 2 | | |
| BW: | 43 | | |
| AT(NON): | 1095 | | |
| AT(CAR): | 25550 | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
Site 2 – Area A Downstream, Zone 2
EXPOSURE SCENARIO: Older Child Trespasser; CTE

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0 | O | 6.90E-01 | 2.90E-01 | 4.50E-03 | 1.80E-03 | 0.00E+00 |
| Tetrachloroethene | 0 | O | 4.30E+00 | 9.00E-01 | 4.80E-02 | 2.50E-01 | 0.00E+00 |
| 4,4'-DDD | 0.0022 | O | 3.70E+01 | 7.80E+00 | 2.80E-01 | 6.30E+01 | 6.72E-06 |
| 4,4'-DDE | 0.0001 | O | 3.60E+01 | 7.60E+00 | 2.40E-01 | 4.90E+01 | 2.59E-07 |
| 4,4'-DDT | 0.00034 | O | 6.00E+01 | 1.30E+01 | 4.30E-01 | 2.30E+02 | 2.06E-06 |
| Arsenic | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Boron | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Cadmium | 0.00092 | I | | | 1.00E-03 | | 1.84E-09 |
| ~~Iron~~ | ~~4.28~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~8.70E-08~~ |
| Manganese | 0.729 | I | | | 1.00E-03 | | 1.46E-06 |
| Mercury | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | |

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)**
Site 2 – Area A Downstream, Zone 2
EXPOSURE SCENARIO: Older Child Trespasser; CTE
CALCULATE DOSES:

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 6.00E−02 | 6.00E−02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 1.00E−02 | 1.00E−02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDD | 7.29E−07 | 7.02E−05 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDE | 3.31E−08 | 2.70E−06 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDT | 1.13E−07 | 2.15E−05 | 5.00E−04 | 4.00E−04 | 2.25E−04 | 5.38E−02 | 5.40E−02 |
| Arsenic | 0.00E+00 | 0.00E+00 | 3.00E−04 | 2.80E−04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 0.00E+00 | 0.00E+00 | 9.00E−02 | 4.50E−03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 3.05E−07 | 1.92E−08 | 5.00E−04 | ~~1.50E−05~~ 2.5E-5 | 6.10E−04 | ~~1.28E−03~~ 7.68E-4 | ~~1.89E−03~~ 1.38E-3 |
| ~~Iron~~ | ~~1.45E−03~~ | ~~9.14E−05~~ | ~~3.00E−01~~ | ~~1.50E−02~~ | ~~4.84E−03~~ | ~~6.00E−03~~ | ~~1.08E−02~~ |
| Manganese | 2.42E−04 | 1.52E−05 | ~~5.00E−03~~ 2.4E-2 | ~~1.50E−04~~ 7.4E-4 | ~~4.83E−02~~ 1.01E-2 | ~~1.01E−01~~ 2.10E-2 | ~~1.50E−01~~ 3.11E-2 |
| Mercury | 0.00E+00 | 0.00E+00 | 3.00E−04 | 1.50E−05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL RISK** | | | | | ~~5.40E−02~~ 1.09E-2 | ~~1.035−01~~ 7.56E-2 | ~~2.175−01~~ 8.65E-2 |

Revisions
09/23/96
KMS

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
Site 2 – Area A Downstream, Zone 2
EXPOSURE SCENARIO: Older Child Trespasser; CTE
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 7.50E-03 | 7.50E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 5.20E-05 | 5.20E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 3.12E-08 | 3.01E-06 | 2.40E-01 | 3.00E-01 | 7.50E-09 | 9.02E-07 | 9.10E-07 |
| 4,4'-DDE | 1.42E-09 | 1.16E-07 | 3.40E-01 | 4.20E-01 | 4.83E-10 | 4.86E-08 | 4.91E-08 |
| 4,4'-DDT | 4.83E-09 | 9.22E-07 | 3.40E-01 | 4.20E-01 | 1.64E-09 | 3.87E-07 | 3.89E-07 |
| Arsenic | 0.00E+00 | 0.00E+00 | 1.50E+00 | 1.60E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 1.31E-08 | 8.23E-10 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~6.22E-05~~ | ~~3.92E-06~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | 1.04E-05 | 6.52E-07 | | | 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 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | 9.62E-09 | 1.34E-06 | 1.35E-06 |

Revisions
08/23/96
KAS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 2
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment); RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 0 | IR: | 100 |
| EF: | 1 | EF: | 120 |
| Fi: | 1 | Fi: | 1 |
| ED: | 1 | ED: | 10 |
| BW: | 1 | BW: | 43 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 3650 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 7.65E–07 | (AVG ANNUAL DOSE) | CF: | 1.09E–07 |

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 2
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment); RME
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0.28 | 1 | 2.14E–07 | 0.00E+00 | 3.06E–08 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Indeno(1,2,3–cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| 2–Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | |
| Alpha–chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | 1.30E+00 |
| 4,4'–DDD | 850 | 1 | 6.50E–04 | 0.00E+00 | 9.28E–05 | | 2.40E–01 |
| 4,4'–DDE | 24 | 1 | 1.83E–05 | 0.00E+00 | 2.62E–06 | | 3.40E–01 |
| 4,4'–DDT | 59 | 1 | 4.51E–05 | 0.00E+00 | 6.44E–06 | 5.00E–04 | 3.40E–01 |
| Dieldrin | 0.86 | 1 | 6.58E–07 | 0.00E+00 | 9.39E–08 | 5.00E–05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 2E+0* |
| 1,2,3,4,6,7,8–HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~02 |
| ~~Aluminum~~ | ~~11500~~ | ~~1~~ | ~~8.79E–03~~ | ~~0.00E+00~~ | ~~1.26E–03~~ | ~~1.00E+00~~ | |
| Antimony | 11.4 | 1 | 8.72E–06 | 0.00E+00 | 1.25E–06 | 4.00E–04 | |
| Arsenic | 9.5 | 1 | 7.26E–06 | 0.00E+00 | 1.04E–06 | 3.00E–04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–02 | |
| Beryllium | 0.28 | 1 | 2.14E–07 | 0.00E+00 | 3.06E–08 | 5.00E–03 | 4.30E+00 |
| Cadmium | 4 | 1 | 3.06E–06 | 0.00E+00 | 4.37E–07 | 5.00E–04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Iron~~ | ~~23200~~ | ~~1~~ | ~~1.77E–02~~ | ~~0.00E+00~~ | ~~2.53E–03~~ | ~~3.00E–01~~ | |
| Manganese | 399 | 1 | 3.05E–04 | 0.00E+00 | 4.36E–05 | ~~5.00E–03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–04 | |
| Vanadium | 86.9 | 1 | 6.64E–05 | 0.00E+00 | 9.49E–06 | 7.00E–03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KMS

* Based on new PCB guidance (USEPA, September 1996).

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE THREE)**
**Site 2 – Area A Downstream, Zone 2**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment); RME**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX CHILD | HAZARD INDEX YOUTH | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 2.23E-07 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2-Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha-chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 2.23E-05 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 8.91E-07 |
| 4,4'-DDT | 9.02E-02 | 0.00E+00 | 2.19E-06 |
| Dieldrin | 1.32E-02 | 0.00E+00 | 1.50E-06 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~8.79E-03~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 2.18E-02 | 0.00E+00 | 0.00E+00 |
| Arsenic | 2.42E-02 | 0.00E+00 | 1.56E-06 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 4.28E-05 | 0.00E+00 | 1.32E-07 |
| Cadmium | 6.12E-03 | 0.00E+00 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~5.91E-02~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | ~~6.10E-02~~ 1.27E-2 | 0.00E+00 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 9.49E-03 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~2.94E-01~~ 1.78E-1 | **0.00E+00** | **2.88E-05** |

Revisions
02/28/97
KMS

**RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 2
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: *Older Child Trespasser (Surface Soil/Sediment), RME***

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL/SEDIMENT (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 3150 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 1 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 120 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 10 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 1 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 43 |
| BW2 = BODY WEIGHT ADULT (KG): | | 1 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 3650 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

| | | | | | |
|---|---|---|---|---|---|
| DOSEyouth = (CF1)*(C)*(ABS) | CF1 = | 2.41E-05 | CANCER RISK = (CF3)*(C)*(ABS) | CF3 = | 3.44E-06 |
| DOSEadult = (CF2)*(C)*(ABS) | CF2 = | 0.00E+00 | | | |

RISK ASSESSMENT SPREADSHEET -- DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE TWO)
Site 2 -- Area A Downstream, Zone 2
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), RME
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG-DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0 | 0.06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E-05 | ~~7.70E+00~~ 2E+0 * |
| 1,2,3,4,6,7,8-HpCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+03 |
| OCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+02 |
| Cadmium | 4 | 0.01 | 9.63E-07 | 0.00E+00 | 1.38E-07 | ~~1.50E-05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KHS

* Based on new PCB guidance (USEPA, September 1996).

RISK ASSESSMENT SPREADSHEET -- DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE THREE)
Site 2 -- Area A Downstream, Zone 2
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), RME
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | ~~6.42E-02~~ 3.85E-2 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | ~~6.42E-02~~ 3.85E-2 | 0.00E+00 | 0.00E+00 |

Revisions
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KMD

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES**

SITE NAME: Site 2 – Area A Downstream, Zone 2
**LOCATION:** NSB – NLON, Groton, CT
DATE: 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
TWO EXPOSURE ROUTES ARE CONSIDERED: INCIDENTAL INGESTION AND DERMAL CONTACT.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser; RME**

*REFERENCES:* *EPA, DECEMBER 1989 AND JANUARY 1992*

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (L/HR)
ET = EXPOSURE TIME (HRS/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

*DERMAL CONTACT:* *DAD = (DAevent x EV x ED x EF x A)/(BW x AT)*

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: *DAevent = Kp x C x tevent x CF*
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY-STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

*INPUT PARAMETERS:*

INGESTION:

| | | | |
|---|---|---|---|
| CR: | 0.05 | CONVERSION FACTOR (NONCAR) = | 1.53E-03 |
| ET: | 4 | | |
| EF: | 120 | | |
| ED: | 10 | CONVERSION FACTOR (CARCIN) = | 2.18E-04 |
| BW: | 43 | | |
| AT(NOCN): | 3650 | | |
| AT(CAR): | 25550 | | |

DERMAL CONTACT:

| | | | |
|---|---|---|---|
| EV: | 1 | CONVERSION FACTOR (NONCAR) = | 2.41E+01 |
| ED: | 10 | | |
| EF: | 120 | | |
| A: | 3150 | CONVERSION FACTOR (CARCIN) = | 3.44E+00 |
| tevent: | 4 | | |
| BW: | 43 | | |
| AT(NON): | 3650 | | |
| AT(CAR): | 25550 | | |

RISK ASSESSMENT SPREADSHEET -- SURFACE WATER EXPOSURES (PAGE TWO)
Site 2 -- Area A Downstream, Zone 2
EXPOSURE SCENARIO: Older Child Trespasser; RME

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0 | O | 6.90E-01 | 2.90E-01 | 4.50E-03 | 1.80E-03 | 0.00E+00 |
| Tetrachloroethene | 0 | O | 4.30E+00 | 9.00E-01 | 4.80E-02 | 2.50E-01 | 0.00E+00 |
| 4,4'-DDD | 0.0056 | O | 3.70E+01 | 7.80E+00 | 2.80E-01 | 6.30E+01 | 2.42E-05 |
| 4,4'-DDE | 0.00032 | O | 3.60E+01 | 7.60E+00 | 2.40E-01 | 4.90E+01 | 1.17E-06 |
| 4,4'-DDT | 0.0015 | O | 6.00E+01 | 1.30E+01 | 4.30E-01 | 2.30E+02 | 1.29E-05 |
| Arsenic | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Boron | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Cadmium | 0.0021 | I | | | 1.00E-03 | | 8.40E-09 |
| Iron | 8.68 | I | | | 1.00E-03 | | 2.66E-05 |
| Manganese | 1.06 | I | | | 1.00E-03 | | 4.24E-06 |
| Mercury | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
Site 2 – Area A Downstream, Zone 2
EXPOSURE SCENARIO: Older Child Trespasser; RME
CALCULATE DOSES:

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 6.00E-02 | 6.00E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 1.00E-02 | 1.00E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 8.56E-08 | 5.83E-04 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDE | 4.89E-07 | 2.82E-05 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 2.29E-08 | 3.10E-04 | 5.00E-04 | 4.00E-04 | 4.59E-03 | 7.74E-01 | 7.79E-01 |
| Arsenic | 0.00E+00 | 0.00E+00 | 3.00E-04 | 2.80E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 0.00E+00 | 0.00E+00 | 9.00E-02 | 4.50E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 3.21E-08 | 2.02E-07 | 5.00E-04 | ~~1.50E-05~~ 2.5E-5 | 6.42E-03 | ~~1.35E-02~~ 8.10E-3 | ~~1.09E-02~~ 1.45E-2 |
| Iron | ~~1.62E-02~~ | ~~6.42E-04~~ | ~~3.00E-01~~ | ~~1.50E-02~~ | ~~3.30E-02~~ | ~~4.28E-02~~ | ~~7.67E-02~~ |
| Manganese | 1.62E-03 | 1.02E-04 | ~~5.00E-03~~ 2.4E-2 | ~~1.50E-04~~ 7.2E-4 | ~~3.24E-01~~ 6.75E-2 | ~~6.81E-01~~ 1.42E-1 | ~~1.00E+00~~ 2.10E-1 |
| Mercury | 0.00E+00 | 0.00E+00 | 3.00E-04 | 1.50E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | ~~3.69E-01~~ 7.85E-2 | ~~5.15+00~~ 9.24E-1 | ~~1.88E+00~~ 1.00E+0 |

Revisions
08/23/96
KMS

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
Site 2 – Area A Downstream, Zone 2
EXPOSURE SCENARIO: Older Child Trespasser; RME
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 7.50E-03 | 7.50E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 5.20E-05 | 5.20E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 1.22E-06 | 8.33E-05 | 2.40E-01 | 3.00E-01 | 2.94E-07 | 2.50E-05 | 2.53E-05 |
| 4,4'-DDE | 6.99E-08 | 4.03E-06 | 3.40E-01 | 4.20E-01 | 2.38E-08 | 1.69E-06 | 1.72E-06 |
| 4,4'-DDT | 3.28E-07 | 4.42E-05 | 3.40E-01 | 4.20E-01 | 1.11E-07 | 1.86E-05 | 1.87E-05 |
| Arsenic | 0.00E+00 | 0.00E+00 | 1.50E+00 | 1.60E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 4.59E-07 | 2.69E-08 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~1.45E-03~~ | ~~9.17E-05~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | 2.32E-04 | 1.46E-05 | | | 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 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | 4.29E-07 | 4.53E-05 | 4.57E-05 |

Revisions
08/23/96
AMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 2
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 240 | IR: | 0 |
| EF: | 80 | EF: | 1 |
| Fi: | 0.5 | Fi: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 3.76E-07 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 5.37E-09 |

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 2
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0.24 | 1 | 0.00E+00 | 9.02E–08 | 1.29E–09 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Indeno(1,2,3–cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| 2–Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | |
| Alpha–chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | 1.30E+00 |
| 4,4'–DDD | 850 | 1 | 0.00E+00 | 3.19E–04 | 4.56E–06 | | 2.40E–01 |
| 4,4'–DDE | 24 | 1 | 0.00E+00 | 9.02E–06 | 1.29E–07 | | 3.40E–01 |
| 4,4'–DDT | 59 | 1 | 0.00E+00 | 2.22E–05 | 3.17E–07 | 5.00E–04 | 3.40E–01 |
| Dieldrin | 0.12 | 1 | 0.00E+00 | 4.51E–08 | 6.44E–10 | 5.00E–05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 1E+0 * |
| 1,2,3,4,6,7,8–HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~ 03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~06~~ 02 |
| ~~Aluminum~~ | ~~10500~~ | ~~1~~ | ~~0.00E+00~~ | ~~3.05E–03~~ | ~~5.64E–05~~ | ~~1.00E+00~~ | |
| Antimony | 4.4 | 1 | 0.00E+00 | 1.65E–06 | 2.36E–08 | 4.00E–04 | |
| Arsenic | 2.9 | 1 | 0.00E+00 | 1.09E–06 | 1.56E–08 | 3.00E–04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–02 | |
| Beryllium | 0.53 | 1 | 0.00E+00 | 1.99E–07 | 2.84E–09 | 5.00E–03 | 4.30E+00 |
| Cadmium | 1.4 | 1 | 0.00E+00 | 5.26E–07 | 7.51E–09 | 5.00E–04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Iron~~ | ~~14000~~ | ~~1~~ | ~~0.00E+00~~ | ~~5.26E–03~~ | ~~7.51E–05~~ | ~~3.00E–01~~ | |
| Manganese | 187 | 1 | 0.00E+00 | 7.03E–05 | 1.00E–06 | ~~5.00E–03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–04 | |
| Vanadium | 35.6 | 1 | 0.00E+00 | 1.34E–05 | 1.91E–07 | 7.00E–03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KMS

* Based on new PCB guidance (USEPA, September 1996).

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 2
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 9.40E-09 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2-Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha-chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 1.09E-06 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 4.38E-08 |
| 4,4'-DDT | 0.00E+00 | 4.43E-02 | 1.08E-07 |
| Dieldrin | 0.00E+00 | 9.02E-04 | 1.03E-08 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~3.95E-03~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 4.13E-03 | 0.00E+00 |
| Arsenic | 0.00E+00 | 3.63E-03 | 2.33E-08 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 0.00E+00 | 3.98E-05 | 1.22E-08 |
| Cadmium | 0.00E+00 | 1.05E-03 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~1.75E-02~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~1.41E-02~~ 2.94E-3 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 1.91E-03 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~**9.15E-02**~~ 5.89E-2 | **1.30E-06** |

Revisions
02/23/97
KLS

0047

**RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 2
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | | |
|---|---|---|---|
| C | = CONCENTRATION IN SOIL/SEDIMENT (MG/KG) | | |
| SA1 | = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| SA2 | = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 3800 |
| AF | = ADHERENCE FACTOR (MG/SQ CM): | | 0.2 |
| ABS | = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | | Dioxins: | 0.03 |
| | | PCBS: | 0.06 |
| EF1 | = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| EF2 | = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 80 |
| ED1 | = YOUTH EXPOSURE DURATION (YEARS): | | 1 |
| ED2 | = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd | = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 0.5 |
| BW1 | = BODY WEIGHT ADOLESCENT (KG): | | 1 |
| BW2 | = BODY WEIGHT ADULT (KG): | | 70 |
| AT1 | = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 365 |
| AT2 | = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 | = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.70E-08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 1.19E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL /SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 2
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0 | 0.06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 1E+0 * |
| 1,2,3,4,6,7,8–HpCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+03 |
| OCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+02 |
| Cadmium | 1.4 | 0.01 | 0.00E+00 | 1.67E–08 | 2.38E–10 | ~~1.50E–05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KMS

- Based on new PCB guidance (USEPA, September 1996).

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 2
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | ~~1.11E-03~~ 6.66E-4 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 0.00E+00 | ~~1.11E-03~~ 6.66E-4 | 0.00E+00 |

Revisions
02/28/97
KMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 2
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 480 | IR: | 0 |
| EF: | 120 | EF: | 1 |
| Fi: | 1 | Fi: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 2.25E–06 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 3.22E–08 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE TWO)**
**Site 2 – Area A Downstream, Zone 2**
**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0.28 | 1 | 0.00E+00 | 6.31E−07 | 9.02E−09 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E−01 |
| Indeno(1,2,3−cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E−01 |
| 2−Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E−05 | |
| Alpha−chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E−05 | 1.30E+00 |
| 4,4'−DDD | 850 | 1 | 0.00E+00 | 1.92E−03 | 2.74E−05 | | 2.40E−01 |
| 4,4'−DDE | 24 | 1 | 0.00E+00 | 5.41E−05 | 7.73E−07 | | 3.40E−01 |
| 4,4'−DDT | 59 | 1 | 0.00E+00 | 1.33E−04 | 1.90E−06 | 5.00E−04 | 3.40E−01 |
| Dieldrin | 0.86 | 1 | 0.00E+00 | 1.94E−06 | 2.77E−08 | 5.00E−05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E−05 | ~~7.70E+00~~ 2E+0* |
| 1,2,3,4,6,7,8−HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~ 03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~26200~~ | ~~1~~ | ~~0.00E+00~~ | ~~5.01E−02~~ | ~~8.44E−04~~ | ~~1.00E+00~~ | |
| Antimony | 11.4 | 1 | 0.00E+00 | 2.57E−05 | 3.67E−07 | 4.00E−04 | |
| Arsenic | 9.5 | 1 | 0.00E+00 | 2.14E−05 | 3.06E−07 | 3.00E−04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E−02 | |
| Beryllium | 0.72 | 1 | 0.00E+00 | 1.62E−06 | 2.32E−08 | 5.00E−03 | 4.30E+00 |
| Cadmium | 4 | 1 | 0.00E+00 | 9.02E−06 | 1.29E−07 | 5.00E−04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E−03 | |
| ~~Iron~~ | ~~23200~~ | ~~1~~ | ~~0.00E+00~~ | ~~5.23E−02~~ | ~~7.47E−04~~ | ~~3.00E−01~~ | |
| Manganese | 399 | 1 | 0.00E+00 | 9.00E−04 | 1.29E−05 | ~~5.00E−03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E−04 | |
| Vanadium | 86.9 | 1 | 0.00E+00 | 1.96E−04 | 2.80E−06 | 7.00E−03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E−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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KMS

* Based on new PCB guidance (USEPA, September 1996).

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL / SEDIMENT (PAGE THREE)**
**Site 2 – Area A Downstream, Zone 2**
**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 6.58E−08 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3−cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2−Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha−chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDD | 0.00E+00 | 0.00E+00 | 6.57E−06 |
| 4,4'−DDE | 0.00E+00 | 0.00E+00 | 2.63E−07 |
| 4,4'−DDT | 0.00E+00 | 2.66E−01 | 6.46E−07 |
| Dieldrin | 0.00E+00 | 3.88E−02 | 4.43E−07 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8−HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~5.91E−02~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 6.43E−02 | 0.00E+00 |
| Arsenic | 0.00E+00 | 7.14E−02 | 4.59E−07 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 0.00E+00 | 3.25E−04 | 9.97E−08 |
| Cadmium | 0.00E+00 | 1.80E−02 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~1.74E−01~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~1.80E−01~~ 3.75E-2 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 2.80E−02 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~**9.00E−01**~~ 5.24E-1 | **8.55E−06** |

Revisions
02/28/97
KMB

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT

SITE NAME: Site 2 – Area A Downstream, Zone 2
LOCATION: NSB–NLON, Groton, CT
DATE: 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | | |
|---|---|---|---|
| C | = CONCENTRATION IN SOIL/SEDIMENT (MG/KG) | | |
| SA1 | = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| SA2 | = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 3800 |
| AF | = ADHERENCE FACTOR (MG/SQ CM): | | 1 |
| ABS | = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | | Dioxins: | 0.03 |
| | | PCBS: | 0.06 |
| EF1 | = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| EF2 | = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 120 |
| ED1 | = YOUTH EXPOSURE DURATION (YEARS): | | 1 |
| ED2 | = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd | = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 1 |
| BW1 | = BODY WEIGHT ADOLESCENT (KG): | | 1 |
| BW2 | = BODY WEIGHT ADULT (KG): | | 70 |
| AT1 | = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 365 |
| AT2 | = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 | = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 2.55E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 1.78E-05

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 2
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0 | 0.06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 2E+0* |
| 1,2,3,4,6,7,8–HpCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+03 |
| OCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+02 |
| Cadmium | 4 | 0.01 | 0.00E+00 | 7.14E–07 | 1.02E–08 | ~~1.50E–05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KMS

* Based on new PCB guidance (USEPA, September 1996).

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 2
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | ~~4.76E-02~~ 2.86E-2 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 0.00E+00 | ~~4.76E-02~~ 2.86E-2 | 0.00E+00 |

Revisions
02/28/97
KMS

000260

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 3
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 240 | IR: | 0 |
| EF: | 80 | EF: | 1 |
| Fi: | 0.5 | Fi: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 3.76E–07 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 5.37E–09 |

001781

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE TWO)**
**Site 2 – Area A Downstream, Zone 3**
**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Indeno(1,2,3–cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| 2–Nitroaniline | 3.1 | 1 | 0.00E+00 | 1.16E–06 | 1.66E–08 | 6.00E–05 | |
| Alpha–chlordane | 0.49 | 1 | 0.00E+00 | 1.84E–07 | 2.63E–09 | 6.00E–05 | 1.30E+00 |
| 4,4'–DDD | 34 | 1 | 0.00E+00 | 1.28E–05 | 1.82E–07 | | 2.40E–01 |
| 4,4'–DDE | 9 | 1 | 0.00E+00 | 3.38E–06 | 4.83E–08 | | 3.40E–01 |
| 4,4'–DDT | 29 | 1 | 0.00E+00 | 1.09E–05 | 1.56E–07 | 5.00E–04 | 3.40E–01 |
| Dieldrin | 0.19 | 1 | 0.00E+00 | 7.14E–08 | 1.02E–09 | 5.00E–05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 1E+0 * |
| 1,2,3,4,6,7,8–HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~ 03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~17500~~ | ~~1~~ | ~~0.00E+00~~ | ~~6.58E–03~~ | ~~0.30E–05~~ | ~~1.00E+00~~ | |
| Antimony | 2.8 | 1 | 0.00E+00 | 1.05E–06 | 1.50E–08 | 4.00E–04 | |
| Arsenic | 6.6 | 1 | 0.00E+00 | 2.48E–06 | 3.54E–08 | 3.00E–04 | 1.50E+00 |
| Barium | 158 | 1 | 0.00E+00 | 5.94E–05 | 8.48E–07 | 7.00E–02 | |
| Beryllium | 3 | 1 | 0.00E+00 | 1.13E–06 | 1.61E–08 | 5.00E–03 | 4.30E+00 |
| Cadmium | 5.4 | 1 | 0.00E+00 | 2.03E–06 | 2.90E–08 | 5.00E–04 | |
| Chromium | 26.4 | 1 | 0.00E+00 | 9.92E–06 | 1.42E–07 | 5.00E–03 | |
| ~~Iron~~ | ~~120000~~ | ~~1~~ | ~~0.00E+00~~ | ~~4.51E–02~~ | ~~6.44E–04~~ | ~~3.00E–01~~ | |
| Manganese | 488 | 1 | 0.00E+00 | 1.83E–04 | 2.62E–06 | ~~5.00E–03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–04 | |
| Vanadium | 32.9 | 1 | 0.00E+00 | 1.24E–05 | 1.77E–07 | 7.00E–03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KAS

* Based on new PCB guidance (USEPA, September 1996).

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL / SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2-Nitroaniline | 0.00E+00 | 1.94E-02 | 0.00E+00 |
| Alpha-chlordane | 0.00E+00 | 3.07E-03 | 3.42E-09 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 4.38E-08 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 1.64E-08 |
| 4,4'-DDT | 0.00E+00 | 2.18E-02 | 5.29E-08 |
| Dieldrin | 0.00E+00 | 1.43E-03 | 1.63E-08 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~6.58E-03~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 2.63E-03 | 0.00E+00 |
| Arsenic | 0.00E+00 | 8.27E-03 | 5.31E-08 |
| Barium | 0.00E+00 | 8.48E-04 | 0.00E+00 |
| Beryllium | 0.00E+00 | 2.25E-04 | 6.92E-08 |
| Cadmium | 0.00E+00 | 4.06E-03 | 0.00E+00 |
| Chromium | 0.00E+00 | 1.98E-03 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~1.50E-01~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~3.67E-02~~ 7.65E-3 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 1.77E-03 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~**2.50E-01**~~ 7.31E-2 | **2.55E-07** |

Revisions
02/28/97
AMB

000763

000264

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT

**SITE NAME:** Site 2 – Area A Downstream, Zone 3
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL/SEDIMENT (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 3800 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 0.2 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 80 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 1 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 0.5 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 1 |
| BW2 = BODY WEIGHT ADULT (KG): | | 70 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 365 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00
DOSEadult = (CF2)*(C)*(ABS) CF2 = 1.19E–06

CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.70E–08

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL /SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0 | 0.06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 1E+0 * |
| 1,2,3,4,6,7,8–HpCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+03 |
| OCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+02 |
| Cadmium | 5.4 | 0.01 | 0.00E+00 | 6.43E–08 | 9.18E–10 | ~~1.50E–05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions 02/28/97 KMS

* Based on new PCB guidance (OSWER, September 1996).

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL /SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | ~~4.28E-03~~ 2.57E-3 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 0.00E+00 | ~~4.28E-03~~ 2.57E-3 | 0.00E+00 |

Revisions
02/28/97
KMS

000268

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF [redacted]SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 3
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 480 | IR: | 0 |
| EF: | 120 | EF: | 1 |
| Fi: | 1 | Fi: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 2.25E–06 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 3.22E–08 |

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL /SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Indeno(1,2,3–cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| 2–Nitroaniline | 3.1 | 1 | 0.00E+00 | 6.99E–06 | 9.98E–08 | 6.00E–05 | |
| Alpha–chlordane | 0.49 | 1 | 0.00E+00 | 1.10E–06 | 1.58E–08 | 6.00E–05 | 1.30E+00 |
| 4,4'–DDD | 120 | 1 | 0.00E+00 | 2.71E–04 | 3.86E–06 | | 2.40E–01 |
| 4,4'–DDE | 9 | 1 | 0.00E+00 | 2.03E–05 | 2.90E–07 | | 3.40E–01 |
| 4,4'–DDT | 29 | 1 | 0.00E+00 | 6.54E–05 | 9.34E–07 | 5.00E–04 | 3.40E–01 |
| Dieldrin | 0.9 | 1 | 0.00E+00 | 2.03E–06 | 2.90E–08 | 5.00E–05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 2E+0 * |
| 1,2,3,4,6,7,8–HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~ 03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~33100~~ | ~~1~~ | ~~0.00E+00~~ | ~~7.46E–02~~ | ~~1.07E–03~~ | ~~1.00E+00~~ | |
| Antimony | 6.1 | 1 | 0.00E+00 | 1.38E–05 | 1.96E–07 | 4.00E–04 | |
| Arsenic | 17.7 | 1 | 0.00E+00 | 3.99E–05 | 5.70E–07 | 3.00E–04 | 1.50E+00 |
| Barium | 635 | 1 | 0.00E+00 | 1.43E–03 | 2.05E–05 | 7.00E–02 | |
| Beryllium | 5.6 | 1 | 0.00E+00 | 1.26E–05 | 1.80E–07 | 5.00E–03 | 4.30E+00 |
| Cadmium | 13.8 | 1 | 0.00E+00 | 3.11E–05 | 4.44E–07 | 5.00E–04 | |
| Chromium | 48.9 | 1 | 0.00E+00 | 1.10E–04 | 1.57E–06 | 5.00E–03 | |
| ~~Iron~~ | ~~630000~~ | ~~1~~ | ~~0.00E+00~~ | ~~1.44E+00~~ | ~~2.06E–02~~ | ~~3.00E–01~~ | |
| Manganese | 1300 | 1 | 0.00E+00 | 2.93E–03 | 4.19E–05 | ~~5.00E–03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–04 | |
| Vanadium | 56.7 | 1 | 0.00E+00 | 1.28E–04 | 1.83E–06 | 7.00E–03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
03/28/97
KMS

* Based on new PCB guidance (USEPA, September 1996)

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL /SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2-Nitroaniline | 0.00E+00 | 1.16E-01 | 0.00E+00 |
| Alpha-chlordane | 0.00E+00 | 1.84E-02 | 2.05E-08 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 9.28E-07 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 9.85E-08 |
| 4,4'-DDT | 0.00E+00 | 1.31E-01 | 3.18E-07 |
| Dieldrin | 0.00E+00 | 4.06E-02 | 4.64E-07 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~7.46E-02~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 3.44E-02 | 0.00E+00 |
| Arsenic | 0.00E+00 | 1.33E-01 | 8.55E-07 |
| Barium | 0.00E+00 | 2.05E-02 | 0.00E+00 |
| Beryllium | 0.00E+00 | 2.52E-03 | 7.76E-07 |
| Cadmium | 0.00E+00 | 6.22E-02 | 0.00E+00 |
| Chromium | 0.00E+00 | 2.20E-02 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~4.80E+00~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~5.86E-01~~ 1.22E-1 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 1.83E-02 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~4.98E+00~~ 7.21E-1 | **3.46E-06** |

Revisions
02/28/97
KMS

**RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 3
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL/SEDIMENT (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 3800 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 1 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 120 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 1 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 1 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 1 |
| BW2 = BODY WEIGHT ADULT (KG): | | 70 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 365 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 2.55E-07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 1.76E-05

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0 | 0.06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 2E+0* |
| 1,2,3,4,6,7,8–HpCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+03 |
| OCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+02 |
| Cadmium | 13.8 | 0.01 | 0.00E+00 | 2.46E–06 | 3.52E–08 | ~~1.50E–05~~ 2.5E-2 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KAS

* Based on new PCB guidance (USEPA, September 1996).

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL /SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Construction Worker (All Soil/Sediment), RME
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | ~~1.64E-01~~ 9.84E-2 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | **~~1.64E-01~~** 9.84E-2 | **0.00E+00** |

Revisions
02/28/97
TMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 3
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment); CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 0 | IR: | 50 |
| EF: | 1 | EF: | 52 |
| Fi: | 1 | Fi: | 0.5 |
| ED: | 1 | ED: | 3 |
| BW: | 1 | BW: | 43 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 1095 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 8.28E–08 | (AVG ANNUAL DOSE) | CF: | 3.55E–09 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE TWO)**
**Site 2 – Area A Downstream, Zone 3**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment); CTE**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Indeno(1,2,3–cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| 2–Nitroaniline | 3.1 | 1 | 2.57E–07 | 0.00E+00 | 1.10E–08 | 6.00E–05 | |
| Alpha–chlordane | 0.49 | 1 | 4.06E–08 | 0.00E+00 | 1.74E–09 | 6.00E–05 | 1.30E+00 |
| 4,4'–DDD | 120 | 1 | 9.94E–06 | 0.00E+00 | 4.26E–07 | | 2.40E–01 |
| 4,4'–DDE | 2.9 | 1 | 2.40E–07 | 0.00E+00 | 1.03E–08 | | 3.40E–01 |
| 4,4'–DDT | 14 | 1 | 1.16E–06 | 0.00E+00 | 4.97E–08 | 5.00E–04 | 3.40E–01 |
| Dieldrin | 0.17 | 1 | 1.41E–08 | 0.00E+00 | 6.03E–10 | 5.00E–05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 1E+0 * |
| 1,2,3,4,6,7,8–HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~ 03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~17800~~ | ~~1~~ | ~~1.47E–03~~ | ~~0.00E+00~~ | ~~6.32E–05~~ | ~~1.00E+00~~ | |
| Antimony | 2.8 | 1 | 2.32E–07 | 0.00E+00 | 9.94E–09 | 4.00E–04 | |
| Arsenic | 7.2 | 1 | 5.96E–07 | 0.00E+00 | 2.56E–08 | 3.00E–04 | 1.50E+00 |
| Barium | 172 | 1 | 1.42E–05 | 0.00E+00 | 6.11E–07 | 7.00E–02 | |
| Beryllium | 3.3 | 1 | 2.73E–07 | 0.00E+00 | 1.17E–08 | 5.00E–03 | 4.30E+00 |
| Cadmium | 6.1 | 1 | 5.05E–07 | 0.00E+00 | 2.17E–08 | 5.00E–04 | |
| Chromium | 26.8 | 1 | 2.22E–06 | 0.00E+00 | 9.51E–08 | 5.00E–03 | |
| ~~Iron~~ | ~~134000~~ | ~~1~~ | ~~1.11E–02~~ | ~~0.00E+00~~ | ~~4.76E–04~~ | ~~3.00E–01~~ | |
| Manganese | 517 | 1 | 4.28E–05 | 0.00E+00 | 1.84E–06 | ~~5.00E–03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–04 | |
| Vanadium | 32.1 | 1 | 2.66E–06 | 0.00E+00 | 1.14E–07 | 7.00E–03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions 02/28/97 KAG

* Based on new PCB guidance (USEPA, September 1996).

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment); CTE
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX CHILD | HAZARD INDEX YOUTH | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2-Nitroaniline | 4.28E-03 | 0.00E+00 | 0.00E+00 |
| Alpha-chlordane | 6.76E-04 | 0.00E+00 | 2.26E-09 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 1.02E-07 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 3.50E-09 |
| 4,4'-DDT | 2.32E-03 | 0.00E+00 | 1.69E-08 |
| Dieldrin | 2.82E-04 | 0.00E+00 | 9.66E-09 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~1.47E-03~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 5.80E-04 | 0.00E+00 | 0.00E+00 |
| Arsenic | 1.99E-03 | 0.00E+00 | 3.83E-08 |
| Barium | 2.04E-04 | 0.00E+00 | 0.00E+00 |
| Beryllium | 5.47E-05 | 0.00E+00 | 5.04E-08 |
| Cadmium | 1.01E-03 | 0.00E+00 | 0.00E+00 |
| Chromium | 4.44E-04 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~3.70E-02~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | ~~8.56E-03~~ 1.78E-3 | 0.00E+00 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 3.80E-04 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~5.03E-02~~ 1.40E-2 | **0.00E+00** | **2.23E-07** |

Revisions
02/28/97
KAS

000280

**RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 3
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), CTE**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL/SEDIMENT (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 3150 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 0.2 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 52 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 3 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 0.5 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 43 |
| BW2 = BODY WEIGHT ADULT (KG): | | 1 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 1095 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 1.04E–06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 4.47E–08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), CTE
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0 | 0.06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 1E+0 * |
| 1,2,3,4,6,7,8–HpCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+03 |
| OCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+02 |
| Cadmium | 6.1 | 0.01 | 6.37E–08 | 0.00E+00 | 2.73E–09 | ~~1.50E–05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KLS

* Based new PRB guidance (USEPA, September 1996).

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | ~~4.24E-03~~ 2.54E-3 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~4.24E-03~~ 2.54E-3 | **0.00E+00** | **0.00E+00** |

Revisions
02/23/97
KLS

000233

000284

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES**

SITE NAME: Site 2 – Area A Downstream, Zone 3
LOCATION: NSB-NLON, Groton, CT
DATE: 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
TWO EXPOSURE ROUTES ARE CONSIDERED: INCIDENTAL INGESTION AND DERMAL CONTACT.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser; CTE**

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (L/HR)
ET = EXPOSURE TIME (HRS/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY-STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

INGESTION:

| | | | |
|---|---|---|---|
| CR: | 0.05 | CONVERSION FACTOR (NONCAR) = | 3.31E-04 |
| ET: | 2 | | |
| EF: | 52 | | |
| ED: | 3 | CONVERSION FACTOR (CARCIN) = | 1.42E-05 |
| BW: | 43 | | |
| AT(NOCN): | 1095 | | |
| AT(CAR): | 25550 | | |

DERMAL CONTACT:

| | | | |
|---|---|---|---|
| EV: | 1 | CONVERSION FACTOR (NONCAR) = | 1.04E+01 |
| ED: | 3 | | |
| EF: | 52 | | |
| A: | 3150 | CONVERSION FACTOR (CARCIN) = | 4.47E-01 |
| tevent: | 2 | | |
| BW: | 43 | | |
| AT(NON): | 1095 | | |
| AT(CAR): | 25550 | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Older Child Trespasser; CTE

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.004 | O | 6.90E–01 | 2.90E–01 | 4.50E–03 | 1.80E–03 | 4.64E–08 |
| Tetrachloroethene | 0 | O | 4.30E+00 | 9.00E–01 | 4.80E–02 | 2.50E–01 | 0.00E+00 |
| 4,4'–DDD | 0.0001 | O | 3.70E+01 | 7.80E+00 | 2.80E–01 | 6.30E+01 | 3.08E–07 |
| 4,4'–DDE | 0 | O | 3.60E+01 | 7.60E+00 | 2.40E–01 | 4.90E+01 | 0.00E+00 |
| 4,4'–DDT | 0 | O | 6.00E+01 | 1.30E+01 | 4.30E–01 | 2.30E+02 | 0.00E+00 |
| Arsenic | 0.0019 | I | | | 1.00E–03 | | 3.80E–09 |
| Boron | 0 | I | | | 1.00E–03 | | 0.00E+00 |
| Cadmium | 0 | I | | | 1.00E–03 | | 0.00E+00 |
| ~~Iron~~ | ~~2.02~~ | ~~I~~ | | | ~~1.00E–03~~ | | ~~3.84E–06~~ |
| Manganese | 0.357 | I | | | 1.00E–03 | | 7.14E–07 |
| Mercury | 0 | I | | | 1.00E–03 | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | |

RISK ASSESSMENT SPREADSHEET -- SURFACE WATER EXPOSURES (PAGE THREE)
Site 2 -- Area A Downstream, Zone 3
EXPOSURE SCENARIO: Older Child Trespasser; CTE
CALCULATE DOSES:

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 1.33E-06 | 4.84E-07 | 6.00E-02 | 6.00E-02 | 2.21E-05 | 8.07E-06 | 3.02E-05 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 1.00E-02 | 1.00E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 3.31E-08 | 3.19E-06 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 5.00E-04 | 4.00E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 6.29E-07 | 3.97E-08 | 3.00E-04 | 2.80E-04 | 2.10E-03 | 1.42E-04 | 2.24E-03 |
| Boron | 0.00E+00 | 0.00E+00 | 9.00E-02 | 4.50E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | 0.00E+00 | 5.00E-04 | ~~1.50E-05~~ 2.5E-5 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~8.07E-04~~ | ~~8.09E-05~~ | ~~3.00E-01~~ | ~~1.50E-02~~ | ~~3.22E-03~~ | ~~4.06E-03~~ | ~~7.28E-03~~ |
| Manganese | 1.18E-04 | 7.45E-06 | ~~5.00E-03~~ 2.4E-2 | ~~1.50E-04~~ 7.2E-4 | ~~2.37E-02~~ 4.94E-3 | ~~4.97E-02~~ 1.04E-2 | ~~7.68E-02~~ 1.53E-2 |
| Mercury | 0.00E+00 | 0.00E+00 | 3.00E-04 | 1.50E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | ~~2.80E-02~~ 7.06E-3 | ~~5.39E-02~~ 1.06E-2 | ~~8.29E-02~~ 1.76E-2 |

Revisions
08/24/96
KMS

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Older Child Trespasser; CTE
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 5.68E-08 | 2.08E-08 | 7.50E-03 | 7.50E-03 | 4.26E-10 | 1.56E-10 | 5.82E-10 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 5.20E-05 | 5.20E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 1.42E-09 | 1.37E-07 | 2.40E-01 | 3.00E-01 | 3.41E-10 | 4.10E-08 | 4.14E-08 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 3.40E-01 | 4.20E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 3.40E-01 | 4.20E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 2.70E-08 | 1.70E-09 | 1.50E+00 | 1.60E+00 | 4.05E-08 | 2.72E-09 | 4.32E-08 |
| Boron | 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 |
| ~~Iron~~ | ~~4.15E-05~~ | ~~2.61E-06~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | 5.07E-06 | 3.19E-07 | | | 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 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | 4.12E-08 | 4.39E-08 | 8.51E-08 |

Revisions
08/24/96
KHS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 3
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment); RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 0 | IR: | 100 |
| EF: | 1 | EF: | 120 |
| Fi: | 1 | Fi: | 1 |
| ED: | 1 | ED: | 10 |
| BW: | 1 | BW: | 43 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 3650 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 7.65E-07 | (AVG ANNUAL DOSE) | CF: | 1.09E-07 |

000249

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment); RME
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Indeno(1,2,3–cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| 2–Nitroaniline | 3.1 | 1 | 2.37E–06 | 0.00E+00 | 3.39E–07 | 6.00E–05 | |
| Alpha–chlordane | 0.49 | 1 | 3.75E–07 | 0.00E+00 | 5.35E–08 | 6.00E–05 | 1.30E+00 |
| 4,4'–DDD | 120 | 1 | 9.17E–05 | 0.00E+00 | 1.31E–05 | | 2.40E–01 |
| 4,4'–DDE | 2.9 | 1 | 2.22E–06 | 0.00E+00 | 3.17E–07 | | 3.40E–01 |
| 4,4'–DDT | 14 | 1 | 1.07E–05 | 0.00E+00 | 1.53E–06 | 5.00E–04 | 3.40E–01 |
| Dieldrin | 0.9 | 1 | 6.88E–07 | 0.00E+00 | 9.83E–08 | 5.00E–05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 2E+0* |
| 1,2,3,4,6,7,8–HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~ 03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~33100~~ | ~~1~~ | ~~2.53E–02~~ | ~~0.00E+00~~ | ~~3.62E–03~~ | ~~1.00E+00~~ | |
| Antimony | 6.1 | 1 | 4.66E–06 | 0.00E+00 | 6.66E–07 | 4.00E–04 | |
| Arsenic | 17.7 | 1 | 1.35E–05 | 0.00E+00 | 1.93E–06 | 3.00E–04 | 1.50E+00 |
| Barium | 635 | 1 | 4.86E–04 | 0.00E+00 | 6.94E–05 | 7.00E–02 | |
| Beryllium | 5.6 | 1 | 4.28E–06 | 0.00E+00 | 6.12E–07 | 5.00E–03 | 4.30E+00 |
| Cadmium | 13.8 | 1 | 1.06E–05 | 0.00E+00 | 1.51E–06 | 5.00E–04 | |
| Chromium | 48.9 | 1 | 3.74E–05 | 0.00E+00 | 5.34E–06 | 5.00E–03 | |
| ~~Iron~~ | ~~639000~~ | ~~1~~ | ~~4.89E–01~~ | ~~0.00E+00~~ | ~~6.98E–02~~ | ~~3.00E–01~~ | |
| Manganese | 1300 | 1 | 9.94E–04 | 0.00E+00 | 1.42E–04 | ~~5.00E–03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–04 | |
| Vanadium | 56.7 | 1 | 4.34E–05 | 0.00E+00 | 6.19E–06 | 7.00E–03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KMS

* Based on new PCB guidance (USEPA, September 1996).

000730

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL/SEDIMENT (PAGE THREE)**
**Site 2 – Area A Downstream, Zone 3**
**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment); RME**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX CHILD | HAZARD INDEX YOUTH | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2-Nitroaniline | 3.95E-02 | 0.00E+00 | 0.00E+00 |
| Alpha-chlordane | 6.24E-03 | 0.00E+00 | 6.96E-08 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 3.15E-06 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 1.08E-07 |
| 4,4'-DDT | 2.14E-02 | 0.00E+00 | 5.20E-07 |
| Dieldrin | 1.38E-02 | 0.00E+00 | 1.57E-06 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~2.53E-02~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 1.17E-02 | 0.00E+00 | 0.00E+00 |
| Arsenic | 4.51E-02 | 0.00E+00 | 2.90E-06 |
| Barium | 6.94E-03 | 0.00E+00 | 0.00E+00 |
| Beryllium | 8.56E-04 | 0.00E+00 | 2.63E-06 |
| Cadmium | 2.11E-02 | 0.00E+00 | 0.00E+00 |
| Chromium | 7.48E-03 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~1.63E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | ~~1.99E-01~~ 4.15E-2 | 0.00E+00 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 6.19E-03 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~2.03E+00~~ 2.22E-1 | **0.00E+00** | **1.09E-05** |

Revisions
02/28/97
KMG

**RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 3
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), RME**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL/SEDIMENT (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 3150 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 1 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 120 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 10 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 1 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 43 |
| BW2 = BODY WEIGHT ADULT (KG): | | 1 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 3650 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 2.41E-05 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 3.44E-06
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), RME
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0 | 0.06 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 2E+0* |
| 1,2,3,4,6,7,8–HpCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+03 |
| OCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+02 |
| Cadmium | 13.8 | 0.01 | 3.32E–06 | 0.00E+00 | 4.75E–07 | ~~1.50E–05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KAS

*Based new PCB guidance (USL., September 1996).

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SOIL/SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Older Child Trespasser (Surface Soil/Sediment), RME
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | ~~2.22E-01~~ 1.33E-1 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | ~~2.22E-01~~ 1.33E-1 | 0.00E+00 | 0.00E+00 |

Revisions
02/28/97
KAS

000296

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES**

SITE NAME: Site 2 – Area A Downstream, Zone 3
LOCATION: NSB-NLON, Groton, CT
DATE: 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
TWO EXPOSURE ROUTES ARE CONSIDERED: INCIDENTAL INGESTION AND DERMAL CONTACT.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser; RME**

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (L/HR)
ET = EXPOSURE TIME (HRS/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY-STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

INGESTION:

| | | | |
|---|---|---|---|
| CR: | 0.05 | CONVERSION FACTOR (NONCAR) = | 1.53E-03 |
| ET: | 4 | | |
| EF: | 120 | | |
| ED: | 10 | CONVERSION FACTOR (CARCIN) = | 2.18E-04 |
| BW: | 43 | | |
| AT(NOCN): | 3650 | | |
| AT(CAR): | 25550 | | |

DERMAL CONTACT:

| | | | |
|---|---|---|---|
| EV: | 1 | CONVERSION FACTOR (NONCAR) = | 2.41E+01 |
| ED: | 10 | | |
| EF: | 120 | | |
| A: | 3150 | CONVERSION FACTOR (CARCIN) = | 3.44E+00 |
| tevent: | 4 | | |
| BW: | 43 | | |
| AT(NON): | 3650 | | |
| AT(CAR): | 25550 | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Older Child Trespasser; RME

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.008 | O | 6.90E-01 | 2.90E-01 | 4.50E-03 | 1.80E-03 | 1.24E-07 |
| Tetrachloroethene | 0 | O | 4.30E+00 | 9.00E-01 | 4.80E-02 | 2.50E-01 | 0.00E+00 |
| 4,4'-DDD | 0.00035 | O | 3.70E+01 | 7.80E+00 | 2.80E-01 | 6.30E+01 | 1.51E-06 |
| 4,4'-DDE | 0 | O | 3.60E+01 | 7.60E+00 | 2.40E-01 | 4.90E+01 | 0.00E+00 |
| 4,4'-DDT | 0 | O | 6.00E+01 | 1.30E+01 | 4.30E-01 | 2.30E+02 | 0.00E+00 |
| Arsenic | 0.0026 | I | | | 1.00E-03 | | 1.04E-08 |
| Boron | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Cadmium | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| ~~Iron~~ | ~~0.56~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~2.02E-05~~ |
| Manganese | 0.488 | I | | | 1.00E-03 | | 1.95E-06 |
| Mercury | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | |

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)**
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Older Child Trespasser; RME
CALCULATE DOSES:

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 9.17E−06 | 2.97E−06 | 6.00E−02 | 6.00E−02 | 1.53E−04 | 4.96E−05 | 2.02E−04 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 1.00E−02 | 1.00E−02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDD | 5.35E−07 | 3.64E−05 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDE | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDT | 0.00E+00 | 0.00E+00 | 5.00E−04 | 4.00E−04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 3.98E−06 | 2.50E−07 | 3.00E−04 | 2.80E−04 | 1.33E−02 | 8.95E−04 | 1.41E−02 |
| Boron | 0.00E+00 | 0.00E+00 | 9.00E−02 | 4.50E−03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | 0.00E+00 | 5.00E−04 | ~~4.50E−05~~ 2.5E-5 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~1.00E−02~~ | ~~6.32E−04~~ | ~~3.00E−01~~ | ~~1.50E−02~~ | ~~3.34E−02~~ | ~~4.21E−02~~ | ~~7.56E−02~~ |
| Manganese | 7.46E−04 | 4.70E−05 | ~~5.00E−03~~ 2.4E-2 | ~~1.50E−04~~ 7.2E-4 | ~~1.49E−01~~ 3.10E-2 | ~~9.40E−01~~ 6.52E-2 | ~~4.63E−01~~ 9.62E-2 |
| Mercury | 0.00E+00 | 0.00E+00 | 3.00E−04 | 1.50E−05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL RISK** | | | | | ~~1.08E−01~~ 4.45E-2 | ~~3.56E−01~~ 6.61E-2 | ~~5.53E−01~~ 1.11E-1 |

Revisions
08/24/96
KMS

000239

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
Site 2 – Area A Downstream, Zone 3
EXPOSURE SCENARIO: Older Child Trespasser; RME
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 1.31E-06 | 4.25E-07 | 7.50E-03 | 7.50E-03 | 9.83E-09 | 3.19E-09 | 1.30E-08 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 5.20E-05 | 5.20E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 7.65E-08 | 5.21E-06 | 2.40E-01 | 3.00E-01 | 1.83E-08 | 1.56E-06 | 1.58E-06 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 3.40E-01 | 4.20E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 3.40E-01 | 4.20E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 5.68E-07 | 3.58E-08 | 1.50E+00 | 1.60E+00 | 8.52E-07 | 5.73E-08 | 9.09E-07 |
| Boron | 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 |
| Iron | 1.43E-03 | 9.03E-05 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Manganese | 1.07E-04 | 6.72E-06 | | | 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 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | 8.80E-07 | 1.62E-06 | 2.50E-06 |

Revisions
08/24/96
KMS

000300

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 4 (North Lake)
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Recreational Child User (Swimmer), CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | CHILD: | |
|---|---|---|---|
| IR: | 0 | IR: | 100 |
| EF: | 1 | EF: | 55 |
| Fi: | 1 | Fi: | 0.5 |
| ED: | 1 | ED: | 2 |
| BW: | 1 | BW: | 15 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 730 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | CHILD: | | | ADULT/CHILD (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 5.02E–07 | (AVG ANNUAL DOSE) | CF: | 1.44E–08 |

000301

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)**
**Site 2 – Area A Downstream, Zone 4**
**EXPOSURE SCENARIO: Recreational Child User (Swimmer), CTE**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | CHILD ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Indeno(1,2,3–cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| 2–Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | |
| Alpha–chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | 1.30E+00 |
| 4,4'–DDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 2.40E–01 |
| 4,4'–DDE | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 3.40E–01 |
| 4,4'–DDT | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–04 | 3.40E–01 |
| Dieldrin | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 1E+0 * |
| 1,2,3,4,6,7,8–HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~ 03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~4180~~ | ~~1~~ | ~~2.10E–03~~ | ~~0.00E+00~~ | ~~0.00E–05~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E–04 | |
| Arsenic | 2 | 1 | 1.00E–06 | 0.00E+00 | 2.87E–08 | 3.00E–04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–02 | |
| Beryllium | 0.18 | 1 | 9.04E–08 | 0.00E+00 | 2.58E–09 | 5.00E–03 | 4.30E+00 |
| Cadmium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Iron~~ | ~~5550~~ | ~~1~~ | ~~2.79E–03~~ | ~~0.00E+00~~ | ~~7.96E–05~~ | ~~3.00E–01~~ | |
| ~~Manganese~~ | ~~88.5~~ | ~~1~~ | ~~4.45E–05~~ | ~~0.00E+00~~ | ~~1.27E–06~~ | ~~5.00E–03~~ | |
| Mercury | 1.8 | 1 | 9.04E–07 | 0.00E+00 | 2.58E–08 | 3.00E–04 | |
| Vanadium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KAS

* Based on new PCB guidance (USEPA, September 1996).

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)**
**Site 2 – Area A Downstream, Zone 4**
**EXPOSURE SCENARIO: Recreational Child User (Swimmer), CTE**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX CHILD | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2-Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha-chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Dieldrin | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~2.10E-03~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 3.35E-03 | 0.00E+00 | 4.31E-08 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 1.81E-05 | 0.00E+00 | 1.11E-08 |
| Cadmium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~9.29E-03~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| ~~Manganese~~ | ~~8.89E-03~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Mercury | 3.01E-03 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~2.67E-02~~ 6.38E-3 | **0.00E+00** | **5.42E-08** |

Revisions
02/28/97
KAS

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES**

SITE NAME: Site 2 – Area A Downstream, Zone 4 (North Lake)
**LOCATION:** NSB – NLON, Groton, CT
DATE: 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
TWO EXPOSURE ROUTES ARE CONSIDERED: INCIDENTAL INGESTION AND DERMAL CONTACT.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Recreational Child User (Swimmer), CTE**

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (L/HR)
ET = EXPOSURE TIME (HRS/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS:
IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY-STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

INGESTION:

| | | | |
|---|---|---|---|
| CR: | 0.05 | CONVERSION FACTOR (NONCAR) = | 1.00E-03 |
| ET: | 2 | | |
| EF: | 55 | | |
| ED: | 2 | CONVERSION FACTOR (CARCIN) = | 2.87E-05 |
| BW: | 15 | | |
| AT(NOCN): | 730 | | |
| AT(CAR): | 25550 | | |

DERMAL CONTACT:

| | | | |
|---|---|---|---|
| EV: | 1 | CONVERSION FACTOR (NONCAR) = | 7.01E+01 |
| ED: | 2 | | |
| EF: | 55 | | |
| A: | 6980 | CONVERSION FACTOR (CARCIN) = | 2.00E+00 |
| tevent: | 2 | | |
| BW: | 15 | | |
| AT(NON): | 730 | | |
| AT(CAR): | 25550 | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
Site 2 – Area A Downstream, Zone 4 (North Lake)
EXPOSURE SCENARIO: Recreational Child User (Swimmer), CTE

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0 | O | 6.90E-01 | 2.90E-01 | 4.50E-03 | 1.80E-03 | 0.00E+00 |
| Tetrachloroethene | 0 | O | 4.30E+00 | 9.00E-01 | 4.80E-02 | 2.50E-01 | 0.00E+00 |
| 4,4'-DDD | 0 | O | 3.70E+01 | 7.80E+00 | 2.80E-01 | 8.30E+01 | 0.00E+00 |
| 4,4'-DDE | 0 | O | 3.60E+01 | 7.60E+00 | 2.40E-01 | 4.90E+01 | 0.00E+00 |
| 4,4'-DDT | 0 | O | 6.00E+01 | 1.30E+01 | 4.30E-01 | 2.30E+02 | 0.00E+00 |
| Arsenic | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Boron | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Cadmium | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| ~~Iron~~ | ~~0.699~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~1.48E-08~~ |
| Manganese | 0.0515 | I | | | 1.00E-03 | | 1.03E-07 |
| Mercury | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | |

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)**
Site 2 – Area A Downstream, Zone 4 (North Lake)
EXPOSURE SCENARIO: Recreational Child User (Swimmer), CTE
CALCULATE DOSES:

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 6.00E−02 | 6.00E−02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 1.00E−02 | 1.00E−02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDD | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDE | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDT | 0.00E+00 | 0.00E+00 | 5.00E−04 | 4.00E−04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 0.00E+00 | 3.00E−04 | 2.80E−04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 0.00E+00 | 0.00E+00 | 9.00E−02 | 4.50E−03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | 0.00E+00 | 5.00E−04 | ~~1.50E−05~~ 2.5E-5 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~7.02E−04~~ | ~~0.80E−05~~ | ~~3.00E−01~~ | ~~1.50E−02~~ | ~~2.34E−03~~ | ~~6.54E−03~~ | ~~8.88E−03~~ |
| Manganese | 5.17E−05 | 7.22E−06 | ~~5.00E−03~~ 2.4E-2 | ~~1.50E−04~~ 7.2E-4 | ~~1.03E−02~~ 2.15E-3 | ~~4.81E−02~~ 1.00E-2 | ~~5.85E−02~~ 1.22E-2 |
| Mercury | 0.00E+00 | 0.00E+00 | 3.00E−04 | 1.50E−05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | ~~1.07E−02~~ 2.15E-3 | ~~5.47E−02~~ 1.00E-2 | ~~6.74E−02~~ 1.22E-2 |

Revisions
08/24/96
KMS

000307

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
Site 2 – Area A Downstream, Zone 4 (North Lake)
EXPOSURE SCENARIO: Recreational Child User (Swimmer), CTE
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 7.50E−03 | 7.50E−03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 5.20E−05 | 5.20E−05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDD | 0.00E+00 | 0.00E+00 | 2.40E−01 | 3.00E−01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDE | 0.00E+00 | 0.00E+00 | 3.40E−01 | 4.20E−01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDT | 0.00E+00 | 0.00E+00 | 3.40E−01 | 4.20E−01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 0.00E+00 | 1.50E+00 | 1.60E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 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 |
| ~~Iron~~ | ~~2.01E−05~~ | ~~2.86E−06~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | 1.48E−06 | 2.06E−07 | | | 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 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |

Revisions
08/24/96
KAS

000308

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 4 (North Lake)
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Recreational Child User (Swimmer), RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | CHILD: | |
|---|---|---|---|
| IR: | 0 | IR: | 200 |
| EF: | 1 | EF: | 55 |
| Fi: | 1 | Fi: | 1 |
| ED: | 1 | ED: | 6 |
| BW: | 1 | BW: | 15 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 2190 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | CHILD: | | | ADULT/CHILD (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 2.01E–06 | (AVG ANNUAL DOSE) | CF: | 1.72E–07 |

000309

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)**
**Site 2 – Area A Downstream, Zone 4**
**EXPOSURE SCENARIO: Recreational Child User (Swimmer), RME**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | CHILD ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Indeno(1,2,3–cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| 2–Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | |
| Alpha–chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | 1.30E+00 |
| 4,4'–DDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 2.40E–01 |
| 4,4'–DDE | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 3.40E–01 |
| 4,4'–DDT | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–04 | 3.40E–01 |
| Dieldrin | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 2E+0* |
| 1,2,3,4,6,7,8–HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~ 03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~8830~~ | ~~1~~ | ~~1.77E–02~~ | ~~0.00E+00~~ | ~~1.52E–03~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E–04 | |
| Arsenic | 4.5 | 1 | 9.04E–06 | 0.00E+00 | 7.75E–07 | 3.00E–04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–02 | |
| Beryllium | 0.36 | 1 | 7.23E–07 | 0.00E+00 | 6.20E–08 | 5.00E–03 | 4.30E+00 |
| Cadmium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Iron~~ | ~~9930~~ | ~~1~~ | ~~2.00E–02~~ | ~~0.00E+00~~ | ~~1.71E–03~~ | ~~3.00E–01~~ | |
| ~~Manganese~~ | ~~177~~ | ~~1~~ | ~~3.56E–04~~ | ~~0.00E+00~~ | ~~3.05E–05~~ | ~~5.00E–03~~ | |
| Mercury | 7 | 1 | 1.41E–05 | 0.00E+00 | 1.21E–06 | 3.00E–04 | |
| Vanadium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KAS

* Based on new PCB guidance (USEPA, September 1996).

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)**
**Site 2 – Area A Downstream, Zone 4**
**EXPOSURE SCENARIO: Recreational Child User (Swimmer), RME**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX CHILD | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2-Nitroanlline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| *Alpha-chlordane* | *0.00E+00* | *0.00E+00* | *0.00E+00* |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Dieldrin | *0.00E+00* | *0.00E+00* | *0.00E+00* |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~1.77E-02~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 3.01E-02 | 0.00E+00 | 1.16E-06 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 1.45E-04 | 0.00E+00 | 2.67E-07 |
| Cadmium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~6.05E-02~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| ~~Manganese~~ | ~~7.11E-02~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Mercury | 4.69E-02 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~2.33E-01~~ 7.71E-2 | **0.00E+00** | **1.43E-06** |

Revisions
02/28/97
KMS

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES**

SITE NAME: Site 2 – Area A Downstream, Zone 4 (North Lake)
LOCATION: NSB–NLON, Groton, CT
DATE: 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
TWO EXPOSURE ROUTES ARE CONSIDERED: INCIDENTAL INGESTION AND DERMAL CONTACT.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Recreational Child User (Swimmer), RME**

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (L/HR)
ET = EXPOSURE TIME (HRS/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS:
IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY–STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

INGESTION:

| | | | |
|---|---|---|---|
| CR: | 0.05 | CONVERSION FACTOR (NONCAR) = | 2.01E–03 |
| ET: | 4 | | |
| EF: | 55 | | |
| ED: | 6 | CONVERSION FACTOR (CARCIN) = | 1.72E–04 |
| BW: | 15 | | |
| AT(NOCN): | 2190 | | |
| AT(CAR): | 25550 | | |

DERMAL CONTACT:

| | | | |
|---|---|---|---|
| EV: | 1 | CONVERSION FACTOR (NONCAR) = | 7.01E+01 |
| ED: | 6 | | |
| EF: | 55 | | |
| A: | 6980 | CONVERSION FACTOR (CARCIN) = | 6.01E+00 |
| tevent: | 4 | | |
| BW: | 15 | | |
| AT(NON): | 2190 | | |
| AT(CAR): | 25550 | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
Site 2 – Area A Downstream, Zone 4 (North Lake)
EXPOSURE SCENARIO: Recreational Child User (Swimmer), RME

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0 | O | 6.90E-01 | 2.90E-01 | 4.50E-03 | 1.80E-03 | 0.00E+00 |
| Tetrachloroethene | 0 | O | 4.30E+00 | 9.00E-01 | 4.80E-02 | 2.50E-01 | 0.00E+00 |
| 4,4'-DDD | 0 | O | 3.70E+01 | 7.80E+00 | 2.80E-01 | 6.30E+01 | 0.00E+00 |
| 4,4'-DDE | 0 | O | 3.60E+01 | 7.60E+00 | 2.40E-01 | 4.90E+01 | 0.00E+00 |
| 4,4'-DDT | 0 | O | 6.00E+01 | 1.30E+01 | 4.30E-01 | 2.30E+02 | 0.00E+00 |
| Arsenic | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Boron | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Cadmium | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| ~~Iron~~ | ~~2.04~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~8.16E-06~~ |
| Manganese | 0.138 | I | | | 1.00E-03 | | 5.44E-07 |
| Mercury | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
Site 2 – *Area A Downstream, Zone 4 (North Lake)*
EXPOSURE SCENARIO: Recreational Child User (Swimmer), RME
CALCULATE DOSES:

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 6.00E−02 | 6.00E−02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 1.00E−02 | 1.00E−02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDD | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDE | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDT | 0.00E+00 | 0.00E+00 | 5.00E−04 | 4.00E−04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 0.00E+00 | 3.00E−04 | 2.80E−04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 0.00E+00 | 0.00E+00 | 9.00E−02 | 4.50E−03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | 0.00E+00 | 5.00E−04 | ~~4.50E−05~~ 2.5E-2 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~4.10E−03~~ | ~~5.72E−04~~ | ~~3.00E−01~~ | ~~1.50E−02~~ | ~~1.37E−02~~ | ~~3.81E−03~~ | ~~5.18E−02~~ |
| Manganese | 2.73E−04 | 3.81E−05 | ~~5.00E−03~~ 2.4E-2 | ~~1.50E−04~~ 7.2E-4 | ~~5.46E−02~~ 1.14E-2 | ~~2.54E−01~~ 5.29E-2 | ~~3.08E−01~~ 6.43E-2 |
| Mercury | 0.00E+00 | 0.00E+00 | 3.00E−04 | 1.50E−05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | ~~0.05E−02~~ 1.14E-2 | ~~0.02E−01~~ 5.29E-2 | ~~0.01E−01~~ 6.43E-2 |

Revisions
08/24/96
KAS

RISK ASSESSMENT SPREADSHEET -- SURFACE WATER EXPOSURES (PAGE FOUR)
Site 2 -- Area A Downstream, Zone 4 (North Lake)
EXPOSURE SCENARIO: Recreational Child User (Swimmer), RME
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 7.50E-03 | 7.50E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 5.20E-05 | 5.20E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 2.40E-01 | 3.00E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 3.40E-01 | 4.20E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 3.40E-01 | 4.20E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 0.00E+00 | 1.50E+00 | 1.60E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 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 |
| ~~Iron~~ | ~~3.51E-04~~ | ~~4.00E-05~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | 2.34E-05 | 3.27E-06 | | | 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 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |

Revisions
08/24/96
KMS

**RISK ASSESSMENT SPREADSHEET -- INCIDENTAL INGESTION OF SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 4 (North Lake)
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Recreational Adult User (Swimmer), CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 50 | IR: | 0 |
| EF: | 22 | EF: | 1 |
| Fi: | 0.5 | Fi: | 1 |
| ED: | 9 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 3285 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 2.15E-08 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 2.77E-09 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)**
**Site 2 – Area A Downstream, Zone 4**
**EXPOSURE SCENARIO: Recreational Adult User (Swimmer), CTE**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Indeno(1,2,3–cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| 2–Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | |
| Alpha–chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | 1.30E+00 |
| 4,4'–DDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 2.40E–01 |
| 4,4'–DDE | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 3.40E–01 |
| 4,4'–DDT | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–04 | 3.40E–01 |
| Dieldrin | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 1E+0* |
| 1,2,3,4,6,7,8–HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~ 03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~4180~~ | ~~1~~ | ~~0.00E+00~~ | ~~0.00E–05~~ | ~~1.16E–05~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E–04 | |
| Arsenic | 2 | 1 | 0.00E+00 | 4.31E–08 | 5.54E–09 | 3.00E–04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–02 | |
| Beryllium | 0.18 | 1 | 0.00E+00 | 3.87E–09 | 4.98E–10 | 5.00E–03 | 4.30E+00 |
| Cadmium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Iron~~ | ~~5550~~ | ~~1~~ | ~~0.00E+00~~ | ~~1.19E–04~~ | ~~1.54E–05~~ | ~~3.00E–01~~ | |
| ~~Manganese~~ | ~~88.5~~ | ~~1~~ | ~~0.00E+00~~ | ~~1.91E–06~~ | ~~2.45E–07~~ | ~~5.00E–03~~ | |
| Mercury | 1.8 | 1 | 0.00E+00 | 3.87E–08 | 4.98E–09 | 3.00E–04 | |
| Vanadium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KAS

*Based on new PCB guidance (USEPA September 1996).

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)**
**Site 2 – Area A Downstream, Zone 4**
**EXPOSURE SCENARIO: Recreational Adult User (Swimmer), CTE**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2-Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha-chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Dieldrin | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~9.00E-05~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 1.44E-04 | 8.30E-09 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 0.00E+00 | 7.75E-07 | 2.14E-09 |
| Cadmium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~3.98E-04~~ | ~~0.00E+00~~ |
| ~~Manganese~~ | ~~0.00E+00~~ | ~~3.81E-04~~ | ~~0.00E+00~~ |
| Mercury | 0.00E+00 | 1.29E-04 | 0.00E+00 |
| Vanadium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | **~~1.14E-03~~ 2.74E-4** | **1.04E-08** |

Revisions
02/28/97
KMS

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES**

SITE NAME: Site 2 – Area A Downstream, Zone 4 (North Lake)
LOCATION: NSB–NLON, Groton, CT
DATE: 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
TWO EXPOSURE ROUTES ARE CONSIDERED: INCIDENTAL INGESTION AND DERMAL CONTACT.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Recreational Adult User (Swimmer), CTE**

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (L/HR)
ET = EXPOSURE TIME (HRS/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY–STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

INGESTION:

| | | | |
|---|---|---|---|
| CR: | 0.05 | CONVERSION FACTOR (NONCAR) = | 8.61E–05 |
| ET: | 2 | | |
| EF: | 22 | | |
| ED: | 9 | CONVERSION FACTOR (CARCIN) = | 1.11E–05 |
| BW: | 70 | | |
| AT(NOCN): | 3285 | | |
| AT(CAR): | 25550 | | |

DERMAL CONTACT:

| | | | |
|---|---|---|---|
| EV: | 1 | CONVERSION FACTOR (NONCAR) = | 1.72E+01 |
| ED: | 9 | | |
| EF: | 22 | | |
| A: | 20000 | CONVERSION FACTOR (CARCIN) = | 2.21E+00 |
| tevent: | 2 | | |
| BW: | 70 | | |
| AT(NON): | 3285 | | |
| AT(CAR): | 25550 | | |

RISK ASSESSMENT SPREADSHEET -- SURFACE WATER EXPOSURES (PAGE TWO)
Site 2 – Area A Downstream, Zone 4 (North Lake)
EXPOSURE SCENARIO: Recreational Adult User (Swimmer), CTE

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0 | O | 6.90E-01 | 2.90E-01 | 4.50E-03 | 1.80E-03 | 0.00E+00 |
| Tetrachloroethene | 0 | O | 4.30E+00 | 9.00E-01 | 4.80E-02 | 2.50E-01 | 0.00E+00 |
| 4,4'-DDD | 0 | O | 3.70E+01 | 7.80E+00 | 2.80E-01 | 6.30E+01 | 0.00E+00 |
| 4,4'-DDE | 0 | O | 3.60E+01 | 7.60E+00 | 2.40E-01 | 4.90E+01 | 0.00E+00 |
| 4,4'-DDT | 0 | O | 6.00E+01 | 1.30E+01 | 4.30E-01 | 2.30E+02 | 0.00E+00 |
| Arsenic | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Boron | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Cadmium | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| ~~Iron~~ | ~~0.699~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~1.40E-06~~ |
| Manganese | 0.0515 | I | | | 1.00E-03 | | 1.03E-07 |
| Mercury | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
Site 2 – Area A Downstream, Zone 4 (North Lake)
EXPOSURE SCENARIO: Recreational Adult User (Swimmer), CTE
CALCULATE DOSES:

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 6.00E−02 | 6.00E−02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 1.00E−02 | 1.00E−02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDD | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDE | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDT | 0.00E+00 | 0.00E+00 | 5.00E−04 | 4.00E−04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 0.00E+00 | 3.00E−04 | 2.80E−04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 0.00E+00 | 0.00E+00 | 9.00E−02 | 4.50E−03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | 0.00E+00 | 5.00E−04 | ~~1.50E−05~~ 2.5E-5 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~8.02E−05~~ | ~~2.41E−05~~ | ~~3.00E−01~~ | ~~1.50E−02~~ | ~~2.01E−04~~ | ~~1.61E−03~~ | ~~1.81E−03~~ |
| Manganese | 4.43E−06 | 1.77E−06 | ~~5.00E−00~~ 2.4E-2 | ~~1.50E−04~~ 7.2E-4 | ~~8.87E−04~~ 1.85E-4 | ~~1.18E−02~~ 2.46E-3 | ~~1.27E−02~~ 2.65E-3 |
| Mercury | 0.00E+00 | 0.00E+00 | 3.00E−04 | 1.50E−05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | ~~1.08E−03~~ 1.85E-4 | ~~4.34E−02~~ 2.46E-3 | ~~4.45E−02~~ 2.65E-3 |

Revisions
08/24/96
KMG

000323

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
Site 2 – Area A Downstream, Zone 4 (North Lake)
EXPOSURE SCENARIO: Recreational Adult User (Swimmer), CTE
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 7.50E−03 | 7.50E−03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 5.20E−05 | 5.20E−05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDD | 0.00E+00 | 0.00E+00 | 2.40E−01 | 3.00E−01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDE | 0.00E+00 | 0.00E+00 | 3.40E−01 | 4.20E−01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDT | 0.00E+00 | 0.00E+00 | 3.40E−01 | 4.20E−01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 0.00E+00 | 1.50E+00 | 1.60E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 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 |
| ~~Iron~~ | ~~7.74E−08~~ | ~~3.10E−08~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | 5.70E−07 | 2.28E−07 | | | 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 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |

Revisions
08/24/96
KMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 4 (North Lake)
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Recreational Adult User (Swimmer), RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 100 | IR: | 0 |
| EF: | 22 | EF: | 1 |
| Fi: | 1 | Fi: | 1 |
| ED: | 30 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 10950 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 8.61E–08 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 3.69E–08 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)**
**Site 2 – Area A Downstream, Zone 4**
**EXPOSURE SCENARIO: Recreational Adult User (Swimmer), RME**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Indeno(1,2,3–cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| 2–Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | |
| Alpha–chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | 1.30E+00 |
| 4,4'–DDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 2.40E–01 |
| 4,4'–DDE | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 3.40E–01 |
| 4,4'–DDT | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–04 | 3.40E–01 |
| Dieldrin | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 2E+0* |
| 1,2,3,4,6,7,8–HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~ 03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~8830~~ | ~~1~~ | ~~0.00E+00~~ | ~~7.60E–04~~ | ~~3.26E–04~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E–04 | |
| Arsenic | 4.5 | 1 | 0.00E+00 | 3.87E–07 | 1.66E–07 | 3.00E–04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–02 | |
| Beryllium | 0.36 | 1 | 0.00E+00 | 3.10E–08 | 1.33E–08 | 5.00E–03 | 4.30E+00 |
| Cadmium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Iron~~ | ~~9930~~ | ~~1~~ | ~~0.00E+00~~ | ~~8.55E–04~~ | ~~3.66E–04~~ | ~~3.00E–01~~ | |
| ~~Manganese~~ | ~~177~~ | ~~1~~ | ~~0.00E+00~~ | ~~1.52E–05~~ | ~~6.53E–06~~ | ~~5.00E–03~~ | |
| Mercury | 7 | 1 | 0.00E+00 | 6.03E–07 | 2.58E–07 | 3.00E–04 | |
| Vanadium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KMS

* Based on new PCB guidance (USEPA, September 1996).

00326

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)**
**Site 2 – Area A Downstream, Zone 4**
**EXPOSURE SCENARIO: Recreational Adult User (Swimmer), RME**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2-Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha-chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Dieldrin | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~7.60E-04~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 1.29E-03 | 2.49E-07 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 0.00E+00 | 6.20E-06 | 5.71E-08 |
| Cadmium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~2.85E-03~~ | ~~0.00E+00~~ |
| ~~Manganese~~ | ~~0.00E+00~~ | ~~3.05E-03~~ | ~~0.00E+00~~ |
| Mercury | 0.00E+00 | 2.01E-03 | 0.00E+00 |
| Vanadium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | **~~9.97E-03~~ 3.31E-3** | **3.06E-07** |

Revisions
02/28/97
KMS

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES**

SITE NAME: Site 2 – Area A Downstream, Zone 4 (North Lake)
LOCATION: NSB – NLON, Groton, CT
DATE: 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
TWO EXPOSURE ROUTES ARE CONSIDERED: INCIDENTAL INGESTION AND DERMAL CONTACT.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Recreational Adult User (Swimmer), RME**

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (L/HR)
ET = EXPOSURE TIME (HRS/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS:
IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY-STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

INGESTION:

| | | | |
|---|---|---|---|
| CR: | 0.05 | CONVERSION FACTOR (NONCAR) = | 1.72E-04 |
| ET: | 4 | | |
| EF: | 22 | | |
| ED: | 30 | CONVERSION FACTOR (CARCIN) = | 7.38E-05 |
| BW: | 70 | | |
| AT(NOCN): | 10950 | | |
| AT(CAR): | 25550 | | |

DERMAL CONTACT:

| | | | |
|---|---|---|---|
| EV: | 1 | CONVERSION FACTOR (NONCAR) = | 1.72E+01 |
| ED: | 30 | | |
| EF: | 22 | | |
| A: | 20000 | CONVERSION FACTOR (CARCIN) = | 7.38E+00 |
| tevent: | 4 | | |
| BW: | 70 | | |
| AT(NON): | 10950 | | |
| AT(CAR): | 25550 | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
Site 2 – Area A Downstream, Zone 4 (North Lake)
EXPOSURE SCENARIO: Recreational Adult User (Swimmer), RME

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0 | O | 6.90E-01 | 2.90E-01 | 4.50E-03 | 1.80E-03 | 0.00E+00 |
| Tetrachloroethene | 0 | O | 4.30E+00 | 9.00E-01 | 4.80E-02 | 2.50E-01 | 0.00E+00 |
| 4,4'-DDD | 0 | O | 3.70E+01 | 7.80E+00 | 2.80E-01 | 6.30E+01 | 0.00E+00 |
| 4,4'-DDE | 0 | O | 3.60E+01 | 7.60E+00 | 2.40E-01 | 4.90E+01 | 0.00E+00 |
| 4,4'-DDT | 0 | O | 6.00E+01 | 1.30E+01 | 4.30E-01 | 2.30E+02 | 0.00E+00 |
| Arsenic | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Boron | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Cadmium | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| ~~Iron~~ | ~~2.04~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~8.16E-06~~ |
| Manganese | 0.136 | I | | | 1.00E-03 | | 5.44E-07 |
| Mercury | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
Site 2 – Area A Downstream, Zone 4 (North Lake)
EXPOSURE SCENARIO: Recreational Adult User (Swimmer), RME
CALCULATE DOSES:

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 6.00E-02 | 6.00E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 1.00E-02 | 1.00E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 5.00E-04 | 4.00E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 0.00E+00 | 3.00E-04 | 2.80E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 0.00E+00 | 0.00E+00 | 9.00E-02 | 4.50E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | 0.00E+00 | 5.00E-04 | ~~1.50E-05~~ 2.5E-5 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~3.51E-04~~ | ~~1.41E-04~~ | ~~3.00E-01~~ | ~~1.50E-02~~ | ~~1.17E-03~~ | ~~9.37E-06~~ | ~~1.05E-02~~ |
| Manganese | 2.34E-05 | 9.37E-06 | ~~5.00E-06~~ 2.4E-2 | ~~1.50E-04~~ 7.2E-4 | ~~4.68E-03~~ 9.75E-4 | ~~6.25E-06~~ 1.30E-2 | ~~6.71E-02~~ 1.40E-2 |
| Mercury | 0.00E+00 | 0.00E+00 | 3.00E-04 | 1.50E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | ~~5.00E-03~~ 9.75E-4 | ~~7.10E-02~~ 1.30E-2 | ~~7.77E-02~~ 1.40E-2 |

Revisions
08/24/96
KMS

000331

RISK ASSESSMENT SPREADSHEET -- SURFACE WATER EXPOSURES (PAGE FOUR)
Site 2 -- Area A Downstream, Zone 4 (North Lake)
EXPOSURE SCENARIO: Recreational Adult User (Swimmer), RME
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 7.50E-03 | 7.50E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 5.20E-05 | 5.20E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 2.40E-01 | 3.00E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 3.40E-01 | 4.20E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 3.40E-01 | 4.20E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 0.00E+00 | 1.50E+00 | 1.60E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 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 |
| ~~Iron~~ | ~~1.51E-04~~ | ~~8.02E-05~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | 1.00E-05 | 4.01E-06 | | | 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 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |

Revisions
09/24/96
KMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF [redacted] SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 5
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker ([redacted] Sediment), CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 240 | IR: | 0 |
| EF: | 80 | EF: | 1 |
| Fi: | 0.5 | Fi: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 3.76E–07 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 5.37E–09 |

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF ~~soil~~ SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 5
EXPOSURE SCENARIO: Construction Worker ([redacted] Sediment), CTE
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0.5 | 1 | 0.00E+00 | 1.88E–07 | 2.68E–09 | | 7.30E–01 |
| Indeno(1,2,3–cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| 2–Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | |
| Alpha–chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | 1.30E+00 |
| 4,4'–DDD | 4.2 | 1 | 0.00E+00 | 1.58E–06 | 2.25E–08 | | 2.40E–01 |
| 4,4'–DDE | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 3.40E–01 |
| 4,4'–DDT | 2.3 | 1 | 0.00E+00 | 8.64E–07 | 1.23E–08 | 5.00E–04 | 3.40E–01 |
| Dieldrin | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–05 | 1.60E+01 |
| Aroclors | 0.28 | 1 | 0.00E+00 | 1.05E–07 | 1.50E–09 | 2.00E–05 | ~~7.70E+00~~ 1E+0* |
| 1,2,3,4,6,7,8–HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~02 |
| ~~Aluminum~~ | ~~8480~~ | ~~1~~ | ~~0.00E+00~~ | ~~3.19E–03~~ | ~~4.55E–05~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E–04 | |
| Arsenic | 2.2 | 1 | 0.00E+00 | 8.27E–07 | 1.18E–08 | 3.00E–04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–02 | |
| Beryllium | 0.9 | 1 | 0.00E+00 | 3.38E–07 | 4.83E–09 | 5.00E–03 | 4.30E+00 |
| Cadmium | 3.4 | 1 | 0.00E+00 | 1.28E–06 | 1.82E–08 | 5.00E–04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Iron~~ | ~~17900~~ | ~~1~~ | ~~0.00E+00~~ | ~~6.73E–03~~ | ~~9.61E–05~~ | ~~3.00E–01~~ | |
| Manganese | 158 | 1 | 0.00E+00 | 5.94E–05 | 8.48E–07 | ~~6.00E–03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–04 | |
| Vanadium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
FAC

*Based on new PCB guidance (USEPA, September 1996).

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF ~~SOIL~~ SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 5
EXPOSURE SCENARIO: Construction Worker [redacted] Sediment), CTE
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 1.96E−09 |
| Indeno(1,2,3−cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2−Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha−chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDD | 0.00E+00 | 0.00E+00 | 5.41E−09 |
| 4,4'−DDE | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDT | 0.00E+00 | 1.73E−03 | 4.20E−09 |
| Dieldrin | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Aroclors | 0.00E+00 | 5.26E−03 | ~~1.10E−08~~ 1.50E-9 * |
| 1,2,3,4,6,7,8−HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~3.19E−03~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 2.76E−03 | 1.77E−08 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 0.00E+00 | 6.76E−05 | 2.08E−08 |
| Cadmium | 0.00E+00 | 2.55E−03 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~2.24E−02~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~1.10E−02~~ 2.48E-3 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 0.00E+00 | ~~4.98E−02~~ 1.48E-2 | ~~6.16E−8~~ 5.16E-8 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/20/97 KMC

00035

**RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 5
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Construction Worker, CTE**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | | |
|---|---|---|---|
| C | = CONCENTRATION IN SOIL/SEDIMENT (MG/KG) | | |
| SA1 | = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| SA2 | = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 3800 |
| AF | = ADHERENCE FACTOR (MG/SQ CM): | | 0.2 |
| ABS | = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | | Dioxins: | 0.03 |
| | | PCBS: | 0.06 |
| EF1 | = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| EF2 | = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 80 |
| ED1 | = YOUTH EXPOSURE DURATION (YEARS): | | 1 |
| ED2 | = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd | = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 0.5 |
| BW1 | = BODY WEIGHT ADOLESCENT (KG): | | 1 |
| BW2 | = BODY WEIGHT ADULT (KG): | | 70 |
| AT1 | = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 365 |
| AT2 | = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 | = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 1.70E–08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 1.19E–06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH ~~SOIL~~ SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 5
EXPOSURE SCENARIO: Construction Worker, CTE
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0.28 | 0.06 | 0.00E+00 | 2.00E–08 | 2.86E–10 | 2.00E–05 | ~~7.70E+00~~ 1E+0* |
| 1,2,3,4,6,7,8–HpCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+03 |
| OCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+02 |
| Cadmium | 3.4 | 0.01 | 0.00E+00 | 4.05E–08 | 5.78E–10 | ~~1.50E–05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions
02/28/97
KAS

000338

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH ~~SOIL~~ SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 5
EXPOSURE SCENARIO: Construction Worker, CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 9.99E-04 | ~~2.20E-09~~ 2.86E-10 * |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | ~~2.70E-03~~ 1.62E-3 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 0.00E+00 | ~~0.70E-03~~ 2.62E-3 | ~~2.20E-09~~ 2.86E-10 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/28/97 KMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF [redacted] SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 5
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker ([redacted] Sediment), RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL/SEDIMENT SAMPLE (MG/KG)
IR = SOIL/SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 480 | IR: | 0 |
| EF: | 120 | EF: | 1 |
| Fi: | 1 | Fi: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 2.25E–06 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 3.22E–08 |

RISK ASSESSMENT SPREADSHEET - INCIDENTAL INGESTION OF ~~soil~~ SEDIMENT (PAGE TWO)
Site 2 - Area A Downstream, Zone 5
EXPOSURE SCENARIO: Construction Worker (~~All Soil~~/Sediment), RME
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG-DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0.5 | 1 | 0.00E+00 | 1.13E-06 | 1.61E-08 | | 7.30E-01 |
| Indeno(1,2,3-cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E-01 |
| 2-Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E-05 | |
| Alpha-chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E-05 | 1.30E+00 |
| 4,4'-DDD | 12 | 1 | 0.00E+00 | 2.71E-05 | 3.86E-07 | | 2.40E-01 |
| 4,4'-DDE | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 3.40E-01 |
| 4,4'-DDT | 7 | 1 | 0.00E+00 | 1.58E-05 | 2.25E-07 | 5.00E-04 | 3.40E-01 |
| Dieldrin | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E-05 | 1.60E+01 |
| Aroclors | 0.28 | 1 | 0.00E+00 | 6.31E-07 | 9.02E-09 | 2.00E-05 | ~~7.70E+00~~ 2E+0* |
| 1,2,3,4,6,7,8-HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~ 03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~ -02 |
| ~~Aluminum~~ | ~~15300~~ | ~~1~~ | ~~0.00E+00~~ | ~~3.45E-02~~ | ~~4.93E-04~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E-04 | |
| Arsenic | 3.6 | 1 | 0.00E+00 | 6.57E-06 | 1.22E-07 | 3.00E-04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E-02 | |
| Beryllium | 1.5 | 1 | 0.00E+00 | 3.36E-06 | 4.83E-08 | 5.00E-03 | 4.30E+00 |
| Cadmium | 6.1 | 1 | 0.00E+00 | 1.36E-05 | 1.96E-07 | 5.00E-04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E-03 | |
| ~~Iron~~ | ~~33200~~ | ~~1~~ | ~~0.00E+00~~ | ~~7.48E-02~~ | ~~1.07E-03~~ | ~~3.00E-01~~ | |
| Manganese | 236 | 1 | 0.00E+00 | 5.32E-04 | 7.60E-06 | ~~5.00E-03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E-04 | |
| Vanadium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E-03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E-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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KMS

*Based on new PCB guidance (USEPA, September 1996).

RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF ~~soil~~ SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 5
EXPOSURE SCENARIO: Construction Worker ~~(All Soil~~/Sediment), RME
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 1.18E-08 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2-Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha-chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 9.28E-08 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 3.16E-02 | 7.66E-08 |
| Dieldrin | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Aroclors | 0.00E+00 | 3.16E-02 | ~~6.04E-08~~ 1.80E-8 * |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~3.45E-02~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 2.86E-02 | 1.84E-07 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 0.00E+00 | 6.76E-04 | 2.08E-07 |
| Cadmium | 0.00E+00 | 2.75E-02 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~2.49E-01~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~1.06E-01~~ 2.21E-2 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 0.00E+00 | ~~5.10E-01~~ 1.42E-1 | ~~6.42E-07~~ 5.91E-7 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/28/97 KMS

**RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 5
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: *Construction Worker, RME***

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | |
|---|---|---|
| C = CONCENTRATION IN SOIL/SEDIMENT (MG/KG) | | |
| SA1 = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| SA2 = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 3800 |
| AF = ADHERENCE FACTOR (MG/SQ CM): | | 1 |
| ABS = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | Dioxins: | 0.03 |
| | PCBS: | 0.06 |
| EF1 = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| EF2 = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 120 |
| ED1 = YOUTH EXPOSURE DURATION (YEARS): | | 1 |
| ED2 = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 1 |
| BW1 = BODY WEIGHT ADOLESCENT (KG): | | 1 |
| BW2 = BODY WEIGHT ADULT (KG): | | 70 |
| AT1 = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 365 |
| AT2 = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 0.00E+00 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 2.55E–07
DOSEadult = (CF2)*(C)*(ABS) CF2 = 1.78E–05

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH ~~SOIL~~ SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 5
EXPOSURE SCENARIO: Construction Worker, RME
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0.28 | 0.06 | 0.00E+00 | 3.00E–07 | 4.28E–09 | 2.00E–05 | ~~7.70E+00~~ 2E+0* |
| 1,2,3,4,6,7,8–HpCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+03 |
| OCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+02 |
| Cadmium | 6.1 | 0.01 | 0.00E+00 | 1.09E–06 | 1.56E–08 | ~~1.50E–05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KMS

* Based on new PCB guidance (EPA, September 1996).

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RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH ~~SOIL~~ SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 5
EXPOSURE SCENARIO: Construction Worker, RME
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 0.00E+00 | 1.50E-02 | ~~3.30E-08~~ 8.57E-9* |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | ~~7.26E-02~~ 4.36E-2 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | 0.00E+00 | ~~8.76E-02~~ 5.86E-2 | ~~3.30E-08~~ 8.57E-9 |

*Based on new PCB guidance (USEPA, September 1996).

Revisions
02/28/97
KMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 5
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser; CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SEDIMENT SAMPLE (MG/KG)
IR = SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 0 | IR: | 50 |
| EF: | 1 | EF: | 52 |
| Fi: | 1 | Fi: | 0.5 |
| ED: | 1 | ED: | 3 |
| BW: | 1 | BW: | 43 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 1095 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 8.28E-08 | (AVG ANNUAL DOSE) | CF: | 3.55E-09 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)**
**Site 2 – Area A Downstream, Zone 5**
**EXPOSURE SCENARIO: Older Child Trespasser; CTE**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0.5 | 1 | 4.14E–08 | 0.00E+00 | 1.77E–09 | | 7.30E–01 |
| Indeno(1,2,3–cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| 2–Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | |
| Alpha–chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | 1.30E+00 |
| 4,4'–DDD | 4.2 | 1 | 3.48E–07 | 0.00E+00 | 1.49E–08 | | 2.40E–01 |
| 4,4'–DDE | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 3.40E–01 |
| 4,4'–DDT | 2.3 | 1 | 1.91E–07 | 0.00E+00 | 8.16E–09 | 5.00E–04 | 3.40E–01 |
| Dieldrin | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–05 | 1.60E+01 |
| Aroclors | 0.28 | 1 | 2.32E–08 | 0.00E+00 | 9.94E–10 | 2.00E–05 | ~~7.70E+00~~ 1E+0* |
| 1,2,3,4,6,7,8–HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~ 03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~8480~~ | ~~1~~ | ~~7.02E–04~~ | ~~0.00E+00~~ | ~~3.01E–05~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E–04 | |
| Arsenic | 2.2 | 1 | 1.82E–07 | 0.00E+00 | 7.81E–09 | 3.00E–04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–02 | |
| Beryllium | 0.9 | 1 | 7.45E–08 | 0.00E+00 | 3.19E–09 | 5.00E–03 | 4.30E+00 |
| Cadmium | 3.4 | 1 | 2.82E–07 | 0.00E+00 | 1.21E–08 | 5.00E–04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Iron~~ | ~~17900~~ | ~~1~~ | ~~1.48E–03~~ | ~~0.00E+00~~ | ~~6.35E–05~~ | ~~3.00E–01~~ | |
| Manganese | 158 | 1 | 1.31E–05 | 0.00E+00 | 5.61E–07 | ~~5.00E–03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–04 | |
| Vanadium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

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Revisions
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KMB

* Based on new PCB guidance (USEPA, September 1996).

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)**
**Site 2 – Area A Downstream, Zone 5**
**EXPOSURE SCENARIO: Older Child Trespasser; CTE**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX CHILD | HAZARD INDEX YOUTH | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 1.30E−09 |
| Indeno(1,2,3−cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2−Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha−chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDD | 0.00E+00 | 0.00E+00 | 3.58E−09 |
| 4,4'−DDE | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDT | 3.81E−04 | 0.00E+00 | 2.78E−09 |
| Dieldrin | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Aroclors | 1.16E−03 | 0.00E+00 | ~~7.05E−09~~ 9.94E−10 * |
| 1,2,3,4,6,7,8−HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~7.02E−04~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 6.07E−04 | 0.00E+00 | 1.17E−08 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 1.49E−05 | 0.00E+00 | 1.37E−08 |
| Cadmium | 5.63E−04 | 0.00E+00 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~4.94E−03~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | ~~2.62E−03~~ 5.46E−4 | 0.00E+00 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~1.10E−02~~ 3.27E-3 | **0.00E+00** | ~~4.08E−08~~ 3.41E-8 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions
02/28/97
KMD

000321

**RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 5
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

***EXPOSURE SCENARIO: Older Child Trespasser, CTE***

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | | |
|---|---|---|---|
| C | = CONCENTRATION IN SOIL/SEDIMENT (MG/KG) | | |
| SA1 | = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 3150 |
| SA2 | = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| AF | = ADHERENCE FACTOR (MG/SQ CM): | | 0.2 |
| ABS | = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | | Dioxins: | 0.03 |
| | | PCBS: | 0.06 |
| EF1 | = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 52 |
| EF2 | = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| ED1 | = YOUTH EXPOSURE DURATION (YEARS): | | 3 |
| ED2 | = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd | = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 0.5 |
| BW1 | = BODY WEIGHT ADOLESCENT (KG): | | 43 |
| BW2 | = BODY WEIGHT ADULT (KG): | | 1 |
| AT1 | = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 1095 |
| AT2 | = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 | = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 1.04E–06 CANCER RISK = (CF3)*(C)*(ABS) CF3 = 4.47E–08
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH ~~SOIL~~ SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 5
EXPOSURE SCENARIO: Older Child Trespasser, CTE
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0.28 | 0.06 | 1.75E–08 | 0.00E+00 | 7.51E–10 | 2.00E–05 | ~~7.70E+00~~ 1E+0* |
| 1,2,3,4,6,7,8–HpCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+03 |
| OCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+02 |
| Cadmium | 3.4 | 0.01 | 3.55E–08 | 0.00E+00 | 1.52E–09 | ~~1.50E–05~~ 2.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

Revisions
02/28/97
KAMS

* Based on new PCB guidance (USEPA, September 1996).

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH ~~SOIL~~ SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 5
EXPOSURE SCENARIO: Older Child Trespasser, CTE
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 8.77E-04 | 0.00E+00 | ~~5.79E-09~~ 7.51E-10 * |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | ~~2.37E-03~~ 1.42E-3 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | ~~3.24E-03~~ 2.30E-3 | 0.00E+00 | ~~5.79E-09~~ 7.51E-10 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions 02/28/97 KMS

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES**

SITE NAME: Site 2 – Area A Downstream, Zone 5
LOCATION: NSB–NLON, Groton, CT
DATE: 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
TWO EXPOSURE ROUTES ARE CONSIDERED: INCIDENTAL INGESTION AND DERMAL CONTACT.
ASSUMPTIONS ARE OUTLINED BELOW.

***EXPOSURE SCENARIO: Older Child Trespasser; CTE***

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (L/HR)
ET = EXPOSURE TIME (HRS/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY–STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

INGESTION:

| | | | |
|---|---|---|---|
| CR: | 0.05 | CONVERSION FACTOR (NONCAR) = | 3.31E–04 |
| ET: | 2 | | |
| EF: | 52 | | |
| ED: | 3 | CONVERSION FACTOR (CARCIN) = | 1.42E–05 |
| BW: | 43 | | |
| AT(NOCN): | 1095 | | |
| AT(CAR): | 25550 | | |

DERMAL CONTACT:

| | | | |
|---|---|---|---|
| EV: | 1 | CONVERSION FACTOR (NONCAR) = | 1.04E+01 |
| ED: | 3 | | |
| EF: | 52 | | |
| A: | 3150 | CONVERSION FACTOR (CARCIN) = | 4.47E–01 |
| tevent: | 2 | | |
| BW: | 43 | | |
| AT(NON): | 1095 | | |
| AT(CAR): | 25550 | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
Site 2 – Area A Downstream, Zone 5
EXPOSURE SCENARIO: Older Child Trespasser; CTE

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0 | O | 6.90E−01 | 2.90E−01 | 4.50E−03 | 1.80E−03 | 0.00E+00 |
| Tetrachloroethene | 0.003 | O | 4.30E+00 | 9.00E−01 | 4.80E−02 | 2.50E−01 | 5.34E−07 |
| 4,4'−DDD | 0 | O | 3.70E+01 | 7.80E+00 | 2.80E−01 | 6.30E+01 | 0.00E+00 |
| 4,4'−DDE | 0 | O | 3.60E+01 | 7.60E+00 | 2.40E−01 | 4.90E+01 | 0.00E+00 |
| 4,4'−DDT | 0 | O | 6.00E+01 | 1.30E+01 | 4.30E−01 | 2.30E+02 | 0.00E+00 |
| Arsenic | 0 | I | | | 1.00E−03 | | 0.00E+00 |
| Boron | 0 | I | | | 1.00E−03 | | 0.00E+00 |
| Cadmium | 0 | I | | | 1.00E−03 | | 0.00E+00 |
| Iron | 1.87 | I | | | 1.00E−03 | | 8.74E−08 |
| Manganese | 0.248 | I | | | 1.00E−03 | | 4.92E−07 |
| Mercury | 0.00033 | I | | | 1.00E−03 | | 8.60E−10 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)**
Site 2 – Area A Downstream, Zone 5
EXPOSURE SCENARIO: Older Child Trespasser; CTE
CALCULATE DOSES:

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 6.00E-02 | 6.00E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 9.94E-07 | 5.57E-06 | 1.00E-02 | 1.00E-02 | 9.94E-05 | 5.57E-04 | 6.57E-04 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 5.00E-04 | 4.00E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 0.00E+00 | 3.00E-04 | 2.80E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 0.00E+00 | 0.00E+00 | 9.00E-02 | 4.50E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | 0.00E+00 | 5.00E-04 | ~~1.50E-05~~ 2.5E-5 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~8.20E-04~~ | ~~2.90E-05~~ | ~~3.00E-01~~ | ~~1.50E-02~~ | ~~2.07E-03~~ | ~~2.66E-03~~ | ~~4.07E-03~~ |
| Manganese | 8.15E-05 | 5.13E-06 | ~~5.00E-03~~ 2.4E-2 | ~~1.50E-04~~ 7.2E-4 | ~~1.63E-02~~ 3.40E-3 | ~~3.42E-02~~ 7.13E-3 | ~~5.05E-02~~ 1.05E-2 |
| Mercury | 1.09E-07 | 6.89E-09 | 3.00E-04 | 1.50E-05 | 3.64E-04 | 4.59E-04 | 8.24E-04 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | ~~1.88E-02~~ 3.06E-3 | ~~8.78E-02~~ 8.15E-3 | ~~5.67E-02~~ 1.20E-2 |

Revisions
08/24/96
KMG

000359

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
Site 2 – Area A Downstream, Zone 5
EXPOSURE SCENARIO: Older Child Trespasser; CTE
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 7.50E–03 | 7.50E–03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 4.26E–08 | 2.39E–07 | 5.20E–05 | 5.20E–05 | 2.22E–12 | 1.24E–11 | 1.46E–11 |
| 4,4'–DDD | 0.00E+00 | 0.00E+00 | 2.40E–01 | 3.00E–01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'–DDE | 0.00E+00 | 0.00E+00 | 3.40E–01 | 4.20E–01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'–DDT | 0.00E+00 | 0.00E+00 | 3.40E–01 | 4.20E–01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 0.00E+00 | 1.50E+00 | 1.60E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 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 |
| ~~Iron~~ | ~~2.06E–05~~ | ~~1.67E–06~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | 3.49E–08 | 2.20E–07 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Mercury | 4.69E–09 | 2.95E–10 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | 2.22E–12 | 1.24E–11 | 1.46E–11 |

Revisions
08/24/96
KMB

000360

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 5
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser; RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SEDIMENT SAMPLE (MG/KG)
IR = SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 0 | IR: | 100 |
| EF: | 1 | EF: | 120 |
| Fi: | 1 | Fi: | 1 |
| ED: | 1 | ED: | 10 |
| BW: | 1 | BW: | 43 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 3650 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 7.65E–07 | (AVG ANNUAL DOSE) | CF: | 1.09E–07 |

**RISK ASSESSMENT SPREADSHEET -- INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)**
**Site 2 -- Area A Downstream, Zone 5**
**EXPOSURE SCENARIO: Older Child Trespasser; RME**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG-DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0.5 | 1 | 3.82E-07 | 0.00E+00 | 5.46E-08 | | 7.30E-01 |
| Indeno(1,2,3-cd)pyrene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E-01 |
| 2-Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E-05 | |
| Alpha-chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E-05 | 1.30E+00 |
| 4,4'-DDD | 12 | 1 | 9.17E-06 | 0.00E+00 | 1.31E-06 | | 2.40E-01 |
| 4,4'-DDE | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 3.40E-01 |
| 4,4'-DDT | 7 | 1 | 5.35E-06 | 0.00E+00 | 7.65E-07 | 5.00E-04 | 3.40E-01 |
| Dieldrin | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E-05 | 1.60E+01 |
| Aroclors | 0.28 | 1 | 2.14E-07 | 0.00E+00 | 3.06E-08 | 2.00E-05 | ~~7.70E+00~~ 2E+0 * |
| 1,2,3,4,6,7,8-HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~ 03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~15300~~ | ~~1~~ | ~~1.17E-02~~ | ~~0.00E+00~~ | ~~1.67E-03~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E-04 | |
| Arsenic | 3.8 | 1 | 2.91E-06 | 0.00E+00 | 4.15E-07 | 3.00E-04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E-02 | |
| Beryllium | 1.5 | 1 | 1.15E-06 | 0.00E+00 | 1.64E-07 | 5.00E-03 | 4.30E+00 |
| Cadmium | 6.1 | 1 | 4.66E-06 | 0.00E+00 | 6.66E-07 | 5.00E-04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E-03 | |
| ~~Iron~~ | ~~33200~~ | ~~1~~ | ~~2.54E-02~~ | ~~0.00E+00~~ | ~~3.63E-03~~ | ~~3.00E-01~~ | |
| Manganese | 236 | 1 | 1.80E-04 | 0.00E+00 | 2.58E-05 | ~~5.00E-03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E-04 | |
| Vanadium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E-03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E-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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions
02/28/97
KMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)**
**Site 2 – Area A Downstream, Zone 5**
**EXPOSURE SCENARIO: Older Child Trespasser; RME**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX CHILD | HAZARD INDEX YOUTH | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 3.99E−08 |
| Indeno(1,2,3−cd)pyrene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 2−Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha−chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDD | 0.00E+00 | 0.00E+00 | 3.15E−07 |
| 4,4'−DDE | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDT | 1.07E−02 | 0.00E+00 | 2.60E−07 |
| Dieldrin | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Aroclors | 1.07E−02 | 0.00E+00 | ~~2.35E−07~~ 6.10E-8 * |
| 1,2,3,4,6,7,8−HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~1.17E−02~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 9.68E−03 | 0.00E+00 | 6.23E−07 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 2.29E−04 | 0.00E+00 | 7.05E−07 |
| Cadmium | 9.33E−03 | 0.00E+00 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~8.46E−02~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | ~~3.61E−02~~ 7.52E-3 | 0.00E+00 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~1.73E−01~~ 4.82E-2 | 0.00E+00 | ~~2.18E−06~~ 2.00E-6 |

* Based on new PCB guidance (USEPA, September 1996).

Revisions
02/28/97
KMS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH SEDIMENT

SITE NAME: Site 2 – Area A Downstream, Zone 5
LOCATION: NSB–NLON, Groton, CT
DATE: 12/21/95

QUANTITATIVE EVALUATION PERFORMED FOR CADMIUM, DIOXINS, AND PCBS ONLY.
EXPOSURES TO OTHER CHEMICALS OF CONCERN ARE ADDRESSED QUALITATIVELY.

**EXPOSURE SCENARIO: Older Child Trespasser, RME**

RELEVANT EQUATION: DEX = (C x SA x AF x ABS x EF x ED)/(BW x AT x 1E6)

WHERE:

| | | | |
|---|---|---|---|
| C | = CONCENTRATION IN SOIL/SEDIMENT (MG/KG) | | |
| SA1 | = YOUTH SKIN SURFACE AREA (SQ CM/DAY): | | 3150 |
| SA2 | = ADULT SKIN SURFACE AREA (SQ CM/DAY): | | 0 |
| AF | = ADHERENCE FACTOR (MG/SQ CM): | | 1 |
| ABS | = ABSORPTION FRACTION: (DECIMAL FRACTION) | Cd: | 0.01 |
| | | Dioxins: | 0.03 |
| | | PCBS: | 0.06 |
| EF1 | = YOUTH EXPOSURE FREQUENCY (DAYS/YEAR): | | 120 |
| EF2 | = ADULT EXPOSURE FREQUENCY (DAYS/YEAR): | | 1 |
| ED1 | = YOUTH EXPOSURE DURATION (YEARS): | | 10 |
| ED2 | = ADULT EXPOSURE DURATION (YEARS): | | 1 |
| Fd | = FRACTION OF SOIL FROM SOURCE AVAILABLE FOR DERMAL CONTACT | | 1 |
| BW1 | = BODY WEIGHT ADOLESCENT (KG): | | 43 |
| BW2 | = BODY WEIGHT ADULT (KG): | | 1 |
| AT1 | = AVERAGING TIME (DAYS), NONCARCINOGENS (YOUTH): | | 3650 |
| AT2 | = AVERAGING TIME (DAYS), NONCARCINOGENS (ADULT): | | 365 |
| AT3 | = AVERAGING TIME (DAYS), CARCINOGENS: | | 25550 |

DETERMINE CONVERSION FACTORS:
DEX = (C)*(SA SQ CM)*(AF MG/SQ CM)*(ABS)*(EF DAYS/YEAR)*(ED YEARS)/(AT DAYS)/(BW KG)/(1 KG/1E6 MG)

DOSEyouth = (CF1)*(C)*(ABS) CF1 = 2.41E-05
DOSEadult = (CF2)*(C)*(ABS) CF2 = 0.00E+00

CANCER RISK = (CF3)*(C)*(ABS) CF3 = 3.44E-06

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH ~~SOIL~~ SEDIMENT (PAGE TWO)
Site 2 – Area A Downstream, Zone 5
EXPOSURE SCENARIO: Older Child Trespasser, RME
CALCULATE DOSES:

| CHEMICAL | C (MG/KG) | ABSORPTION FRACTION | ANNUAL YOUTH DOSE (MG/KG/DAY) | ANNUAL ADULT DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Aroclors | 0.28 | 0.06 | 4.05E–07 | 0.00E+00 | 5.78E–08 | 2.00E–05 | ~~7.70E+00~~ 2E+0* |
| 1,2,3,4,6,7,8–HpCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+03 |
| OCDD | 0 | 0.03 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.73E+02 |
| Cadmium | 6.1 | 0.01 | 1.47E–06 | 0.00E+00 | 2.10E–07 | ~~1.50E–05~~ 1.5E-5 | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

* Based on new PCB guidance (USEPA, September 1996).

Revisions
02/28/97
KMS

RISK ASSESSMENT SPREADSHEET – DIRECT DERMAL CONTACT WITH ~~SOIL~~ SEDIMENT (PAGE THREE)
Site 2 – Area A Downstream, Zone 5
EXPOSURE SCENARIO: Older Child Trespasser, RME
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Aroclors | 2.02E-02 | 0.00E+00 | ~~4.45E-07~~ 1.16E-7 * |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | ~~0.70E-02~~ 5.87E-2 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL | ~~1.10E-01~~ 7.89E-2 | 0.00E+00 | ~~4.45E-07~~ 1.16E-7 |

*Based on new PCB guidance (USEPA, September 1996).

Revisions 02/28/97 KMS

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES**

**SITE NAME:** Site 2 – Area A Downstream, Zone 5
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
TWO EXPOSURE ROUTES ARE CONSIDERED: INCIDENTAL INGESTION AND DERMAL CONTACT.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser; RME**

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (L/HR)
ET = EXPOSURE TIME (HRS/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY–STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

INGESTION:

| | | | |
|---|---|---|---|
| CR: | 0.05 | CONVERSION FACTOR (NONCAR) = | 1.53E–03 |
| ET: | 4 | | |
| EF: | 120 | | |
| ED: | 10 | CONVERSION FACTOR (CARCIN) = | 2.16E–04 |
| BW: | 43 | | |
| AT(NOCN): | 3650 | | |
| AT(CAR): | 25550 | | |

DERMAL CONTACT:

| | | | |
|---|---|---|---|
| EV: | 1 | CONVERSION FACTOR (NONCAR) = | 2.41E+01 |
| ED: | 10 | | |
| EF: | 120 | | |
| A: | 3150 | CONVERSION FACTOR (CARCIN) = | 3.44E+00 |
| tevent: | 4 | | |
| BW: | 43 | | |
| AT(NON): | 3650 | | |
| AT(CAR): | 25550 | | |

RISK ASSESSMENT SPREADSHEET -- SURFACE WATER EXPOSURES (PAGE TWO)
Site 2 -- Area A Downstream, Zone 5
EXPOSURE SCENARIO: Older Child Trespasser; RME

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0 | O | 6.90E-01 | 2.90E-01 | 4.50E-03 | 1.80E-03 | 0.00E+00 |
| Tetrachloroethene | 0.003 | O | 4.30E+00 | 9.00E-01 | 4.80E-02 | 2.50E-01 | 7.55E-07 |
| 4,4'-DDD | 0 | O | 3.70E+01 | 7.80E+00 | 2.80E-01 | 6.30E+01 | 0.00E+00 |
| 4,4'-DDE | 0 | O | 3.60E+01 | 7.60E+00 | 2.40E-01 | 4.90E+01 | 0.00E+00 |
| 4,4'-DDT | 0 | O | 6.00E+01 | 1.30E+01 | 4.30E-01 | 2.30E+02 | 0.00E+00 |
| Arsenic | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Boron | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Cadmium | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| ~~Iron~~ | ~~2.98~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~1.10E-05~~ |
| Manganese | 0.533 | I | | | 1.00E-03 | | 2.13E-06 |
| Mercury | 0.0015 | I | | | 1.00E-03 | | 6.00E-09 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
Site 2 – Area A Downstream, Zone 5
EXPOSURE SCENARIO: Older Child Trespasser; RME
CALCULATE DOSES:

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 6.00E-02 | 6.00E-02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 4.59E-06 | 1.82E-05 | 1.00E-02 | 1.00E-02 | 4.59E-04 | 1.82E-03 | 2.28E-03 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 5.00E-04 | 4.00E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 0.00E+00 | 3.00E-04 | 2.80E-04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 0.00E+00 | 0.00E+00 | 9.00E-02 | 4.50E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | 0.00E+00 | 5.00E-04 | ~~1.50E-05~~ 2.5E-5 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Iron | ~~4.50E-03~~ | ~~2.87E-04~~ | ~~3.00E-01~~ | ~~1.50E-02~~ | ~~1.52E-02~~ | ~~1.91E-02~~ | ~~3.43E-02~~ |
| Manganese | 8.15E-04 | 5.13E-05 | ~~5.00E-03~~ 2.4E-2 | ~~1.60E-04~~ 7.2E-4 | ~~1.63E-01~~ 3.40E-2 | ~~3.42E-01~~ 7.13E-2 | ~~5.05E-01~~ 1.05E-1 |
| Mercury | 2.29E-06 | 1.45E-07 | 3.00E-04 | 1.50E-05 | 7.65E-03 | 9.63E-03 | 1.73E-02 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | ~~1.88E-01~~ 4.21E-2 | ~~3.78E-01~~ 8.28E-2 | ~~5.59E-01~~ 1.25E-1 |

Revisions
08/24/96
KAS

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
Site 2 – Area A Downstream, Zone 5
EXPOSURE SCENARIO: Older Child Trespasser; RME
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 7.50E-03 | 7.50E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 6.55E-07 | 2.60E-06 | 5.20E-05 | 5.20E-05 | 3.41E-11 | 1.35E-10 | 1.69E-10 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 2.40E-01 | 3.00E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 3.40E-01 | 4.20E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 3.40E-01 | 4.20E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 0.00E+00 | 1.50E+00 | 1.60E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 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 |
| ~~Iron~~ | ~~0.51E-04~~ | ~~4.16E-05~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | 1.16E-04 | 7.34E-06 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Mercury | 3.28E-07 | 2.06E-08 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | 3.41E-11 | 1.35E-10 | 1.69E-10 |

000372

Revisions
08/24/96
KMG

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL**

**SITE NAME:** Site 2 – Area A Downstream, Zone 6
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker (Sediment), CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SOIL SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 240 | IR: | 0 |
| EF: | 80 | EF: | 1 |
| Fi: | 0.5 | Fi: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 3.76E–07 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 5.37E–09 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)**
**Site 2 – Area A Downstream, Zone 6**
**EXPOSURE SCENARIO: Construction Worker (Sediment), CTE**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0.48 | 1 | 0.00E+00 | 1.80E–07 | 2.58E–09 | | 7.30E+00 |
| Benzo(B)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Indeno(1,2,3–cd)pyrene | 0.66 | 1 | 0.00E+00 | 2.48E–07 | 3.54E–09 | | 7.30E–01 |
| 2–Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | |
| Alpha–chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | 1.30E+00 |
| 4,4'–DDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 2.40E–01 |
| 4,4'–DDE | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 3.40E–01 |
| 4,4'–DDT | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–04 | 3.40E–01 |
| Dieldrin | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 2E+0 |
| 1,2,3,4,6,7,8–HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+07 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+08 |
| ~~Aluminum~~ | ~~0~~ | ~~1~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E–04 | |
| Arsenic | 1.1 | 1 | 0.00E+00 | 4.13E–07 | 5.90E–09 | 3.00E–04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–02 | |
| Beryllium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | 4.30E+00 |
| Cadmium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Iron~~ | ~~0~~ | ~~1~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E–01~~ | |
| Manganese | 534 | 1 | 0.00E+00 | 2.01E–04 | 2.87E–06 | 5.00E–03 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–04 | |
| Vanadium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

000374

Revisions
00/2.4/94
KMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)**
**Site 2 – Area A Downstream, Zone 6**
**EXPOSURE SCENARIO: Construction Worker (Sediment), CTE**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 1.88E−08 |
| Benzo(B)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3−cd)pyrene | 0.00E+00 | 0.00E+00 | 2.59E−09 |
| 2−Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha−chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDE | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDT | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Dieldrin | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8−HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 1.38E−03 | 8.86E−09 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~4.01E−02~~ 8.37E-3 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~4.15E−02~~ 9.75E-3 | **3.03E−08** |

Revisions
08/24/94
KMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 6
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Construction Worker (Sediment), RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SEDIMENT SAMPLE (MG/KG)
IR = SOIL INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 480 | IR: | 0 |
| EF: | 120 | EF: | 1 |
| Fi: | 1 | Fi: | 1 |
| ED: | 1 | ED: | 1 |
| BW: | 70 | BW: | 1 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 365 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 2.25E–06 | (AVG ANNUAL DOSE) | CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 3.22E–08 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE TWO)**
**Site 2 – Area A Downstream, Zone 6**
**EXPOSURE SCENARIO: Construction Worker (Sediment), RME**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG-DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0.64 | 1 | 0.00E+00 | 1.44E-06 | 2.06E-08 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E-01 |
| Indeno(1,2,3-cd)pyrene | 1.2 | 1 | 0.00E+00 | 2.71E-06 | 3.86E-08 | | 7.30E-01 |
| 2-Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E-05 | |
| Alpha-chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E-05 | 1.30E+00 |
| 4,4'-DDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 2.40E-01 |
| 4,4'-DDE | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 3.40E-01 |
| 4,4'-DDT | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E-04 | 3.40E-01 |
| Dieldrin | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E-05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E-05 | ~~7.70E+00~~ 2E+0* |
| 1,2,3,4,6,7,8-HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~ 03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~0~~ | ~~1~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E-04 | |
| Arsenic | 1.1 | 1 | 0.00E+00 | 2.48E-06 | 3.54E-08 | 3.00E-04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E-02 | |
| Beryllium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E-03 | 4.30E+00 |
| Cadmium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E-04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E-03 | |
| ~~Iron~~ | ~~0~~ | ~~1~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~3.00E-01~~ | |
| Manganese | 877 | 1 | 0.00E+00 | 1.98E-03 | 2.82E-05 | ~~5.00E-03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E-04 | |
| Vanadium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E-03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E-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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

*Based on new PCB guidance (OSWER, September 1996).

Revisions
02/28/97
AMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SOIL (PAGE THREE)**
**Site 2 – Area A Downstream, Zone 6**
**EXPOSURE SCENARIO: Construction Worker (Sediment), RME**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX YOUTH | HAZARD INDEX ADULT | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 1.50E-07 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 2.82E-08 |
| 2-Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha-chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Dieldrin | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 8.27E-03 | 5.31E-08 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | 0.00E+00 | ~~8.85E-01~~ 8.22E-2 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | **0.00E+00** | ~~4.04E-01~~ 9.05E-2 | **2.32E-07** |

Revisions
02/28/97
TAAS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 6
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser; CTE**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SEDIMENT SAMPLE (MG/KG)
IR = SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 0 | IR: | 50 |
| EF: | 1 | EF: | 52 |
| Fi: | 1 | Fi: | 0.5 |
| ED: | 1 | ED: | 3 |
| BW: | 1 | BW: | 43 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 1095 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 8.28E–08 | (AVG ANNUAL DOSE) | CF: | 3.55E–09 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)**
**Site 2 – Area A Downstream, Zone 6**
**EXPOSURE SCENARIO: Older Child Trespasser; CTE**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0.48 | 1 | 3.98E–08 | 0.00E+00 | 1.70E–09 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E–01 |
| Indeno(1,2,3–cd)pyrene | 0.66 | 1 | 5.47E–08 | 0.00E+00 | 2.34E–09 | | 7.30E–01 |
| 2–Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | |
| Alpha–chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E–05 | 1.30E+00 |
| 4,4'–DDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 2.40E–01 |
| 4,4'–DDE | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 3.40E–01 |
| 4,4'–DDT | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–04 | 3.40E–01 |
| Dieldrin | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E–05 | ~~7.70E+00~~ 1E+0* |
| 1,2,3,4,6,7,8–HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~ 03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~0~~ | ~~1~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E–04 | |
| Arsenic | 1.1 | 1 | 9.11E–08 | 0.00E+00 | 3.90E–09 | 3.00E–04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–02 | |
| Beryllium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | 4.30E+00 |
| Cadmium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E–03 | |
| ~~Iron~~ | ~~9580~~ | ~~1~~ | ~~7.89E–04~~ | ~~0.00E+00~~ | ~~0.00E–05~~ | ~~3.00E–01~~ | |
| Manganese | 534 | 1 | 4.42E–05 | 0.00E+00 | 1.90E–06 | ~~5.00E–03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–04 | |
| Vanadium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E–03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E–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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

000382

Revisions
02/28/97
KMS

* Based on new PCB guidance (USEPA, September 1996).

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)**
**Site 2 – Area A Downstream, Zone 6**
**EXPOSURE SCENARIO: Older Child Trespasser; CTE**
DETERMINE HAZARD INDICES AND CANCER RISK

| CHEMICAL | HAZARD INDEX CHILD | HAZARD INDEX YOUTH | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 1.24E-08 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 1.71E-09 |
| 2-Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha-chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Dieldrin | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 3.04E-04 | 0.00E+00 | 5.86E-09 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~2.63E-03~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | ~~8.85E-03~~ 1.84E-3 | 0.00E+00 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~1.18E-02~~ 2.14E-3 | **0.00E+00** | **2.00E-08** |

Revisions
02/28/97
KAS

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES**

SITE NAME: Site 2 – Area A Downstream, Zone 6
LOCATION: NSB–NLON, Groton, CT
DATE: 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
TWO EXPOSURE ROUTES ARE CONSIDERED: INCIDENTAL INGESTION AND DERMAL CONTACT.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser; CTE**

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (L/HR)
ET = EXPOSURE TIME (HRS/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY – STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

INGESTION:

| | | | |
|---|---|---|---|
| CR: | 0.05 | CONVERSION FACTOR (NONCAR) = | 3.31E–04 |
| ET: | 2 | | |
| EF: | 52 | | |
| ED: | 3 | CONVERSION FACTOR (CARCIN) = | 1.42E–05 |
| BW: | 43 | | |
| AT(NOCN): | 1095 | | |
| AT(CAR): | 25550 | | |

DERMAL CONTACT:

| | | | |
|---|---|---|---|
| EV: | 1 | CONVERSION FACTOR (NONCAR) = | 1.04E+01 |
| ED: | 3 | | |
| EF: | 52 | | |
| A: | 3150 | CONVERSION FACTOR (CARCIN) = | 4.47E–01 |
| tevent: | 2 | | |
| BW: | 43 | | |
| AT(NON): | 1095 | | |
| AT(CAR): | 25550 | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
Site 2 – Area A Downstream, Zone 6
EXPOSURE SCENARIO: Older Child Trespasser; CTE

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0 | O | 6.90E–01 | 2.90E–01 | 4.50E–03 | 1.80E–03 | 0.00E+00 |
| Tetrachloroethene | 0 | O | 4.30E+00 | 9.00E–01 | 4.80E–02 | 2.50E–01 | 0.00E+00 |
| 4,4'–DDD | 0 | O | 3.70E+01 | 7.80E+00 | 2.80E–01 | 6.30E+01 | 0.00E+00 |
| 4,4'–DDE | 0 | O | 3.60E+01 | 7.60E+00 | 2.40E–01 | 4.90E+01 | 0.00E+00 |
| 4,4'–DDT | 0 | O | 6.00E+01 | 1.30E+01 | 4.30E–01 | 2.30E+02 | 0.00E+00 |
| Arsenic | 0 | I | | | 1.00E–03 | | 0.00E+00 |
| Boron | 0.908 | I | | | 1.00E–03 | | 1.82E–06 |
| Cadmium | 0 | I | | | 1.00E–03 | | 0.00E+00 |
| ~~Iron~~ | ~~0.889~~ | ~~I~~ | | | ~~1.00E–03~~ | | ~~1.78E–06~~ |
| Manganese | 0.695 | I | | | 1.00E–03 | | 1.39E–06 |
| Mercury | 0 | I | | | 1.00E–03 | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
Site 2 – Area A Downstream, Zone 8
EXPOSURE SCENARIO: Older Child Trespasser; CTE
CALCULATE DOSES:

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 6.00E−02 | 6.00E−02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 1.00E−02 | 1.00E−02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDD | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDE | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDT | 0.00E+00 | 0.00E+00 | 5.00E−04 | 4.00E−04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 0.00E+00 | 3.00E−04 | 2.80E−04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 3.01E−04 | 1.90E−05 | 9.00E−02 | 4.50E−03 | 3.34E−03 | 4.21E−03 | 7.55E−03 |
| Cadmium | 0.00E+00 | 0.00E+00 | 5.00E−04 | ~~1.50E−05~~ 2.5E-5 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~2.95E−04~~ | ~~1.88E−05~~ | ~~3.00E−01~~ | ~~1.50E−02~~ | ~~9.82E−04~~ | ~~1.24E−03~~ | ~~2.22E−03~~ |
| Manganese | 2.30E−04 | 1.45E−05 | ~~5.00E−03~~ 2.4E-2 | ~~1.50E−04~~ 7.2E-4 | ~~4.61E−02~~ 9.60E-3 | ~~9.67E−03~~ 2.01E-2 | ~~1.43E−01~~ 2.97E-2 |
| Mercury | 0.00E+00 | 0.00E+00 | 3.00E−04 | 1.50E−05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | ~~5.84E−02~~ 1.29E-2 | ~~1.02E−01~~ 2.43E-2 | ~~1.63E−01~~ 3.73E-2 |

Revisions
08/24/96
HMS

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE FOUR)
Site 2 – Area A Downstream, Zone 6
EXPOSURE SCENARIO: Older Child Trespasser; CTE
CALCULATE INCREMENTAL CANCER RISKS.

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 7.50E−03 | 7.50E−03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 5.20E−05 | 5.20E−05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDD | 0.00E+00 | 0.00E+00 | 2.40E−01 | 3.00E−01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDE | 0.00E+00 | 0.00E+00 | 3.40E−01 | 4.20E−01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDT | 0.00E+00 | 0.00E+00 | 3.40E−01 | 4.20E−01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 0.00E+00 | 1.50E+00 | 1.60E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 1.29E−05 | 8.12E−07 | | | 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 |
| ~~Iron~~ | ~~1.26E−05~~ | ~~7.95E−07~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | 9.87E−06 | 6.22E−07 | | | 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 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |

Revisions
08/24/96
KMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT**

**SITE NAME:** Site 2 – Area A Downstream, Zone 6
**LOCATION:** NSB–NLON, Groton, CT
**DATE:** 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY THIS SPREADSHEET.
EXPOSURES THROUGH PICA INGESTION ARE CONSIDERED.
ASSUMPTIONS ARE OUTLINED BELOW.

**EXPOSURE SCENARIO: Older Child Trespasser; RME**

RELEVANT EQUATION: IEX = (C x IR x Fi x BIO x EF x ED)/(BW x AT x 1E6)

WHERE:
C = MEAN CONCENTRATION IN SEDIMENT SAMPLE (MG/KG)
IR = SEDIMENT INGESTION RATE (MG/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
Fi = FRACTION FROM CONTAMINATED SOURCE
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)
BIO = BIOAVAILABILITY

ENTER INPUT PARAMETERS:

| ADULT: | | YOUTH: | |
|---|---|---|---|
| IR: | 0 | IR: | 100 |
| EF: | 1 | EF: | 120 |
| Fi: | 1 | Fi: | 1 |
| ED: | 1 | ED: | 10 |
| BW: | 1 | BW: | 43 |
| AT(CAR): | 25550 | AT(CAR): | 25550 |
| AT(NON): | 365 | AT(NON): | 3650 |

DETERMINE CONVERSION FACTORS:

| ADULT: | | | YOUTH: | | | ADULT/YOUTH (CANCER RISK): | |
|---|---|---|---|---|---|---|---|
| CF: | 0.00E+00 | (AVG ANNUAL DOSE) | CF: | 7.65E–07 | (AVG ANNUAL DOSE) | CF: | 1.09E–07 |

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE TWO)**
**Site 2 – Area A Downstream, Zone 6**
**EXPOSURE SCENARIO: Older Child Trespasser; RME**
CALCULATE DOSES:

| CHEMICAL | C(MG/KG) | BIOAVAILABILITY | YOUTH ANNUAL DOSE (MG/KG/DAY) | ADULT ANNUAL DOSE (MG/KG/DAY) | LIFETIME AVERAGE DOSE (MG/KG/DAY) | RFD (MG/KG/DAY) | CSF (KG–DAY/MG) |
|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | 0.64 | 1 | 4.89E−07 | 0.00E+00 | 6.99E−08 | | 7.30E+00 |
| Benzo(b)fluoranthene | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 7.30E−01 |
| Indeno(1,2,3−cd)pyrene | 1.2 | 1 | 9.17E−07 | 0.00E+00 | 1.31E−07 | | 7.30E−01 |
| 2−Nitroaniline | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E−05 | |
| Alpha−chlordane | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 6.00E−05 | 1.30E+00 |
| 4,4'−DDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 2.40E−01 |
| 4,4'−DDE | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 3.40E−01 |
| 4,4'−DDT | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E−04 | 3.40E−01 |
| Dieldrin | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E−05 | 1.60E+01 |
| Aroclors | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 2.00E−05 | ~~7.70E+00~~ 2E+0* |
| 1,2,3,4,6,7,8−HpCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~07~~ 03 |
| OCDD | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | | 1.56E+~~08~~ 02 |
| ~~Aluminum~~ | ~~0~~ | ~~1~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~1.00E+00~~ | |
| Antimony | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 4.00E−04 | |
| Arsenic | 1.1 | 1 | 8.41E−07 | 0.00E+00 | 1.20E−07 | 3.00E−04 | 1.50E+00 |
| Barium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E−02 | |
| Beryllium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E−03 | 4.30E+00 |
| Cadmium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E−04 | |
| Chromium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 5.00E−03 | |
| ~~Iron~~ | ~~10500~~ | ~~1~~ | ~~8.03E−03~~ | ~~0.00E+00~~ | ~~1.15E−03~~ | ~~3.00E−01~~ | |
| Manganese | 877 | 1 | 6.71E−04 | 0.00E+00 | 9.58E−05 | ~~5.00E−03~~ 2.4E-2 | |
| Mercury | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E−04 | |
| Vanadium | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 7.00E−03 | |
| Zinc | 0 | 1 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.00E−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 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |
| | | | 0.00E+00 | 0.00E+00 | 0.00E+00 | | |

*Based on new PCB guidance (USEPA, September 1996).

Revisions
02/28/97
KMS

**RISK ASSESSMENT SPREADSHEET – INCIDENTAL INGESTION OF SEDIMENT (PAGE THREE)**
**Site 2 – Area A Downstream, Zone 6**
**EXPOSURE SCENARIO: Older Child Trespasser; RME**
DETERMINE HAZARD INDICES AND CANCER RISK:

| CHEMICAL | HAZARD INDEX CHILD | HAZARD INDEX YOUTH | INCREMENTAL CANCER RISK |
|---|---|---|---|
| Benzo(a)pyrene | 0.00E+00 | 0.00E+00 | 5.10E-07 |
| Benzo(b)fluoranthene | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 0.00E+00 | 0.00E+00 | 9.57E-08 |
| 2-Nitroaniline | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Alpha-chlordane | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Dieldrin | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Aroclors | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 1,2,3,4,6,7,8-HpCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| OCDD | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Aluminum~~ | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Antimony | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 2.80E-03 | 0.00E+00 | 1.80E-07 |
| Barium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Beryllium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Cadmium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Chromium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| ~~Iron~~ | ~~2.68E-02~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | ~~1.34E-01~~ 2.79E-2 | 0.00E+00 | 0.00E+00 |
| Mercury | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Vanadium | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Zinc | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| **TOTAL** | ~~1.64E-01~~ 3.07E-2 | **0.00E+00** | **7.86E-07** |

Revisions
02/28/97
KMD

**RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES**

SITE NAME: Site 2 – Area A Downstream, Zone 6
LOCATION: NSB–NLON, Groton, CT
DATE: 01/08/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
TWO EXPOSURE ROUTES ARE CONSIDERED: INCIDENTAL INGESTION AND DERMAL CONTACT.
ASSUMPTIONS ARE OUTLINED BELOW.

***EXPOSURE SCENARIO: Older Child Trespasser; RME***

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

INGESTION: IEX = (C x CR x ET x EF x ED)/(BW x AT)

WHERE:
C = SURFACE WATER CONCENTRATION (MG/L)
CR = CONTACT RATE (L/HR)
ET = EXPOSURE TIME (HRS/EVENT)
EF = EXPOSURE FREQUENCY (EVENTS/YEAR)
ED = EXPOSURE DURATION (YEARS)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

DERMAL CONTACT: DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1000 CM**3/L)
t* = TIME IT TAKES TO REACH STEADY-STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

INGESTION:

| | | | |
|---|---|---|---|
| CR: | 0.05 | CONVERSION FACTOR (NONCAR) = | 1.53E-03 |
| ET: | 4 | | |
| EF: | 120 | | |
| ED: | 10 | CONVERSION FACTOR (CARCIN) = | 2.18E-04 |
| BW: | 43 | | |
| AT(NOCN): | 3650 | | |
| AT(CAR): | 25550 | | |

DERMAL CONTACT:

| | | | |
|---|---|---|---|
| EV: | 1 | CONVERSION FACTOR (NONCAR) = | 2.41E+01 |
| ED: | 10 | | |
| EF: | 120 | | |
| A: | 3150 | CONVERSION FACTOR (CARCIN) = | 3.44E+00 |
| tevent: | 4 | | |
| BW: | 43 | | |
| AT(NON): | 3650 | | |
| AT(CAR): | 25550 | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE TWO)
Site 2 – Area A Downstream, Zone 6
EXPOSURE SCENARIO: Older Child Trespasser; RME

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0 | O | 6.90E-01 | 2.90E-01 | 4.50E-03 | 1.80E-03 | 0.00E+00 |
| Tetrachloroethene | 0 | O | 4.30E+00 | 9.00E-01 | 4.80E-02 | 2.50E-01 | 0.00E+00 |
| 4,4'-DDD | 0 | O | 3.70E+01 | 7.80E+00 | 2.80E-01 | 6.30E+01 | 0.00E+00 |
| 4,4'-DDE | 0 | O | 3.60E+01 | 7.60E+00 | 2.40E-01 | 4.90E+01 | 0.00E+00 |
| 4,4'-DDT | 0 | O | 6.00E+01 | 1.30E+01 | 4.30E-01 | 2.30E+02 | 0.00E+00 |
| Arsenic | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| Boron | 1.54 | I | | | 1.00E-03 | | 6.16E-06 |
| Cadmium | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| ~~Iron~~ | ~~2.34~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~9.36E-06~~ |
| Manganese | 1.14 | I | | | 1.00E-03 | | 4.56E-06 |
| Mercury | 0 | I | | | 1.00E-03 | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | |

RISK ASSESSMENT SPREADSHEET – SURFACE WATER EXPOSURES (PAGE THREE)
Site 2 – Area A Downstream, Zone 6
EXPOSURE SCENARIO: Older Child Trespasser; RME
CALCULATE DOSES.

| CHEMICAL | ANNUAL INGESTION DOSE (MG/KG/DAY) | ANNUAL DERMAL DOSE (MG/KG/DAY) | INGESTION RfD (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX INGESTION | HAZARD INDEX DERMAL | TOTAL HAZARD INDEX |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 6.00E−02 | 6.00E−02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 1.00E−02 | 1.00E−02 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDD | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDE | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'−DDT | 0.00E+00 | 0.00E+00 | 5.00E−04 | 4.00E−04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 0.00E+00 | 3.00E−04 | 2.80E−04 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 2.35E−03 | 1.48E−04 | 9.00E−02 | 4.50E−03 | 2.62E−02 | 3.30E−02 | 5.91E−02 |
| Cadmium | 0.00E+00 | 0.00E+00 | 5.00E−04 | ~~1.50E−05~~ 2.5E-5 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Iron | 3.58E−03 | 2.25E−04 | 3.00E−01 | 1.50E−02 | 1.19E−02 | 1.50E−02 | 2.70E−02 |
| Manganese | 1.74E−03 | 1.10E−04 | ~~5.00E−03~~ 2.4E-2 | ~~4.50E−04~~ 7.2E-4 | ~~3.49E−01~~ 7.27E-2 | ~~7.30E−01~~ 1.53E-1 | ~~1.08E+00~~ 2.26E-1 |
| Mercury | 0.00E+00 | 0.00E+00 | 3.00E−04 | 1.50E−05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | ~~8.07E−01~~ 9.89E-2 | ~~7.80E−01~~ 1.86E-1 | ~~1.47E+00~~ 2.85E-1 |

RISK ASSESSMENT SPREADSHEET -- SURFACE WATER EXPOSURES (PAGE FOUR)
Site 2 -- Area A Downstream, Zone 6
EXPOSURE SCENARIO: Older Child Trespasser; RME
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE INGESTION DOSE (MG/KG/DAY) | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF INGESTION (KG/DAY/MG) | CSF DERMAL (KG/DAY/MG) | CANCER RISK INGESTION | CANCER RISK DERMAL CONTACT | TOTAL CANCER RISK |
|---|---|---|---|---|---|---|---|
| Methylene chloride | 0.00E+00 | 0.00E+00 | 7.50E-03 | 7.50E-03 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Tetrachloroethene | 0.00E+00 | 0.00E+00 | 5.20E-05 | 5.20E-05 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDD | 0.00E+00 | 0.00E+00 | 2.40E-01 | 3.00E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDE | 0.00E+00 | 0.00E+00 | 3.40E-01 | 4.20E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 4,4'-DDT | 0.00E+00 | 0.00E+00 | 3.40E-01 | 4.20E-01 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Arsenic | 0.00E+00 | 0.00E+00 | 1.50E+00 | 1.60E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| Boron | 3.36E-04 | 2.12E-05 | | | 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 |
| ~~Iron~~ | ~~5.11E-04~~ | ~~3.22E-05~~ | | | ~~0.00E+00~~ | ~~0.00E+00~~ | ~~0.00E+00~~ |
| Manganese | 2.49E-04 | 1.57E-05 | | | 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 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| 0 | 0.00E+00 | 0.00E+00 | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |
| TOTAL RISK | | | | | 0.00E+00 | 0.00E+00 | 0.00E+00 |

Revisions
08/24/96
KMS

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: .Site 2 – Area A Downstream
LOCATION: NSB–NLON, Groton, CT
DATE: 01/06/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: **Construction Worker, CTE**

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE:
DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE:
Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1 L/1000 CM**3)
t* = TIME IT TAKES TO REACH STEADY–STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

| | |
|---|---|
| EV: | 1 |
| ED: | 1 |
| EF: | 80 |
| A: | 3800 |
| tevent: | 8 |
| BW: | 70 |
| AT(NON): | 365 |
| AT(CAR): | 25550 |

CONVERSION FACTOR (NONCAR) = 1.19E+01

CONVERSION FACTOR (CARCIN) = 1.70E–01

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
Site 2 – Area A Downstream
EXPOSURE SCENARIO: Construction Worker, CTE

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Benzene | 0.003 | O | 6.30E-01 | 2.60E-01 | 2.10E-02 | 1.30E-02 | 5.31E-07 |
| Bromodichloromethane | 0.004 | O | 2.10E+00 | 8.70E-01 | 5.80E-03 | 1.20E-02 | 2.25E-07 |
| Chloroform | 0.005 | O | 1.10E+00 | 4.70E-01 | 8.90E-03 | 9.30E-03 | 3.95E-07 |
| Chloromethane | 0.004 | O | 4.30E-01 | 1.80E-01 | 4.20E-03 | 8.10E-04 | 1.40E-07 |
| 1,2-Dichloroethene | 0.005 | O | 8.20E-01 | 3.40E-01 | 1.00E-02 | 7.20E-03 | 4.32E-07 |
| Methylene chloride | 0.005 | O | 6.90E-01 | 2.90E-01 | 4.50E-03 | 1.80E-03 | 1.93E-07 |
| 1,1,2,2-Tetrachloroethane | 0.005 | O | 2.20E+00 | 9.20E-01 | 9.00E-03 | 2.50E-02 | 4.38E-07 |
| Trichloroethene | 0.005 | O | 1.30E+00 | 5.50E-01 | 1.60E-02 | 2.60E-02 | 7.16E-07 |
| Vinyl chloride | 0.009 | O | 5.10E-01 | 2.10E-01 | 7.30E-03 | 2.30E-03 | 5.52E-07 |
| Benzo(a)pyrene | 0.004 | O | 1.40E+01 | 2.90E+00 | 1.20E+00 | 1.30E+02 | 6.39E-05 |
| Benzo(b)fluoranthene | 0.004 | O | 1.40E+01 | 3.00E+00 | 1.20E+00 | 1.30E+02 | 6.50E-05 |
| Benzo(k)fluoranthene | 0.004 | O | 1.40E+01 | 3.00E+00 | 1.20E+00 | 1.30E+02 | 6.50E-05 |
| Bis(2-ethylhexyl)phthalate | 0.007 | O | 1.00E+02 | 2.10E+01 | 3.30E-02 | 1.30E+01 | 8.28E-06 |
| Dibenz(a,h)anthracene | 0.004 | O | 2.10E+01 | 4.40E+00 | 2.70E+00 | 6.90E+02 | 1.77E-04 |
| Indeno(1,2,3-cd)pyrene | 0.004 | O | 2.10E+01 | 4.20E+00 | 1.90E+00 | 3.80E+02 | 1.22E-04 |
| ~~Aluminum~~ | ~~5.98~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~4.54E-05~~ |
| Antimony | 0.007 | I | | | 1.00E-03 | | 5.60E-08 |
| Arsenic | 0.0033 | I | | | 1.00E-03 | | 2.64E-08 |
| Barium | 0.106 | I | | | 1.00E-03 | | 8.48E-07 |
| Beryllium | 0.00068 | I | | | 1.00E-03 | | 5.44E-09 |
| Boron | 0.094 | I | | | 1.00E-03 | | 7.52E-07 |
| Cadmium | 0.0017 | I | | | 1.00E-03 | | 1.36E-08 |
| Chromium | 0.0091 | I | | | 2.00E-03 | | 1.46E-07 |
| ~~Copper~~ | ~~0.0203~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~1.62E-07~~ |
| ~~Iron~~ | ~~18.7~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~1.50E-04~~ |
| Manganese | 1.73 | I | | | 1.00E-03 | | 1.38E-05 |
| Mercury | 0.00012 | I | | | 1.00E-03 | | 9.60E-10 |
| Thallium | 0.0036 | I | | | 1.00E-03 | | 2.88E-08 |
| Vanadium | 0.0157 | I | | | 1.00E-03 | | 1.26E-07 |
| | | | | | 1.00E-03 | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
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| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |

Revisions
08/24/96
KMS

RISK ASSESSMENT SPREADSHEET -- DERMAL CONTACT WITH GROUNDWATER WATER (PAGE THREE)
Site 2 – Area A Downstream
EXPOSURE SCENARIO: Construction Worker, CTE
CALCULATE DOSES:

| CHEMICAL | ANNUAL DERMAL DOSE (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX DERMAL |
|---|---|---|---|
| Benzene | 6.32E-06 | | 0.00E+00 |
| Bromodichloromethane | 2.67E-06 | 2.00E-02 | 1.34E-04 |
| Chloroform | 4.70E-06 | 1.00E-02 | 4.70E-04 |
| Chloromethane | 1.67E-06 | | 0.00E+00 |
| 1,2-Dichloroethene | 5.14E-06 | 9.00E-03 | 5.71E-04 |
| Methylene chloride | 2.29E-06 | 6.00E-02 | 3.82E-05 |
| 1,1,2,2-Tetrachloroethane | 5.21E-06 | | 0.00E+00 |
| Trichloroethene | 8.52E-06 | 6.00E-03 | 1.42E-03 |
| Vinyl chloride | 6.57E-06 | | 0.00E+00 |
| Benzo(a)pyrene | 7.60E-04 | | 0.00E+00 |
| Benzo(b)fluoranthene | 7.73E-04 | | 0.00E+00 |
| Benzo(k)fluoranthene | 7.73E-04 | | 0.00E+00 |
| Bis(2-ethylhexyl)phthalate | 9.85E-05 | 1.10E-02 | 8.95E-03 |
| Dibenz(a,h)anthracene | 2.11E-03 | | 0.00E+00 |
| Indeno(1,2,3-cd)pyrene | 1.45E-03 | | 0.00E+00 |
| ~~Aluminum~~ | ~~5.41E-04~~ | ~~5.00E-02~~ | ~~1.08E-02~~ |
| Antimony | 6.66E-07 | 4.00E-04 | 1.67E-03 |
| Arsenic | 3.14E-07 | 2.80E-04 | 1.12E-03 |
| Barium | 1.01E-05 | 3.50E-03 | 2.88E-03 |
| Beryllium | 6.47E-08 | 2.50E-04 | 2.59E-04 |
| Boron | 8.95E-06 | 4.50E-03 | 1.99E-03 |
| Cadmium | 1.62E-07 | ~~1.50E-05~~ 2.5E-5 | ~~1.08E-03~~ 6.48E-3 |
| Chromium | 1.73E-06 | 1.00E-04 | 1.73E-02 |
| ~~Copper~~ | ~~1.93E-06~~ | ~~2.20E-02~~ | ~~8.78E-05~~ |
| ~~Iron~~ | ~~1.78E-06~~ | ~~1.50E-02~~ | ~~1.19E-04~~ |
| Manganese | 1.65E-04 | ~~1.50E-04~~ 7.2E-4 | ~~1.10E+00~~ 2.29E-1 |
| Mercury | 1.14E-08 | 1.50E-05 | 7.61E-04 |
| Thallium | 3.43E-07 | 4.00E-06 | 8.57E-02 |
| Vanadium | 1.49E-06 | 3.50E-04 | 4.27E-03 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| 0 | 0.00E+00 | | 0.00E+00 |
| TOTAL RISK | | | ~~4.87E+00~~ 3.63E-1 |

Revisions
09/24/96
KMS

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE FOUR)
Site 2 – Area A Downstream
EXPOSURE SCENARIO: Construction Worker, CTE
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF DERMAL (KG/DAY/MG) | CANCER RISK DERMAL CONTACT |
|---|---|---|---|
| Benzene | 9.03E –08 | 2.90E –02 | 2.62E –09 |
| Bromodichloromethane | 3.82E –08 | 6.20E –02 | 2.37E –09 |
| Chloroform | 6.72E –08 | 6.10E –03 | 4.10E – 10 |
| Chloromethane | 2.39E –08 | 1.30E –02 | 3.10E – 10 |
| 1,2 – Dichloroethene | 7.34E –08 | | 0.00E +00 |
| Methylene chloride | 3.28E –08 | 7.50E –03 | 2.46E – 10 |
| 1,1,2,2 – Tetrachloroethane | 7.45E –08 | 2.00E +01 | 1.49E –06 |
| Trichloroethene | 1.22E –07 | 1.10E –02 | 1.34E –09 |
| Vinyl chloride | 9.38E –08 | 1.90E +00 | 1.78E –07 |
| Benzo(a)pyrene | 1.09E –05 | | 0.00E +00 |
| Benzo(b)fluoranthene | 1.10E –05 | | 0.00E +00 |
| Benzo(k)fluoranthene | 1.10E –05 | | 0.00E +00 |
| Bis(2 –ethylhexyl)phthalate | 1.41E –06 | 2.50E –02 | 3.52E –08 |
| Dibenz(a,h)anthracene | 3.01E –05 | | 0.00E +00 |
| Indeno(1,2,3 – cd)pyrene | 2.07E –05 | | 0.00E +00 |
| ~~Aluminum~~ | ~~7.72E –08~~ | | ~~0.00E +00~~ |
| Antimony | 9.52E –09 | | 0.00E +00 |
| Arsenic | 4.49E –09 | 1.60E +00 | 7.18E –09 |
| Barium | 1.44E –07 | | 0.00E +00 |
| Beryllium | 9.25E – 10 | 8.60E +01 | 7.95E –08 |
| Boron | 1.28E –07 | | 0.00E +00 |
| Cadmium | 2.31E –09 | | 0.00E +00 |
| Chromium | 2.47E –08 | | 0.00E +00 |
| ~~Copper~~ | ~~2.78E –08~~ | | ~~0.00E +00~~ |
| ~~Iron~~ | ~~2.54E –05~~ | | ~~0.00E +00~~ |
| Manganese | 2.35E –06 | | 0.00E +00 |
| Mercury | 1.63E – 10 | | 0.00E +00 |
| Thallium | 4.90E –09 | | 0.00E +00 |
| Vanadium | 2.13E –08 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| TOTAL RISK | | | 1.80E –08 |

Revisions
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KMS

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER

SITE NAME: Site 2 – Area A Downstream
LOCATION: NSB–NLON, Groton, CT
DATE: 01/06/96

HAZARD INDICES AND INCREMENTAL CANCER RISKS ARE CALCULATED BY ON THE FOLLOWING SPREADSHEETS.
ASSUMPTIONS ARE OUTLINED BELOW.

EXPOSURE SCENARIO: Construction Worker, RME

REFERENCES: EPA, DECEMBER 1989 AND JANUARY 1992

DAD = (DAevent x EV x ED x EF x A)/(BW x AT)

WHERE: DAD = DERMALLY ABSORBED DOSE (MG/KG/DAY)
DAevent = ABSORBED DOSE PER EVENT (MG/CM**2/EVENT)
EV = EVENT FREQUENCY (EVENTS/DAY)
ED = EXPOSURE DURATION (YEARS)
EF = EXPOSURE FREQUENCY (DAYS/YEAR)
A = SKIN SURFACE AREA AVAILABLE FOR CONTACT (CM**2)
BW = BODY WEIGHT (KG)
AT = AVERAGING TIME (DAYS)

FOR INORGANICS: DAevent = Kp x C x tevent x CF
FOR ORGANICS: IF tevent < t*, DAevent = 2Kp x C x CF x (6T x tevent/3.141592654)**0.5
IF tevent > t*, DAevent = Kp x C x CF x ((tevent/(1 + B)) + (2T x ((1+3B)/(1 + B))))

WHERE: Kp = PERMEABILITY COEFFICIENT FROM WATER (CM/HR)
C = CONCENTRATION OF CHEMICAL IN WATER (MG/L)
tevent = DURATION OF EVENT (HR/EVENT)
CF = CONVERSION FACTOR (1 L/1000 CM**3)
t* = TIME IT TAKES TO REACH STEADY–STATE (HOUR)
T = LAG TIME (HOUR)
B = PARTITIONING CONSTANT DERVIDED BY BUNGE MODEL (DIMENSIONLESS)

INPUT PARAMETERS:

| | |
|---|---|
| EV: | 1 |
| ED: | 1 |
| EF: | 120 |
| A: | 3600 |
| tevent: | 8 |
| BW: | 70 |
| AT(NON): | 365 |
| AT(CAR): | 25550 |

CONVERSION FACTOR (NONCAR) = 1.78E+01

CONVERSION FACTOR (CARCIN) = 2.55E–01

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE TWO)
Site 2 – Area A Downstream
EXPOSURE SCENARIO: Construction Worker, RME

| CHEMICAL | CONC. (MG/L) | ORGANIC OR INORGANIC? | t* (HR) | T (HR) | Kp (CM/HR) | B | DAevent |
|---|---|---|---|---|---|---|---|
| Benzene | 0.003 | O | 6.30E-01 | 2.60E-01 | 2.10E-02 | 1.30E-02 | 5.31E-07 |
| Bromodichloromethane | 0.004 | O | 2.10E+00 | 8.70E-01 | 5.80E-03 | 1.20E-02 | 2.25E-07 |
| Chloroform | 0.007 | O | 1.10E+00 | 4.70E-01 | 8.90E-03 | 9.30E-03 | 5.53E-07 |
| Chloromethane | 0.004 | O | 4.30E-01 | 1.80E-01 | 4.20E-03 | 8.10E-04 | 1.40E-07 |
| 1,2-Dichloroethene | 0.02 | O | 8.20E-01 | 3.40E-01 | 1.00E-02 | 7.20E-03 | 1.73E-06 |
| Methylene chloride | 0.008 | O | 6.90E-01 | 2.90E-01 | 4.50E-03 | 1.80E-03 | 3.08E-07 |
| 1,1,2,2-Tetrachloroethane | 0.008 | O | 2.20E+00 | 9.20E-01 | 9.00E-03 | 2.50E-02 | 5.26E-07 |
| Trichloroethene | 0.009 | O | 1.30E+00 | 5.50E-01 | 1.80E-02 | 2.60E-02 | 1.29E-06 |
| Vinyl chloride | 0.08 | O | 5.10E-01 | 2.10E-01 | 7.30E-03 | 2.30E-03 | 4.91E-06 |
| Benzo(a)pyrene | 0.004 | O | 1.40E+01 | 2.90E+00 | 1.20E+00 | 1.30E+02 | 6.39E-05 |
| Benzo(b)fluoranthene | 0.004 | O | 1.40E+01 | 3.00E+00 | 1.20E+00 | 1.30E+02 | 6.50E-05 |
| Benzo(k)fluoranthene | 0.004 | O | 1.40E+01 | 3.00E+00 | 1.20E+00 | 1.30E+02 | 6.50E-05 |
| Bis(2-ethylhexyl)phthalate | 0.042 | O | 1.00E+02 | 2.10E+01 | 3.30E-02 | 1.30E+01 | 4.97E-05 |
| Dibenz(a,h)anthracene | 0.004 | O | 2.10E+01 | 4.40E+00 | 2.70E+00 | 6.90E+02 | 1.77E-04 |
| Indeno(1,2,3-cd)pyrene | 0.004 | O | 2.10E+01 | 4.20E+00 | 1.90E+00 | 3.80E+02 | 1.22E-04 |
| ~~Aluminum~~ | ~~48.8~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~3.90E-04~~ |
| Antimony | 20.9 | I | | | 1.00E-03 | | 1.67E-04 |
| Arsenic | 0.0132 | I | | | 1.00E-03 | | 1.06E-07 |
| Barium | 0.447 | I | | | 1.00E-03 | | 3.58E-06 |
| Beryllium | 0.0025 | I | | | 1.00E-03 | | 2.00E-08 |
| Boron | 0.358 | I | | | 1.00E-03 | | 2.86E-06 |
| Cadmium | 0.0078 | I | | | 1.00E-03 | | 6.24E-08 |
| Chromium | 0.0431 | I | | | 2.00E-03 | | 6.90E-07 |
| ~~Copper~~ | ~~0.186~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~1.49E-06~~ |
| ~~Iron~~ | ~~60.6~~ | ~~I~~ | | | ~~1.00E-03~~ | | ~~4.85E-04~~ |
| Manganese | 6.98 | I | | | 1.00E-03 | | 5.58E-05 |
| Mercury | 0.0006 | I | | | 1.00E-03 | | 4.80E-09 |
| Thallium | 0.001 | I | | | 1.00E-03 | | 8.00E-09 |
| Vanadium | 0.116 | I | | | 1.00E-03 | | 9.28E-07 |
| | | | | | 1.00E-03 | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
| | | | | | | | 0.00E+00 |
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| | | | | | | | 0.00E+00 |

Revisions
08/14/96
KMS

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER WATER (PAGE THREE)
Site 2 – Area A Downstream
EXPOSURE SCENARIO: Construction Worker, RME
CALCULATE DOSES:

| CHEMICAL | ANNUAL DERMAL DOSE (MG/KG/DAY) | DERMAL RfD (MG/KG/DAY) | HAZARD INDEX DERMAL |
|---|---|---|---|
| Benzene | 9.48E –06 | | 0.00E +00 |
| Bromodichloromethane | 4.01E –06 | 2.00E –02 | 2.01E –04 |
| Chloroform | 9.88E –06 | 1.00E –02 | 9.88E –04 |
| Chloromethane | 2.50E –06 | | 0.00E +00 |
| 1,2 – Dichloroethene | 3.08E –05 | 9.00E –03 | 3.42E –03 |
| Methylene chloride | 5.50E –06 | 6.00E –02 | 9.17E –05 |
| 1,1,2,2 – Tetrachloroethane | 9.38E –06 | | 0.00E +00 |
| Trichloroethene | 2.30E –05 | 6.00E –03 | 3.83E –03 |
| Vinyl chloride | 8.78E –05 | | 0.00E +00 |
| Benzo(a)pyrene | 1.14E –03 | | 0.00E +00 |
| Benzo(b)fluoranthene | 1.16E –03 | | 0.00E +00 |
| Benzo(k)fluoranthene | 1.16E –03 | | 0.00E +00 |
| Bis(2 – ethylhexyl)phthalate | 8.88E –04 | 1.10E –02 | 8.08E –02 |
| Dibenz(a,h)anthracene | 3.16E –03 | | 0.00E +00 |
| Indeno(1,2,3 – cd)pyrene | 2.17E –03 | | 0.00E +00 |
| ~~Aluminum~~ | ~~6.97E –03~~ | ~~5.00E –02~~ | ~~1.39E –01~~ |
| Antimony | 2.98E –03 | 4.00E –04 | 7.46E +00 |
| Arsenic | 1.88E –06 | 2.80E –04 | 6.73E –03 |
| Barium | 6.38E –05 | 3.50E –03 | 1.82E –02 |
| Beryllium | 3.57E –07 | 2.50E –04 | 1.43E –03 |
| Boron | 5.11E –05 | 4.50E –03 | 1.14E –02 |
| Cadmium | 1.11E –06 | ~~1.50E –05~~ 2.5E-5 | ~~7.42E –02~~ 4.45E-2 |
| Chromium | 1.23E –05 | 1.00E –04 | 1.23E –01 |
| ~~Copper~~ | ~~2.66E –05~~ | ~~2.20E –02~~ | ~~1.21E –03~~ |
| ~~Iron~~ | ~~8.65E –03~~ | ~~1.50E –02~~ | ~~5.77E –01~~ |
| Manganese | 9.97E –04 | ~~1.50E –04~~ 7.2E-4 | ~~6.64E +00~~ 1.38E+0 |
| Mercury | 8.57E –08 | 1.50E –05 | 5.71E –03 |
| Thallium | 1.43E –07 | 4.00E –06 | 3.57E –02 |
| Vanadium | 1.86E –05 | 3.50E –04 | 4.73E –02 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| TOTAL RISK | | | ~~1.52E +01~~ 9.22E+0 |

Revisions
08/24/96
KMS

RISK ASSESSMENT SPREADSHEET – DERMAL CONTACT WITH GROUNDWATER (PAGE FOUR)
Site 2 – Area A Downstream
EXPOSURE SCENARIO: Construction Worker, RME
CALCULATE INCREMENTAL CANCER RISKS:

| CHEMICAL | LIFETIME AVERAGE DERMAL DOSE (MG/KG/DAY) | CSF DERMAL (KG/DAY/MG) | CANCER RISK DERMAL CONTACT |
|---|---|---|---|
| Benzene | 1.35E –07 | 2.90E –02 | 3.93E –09 |
| Bromodichloromethane | 5.73E –08 | 6.20E –02 | 3.55E –09 |
| Chloroform | 1.41E –07 | 6.10E –03 | 8.61E – 10 |
| Chloromethane | 3.58E –08 | 1.30E –02 | 4.65E – 10 |
| 1,2 – Dichloroethene | 4.40E –07 | | 0.00E +00 |
| Methylene chloride | 7.86E –08 | 7.50E –03 | 5.90E – 10 |
| 1,1,2,2 – Tetrachloroethane | 1.34E –07 | 2.00E +01 | 2.68E –06 |
| Trichloroethene | 3.29E –07 | 1.10E –02 | 3.62E –09 |
| Vinyl chloride | 1.25E –06 | 1.90E +00 | 2.38E –06 |
| Benzo(a)pyrene | 1.63E –05 | | 0.00E +00 |
| Benzo(b)fluoranthene | 1.66E –05 | | 0.00E +00 |
| Benzo(k)fluoranthene | 1.66E –05 | | 0.00E +00 |
| Bis(2 – ethylhexyl)phthalate | 1.27E –05 | 2.50E –02 | 3.16E –07 |
| Dibenz(a,h)anthracene | 4.52E –05 | | 0.00E +00 |
| Indeno(1,2,3 – cd)pyrene | 3.10E –05 | | 0.00E +00 |
| ~~Aluminum~~ | ~~9.85E –05~~ | | ~~0.00E +00~~ |
| Antimony | 4.26E –05 | | 0.00E +00 |
| Arsenic | 2.69E –08 | 1.60E +00 | 4.31E –08 |
| Barium | 9.12E –07 | | 0.00E +00 |
| Beryllium | 5.10E –09 | 8.60E +01 | 4.39E –07 |
| Boron | 7.30E –07 | | 0.00E +00 |
| Cadmium | 1.59E –08 | | 0.00E +00 |
| Chromium | 1.76E –07 | | 0.00E +00 |
| ~~Copper~~ | ~~3.79E –07~~ | | ~~0.00E +00~~ |
| ~~Iron~~ | ~~1.24E –04~~ | | ~~0.00E +00~~ |
| Manganese | 1.42E –05 | | 0.00E +00 |
| Mercury | 1.22E –09 | | 0.00E +00 |
| Thallium | 2.04E –09 | | 0.00E +00 |
| Vanadium | 2.37E –07 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| 0 | 0.00E +00 | | 0.00E +00 |
| TOTAL RISK | | | 5.87E –08 |

Revisions
08/24/96
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00404

## IEUBK MODEL - EXPOSURE TO LEAD (PAGE 1 OF 2)

**SITE NAME:** Site 2 - Area A Downstream, Zone 2
**LOCATION:** NSB-NLON, Groton, CT
**DATE:** 01/08/96

**EXPOSURE SCENARIO:** CTE / RME

LEAD MODEL Version 0.99d

AIR CONCENTRATION: 0.100 ug Pb/m3 DEFAULT
Indoor AIR Pb Conc: 30.0 percent of outdoor.
Other AIR Parameters:

| Age | Time Outdoors (hr) | Vent. Rate (m3/day) | Lung Abs. (%) |
|---|---|---|---|
| 0-1 | 1.0 | 2.0 | 32.0 |
| 1-2 | 2.0 | 3.0 | 32.0 |
| 2-3 | 3.0 | 5.0 | 32.0 |
| 3-4 | 4.0 | 5.0 | 32.0 |
| 4-5 | 4.0 | 5.0 | 32.0 |
| 5-6 | 4.0 | 7.0 | 32.0 |
| 6-7 | 4.0 | 7.0 | 32.0 |

DIET: DEFAULT

DRINKING WATER Conc: 10.50 ug Pb/L
WATER Consumption: DEFAULT

SOIL & DUST:
Soil: constant conc.
Dust: constant conc.

| Age | Soil (ug Pb/g) | House Dust (ug Pb/g) |
|---|---|---|
| 0-1 | 207.0 | 200.0 |
| 1-2 | 207.0 | 200.0 |
| 2-3 | 207.0 | 200.0 |
| 3-4 | 207.0 | 200.0 |
| 4-5 | 207.0 | 200.0 |
| 5-6 | 207.0 | 200.0 |
| 6-7 | 207.0 | 200.0 |

Additional Dust Sources: None DEFAULT

PAINT Intake: 0.00 ug Pb/day DEFAULT

MATERNAL CONTRIBUTION: Infant Model
Maternal Blood Conc: 2.50 ug Pb/dL

CALCULATED BLOOD Pb and Pb UPTAKES:

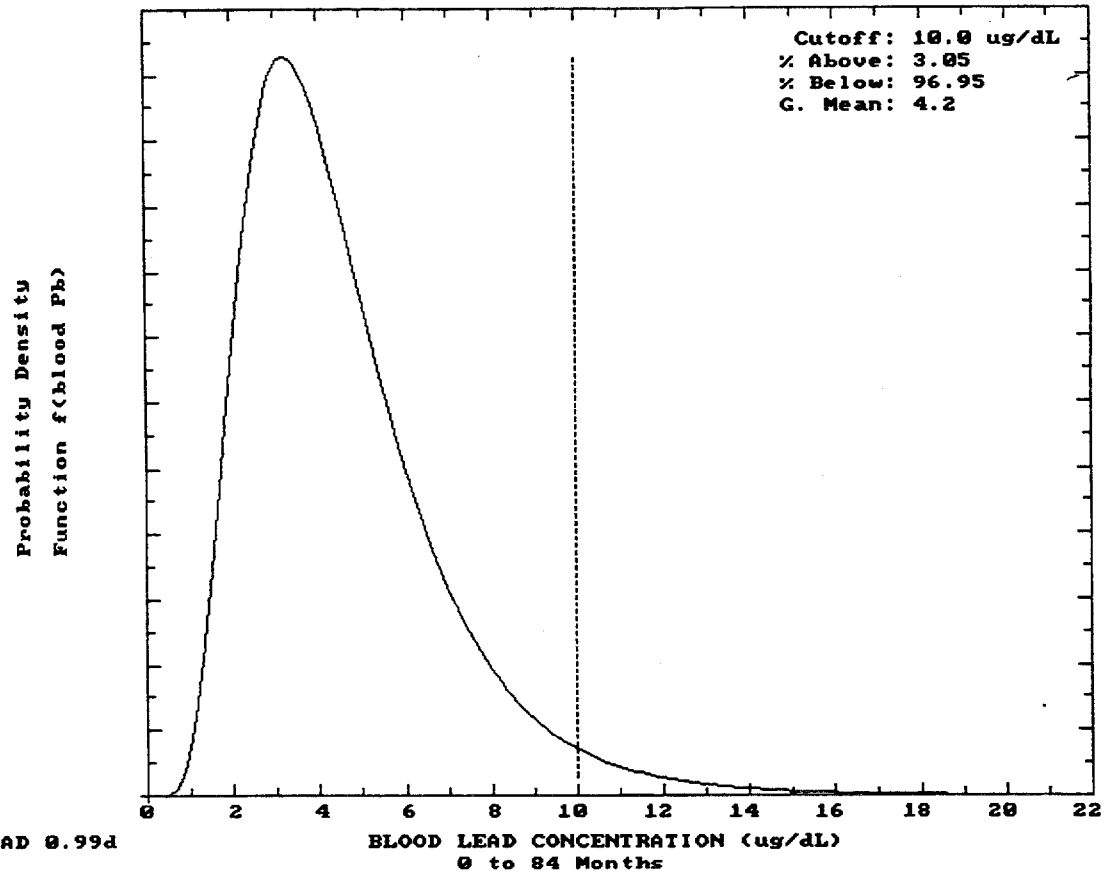
| YEAR | Blood Level (ug/dL) | Total Uptake (ug/day) | Soil+Dust Uptake (ug/day) |
|---|---|---|---|
| 0.5-1: | 4.4 | 8.21 | 4.72 |
| 1-2: | 5.1 | 12.36 | 7.38 |
| 2-3: | 4.8 | 12.95 | 7.47 |
| 3-4: | 4.6 | 13.07 | 7.57 |
| 4-5: | 3.9 | 11.33 | 5.73 |
| 5-6: | 3.5 | 11.18 | 5.20 |
| 6-7: | 3.2 | 11.30 | 4.93 |

| YEAR | Diet Uptake (ug/day) | Water Uptake (ug/day) | Paint Uptake (ug/day) | Air Uptake (ug/day) |
|---|---|---|---|---|
| 0.5-1: | 2.52 | 0.96 | 0.00 | 0.02 |
| 1-2: | 2.59 | 2.35 | 0.00 | 0.03 |
| 2-3: | 2.95 | 2.48 | 0.00 | 0.06 |
| 3-4: | 2.87 | 2.56 | 0.00 | 0.07 |
| 4-5: | 2.82 | 2.71 | 0.00 | 0.07 |
| 5-6: | 3.00 | 2.88 | 0.00 | 0.09 |
| 6-7: | 3.33 | 2.95 | 0.00 | 0.09 |

IEUBK MODEL - EXPOSURE TO LEAD (PAGE 2 OF 2)

SITE NAME: Site 2 - Area A Downstream, Zone 2
LOCATION: NSB-NLON, Groton, CT
DATE: 01/08/96

EXPOSURE SCENARIO: CTE/RME




LEAD 0.99d

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 1 - SOIL/SEDIMENT (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| 2-Butanone | 0.12 | 0.04 | 500 | 1000 | 8 | 80 |
| Acetone | 0.32 | 0.19 | 500 | 1000 | 14 | 140 |
| Carbon disulfide | 0.011 | 0.005 | - | - | - | - |
| Ethylbenzene | 0.002 | 0.002 | 500 | 1000 | 10.1 | 10.1 |
| Methylene chloride | 0.045 | 0.016 | 82 | 760 | 0.1 | 1.0 |
| Tetrachloroethene | 0.004 | 0.004 | 12 | 110 | 0.1 | 1 |
| Toluene | 0.004 | 0.004 | 500 | 1000 | 20 | 67 |
| Xylenes (total) | 0.003 | 0.003 | 500 | 1000 | 19.5 | 19.5 |
| 4-Methylphenol | 0.23 | 0.18 | - | - | - | - |
| Acenaphthene | 0.14 | 0.12 | - | - | - | - |
| Anthracene | 0.39 | 0.36 | 1000 | 2500 | 40 | 400 |
| Benzo(a)anthracene | 0.85 | 0.33 | 1 | 7.8 | 1 | 1 |
| Benzo(a)pyrene | 0.59 | 0.31 | 1 | 1 | 1 | 1 |
| Benzo(b)fluoranthene | 0.75 | 0.29 | 1 | 7.8 | 1 | 1 |
| Benzo(g,h,i)perylene | 0.26 | 0.15 | - | - | - | - |
| Benzo(k)fluoranthene | 0.29 | 0.15 | 8.4 | 78 | 1 | 1 |
| Benzoic acid | 0.082 | 0.082 | - | - | - | - |
| Bis(2-Ethylhexyl)phthalate | 0.16 | 0.15 | 44 | 410 | 1 | 11 |
| Chrysene | 0.72 | 0.36 | - | - | - | - |
| Di-N-butyl phthalate | 0.053 | 0.053 | 1000 | 2500 | 14 | 140 |
| Di-N-octyl phthalate | 0.081 | 0.081 | 1000 | 2500 | 2 | 20 |
| Dibenzofuran | 0.1 | 0.10 | - | - | - | - |
| Fluoranthene | 1.5 | 0.7 | 1000 | 2500 | 5.6 | 56 |
| Fluorene | 0.2 | 0.19 | 1000 | 2500 | 5.6 | 56 |
| Indeno(1,2,3-Cd)pyrene | 0.36 | 0.16 | - | - | - | - |
| Naphthalene | 0.08 | 0.080 | 1000 | 2500 | 5.6 | 56 |
| Phenanthrene | 1.6 | 0.6 | 1000 | 2500 | 4 | 40 |
| Pyrene | 1.9 | 0.7 | 1000 | 2500 | 4 | 40 |
| 4,4'-DDD | 300 | 41 | - | - | - | - |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 1 - SOIL/SEDIMENT (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| 4,4'-DDE | 24 | 3 | - | - | - | - |
| 4,4'-DDT | 1400 | 71 | - | - | - | - |
| Alpha-Chlordane | 0.29 | 0.16 | 0.49 (5) | 2.2 (5) | 0.066 (5)* | 0.066 (5) * |
| Dieldrin | 0.37 | 0.19 | 0.038 * | 0.36 * | 0.007 * | 0.007 * |
| Endosulfan I | 0.0037 | 0.0037 | - | - | - | - |
| Gamma-Chlordane | 0.081 | 0.081 | 0.49 (5) | 2.2 (5) | 0.066 (5)* | 0.066 (5) * |
| Heptachlor | 0.016 | 0.016 | 0.14 | 1.3 | 0.013 * | 0.013 * |
| 1,2,3,4,6,7,8-HPCDD | 0.0005 | 0.0005 | - | - | - | - |
| OCDD | 0.0054 | 0.005 | - | - | - | - |
| OCDF | 0.0006 | 0.0006 | - | - | - | - |
| Aluminum | 18800 | 10958 | - | - | - | - |
| Arsenic | 39.9 | 8.9 | 10 * | 10 * | - | - |
| Barium | 154 | 62 | 4700 | 1.4E+5 | - | - |
| Beryllium | 1.8 | 0.9 | 2 | 2 | - | - |
| Boron | 26.3 | 19.7 | - | - | - | - |
| Cadmium | 30.1 | 7.2 | 34 | 1000 | - | - |
| Calcium | 5720 | 2925 | - | - | - | - |
| Chromium (total) | 43.4 | 22.1 | 100 (6) | 100 (6) | - | - |
| Cobalt | 26.6 | 10.6 | - | - | - | - |
| Copper | 118 | 30 | 2500 | 7.6E+4 | - | - |
| Cyanide | 3.4 | 1.8 | 1400 | 4.1E+4 | - | - |
| Iron | 195000 | 49338 | - | - | - | - |
| Lead | 223 | 52 | 500 | 1000 | - | - |
| Magnesium | 9640 | 3918 | - | - | - | - |
| Manganese | 2850 | 525 | - | - | - | - |
| Mercury | 0.33 | 0.33 | 20 | 610 | - | - |
| Nickel | 44.6 | 16.7 | 1400 | 7500 | - | - |
| Potassium | 3620 | 1447 | - | - | - | - |
| Selenium | 3.2 | 1.2 | 340 | 1E+4 | - | - |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 1 - SOIL/SEDIMENT (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| Silver | 4.3 | 4.3 | 340 | 1E+4 | - | - |
| Sodium | 2070 | 742 | - | - | - | - |
| Vanadium | 64.9 | 31.5 | 470 | 1.4E+4 | - | - |
| Zinc | 2720 | 242 | 2E+4 | 6.1E+5 | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 CTDEP, December 13, 1995.
3 Cis-1,2-dichloroethene.
4 1,3-Dichloropropene (total).
5 Chlordane.
6 Chromium (hexavalent).

000409

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 2 - SOIL/SEDIMENT (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| 1,1-Dichloroethene | 0.016 | 0.016 | 1 | 9.5 | 0.14 | 1.4 |
| 2-Butanone | 0.28 | 0.14 | 500 | 1000 | 8 | 80 |
| Acetone | 0.9 | 0.49 | 500 | 1000 | 14 | 140 |
| Carbon disulfide | 0.007 | 0.007 | - | - | - | - |
| Tetrachloroethene | 0.058 | 0.058 | 12 | 110 | 0.1 | 1 |
| Toluene | 0.1 | 0.10 | 500 | 1000 | 20 | 67 |
| Trichloroethene | 0.024 | 0.024 | 56 | 520 | 0.1 | 1 |
| 4-Chloro-3-methylphenol | 0.42 | 0.42 | - | - | - | - |
| 4-Methylphenol | 1.1 | 0.9 | - | - | - | - |
| Acenaphthene | 0.21 | 0.21 | - | - | - | - |
| Benzo(a)anthracene | 0.34 | 0.34 | 1 | 7.8 | 1 | 1 |
| Benzo(a)pyrene | 0.28 | 0.21 | 1 | 1 | 1 | 1 |
| Benzo(b)fluoranthene | 0.46 | 0.31 | 1 | 7.8 | 1 | 1 |
| Benzo(g,h,i)perylene | 0.29 | 0.22 | - | - | - | - |
| Benzo(k)fluoranthene | 0.29 | 0.23 | 8.4 | 78 | 1 | 1 |
| Benzoic acid | 3.2 | 1.7 | - | - | - | - |
| Chrysene | 0.63 | 0.43 | - | - | - | - |
| Di-N-butyl phthalate | 0.18 | 0.18 | 1000 | 2500 | 14 | 140 |
| Fluoranthene | 1 | 0.49 | 1000 | 2500 | 5.6 | 56 |
| Indeno(1,2,3-Cd)pyrene | 0.24 | 0.24 | - | - | - | - |
| Pentachlorophenol | 0.31 | 0.31 | 5.1 | 48 | 1 | 1 |
| Phenanthrene | 0.62 | 0.33 | 1000 | 2500 | 4 | 40 |
| Pyrene | 1 | 0.51 | 1000 | 2500 | 4 | 40 |
| 4,4'-DDD | 850 | 150 | - | - | - | - |
| 4,4'-DDE | 24 | 5 | - | - | - | - |
| 4,4'-DDT | 59 | 14 | - | - | - | - |
| Alpha-Chlordane | 0.0013 | 0.0013 | 0.49 (5) | 2.2 (5) | 0.066 (5) | 0.066 (5) |
| Dieldrin | 0.86 | 0.25 | 0.038 * | 0.36 * | 0.007 * | 0.007 * |
| Endrin aldehyde | 0.24 | 0.24 | - | - | - | - |

SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)
SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 2 - SOIL/SEDIMENT (MG/KG)
NSB-NLON, GROTON, CONNECTICUT

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| Endrin ketone | 0.28 | 0.28 | - | - | - | - |
| Gamma-Chlordane | 0.023 | 0.023 | 0.49 (5) | 2.2 (5) | 0.066 (5) | 0.066 (5) |
| Heptachlor epoxide | 0.0006 | 0.0006 | 0.067 | 0.63 | 0.02 | 0.02 |
| Aluminum | 26200 | 9339 | - | - | - | - |
| Antimony | 11.4 | 11.4 | 27 | 8200 | - | - |
| Arsenic | 9.5 | 4.0 | 10 | 10 | - | - |
| Barium | 111 | 55 | 4700 | 1.4E+5 | - | - |
| Beryllium | 0.72 | 0.37 | 2 | 2 | - | - |
| Boron | 19.1 | 17.1 | - | - | - | - |
| Cadmium | 4 | 3 | 34 | 1000 | - | - |
| Calcium | 11300 | 3785 | - | - | - | - |
| Chromium (total) | 28.6 | 11.1 | 100 (6) | 100 (6) | - | - |
| Cobalt | 13.4 | 4.8 | - | - | - | - |
| Copper | 45.5 | 29.9 | 2500 | 7.6E+4 | - | - |
| Cyanide | 0.2 | 0.20 | 1400 | 4.1E+4 | - | - |
| Iron | 23200 | 12790 | - | - | - | - |
| Lead | 661 | 124 | 500 * | 1000 | - | - |
| Magnesium | 3920 | 1451 | - | - | - | - |
| Manganese | 399 | 185 | - | - | - | - |
| Nickel | 25.2 | 14.6 | 1400 | 7500 | - | - |
| Potassium | 724 | 382 | - | - | - | - |
| Selenium | 3 | 3 | 340 | 1E+4 | - | - |
| Sodium | 2220 | 1003 | - | - | - | - |
| Vanadium | 86.9 | 37.3 | 470 | 1.4E+4 | - | - |
| Zinc | 111 | 54 | 2E+4 | 6.1E+5 | - | - |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 2 - SOIL/SEDIMENT (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 CTDEP, December 13, 1995.
3 Cis-1,2-dichloroethene.
4 1,3-Dichloropropene (total).
5 Chlordane.
6 Chromium (hexavalent).

## SUMMARY OF COMPARISON TO STATE STANDARDS (1)
## SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 3 - SOIL/SEDIMENT (MG/KG)
## NSB-NLON, GROTON, CONNECTICUT

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| Carbon disulfide | 0.004 | 0.004 | - | - | - | - |
| Methylene chloride | 0.07 | 0.026 | 82 | 760 | 0.1 | 1.0 |
| Trichloroethene | 0.003 | 0.003 | 56 | 520 | 0.1 | 1 |
| 2-Nitroaniline | 3.1 | 3.1 | - | - | - | - |
| 4,6-Dinitro-2-methylphenol | 6.2 | 6.2 | - | - | - | - |
| Benzo(b)fluoranthene | 0.16 | 0.16 | 1 | 7.8 | 1 | 1 |
| Fluoranthene | 0.06 | 0.060 | 1000 | 2500 | 5.6 | 56 |
| Pyrene | 0.14 | 0.10 | 1000 | 2500 | 4 | 40 |
| 4,4'-DDD | 120 | 36 | - | - | - | - |
| 4,4'-DDE | 9 | 2 | - | - | - | - |
| 4,4'-DDT | 29 | 4 | - | - | - | - |
| Alpha-Chlordane | 0.49 | 0.15 | 0.49 (5) | 2.2 (5) | 0.066 (5)* | 0.066 (5) * |
| Aroclor-1254 | 0.035 | 0.035 | 1 | 10 | - | - |
| Dieldrin | 0.9 | 0.20 | 0.038 * | 0.36 * | 0.007 * | 0.007 * |
| Endosulfan sulfate | 0.0039 | 0.0039 | - | - | - | - |
| Endrin | 0.084 | 0.084 | 20 | 610 | - | - |
| Gamma-Chlordane | 0.18 | 0.18 | 0.49 (5) | 2.2 (5) | 0.066 (5)* | 0.066 (5) * |
| Heptachlor | 0.046 | 0.046 | 0.14 | 1.3 | 0.013 * | 0.013 * |
| Heptachlor epoxide | 0.0014 | 0.0014 | 0.067 | 0.63 | 0.02 | 0.02 |
| Aluminum | 33100 | 17486 | - | - | - | - |
| Antimony | 6.1 | 6.1 | 27 | 8200 | - | - |
| Arsenic | 17.7 | 6.6 | 10 * | 10 * | - | - |
| Barium | 635 | 158 | 4700 | 1.4E+5 | - | - |
| Beryllium | 5.6 | 3.0 | 2 * | 2 * | - | - |
| Boron | 23.8 | 13.9 | - | - | - | - |
| Cadmium | 13.8 | 8.0 | 34 | 1000 | - | - |
| Calcium | 92200 | 16577 | - | - | - | - |
| Chromium (total) | 48.9 | 26.4 | 100 (6) | 100 (6) | - | - |
| Cobalt | 26.7 | 11.8 | - | - | - | - |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 3 - SOIL/SEDIMENT (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| Copper | 94.3 | 48.2 | 2500 | 7.6E+4 | - | - |
| Cyanide | 21.4 | 7.9 | 1400 | 4.1E+4 | - | - |
| Iron | 639000 | 119900 | - | - | - | - |
| Lead | 82 | 37 | 500 | 1000 | - | - |
| Magnesium | 4420 | 2361 | - | - | - | - |
| Manganese | 1300 | 488 | - | - | - | - |
| Nickel | 46.7 | 24.5 | 1400 | 7500 | - | - |
| Potassium | 2390 | 1634 | - | - | - | - |
| Selenium | 17.8 | 17.8 | 340 | 1E+4 | - | - |
| Sodium | 1930 | 677 | - | - | - | - |
| Vanadium | 56.7 | 32.9 | 470 | 1.4E+4 | - | - |
| Zinc | 617 | 244 | 2E+4 | 6.1E+5 | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 CTDEP, December 13, 1995.
3 Cis-1,2-dichloroethene.
4 1,3-Dichloropropene (total).
5 Chlordane.
6 Chromium (hexavalent).

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 4 - SEDIMENT (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| Methylene chloride | 0.014 | 0.011 | 82 | 760 | 0.1 | 1.0 |
| Benzo(b)fluoranthene | 0.047 | 0.047 | 1 | 7.8 | 1 | 1 |
| Fluoranthene | 0.068 | 0.068 | 1000 | 2500 | 5.6 | 56 |
| Pyrene | 0.064 | 0.064 | 1000 | 2500 | 4 | 40 |
| Aluminum | 8830 | 4175 | - | - | - | - |
| Arsenic | 4.5 | 2.0 | 10 | 10 | - | - |
| Barium | 41.9 | 22.5 | 4700 | 1.4E+5 | - | - |
| Beryllium | 0.36 | 0.36 | 2 | 2 | - | - |
| Cadmium | 1.7 | 1.7 | 34 | 1000 | - | - |
| Calcium | 1150 | 820 | - | - | - | - |
| Chromium (total) | 12.5 | 8.4 | 100 (6) | 100 (6) | - | - |
| Cobalt | 5.5 | 5.5 | - | - | - | - |
| Copper | 36.5 | 15.9 | 2500 | 7.6E+4 | - | - |
| Iron | 9930 | 5545 | - | - | - | - |
| Lead | 13.1 | 7.8 | 500 | 1000 | - | - |
| Magnesium | 2350 | 1398 | - | - | - | - |
| Manganese | 177 | 89 | - | - | - | - |
| Mercury | 7 | 4 | 20 | 610 | - | - |
| Nickel | 8.6 | 6.9 | 1400 | 7500 | - | - |
| Potassium | 1310 | 764 | - | - | - | - |
| Sodium | 375 | 375 | - | - | - | - |
| Vanadium | 21.4 | 10.3 | 470 | 1.4E+4 | - | - |
| Zinc | 37.7 | 19.3 | 2E+4 | 6.1E+5 | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 CTDEP, December 13, 1995.
3 Cis-1,2-dichloroethene.
4 1,3-Dichloropropene (total).
5 Chlordane.
6 Chromium (hexavalent).

## SUMMARY OF COMPARISON TO STATE STANDARDS (1)
## SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 5 - SEDIMENT (MG/KG)
## NSB-NLON, GROTON, CONNECTICUT

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| Carbon disulfide | 0.002 | 0.002 | - | - | - | - |
| 4-Chloroaniline | 0.51 | 0.51 | - | - | - | - |
| Acenaphthylene | 0.071 | 0.071 | 1000 | 2500 | 8.4 | 84 |
| Anthracene | 0.068 | 0.068 | 1000 | 2500 | 40 | 400 |
| Benzo(a)anthracene | 0.7 | 0.47 | 1 | 7.8 | 1 | 1 |
| Benzo(a)pyrene | 0.41 | 0.30 | 1 | 1 | 1 | 1 |
| Benzo(b)fluoranthene | 0.5 | 0.42 | 1 | 7.8 | 1 | 1 |
| Benzo(g,h,i)perylene | 0.73 | 0.73 | - | - | - | - |
| Benzo(k)fluoranthene | 0.17 | 0.14 | 8.4 | 78 | 1 | 1 |
| Benzoic acid | 0.091 | 0.091 | - | - | - | - |
| Chrysene | 1.2 | 0.7 | - | - | - | - |
| Fluoranthene | 1 | 0.64 | 1000 | 2500 | 5.6 | 56 |
| Indeno(1,2,3-Cd)pyrene | 0.75 | 0.75 | - | - | - | - |
| Phenanthrene | 0.98 | 0.47 | 1000 | 2500 | 4 | 40 |
| Pyrene | 2.7 | 1.3 | 1000 | 2500 | 4 | 40 |
| 4,4'-DDD | 12 | 6 | - | - | - | - |
| 4,4'-DDE | 0.35 | 0.26 | - | - | - | - |
| 4,4'-DDT | 7 | 2 | - | - | - | - |
| Aroclor-1260 | 0.28 | 0.28 | 1 | 10 | - | - |
| Aluminum | 15300 | 8480 | - | - | - | - |
| Arsenic | 3.8 | 2.2 | 10 | 10 | - | - |
| Barium | 60.5 | 39.6 | 4700 | 1.4E+5 | - | - |
| Beryllium | 1.5 | 1.2 | 2 | 2 | - | - |
| Cadmium | 6.1 | 3.4 | 34 | 1000 | - | - |
| Calcium | 2160 | 1666 | - | - | - | - |
| Chromium (total) | 23.9 | 15.0 | 100 (6) | 100 (6) | - | - |
| Cobalt | 9.3 | 5.7 | - | - | - | - |
| Copper | 45.7 | 25.9 | 2500 | 7.6E+4 | - | - |
| Iron | 33200 | 17940 | - | - | - | - |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 5 - SEDIMENT (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| Lead | 64.2 | 29.1 | 500 | 1000 | - | - |
| Magnesium | 3790 | 2570 | - | - | - | - |
| Manganese | 236 | 158 | - | - | - | - |
| Mercury | 0.26 | 0.21 | 20 | 610 | - | - |
| Nickel | 19.1 | 10.8 | 1400 | 7500 | - | - |
| Potassium | 2080 | 1305 | - | - | - | - |
| Silver | 7.8 | 7.8 | 340 | 1E+4 | - | - |
| Sodium | 3500 | 1091 | - | - | - | - |
| Vanadium | 42.8 | 24.6 | 470 | 1.4E+4 | - | - |
| Zinc | 135 | 85 | 2E+4 | 6.1E+5 | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 CTDEP, December 13, 1995.
3 Cis-1,2-dichloroethene.
4 1,3-Dichloropropene (total).
5 Chlordane.
6 Chromium (hexavalent).

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A DOWNSTREAM, ZONE 6 - SEDIMENT (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| Methylene chloride | 0.001 | 0.001 | 82 | 760 | 0.1 | 1.0 |
| Acenaphthene | 0.041 | 0.041 | - | - | - | - |
| Acenaphthylene | 0.15 | 0.11 | 1000 | 2500 | 8.4 | 84 |
| Anthracene | 0.16 | 0.13 | 1000 | 2500 | 40 | 400 |
| Benzo(a)anthracene | 0.78 | 0.47 | 1 | 7.8 | 1 | 1 |
| Benzo(a)pyrene | 0.64 | 0.37 | 1 | 1 | 1 | 1 |
| Benzo(b)fluoranthene | 0.52 | 0.35 | 1 | 7.8 | 1 | 1 |
| Benzo(g,h,i)perylene | 1.2 | 1.2 | - | - | - | - |
| Benzo(k)fluoranthene | 0.32 | 0.25 | 8.4 | 78 | 1 | 1 |
| Benzoic acid | 0.046 | 0.046 | - | - | - | - |
| Chrysene | 0.95 | 0.53 | - | - | - | - |
| Fluoranthene | 1.3 | 0.8 | 1000 | 2500 | 5.6 | 56 |
| Fluorene | 0.13 | 0.09 | 1000 | 2500 | 5.6 | 56 |
| Indeno(1,2,3-Cd)pyrene | 1.2 | 0.7 | - | - | - | - |
| Phenanthrene | 1.6 | 0.8 | 1000 | 2500 | 4 | 40 |
| Pyrene | 4.7 | 1.9 | 1000 | 2500 | 4 * | 40 |
| 4,4'-DDE | 0.12 | 0.12 | - | - | - | - |
| 4,4'-DDT | 0.12 | 0.12 | - | - | - | - |
| Aluminum | 4000 | 2913 | - | - | - | - |
| Arsenic | 1.1 | 1.1 | 10 | 10 | - | - |
| Barium | 32.1 | 24.4 | 4700 | 1.4E+5 | - | - |
| Cadmium | 2 | 2 | 34 | 1000 | - | - |
| Calcium | 2750 | 1388 | - | - | - | - |
| Chromium (total) | 6 | 5 | 100 (6) | 100 (6) | - | - |
| Cobalt | 6 | 4 | - | - | - | - |
| Copper | 16 | 12 | 2500 | 7.6E+4 | - | - |
| Iron | 10500 | 9020 | - | - | - | - |
| Lead | 38.2 | 20.1 | 500 | 1000 | - | - |
| Magnesium | 2320 | 1692 | - | - | - | - |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A DOWNSTREAM, ZONE 6 - SEDIMENT (MG/KG)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Direct Exposure (2) | | Pollutant Mobility (2) | |
|---|---|---|---|---|---|---|
| | | | Residential | Industrial | GA/GAA | GB |
| Manganese | 877 | 575 | - | - | - | - |
| Nickel | 6.1 | 4.9 | 1400 | 7500 | - | - |
| Potassium | 787 | 556 | - | - | - | - |
| Sodium | 230 | 205 | - | - | - | - |
| Vanadium | 12.4 | 10.7 | 470 | 1.4E+4 | - | - |
| Zinc | 53.3 | 46.2 | 2E+4 | 6.1E+5 | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 CTDEP, December 13, 1995.
3 Cis-1,2-dichloroethene.
4 1,3-Dichloropropene (total).
5 Chlordane.
6 Chromium (hexavalent).

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES - UNFILTERED GROUNDWATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | State MCL (2) | Groundwater Protection (3) | Surface Water Protection (3) |
|---|---|---|---|---|---|
| 1,1,2,2-Tetrachloroethane | 7 | 7 | - | 0.5 * | 110 |
| 1,2-Dichloroethene (total) | 28 | 13 | 70 (4) | 70 (4) | - |
| Benzene | 1 | 1 | 5 | 1 | 710 |
| Bromodichloromethane | 2 | 2 | 100 | - | - |
| Chloroform | 12 | 7 | 100 | 6 * | 14100 |
| Chloromethane | 2 | 2 | - | - | - |
| Methylene chloride | 11 | 10 | 5 * | 5 * | 48000 |
| Trichloroethene | 17 | 7 | 5 * | 5 * | 2340 |
| Vinyl chloride | 130 | 92 | 2 * | 2 * | 15750 |
| Benzo(a)pyrene | 1 | .2 | 0.2 * | 0.2 * | 0.3 * |
| Benzo(b)fluoranthene | 1 | 1 | - | 0.08 * | 0.3 * |
| Benzo(g,h,i)perylene | 4 | 4 | - | - | - |
| Benzo(k)fluoranthene | 1 | 1 | - | 0.5 * | 0.3 * |
| Benzoic acid | 0.9 | 0.65 | - | - | - |
| Bis(2-Ethylhexyl)phthalate | 59 | 15 | 6 * | 2 * | 59 |
| Di-N-octyl phthalate | 5 | 3 | - | 100 | - |
| Dibenzo(a,h)anthracene | 3 | 3 | - | - | - |
| Diethyl phthalate | 0.8 | 0.75 | - | - | - |
| Indeno(1,2,3-Cd)pyrene | 3 | 3 | - | - | - |
| Phenol | 3 | 3 | - | 4000 | 92000000 |
| Aluminum | 97400 | 8847 | - | - | - |
| Arsenic | 23.9 | 5.0 | 50 | 50 | 4 * |
| Barium | 835 | 106 | 2000 | 1000 | - |
| Beryllium | 4.4 | 2.3 | 4 * | 4 * | 4 * |
| Boron | 374 | 158 | - | - | - |
| Cadmium | 16 | 6 | 5 * | 5 * | 6 * |
| Calcium | 196000 | 43666 | - | - | - |
| Chromium (total) | 84.6 | 20.1 | 100 (5) | 50 (5) * | 110 (6) |
| Cobalt | 60.3 | 19.2 | - | - | - |

**SUMMARY OF COMPARISON TO STATE STANDARDS (1) (Continued)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES - UNFILTERED GROUNDWATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | State MCL (2) | Groundwater Protection (3) | Surface Water Protection (3) |
|---|---|---|---|---|---|
| Copper | 370 | 37 | - | 1300 | 48 * |
| Iron | 121000 | 22191 | - | - | - |
| Lead | 220 | 35 | - | 15 * | 13 * |
| Magnesium | 62200 | 15239 | - | - | - |
| Manganese | 7110 | 1959 | 5000 (7) * | - | - |
| Mercury | 1.1 | 1.1 | 2 | 2 | 0.4 * |
| Nickel | 61.5 | 25.4 | 100 | 100 | 880 |
| Potassium | 46300 | 8412 | - | - | - |
| Selenium | 6.3 | 3.7 | 50 | 50 | 50 |
| Silver | 3.3 | 2.5 | 50 | 36 | 12 |
| Sodium | 569000 | 160248 | 28000 (8) * | - | - |
| Thallium | 10 | 7 | 2 * | 5 * | 63 |
| Vanadium | 229 | 43 | - | 50 * | - |
| Zinc | 800 | 73 | - | 5000 | 123 * |

Footnotes:

1 * - Indicates that maximum detection exceed this standard.
2 Maximum Contaminant Level. Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
3 CTDEP, December 13, 1995.
4 Cis-1,2-dichloroethene.
5 Chromium (total).
6 Chromium (hexavalent).
7 Current Connecticut Department of Public Health and Addiction Services Action Level.
8 Notification Level.

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES - FILTERED GROUNDWATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | State MCL (2) | Groundwater Protection (3) | Surface Water Protection (3) |
|---|---|---|---|---|---|
| Aluminum | 4050 | 765 | - | - | - |
| Antimony | 20.9 | 17.9 | 6 * | 6 * | 86000 |
| Arsenic | 6 | 4 | 50 | 50 | 4 * |
| Barium | 363 | 67 | 2000 | 1000 | - |
| Beryllium | 1 | 1 | 4 | 4 | 4 |
| Boron | 359 | 163 | - | - | - |
| Cadmium | 4.3 | 3.4 | 5 | 5 | 6 |
| Calcium | 176000 | 39728 | - | - | - |
| Cobalt | 27.4 | 17.1 | - | - | - |
| Copper | 3.4 | 2.6 | - | 1300 | 48 |
| Iron | 35700 | 6922 | - | - | - |
| Lead | 5.8 | 2.7 | - | 15 | 13 |
| Magnesium | 61000 | 12628 | - | - | - |
| Manganese | 7630 | 1702 | 5000 (7) * | - | - |
| Mercury | 0.4 | 0.40 | 2 | 2 | 0.4 |
| Nickel | 56.3 | 23.4 | 100 | 100 | 880 |
| Potassium | 20900 | 7095 | - | - | - |
| Silver | 2 | 2 | 50 | 36 | 12 |
| Sodium | 3560000 | 217732 | 28000 (8) * | - | - |
| Thallium | 7.7 | 6.4 | 2 * | 5 * | 63 |
| Zinc | 39.3 | 11.3 | - | 5000 | 123 |

Footnotes:

1 * - Indicates that maximum detection exceed this standard.
2 Maximum Contaminant Level. Title 19, Health and Safety, the Public Health Code of the State of Connecticut, Chapter II Environmental Health.
3 CTDEP, December 13, 1995.
4 Cis-1,2-dichloroethene.
5 Chromium (total).
6 Chromium (hexavalent).
7 Current Connecticut Department of Public Health and Addiction Services Action Level.
8 Notification Level.

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 1 - UNFILTERED SURFACE WATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Water Quality Standards (2) | | | |
|---|---|---|---|---|---|---|
| | | | Aquatic Life | | Human Health | |
| | | | Freshwater | Saltwater | Organisms | Water and Organisms |
| Carbon disulfide | 3 | 2 | - | - | - | - |
| Methylene chloride | 20 | 19 | - | - | 1600 | 4.7 * |
| 4,4'-DDD | 0.39 | 0.25 | - | - | 0.00084 * | 0.00083 * |
| Aluminum | 2090 | 395 | - | - | - | - |
| Arsenic | 19.4 | 19.4 | 190 | 36 | 0.14 * | 0.018 * |
| Barium | 53.6 | 46.4 | - | - | - | - |
| Boron | 152 | 128 | - | - | - | - |
| Calcium | 37400 | 28506 | - | - | - | - |
| Copper | 10.4 | 6.8 | 4.8 * | 2.9 * | - | - |
| Iron | 5220 | 2511 | - | - | - | - |
| Lead | 13.6 | 7.9 | 1.3 * | 8.5 * | - | 50 |
| Magnesium | 23000 | 15683 | - | - | - | - |
| Manganese | 1740 | 1272 | - | - | - | - |
| Nickel | 1.3 | 1.3 | 88 | 8.3 | 4600 | 610 |
| Potassium | 8520 | 7284 | - | - | - | - |
| Sodium | 207000 | 144121 | - | - | - | - |
| Vanadium | 5.7 | 5.7 | - | - | - | - |
| Zinc | 58.3 | 28.0 | 12.3 * | 86 | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 Connecticut Water Quality Standards, 1992.
3 Chromium (hexavalent).

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 1 - FILTERED SURFACE WATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Water Quality Standards (2) | | | |
|---|---|---|---|---|---|---|
| | | | Aquatic Life | | Human Health | |
| | | | Freshwater | Saltwater | Organisms | Water and Organisms |
| Aluminum | 96.1 | 93.1 | - | - | - | - |
| Arsenic | 2.2 | 2.2 | 190 | 36 | 0.14 * | 0.018 * |
| Barium | 49.9 | 48.3 | - | - | - | - |
| Boron | 149 | 133 | - | - | - | - |
| Calcium | 36900 | 32850 | - | - | - | - |
| Cobalt | 1 | 1 | - | - | - | - |
| Iron | 4140 | 1655 | - | - | - | - |
| Magnesium | 22500 | 18200 | - | - | - | - |
| Manganese | 1700 | 1438 | - | - | - | - |
| Mercury | 0.29 | 0.29 | 0.012 * | 0.025 * | 0.15 * | 0.14 * |
| Nickel | 1.9 | 1.9 | 88 | 8.3 | 4600 | 610 |
| Potassium | 8360 | 8050 | - | - | - | - |
| Sodium | 203000 | 168750 | - | - | - | - |
| Zinc | 21.1 | 21.1 | 12.3 * | 86 | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 Connecticut Water Quality Standards, 1992.
3 Chromium (hexavalent).

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 2 - UNFILTERED SURFACE WATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Water Quality Standards (2) | | | |
|---|---|---|---|---|---|---|
| | | | Aquatic Life | | Human Health | |
| | | | Freshwater | Saltwater | Organisms | Water and Organisms |
| 4,4'-DDD | 5.9 | 2.4 | - | - | 0.00084 * | 0.00083 * |
| 4,4'-DDE | 0.35 | 0.26 | - | - | 0.00059 * | 0.00059 * |
| 4,4'-DDT | 1.5 | 0.9 | 0.001 * | 0.001 * | 0.00059 * | 0.00059 * |
| Aluminum | 781 | 260 | - | - | - | - |
| Barium | 36.6 | 33.8 | - | - | - | - |
| Boron | 90.8 | 82.2 | - | - | - | - |
| Cadmium | 2.1 | 2.1 | 660 | 9.3 | 170 | 16 |
| Calcium | 22400 | 17600 | - | - | - | - |
| Cobalt | 5.4 | 3.3 | - | - | - | - |
| Copper | 9.4 | 4.0 | 4.8 * | 2.9 * | - | - |
| Iron | 6660 | 4294 | - | - | - | - |
| Lead | 2.8 | 2.8 | 1.3 * | 8.5 | - | 50 |
| Magnesium | 8600 | 6474 | - | - | - | - |
| Manganese | 1060 | 729 | - | - | - | - |
| Potassium | 6040 | 5184 | - | - | - | - |
| Sodium | 126000 | 110100 | - | - | - | - |
| Vanadium | 2.4 | 2.0 | - | - | - | - |
| Zinc | 34.6 | 23.3 | 12.3 * | 86 | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 Connecticut Water Quality Standards, 1992.
3 Chromium (hexavalent).

## SUMMARY OF COMPARISON TO STATE STANDARDS (1)
## SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 2 - FILTERED SURFACE WATER (UG/L)
## NSB-NLON, GROTON, CONNECTICUT

| Parameter | Maximum | Average of Positive Hits | Water Quality Standards (2) | | | |
|---|---|---|---|---|---|---|
| | | | Aquatic Life | | Human Health | |
| | | | Freshwater | Saltwater | Organisms | Water and Organisms |
| Aluminum | 45.3 | 40.3 | - | - | - | - |
| Barium | 33.6 | 33.0 | - | - | - | - |
| Boron | 90.2 | 84.9 | - | - | - | - |
| Calcium | 17300 | 16767 | - | - | - | - |
| Cobalt | 1.2 | 1.2 | - | - | - | - |
| Iron | 998 | 616 | - | - | - | - |
| Magnesium | 6660 | 6173 | - | - | - | - |
| Manganese | 668 | 642 | - | - | - | - |
| Nickel | 1.5 | 1.3 | 88 | 8.3 | 4600 | 610 |
| Potassium | 6330 | 5857 | - | - | - | - |
| Sodium | 126000 | 125000 | - | - | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 Connecticut Water Quality Standards, 1992.
3 Chromium (hexavalent).

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 3 - UNFILTERED SURFACE WATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Water Quality Standards (2) | | | |
|---|---|---|---|---|---|---|
| | | | Aquatic Life | | Human Health | |
| | | | Freshwater | Saltwater | Organisms | Water and Organisms |
| Methylene chloride | 6 | 6 | - | - | 1600 | 4.7 * |
| 4,4'-DDD | 0.35 | 0.17 | - | - | 0.00084 * | 0.00083 * |
| Aluminum | 508 | 288 | - | - | - | - |
| Barium | 61.5 | 45.4 | - | - | - | - |
| Boron | 285 | 136 | - | - | - | - |
| Calcium | 32800 | 20489 | - | - | - | - |
| Cobalt | 3.5 | 3.3 | - | - | - | - |
| Copper | 12.6 | 7.8 | 4.8 * | 2.9 * | - | - |
| Cyanide | 11.3 | 11.3 | 5.2 * | 1 * | 220000 | 700 |
| Iron | 6560 | 2921 | - | - | - | - |
| Lead | 5.6 | 4.6 | 1.3 * | 8.5 | - | 50 |
| Magnesium | 18600 | 7903 | - | - | - | - |
| Manganese | 488 | 357 | - | - | - | - |
| Nickel | 6.4 | 6.0 | 88 | 8.3 | 4600 | 610 |
| Potassium | 14200 | 8786 | - | - | - | - |
| Sodium | 145000 | 108100 | - | - | - | - |
| Zinc | 70.3 | 36.3 | 12.3 * | 86 | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 Connecticut Water Quality Standards, 1992.
3 Chromium (hexavalent).

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 3 - FILTERED SURFACE WATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Water Quality Standards (2) | | | |
|---|---|---|---|---|---|---|
| | | | Aquatic Life | | Human Health | |
| | | | Freshwater | Saltwater | Organisms | Water and Organisms |
| Aluminum | 66.3 | 65.5 | - | - | - | - |
| Arsenic | 2.6 | 2.4 | 190 | 36 | 0.14 * | 0.018 * |
| Barium | 56.9 | 50.5 | - | - | - | - |
| Boron | 78.4 | 76.3 | - | - | - | - |
| Calcium | 20900 | 20067 | - | - | - | - |
| Cobalt | 3.5 | 3.2 | - | - | - | - |
| Iron | 2800 | 2473 | - | - | - | - |
| Lead | 5.2 | 5.2 | 1.3 * | 8.5 | - | 50 |
| Magnesium | 5860 | 5763 | - | - | - | - |
| Manganese | 454 | 439 | - | - | - | - |
| Nickel | 6.7 | 6.0 | 88 | 8.3 | 4600 | 610 |
| Potassium | 7560 | 6217 | - | - | - | - |
| Sodium | 111000 | 102433 | - | - | - | - |
| Zinc | 29 | 29 | 12.3 * | 86 | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 Connecticut Water Quality Standards, 1992.
3 Chromium (hexavalent).

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 4 - UNFILTERED SURFACE WATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Water Quality Standards (2) | | | |
|---|---|---|---|---|---|---|
| | | | Aquatic Life | | Human Health | |
| | | | Freshwater | Saltwater | Organisms | Water and Organisms |
| Aluminum | 1670 | 491 | - | - | - | - |
| Boron | 215 | 175 | - | - | - | - |
| Calcium | 13700 | 12388 | - | - | - | - |
| Copper | 10 | 10 | 4.8 * | 2.9 * | - | - |
| Iron | 2040 | 699 | - | - | - | - |
| Lead | 10.6 | 4.0 | 1.3 * | 8.5 * | - | 50 |
| Magnesium | 2220 | 1818 | - | - | - | - |
| Manganese | 136 | 62 | - | - | - | - |
| Potassium | 2680 | 2074 | - | - | - | - |
| Sodium | 38700 | 35620 | - | - | - | - |
| Zinc | 19.9 | 18.5 | 12.3 * | 86 | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 Connecticut Water Quality Standards, 1992.
3 Chromium (hexavalent).

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**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 5 - UNFILTERED SURFACE WATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Water Quality Standards (2) | | | |
|---|---|---|---|---|---|---|
| | | | Aquatic Life | | Human Health | |
| | | | Freshwater | Saltwater | Organisms | Water and Organisms |
| Carbon disulfide | 2 | 2 | - | - | - | - |
| Ethylbenzene | 3 | 2 | - | - | 29000 | 3100 |
| Styrene | 2 | 2 | - | - | - | - |
| Tetrachloroethene | 3 | 3 | - | - | 8.85 | 0.8 * |
| Xylenes (total) | 6 | 5 | - | - | - | - |
| 4,4'-DDD | 0.15 | 0.14 | - | - | 0.00084 * | 0.00083 * |
| Aluminum | 396 | 188 | - | - | - | - |
| Barium | 87 | 52 | - | - | - | - |
| Boron | 238 | 235 | - | - | - | - |
| Calcium | 31900 | 22313 | - | - | - | - |
| Copper | 11.7 | 9.7 | 4.8 * | 2.9 * | - | - |
| Iron | 2980 | 1796 | - | - | - | - |
| Lead | 7 | 5 | 1.3 * | 8.5 | - | 50 |
| Magnesium | 51600 | 13443 | - | - | - | - |
| Manganese | 533 | 245 | - | - | - | - |
| Mercury | 1.5 | 1.5 | 0.012 * | 0.025 * | 0.15 * | 0.14 * |
| Nickel | 12.9 | 12.9 | 88 | 8.3 * | 4600 | 610 |
| Potassium | 20300 | 11760 | - | - | - | - |
| Sodium | 444000 | 156363 | - | - | - | - |
| Zinc | 71.6 | 35.7 | 12.3 * | 86 | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 Connecticut Water Quality Standards, 1992.
3 Chromium (hexavalent).

**SUMMARY OF COMPARISON TO STATE STANDARDS (1)**
**SITE 2 AREA A DOWNSTREAM WATERCOURSES, ZONE 6 - UNFILTERED SURFACE WATER (UG/L)**
**NSB-NLON, GROTON, CONNECTICUT**

| Parameter | Maximum | Average of Positive Hits | Water Quality Standards (2) | | | |
|---|---|---|---|---|---|---|
| | | | Aquatic Life | | Human Health | |
| | | | Freshwater | Saltwater | Organisms | Water and Organisms |
| Xylenes (total) | 2 | 2 | - | - | - | - |
| Di-N-butyl phthalate | 0.6 | 0.60 | - | - | 12000 | 2700 |
| 4,4'-DDD | 0.19 | 0.19 | - | - | 0.00084 * | 0.00083 * |
| Aluminum | 104 | 68 | - | - | - | - |
| Barium | 34.1 | 28.8 | - | - | - | - |
| Boron | 1540 | 908 | - | - | - | - |
| Calcium | 124000 | 58750 | - | - | - | - |
| Copper | 11.4 | 10.3 | 4.8 * | 2.9 * | - | - |
| Iron | 2340 | 889 | - | - | - | - |
| Lead | 2.8 | 2.4 | 1.3 * | 8.5 | - | 50 |
| Magnesium | 400000 | 133400 | - | - | - | - |
| Manganese | 1140 | 695 | - | - | - | - |
| Mercury | 0.3 | 0.30 | 0.012 * | 0.025 * | 0.15 * | 0.14 * |
| Potassium | 175000 | 55508 | - | - | - | - |
| Selenium | 1.4 | 1.4 | 5 | 71 | 6800 | 100 |
| Sodium | 902000 | 403500 | - | - | - | - |
| Vanadium | 6.1 | 6.1 | - | - | - | - |
| Zinc | 18 | 16 | 12.3 * | 86 | - | - |

Footnotes:

1 * - Indicates that maximum detection exceeds this standard.
2 Connecticut Water Quality Standards, 1992.
3 Chromium (hexavalent).